Strong Start for Mothers and Newborns Evaluation:

YEAR 5 PROJECT SYNTHESIS

Volume 1: Cross-Cutting Findings

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Executive Summary

In 2016 the United States spent an estimated $111 billion on pregnancy and newborn care (National Center for Health Statistics, 2016). Despite this high spending, the U.S. continues to experience some of the worst maternal and infant outcomes among developed countries, including high rates of maternal and infant mortality (United Health Foundation, 2016).

The Strong Start for Mothers and Newborns initiative, funded under Section 3021 of the Affordable Care Act (ACA), aimed to improve maternal and infant outcomes for women covered by Medicaid and the Children's Health Insurance Program (CHIP) during pregnancy. The initiative funded enhanced services through three evidence-based prenatal care models—Birth Centers, Group Prenatal Care, and Maternity Care Homes—and supported the delivery of these services through 27 awardees and 211 provider sites across 32 states, the District of Columbia, and Puerto Rico. Four-year cooperative agreements were awarded on February 15, 2013 by the Center for Medicare and Medicaid Innovation (CMMI) of the Centers for Medicare and Medicaid Services (CMS). The Strong Start awardees comprised a wide variety of organizations, including hospital and health systems, health plans, and community-based providers and agencies; only one award directly contracted with a state.

CMMI contracted with the Urban Institute to conduct an independent, five-year evaluation of Strong Start implementation and the program's impacts on maternal and infant health outcomes, health care delivery, and cost of care. Urban partnered with the American Institutes for Research (AIR), Health Management Associates (HMA), and Briljent to assist with the effort. Specifically, the evaluation set out to answer the following key research questions:

1. How does Strong Start prenatal care differ from typical Medicaid maternity practice?
2. What are the characteristics of Strong Start participants?
3. What is the impact of Strong Start on outcomes (gestational age, birth weight, and costs)?

To answer these questions, the evaluation included three primary components:

- ***Qualitative case studies***, which provided an in-depth understanding of how Strong Start approaches were designed, implemented, and evolved over time;
- ***Participant-level process evaluation (PLPE)***, which collected detailed information on the demographic and risk characteristics, service use, and outcomes of all Strong Start participants; and
- ***Impact analysis***, which assessed whether and to what extent Strong Start had an impact on rates of preterm birth, low birthweight births, and Medicaid/CHIP costs through pregnancy and the first year after birth.

This Year 5 Project Synthesis presents final findings from the evaluation.

SUMMARY OF FINDINGS

We synthesize five years of findings regarding the women served by Strong Start, awardees' experiences implementing the initiative, outcomes among participants, and the impacts of Strong Start on rates of preterm birth, low birthweight, Medicaid costs, and other select outcomes.

WHO WAS SERVED BY STRONG START?

The Strong Start evaluation collected detailed information on the demographic profiles and risk characteristics of every woman that was served under the initiative.

Strong Start provided enhanced prenatal care to a large and diverse group of women. Strong Start touched the lives of nearly 46,000 women and their infants. According to the PLPE data collected by the evaluation, Strong Start participants were disproportionately black (40 percent) and Hispanic (30 percent) compared with pregnant Medicaid beneficiaries overall (who are 25 percent black and 20 percent Hispanic) (Kaiser Family Foundation, 2016). The overrepresentation of black women was driven, in part, by the large number of awardees in the southeastern U.S., where there is a concentration of black residents overall, and is notable because black women across all income levels are more likely than white or Hispanic women to experience adverse pregnancy outcomes (Zhang et el. 2013; Martin et al 2015).

Strong Start participants faced a large number of social and medical challenges that placed them at risk of experiencing poor birth outcomes. Nearly half of women enrolled in Strong Start were neither employed nor in school, more than a quarter had not completed high school or a GED, and just 15 percent possessed a college degree. A fifth experienced food insecurity, and more than one-third reported barriers to accessing prenatal care (most commonly not having a car or money to afford a ride). Nearly 28 percent of Strong Start participants screened positive for depression—a rate more than twice what is reported in the literature for pregnant women generally (Bennett et al. 2004; Melville et al. 2010; Katon et al. 2011; Gavin et al. 2005). Many Strong Start participants also suffered from chronic health conditions related to poor birth outcomes. More than a third of participants were obese and another 26 percent were overweight. The majority of participants had previously given birth (61 percent) and many of these women had experienced a prior poor birth outcome. More than 20 percent had a prior preterm birth, the strongest predictor of subsequent preterm birth.

WHAT WERE THE STRONG START INTERVENTIONS?

Strong Start's enhanced prenatal care models were designed to address perceived weaknesses in "typical" prenatal care. The vast majority of Medicaid maternity care is offered in settings such as private solo or group physician practices, Federally Qualified Health Centers, and hospital outpatient department clinics, and is delivered under prepaid managed care arrangements. Criticisms of typical prenatal care include that it is overly medical in focus, paying insufficient attention to psychosocial risks that contribute to poor birth outcomes; overly interventionist in that providers may induce labor or perform C-section deliveries without medical indication; insufficiently focused on education on such critical issues as nutrition, exercise, childbirth preparation, breastfeeding, and family planning; and lacking in continuity in that pregnant women are usually seen by many providers over the course of

their pregnancies, undermining the establishment of a strong, trusting relationship between each woman and her provider.

In-depth case studies allowed the evaluation to develop a nuanced understanding of the three Strong Start interventions, how they differed from "typical" Medicaid prenatal care, and how they were implemented.

Birth Centers (BCs) followed the midwifery model of care supplemented by peer counselors who provided support, health education, and referrals. The Birth Center model was implemented by two awardees in 47 sites and served approximately 20 percent of all Strong Start participants who received their prenatal care at the Birth Center regardless of where they gave birth. The evaluation's case studies found that all sites reflected two key characteristics: 1) prenatal care following the midwifery model, which is a holistic and wellness approach to pregnancy and birth that is more time-intensive than typical OB/GYN care; and 2) psychosocial support, health education, and referrals to additional resources provided by a "peer counselor."

Group Prenatal Care (GPC) engaged groups of women over their pregnancies and provided clinical care and in-depth education during two-hour facilitated sessions. Group Prenatal Care was implemented by 15 awardees in 60 sites and served approximately 23 percent of Strong Start participants. These awardees provided comprehensive prenatal care in a group setting (rather than the typical one-on-one care provided by obstetrical providers) via a series of facilitated sessions covering a broad range of issues, including nutrition and exercise, stress reduction, family planning, parenting, domestic violence, and childbirth preparation. Group Prenatal Care awardees were also uniform in their emphasis on building strong peer relationships among enrolled pregnant women.

Maternity Care Homes (MCHs) augmented typical prenatal care with the addition of "care managers" to facilitate coordination and provide psychosocial supports. Maternity Care Homes were implemented by 17 awardees at 112 sites and served the largest proportion of Strong Start enrollees, 57 percent. Maternity Care Homes were the most varied in their approach to Strong Start, as well as the intensity of their interventions; but, their consistent feature was the addition of "care managers" to provide care coordination and psychosocial support to enrolled pregnant women.

Intensive education, psychosocial support, and referrals to non-medical services were primary attributes of all Strong Start models. Each of the Strong Start models went beyond an exclusively medical focus to provide a range of educational interventions designed to improve outcomes, addressing such topics as nutrition, exercise, family planning/birth spacing, breastfeeding, stress management, smoking cessation, oral hygiene, normal and abnormal pregnancy symptoms, preterm birth prevention, childbirth preparation, and infant care and safety, among others. Furthermore, across models, Strong Start staff strived to make referrals (as possible) to non-medical services that could support healthy pregnancies; services commonly included food support programs, behavioral health care, dental care, domestic violence services, housing support, transportation services, childcare, and utility assistance. Finally, the three models shared an emphasis on psychosocial support through relationship-based care. For Group Prenatal Care awardees, this support was provided by group facilitators and by the participants themselves. For Birth Centers, the midwife and peer counselor provided psychosocial support; in Maternity care homes, this role was filled by the care manager.

Strong Start awardees worked hard to address a range of implementation challenges through creativity, adaptability, and persistence. Across models, common implementation challenges included identifying and enrolling eligible women into Strong Start, integrating enhanced prenatal care services into existing models of care, and handling program-related data burdens. Early in the demonstration, many awardees perceived that prenatal care providers did not support Strong Start because they made few referrals to the program. Especially intractable was the challenge of addressing the full scope of client needs because most communities had insufficient resources to help women with mental health, substance abuse, transportation, affordable childcare, and housing. Over time, however, Strong Start awardees refined their approaches to care, succeeding in overcoming many, if not all, of these challenges.

WHAT DID WOMEN SAY ABOUT THEIR EXPERIENCES WITH STRONG START?

Participant focus groups gave voice to the experiences of pregnant and postpartum women, who overwhelmingly said that they appreciated the extra time, support, and education Strong Start provided. Most women with prior pregnancies said they were more satisfied with their prenatal and delivery experiences under Strong Start than they had with typical maternity care in the past.

WHAT OUTCOMES DID STRONG START PARTICIPANTS EXPERIENCE?

Descriptive analyses of the PLPE data revealed that patient risk profiles and rates of preterm birth varied considerably across the three Strong Start models, with women served by Birth Centers experiencing the lowest risk levels. Birth Center participants had dramatically lower rates of preterm birth (4.5 percent) than women served by either Group Prenatal Care (12 percent) or Maternity Care Homes (12.9 percent). Similarly, rates of low birthweight among Birth Center participants were much lower (3.6 percent) than for Group Prenatal Care and Maternity Care Home participants (10 percent and 10.5 percent, respectively). Finally, Cesarean section deliveries for Strong Start participants were, by far, lowest for women in Birth Centers (13 percent). In contrast, approximately 30 percent of Group Prenatal Care and Maternity Care Home participants had C-sections.

HOW DID WOMEN'S OUTCOMES COMPARE ACROSS STRONG START MODELS?

Regression adjusted analysis using the PLPE data compared the outcomes for all women who participated in Strong Start while controlling for a host of participant characteristics and medical and social risk factors commonly associated with poor birth outcomes, some of which not are not available in data sources such as vital records (e.g. depression, food insecurity). These results cannot convey the *impacts* of Strong Start compared to typical Medicaid prenatal care (impact analysis is presented in the next section), but they can describe how mothers and infants in the three Strong Start models fared relative to one another. Linear regression models used Maternity Care Homes as the reference category when comparing models because this model had the largest number of Strong Start enrollees and was, arguably, the most similar to typical models of prenatal care.

Regressions of participant data show that Birth Center participants experienced significantly better outcomes than their counterparts in Maternity Care Homes, but Group Prenatal Care enrollees (overall) did not. After demographic, medical and social risks were controlled, women enrolled in Birth Centers were five percentage points less likely to have a preterm birth than women enrolled in Maternity Care Homes. Birth Center participants were also four percentage points less likely to deliver a low birthweight infant, and seven percentage points less likely to have a C-section delivery than Maternity Care Home enrollees. While, overall, there were no significant differences in outcomes between women in Group Prenatal Care and their counterparts served by Maternity Care Homes, black Group Prenatal Care participants were three percentage points less likely to deliver a low birthweight baby, and white participants were five percentage points less likely to have a preterm birth.

WHAT WERE THE IMPACTS OF STRONG START ON BIRTH OUTCOMES AND COST OF CARE?

In the largest study of its type conducted to date, the evaluation used linked birth certificate, Medicaid eligibility, and Medicaid claims/encounter data to compare birth and cost outcomes for women participating in Strong Start enhanced prenatal care to outcomes for comparable, non-participating Medicaid-enrolled women. For each awardee and for individual sites with sufficient sample size, we used propensity score re-weighting to develop a comparison group of women with risk profiles closely matched to those of women enrolled in Strong Start. We were able to include awardees and sites in 13 states to estimate the impacts of Strong Start on birth outcomes, with nine of these states also included in the cost outcomes analysis.

Strong Start participants in Birth Centers had significantly more positive birth outcomes than women in comparison groups who received care from typical Medicaid providers. Regardless of whether women gave birth at the Birth Center or in a hospital, infants born to Birth Center participants had an average clinical estimate of gestation that was almost half a week longer than that of infants born to comparison group women, were significantly less likely to be preterm than comparison group infants (6.3 percent vs. 8.5 percent), and were less likely to be born at low birthweight (5.9 percent vs. 7.4 percent). Rates of C-section deliveries were 17.5 percent for Strong Start women who received care in a Birth Center compared to 29.0 percent for matched women in typical care. Strong Start participants were more likely to have weekend deliveries than women in the comparison group, indicating lower incidence of planned inductions or C-sections. Finally, rates of vaginal birth after C-section (VBAC) were 24.6 percent for women enrolled in Strong Start Birth Centers compared to 12.5 percent for women in typical Medicaid prenatal care.

Birth Center participants in Strong Start achieved better birth outcomes at a lower overall cost. Delivery expenditures were, on average, 21 percent lower and total expenditures from delivery until the infant's first birthday were 16 percent less for women enrolled in Birth Centers than for women and infants in the comparison group. Lower costs appeared to be driven, in part, by changes in the approach to prenatal care and associated outcomes (such as lower rates of C-sections), and small reductions in the number of infant emergency department visits and hospitalizations following delivery. Lower costs were also likely due to lower reimbursement rates for professional fees and deliveries in Birth Centers relative to hospitals.

Group Prenatal Care participants were more likely to have a weekend delivery compared to women receiving typical Medicaid prenatal care. Just over a quarter (25.5 percent) of women in Group Prenatal Care had a weekend delivery as compared to 22.0 percent of women in the comparison group, suggesting that women in Group Prenatal Care were less likely to have scheduled inductions or cesareans. There were no significant effects of Strong Start enrollment on the clinical estimate of gestation, rates of preterm or very preterm birth, average birthweight, rates of low birthweight, or the probability of having an Apgar score greater than or equal to seven.

Prenatal care expenditures were lower for Strong Start Group Prenatal Care enrollees compared to women in typical Medicaid prenatal care. Expenditures in the eight months prior to delivery for women enrolled in Group Prenatal Care were about 15 percent lower than the average for women in the comparison group. This lower cost may have been driven, in part, by a reduction in the number of maternal hospitalizations during the prenatal period.

Maternity Care Home participants were also more likely to have a weekend delivery compared to women in typical Medicaid prenatal care, but there was no evidence that Strong Start Maternity Care Homes improved birth outcomes or reduced costs relative to typical Medicaid prenatal care. There was a small increase in weekend deliveries for women enrolled in Strong Start Maternity Care Homes, suggesting that awardees may have been less likely to plan inductions for Strong Start women than typical prenatal care providers were with their patients. However, we found no other positive effects of enrollment in a Maternity Care Home on birth outcomes or cost of care. More than the other Strong Start models, there was considerable variation in effects across Maternity Care Homes, with some awardees or sites demonstrating some positive outcomes even though the pooled analysis did not. Findings did not appear correlated with the intensity of the intervention.

DISCUSSION

The results from the Strong Start evaluation hold a range of implications both for Medicaid and for prenatal care practice more generally. For Medicaid, the clear take-away is that if more pregnant beneficiaries accessed Birth Centers for their maternity care, on average they would likely experience significantly better birth outcomes and, as a result, the program could save money. Unfortunately, many barriers stand in the way of obtaining Birth Center care. The Strong Start evaluation's case studies identified many reasons why only a small fraction of pregnant Medicaid beneficiaries receives their maternity care from Birth Centers.

Managed care has become the dominant service delivery and payment model for Medicaid, but Birth Center providers told us that they often have difficulty contracting with Medicaid managed care organizations (MCOs). Even when Birth Centers succeed in obtaining contracts, reimbursement rates are often too low to cover the actual cost of care, especially given the time-intensive nature of prenatal care offered under the midwifery model. Traditional Medicaid fee-for-service reimbursement for professional and facility fees are a fraction of what the program pays obstetricians and hospitals. The financial strain of low payment rates can be exacerbated when Medicaid payments are delayed or when lengthy Medicaid eligibility determination processes delay pregnant women's enrollment. Combined, these factors cause many Birth Centers to limit the number of Medicaid beneficiaries they serve. In some states scope of practice laws and licensing policies make it difficult for Birth Centers and midwives

to practice at all, which can further limit the availability of Birth Center care for pregnant women, regardless of Medicaid status.

Existing Medicaid policies can also hinder the development of enhanced prenatal care models generally, such as Group Prenatal Care and Maternity Care Home models. This evaluation's telephone survey with Medicaid and CHIP officials in select states revealed that program policies rarely offer explicit coverage of or incentives for prenatal care enhancements. States currently retain the flexibility to adopt Targeted Case Management for pregnant women or Enhanced Prenatal Care services through the State Plan Amendment process, but these options were more widely used by states when Medicaid was a fee-for-service program and are less viable in a program now dominated by prepaid managed care (Hill et al, 2009). The proprietary nature of Medicaid managed care health plan information creates barriers to accessing information about how MCOs manage their provider networks, pay providers, and specify the content of prenatal care services delivered under bundled payment arrangements. The proliferation of managed care thus means that state and federal officials have fewer direct policy levers to influence changes in health plan and provider service delivery.

In conclusion, this evaluation provides clear evidence that prenatal care in Strong Start's Birth Centers –with their holistic model of care – succeeded in significantly improving almost every outcome we measured, most importantly rates of preterm birth, low birthweight, and C-section deliveries, when participants were considered against a comparison group with similar risks. Improved outcomes, as well as reductions in health care utilization, likely contributed to reduced expenditures.,. It seems quite likely that, if progress could be made in addressing the barriers to Birth Center care described above, more Medicaid-covered pregnant women could experience positive births, more infants born to Medicaid mothers could start their lives healthy, and the Medicaid program—at both the federal and state levels—could reap significant savings.

It is unrealistic for Birth Centers to become the dominant maternity care provider under Medicaid or in the U.S. any time soon, however. Thus, more typical maternity care settings, where the vast majority of women of all incomes and insurance types still receive care, will continue to face the challenge of improving outcomes for women and infants. The Strong Start evaluation's findings provide insights that may be helpful in this regard. Namely, the midwifery model of care, which can be practiced by any provider in any setting, offers lessons for how to structure prenatal care to improve outcomes for women who face poverty, relationship instability, depression, and a host of other life-challenges.

Across all Strong Start models, providers such care managers, group care facilitators, midwives, and peer counselors were praised for spending more time with patients and focusing on health education and psychosocial support services, areas often not addressed in typical clinical visits. However, Strong Start providers and staff also described the difficulties they encountered in addressing the most pressing needs of participants, in particular needs for mental health treatment, opioid and other substance use treatment, stable housing, healthy food, transportation, and personal safety (especially with regard to intimate partner violence), because resources to mitigate these needs were so often in short supply in their communities. Given the complex needs and high levels of medical and social risk among many Medicaid-enrolled women, accompanied by inadequate community resources, it is unsurprising that relatively small changes in clinical care practice, such as those adopted by Maternity Care Homes, were not sufficient to improve birth outcomes. Moving forward, comprehensively attending to the broader needs faced by low-income women, including many social determinants of health, will be necessary to achieve reductions in preterm birth and other improved outcomes. No model of care can sufficiently address the myriad needs of Medicaid-enrolled women, particularly those at higher risk, without broad community support and robust social support systems.

Introduction

In 2016 the United States spent a total of $3.2 trillion on healthcare, with an estimated $111 billion of that spent on pregnancy and newborn care (National Center for Health Statistics, 2016). However, despite these high rates of spending, the United States continues to experience some of the worst maternal and infant outcomes compared to similar countries, with among the highest rates of maternal and infant mortality (United Health Foundation, 2016). According to the Centers for Disease Control and Prevention (CDC), 1 out of every 10 infants born in 2016 was preterm, and the infant mortality rate was 5.9 deaths per 1000 live births, ranking the United States last among 27 other wealthy nations of the world (CDC, 2015; CDC, 2016; CDC, 2018). Within the United States, some of the worst outcomes are concentrated in Southeastern states, such as Mississippi, Louisiana, South Carolina, and Alabama. There are also significant disparities among these outcomes by race-ethnicity, with black women faring particularly poorly. The rate of low birthweight births for babies born to black mothers is nearly twice the rate of babies born to white mothers, thirteen percent versus seven percent (Rothwell, 2015), while the rate of preterm birth for black mothers is one-and-one-half times higher than the rate for white mothers (13.3 percent vs. 9 percent); Hispanic mothers experience preterm birth rates that are essentially on par with those of white mothers (March of Dimes, 2016).

The Strong Start for Mothers and Newborns Initiative (Strong Start II),[1] funded under Section 3021 of the Affordable Care Act (ACA), aimed to improve maternal and infant outcomes for women covered by Medicaid and the Children's Health Insurance Program (CHIP) during pregnancy. The initiative funded services through three evidence-based prenatal care models – Birth Centers, Group Prenatal Care, and Maternity Care Homes – and supported the delivery of enhanced services through 27 awardees and approximately 210 provider sites[2] across 32 states, the District of Columbia, and Puerto Rico.[3] The Center for Medicare and Medicaid Innovation (CMMI) of the Centers for Medicare and Medicaid Services (CMS) awarded four-year cooperative agreements, funded from a budget of $41.4 million, on February 15, 2013 that were intended to fund three years of service provision. Most awardees received no-cost extensions to prolong service provision by up to 12 months, but all had completed Strong Start program operations by February 2017. At the time of this writing, any sustained services are no longer supported by Strong Start cooperative agreement funds.

CMMI contracted with the Urban Institute to conduct an independent evaluation of Strong Start; Urban partnered with the American Institutes for Research (AIR), Health Management Associates (HMA), and Briljent to assist with the effort. This five-year study was charged with evaluating the

[1] Strong Start II, which is the subject of this report, is one of two initiatives to improve birth outcomes that have been funded by CMS. The other initiative, Strong Start I, was designed to reduce early elective deliveries. In addition, the Mother and Infant Home Visiting Program (MIHOPE) has a Strong Start component involving sites that provide care beginning in the prenatal period. The Strong Start II and MIHOPE-Strong Start programs are being evaluated separately. For the remainder of this document, references to Strong Start refer to Strong Start II.

[2] This number reflects the total number of unique provider sites that ever participated in Strong Start, but excludes nine Birth Center sites and one Group Prenatal Care site that joined the program but never enrolled any women into the program. Over time, the number of provider sites in Strong Start declined, as some dropped out of the initiative. At the close of Strong Start, there were 175 active providers.

[3] This number reflects the highest number of states where Strong Start providers ever operated. Over time, as some providers dropped out of the initiative, the number of states where Strong Start was operating also declined. At the close of the initiative, Strong Start providers were operating in 29 states, DC, and Puerto Rico.

implementation and impact of Strong Start on maternal and infant health outcomes, health care delivery, and cost of care; key research questions are displayed in Figure 1.

FIGURE 1: RESEARCH QUESTIONS BY EVALUATION COMPONENT

Qualitative Case Studies

1. What are the features of the Strong Start models operated by the study sites?
    a. To what extent are features common, or different, across sites?
    b. Are the models being implemented as designed? How has implementation varied?
    c. How similar (or dissimilar) are the context and delivery of prenatal care in the Maternity Care Home, Group Prenatal Care, and Birth Center Models?
2. How do prenatal care and delivery in Strong Start sites differ from usual Medicaid or CHIP prenatal/delivery care in the same geographic areas?
    a. How does care in Strong Start sites differ from care provided in the same sites prior to the program's implementation?
3. What are stakeholders' (e.g., awardee, state, provider, beneficiary) views of how Strong Start demonstrations are being implemented?
    a. What works best for patients and providers, and what are the most challenging aspects of implementation?
    b. What are the most important factors in successful implementation of Strong Start demonstrations, both within each model and across models?
4. How generalizable are the Strong Start models to other Medicaid and CHIP care settings across the country?
    a. What features are critical for successful replication and scaling up of Strong Start?

Participant Level Process Evaluation

5. What are the characteristics of Strong Start participants by model, site, time period, including demographic characteristics (age, race/ethnicity, family composition, income), eligibility group, risk characteristics (physical, behavioral, socioemotional), and prior pregnancy status?
6. How many Strong Start services are provided to participating women, of what type, by time period, site/approach, and participant characteristics?
7. What are participant outcomes (e.g., mode of delivery, gestational age, and birth weight), how do they change over time, and how do they compare across Strong Start models?

Impact Analysis

8. What is the impact of Strong Start on infant gestational age, birth weight, rate of Cesarean Section births, and cost for women and infants during pregnancy/over the first year of life?
9. Does the impact differ across awardees and across the three Strong Start models?
    a. Does it vary by characteristics of enrolled women (e.g., race/ethnicity, health risks)? If so, how?
10. How does the implementation analysis explain the impact findings?
    a. For example, which features of the models led to the greatest impact of the program?

To answer these questions, the evaluation included three primary components: qualitative case studies, a participant-level process evaluation, and an impact analysis. In addition, the evaluation scope of work included the analysis of select program monitoring measures collected by CMMI to support the oversight of Strong Start implementation, as well as a technical assistance and data acquisition task that worked to collect birth certificate and Medicaid data from states with Strong Start awards.

The purpose of this Year 5 final evaluation report is to present final synthesized findings from the Strong Start for Mothers & Newborns evaluation and summarize the evaluation's research efforts and approaches. The remainder of this section offers background on the three enhanced models of care supported by Strong Start, provides a brief overview of the characteristics of the Strong Start awardees, and summarizes the evaluation design and its research components.

OVERVIEW OF STRONG START ENHANCED PRENATAL CARE MODELS

The Strong Start enhanced prenatal care models were designed to address perceived weaknesses in "typical" prenatal care delivery models. The vast majority of Medicaid maternity care is practiced in such settings as private solo and/or group practices, Federally Qualified Health Centers, and hospital outpatient department clinics. Furthermore, this care is generally delivered through managed care arrangements, as prepaid managed care has become the dominant service delivery and financing model of Medicaid in most states. Criticisms of typical care often cited in the literature include that it is:

- overly medical in focus (paying less attention to psychosocial risks that contribute to poor birth outcomes, such as poverty, unsafe housing, food insecurity, intimate partner violence, and mental health);
- overly interventionist (in that providers may be quick to intervene medically in normal pregnancies and births, such as by inducing labor or conducting C-sections without medical indication);
- insufficiently focused on education (on such critical issues as nutrition, exercise, childbirth preparation, breastfeeding, and family planning); and,
- lacking in continuity, (in that pregnant women will often be seen by many different health care providers over the course of their prenatal, delivery, and postpartum care, thus undermining the establishment of a strong trusting relationships between each woman and her provider).

Described below are the three Strong Start "enhanced" prenatal care models, their core components, evidence of their effectiveness in the literature, and discussion of how they address the weaknesses in "typical" prenatal care identified above.

BIRTH CENTER CARE

Freestanding Birth Centers are not just for giving birth—they are facilities that provide comprehensive prenatal, delivery, and postpartum care (and often well-woman gynecological care as well). They are almost always directed by midwives. Unless medical complications arise, women enrolled in Birth Centers receive their prenatal and postpartum follow-up care at a Birth Center. They may deliver their infants either at the Birth Center attended by a midwife; at a hospital, where deliveries may be attended by midwives, physicians, or a mixed team; or, in some cases, at home attended by a midwife. Many Birth

Centers, nationally, are accredited by the Commission for the Accreditation of Birth Centers. Until recently not all states covered Birth Center care under Medicaid (Ranji et al. 2009). Although coverage of Birth Centers is currently required by the ACA, many Birth Centers still have difficulties with reimbursement because specific insurance carriers, particularly managed care organizations (MCOs), may not include Birth Centers in their networks. States have different licensure requirements, and some states do not have any accredited birth centers.

Birth Centers, which follow the midwifery model of prenatal care,[4] are characterized as providing substantial education and psychosocial support along with low rates of medical intervention, standing in direct contrast to the "typical" prenatal care model described above. For example, a study by Palmer et al. (2009) considered three sites of prenatal care: a Birth Center, a teaching hospital, and a safety net clinic. The study found that midwives at the Birth Center offered longer prenatal care visits than their counterparts in the other settings. Interventions such as pharmaceutically induced labor and continuous electronic fetal monitoring are generally not used at Birth Centers (Stapleton et al. 2013). For Strong Start, the Birth Center model was further enhanced by the addition of support provided by "peer counselors," who met with women several times over the course of their pregnancies.

While research on the impact of Birth Centers is limited, there is substantial research on midwife provided prenatal care in various settings,[5] though results vary across studies. For example, across nine studies (including one review) of the impact of prenatal midwifery care on birth outcomes, three found a significant reduction in preterm birth rates and four found a significant increase in birth weight (Howell et al. 2014; Sandall et al. 2015). However, none of these studies focused only on Medicaid-enrolled women. Thus, the current evaluation contributes substantial information specifically concerning the impact of midwifery care in Birth Centers for Medicaid-enrolled women and their infants.

GROUP PRENATAL CARE

In place of brief, medically-focused individual appointments with an obstetrical provider, Group Prenatal Care offers pregnant women the opportunity to receive care in a group setting, meeting together as a cohort to have prenatal care appointments that include additional time for education and support from their providers and other pregnant women. The most well-known Group Prenatal Care model is *CenteringPregnancy* (Centering), which was formalized in 1998 through the Centering HealthCare Institute (CHI). Under Centering, groups of 8 to 12 pregnant women are brought together about 10 times beginning mid-pregnancy to have their prenatal care appointments, which also include facilitated group discussions about health, nutrition, childbirth preparation, stress reduction, family planning, parenting and personal relationships (among other topics). Strong Start awardees implementing Group Prenatal Care were not required to adopt a curriculum, but almost all explicitly used Centering or modeled their approach after Centering.

[4] American College of Nurse Midwives, http://www.midwife.org/Our-Philosophy-of-Care
[5] While birth centers universally offer the midwifery model, midwives in other settings may sometimes follow a medicalized or obstetric model.

At the start of the Strong Start for Mothers and Newborns initiative, there was a paucity of research on the effectiveness of Group Prenatal Care. One literature review on its effects on birth outcomes identified 11 studies that report its impact on birth weight and/or gestational age (Howell et al. 2014).[6] Four of these studies found a statistically significant reduction in the rate of preterm birth and three showed a positive impact on birth weight. A more recent study in South Carolina compared the outcomes of Medicaid enrollees participating in *CenteringPregnancy* to those of Medicaid women receiving traditional, individual prenatal care. The study estimated that Centering participation reduced risk of premature birth by 36 percent compared with women who had traditional prenatal care and that, for every premature birth prevented, there was an average savings of $22,667 during the infant's first year of life. In addition, participation in Centering reduced the incidence of low birthweight births by 44 percent, resulting in a cost savings of $29,627 during the infant's first year of life. Finally, the study found that infants of Centering participants had a reduced risk of a NICU stay (28 percent), saving $27,249 per avoided stay (Gareau et al. 2016). The current evaluation further analyzes the impacts of Group Prenatal Care by considering a range of sites, states, and implementation approaches simultaneously.

MATERNITY CARE HOMES

Maternity Care Homes are intended to improve continuity of care for pregnant women and their infants during pregnancy, childbirth, and postpartum. The Maternity Care Home approach builds on the similar concept of the patient centered medical home (PCMH). The PCMH was first created for pediatric care in the late 1960s, has evolved and expanded to cover other forms of primary care, and has recently become a major focus of health care delivery system reforms in both the Medicaid and Medicare programs. According to Childbirth Connection, the various components of the Maternity Care Home model may include a single clinician providing or coordinating care (to improve continuity); continuous quality improvement; patient-centeredness (to focus more attention on pregnant women and their questions and concerns); and timely access to care (Romano 2012). In November 2010, North Carolina began to develop a list of core competencies for a Medicaid Maternity Care Home (North Carolina Department of Health and Human Services 2010). These competencies include providing all eligible pregnant women with a medical home and, for those identified as high-risk, case management services to help improve birth outcomes and continuity of care. This effort builds on a current program, begun in the state in 1987, called *Baby Love* which provides care coordination services to Medicaid-eligible pregnant women (HCPHA, 2006). Under Strong Start, the most consistent feature of the Maternity Care Home model was the addition of a care manager to organize and improve women's access to care.

Because the Maternity Care Home model is relatively new and not consistently implemented, there is little evaluation research documenting its effectiveness. Several studies in the 1990s showed the positive impacts of enhanced prenatal care initiatives that incorporated such services as case management/care coordination, health and nutrition education, psychosocial counseling, and home visiting on birth outcomes, such as the probability of having a low birth weight infant (Heins et al. 1990). Particularly relevant is an early evaluation of North Carolina's *Baby Love* program suggesting that the program's care coordination and support reduced low birthweight rates and Medicaid costs (Buescher et al. 1991). However, a more recent comprehensive review of the literature on similar enhanced

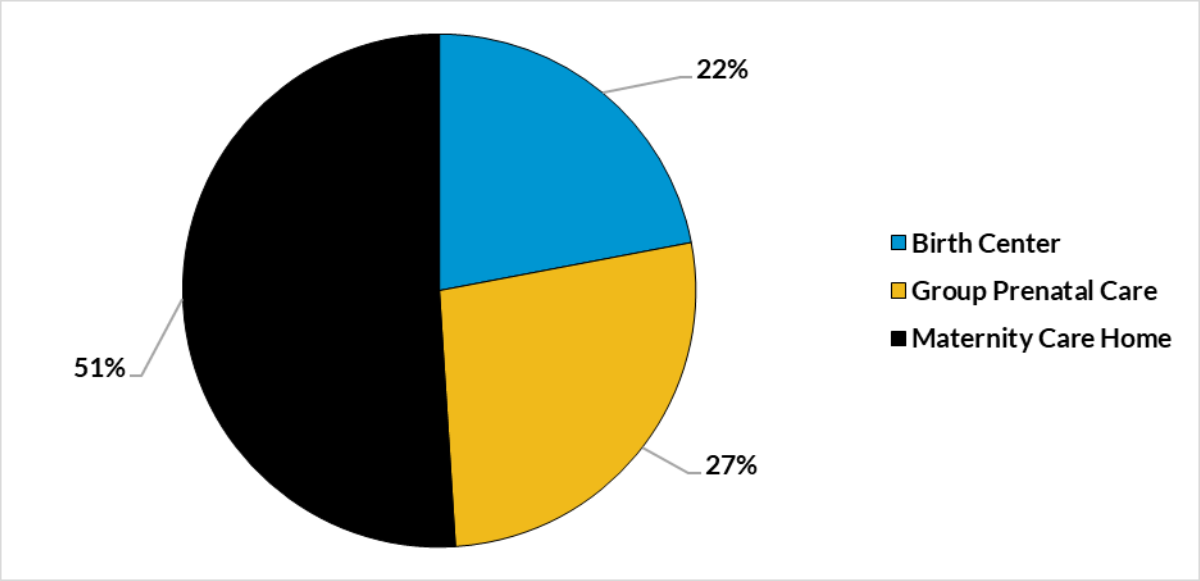
[6] Specific information related to the Strong Start design plan can be found in Annual Reports 1, 2, and 3.

prenatal care services for Medicaid women found mixed results across settings (Anum et al. 2010). The national data from the Strong Start evaluation builds on this base and furthers policymakers' understanding of the impact of Maternity Care Home models on Medicaid birth outcomes.

STRONG START AWARDEES AND SITES

The 27 Strong Start awardees each provided enhanced services through one or more of the Strong Start models of care: two implemented Birth Center care, 15 implemented Group Prenatal Care, and 17 implemented the Maternity Care Home approach. Included in these counts are six awardees that implemented more than one model. As shown in Figure 2, 22 percent of Strong Start's provider sites provided services in a Birth Center Setting (47 sites), 27 percent offered Group Prenatal Care (60 sites), and 51 percent of Strong Start's provider sites implemented Maternity Care Home (112 sites).

FIGURE 2: STRONG START SITES, BY MODEL (N=219)[7]



Notes: As discussed in Table 1, this figure lists 219 sites; however, the number of unique sites throughout the Strong Start award period is 210. The larger number encompasses multiple models offered at the same location.

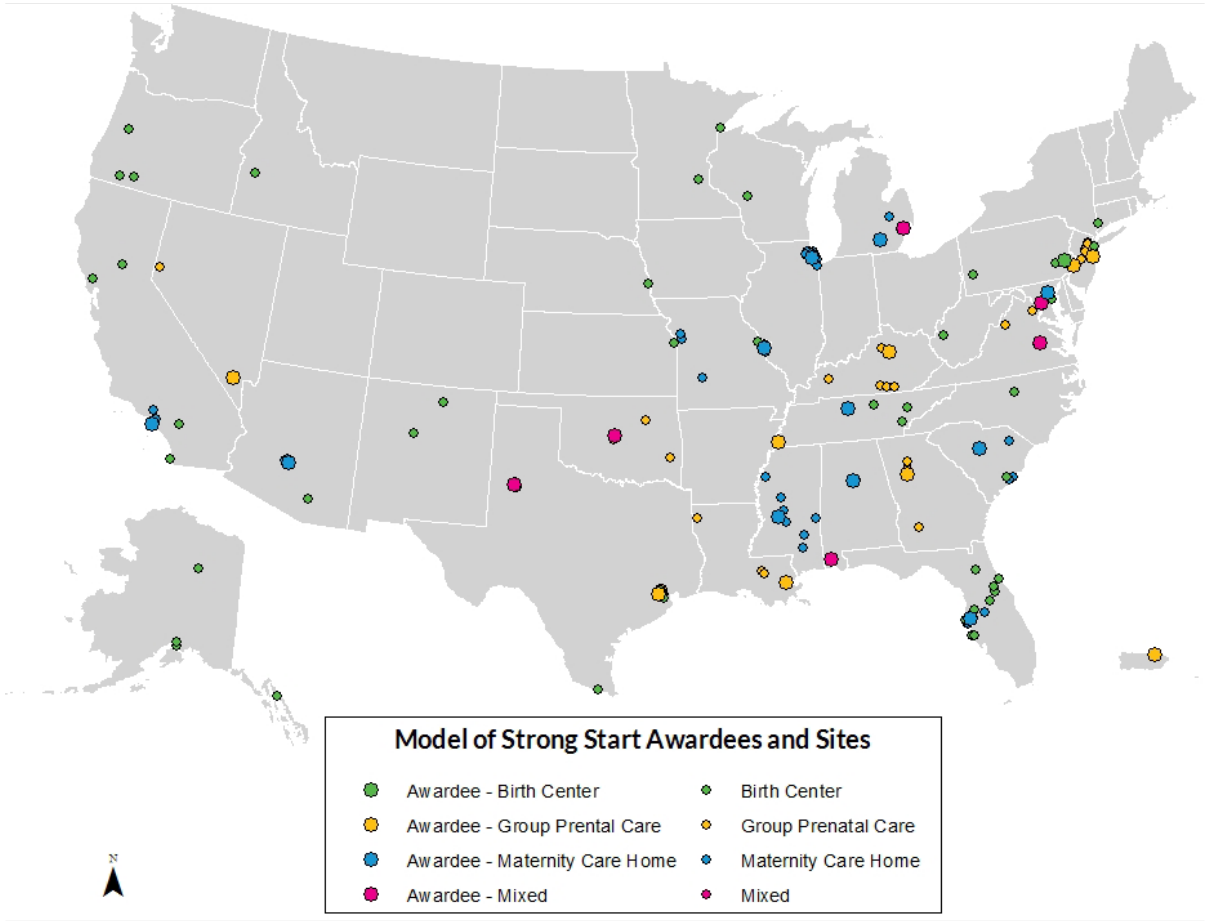
The Strong Start awardee sites were spread widely across 32 states, the District of Columbia, and Puerto Rico. The geographic distribution of Strong Start sites is illustrated in Figure 3. The Southeastern region of the US had the largest number of sites, an intentional result of CMMI's desire to target areas with the highest rates of preterm birth. As seen in Table 1, the number of Strong Start provider sites per state/territory ranged from just one (in Puerto Rico) to 31 sites (in Illinois).

The Strong Start awardees comprised a wide variety of organizations and health care organizations, including hospital and health systems, health plans, and community-based providers and agencies. There was similar diversity among the Strong Start provider sites, but more than half were either Federally Qualified Health Centers (FQHCs) or outpatient clinics associated with a hospital or health

[7] These three numbers sum to 219, which is higher than the total number of unique sites—210—because six awardees implemented more than one of the three Strong Start models of enhanced prenatal care.

center. The remaining sites included nationally certified Birth Centers, tribal health centers, local health departments, and physician groups. It is important to note that, with one exception,[8] CMMI did not directly contract with states or state Medicaid agencies in making its awards, which limited the initiative's ability to require the submission of state data for evaluation purposes, use Medicaid policy to guide awardee implementation, or influence awardees' decisions with regard to sustainability.

FIGURE 3: DISTRIBUTION OF STRONG START AWARDEES AND SITES ACROSS THE UNITED STATES



Strong Start awardees initially received funding for a four-year period, intended to comprise a three-year intervention period for implementation and service delivery, and a fourth year to complete program and evaluation data collection. Most awardees ultimately received no-cost extensions, allowing them to continue to enroll participants and provide services for part or all of the fourth year of the program and to continue data submission into a fifth year. Most Strong Start program enrollment had ended by September 2016, and many awardees had also ceased Strong Start–funded enhanced services by that point (see Table 1). Across awardees, end dates for enrollment ranged from August 2015 to December 2016. Accordingly, the final deliveries among Strong Start-enrolled women occurred between February 2016 and March 2017. All Strong Start programs, including the submission of all evaluation data, ended by June 2017.

[8] The Oklahoma Health Care Authority the state agency responsible for administering Oklahoma's Medicaid program, *SoonerCare*.

TABLE 1: STRONG START SITES EVER ENROLLING PARTICIPANTS BY AWARDEE

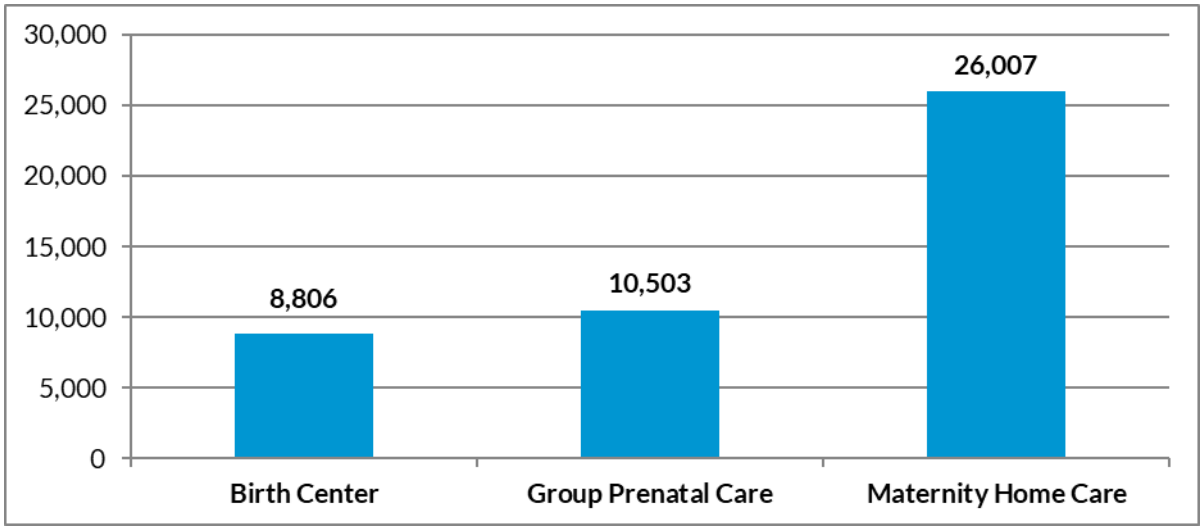
Awardee Name	State	Strong Start Model	Number of Sites			Status of Award	
			BC	GPC	MCH	Enrollment Period	Final Deliveries
Access Community Health Network (ACCESS)	IL	MCH	N/A	N/A	31	August 2013 - January 2016	September 2016
Albert Einstein Healthcare Network (Einstein)	PA	GPC	N/A	3	N/A	May 2013 – July 2016	December 2016
American Association of Birth Centers (AABC)	22[1]	BC	46	N/A	N/A	June 2013 - September 2016	December 2016
Amerigroup Corporation (Amerigroup)	LA	GPC	N/A	7	N/A	February 2014 - August 2016	December 2016
Central Jersey Family Health Consortium, Inc. (Central Jersey)	NJ	GPC	N/A	7	N/A	April 2013 - July 2016	December 2016
Florida Association of Healthy Start Coalitions (FASHC)	FL	MCH	N/A	N/A	8	November 2013 - June 2016	October 2016
Grady Memorial Hospital Corporation DBA Grady Health System (Grady)	GA	GPC	N/A	4	N/A	October 2013 - May 2016	November/ December 2016
Harris County Hospital District (Harris)	TX	GPC	N/A	7	N/A	August 2013 - March 2016	August 2016
HealthInsight of Nevada (HealthInsight)	NV	GPC	N/A	3	N/A	September 2013 - July 2016	February 2017
Johns Hopkins University (Hopkins)	MD	MCH	N/A	N/A	5	July 2013 – April 2016	November 2016
Los Angeles County Department of Health Services (LADHS)	CA	MCH	N/A	N/A	6	October 2013 - August 2016	December 2016
Maricopa Special Health Care District (Maricopa)	AZ	MCH	N/A	N/A	5	May 2013 - December 2016	February 2017
Medical University of South Carolina (MUSC)	SC	MCH	N/A	N/A	5	September 2013 – December 2015	April/May 2016
Meridian Health Plan (Meridian)	MI	MCH	N/A	N/A	1	September 2013 – December 2015	February 2016
Mississippi Primary Health Care Association, Inc. (MPHCA)	MS	MCH	N/A	N/A	8	June 2013 – September 2015	May 2016
Oklahoma Health Care Authority (OKHCA)[2]	OK	GPC, MCH	N/A	4	4	August 2013 – September 2016	January 2017
Providence Health Foundation (Providence)	DC	BC, MCH, GPC	1	2	3	July 2013 - November 2016	January 2017
Signature Medical Group (Signature)	MO	MCH	N/A	N/A	9	August 2013 – December 2015	August 2016
St. John Community Health Investment Corp. (St. John)[4]	MI	GPC, MCH	N/A	4	1	May 2013 - October 2016	January 2017
Texas Tech University Health Sciences Center (Texas Tech)	TX	MCH, GPC	N/A	1	2	October 2014 – October 2016	February 2017
United Neighborhood Health Services, Inc. (United)	TN	MCH	N/A	N/A	8	June 2013 – June 2016	March 2017
University of Alabama at Birmingham (UAB)	AL	MCH	N/A	N/A	4	May 2013 - February 2016	August 2016
University of Kentucky Research Foundation (UKRF)	KY	GPC	N/A	7	N/A	August 2013 - March 2016	September 2016
University of Puerto Rico Medical Sciences Campus (UPR)	PR	GPC	N/A	1	N/A	August 2013 – February 2016	September 2016
University of South Alabama (USA)[3]	AL	MCH, GPC	N/A	2	7	October 2013 - May 2016	September 2016
University of Tennessee Health Sciences Center (UTHSC)	TN	GPC	N/A	2	N/A	September 2013 - June 2016	October 2016
Virginia Commonwealth University (VCU)[5]	VA	GPC, MCH	N/A	6	5	May 2013 - September 2016	December 2016
TOTALS			**47**	**60**	**112**	**N/A**	

Sources: Data on the number of sites is primarily from the evaluation's four years of case study data collection and form submission information in the participant-level process evaluation data. The information is supplemented by additional documents provided to the case study team during the data collection period, and the program monitoring reports awardees submit to CMMI.

Notes: [1] The American Association of Birth Centers was the only awardee operating in more than one state. During the Strong Start evaluation, AABC had active sites in Alaska, Arizona, California, Connecticut, Florida, Idaho, Illinois, Kansas, Maryland, Minnesota, Missouri, Nebraska, New Mexico, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, West Virginia, and Wisconsin.
[2] Two OKHCA sites implemented both MCH and GPC models. These sites are each counted once in the MCH column, and once in the GPC column. Therefore, the total number of sites overall is smaller than the totals reported in this table.
[3] Two USA sites implemented both MCH and GPC models. These sites are each counted once in the MCH column, and once in the GPC column. Therefore, the total number of sites overall is smaller than the totals reported in this table.
[4] One St. John site implemented both MCH and GPC models. This site is counted once in the MCH column, and once in the GPC column. Therefore, the total number of sites overall is smaller than the totals reported in this table.
[5] Four VCU sites implemented both MCH and GPC models. These sites are each counted once in the MCH column, and once in the GPC column. Therefore, the total number of sites overall is smaller than the totals reported in this table. For one of the four sites, case study interviewees gave conflicting reports of whether the site had implemented the MCH model; for this annual report (and in this table) that site is counted as having both the GPC and MCH model.

Initially, Strong Start had a goal of reaching up to 80,000 women over a three-year award period, with awardee-specific enrollment goals generally between 1,500 and 3,000 women. However, because of implementation delays and early challenges with enrollment, in Year 2, most Strong Start awardees revised their enrollment targets downward (CMS/CMMI, 2014). Most new enrollment goals were between 1,000 and 2,000 women over the entire period of program operation (three to four years depending on whether the awardee received a no-cost extension for up to one year), with the total enrollment goal revised to approximately 58,000 women across all 27 awardees. In Years 3 and 4, awardees worked toward revised goals and Strong Start ended with a total of 45,599 women ever enrolled in the program,[9] nearly 80 percent of the revised target enrollment. Figure 4 shows the total enrollment in Strong Start by model. Maternity Care Home awardees accounting for the highest enrollment numbers, with more than double the enrollment of either of the other models.

FIGURE 4: TOTAL STRONG START ENROLLMENT, BY MODEL (N=45,316)



[9] This number represents the official enrollment total reported by CMMI program administrators. The total number of enrollees reported in Strong Start awardee quarterly monitoring reports is somewhat higher, however (46,353). Finally, the number of women for whom at least one participant Level Program Evaluation data form was submitted was 45,316. This final number, reflecting the total number of women who "participated in the evaluation," is used in the remainder of this report.

The state and local context within which Strong Start awardees operated may have affected their operations and, potentially, their success. For example, Medicaid and CHIP eligibility and coverage policies vary considerably across the 32 states (and the District of Columbia and Puerto Rico) where Strong Start awardees were situated. States included those with some of the most and least generous income eligibility limits and benefits packages in the country. The upper Medicaid/CHIP[10] income eligibility limit for pregnant women in April 2017 in the Strong Start states ranged from the minimum federally-required level of 138 percent of the federal poverty level (FPL) in Louisiana and Oklahoma, to 324 percent of the FPL in the District of Columbia.

Implementation of the ACA, which occurred prior to and during Strong Start program operations, changed the coverage landscape in every state. Starting in 2014, half of the Strong Start states (13 states and the District of Columbia) had elected to expand Medicaid coverage to all adults with incomes up to 138 percent of poverty[11] regardless of pregnancy or parenting status.[12] By July 2016, this total had increased to 14 Strong Start states and DC. When Strong Start operations ceased in 2017, 16 states and DC had expanded their Medicaid programs under ACA authority. (For detailed information regarding each state's income eligibility threshold by coverage authority, please see detailed fact sheets provided by the Henry K. Kaiser Family Foundation,[13] an example of which can be found in Appendix A.

EVALUATION DESIGN

The Strong Start evaluation employed a mixed-methods research design, comprised of case studies of implementation, the collection and analysis of participant-level process evaluation indicators, and a quantitative analysis of the impacts of Strong Start on birth outcomes and costs of care. The evaluation also employed a technical assistance component to acquire birth certificate and Medicaid data from states with Strong Start awards and/or support states in developing their capacity to link these data so that the evaluation could assess program impacts. Finally, the evaluation included the analysis of certain program monitoring data collected from the Strong Start awardees by CMMI to support the oversight of awardee implementation. This section provides brief summaries of these research methods.

CASE STUDIES OF IMPLEMENTATION

The evaluation team conducted case studies in each of the first four years of the evaluation. Case studies provided an in-depth understanding of how Strong Start models were designed, implemented, and evolved over time; documented barriers or challenges awardees encountered during implementation; and described perceived successes and factors that contributed to success. Case studies included four components: document review, key informant interviews, focus groups with participating pregnant and postpartum women (as well as a small number of groups with similar nonparticipants), and structured observations of care and care settings. Because of resource limitations that precluded studying all service delivery sites, we collected case study data from all awardees and

[10] Pregnant women themselves are eligible for CHIP in just three of the Strong Start states–Missouri, New Jersey, and Virginia. However, the following states have adopted the CHIP "unborn child" option, which permits states to consider a fetus a "targeted low-income child" for the purposes of CHIP coverage: CA, IL, LA, MI, MN, MO, NE, NJ, OK, OR, TN, TX, VA, WI.
[11] The ACA establishes a minimum income eligibility level of 133 percent of FPL for states that opt to expand Medicaid, and also establishes a standard 5 percent income disregard. Taken together, this means that the ACA's minimum income eligibility level for Medicaid expansion is 138 percent of FPL.
[12] This includes states (e.g., Michigan and Pennsylvania) that have expanded Medicaid through a Section 1115 waiver.
[13] https://www.kff.org/medicaid/fact-sheet/where-are-states-today-medicaid-and-chip/

approximately one-third of sites they operated. Table 2 summarizes data collection for each of the four case study rounds, including when and how data were collected, the number of key informant interviews conducted and total number of key informants, the number of focus groups conducted and total number of focus group participants, and the number of structured observations performed. Appendix B describes Case Study methodology in more detail.

TABLE 2: STRONG START CASE STUDY DATA COLLECTION, YEARS 1-4

Evaluation Year	Data Collection Period	Mode of Data Collection[1]	Key Informant Interviews (N)	Key Informants (N)	Focus Groups† (N)	Focus Group Participants† (N)	Structured Observations[2] (N)
Year 1	Mar. 2014 - Nov. 2014	Primarily in person	266	409	65	488	36
Year 2	Mar. 2015 - Jun. 2015	Primarily by phone	152	207	2	18	2
Year 3	Nov. 2015 - Jun. 2016	Primarily in person	211	314	65	440	12
Year 4	Oct. 2016 - May 2017	Primarily by phone	110	144	1	5	0
TOTALS	**N/A**	**N/A**	**739**	**1074**	**133**	**951**	**48**

Notes: All columns marked with a dagger symbol (†) indicate that nearly all the evaluation's focus group participants were pregnant and postpartum women enrolled in Strong Start (123 groups with a total of 892 women). In Year 1, the case study team conducted 10 focus groups with 59 pregnant and postpartum women not enrolled in the program, to collect information on sites' typical (non-enhanced) models of prenatal care. These non-enrollee groups and participants are included in the totals for this table.

[1] In Years 1 and 3, nearly every awardee and many AABC sites were visited in person. In Year 2 and Year 4 data collection was by phone with the exception of an in-person site visit with the University of Puerto Rico involving in-person interviews and focus groups; and in Y4 a small number of in-person interviews and one participant focus group for Virginia Commonwealth University and in-person interviews at the AABC site in North Carolina.

[2] Structured observation numbers are approximated.

PARTICIPANT-LEVEL PROCESS EVALUATION

The participant-level process evaluation gave timely feedback to CMMI, the evaluation team, and Strong Start awardees and sites on key indicators of enrollee demographics and risk factors, program performance, and interim participant outcomes. Using four data-gathering instruments, the evaluation collected detailed information on the participants' demographic characteristics and risk profiles, service use, and outcomes of all Strong Start participants. The instruments included an Intake Form, Third Trimester and Postpartum Surveys (all completed by participants, with or without assistance), and an Exit Form (which was completed by awardee staff based largely on medical record reviews). Copies of these forms are included in Appendix D. Strong Start awardees were required to collect participant-level data from all of their sites and transmit these data to the evaluation team on a quarterly basis through a system that protected patients' identifying and personal health information.

Data identified and tracked risk factors for preterm birth among participants, complications experienced by participants during pregnancy, enhanced and routine services provided during pregnancy and postpartum, and birth processes and outcomes for women and infants. Individual-level data were summarized in quarterly reports.

In total, the evaluation team received 42,988 Intake Forms, 27,109 Third Trimester Surveys, 27,135 Postpartum Surveys, and 44,485 Exit Forms. This information is summarized in Table 3.

TABLE 3: CUMULATIVE FORM SUBMISSION THROUGH YEAR 4

Evaluation Year	Number of Awardees Submitting Data	Total Intake Forms Submitted	Total Third Trimester Surveys Submitted	Total Postpartum Surveys Submitted	Total Exit Forms Submitted
Year 1	22	3,666	568	343	N/A
Year 2	26	19,155	8,704	6,949	6,669
Year 3	27	38,149	20,387	18,049	24,951
Year 4	27	42,581	26,619	25,939	37,965
TOTALS	**27**	**42,988**	**27,109**	**27,135**	**44,485**

TECHNICAL ASSISTANCE AND DATA ACQUISITION

The Technical Assistance and Data Acquisition team spent the first two evaluation years working with the Impacts team to plan the evaluation's data collection approach; reach out to Vital Records and Medicaid agencies in 20 states; and begin submitting requests to obtain the birth certificate, Medicaid eligibility, and Medicaid claims/encounter data necessary for the impact analysis. During Year 3, the Impacts, Technical Assistance, and Data Acquisition teams worked closely together and with states to begin receiving vital records and Medicaid files. In Year 4, the teams continued to engage with state agencies to move the data submission process forward, as well as facilitate back-and-forth communications when the Impacts team needed follow up questions answered or required updated data files from states. This work continued into Year 5 as the Impacts team finalized its analysis.

IMPACT ANALYSIS

The impact analysis was designed to assess whether and to what extent Strong Start models of care had an impact on three key outcomes: rates of preterm birth, rates of low birthweight births, and Medicaid/CHIP costs through pregnancy and the first year after birth. This analysis, which relied on linked birth certificate and Medicaid data for births occurring in 2014, 2015, and 2016, also assessed whether these impacts varied among enhanced prenatal care models, awardees, sites (where feasible), and type of services offered and received. The gold standard design for estimating program treatment effects is a randomized control trial. However, Strong Start was not designed to assign either awardees or participants to treatment and control groups through intentional randomization. Many CMMI evaluations rely on quasi-experimental designs that use a difference-in-difference approach, but the particular questions asked of this evaluation did not lend themselves to this strategy. This is because Strong Start layered enhancements upon existing models of prenatal care rather than implementing entirely new models of care, and therefore, there was no pre-period with which to compare. We therefore needed to take an observational approach that compared outcomes for women participating in Strong Start and their infants to outcomes for non-participating Medicaid enrolled women with similar risk profiles and their infants.

During Year 1, the evaluation team, in conjunction with a panel of twenty research methods and maternity care experts, determined that the best approach would focus on measuring the effects of Strong Start in comparison to "typical" Medicaid maternity care practices,[14] which required the selection of comparison groups of women who did not receive services in Strong Start Birth Centers, Group Prenatal Care, or Maternity Care Homes. In Year 2, the evaluation team began to engage with states and refined the process for requesting matched birth certificate and Medicaid eligibility and claims data. During Year 3, there were two major tasks that the Impacts team finalized to move the data acquisition process forward: selecting comparison groups and establishing a decision rule for excluding a relatively small number of cases for which an accurate comparison group could not be drawn (for example, because women in Strong Start were served at a location where *all* high-risk women in the state were referred for prenatal care). After obtaining merged birth certificate and Medicaid data from states, a propensity score re-weighting method (described in more detail and justified as an appropriate evaluation strategy in Appendix R of this report) was used to select well-matched comparison groups of Medicaid women who delivered during the same period, who resided in roughly the same geographic area as Strong Start participants, and who had similar risk characteristics.

In Year 4, the Impacts team also linked Medicaid eligibility and birth certificate data for states that did not link the data themselves, cleaned claims data for several states, assessed selection bias and comparison group challenges to determine the appropriateness of various analyses, and applied preliminary propensity score reweighting models for four states to test the methods. In the Year 5, the final year of the evaluation, the team continued to collect, prepare, and analyze Medicaid and birth certificate data for remaining states and years; developed analytic claims files and finalized an approach to analyzing costs data; prepared final estimates on the impact of Strong Start on birth outcomes and costs/utilization (from claims data); and implemented enhancements to the propensity score reweighting approach.

ORGANIZATION OF THE YEAR 5 PROJECT SYNTHESIS

This Year 5 Project Synthesis presents final findings from the five-year Strong Start evaluation and concentrates on synthesizing information gathered across the three evaluation components throughout the course of the evaluation. Volume 1 of the Project Synthesis presents cross-cutting findings across awardees and enhanced prenatal care models, while Volume II presents awardee-specific findings. In Volume 1, we present the following cross-cutting results:

- Findings from the qualitative Case Studies of implementation;
- Participant-Level Process Evaluation descriptive findings;
- Summaries of lessons learned from the Technical Assistance and Data Acquisition effort;
- Impact Analysis based on merged birth certificate and Medicaid eligibility and claims/encounter data;
- A series of Regression Adjusted Outcomes Analyses using the PLPE data; and
- Summary of Findings based on a synthesis of our findings across all components and all years of the evaluation.

[14] Typical Medicaid maternity care practices include private providers, community health centers, public health department clinics, and hospital outpatient departments that do not offer prenatal care through any of the Strong Start models.

Year 5 Results

This volume presents findings from Year 5 of the evaluation. Case study findings come first, followed by participant-level program evaluation findings. We then present lessons learned from the Evaluation team's effort to work with state agencies to acquire birth certificate and Medicaid data. The effects of Strong Start on maternal and infant outcomes and costs are assessed through model-level impact analyses based on merged birth certificate and Medicaid data, presented for the first time in this report. We conclude with a series of regression-adjusted outcome analyses using PLPE data.

CASE STUDIES

Our final case study analysis summarizes awardees' experiences implementing the Strong Start program and is based on four rounds of comprehensive data collection from all 27 awardees and a selection of their provider sites. Specifically, this section presents common features and variations in Strong Start awardees' implementation approaches, classification of the intensity of each awardee's Strong Start intervention, awardees' most significant implementation challenges and successes, factors awardees and sites identified as most critical for successful replication of their Strong Start models, and awardees' plans for sustaining their Strong Start programs.

DESCRIPTION OF THE STRONG START MODELS

Though each awardee took a unique approach to implementing its Strong Start enhanced care model, all shared some similar elements. Table 4 shows common features defining each of the three Strong Start models and how awardees' implementation approaches varied.

Just two awardees implemented the Birth Center model, with a single awardee, AABC, operating all but one of the 47 birth center sites that participated in Strong Start during the award period. All sites across both awardees adopted the same two key components—1) prenatal care provided by midwives following the midwifery model of care[15] paired with 2) psychosocial support, health education, and referrals provided by a peer counselor or perinatal navigator. [AABC's 46 sites used a peer counselor and Providence's single Birth Center site used a perinatal navigator. For simplicity, we use the single term "peer counselor" to refer to them.] Some variation existed, however, in the average number and mode of encounters between peer counselors and enrollees and in the qualifications of the counselor. For instance, AABC did not use a standard definition of "peer," though the awardee expected the peer counselor role to be distinct from the prenatal care provider. Some AABC peer counselors had no formal preparation beyond the awardee-created Strong Start training modules; they were selected for characteristics that qualified them as peers of Strong Start participants, such as living in the same community, being young with small children, or having been a birth center prenatal patient. Most,

[15] The midwifery model of care involves a holistic and wellness approach to pregnancy and birth. The approach combines medical care with comprehensive education about pregnancy, labor, delivery, and postpartum care using a patient-centered process designed to empower women to take control of their health. Midwifery visits are generally at least 30 minutes (compared to 10-15 minutes for a typical prenatal care visit with an OB/GYN) allowing more time to identify and addressing patients' medical, psychosocial, or educational needs. http://www.midwife.org/Our-Philosophy-of-Care.

however, had clinical or formal health education backgrounds as nurses, lactation consultants, doulas, or other certified health workers.

TABLE 4: COMMON FEATURES DEFINING EACH STRONG START MODEL AND VARIATIONS IN IMPLEMENTATION

Model Type	Birth Center	Group Prenatal Care	Maternity Care Home
Common features defining the model	• Midwifery model of care • Psychosocial support, health education, and referrals provided by a peer counselor or perinatal navigator	• Prenatal care in a group setting • Series of facilitated, face-to-face sessions covering health assessment, education, support • Emphasis on building supportive peer relationships	• Addition of new staff to provide care management/coordination and psychosocial support to eligible pregnant women
Variations in model implementation	• Peer counselor or perinatal navigator qualifications (e.g., some professionally trained, others share demographic features with participants) • Number of encounters ranged from 4 to 14 • Mode of encounters: most in-person at birth center, some by phone or in participant's home • Some birth centers offered childbirth education or other classes free of charge to Strong Start participants (previously these classes required a fee)	• Use of *CenteringPregnancy* approach: most followed closely, some used modified approach • Group facilitator qualifications, both for the clinician facilitator (e.g., CNM, FNP, OB/GYN) and second facilitator who was sometimes a prenatal care provider but often not (e.g., RN, social worker, community health worker) • Number of facilitators ranged from 1 to 3 • Number of group care sessions: most used 10 (per Centering), with range of 6-12 sessions • Group size: most averaged 8-12 women, with range of 3-16 • Composition of groups: most group by gestational age (per Centering), some group by demographic features or medical risk factors	• Care manager accessibility: some 24/7, others followed clinic hours • Care manager qualifications (e.g., RN, LCSW, CHW) • Number of encounters ranged from 1 to 8 • Mode of encounters: most in-person at clinic, some by phone or in participant's home • Number of care managers assigned to each patient: some use two-person teams, others assigned participant to single care manager • Additional program components such as prenatal classes, free dental care, nutritional counseling, and skill-building or collaboration opportunities for prenatal care providers

All Group Prenatal Care awardees provided prenatal care in a group setting via a series of facilitated, face-to-face sessions covering a broad range of issues, including health assessment, education, and support. These awardees also were uniform in their emphasis on building peer relationships. Many had common features because they followed CHI's *CenteringPregnancy* curriculum and standards closely (e.g., providing 10 sessions, using co-facilitators, and creating cohorts based on gestational age).[16] But individual sites affiliated with about one-third of the awardees adopted an approach that departed somewhat from Centering. UPR, for instance, provided 12 sessions, and one HealthInsight site provided only six. Several awardees grouped women based on demographic features or medical risk factors rather than (or in addition to) gestational age. Some examples include CJFHC's and UTHSC's groups for women with gestational diabetes, UKRF's groups for Spanish Speakers or

[16] Under the *CenteringPregnancy* approach, prenatal care cohorts (typically grouped by gestational age) meet ten times over a seven-month period. Two trained facilitators lead each session, which are scheduled for two hours and take place in a private space large enough to accommodate patient members and support people in the proscribed circular seating arrangement. Sessions begin with time for socialization while individual health assessments occur in a screened-off area in the corner of the room. Group members also participate in self-care activities like weighing themselves and taking their own blood pressure, which they record in their own charts. The second half of the Centering session involves a facilitated discussion about a particular topic. Centering materials available through the Centering Healthcare Institute include facilitator guides with suggested session content and activities, discussion aides, and notebooks that patients use throughout pregnancy.

women with opioid addition, VCU's groups for teens or women with high-risk pregnancies, and UPR's groups for women with HIV, Zika virus, or rheumatic diseases.

Maternity Care Home awardees were the most varied in how they implemented Strong Start. All awardees added new staff to identify participant needs, coordinate care, and provide psychosocial support to eligible pregnant women. Though these individuals had a variety of titles, for simplicity we use the single term "care manager" to refer to them. Having a care manager was their only shared feature, however, and they adopted a range of approaches regarding care manager qualifications, the number and mode of encounters, and care manager assignments. For instance, most Maternity Care Home models assigned a participant to a single care manager, but some used teams of two managers with complementary skills. The ACCESS awardee paired a social worker with a registered nurse, while at Johns Hopkins, three teams—each composed of a nurse care manager and community health worker—were embedded at Strong Start sites. Some Maternity Care Home awardees also had other program components beyond care management. MPHCA, for instance, provided free dental care and (at some sites) free childcare during prenatal visits. USA provided a nutrition education session with a registered dietician for some participants (including teens), primiparous women, or those entering care either underweight or obese.[17]

Similarities and Differences across the Strong Start Models

Though the three Strong Start models had their own distinct and defining features, there were also similarities across the models. Each provided education related to a range of prenatal, childbirth, and postpartum issues including (but were not limited to) nutrition, exercise, family planning, breastfeeding, normal and abnormal pregnancy symptoms, stress management, infant care and safety, what to expect during labor and delivery, smoking cessation, how to manage health conditions, oral hygiene, and preterm birth prevention. In Maternity Care Homes and Birth Centers, education was generally delivered one-on-one as part of care manager or peer counselor encounters. In Group Prenatal Care, each session included shared learning via facilitated discussion on a specific topic. Participants across models highlighted health education as a major benefit of Strong Start during the evaluation's focus groups.

> *"I probably would skip a lot of my appointments, but the [care manager] is really positive and teaches me different ways to think about things. We go over my diabetic stuff and she gives me different lists and talks to me about how it could affect the baby's heart." – Maternity Care Home participant*

> *"At the doctor's office you sit and wait and wait and wait. At Centering you go in and are learning right away." – Group Prenatal Care participant*

> *"I received a lot of handouts about healthy eating and I expressed to [the peer counselor] that I wasn't eating well because I am not really into vegetables. She gave me some easy suggestions for incorporating vegetables that I had not really thought about. It made me feel like I was doing better." – Birth Center participant*

[17] In the final evaluation year, the case study team conducted a small number of key informant interviews in support of the development of "special study" manuscripts on the Group Prenatal Care and Birth Center models. Findings from these interviews are summarized in Appendix C.

Across models, Strong Start staff made referrals to non-medical services not provided during prenatal visits. They often found participants were unaware of the resources available in their community or their eligibility for programs that could help them have a healthier pregnancy. In Maternity Care Homes and Birth Centers, referrals were direct and often based on the needs assessment conducted with the evaluation's Intake form. Common referrals were made to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Supplemental Nutrition Assistance Program (SNAP), behavioral health care, dental care, domestic violence services, smoking cessation classes, nutrition counseling, housing support, transportation services, childcare and services for other children in the family, and assistance with utility payments. Care managers and peer counselors usually followed up with participants about whether they accessed the referred service. Group prenatal care awardees invited guest speakers to join topical discussions and provided materials/contact information for the speakers and other community resources during sessions. Guest speakers commonly included pediatricians, social workers, doulas, domestic violence counselors, or WIC staff. Strong Start focus group participants recounted the many resources they had been connected to via Strong Start.

> *"[The care manager] tells you stuff no one else will, like babies' doctors—I didn't know you were supposed to look for them way ahead of time. She gives you resources for groups, or if you lost your job, employment opportunities, WIC information, food stamps, [etc.]—things you don't know exist." – Maternity Care Home participant*

> *"We had a social worker come in, and she could help us with anything we may need—housing, food, [and] things outside medical care. If we need it, we can reach out to her and she would help us with that." – Group Prenatal Care participant*

> *"I have a few needs [the peer counselor] helped out with – she told me about food banks in town when my husband lost his job. She had it quicker than I could blink."– Birth Center participant*

Finally, the three models shared an emphasis on psychosocial support through relationship-based care. For Group Prenatal Care awardees, this support was provided by group facilitators and by the other women participating in the group. Key informants reported that group members respected and learned from one another's experiences and felt both supported by and accountable to one another. Focus group participants echoed this sentiment and valued the relationship they formed with their prenatal care group facilitator.

> *"I missed one appointment... [The facilitator] called me to make sure everything was okay, and then like three people from my Centering group texted to make sure I was okay." – Group Prenatal Care participant*

> *"One thing with the group is you need to share what you have, and sometimes it can be hard. But [the facilitator] makes it really comfortable. I really like her; we can talk about anything with her." – Group Prenatal Care participant*

> *"The [facilitator] helped me with depression and a domestic violence situation. She's not judging you. She's not talking down to you." – Group Prenatal Care participant*

For Maternity Care Home and Birth Center awardees, psychosocial support was provided by care managers or peer counselors. In some cases, these program staff members were licensed clinical social workers who provided counseling services. More often, however, psychosocial support was provided less formally and included regular check-ins with participants about how they were feeling, reminding them about or helping prepare for prenatal and other appointments, and reinforcing or further explaining information provided at appointments. Focus group participants spoke highly of this support, and sometimes said they felt more comfortable sharing concerns with Strong Start staff than with their prenatal care provider.

> *"I didn't have anything like this with my first pregnancy and I really just wanted support, especially from an outside source. Sometimes you don't get that from your family." – Maternity Care Home participant*

> *"I wouldn't have told others about being bi-polar. I honestly feel like I can talk with [my care manager] about anything." Maternity Care Home participant*

> *"You can't ignore stress. My blood pressure was down 20 points today…. I felt so much better. That's a sign of the emotional support I'm getting and how it's affecting my physical health." – Birth Center participant*

Having a consistent Strong Start enhanced service provider was an important element of relationship-based care across the three models. With few exceptions, the same Strong Start care manager, peer counselor, or group facilitators served a participant throughout her pregnancy. Awardees agreed that this continuity allowed for increased understanding of patient needs and improved participants' trust while also promoting their willingness to share feelings, confidence to ask questions, and group bonding. A key informant from the AABC site in Sarasota Florida explained that participants' ongoing relationships with the same peer counselors "opened pathways and doors to better communication, to find out more about their needs." This shared program feature was also a significant departure from typical prenatal care where patients often saw a number of different providers during pregnancy. A key informant at LADHS (Maternity Care Home) remarked, "The care manager is the only one who follows the patient all the way through."

Comparisons between Strong Start and Sites' Previous Approach to Prenatal Care

Early in the evaluation period, the case study team assessed each awardee's prenatal care model prior to implementing Strong Start. For most awardees and sites, Strong Start represented a considerable change from their previous model of prenatal care. With regard to Maternity Care Homes awardees rarely felt that their prior approach to prenatal care offered a robust set of psychosocial support and referral services for patients. Some sites affiliated with large tertiary care centers (e.g., MUSC, Texas Tech, LADHS) reported good access to specialists and clinical referrals, and in some cases high-risk populations like teens or women with substance use disorder also had consistent access to social workers. Some Maternity Care Home awardees described statewide or regionally-focused programs that provided care coordination and support to low-income or Medicaid-covered prenatal patients,

such as Alabama's Maternity Care Program[18] or Healthy Start.[19] And some sites, especially those affiliated with Federally-Qualified Health Centers (FQHCs) described established relationships with community-based resources and co-located dental, behavioral health, or nutrition services. Overall, however, access to care coordination, referral networks, and social work services were limited or nonexistent prior to Strong Start.

About half of the awardees that implemented Group Prenatal Care under Strong Start had previous experience with the model, and used their Strong Start funding to expand Group Prenatal Care or add service components like Community Health Workers. In some cases, (e.g., Harris, Providence) awardees had well-established group care programs they had operated for years while others' prior experience was limited to pilot programs (e.g., Einstein, UKRF). Awardees not offering group care prior to Strong Start usually provided a typical prenatal care model of consisting of brief one-on-one visits with OBs or midwives, with limited time for patient education and discussion, and referrals to community-based services on an ad-hoc basis only.

All Birth Center sites offered comprehensive maternity care provided by midwives prior to implementing Strong Start. The midwifery approach to care, an inherent feature of the Strong Start birth centers, involves a holistic and wellness approach to pregnancy and birth. Though birth centers view the midwifery model as enhanced care, it is not reimbursed as such (i.e., payment rates are the same or lower than rates for typical OB/GYN care). The birth centers also offered a variety of enhanced services and educational opportunities (e.g., lactation counseling, childbirth education classes, nutrition services, a lending library, and support groups). However, except for two AABC sites with established Community Health Worker (CHW) programs, none of the birth centers offered prenatal peer support or similar services before implementing Strong Start. Birth Centers' connections to community-based resources and referral links varied—some had many well-established networks before Strong Start (especially sites that were also FQHCs or served as a safety-net health care provider in their community) while others did not. Most Strong Start Birth Center sites did not target Medicaid beneficiaries before they participated in the program, and Strong Start prompted some to make greater efforts to reach and offer care women enrolled in Medicaid.

In sum, Strong Start program staff and participants identified several common key differences between Strong Start enhanced care and the prenatal care that awardees and sites previously provided. Compared to typical prenatal care, Strong Start care:

- Involved a continuous Strong Start staff person (care manager, peer counselor, group facilitator), offering better care continuity throughout a woman's pregnancy;
- Consistently identified patient needs via comprehensive prenatal intake;
- Provided more education and psychosocial support;

[18] Alabama has a long history of providing care coordination and psychosocial support for pregnant Medicaid enrollees through its Maternity Care Program. In each of the state's 14 maternity care districts, a primary contractor works with maternity care providers to deliver enhanced support. The Maternity Care Program, called either Steps Ahead or MOMCare in the regions with Strong Start awards, requires a minimum of two encounters with a care coordinator. The initial encounter occurs at entry into Medicaid for prenatal services and the other required encounter must occur after delivery, but before the mother has left the hospital. http://www.usahealthsystem.com/momcare

[19] Supported by the Health Resources and Services Administration (HRSA), Healthy Start works to prevent infant mortality in 87 communities with infant mortality rates at least 1.5 times the national average and high rates of low birthweight, preterm birth, maternal mortality and maternal morbidity (serious medical conditions resulting from or aggravated by pregnancy and delivery). https://mchb.hrsa.gov/maternal-child-health-initiatives/healthystart/

- Connected patients to more resources, both Medicaid and non-medical, and included follow-up on referrals;
- Allowed patients more time to ask questions and discuss concerns with providers, and allowed provider to get to know their patients better, particularly for Group Prenatal Care;
- Included peer-to-peer learning (for Group Prenatal Care); and,
- Let patients use their time more productively, particularly in Group Prenatal Care where time was spent in a facilitated group discussion rather than in the waiting room prior to an individual appointment.

INTERVENTION INTENSITY

One metric on which Strong Start interventions varied across awardees is the intensity of the intervention provided to enrollees. To systematically describe the range of interventions implemented by awardees on this metric, we classified the intensity of the intervention provided for each Strong Start awardee.

Definition of Intervention Intensity by Model

The evaluation defines intensity based on the absolute level of enhanced prenatal care services received by women enrolled in Strong Start. This includes enhanced prenatal care services provided through Strong Start as well as non-Strong Start prenatal care enhancements in place before Strong Start implementation or provided to all women served by a site. To be included in our intensity classification, an enhancement needed to be specific to an awardee; therefore, we do not include state-wide enhancements for pregnant Medicaid beneficiaries, such as MOMCare in Alabama. We measure intensity at the awardee level, except for Birth Centers, for which intensity is measured at the site-level. When intensity varies across an awardee's sites, an awardee is classified by the intensity level experienced by most women served by the awardee.

We created three levels of intensity for each Strong Start model: low, medium, and high intensity. The definition for each classification was developed inductively based on patterns that emerged while reviewing case study memos for all awardees. Definitions are based on observable characteristics of interventions for which information was available consistently across awardees.

Birth Center

- **Low Intensity:** Interventions that do not include peer-counselor encounters beyond visits with the midwife or that include fewer than four encounters
- **Medium Intensity:** Interventions with four encounters (the recommended minimum for both birth center awardees) and no enhancements
- **High Intensity:** Interventions with more than four encounters or additional enhancements

Group Prenatal Care

- **Low Intensity:** Interventions less than the Centering Healthcare Institute's (CHI) *CenteringPregnancy* curriculum
- **Medium Intensity:** Interventions implementing Centering or an equivalent
- **High Intensity:** Interventions implementing Centering or an equivalent and additional services or content

Maternity Care Home

- **Low Intensity:** Interventions with fewer than four encounters with a care manager/coordinator
- **Medium Intensity:** Interventions with four or more encounters that only provide education and referral services or fewer than four encounters that provide direct services
- **High Intensity:** Interventions with four or more encounters and provision of additional direct services

We used the definitions above to classify all Strong Start awardee and Birth Center sites into "low," "medium," and "high" designations within each model. Draft classifications were made based on review of case study memos and were discussed by the evaluation team internally and with CMMI. Team members then followed up on questions that arose during the discussion and checked case study memos and notes to resolve questions. Finally, awardee and sites were reclassified based on these reviews.

Summary of Awardee Intervention Intensity Classifications

We classified intervention intensity for 23 Birth Center sites for which case study data were available. Birth Center sites are classified at the site level rather than the awardee level because all but one was in the same awardee – AABC. These 23 sites represent 49 percent of all Birth Center sites in Strong Start.[20] Among these sites, we classified 9 percent as low intensity (2 sites), 61 percent as medium intensity (14 sites), and 30 percent as high intensity (7 sites). Low intensity sites only provided three encounters, or stated that midwives provided enhanced services during traditional visits. Some high intensity sites provided as many as ten to fourteen encounters, while others provided Group Prenatal Care using the *CenteringPregnancy* approach in addition to Birth Center care with peer counseling services.

[20] The case study team selected AABC sites for data collection using the following criteria: geographic variation (including state and urban/rural location), the number of participants enrolled in Strong Start, and type of midwives practicing at the center (e.g., certified nurse-midwives vs. certified professional midwives or certified midwives).

Among the 14 awardees providing Group Prenatal Care, we classified 14 percent of interventions as low intensity (2 awardees), 50 percent as medium intensity (7 awardees), and 36 percent as high intensity (5 awardees). Low intensity awardees offered fewer than the ten Group Prenatal Care sessions that are standard in the Centering curriculum. The additional services and content provided by high intensity awardees ranged from case management support similar to that provided in the Maternity Care Home model, to partnerships with local organizations to provide additional services and supports, to specialized groups targeting women with specific risk factors.

Of the 17 Maternity Care Home awardees, we classified 24 percent as low intensity (4 awardees), 47 percent as medium intensity (8 awardees), and 29 percent as high intensity (5 awardees). Awardees with low intensity interventions often did not specify a standard number of encounters to be provided to all enrollees or reported fewer than four encounters. High intensity interventions provided enhancements ranging from additional encounters with the care manager to the direct provision of counseling services through a clinical social worker.

Intervention intensity is only one metric by which awardees can be compared, and our classification system relies on intervention characteristics that were readily identifiable for each awardee. Thus, this classification system is unlikely to fully capture differences between awardees, as those considered to be low intensity on this measure may be high performing in other ways. For example, this system is unable to capture the strength of relationships built between care managers and Strong Start enrollees among Maternity Care Home awardees, an aspect of the Strong Start program patient participants said was important to them. Despite these limitations, classifying intervention intensity provides an additional metric to inform our understanding of the Strong Start program and its impacts. This classification of intervention intensity is used in the Impact Analysis section to assess whether there were differences in impact by the intensity of the intervention.

STRONG START IMPLEMENTATION CHALLENGES AND SUCCESSES

In this section, we summarize major implementation challenges and successes reported by Strong Start awardees and sites over the course of the demonstration period.[21] Most challenges and successes persisted throughout implementation and were experienced by multiple awardees within and across each model. Challenges were often inter-related. Issues with low provider buy-in and high staff turnover, for instance, contributed to slow enrollment and low program participation.

Summary of Primary Implementation Challenges

Table 5 shows primary implementation challenges reported by Strong Start awardees over four annual rounds of evaluation case studies. Challenges are included in the table if they were reported in multiple case study rounds and/or across multiple Strong Start models. Top challenges included limited pre-implementation planning; lack of stakeholder support; program enrollment and participation challenges; issues related to staffing, work flows, and scheduling; difficulties operationalizing whole-person approaches to care; data collection and reporting problems; and challenges stemming from

[21] As in prior years, Birth Center findings are presented in a slightly different manner–as sites reporting rather than awardees–since all but one of Strong Start's Birth Center sites are operated by AABC. Each year the evaluation team selected a set of AABC sites for inclusion in the case studies to ensure that data are collected from a similar number of sites implementing each model.

Medicaid policies and state regulations. Each challenge is discussed in more detail in the following paragraphs.

TABLE 5: PRIMARY CHALLENGES REPORTED DURING THE STRONG START AWARD PERIOD, BY MODEL AND EVALUATION YEAR[1,2]

Challenge	Birth Center				Group Prenatal Care				Maternity Care Home			
	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4
Lack of pre-implementation planning	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	Yes	No
Lack of stakeholder support	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Difficulty enrolling eligible women	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No
Poor attendance and program retention	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Staffing issues	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes
Work flow and scheduling problems	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Inadequate space	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes
Difficulty addressing psychosocial needs	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Onerous program data and reporting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Medicaid policies and state regulations	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	No	Yes

Notes: [1] "Yes" indicates that one or more key informants from at least one awardee or birth center site reported the challenge in the relevant year. Challenges are included in this table if they were reported in multiple case study rounds and/or across multiple Strong Start models.
[2] In Years 1 through 3, key informants were asked to identify the most challenging aspect of Strong Start at that point in the demonstration period. In Year 4, however, key informants were asked to reflect on the multi-year demonstration period and identify the most challenging aspect of Strong Start during that entire period.

Limited pre-implementation planning. In the first round of case studies, many awardees and sites voiced concerns about limited pre-implementation planning and general lack of program implementation guidance. Most felt their problems stemmed from a compressed award rollout period (dictated by CMMI) which did not include sufficient time to hire and train staff, develop procedures for enrollment, and set up data collection infrastructure before enrollment began. One key informant from LADHS characterized the Strong Start rollout by stating, "We didn't have a planning period; it was just implementation."

In some cases, administrative processes of individual awardees were the primary cause of delays in implementation and limited time for pre-implementation planning. Some birth center sites felt challenged by the lack of structure and guidance from AABC on how to implement and operationalize the awardee's peer counseling component. AABC's preference, however, was to provide some peer counselor training materials but allow sites flexibility to adapt the program to their circumstances and patient population. Several Birth Center and Maternity Care Home key informants wanted more opportunities to engage with other sites to share best practices, noting that this could have aided their implementation efforts. Though a CMMI Learning and Diffusion contractor worked with the Strong Start awardees, it was not clear whether or how widely the Learning and Diffusion activities were promoted among sites, Finally, some awardees were frustrated that Strong Start funding did not cover start-up costs for program design and implementation, including outreach activities and certification costs (e.g., CHI certification for Group Prenatal Care).

Lack of provider and other stakeholder support. Many key informants felt that stakeholder buy-in was crucial for successful implementation and integration of new models of care into standard practice. Most agreed that support was necessary at multiple levels—executives and managers, prenatal care providers, and front office staff. Initially, awardees and sites from all models reported difficulty achieving stakeholder support, but the challenges were more pronounced and persistent among Group Prenatal Care and Maternity Care Home awardees. Some Birth Center sites struggled to get midwives and other staff to screen and refer eligible patients for recruitment, but these problems were largely resolved by Year 3. In contrast, some Group Prenatal Care and Maternity Care Home sites continued to vie for support from staff and leadership throughout the demonstration period. Office staff members were sometimes resistant to adapting their daily routine to accommodate recruitment and scheduling for group sessions or care manager appointments. For providers, lack of support typically stemmed from reluctance to embrace a new approach to care delivery or work with new staff, including a perception that doing so would increase their workload or otherwise disrupt the clinic work flow. One key informant from ACCESS explained, "Some of our providers are used to working alone and don't want anyone else to be involved." Some providers (particularly in Group Prenatal Care settings) viewed Strong Start as competition and withheld support because they were concerned about losing patients to the new model and the subsequent negative impact on their practice revenue. Provider buy-in was also difficult to achieve in some sites associated with teaching hospitals, where resident supervisors were concerned that involvement in group care would be a distraction for residents' core training and take too much time away from their direct care of women, and residents themselves simply did not have the bandwidth to familiarize themselves and embrace the new model of care. Finally, some providers at Group Prenatal Care sites simply did not believe in the group care model, and felt that individual prenatal visits were either preferred or necessary.

Enrollment and participation challenges. Identifying and enrolling eligible women in Strong Start was a common challenge, especially in the first years of program implementation. In Year 1, several awardees struggled to set up new processes, hire staff, adjust clinic work flow, and familiarize providers and other stakeholders with the intervention. Such challenges slowed the pace of implementation and contributed to lower-than-expected enrollment for most sites. Enrollment challenges were so widespread that CMMI asked awardees to revise their enrollment targets in Year 2 and revised program eligibility criteria so that more Medicaid and CHIP enrollees were eligible for Strong Start.[22] Other barriers to enrollment included low Medicaid volume in general (especially among birth centers), internal communication issues related to identifying and referring eligible women to Strong Start, and ineffective outreach. Some enrollment challenges related to the target population itself: eligible women sometimes declined participation in Strong Start, most commonly because they did not think they needed the extra support or did not believe that the program was a good use of their time. For Maternity Care Home awardees, enrollment challenges were generally limited to Year 1. Birth centers

[22] Initially Strong Start required the vast majority of women enrolled to be no more than 20 weeks' gestational age (some exceptions allowed limited enrollment up to 28 weeks) and have at least two risk factors for preterm birth–the first factor being Medicaid or CHIP eligibility, plus an additional risk factor. In July 2014, the criteria for enrollment were modified by CMMI to a) remove the gestational age cutoff and b) eliminate the requirement for a second risk factor. Even after the modifications, some awardees still used a gestational age cutoff, and/or required at least one additional risk factor (besides Medicaid/CHIP eligibility) to qualify women for their Strong Start programs. CMMI continued to alter the gestational age cutoff, eventually settling on a policy that generally restricted Strong Start eligibility to women who were no more than 29 weeks' gestation but allowed exceptions.

and Group Prenatal Care awardees, on the other hand, experienced more persistent challenges throughout the award period (described later in this section).

A related challenge across models involved patient engagement and retention throughout the Strong Start intervention. Key informants identified several common barriers that prevented enrollees from participating fully in Strong Start. These included lack of transportation and childcare, time constraints or other priorities such as school or employment, language barriers, and resistance to group settings or sharing personal information. Some awardees had difficulty maintaining contact with participants because of transience and unreliable phone access, especially Maternity Care Home awardees who more often relied on phone-based contact. Postpartum engagement was often the most challenging for awardees (see Highlight Box 1).

HIGHLIGHT BOX 1

Engaging Women Postpartum: Challenges and Strategies

Recognizing the postpartum period as a particularly vulnerable time for women when they may need lots of support and encouragement, Strong Start awardees placed emphasis on educating patients about postpartum care and potential postpartum issues (e.g., depression, family planning, or breastfeeding difficulties), making resources and referrals available for postpartum support and services, and keeping in touch and following-up with patients after they delivered their babies. However, many awardees reported that despite their best efforts, some participants disengaged from Strong Start after delivery and did not attend their postpartum check-up. Per key informants, some women think that "they are done and don't need to come back," others just get too busy or experience barriers to care, and some might see a different provider.

Strategies awardees developed to increase rates of postpartum visits included making reminder phone calls and offering incentives, such as baby photos or footprints at the 6-week check-up. One Maternity Care Home awardee reported that care managers would visit Strong Start participants while they were still in the hospital post-delivery to personally schedule and encourage them to attend their postpartum check-up. A Group Prenatal Care awardee hosted "birthday parties" for the group members' new babies as an incentive for women to attend a postpartum session. Many Birth Centers conducted several postpartum home visits with Strong Start participants, checking up on both moms and babies.

Staffing, work flow, scheduling, and space issues. In early implementation, many awardees and sites experienced difficulties related to program staffing, including limited guidance on establishing new positions and responsibilities; difficulty hiring appropriate staff or redefining roles for existing staff; high staff turnover; limited training opportunities; and inadequate funding to compensate staff for overtime spent on activities such as collecting and reporting data, outreach, or developing program materials and resources (e.g., patient handouts, referral resources, relationships with community-based organizations). Additionally, many awardees had trouble integrating Strong Start services into existing patient care work flows. Early in their implementation period, some Birth Center and Maternity Care Home awardees reported difficulties figuring out how to best structure and seamlessly integrate peer counselor and care manager encounters into a site's existing prenatal care patient flow to avoid additional burden for both providers and patients. A successful integration strategy for many sites was to schedule care manager and peer counselor encounters immediately prior to or after patients' prenatal or postpartum appointments (additional strategies are described below in the Implementation Successes section).

Work flow and scheduling issues were particularly prevalent among Group Prenatal Care awardees and extended beyond the early months of the program. Many sites struggled to identify the best times for group sessions or to coordinate the sessions with the clinic's schedule of individual OB/GYN appointments. Lack of staff support for the model, lagging program enrollment and retention, or outdated electronic systems unable to accommodate group scheduling contributed to work flow and scheduling problems. Securing adequate, private, and comfortable space to hold group sessions was also a significant issue for some Group Prenatal Care awardees. Most sites were ultimately able to overcome space challenges through creative thinking about repurposing other spaces (e.g., waiting rooms or staff break rooms), but space remained a chronic issue for some.

Difficulty addressing patients' psychosocial needs and barriers to care. As described above, each Strong Start model strove to address participants' psychosocial needs through enhanced prenatal care services. Awardees used the evaluation's Intake form to identify participant risks that might have otherwise gone undetected, such as food insecurity or domestic violence. However, uncovering these issues often led to realization that there were insufficient resources at care sites and in the community to address Strong Start participants' needs. Awardees and sites most frequently identified access to mental health services, substance use disorder treatment, and affordable housing as the most difficult to obtain. Other common needs, as mentioned above, included childcare and transportation. While some sites took steps to address childcare and transportation needs as part of their interventions, most found that they proved to be unsolvable barriers to Strong Start participation and prenatal care attendance. A key informant from ACCESS, a Maternity Care Home operating in the Chicago area, explained:

> *"A big policy issues in Chicago is around transportation. We know that Medicaid offers funds for transportation, but the hoops that are involved [to access this transportation] are much bigger issues. The Chicago transportation system looks big but has very limited functionality and hours in certain communities. Another challenge is that a transportation voucher may only cover the cost for the mother, and if she has two or three children to bring along on public transportation, especially if she's already pregnant, it can be really difficult."*

Some awardees, particularly those implementing Group Prenatal Care and Maternity Care Homes, expressed frustration that Strong Start funds were not allowed to cover program expenses they deemed essential. For instance, they wanted to use their Strong Start award to pay for healthy snacks for group sessions or incentives (e.g., gift cards or baby supplies) to promote program enrollment and participation. One key informant from LADHS encouraged CMMI to not consider "food, water…a stroller and transportation not as incentive[s], but as a basic need" of program participants.

Onerous data requirements. Most Strong Start awardees and sites reported challenges meeting the Strong Start program's administrative demands and found the data collection and reporting requirements particularly burdensome. These requirements included (1) cooperative agreement management and project progress reports for the CMMI program team and (2) participant-level data collection for the Strong Start evaluation team, consisting of an intake form, third trimester prenatal survey, postpartum survey, and exit form. Awardees uniformly expressed frustration regarding the amount of data required, coupled with changing specifications of CMMI progress reporting and the gradual rollout of participant-level forms. Many struggled to efficiently incorporate Strong Start forms into patient encounters, allocate data collection and reporting responsibilities among staff, and adapt

electronic medical record (EMR) systems to capture required elements and generate reports. Some AABC sites, for example, were simultaneously implementing and learning how to work with the Perinatal Data Registry (PDR), a pre-existing online data collection system AABC adapted to collect Strong Start patient-level data and transmit it to the central AABC awardee. Key informants sometimes reported that patients too were burdened by Strong Start data requirements, particularly when filling out the multi-page Intake Form, which some women found difficult to comprehend and others found too "invasive." On the other hand, some Strong Start staff reported that information from the Intake helped them identify patients' needs that might have otherwise gone unnoticed, and several awardees used the evaluation's data collection requirements to help structure Strong Start encounters.

Medicaid policies and state regulations, particularly for Birth Center sites. Finally, a number of awardees and sites noted challenges related to state Medicaid policies and procedures. Especially in the program's first year, when awardees across the board focused largely on increasing enrollment, some reported difficulties enrolling eligible women in Medicaid. Key informants from multiple states raised concerns about lengthy eligibility processing times—in the most extreme cases, Strong Start participants did not receive Medicaid coverage until several months after they had applied (and well into their pregnancies). Though in most states with Strong Start sites, Medicaid and CHIP programs had policies providing expedited presumptive eligibility to pregnant women,[23] awardees sometimes reported that providers were not willing to accept it and would not see a patient without full Medicaid/CHIP eligibility (which could take weeks or even months to obtain). In addition, some awardees reported challenges with continuous care after the maternity period, noting that pregnancy-related Medicaid coverage typically expires at 60 days postpartum and in many states women do not have an affordable coverage option to which they can transition after that period ends.

For Birth Center sites, Medicaid policy challenges were more extensive (see Highlight Box 2). They included difficulties contracting with Medicaid managed care organizations and Medicaid reimbursement for birth center services too low to cover the actual cost of care. Some Birth Center sites also experienced significant delays in receipt of Medicaid payments. For these reasons, a few Strong Start-participating birth centers were forced to limit the number of Medicaid patients they accepted to remain financially viable. In addition, Birth Center sites in some states experienced significant challenges in establishing themselves as prenatal care providers because of scope of practice laws and licensing policies that made it difficult for birth centers and midwives to

HIGHLIGHT BOX 2

Unique Medicaid-Related Challenges for Birth Centers

Some Strong Start Birth Center sites faced notable financial challenges related to low reimbursement from insurance carriers. Birth centers are typically reimbursed by Medicaid at rates that are much lower than reimbursement for hospital-based births. A Birth Center site in Charleston South Carolina reported receiving about $800 for prenatal care and an additional $800 facility fee for birth services from the state's Medicaid managed care program, when the actual cost of care was approximately $3,000. Because of these financial considerations, Strong Start staff purposefully did not conduct any external outreach efforts for the program and as of January 2017 (once its Strong Start participation had ended) the birth center stopped enrolling Medicaid patients entirely. Though freestanding birth center services are a mandatory covered benefit under Medicaid, AABC and its sites reported that many Birth Centers cannot get contracts with the Medicaid MCOs that provide the bulk of Medicaid services to pregnant beneficiaries.

[23] Under presumptive eligibility, a state extends coverage to individuals temporarily (and reimburses providers for care provided) while a full eligibility determination is made. https://www.kff.org/health-reform/state-indicator/presumptive-eligibility-in-medicaid-chip

practice. For instance, some states such as Florida have restrictive rules for advanced-practice nurses (including CNMs), placing limits on scope of practice and requiring physician oversight.

Summary of Primary Implementation Successes Over the Demonstration Period

Primary implementation successes reported by Strong Start awardees and sites are displayed in Table 6. Successes are included in this table if they were reported in multiple case study rounds and/or across multiple Strong Start models. Strong Start implementation successes include developing innovative systems to facilitate program implementation; achieving stakeholder buy-in; increasing participant enrollment and engagement; integrating Strong Start components into sites' standard model of care; well-qualified and skilled Strong Start staff; and establishing collaborative relationships with other organizations to address patients' psychosocial needs and barriers to care. Many of these successes stemmed from the challenges discussed above, as Strong Start awardees and sites developed effective strategies to address the implementation problems they experienced.

TABLE 6: PRIMARY SUCCESSES REPORTED DURING THE STRONG START AWARD PERIOD, BY MODEL AND EVALUATION YEAR[1,2]

Success	Birth Center				Group Prenatal Care				Maternity Care Home			
	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4	Y1	Y2	Y3	Y4
Implementation guidance and support	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes
Achieving stakeholder buy-in	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Increasing enrollment and engagement	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Program design and integration	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No
Well-qualified and skilled staff	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Addressing patients' psychosocial needs	No	No	No	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes

Notes: [1]A "Yes" indicates that one or more key informants from at least one awardee or Birth Center site reported the success in the relevant year. Successes are included in this table if they were reported in multiple case study rounds and/or across multiple Strong Start models.
[2] In Years 1 through 3, key informants were asked to identify the most successful aspect of Strong Start at that point in the demonstration period. In Year 4, however, key informants were asked to reflect on the multi-year demonstration period and identify the most successful aspect of Strong Start during that entire period.

Implementation guidance and support. In response to early implementation challenges, some awardees provided targeted support and technical assistance to their sites. For example, when Birth Center sites struggled with operationalizing the peer counseling component, AABC developed a "Quick Start" guide, which many informants referred to as a "cheat sheet," that addressed how to enroll participants, provide peer support services, and report program data. Several awardees supported their sites by creating opportunities for sharing knowledge and best practices via meetings, conference calls, learning collaboratives, and regular newsletters.

Achieving stakeholder buy-in. Getting broad-based support from organizational leadership, providers, and clinic staff was often identified as crucial to successful implementation of Strong Start. The most common effective strategies for increasing stakeholder support for interventions included identifying and nurturing a liaison or champion (most often a provider or administrator) to speak on behalf of Strong Start and educate other staff; hosting information sessions for providers and staff to introduce the program offer educate them about program processes and new protocols; and keeping the staff and executive leadership regularly informed about Strong Start activities and implementation progress (e.g., through newsletters, presentations at staff meetings). A care manager at FAHSC started bringing homemade brownies for the front desk staff member who sent her the most Strong Start participant referrals each month. Several Group Prenatal Care awardees cultivated provider and office staff support by inviting stakeholders to observe a group session and experience the approach for themselves. Being able to establish firm stakeholder support for Strong Start played an important role in sustaining enhanced services after the award period ended.

Increasing program enrollment and participant engagement. Virtually all awardees spent considerable time and effort refining recruitment strategies to boost Strong Start enrollment, particularly in the first half of the demonstration period when many struggled to meet program enrollment targets. Key informants identified a number of best practices including cross-training multiple Strong Start and office staff to recruit and enroll patients; centralizing all enrollment-related responsibilities; having peer counselors, group facilitators, and care managers directly involved in recruitment; training OB/GYNs and midwives to introduce the program and refer patients; and establishing referral processes with community organizations and social service agencies.

Many awardees and sites emphasized the importance of face-to-face recruitment and strong communication skills. Key informants also shared their most effective messaging tactics, which included enrollment processes that involved presenting Strong Start as part of the site's standard approach to prenatal care and explaining the benefits of participation (e.g., provider continuity, reductions in negative birth outcomes, psychosocial support), meaning that patients had to "opt out" if they did not want to participate. Some awardees reported better enrollment success when they explained that participating in Strong Start could benefit not only the pregnant woman herself, but other women as well. One key informant explained, "People are more likely to say 'yes' if they feel that they are part of something big or revolutionary that will help others." Similarly, some Birth Center sites felt women were most receptive when Strong Start was described as a research project gathering data on the benefits of midwifery and birth center care.

Strong Start sites used either an opt-in or opt-out enrollment approach (see Highlight Box 3). Though opt-in enrollment was a much more common approach, some awardees and sites switched to opt-out during the award period and found this was a more effective enrollment strategy. Other strategies include developing and distributing Strong Start promotional materials, playing a promotional video in OB waiting rooms, using the EMR or other health system data to identify eligible women, and providing small incentives from outside funding sources to increase enrollment. Some Group Prenatal Care awardees showed eligible patients the group meeting room or encouraged them to observe a session to entice them to enroll.

HIGHLIGHT BOX 3

Opt-In and Opt-Out Enrollment Approaches

Strong Start awardees and sites adopted one of two distinct enrollment approaches:

- **Opt-in enrollment**: eligible patients made an active choice between enrolling in Strong Start or receiving typical prenatal care.
- **Opt-out enrollment**: eligible patients were automatically enrolled in Strong Start unless they actively declined participation.

Most awardees who chose an opt-in approach did so because it "felt" right to give women options. They believed women who actively chose to participate in Strong Start would be more engaged in their care and committed to attending sessions and encounters. Others including UPR, Einstein, Meridian, and Signature used opt-out enrollment from the start because they were interested in fundamentally transforming their prenatal care practice and maximizing enrollment. Some awardees tried both enrollment approaches, usually transitioning from opt-in to opt-out enrollment because the latter method was associated with better uptake. A key informant at United noted, "Instead of asking people if they wanted to be part [of Strong Start] we said this is our program. You are here for care and this is what you get."

Successfully enrolling participants in Strong Start did not always translate to robust program attendance on an ongoing basis. Group Prenatal Care awardees especially found that it was sometimes difficult for patients to commit to the fixed schedule of two-hour group sessions. They described several strategies to boost session attendance, including providing participants with a written schedule of group session dates as far in advance as possible; making reminder phone calls and sending texts in the days preceding each session; personal follow-up with members who missed sessions; and using non-Strong Start-funded incentives (e.g., raffles for gift cards and baby gear) to keep participants motivated and engaged throughout the session cycle. Some Birth Centers and Maternity Care Home awardees also worked to keep participants engaged by making peer counseling and care manager encounters as convenient as possible. Some techniques included coordinating in-person encounters with prenatal and postpartum visits, using telephonic and text-based communication to facilitate more regular contact with participants, and making peer counselors and care managers available nearly 24/7. Some awardees also tasked CHWs or similar staff with targeted outreach and home visits to the hardest-to-reach participants.

Awardees across models attempted to reduce common barriers to participation by arranging for or educating patients about Medicaid-covered transportation options, or providing transportation vouchers. Some sites also either provided childcare or allowed women to bring their children to individual prenatal care appointments or group sessions. All the Birth Center sites included in the case studies either allowed (and in some cases encouraged) women to bring children to their appointments or provided a play area for children in the waiting room. Allowing children in appointments seemed to enhance the care experience for many Birth Center patients, who described how midwives would include their children in prenatal exam activities such as using a Doppler monitor to find the fetal heartbeat. Though Group Prenatal Care awardees generally discouraged participants from bringing

children to appointments (as is stipulated by the *CenteringPregnancy* model) several suggested that they would rather have a woman attend with her children than skip the session because of lack of childcare. Maternity Care Home awardees sometimes discouraged participants from bringing children to appointments. These awardees tried to schedule in-person encounters during school hours, encouraged patients with young children to bring another adult to supervise the children, or made referrals to Early Head Start or to churches or local organizations that provide childcare, though it was not clear how often these services were available and affordable.

Program design and integration into standard care. The extent to which awardees could seamlessly integrate Strong Start enhancements into their pre-existing model of care was often associated with successful implementation, particularly in sites that experienced initial resistance to new care approaches from providers and office staff.

For Maternity Care Home and Birth Center awardees and sites, successful integration often meant thoughtfully scheduling care manager and peer counselor encounters immediately prior to or after patients' prenatal or postpartum appointments; communicating by phone or text as often as needed; making sure the educational component of Strong Start encounters did not merely duplicate what patients heard from their OB/GYNs or midwives; and establishing collaborative relationships between providers and Strong Start staff to address patient needs, such as through case conferencing. Some Group Prenatal Care awardees developed sessions targeting specific populations (e.g., women with HIV, Spanish speakers) to better meet the needs of a site and its patients. When a Strong Start program was integrated into the pre-existing model of care or provided a clear value-add by targeting a special population with unique needs, providers more easily recognized and appreciated the benefits of the enhanced services and were thus more open to sustaining the enhancements. UKRF's prenatal care groups for women with opioid addiction (called PATHWAY) is a good example of a sustained program like this, as described in Highlight Box 4.

HIGHLIGHT BOX 4

Group Prenatal Care for Women with Opioid Addiction

UKRF's PATHWAY (with "PATH" standing for Perinatal Assistance and Treatment Home) group enrolled pregnant women who were addicted to opioids and receiving suboxone treatment (most commonly, though methadone treatment is also used). One key informant described the value of PATHWAY by saying, "These women have never had quality prenatal education. We treat them like regular pregnant women, and the look on their face[s], they are so relieved this treatment and these services encourage them to continue pursuing healthcare." Generally, women in this program felt more comfortable, respected, and cared for in comparison to experiences during previous medical treatment or pregnancies. One focus group participant in PATHWAY said, "Everyone is really nice here. This is the only place where everyone understands that you can be a drug addict and pregnant at the same time. [There is no] shameful scorning. They are not judging you. That's a blessing as far as I'm concerned."

While provider support was difficult to establish for Group Prenatal Care more generally at UKRF, it was easier to obtain for specific groups such as PATHWAY. The awardee sustained PATHWAY using institutional funding, and the program grew considerably after the Strong Start award period ended. Since the institutional funding now supporting PATHWAY is more generous than Strong Start award funding, UKRF added a full-time therapist to the program, developed a postpartum component called *Beyond Birth*, and created therapy groups and 12-step groups for PATHWAY participants.

Well-Qualified and Skilled Strong Start Staff. Hiring and training competent, accomplished, and committed staff had a significant impact on the overall success of the program and was a topic that figured prominently in evaluation interviews over the course of the demonstration period. For Maternity Care Home and Birth Center awardees and site, these staff included care managers and peer counselors whose salaries were typically paid for using Strong Start funds. For Group Prenatal Care awardees, these staff included group facilitators (e.g., OB/GYN physicians, RNs, and Advanced-Practice Nurses) who were trained using Strong Start funds but whose salaries were not generally a Strong Start expense. During the last round of case studies, key informants identified the staff attributes they felt were most important for successful program implementation (see Table 7).

For all awardees and sites, the top attributes were ability to connect with patients (often described as having empathy or truly wanting to help people), being of a similar background as the target population, and prior experience working with pregnant patients or in an environment similar to the Strong Start site. Though professional qualifications were felt to be very important by most awardees and sites, many also emphasized the importance of relationship-building skills, a positive attitude, and relatable engaging personalities in addition to credentials. Some key informants even felt that interpersonal skills were more important than professional qualifications or an advanced degree.

TABLE 7: MOST IMPORTANT STRONG START STAFF ATTRIBUTES FOR SUCCESSFUL PROGRAM IMPLEMENTATION[1]

Model Type	Most Commonly-Identified Strong Start Staff Attribute
All Awardees & Sites	1. Ability to connect with patients, has empathy 2. Relatable, shared demographics with target population 3. Prior experience working with pregnant patients 4. Experience working in environment like Strong Start provider site
Maternity Care Home Awardees	1. Ability to connect with patients, has empathy 2. Social work background or training 3. Passionate and dedicated, knowledge of community resources, familiar with community, prior experience working with pregnant patients, and cultural competence
Group Prenatal Care Awardees	1. Nurse-midwife or nurse-practitioner background or training 2. Prior experience working with pregnant patients 3. Good listener and/or communicator, current on latest maternity care knowledge and training, and ability to connect with patients, has empathy
Birth Center Awardees and Sites	1. Relatable, shared demographics with target population 2. Experience working in environment similar to Strong Start provider site 3. Ability to connect with patients, has empathy

Notes: The three most common attributes for all awardees and sites and within each model are included in this table. Five or more awardees or sites reported the attributes listed for all awardees and sites. Two or more awardees or sites reported the attributes listed for each model. This analysis includes 17 Maternity Care Home awardees, 15 Group Prenatal Care awardees, and 12 Birth Center awardees or sites.

Addressing patient's psychosocial needs. Although addressing psychosocial needs, especially behavioral health and housing, remained challenging for most awardees and sites, many were successful in establishing new collaborative relationships with local health care providers, community-based organizations, and social service agencies in order to connect Strong Start participants to a range of supports and services.

Some awardees collaborated with their state Medicaid agencies to expedite enrollment of eligible women or helped participants sign up for other benefits such as WIC or cash assistance. Others facilitated participants' transportation to prenatal care appointments, provided referrals to dental care and behavioral health services, or assisted participants in obtaining food and baby supplies. Some Group Prenatal Care awardees leveraged their connections to other providers and community-based organizations to arrange for guest speakers at group sessions (e.g., pediatricians, home visiting program representatives, lactation consultants).

Sustaining the Strong Start Programs

Sustaining a program once the award period ended was perhaps the most significant indicator of implementation success for Strong Start awardees. In the evaluation's fourth annual report,[24] we reported that slightly more than half of Strong Start awardees and Birth Center sites were fully or partially sustaining enhanced prenatal care models implemented under Strong Start (Hill et al, 2018). As shown in Table 8, 9 of 17 Maternity Care Home and 7 of 13 Group Prenatal Care awardees had decided to continue their full programs at all or some sites. All Birth Center sites studied in evaluation Y4 were continuing their pre–Strong Start midwifery model of prenatal care, and most had also decided to continue peer counseling in some shape or form, although financial constraints meant that after Strong Start funding ended, services were less intensive.

TABLE 8: SUSTAINABILITY OF THE STRONG START PROGRAMS IN EVALUATION YEAR 4

Awardee Model of Care	Full Model Sustained		Partial Model Sustained		Continuing Prior Enhanced Model w/out SS Additions[1]	Not Sustaining Model
	All SS Sites	Some SS Sites	All SS Sites	Some SS Sites		
Maternity Care Home awardees[2] (n=17)	6	3	0	2	1	6
Group Prenatal Care awardees (n=13)	4	3	0	0	5	1
Birth Center sites (n=11)	3	N/A	6	N/A	2	0

Notes: [1] Some awardees and sites had enhanced prenatal care in place before they implemented Strong Start. In these cases, Strong Start services were layered on top of the preexisting enhancements, or the Strong Start award replaced expired funding to maintain enhanced prenatal care. For example, sites with established Group Prenatal Care programs that added community health worker services to group sessions, or Birth Center sites that added peer counseling services to complement their midwifery model of care. This column shows awardees and sites that will maintain the enhanced care models they had in place prior to Strong Start, but will not sustain the additional services that were layered on top of their pre-Strong Start enhancements.

[2] Johns Hopkins University reported some sites sustaining full model and others sustaining a partial model and therefore is represented in both columns. All other MCH and GPC awardees reported uniform sustainability plans for the sites that were sustaining a SS model (e.g., all sites sustained either full or partial model).

[24] The fourth annual report was based on data collected during the final round of case study interviews (October 2016 - May 2017). https://downloads.cms.gov/files/cmmi/strongstart-snhancedprenatalcaremodels_evalrptyr4v1.pdf

Awardees and sites reported that having a funding source for enhanced prenatal care services was the most crucial component for sustainability. Most sustaining awardees were partly or fully self-funding sustained services (i.e., using internal practice or health system monies once the Strong Start intervention period ended). A few were relying on external grants or philanthropic funding (sometimes in combination with self-funding), and a small group of awardees reported receiving support or reimbursement from Medicaid or Medicaid managed care organizations (MCOs) to continue Strong Start services, as described in Highlight Box 5. Besides funding, key informants identified several other factors as critical to their ability to sustain Strong Start services, with the most common being leadership and organizational support, and data showing Strong Start's positive impact.

HIGHLIGHT BOX 5

Sustaining Strong Start with Medicaid or Medicaid MCO Funding

Several awardees used Medicaid or Medicaid MCO funding to continue their Strong Start services:

- *ACCESS Community Health Network* in Illinois (Maternity Care Home) sustained care coordination services for pregnant patients through a combination of Medicaid MCO funds and private philanthropic funding.
- *United Neighborhood Health Services* (Maternity Care Home) sustained and expanded its Strong Start intervention through a Medicaid value-based payment reform pilot program that provides per member per month payments to clinics for implementation of the patient-centered medical home model.
- *Virginia Commonwealth University* (Group Prenatal Care and Maternity Care Home) key informants reported that Virginia Medicaid now pays an enhanced reimbursement rate for Group Prenatal Care, which is helping the awardee sustain its Strong Start program.
- *Amerigroup Corporation* (), the only Medicaid MCO Group Prenatal Care awardee, received approval from the Louisiana Medicaid agency in 2015 to provide enhanced reimbursement for group care (approximately an additional $50 per participant per session) to providers in its MCO network.

KEY CONSIDERATIONS FOR REPLICATING STRONG START MODELS

With very few exceptions, awardees believed the enhanced prenatal care models they implemented under Strong Start were worthy of replication. Based on their observations and interactions with Strong Start participants over the course of the intervention, awardees perceived that the program had many positive effects for women and newborns, including increased patient satisfaction with prenatal care; more trust in and engagement with the health care system; an increased sense of well-being; improved self-care and management of chronic conditions; greater food, housing, and financial security; and better awareness of community resources and how to access them.

During the Year 4 case study interviews, we asked key informants to reflect on their experiences under Strong Start and identify factors they felt were most important to successful program replication, including those related to program design and implementation decisions, as well as to the environment in which their programs operated. Specifically, we prompted key informants to identify the most important program replicability factors related to: their prenatal care practice and providers; the patient population they served; the communities where sites were located; and, policies or regulations that influenced the care they could provide.

Replicability Factors Related to Provider and Practice Sites

The largest number factors that awardees and sites identified as important for replication were related to providers and practice sites. Table 9 displays these factors, across all awardees and sites and by model. Factors are assigned a high, medium, or low level of importance based on the proportion of awardees and sites that identified the factor during their Year 4 case study interviews. Given the large number of replication factors reported in this category, only factors that were rated a high or medium level of importance by all awardees and sites and within each model are discussed in more detail below (i.e., factors listed in the first seven rows of the table). (For Birth Center sites, these factors apply to replication of the peer counseling services funded under Strong Start, not the midwifery model of care.)

TABLE 9: MOST IMPORTANT PROGRAM REPLICABILITY FACTORS RELATED TO PROVIDERS AND PRACTICE SITES

Factor[1]	Importance Based on Number of Awardees/Sites Reporting Factor[2]			
	All Awardees/ Sites	Birth Center	Group Prenatal Care	Maternity Care Home
Well-qualified, skilled Strong Start staff (specific attributes varied)	High	High	High	High
Appropriate space for providing Strong Start services	High	Medium	High	High
Provider and administrative staff buy-in and support	High	Medium	Medium	High
Presence of program "champions"	Medium	Medium	High	High
Strong Start staff continuity	Medium	Medium	High	Medium
Convenient provider site location	Medium	Medium	High	Medium
Practice-level commitment to holistic, patient-driven care approach	Medium	Medium	Medium	Medium
Use of Electronic Medical Record (EMR) system	Medium	Low	Medium	Medium
Education for providers and clinic staff about the model	Medium	Low	Medium	Medium
Collaboration between providers, office staff, and Strong Start staff	Medium	Low	Low	Medium
Adequate training for Strong Start staff	Low	Not reported	Medium	Medium
Sufficient patient volume	Low	Low	Medium	Low
Adequate staffing for the model	Low	Not reported	Medium	Low
Integrating Strong Start services into provider site work flow	Low	Low	Low	Low
Care manager flexibility	Low	Not reported	Not reported	Low
Consistent providers/low turnover at site	Low	Low	Not reported	Not reported

Notes: [1] A replicability factor is included in the table if it was reported by at least 15% awardees and/or sites.
[2] An assignment of "low" indicates that fewer than 25% of awardees or sites studied in Year 4 reported the factor; "medium" indicates that between 25% and 50% of awardees or sites reported the factor; and, "high" indicates that more than 50% awardees or sites reported the factor. This analysis included 17 Maternity Care Home awardees, 15 Group Prenatal Care awardees, and 12 Birth Center awardees or sites.

Three factors were mentioned by more than half of the awardees and Birth Center sites (and thus are assigned a "high" level of importance):

- Well-qualified and skilled Strong Start staff
- Appropriate space for providing Strong Start services, and
- Provider and administrative staff buy-in and support for the program.

When discussing how a program like theirs could be successfully replicated, awardee and site staff often mentioned various ***qualifications and skills of the individuals they had selected to deliver Strong Start services***. The Strong Start Implementation Challenges and Successes section includes a discussion of staff attributes, as having well-qualified and skilled Strong Start staff was also the most commonly-mentioned factor related to program success. Table 6 in the previous section shows the most important Strong Start staff attributes for successful program implementation, for all awardees and sites and by model. Maternity care home awardees were most likely to report that staff ability to connect with patients (or having empathy) was important for successful replication, given the model's focus on

psychosocial support. Group Prenatal Care awardees felt that having a background as a nurse midwife or nurse practitioner was important, reasoning that these advanced practice nurses were trained to value health education and discussion with patients and so were a "natural fit" for their model. Birth center awardees and sites were most likely to identify being relatable or having a shared background to patients as important, since their intervention placed more value on peers as counselors. Notably, however, many Birth Center peer counselors had professional qualifications as well as (or instead of) sharing patient demographics.

Many awardees and sites, and especially those implementing Maternity Care Homes or Group Prenatal Care, felt that having ***appropriate space for Strong Start service delivery*** was a key factor for successful program replication. They generally agreed that the space should be dedicated to Strong Start activities but not compromise the efficiency of the site's prenatal care practice or disrupt the patient work flow. Other suggestions varied by model. Maternity Care Home awardees and Birth Centers emphasized privacy, since care manager or peer counselor encounters sometimes delved into sensitive topics. Group prenatal care awardees focused on the size of the space (large enough for a group cohort plus support persons, and for group activities) and felt that it should be welcoming. Some Birth Centers noted the importance of a "home-like" and inviting, peaceful space for providing enhanced prenatal care.

When prenatal care providers and others who work in clinics and birth centers ***buy-into and give support*** to a program like Strong Start, it has a much better chance at succeeding, even in the face of significant implementation challenges. Provider support is critical, particularly for programs where the provider plays a role in recruitment or delivering the enhanced services. An Amerigroup (Group Prenatal Care) key informant explained, "Your provider has to have the desire, especially at the beginning, because it is more work to prepare for each group and get the dynamic of each group. It's not your typical visit." Most awardees and sites felt that buy-in needed to be "universal" and involve all elements of the practice for the program to be replicated most effectively. As a key informant from the Grady (Group Prenatal Care) awardee noted:

> *"Most things are manageable if all the personnel are educated and treated respectfully about the program, so everyone owns it. The front desk person needs to own it, not treat it like second class care. They need to know where it comes from, and why it's so invaluable."*

Several other replicability factors included in Table 9 are related to broad stakeholder support. For instance, more than half of Maternity Care Home and Group Prenatal Care awardees, and more than a quarter of Birth Center awardees and sites, identified the ***presence of program champions*** as an important factor. Champions were valuable because they kept positive attention on Strong Start and could be effective messengers about the intervention's purpose and progress, thus promoting support from others. They could also facilitate program operations, as one Group Prenatal Care awardee pointed out that an administrator champion had helped reserve space for groups and rearranged provider schedules to accommodate group sessions. Awardees that had prior experience with the enhanced prenatal care model sometimes had pre-existing champions which made program implementation much smoother. A key informant from UTHSC (Group Prenatal Care) noted:

"The reason we were successful was the fact that we have been doing Centering since 2005, so we already knew the concept, we already had champions. If you don't have a champion you're just not going to make it. Even with a champion other people in the organization can set barriers…people who don't [believe in] your vision or understand the process."

When providers and leadership possess a ***practice-level commitment to a holistic, patient-driven care approach,*** they may be more supportive of a program like Strong Start and more willing to dedicate the time and resources to making it a success. Awardees and sites described this important replicability factor as a recognition that effective prenatal care comprises not only evidence-based medical care, but also care that identifies and addresses the psychosocial needs of women and their families. A key informant from Providence (which implemented all three models) explained:

"One of the things our midwifery director and team is so invested in [is] the social aspect of our patients, because when you have patients who have housing or other social risk factors that affect their lives, the baby in their belly is not their first priority."

Another key informant from Signature (Maternity Care Home) shared a similar sentiment when discussing how providers and Strong Start staff worked together to develop their comprehensive care approach. She said:

"One of the things we do really well is [understand] that holistic lens. How does filling out a Medicaid application affect the pregnancy? How does that dental infection affect the pregnancy? How does not having a safe place to live affect the pregnancy? It all affects it."

Two replicability factors related to providers and practice sites that were identified by more than half of Group Prenatal Care awardees (and smaller proportions of other awardees and sites) were ***Strong Start staff continuity*** and ***convenient provider site location.*** As noted earlier in this section, having a continuous enhanced service provider—whether it is a care manager, peer counselor, or group facilitator—was a shared feature of all the models. However, Group Prenatal Care awardees were more likely to name this feature as important for program replicability, perhaps because of the increased amount of time facilitators spent with group participants (i.e., roughly 20 hours total for awardees using Centering's ten 2-hour session approach) when compared to the time care managers and peer counselors spent with participants in their caseload. Group prenatal care awardees felt that having the same facilitator for each session gave patients comfort and confidence, and facilitated group bonding and cohesiveness. A key informant from Einstein (Group Prenatal Care) reported:

"We see that groups are more successfully if they meet the centering provider the first time when the come in for their appointment, rather than meeting someone and then being sent on to Centering. We had better turnout with the same provider, and bonding with them and knowing them."

Regarding location, a number of Group Prenatal Care awardees struggled with session attendance. A conveniently located provider site that was near public transportation and/or within the community where most patients live helped ensure better attendance. Though awardees and sites across models experienced challenges related to patient transportation barriers, Group Prenatal Care awardees could not employ 'workarounds' as easily as those implementing the other models. Maternity Care Home and Birth center sites could sometimes substitute home visits or phone-based communication for in-person

care manager encounters when patients had difficulty getting to the provider site, but Group Care services were predicated on attendance at the group visit. Some Maternity Care Home awardees and Birth Center sites also identified provider site location as a replicability factor, but they emphasized the importance of choosing program sites that had a sufficient volume of low-income and/or Medicaid-covered patients so the program could enroll enough participants. A UNHS (Maternity Care Home) key informant said:

> *"In terms of the location of my clinic, our program works well because we are in a low-income area, where there is housing for low-income… patients. They need extra support and they need to know where they can find resources and Strong Start provides a lot of that type of support."*

Replicability Factors Related to the Patient Population

Awardees and sites also identified a number of patient-related factors they believed were important for program replication; Table 10 shows the factors most commonly-mentioned, by model. None of these factors were reported by more than half of awardees and sites. Only one factor was reported by more than a quarter of all awardees and sites—the presence of ***engaged patients***. Awardees and sites implementing the Maternity Care Home and Birth Center models were most likely to identify an engaged patient population as important for successful program replication, though key informants' opinions on this matter were sometimes mixed. For instance, one ACCESS (Maternity Care Home) key informant indicated that it can be "critical" that the patient is looking for help, noting that otherwise, "you can do everything possible, but they have something getting in the way of taking advantage of those opportunities." But at ACCESS there was also tacit acknowledgement of the wide variation among patients, and another key informant suggested that "meeting patients where they are" is critical for building a rapport that facilitates patient engagement. A different Maternity Care Home awardee felt engagement was especially important if the target population includes patients with mental health or substance use disorders, as the intervention may not be very effective if these patients did not want to engage with enhanced service providers.

TABLE 10: MOST IMPORTANT PROGRAM REPLICABILITY FACTORS RELATED TO THE PATIENT POPULATION

Factor[1]	Importance Based on Number of Awardees/Sites Reporting Factor[2]			
	All Awardees/ Sites	Birth Center	Group Prenatal Care	Maternity Care Home
Engaged Patients	Medium	Medium	Low	Medium
Strong visit attendance rates	Low	Low	Low	Not reported
Site's ability to address patient barriers to care	Low	Low	Low	Low
Targeted outreach to hard-to-reach participants	Low	Not reported	Low	Low

Notes: [1] A replicability factor is included in the table if it was reported by at least 10% awardees and/or sites.
[2] An assignment of "low" indicates that fewer than 25% of awardees or sites studied in Year 4 reported the factor; "medium" indicates that between 25% and 50% of awardees or sites reported the factor; and, "high" indicates that more than 50% awardees or sites reported the factor. This analysis included 17 Maternity Care Home awardees, 15 Group Prenatal Care awardees, and 12 Birth Center awardees or sites.

Birth centers emphasized the importance of a patient population that is "proactive and motivated" to have a healthy pregnancy, which they felt contributed to program success. A key informant from AABC's San Diego site added that patient engagement can be especially important for the midwifery model of care because patients must be open to building relationships with their midwives.

Across the models, awardees and sites acknowledged that providers and Strong Start staff played an important role in engagement. Though a few tended to place the onus of responsibility squarely on the patient rather than consider how they might improve their own approach to care, most Strong Start programs recognized the ways they could stimulate patient engagement. They could, for instance, tailor recruitment messages so that patients understand the benefits of participating in the program; be approachable and supportive; and be well-equipped to help patients access resources to address the barriers to care that might make engagement challenging such as homelessness, substance use, and lack of transportation.

Though Group Prenatal Care awardees were less likely to specifically mention an engaged patient population as key for replicability, some noted the importance of a related factor—***visit attendance rates***. They described how the group dynamic suffers when session attendance is low, because the discussion includes fewer individuals and is often less robust or interesting for participants. Some also emphasized the importance of an adequate group size for the model to be financially viable. Key informants from UTHSC (Group Prenatal Care) felt that attendance was important but also suggested ways to adjust the program to ensure success even with lower attendance rates. For instance, a site could create larger cohorts with the expectation that several participants will not show up, and leave time for midwives to have individual appointments later in the day (after sessions end) with women who did not show up. Average group size for the Strong Start awardees was usually in the range of 8-12 participants, but for some it was as low as 3-5 participants.

Awardees and sites representing each model felt that a site's ***ability to address patient barriers to care*** was an important factor for successful program replication, and one that is related to both patient engagement and visit attendance rates. In particular, several mentioned that an intervention will be more successful if a site can assist patients with transportation problems. Strong Start awardees helped participants schedule rides with Medicaid-covered transportation vendors; encouraged car-pooling for Group Prenatal Care cohort members coming from the same neighborhoods; and in a few cases provided taxi, bus, or gas vouchers paid for under other programs (e.g., the St. John awardee funded taxis and Lyft rides through the health system's breastfeeding support group program).

Finally, a small number of Maternity Care Home and Group Prenatal Care awardees conducted ***targeted outreach*** to the hardest-to-reach program participants. For instance, VCU (Maternity Care Home and Group Prenatal Care) key informants suggested that for a program like Strong Start to accomplish its goals, patient isolation and lack of engagement in care should trigger additional outreach and home-based services. VCU program staff conducted outreach in housing projects to hard-to-reach participants. At UNHS (Maternity Care Home), Strong Start staff prioritized reminder calls for patients with high no-show rates and followed up immediately with additional phone calls and rescheduling opportunities if those patients missed prenatal appointments.

Replicability Factors Related to Community and Policies/Regulations

Some awardees and sites identified factors associated with their particular communities, or policies and regulations as influencing the care they provided and being important for program replication. These factors are displayed in Table 11.

TABLE 11: MOST IMPORTANT PROGRAM REPLICABILITY FACTORS RELATED TO COMMUNITY AND POLICIES/REGULATIONS

Factor[1]	Importance Based on Number of Awardees/Sites Reporting Factor[2]			
	All Awardees/ Sites	Birth Center	Group Prenatal Care	Maternity Care Home
Sufficient funding for enhanced prenatal care services	Medium	Medium	Medium	Low
Availability of community resources to meet program participants' needs	Medium	Low	Low	Medium
Strong connections to community resources	Low	Low	Low	Low
[Birth Center Only] Relationship to medical community	Low	High	Not reported	Not reported
[Birth Center Only] Affordable licensure and credentialing	Low	Low	Not reported	Not reported

Notes: [1] A replicability factor is included in the table if it was reported by at least 10% awardees and/or sites.
[2] An assignment of "low" indicates that fewer than 25% of awardees or sites studied in Year 4 reported the factor; "medium" indicates that between 25% and 50% of awardees or sites reported the factor; and, "high" indicates that more than 50% awardees or sites reported the factor. This analysis included 17 Maternity Care Home awardees, 15 Group Prenatal Care awardees, and 12 Birth Center awardees or sites.

More than a quarter of all awardees and sites, especially those implementing Group Prenatal Care and Birth Center models, felt that having ***sufficient funding*** for enhanced prenatal care services was an important factor for replicability. This finding is not surprising given that funding was also identified as the most critical factor for sustaining Strong Start programs. Though some awardees included internal (organizational) monies or grants among the funding sources that would aid replicability, most felt the best source of funding for long-term program success was reimbursement from Medicaid or other health care payers. Funding recommendations varied by model:

- Maternity care home awardees were least likely to identify funding as an important factor for replication, perhaps because care coordination services and case management are already covered services for many Medicaid programs. In a 2016 survey the evaluation team conducted with Medicaid officials in 20 Strong Start states, most officials indicated that care coordination or case management are covered services though some noted the services were provided through a specific program or limited to high-risk women, and others reported it was the MCOs' role to provide them (Hill et al., 2018). Programs such as Strong Start, therefore, may need to contract with MCOs or become certified providers to qualify for Medicaid reimbursement. The ACCESS awardee was successful in obtaining funding to sustain its Strong Start services through Blue Cross/Blue Shield's Medicaid managed care plan "Blue Community" in Illinois. In contrast, other Maternity Care Home awardees noted that few MCOs reimburse for care coordination or case management services and often provide the services in-house instead.
- Group prenatal care awardees felt more practices would offer the model if it were incentivized through Medicaid/CHIP reimbursement policies. CJFHC key informants believed that if data showed improvements in birth outcomes, MCOs might consider a performance-based reimbursement approach that would motivate providers to implement the model. Amerigroup

officials noted that group care programs carry certain costly elements, including training and certification for those choosing the *CenteringPregnancy* approach, establishing a room for group sessions, and (potentially) seeing fewer patients than can be seen through typical prenatal care. Without enhanced third-party reimbursement, key informants expressed skepticism that Group Prenatal Care could be financially viable. Amerigroup Louisiana health plan implemented an enhanced Group Prenatal Care reimbursement fee of $50 per member per visit for Medicaid providers during the Strong start award period, which encouraged some of the awardee's sites to sustain the model.

- For Birth Center sites, a primary challenge for replication of the peer counseling component is that, in most states, peer counseling services are not billable under Medicaid/CHIP. However, birth centers face broader challenges because Medicaid programs often pay lower fees for midwife services than they do for physician and hospital services. Low payments particularly impact birth center facility fees and midwife provider fees. The evaluation's 2016 survey of Medicaid officials in Strong Start states found large payment differentials for uncomplicated vaginal deliveries at birth centers versus hospitals, with birth centers paid as little as 15 percent of hospital rates for the same delivery, and between obstetricians and midwives' reimbursement, with midwives paid 70 to 92 percent of physician rates for the same service (Hill et al. 2018). Low reimbursement has been a recurrent theme in the evaluation's case studies of Birth Centers, with some sites struggling to serve Medicaid beneficiaries because reimbursement does not cover the cost of providing care to these patients. Inability to get contracts with Medicaid MCOs is another significant barrier. A key informant from AABC explained, "It feels like MCOs want to deal with people they are used to dealing with, which is bigger hospitals and health networks."

The availability of ***community resources*** to meet participants' needs was identified as an important replicability factor primarily by Maternity Care Home awardees whose interventions were usually centered on identifying participant needs and making referrals to outside resources. As was the case among other awardees, Maricopa care managers often made referrals to WIC, food banks, and behavioral health counseling. While establishing connections with community organizations and social service agencies required staff time and networking, a Maricopa key informant noted, "our facility can only do so much and we can't provide everything that patients may need." Several key informants from LADHS noted it could be more difficult to implement the model in a resource-poor area or in a state lacking policies that encourage or require health systems to examine the psychosocial context of a patient. At the same time, they agreed that patients could still benefit from a Maternity Care Home model even where outside resources were more limited.

Two Group Prenatal Care awardees reported that a community with resources for low-income individuals was helpful when scheduling guest speakers, compiling handout materials for group sessions, and obtaining incentives (Strong Start funding could not be used for incentives). HealthInsight key informants, for instance, noted that the presence of local lactation consultants and organizations that provide necessities such as car seats and diaper bags helped them meet their program goals.

While availability of resources was important, some awardees added that program staff must be skilled at making ***strong connections to community resources.*** This involves forging relationships within the community as well as keeping resource lists organized, updated, and verified (i.e., checking a resource out and confirming it is appropriate and accessible prior to making the referral). ACCESS

(Maternity Care Home) considered its relationships with other community providers key to program success. ACCESS staff created what they called the "Purple Binder" for Strong Start, which was a constantly-updated clearinghouse for resources available in specific pockets of the city of Chicago. An ACCESS key informant explained:

> *"If care managers run out of ideas [on how to help a patient], [the binder] helps us to identify resources in a specific neighborhood, and where other care managers or providers have referred patients. The Purple Binder is integrated into our EMR system…you can put in a patient zip code and a service they might need and see a list of things that are near them like food pantries or mental health services that they might not be able to get at their health clinic."*

The two final factors included in Table 11 are specific to the Birth Center model of care. More than half of Birth Center awardees and sites identified a Birth Center's ***relationship with the broader medical community*** as a key factor for replicating the model. A Birth Center without good support from the medical community is in a riskier position because midwives and Birth Centers have a limited scope of practice, and collaborative relationships are critical to their ability to provide safe and high-quality care when complications arise. One key informant from the AABC awardee noted:

> *"With cooperation [between Birth Centers and the medical community] you are building trust, setting up procedures for communication so moms and babies are safer, and outcomes will be better."*

Another noted that when Birth Center midwives have hospital privileges and attend planned hospital births, collaborative relationships improve because hospital providers see midwives practicing, and "not just transferring their complicated cases." In a brief Internet-based survey of AABC sites conducted as part of the Strong Start evaluation in December 2016, a majority of survey respondents (24 of 37) described their relationship with the medical community as cooperative and supportive.

Finally, ***affordable licensure and credentialing*** are important for replication of the Birth Center model. A few sites noted that becoming licensed and/or credentialed is necessary for participating in the Medicaid program and contracting with MCOs, but the associated fees can be unaffordable, especially for independently-operated Birth Centers. A key informant from the AABC site in Grandin Florida explained that financial challenges are exacerbated for the Birth Center because the Medicaid MCOs do not pay Birth Center facility fees, and some MCOs require credentialing by both AABC and licensing from the state. This site reported that it could no longer afford the former, resulting in health plans refusing to pay for services rendered to Medicaid beneficiaries. A related concern is that during the Strong Start award period, Birth Centers in Florida and South Carolina reported that their states were considering regulations that would place additional burdens on centers or make it more difficult for midwives to practice.

DISCUSSION

The evaluation's Case Studies provide a rich profile of the three Strong Start models of prenatal care (Birth Centers, Group Prenatal Care, and Maternity Care Homes) by examining their interventions, the challenges they faced, and their perceived successes. While each model had distinct features, there were also similarities across the models. All provided education related to a range of prenatal, childbirth, and postpartum issues, made referrals to non-medical services not provided during prenatal

visits, and shared an emphasis on psychosocial support through relationship-based care. These innovative features were designed to address the myriad social risk factors that most Strong Start participants faced. The program had a wide geographic reach, providing enhanced prenatal care in about half the U.S. states.

Pregnant women served by Strong Start reported satisfaction with many features of the program. In 120 focus groups with nearly 900 pregnant and postpartum women, we heard that women valued the additional time and attention they received, including emotional support, education on a broad range of issues including family planning and breast feeding, and referrals to community services. Program staff expressed similar positive sentiments during interviews. Most felt Strong Start enhancements had substantial advantages for their patients, including more satisfaction with prenatal care; increased trust in and engagement with the health care system; an improved sense of well-being; better management of chronic conditions; greater food, housing, and financial security; and greater awareness of community resources and how to access them.

Awardees' Strong Start programs were shaped by a range of implementation challenges and successes. Common challenges reported during the four rounds of case studies included limited pre-implementation planning; lack of stakeholder support; program enrollment and participation challenges; issues related to staffing, work flows, and scheduling; difficulties operationalizing whole-person approaches to care; data collection and reporting problems; and challenges stemming from Medicaid policies and state regulations. Awardees struggled to address the full scope of their clients' needs because of insufficient resources in the community to meet women's needs for mental health services, substance abuse treatment, transportation, affordable childcare, and housing. Primary awardee successes included developing innovative systems to facilitate program implementation; cultivating and achieving stakeholder buy-in; increasing participant enrollment and engagement; integrating Strong Start components into sites' standard model of care; well-qualified and skilled Strong Start staff; and establishing collaborative relationships with other organizations to address patients' psychosocial needs and barriers to care.

During the final round of case study interviews, program staff reflected on their experiences under Strong Start. With very few exceptions, awardees believed the enhanced prenatal care models they implemented under Strong Start were worthy of replication and hoped that Medicaid would consider including enhanced services as part of their standard prenatal care coverage.- When asked to identify the factors important to successful program replication, awardees most commonly mentioned well-qualified and skilled Strong Start staff, appropriate space for providing Strong Start services, provider and administrative staff buy-in and support for the program, the presence of engaged patients, and having sufficient funding for enhanced prenatal care services.

PARTICIPANT-LEVEL PROCESS EVALUATION FINDINGS: A DESCRIPTIVE LOOK AT PARTICIPANT RISK PROFILES, SERVICE USE AND OUTCOMES

INTRODUCTION

Throughout Strong Start implementation, the evaluation team collected extensive data from individual participants enrolled in the program. In addition to allowing us to describe a broad range of characteristics of the enrolled population, these data also provide information on visit type and frequency, as well as pregnancy conditions and outcomes. Data on many of the measures collected are not available elsewhere or were not available in a timely manner. In this section, we describe the data collection process and the content of the data, present an overview of the completeness of these data, and discuss how these data have contributed to the evaluation. Following this, we present a detailed description of Strong Start enrollees, including their demographic characteristics and medical and social risk profiles. We then describe some of the routine and enhanced services received by enrollees. The section concludes with a description of pregnancy conditions and outcomes experienced by women enrolled in Strong Start. Multivariate analyses using the PLPE data are presented later in the Regression Adjusted Outcomes Analyses section.

PLPE DATA COLLECTION

The PLPE data collection effort was a collaboration between CMMI and the Urban Institute. CMMI developed and fielded the first participant-level data collection instrument (the Intake Form) prior to the evaluation contract being awarded, ensuring that intake data were captured by awardees who initiated services before the evaluation contract was awarded. Three additional instruments were designed, tested, and implemented by the evaluation team in 2013/2014. We developed a system for awardees to collect and submit these data either electronically or by scannable form and provided technical assistance as they integrated these systems into their work flow.

Full versions of the participant-level data collection instruments are included in Appendix D. A brief description of each form is presented below:

- ***Intake Form.*** The Intake Form is a six-page form that addresses questions pertaining to the participant's sociodemographic characteristics, pregnancy history, delivery intentions, and risk factors for premature birth. In addition, the form includes screening tools for depression, anxiety, intimate partner violence, substance abuse, and food security (see Appendix D for additional information). Many measures on this form are consistent with those asked in the MIHOPE Strong Start evaluation (Lee et al. 2016). Administration of the Intake Form was ultimately established as a condition of participant enrollment, resulting in a very robust response rate (95 percent). In most cases, these forms were self-administered by participants; but, in select cases, Strong Start staff administered the form in interview-format, particularly when interventions were phone-based. Forms were available in Spanish and English. As noted in a previous Strong Start Evaluation Annual Report, many awardees indicated that the Intake

form was useful in assessing patient-risk and establishing a care plan, and several were planning to retain at least a modified version of the Intake Form in their practices (Hill et al. 2018).

- ***Third Trimester Survey & Postpartum Surveys.*** These are each two-page surveys designed to capture information on select measures of health and well-being. The Third Trimester Survey collects information on smoking, marital status, intimate partner violence, delivery and postpartum intentions (delivery support, delivery expectations, intentions to breastfeed) and client satisfaction. The Postpartum Survey collects information on delivery experiences, breastfeeding and family planning, as well as satisfaction with prenatal and delivery care. Select measures were repeated from the Intake Form so that participants could be tracked over time. These short surveys were self-administered, and available in both Spanish and English. Awardees received guidance to distribute Third Trimester Surveys when women were between 28 and 32 weeks gestation and the Postpartum Survey at women's postpartum visit. If participants did not return for a postpartum visit, awardees were asked to reach out to by phone within 10 weeks of delivery and administer the survey by phone. Response rates for these two participant-level forms were overall low (approximately 60 percent for each form). This is likely attributable to several factors including:
    - The Third Trimester Survey was rolled out after some women had already delivered.
    - Approximately 21 percent of enrolled women dropped out of Strong Start prior to delivery. Exit forms indicate that women did not continue in Strong Start for a variety of reasons including miscarriage or termination (approximately 3.6 percent), voluntary withdrawal from the program (4.2 percent), move or relocation (2.9 percent), loss of Medicaid eligibility (0.6 percent), and loss to follow up (approximately 7.5 percent).
    - Many women did not show up for a postpartum visit. In some, but not all cases, awardees tried to reach participants on the phone, but found it challenging. In some cases, awardee staff were unable to contact participants by phone (their numbers changed or they did not answer calls). In other cases, awardee staff were focused on other tasks and found it challenging to allot the time necessary to track participants down.
- ***Exit Form.*** The Exit Form collects clinical and program data from the medical chart or the Strong Start program record following discharge for all participants whether or not they completed the program. These data are used to quantify clinical pregnancy risks and clinical outcomes. Awardees were polled prior to development to determine what data would be routinely available. An initial version was piloted with four awardees in January 2014. Additional revisions were made in the spring of 2014 based on feedback from awardees and CMMI program and evaluation staff. Exit Forms were available in Spanish and English. Response rates for the Exit Form are high (98 percent), though item non-response exceeds 20 percent for certain measures.

To facilitate data management, a PLPE "crosswalk form" was created to link participant Study IDs with their identifying information. The crosswalk is the source for personal identifiers including participant name, birthdate, address, infant name, infant date of birth, and Medicaid ID, if available. Crosswalks templates with pre-filled Study IDs were provided to awardees and shared with the evaluation team quarterly through a secure FTP site maintained by Urban Institute.

Throughout the data collection period, the evaluation team provided awardees with ongoing support and technical assistance to mitigate data quality issues that arose and to provide requested

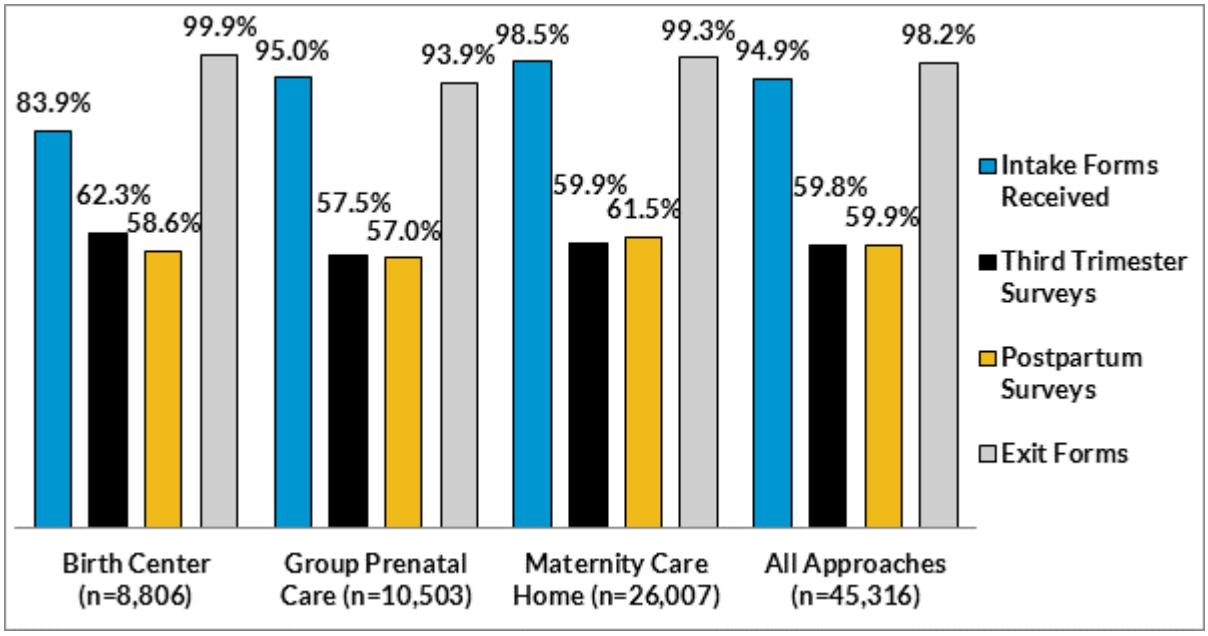
support. At the outset, the evaluation team held several training webinars and attended annual awardee meetings to provide in-person assistance. Each awardee was assigned a liaison from the evaluation team who was available to field questions throughout program implementation and awardee closeout. Periodically (or when necessary) senior members of the team also held phone calls with awardees to resolve data issues. Initial concern about burden associated with these data collection requirements generally gave way to appreciation for the structure they provided to Strong Start encounters as well as the utility of the information being collected.

The PLPE data have distinct advantages as an evaluation tool, particularly the ability to analyze at the individual-level. The process also made use of built-in validity checks. CMMI's program team collected data in aggregate from awardees on a quarterly basis using Excel spreadsheets. Primary data elements included enrollment figures, overall demographics, insurance coverage, gestational age at enrollment, and outcomes. These served as a supplement to the PLPE data and helped to determine the denominator for the proportion of forms collected. Additional information on the Quarterly Program Monitoring Report collected by CMMI is available in Appendix F.

COMPLETENESS OF PLPE DATA

Form submission rates for the PLPE data (presented by model in Figure 5) are robust, particularly for Intake and Exit Forms. Rates of missing data by measure vary greatly by awardee and are very high for a small number of awardees. Rates of missing data for items on the Intake Form (item non-response) range from 1 percent to 27 percent, with an average non-response rate of about five percent. Exit Form item non-response ranges from 3 percent to 29 percent, with an average of about 12 percent overall. Item non-response also varies across measures on each form. PLPE data quality summaries by awardee are presented in Appendix G. In addition, item non-response rates for each measure of interest overall and by model can be found in Appendix H, and by awardee in Appendix I.

FIGURE 5: PLPE FORM SUBMISSION, BY MODEL AND OVERALL



Notes: Denominators for form submission rates are based on the total number of women for whom we have any form.

The PLPE data collection has resulted in a rich and comprehensive data set reflecting the entire program implementation period and nearly all program participants. Using these data, we have been able describe the demographic, social and medical risk factors of Strong Start participants as well as report preliminary outcomes associated with the initiative prior to this information being available through other means, or in lieu of other data (e.g., in states where administrative data files were not obtainable for the Impact Analysis section). Birth certificate and Medicaid claims data being used to assess the impact of the Strong Start initiative were not available until the last year of the evaluation. With the PLPE data we have been able to:

- Characterize the Strong Start population;
- Track intervention intensity and frequency;
- Confirm/corroborate/evaluate birth certificate and Medicaid data reliability;
- Evaluate interim outcomes not reliably available elsewhere;
- Provide an early look at key outcomes prior to other data being available; and
- Control for risk factors not reliably available elsewhere when looking at primary Strong Start outcomes (gestational age, birthweight and delivery method).

METHODOLOGY

Analyses presented below reflect all available data collected through August 31, 2017, which allowed for awardees to submit data following completion of program implementation. Any individual with at least one form was included in the final analytic dataset, resulting in a total N of 45,316 observations. This is slightly fewer than the CMMI Strong Start program team reports as the total number of women ever enrolled in Strong Start (N=45,999). There are several possible reasons for this discrepancy. In addition to the few cases where no forms were submitted for a woman enrolled in Strong Start, there were also observations removed from the PLPE dataset because the awardee failed to obtain proper consent from the individual, other cases where women were counted as enrolled, but received no Strong Start services and no forms were administered, and cases where the enrollee counts and the PLPE counts simply did not line up (see Appendix F for additional information).

In addition, we restricted the analyses presented below to women with singleton births. This resulted in the exclusion of N=607 women from the dataset (20 Birth Center multiples, 123 Group Prenatal Care multiples, and 464 Maternity Care Home multiples). Multiples were excluded because 1) most Birth Centers will not treat women with multiple gestations, so including them in our analyses would bias by model-results, and 2) data quality related to the birth outcomes of individuals reporting multiple gestations was especially poor.

The data were analyzed using STATA 14. All reported rates exclude women with missing data resulting from not having a form or item non-response. Rates also exclude women not included in the relevant universe (e.g., women who did not have a prior birth are not included in the denominator for women who have a prior preterm birth or prior low birthweight baby). Five measures also exclude women with outlier responses (mother's age, BMI, gestational age, birthweight, and interpregnancy interval). Complete tables by model and by awardee are included in Appendix H and Appendix I. Though the findings exclude women with missing data, we do report the rate of missing data for each measure as well as the share of women not included in the relevant universe. Where significance is mentioned, it is estimated using two-sided t-tests ($p < 0.001$).

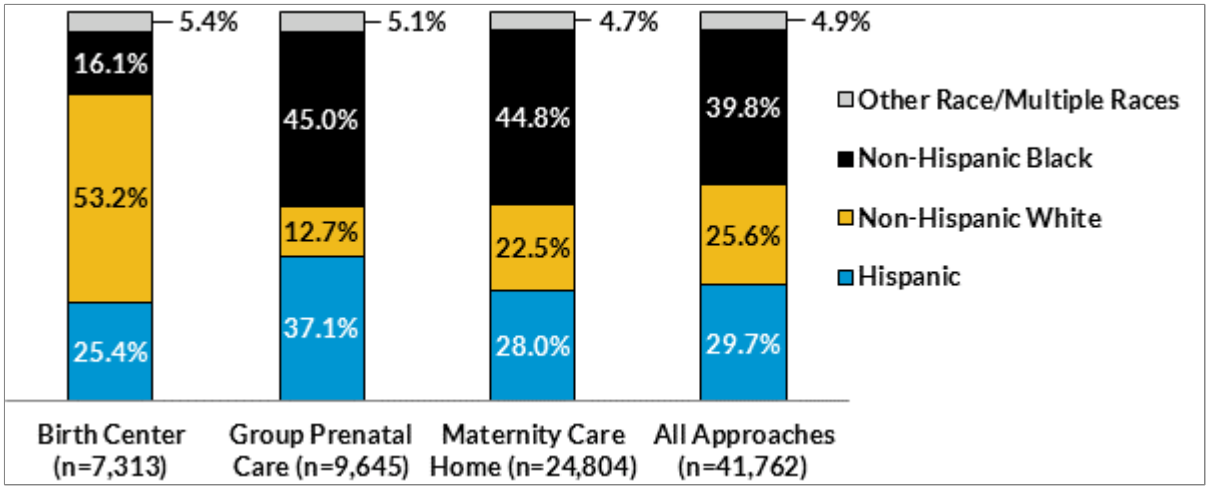
STRONG START PARTICIPANT PROFILES

In this section, we depict the risk profiles of Strong Start participants, beginning with their demographic characteristics, followed by descriptions of the wide range of social and economic challenges participants face and, finally a summary of the medical risk factors they possess.

Demographic Profile of Strong Start Participants

As reported in prior Strong Start Annual Reports, Strong Start enrollees are disproportionately black and Hispanic compared with pregnant Medicaid beneficiaries overall. The overrepresentation of black women in the Strong Start population is notable, given evidence that black women of all income levels are more likely to experience adverse pregnancy outcomes than comparable white or Hispanic pregnant women (Zhang et al. 2013; Martin et al. 2015). Forty percent of Strong Start enrollees are black, and 30 percent are Hispanic, while data from the National Health Insurance Survey (NHIS) indicate that 25 percent of pregnant Medicaid beneficiaries overall are black, and 20 percent are Hispanic. The disproportionate representation of black in Strong Start is likely driven in part by a concentration of awardees in the Southeastern United States. The large proportion of Hispanic women is likely driven by the Hispanic populations of states with large awardees, particularly Arizona, Texas, the territory of Puerto Rico, and the city of Los Angeles. Though Hispanic women are sometimes reported as being at higher risk for poor birth outcomes than are white women, when origin is considered, Puerto Rican women are at considerably higher risk, while women with origins in Mexico are not (Martin et al. 2018). Half of Hispanic women enrolled in Strong Start identify as Mexican (50 percent), and approximately 12 percent identify as Puerto Rican. Approximately one-quarter of Strong Start participants identify as white, though the proportion of Birth Center enrollees who are white exceeds 50 percent. Approximately 45 percent of women enrolled in Group Prenatal Care and Maternity Care Home awardees are black, but more Hispanic women are enrolled in Group Prenatal Care. Strong Start awardees enrolled very few Asian women, and as a result, they are grouped with "other/multiple races." Racial breakdowns by model and overall are presented in Figure 6.

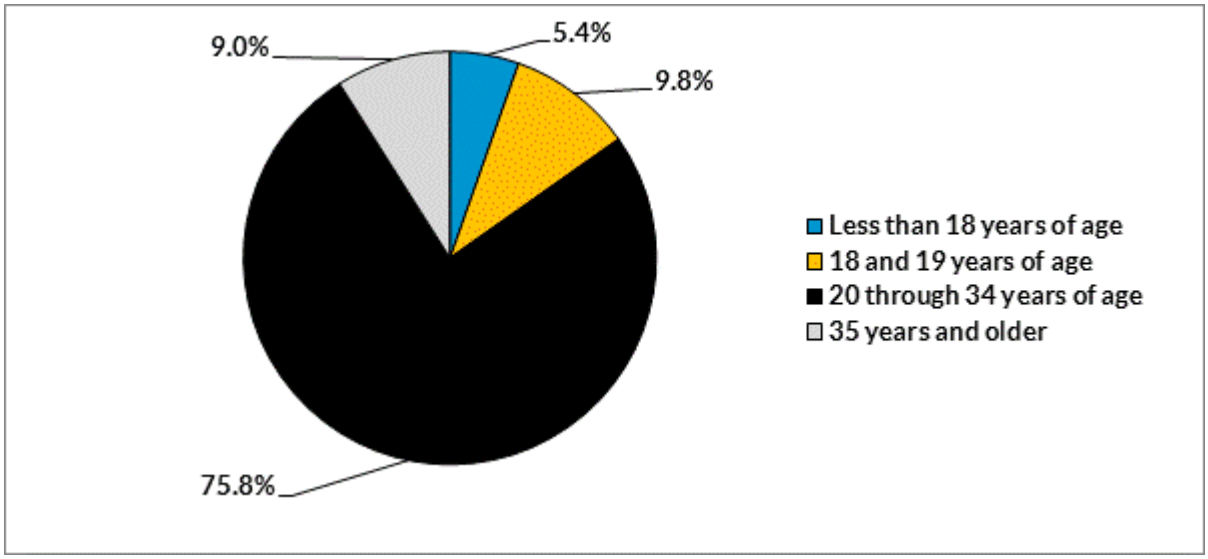
FIGURE 6: PARTICIPANT RACE AND ETHNICITY, BY MODEL AND OVERALL



Notes: Women with missing data are excluded from these calculations. Rates of missing for race and ethnicity by model are as follows: 16.8 percent for Birth Centers, 7.1 percent for Group Prenatal Care, 2.9 percent for Maternity Care Homes, and 6.6 percent for All Approaches. Rates of missing by measure can also be found in Appendix H.

The vast majority of Strong Start participants fall within what is considered the healthiest window for pregnancy and birth—20-34 years of age (76 percent)—at the time they enrolled in the program. The mean age of Strong Start women having their first birth was 22.6, compared with a mean age of 26.6 for all U.S. women giving birth for the first time in 2016 (Martin et. al, 2018). As presented in Figure 7, few Strong Start participants were young teens (5 percent) which is consistent with other data that indicate that most teen pregnancies occur to older teens (18-19 years old) (Kost and Maddow-Zimet 2016). Eighteen and 19-year-olds made up about 10 percent of Strong Start participants. Approximately nine percent of women were of advanced maternal age (>=35 years of age), an age range during which risks increase for C-section, gestational diabetes and other adverse pregnancy conditions.

FIGURE 7: MOTHER'S AGE AT INTAKE



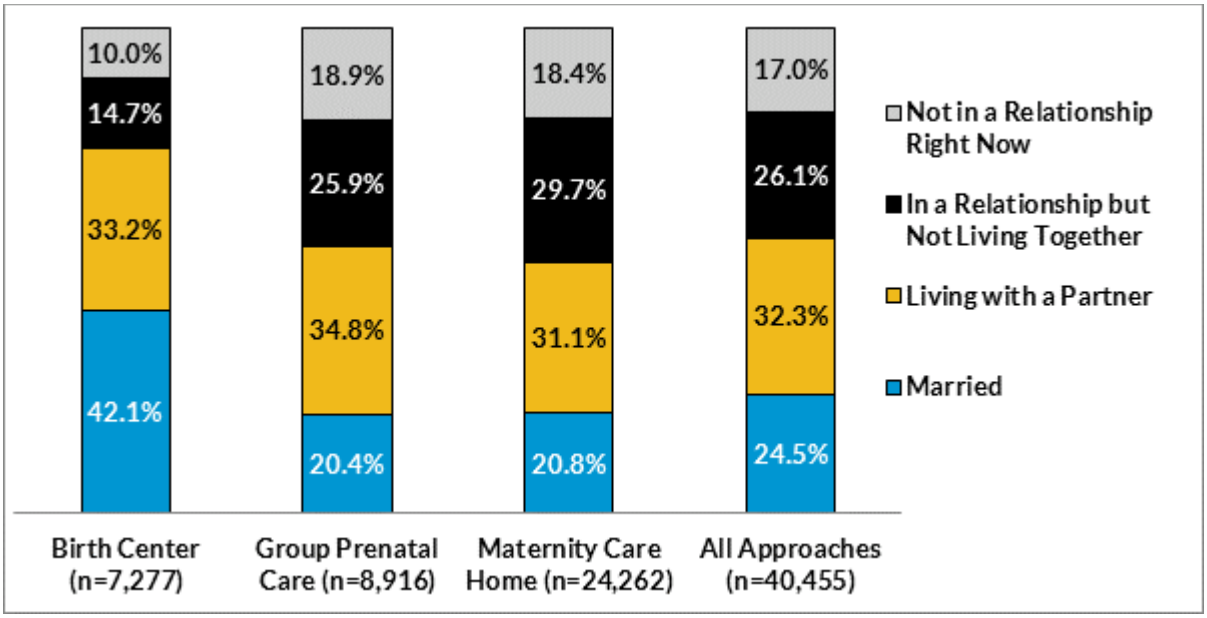
Notes: N = 42,297. Rates are based on women for whom Intake Forms were submitted and who had nonmissing data for birth date on the crosswalk and date of entry into care on the Intake Form. Women with missing data are excluded from these calculations. The rate of missing for mother's age at intake for all models is 5.4 percent. Rate of missing by measure can also be found in Appendix H.

As we have reported in the past, the share of Strong Start participants who were married was substantially lower than reported in other studies of low-income mothers (see Figure 8). Only one-quarter of all Strong Start participants reported being married. Published studies suggest that marriage rates among low-income mothers do range widely and have been decreasing in recent years, but Strong Start participants were less likely to be married than the low end of the range reported in the literature. Prior studies report marriage rates for low-income women ranging from 30 percent to 70 percent (Shattuck and Krieder 2013; Brown et al. 2015; Gibson-Davis and Rackin 2014). Because being unmarried was a risk factor that a small number of awardees initially used for determining Strong Start eligibility, we might expect that more unmarried women were enrolled in the early years of Strong Start. However, we find that marriage rates did not vary after the requirement for a risk in addition to Medicaid eligibility was removed in mid-2014. Most Strong Start enrollees did, however, report having a partner; in addition to those who were married, more than 32 percent of Strong Start participants were living with a partner, and another 26 percent of participants were in a relationship but not living with their partner. These patterns vary somewhat by model, with Birth Center participants being significantly more likely to be married (42 percent) than women in other models. Maternity Care Home enrollees were significantly more likely to be in a relationship but not living with their partners (30

percent) than women in other models ($p < 0.001$). Women enrolled in Group Prenatal Care were significantly more likely to report not being in a relationship compared to Birth Center participants (19 percent vs. 10 percent; $p < 0.001$), but the difference between Group Prenatal Care and Maternity Care Home participants is not significant.

Relationship status and stability can contribute to healthy pregnancy and positive birth outcomes. Several studies have demonstrated that both the type and quality of a woman's relationship can have bearing on maternal and infant outcomes around pregnancy, with women in stable partnerships experiencing more positive outcomes (Bloch et al. 2010; Fairley and Leyland 2006; Butler and Behrman 2007). Research also indicates that many low-income women who are partnered at the time of their child's birth do have plans to marry but delay marriage because of financial instability (Cho et al. 2016).

FIGURE 8: RELATIONSHIP STATUS OF STRONG START PARTICIPANTS AT INTAKE, BY MODEL AND OVERALL

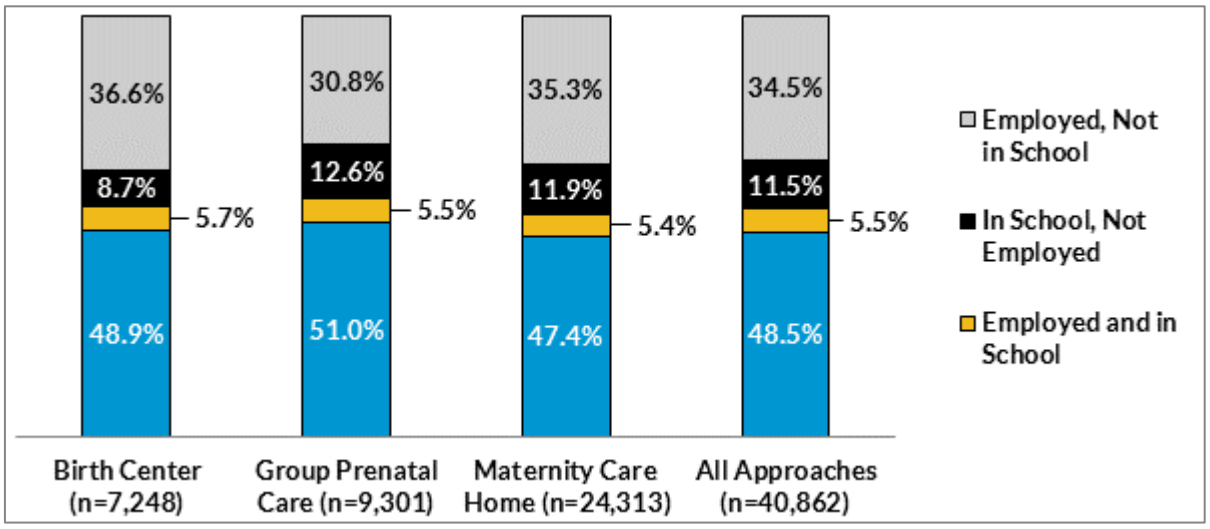


Notes: Missing data are excluded from these calculations. Rates of missing for relationship status by model are as follows: 17.2 percent for Birth Centers, 14.1 percent for Group Prenatal Care, 5.0 percent for Maternity Care Homes, and 9.5 percent across All Approaches. Rates of missing by measure can also be found in Appendix H.

Social and Economic Challenges among Strong Start Participants

Throughout the Strong Start evaluation, we have observed that participants report facing a multitude of social and economic challenges. For instance, nearly half of participants were neither employed nor in school (48 percent). Participants in their teens were more likely to be in school than women older than 20 (47 percent vs 12 percent; $p < 0.001$), but overall rates of employment (presented in Figure 9) were low. Employment and school status rates did vary significantly by race/ethnicity ($p < 0.001$): white women were the most likely to be working (37.0 percent), black women were the most likely to be in school (14.7 percent) and Hispanic women were the most likely to be neither working nor in school (52.8 percent). Women with a prior birth were more likely to be working than women who had not previously given birth (35.3 percent vs. 33.4 percent; $p < 0.001$), and less likely to be in school (6.5 percent vs. 19.0 percent; $p < 0.001$).

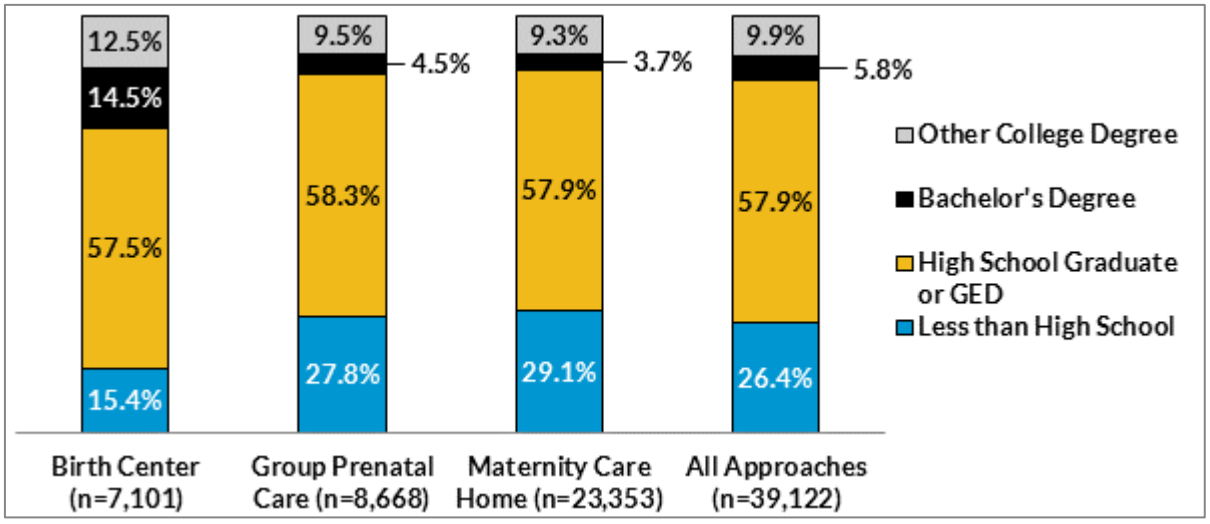
FIGURE 9: EMPLOYMENT AND SCHOOL ATTENDANCE AT INTAKE FOR STRONG START PARTICIPANTS, BY MODEL AND OVERALL



Notes: Missing data are excluded from these calculations. Rates of missing for employment and school status by model are as follows: 17.5 percent for Birth Centers, 10.4 percent for Group Prenatal Care, 4.8 percent for Maternity Care Homes, and 8.6 percent across All Approaches. Rates of missing by measure can also be found in Appendix H.

Furthermore, Strong Start enrollees had relatively low levels of educational attainment overall. More than 84 percent had a high school degree or less. Very few participants had a Bachelor's degree (about six percent), but an additional 10 percent did have some college experience, which may be an Associate's degree or vocational training. We did observe the statistically significant finding that women enrolled in Birth Center care were more than three times as likely to have a college degree than women enrolled in either of the other two models ($p < 0.001$), though the vast majority of birth center participants still did not have a college degree. Participant rates of educational attainment are presented in Figure 10.

FIGURE 10: HIGHEST LEVEL OF EDUCATION COMPLETED BY STRONG START PARTICIPANTS, BY MODEL AND OVERALL

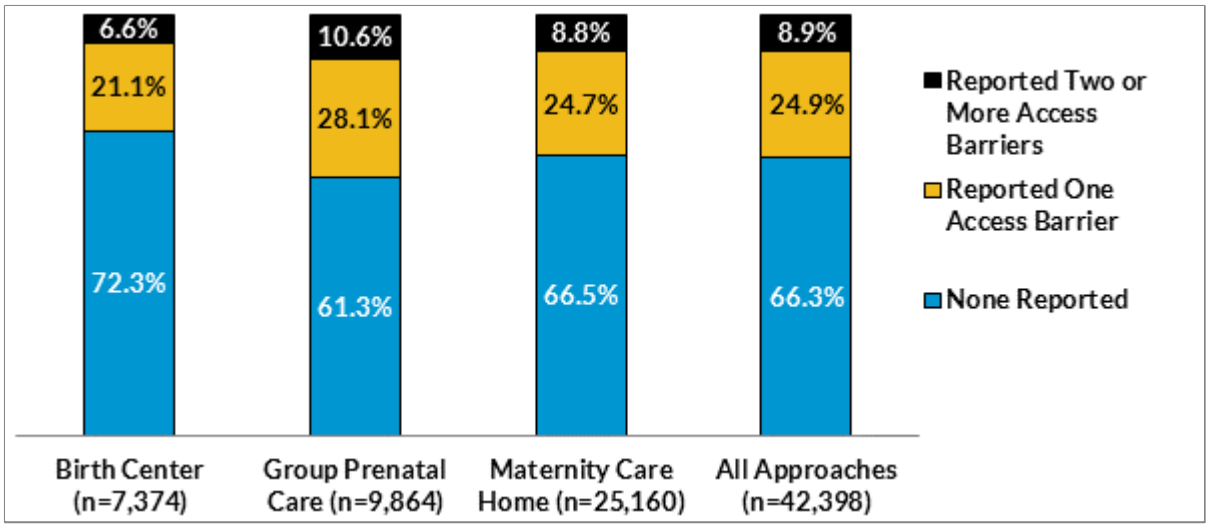


Notes: Missing data are excluded from these calculations. Rates of missing for education level by model are as follows: 19.2 percent for Birth Centers, 16.5 percent for Group Prenatal Care, 8.6 percent for Maternity Care Homes, and 12.5 percent across All Approaches. Rates of missing by measure can also be found in Appendix H.

Education and employment patterns among participants could be related to the fact that many women enrolled in Strong Start already had children. Most women enrolled in Strong Start had a prior pregnancy (72 percent overall), and 61 percent had previously given birth. This is especially true among participants over 20, among whom 79 percent had a prior pregnancy and 68 percent reported having a prior birth. This observation is not surprising given the fact that some awardees initially targeted women with medical characteristics that would put them at increased risk of having a preterm baby, including some that specifically targeted women with prior preterm births.

Women enrolled in Strong Start reported struggling with a variety of other social and economic challenges. Black and Hispanic women enrolled in Strong Start reported experiencing access barriers to prenatal care at similar rates (37 and 36 percent respectively), while white women were significantly less likely to report experiencing a barrier to accessing prenatal care (26 percent; $p < 0.001$). Many participants, though fewer that we might expect, specifically reported experiencing food insecurity (20 percent). More than a quarter of participants reported that it was difficult for them to get to their prenatal care appointments (34 percent, see Figure 11), with the most commonly reported barriers including not having a car (60 percent of women who reported difficulties), not having enough money for a ride (20 percent), and work hours (17 percent). Barriers reported on the Intake are in line with case study findings that consistently indicated, for instance, that transportation challenges pose substantial barriers to care for some women. Transportation barriers can range from not have access to a reliable vehicle, challenges with Medicaid transportation (e.g., inability to bring older children, inflexible Medicaid transportation schedules), and costs and access associated with public transportation.

FIGURE 11: NUMBERS OF BARRIERS TO PRENATAL CARE ACCESS REPORTED BY PARTICIPANTS, BY MODEL AND OVERALL



Notes: Missing data due to no intake form are excluded from these calculations; item nonresponse cannot be captured for this measure. Rates of missing for number of barrier to care by model are as follows: 16.1 percent for Birth Centers, 5.0 percent for Group Prenatal Care, 1.5 percent for Maternity Care Homes, and 5.2 percent across All Approaches. Rates of missing by measure can also be found in Appendix H. Ns include women with an intake form.

Mental health frequently arose as an issue during Strong Start case study interviews. In the PLPE data, we observe that nearly 28 percent of women screened positive for depression and more than 35 percent had some level of anxiety (mild, moderate or severe).[25] Black participants were significantly

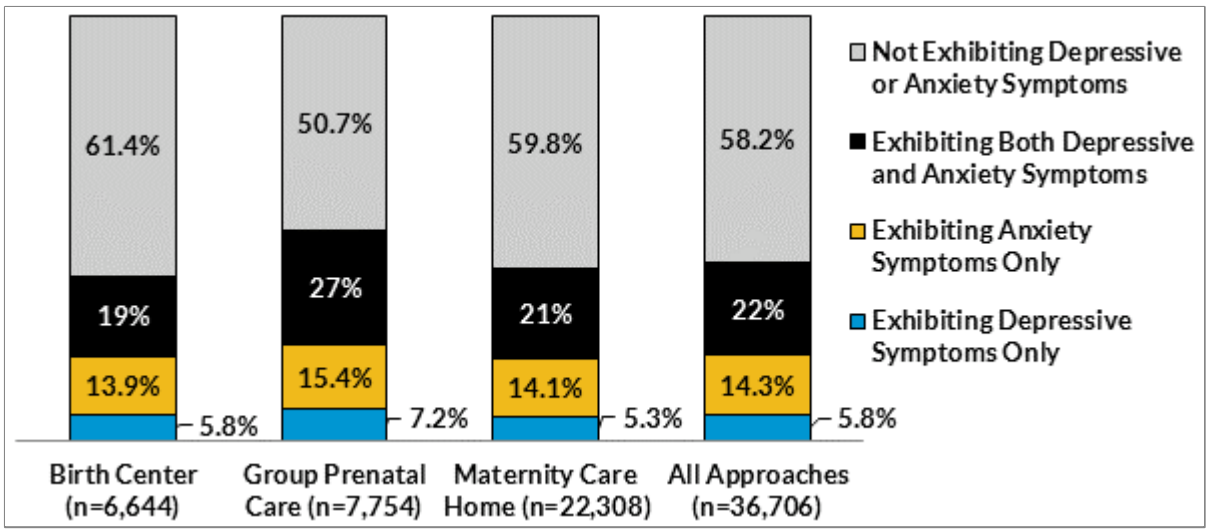
[25] Anxiety was measured using the GAD-7; scoring procedures are reported in Appendix E.

more likely to screen positive for depression than white women (34 percent vs. 25 percent; $p < 0.001$), while Hispanic women were significantly less likely to screen positive for depressive symptoms than white women (21 percent; $p < 0.001$).When we look at women who screened positive for either depression, or anxiety or both, we observe that a sizable share of women enrolled in the program struggle with both anxiety and depression (21.8 percent).

Typical rates of depression among pregnant women in the U.S. have been reported in the literature to range from 6 to 13 percent, and rely on a variety of scales to assess depression, including the PHQ-9, the Edinburgh, and the CES-D (Venkatesh et al. 2016, Bennett et al. 2004; Melville et al. 2010; Katon et al. 2011, Gavin et al. 2005). Though prenatal anxiety is understudied, a 2014 meta-analysis of antenatal generalized anxiety disorder (GAD) found that between 0 and 10.5 percent of pregnant women experience generalized anxiety (Goodman et al. 2014), less than a third of what was observed among Strong Start participants. High rates of depression and anxiety experienced by women in Strong Start (presented in Figure 12) may be a result of increased stress in the lives of women living in poverty, many of whom are also experiencing an unintended or mistimed pregnancy. Approximately 70 percent of Strong Start participants reported that they were not trying to become pregnant.

Prior research has suggested that depression during pregnancy is associated with myriad poor birth outcomes, including preterm birth and low birth weight (Grote et al. 2010). Antenatal anxiety has been associated with shorter gestations and low birthweight, but the strongest evidence links anxiety during pregnancy with reduced capacity for women's offspring to appropriately self-regulate, with cognitive and motor development delays and with challenges related to infant temperament during the first year of life (Beijers et al. 2010). Our data allow us to correlate depression and anxiety with birth outcomes, but we are unable to assess longer term consequences.

FIGURE 12: PROPORTION OF STRONG START PARTICIPANTS EXHIBITING DEPRESSIVE SYMPTOMS, ANXIETY, OR BOTH AT INTAKE, BY MODEL AND OVERALL



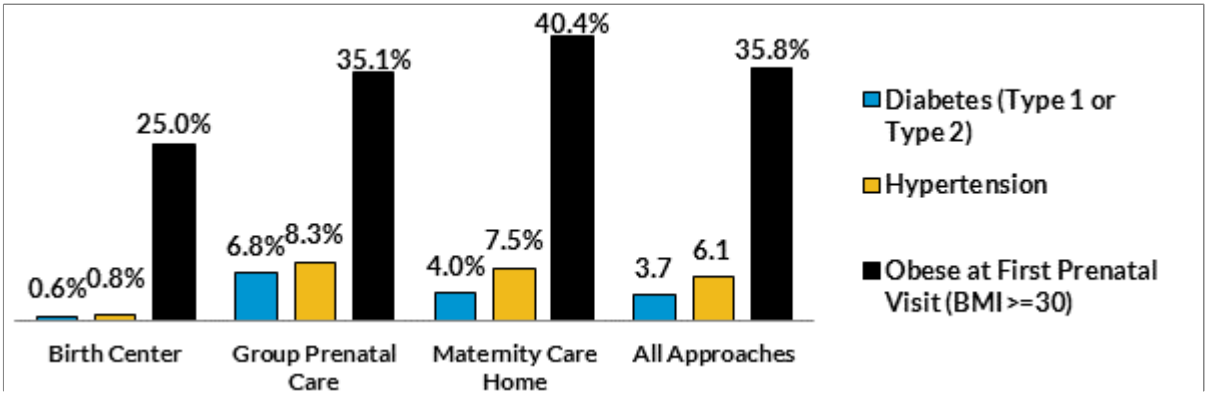
Notes: Ns include women with nonmissing data for both depression and anxiety. Rates of missing for combined anxiety and depression by model are: 24.4 percent for Birth Centers, 25.3 percent for Group Prenatal Care, 12.7 percent for Maternity Care Homes, and 17.9 percent across all approaches. Rates of missing by measure can be found in Appendix H.

Strong Start Participants' Medical Risk Profiles

In addition to considerable economic and psychosocial needs, many Strong Start participants suffered from other chronic health conditions that can make pregnancy risky. In line with national trends that indicate that rates of overweight and obesity are increasing among women of reproductive age, particularly among women who are black, have a high school degree or less, and are multiparous (Meehan et al. 2014, Kim et al. 2007), we observe that well over half of women enrolled in Strong Start were overweight or obese at intake (26 percent are overweight and 36 percent are obese). Rates of obesity exceeded 40 percent among women enrolled in the Maternity Care Home model, as presented in Figure 13. The Maternity Care Home model also had a higher proportion of black women, who generally had higher rates of obesity (42 percent) than Hispanic (35 percent) or white (30 percent) women. Higher maternal weight has been associated with increased risk of diabetes (prior to and during pregnancy), hypertension, C-section delivery, macrosomic infants, and other poor outcomes (Leddy et al. 2008; Bloomberg and Kallen 2009; Yu et al. 2013).

Associated chronic diseases did not appear to track with rates of overweight and obesity among Strong Start participants, as presented in Figure 13. Specifically, participants had relatively low levels of pre-pregnancy diabetes (approximately 4 percent overall, 0.6 percent among Birth Center enrollees, 6.8 percent among Group Prenatal Care enrollees, and 4.0 percent among Maternity Care Home enrollees). Notably, some Group Prenatal Care awardees included groups that specifically targeted women with diabetes, which may account for the slightly larger proportion of diabetic women enrolled in this model. Rates of pre-pregnancy hypertension were slightly higher than rates of pre-pregnancy diabetes (6 percent overall, 0.8 percent among Birth Center enrollees, 8.3 percent among Group Prenatal Care Enrollees, and 7.5 percent among Maternity Care Home enrollees). The Strong Start population in aggregate appears to be less likely than the overall population of low-income pregnant women to have a pre-pregnancy diagnosis of hypertension, but has similar rates of diabetes, on average. This may be related to the fact that Strong Start participants are slightly younger than the mean age of mothers in the U.S. overall (25.6 percent vs. 28.7) (CDC 2018). One study reports that approximately 3 percent of low-income women of reproductive age (18-44) have diabetes and 12 percent are hypertensive (Robbins et al., 2013).

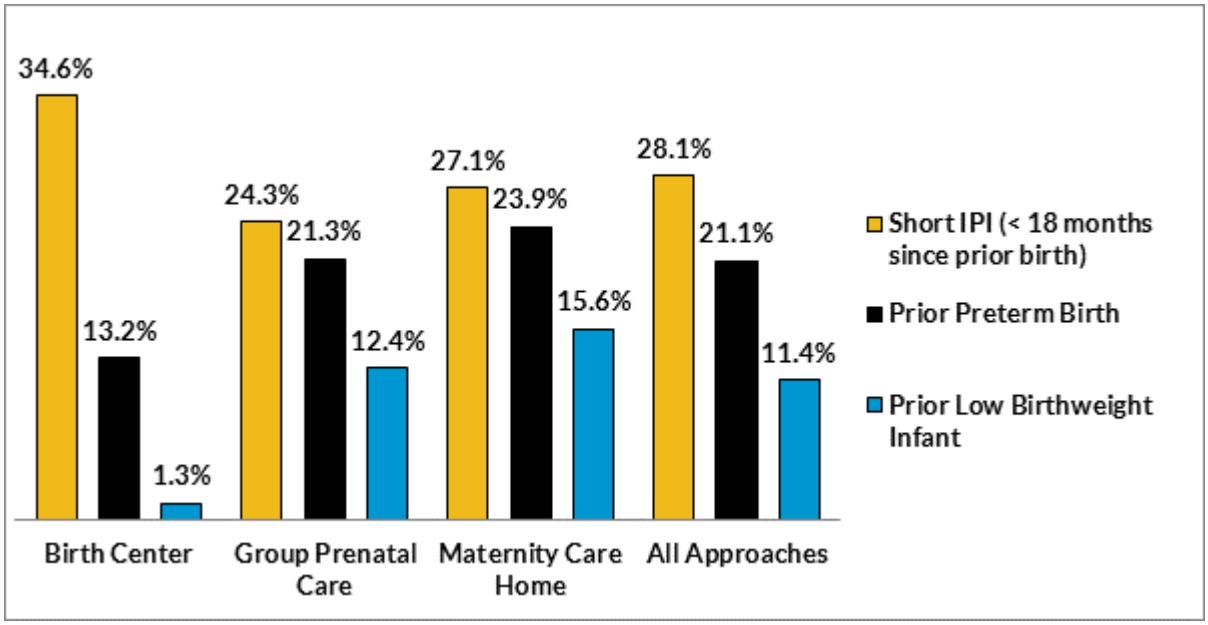
FIGURE 13: PRE-PREGNANCY DIAGNOSIS OF DIABETES, HYPERTENSION, AND OBESITY, BY MODEL AND OVERALL



Notes: Missing data are excluded from these calculations. Rates of missing by measure can be found in Appendix H. Denominators for diabetes are: BC=8,750, GPC=6,757, MCH=21,525, Total=37,032. Denominators for hypertension are: BC=8,752, GPC=8,059, MCH=22,046, Total=38,857. Denominators for obesity at first prenatal visit are: BC=8,474, GPC=7,052, MCH=20,908, Total=36,434. Denominators include women with nonmissing data for that outcome.

As mentioned earlier, many women enrolled in Strong Start had previously been pregnant (72 percent) or given birth (61 percent). Many women who have had a prior birth have also experienced prior poor birth outcomes (see Figure 14). More than 20 percent of women with a prior birth had delivered preterm (before 37 completed weeks' gestation)—the overall preterm rate in the U.S. is around 10 percent. Given that having a prior preterm birth is one of the strongest predictors of subsequent preterm birth, this high proportion suggests that the Strong Start population is especially at risk for delivering a preterm infant. Although we might expect birthweight to track closely with prior preterm, rates of prior low birthweight (less than 2500g) are about half those of prior preterm birth (11 percent compared to 21 percent), which may indicate that many prior preterm births were late preterm, with infants at a normal birthweight, or could indicate a data quality issue. Many participants (28 percent), and especially women enrolled in Birth Center care (35 percent), report a short interpregnancy interval between their Strong Start pregnancy and their prior birth (measured as less than 18 months). This could be related to the finding presented in previous evaluation reports that Birth Center participants were the least likely to be using a highly effective form of contraception postpartum (Hill et al. 2018; Cross-Barnet et al. 2018), as such women are more likely to experience an unintended pregnancy. However, Birth Center enrollees had the highest rate of intended pregnancy (38 percent) as compared to the overall rate among Strong Start participants (29 percent). Having at least 18 months between pregnancies can be important to the health of the mother and infant. Closely spaced pregnancies do not allow sufficient time for a woman's body to heal and increase risks for complications such as placenta previa and placental abruption (see also Conde-Agudelo et al., 2006). Infants born after a short interpregnancy interval may be at increased risk for being born preterm, at low birthweight or small for gestational age (Conde-Agudelo et al., 2006, 2012; DeFranco et al., 2007).

FIGURE 14: MEDICAL RISK FACTORS AMONG WOMEN WITH A PRIOR BIRTH, BY MODEL AND OVERALL



Notes: Missing data are excluded from these calculations. Rates of missing and not in universe by measure can be found in Appendix H. Denominators for previous preterm birth are: BC=5,588, GPC=5,150, MCH=15,608, Total=26,346. Denominators for previous low birthweight are: BC=5,487, GPC=3,626, MCH=12,699, Total=21,812. Denominators for short interpregnancy interval are: BC=4,052, GPC=3,664, MCH=12,235, Total=19,951. Denominators include women with a prior birth and nonmissing data for that outcome.

VISIT FREQUENCY AND INTENSITY

As described earlier in this report, prenatal care enhancements offered to Strong Start participants varied by model and by awardee. Using PLPE data, we can track both the type and frequency of specific kinds of visits. Below we quantify the routine prenatal care visits Strong Start participants received as well as the enhanced encounters and services provided to them during their Strong Start pregnancies.

Routine Prenatal Care

Awardees were instructed to document routine prenatal care visits for participants, defined as "routine clinical prenatal care visits with a physician, midwife, nurse practitioner, or similar care provider that occurred during the current pregnancy." For routine Group Prenatal Care visits, awardees were instructed to "include Group Prenatal Care visits, such as Centering visits only." Through the PLPE data we tracked the type and frequency of routine prenatal care visits participants received, presented in Table 12. As expected, the bulk of those who attended Group Prenatal Care sessions were enrolled in the Group Prenatal Care model. However, only 79.5 percent of women enrolled in Group Prenatal Care reportedly attended group visits. While it is likely that at least some of the remaining 20 percent dropped out of Strong Start prior to attending any sessions (48 percent of these women exited Strong Start prior to delivery), others may represent data quality issues or cases in which participation in Strong Start did not result in receipt of enhanced prenatal care services. Women who did attend Group Prenatal Care sessions had, on average, 5.7 group visits.

A small proportion of Birth Center and Maternity Care Home participants also attended group visits (1.6 percent and 2.3 percent, respectively). We did learn through case study analyses that at a limited number of sites in these models, Group Prenatal Care was an option that existed before Strong Start implementation. For instance, one of the ACCESS' Strong Start sites in Chicago offered Centering to some of its most high-risk clients, and several Birth Center sites utilized a Group Prenatal Care model as their standard of care. Maternity Care Home participants who attended group sessions attended fewer sessions on average than those enrolled in the Group Prenatal Care model of Strong Start (4.8 visits), but Birth Center participants who attended Group Prenatal Care sessions attended an average of seven group visits.

Nearly all Birth Center participants received at least one individual care visit (99.7 percent), and 90 percent of Maternity Care Home participants received at least one individual visit. Birth Center participants attended on average 9.3 individual visits and Maternity Care Home participants attended 8.8 individual visits, on average.

The American Congress of Obstetricians and Gynecologists (ACOG) recommends that women without pregnancy complications schedule visits for every four weeks until 28 weeks gestation, then every two weeks until they reach 36 weeks, then weekly thereafter. Some awardees did provide the evaluation team with visit dates, while others did not, making it challenging to determine when visits occurred over the course of each participant's pregnancy. While there is consensus about the importance of prenatal care, the ideal number of visits a woman should have during her pregnancy is less clear. More visits (even among low-risk women) are not consistently associated with improved outcomes (Buekens et al. 1993, Carter et al. 2016). Strong Start programs generally enrolled a higher

risk group of women, and more visits might signal higher risk pregnancies rather than adequate prenatal care, appropriately distributed throughout one's pregnancy.

One feature of most Strong Start programs was an effort to help women enroll early in pregnancy and keep their prenatal care appointments, efforts lauded by both participants and staff. Based on awardees' program monitoring reports, we found that the majority of Strong Start participants initiated care prior to 20 weeks (enrolling the vast majority of participants before 20 weeks was initially a program requirement, but that requirement was changed in 2014). Still, many sought care later than other pregnant populations, perhaps because their pregnancy was not intended, they were unsure if they had health coverage, or because they experienced barriers to accessing prenatal care (Child Trends 2015). Therefore, some women enrolled in Strong Start who did meet thresholds for an adequate number of routine prenatal care visits may have had these visits during a compressed time frame later in their pregnancies.

TABLE 12: STRONG START ROUTINE PRENATAL CARE VISIT TYPE AND FREQUENCY, BY MODEL AND OVERALL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Routine Prenatal Care (Individual Visits)					
Missing Data	%	0.1	6.2	0.7	1.9
Women with Non-Missing Data	**N**	**8,778**	**9,740**	**25,360**	**43,878**
Received Individual Visits	%	99.7	72.8	90.0	88.1
Average Number of Individual Prenatal Visits	Mean	9.3	5.3	8.8	8.3
Routine Prenatal Care (Group Visits)					
Missing Data	%	0.1	6.2	0.7	1.9
Women with Non-Missing Data	**N**	**8,778**	**9,740**	**25,360**	**43,878**
Received Group Visits	%	1.6	79.5	2.3	19.3
Average Number of Group Prenatal Visits	Mean	7.0	5.7	4.8	5.7

Enhanced Encounters and Services

In addition to routine prenatal care visits, Birth Centers and Maternity Care Homes provided encounters with a care manager. Care managers (sometimes referred to as care coordinators or peer counselors by individual awardees) translated medical information for patients, navigated needed insurance approvals, made referrals for medical non-medical services, provided emotional support, and administered evaluation forms (Hill et al. 2018). Nearly all Birth Center enrollees (99.5 percent) and 93 percent of Maternity Care Home enrollees received at least one care coordination encounter during their pregnancy. While we understand from our case study analyses that the number of care coordinator encounters varied widely by awardee and even within awardees (see Hill et al. 2018), on average women met with their care coordinators approximately four times during their pregnancy or postpartum (3.2 times for Birth Centers and 4.6 times for Maternity Care Homes). Although not a central aspect of Group Prenatal Care awardee interventions, 46 percent of group enrollees did receive a care coordinator encounter during their pregnancy, with an average number of 2.3 encounters.

Given the high need for mental health care demonstrated among the population of Strong Start enrollees, some awardees focused on providing mental health services or referring women to outside services. As described above, mental health care access can be quite limited for Medicaid beneficiaries. This may be especially true for pregnant Medicaid beneficiaries, as some mental health providers are reluctant to treat depressed pregnant women in general, especially those who require medication

management (Weinreb et al. 2014). As presented in Table 13, PLPE data indicate that less than six percent of participants received a mental health encounter during their pregnancies (though we know that more than a quarter of women screened positive for depression and/or anxiety). Women enrolled in Maternity Care Homes, however, were the most likely to have received a mental health encounter (8.8 percent). This could be because many Maternity Care Homes were part of an FQHC network or university-based health system, where specialty care referrals may be more streamlined or where mental health providers may be available on site. Mental health encounters were notably rare among Birth Center participants, with less than one percent of women reportedly receiving an encounter. Across models, if a mental health encounter was provided by a caregiver not associated with the site, this information may not have been known or reported.

TABLE 13: ENHANCED ENCOUNTER TYPE AND FREQUENCY, BY MODEL AND OVERALL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Care Coordinator Encounters					
Missing Data	%	0.6	31.8	8.6	12.4
Women with Non-Missing Data	**N**	**8,732**	**7,081**	**23,342**	**39,155**
Received Care Coordinator Encounters	%	99.5	46.1	93.0	86.0
Average Number of Care Coordinator Encounters	Mean	3.2	2.3	4.6	4.0
Mental Health Encounters					
Missing Data	%	5.2	35.2	16.4	18.5
Women with Non-Missing Data	**N**	**8,331**	**6,731**	**21,354**	**36,416**
Received Mental Health Encounters	%	0.7	3.4	8.8	5.9
Average Number of Mental Health Encounters	Mean	1.9	1.7	2.4	2.3

INTERIM OUTCOMES

The PLPE data allow us to track pregnancy conditions that developed during women's time in Strong Start and assess variation across models and by participant characteristics. This benefit of the PLPE data is particularly important, as measures of pregnancy conditions are not readily available from other data sources, or available in a timely manner, and adverse conditions may contribute to poor pregnancy outcomes. In this section, we describe the incidence of select pregnancy conditions among Strong Start participants that are directly related to maternal and infant outcomes, as displayed in Figure 15. Later in the report, in the Regression Adjusted Outcomes Analyses section, we present risk-adjusted analyses for two of these conditions – gestational diabetes and preeclampsia.

Gestational Diabetes

Slightly more than six percent of Strong Start participants developed gestational diabetes during their pregnancies.[26] This is higher than we have reported in years' past, but lower than overall rates of gestational diabetes in a comparable population. For example, findings from a study using the Pregnancy Risk Assessment Monitoring System (PRAMS) data and birth certificates suggest that the incidence of gestational diabetes among women enrolled in Medicaid is nearly 10 percent (DeSisto, Kim, & Sharma, 2014). Low rates among Strong Start enrollees may be especially notable given that

[26] Some women in Strong Start are reported to have both pre-pregnancy diabetes and have developed gestational diabetes. When we limit the sample to Strong Start participants without pre-pregnancy diabetes (excluding 1,270 women), we find that 5.5 percent of Strong Start participants developed gestational diabetes during their pregnancies.

some awardees enrolled women specifically because they had gestational diabetes or were at risk of developing gestational diabetes based on their medical history. We do not, however, know the gestational diabetes status of 18 percent of Strong Start women due to missing data.

Women enrolled in Maternity Care Homes were significantly more likely to develop gestational diabetes than participants in the other two models (7.9 percent vs. 6.0 percent in Group Prenatal Care and 2.8 percent for Birth Centers; $p < 0.001$). This could be related to the fact that Maternity Care Home awardees enrolled more women with risk factors associated with gestational diabetes. As shown in Table 14, rates of gestational diabetes are higher than average for Hispanic women, women age 35 and older, and women who are obese. Maternity Care Home awardees enrolled more women who were overweight or obese (66.2 percent) and more women of advanced maternal age (9.5 percent) than the other models. Birth centers had a similar proportion of women who are >35 years old, but a smaller proportion of women who are overweight or obese (50.7 percent). We also observe that Hispanic women enrolled in Strong Start were more likely to develop gestational diabetes than women of other race/ethnicities—8.7 percent of Hispanic women develop gestational diabetes compared with about 5 percent of white and black Strong Start participants.

TABLE 14: RATES OF GESTATIONAL DIABETES BY PARTICIPANT CHARACTERISTICS

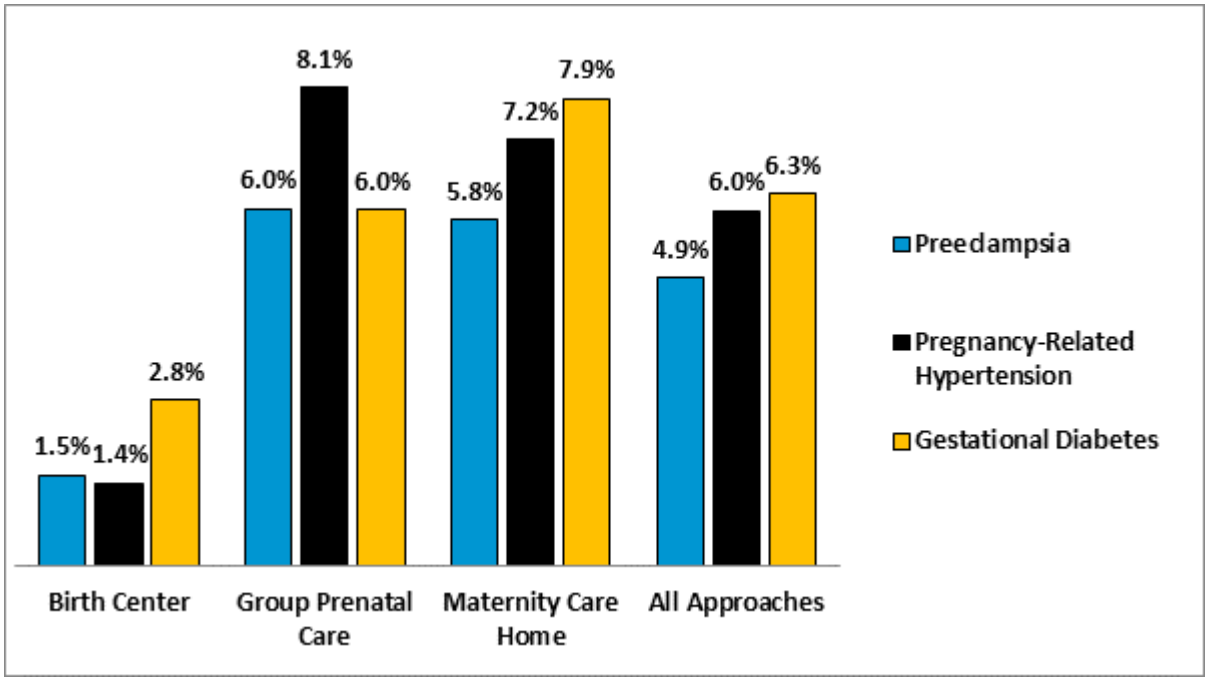
Participant Characteristics	N or %	Share that Developed Gestational Diabetes
Women with Non-Missing Data	**N**	**36,687**
All Participants	%	6.3
Race/Ethnicity		
Women with Non-Missing Data	**N**	**34,130**
Hispanic	%	8.7
Non-Hispanic White	%	5.1
Non-Hispanic Black	%	5.2
Other Race/Multiple Races	%	7.9
Age		
Women with Non-Missing Data	**N**	**34,564**
Less than 18 Years of Age	%	1.8
18 and 19 Years of Age	%	2.9
20 Through 34 Years of Age	%	6.1
35 Years and Older	%	14.9
BMI		
Women with Non-Missing Data	**N**	**32,911**
Underweight (BMI < 18.5)	%	2.3
Normal weight (=>18.5 BMI < 25)	%	2.6
Overweight (=>25 BMI < 30)	%	5.9
Obese (=>30 BMI < 40)	%	10.1
Very obese (BMI >= 40)	%	13.1

During case study interviews we heard that many Strong Start awardees focused on providing nutrition counseling, dietary guidance, linkages to WIC, and referrals to a nutritionist or diabetes support group. Perhaps those efforts translated into reductions in gestational diabetes in this high-risk population. Approximately one-quarter of participants received separate nutrition counseling sessions during their Strong Start pregnancy, according to the PLPE visit data. In addition, we know that the midwifery model of care practiced in Birth Centers emphasizes good nutrition and healthy activity during pregnancy and there are also sessions on this in the Centering pregnancy curriculum utilized by most Group Prenatal Care awardees.

Pregnancy-Induced Hypertension and Preeclampsia

In contrast to the lower gestational diabetes rates found among Strong Start participants, pregnancy-related hypertension rates were higher than those reported in the literature for low-income women, generally—six percent compared to approximately three percent (Bateman et al., 2012). These rates vary by model, with women in Group Prenatal Care and Maternity Care Homes having much higher rates of pregnancy-induced hypertension and preeclampsia than women enrolled in the Birth Center model. These results are presented in Figure 15.

FIGURE 15: RATES OF GESTATIONAL DIABETES, PREGNANCY-RELATED HYPERTENSION AND PREECLAMPSIA, BY MODEL AND OVERALL



Notes: Missing data are excluded from these calculations. Rates of missing and not in universe by measure can be found in Appendix H. Denominators for gestational diabetes are: BC=8,723, GPC=7,798, MCH=20,166, Total=36,687. Denominators for pregnancy-related hypertension are: BC=8,722, GPC=7,631, MCH=20,216, Total=36,569. Denominators for preeclampsia are: BC=8,722, GPC=7,767, MCH=20,070, Total=36,559. Ns include women with nonmissing data for that outcome.

High rates of pregnancy-induced hypertension and preeclampsia among Strong Start participants appear to be driven, at least in part, by race, which varies by model. We observe that 9.2 percent of black women developed pregnancy-induced hypertension during their Strong Start pregnancy compared with 3.7 percent of white women and 4.5 percent of Hispanic women. The literature shows that black women are at higher risk of hypertensive problems in general and specifically during pregnancy (Yoon et al. 2015, Ghosh et al. 2015). Higher rates of pregnancy-induced hypertension among black women also track with higher rates of preeclampsia: while the overall rate of preeclampsia among all Strong Start women is 4.9 percent, it is 6.6 percent for black women. The underlying causes and mechanisms for preventing pregnancy-induced hypertension are largely elusive and, therefore, pose a particular challenge to prenatal care providers. The incidence of preeclampsia has been on the rise in the U.S., however, and there is evidence that rising rates may be related to higher rates of obesity and related conditions such as hypertension and diabetes (Jeyabalan 2013). Though use of low-dose

aspirin during pregnancy has been shown to reduce the risk of pre-eclampsia for those at risk, and is recommended practice by the U.S. Preventive Services Task Force, data collected through the case studied indicate that it was used inconsistently in Strong Start.

Labor Induction

Labor was induced for about one-third of Strong Start participants (32 percent). The CDC reports induction rates in 2016 were 20 percent for all U.S women in 2016 (Martin et al. 2018), but evidence suggests that birth certificate and hospital discharge records underreport the true rate of inductions (Kjerulff & Attanasio 2017). A recent study looking at health plan data indicates the real rate of induction is likely much higher than 20 percent, peaking at 32.2 percent in 2005 and declining to 29.1 percent in 2007 (Dublin et al. 2014), rates that are more consistent with what we observe in the Strong Start population. According to PLPE data, most Strong Start women who were induced were induced with Pitocin (84 percent), but some deliveries may have been induced with prostaglandins by the artificial rupture of membranes (AROM), or by other means.

Most induced Strong Start deliveries occurred between 39 and 41 weeks gestation (50.1 percent), but nearly a quarter (24.1 percent) were early term inductions (between 37 and 39 weeks), and approximately 9 percent were induced preterm. Unfortunately, the nature of the PLPE data does not allow us to assess whether reported inductions were elective or medically necessary, but we can observe that approximately 47 percent of women who were induced preterm had preeclampsia, 20 percent had pregnancy related hypertension, and 12 percent had gestational diabetes. A national movement to reduce the number of elective early term births has led to recent declines in non-medically indicated induction being performed prior to 39 weeks, and many Strong Start awardees had a reduction in early elective deliveries (both through induction and cesarean) as an operational goal. In fact, the largest changes in the induction rate in recent years have occurred among early-term births (Osterman and Martin 2014). In focus groups with participants, the evaluation team asked whether any provider or Strong Start staff had spoken with them about the importance of carrying their babies until at least 39 weeks, and if so, why. Consistently, we heard that this was a point that was emphasized, particularly in Birth Center and Group Prenatal Care, and that early elective inductions were generally discouraged.

STRONG START BIRTH OUTCOMES

Below we briefly describe the primary maternal and infant outcomes we observe among Strong Start participants in the PLPE data. Additional risk adjusted analyses are also presented in the Regression Adjusted Outcomes Analyses section.

Gestational Age

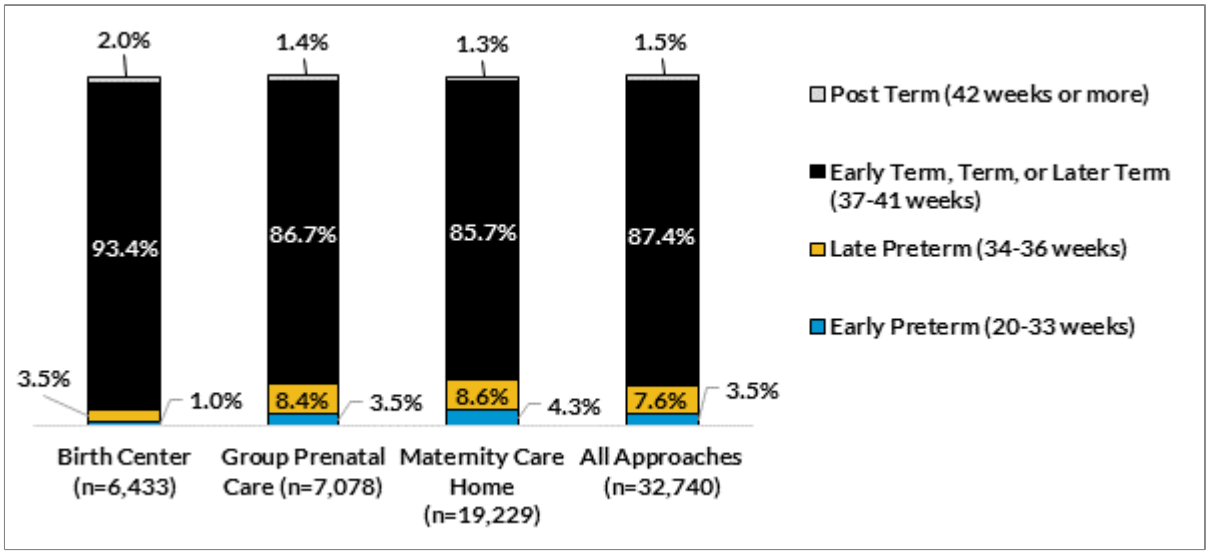
Preterm birth was a primary outcome that Strong Start sought to affect through funding enhanced care and support to Medicaid beneficiaries throughout their pregnancies. In the U.S., women who are poor are at increased risk of experiencing preterm birth, as are black women regardless of socioeconomic status. As reported above, most women enrolled in Strong Start, all of whom had incomes low enough to

make them eligible for Medicaid and 40 percent of whom were also black, have had a prior birth, and 21.1 percent of participants with a prior birth had a preterm birth prior to Strong Start.

As we have reported in years past, the preterm birth rates among Strong Start participants are slightly higher than rates observed nationally for all women (11.1 percent vs. 9.8 percent); reliable national rates of preterm birth among Medicaid participants are not available. Also, as noted in earlier in the report, several Strong Start awardees were located in the Southeastern U.S. (Mississippi, Alabama, Georgia, Tennessee, Kentucky, South Carolina, Louisiana, and Florida), where rates of preterm birth are higher than the national average. In several of these states, preterm birth rates exceed 11 percent overall, regardless of insurance coverage (Martin et al. 2018). In Mississippi and Louisiana in 2016, overall preterm birth rates were 13.7 percent and 12.6 percent respectively.

Preterm birth rates do vary by model and are presented in Figure 16. Birth Center participants had the lowest rate of preterm delivery (4.5 percent), while 11.9 percent of Group Prenatal Care participants and 12.95 percent of Maternity Care Home participants had a preterm birth. Most preterm births among Strong Start participants occurred after 34 weeks (late preterm). These rates (7.6 percent) are only slightly higher than those reported for all women by the CDC for 2016 (7.1 percent) (Martin et al. 2018). Rates of early preterm births (20-33 weeks) are approximately one percentage point higher for Strong Start participants than for all U.S. birth in 2016 (3.5 percent vs. 2.8 percent). Notably, these differences are smaller than those we have reported in past years, which can be attributed to both a slight increase in preterm births nationally in 2016 as well as the fact that, with the complete PLPE dataset, preterm birth rates for the Strong Start population are lower than reported in previous years when all data had not yet been submitted.

FIGURE 16: INFANT ESTIMATED GESTATIONAL AGE (EGA) AT BIRTH AMONG WOMEN WITH A LIVE BIRTH, BY MODEL AND OVERALL



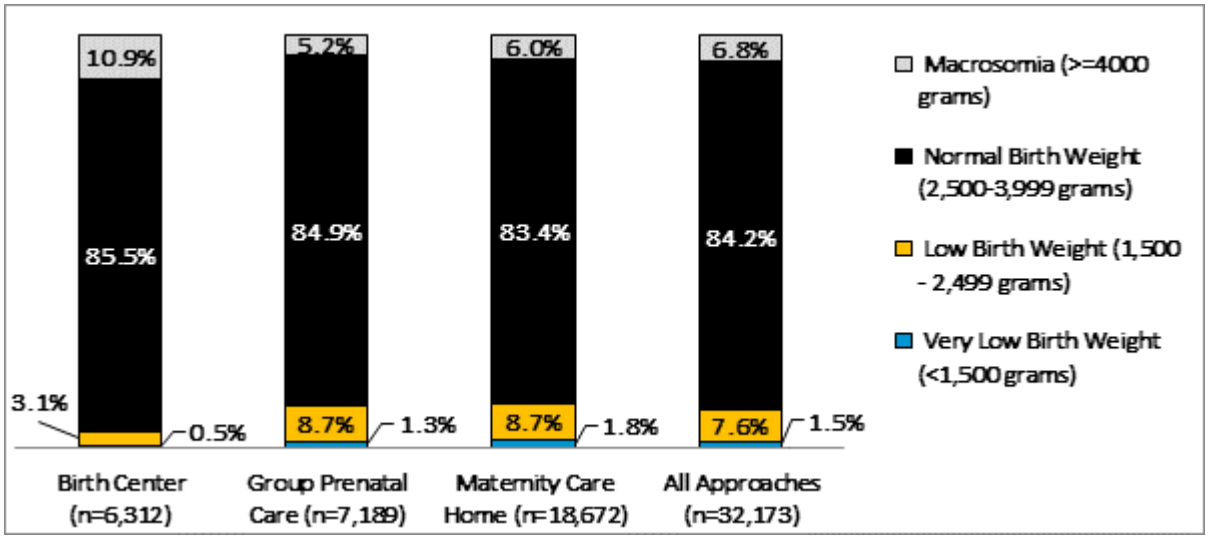
Notes: Missing data are excluded from these calculations. Rates of missing for EGA by model are as follows: 0.7 percent for Birth Centers, 15.4 percent for Group Prenatal Care, 5.8 percent for Maternity Care Homes, and 7.0 percent across all approaches. Rates of missing and not in universe by measure can also be found in Appendix H. Ns include women with a live birth and nonmissing data for EGA.

Black women enrolled in Strong Start were the most likely to deliver a preterm infant (13.4 percent), but this is lower than the rate of preterm birth for all black women in the U.S. (13.8) (Martin et al. 2018). White Strong Start participants had lower rates of preterm birth than white women nationally overall in 2016 (8.6 vs. 9.0). But, rates of preterm for Hispanic women enrolled in Strong Start were considerably higher than Hispanic women in the U.S. as a whole (11.2 percent vs. 9.5 percent). This may be driven in part by one awardee—the University of Puerto Rico—where 21.4 percent of Strong Start pregnancies were delivered preterm. Puerto Rican women are generally more likely to have a preterm birth; the CDC reports a preterm birth rate of 11.1 percent for Puerto Rican women overall—including those living on the mainland—and a 2016 March of Dimes analysis of NCHS data reports 11.4 percent of women living in Puerto Rico had a preterm birth. In addition, UPR served as the only provider in Puerto Rico for high-risk women insured through Medicaid. When we exclude UPR from our calculations, the preterm birth rate among Hispanic women in the PLPE dataset decreases to 10.3 percent, which is more in line with the national average.

Infant Birthweight

Strong Start participants had higher rates of low birthweight than U.S. women overall: 9.1 percent vs. 8.2 percent (Martin et al. 2018); however, when we break down rates by race and ethnicity, we observe that black women enrolled in Strong Start were less likely to have a low birthweight infant that black women nationally (12.5 percent vs. 13.7 percent) and rates were nearly the same for white and Hispanic women in Strong Start and the U.S. as a whole (Martin et al. 2018). Low birthweight rates for Strong Start participants who are in the other/mixed race category are 8.7 percent, and we are missing race/ethnicity for 5.8 percent of women for whom we have birthweight information—6.2 percent of whom had a very low birthweight infant. Only 6.8 percent of Strong Start infants were born macrosomic (> 4,000g) compared with 7.9 percent of U.S. infants born in 2016 (Martin et al. 2018). Infant birthweight by model and overall is displayed in Figure 17.

FIGURE 17: INFANT BIRTHWEIGHT AMONG WOMEN WITH A LIVE BIRTH, BY MODEL AND OVERALL

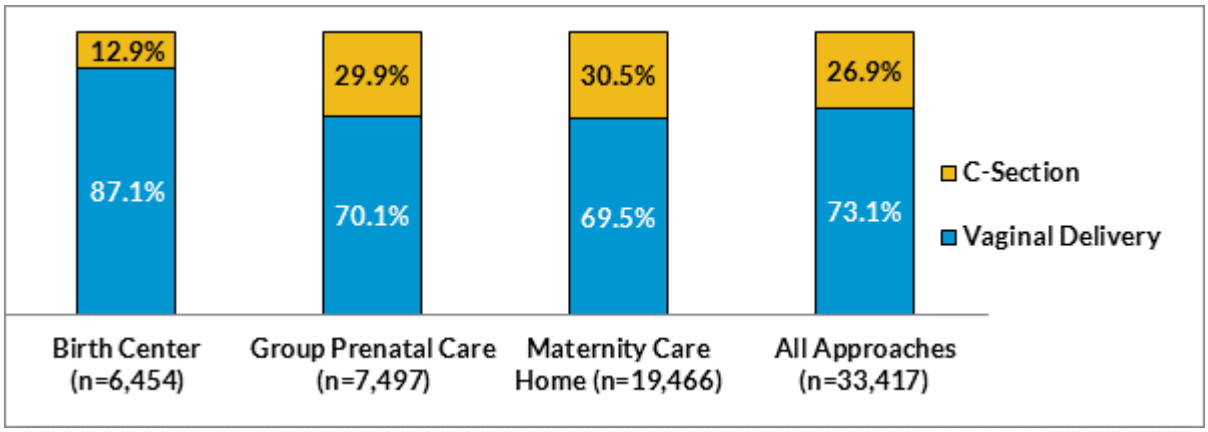


Notes: Missing data are excluded from these calculations. Rates of missing for birth weight by model are as follows: 2.1 percent for Birth Centers, 14.3 percent for Group Prenatal Care, 8.0 percent for Maternity Care Homes, and 8.3 percent across All Approaches. Rates of missing and not in universe by measure can also be found in Appendix H. Ns include women with a live birth and nonmissing data for birth weight.

Delivery Method

The C-section rate for Strong Start participants is substantially lower than the U.S. rate overall for 2016 (26.9 percent vs. 31.9 percent), consistent with trends observed throughout the Strong Start evaluation. Though none of the models exceeded the national rate, the overall rate for Strong Start continues to be driven primarily by very low rates of C-section among women enrolled in Birth Center care. Fewer than 13 percent of Birth Center participants had a C-section delivery in contrast to approximately 30 percent of Group Prenatal Care participants and Maternity Care Home participants. These rates are presented in Figure 18.

FIGURE 18: DELIVERY METHOD AMONG STRONG START PARTICIPANTS WITH A DELIVERY, BY MODEL AND OVERALL

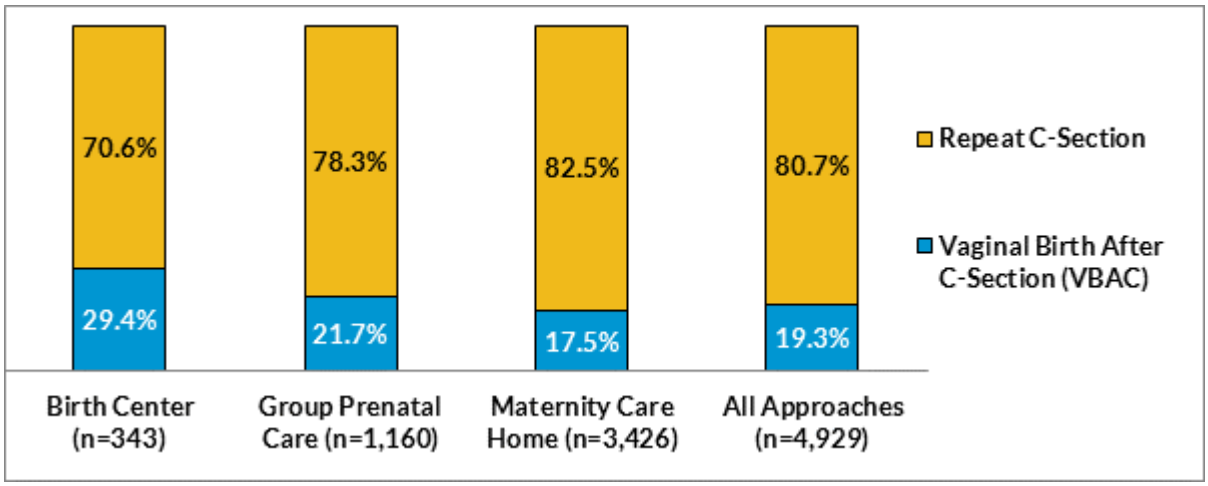


Notes: Missing data are excluded from these calculations. Rates of missing for delivery method by model are as follows: 0.7 percent for Birth Centers, 12.0 percent for Group Prenatal Care, 5.6 percent for Maternity Care Homes, and 6.1 percent across All Approaches. Rates of missing and not in universe by measure can also be found in Appendix H. Ns include women with a delivery and nonmissing data for delivery method.

Trends in C-section by race and ethnicity were similar to those for the nation as a whole, though Strong Start rates of C-section remained consistently lower when considered by race/ethnicity. In the U.S. overall, black women are the most likely to have a Cesarean delivery in 2016 (35.9 percent) and are also the most likely Strong Start participants to deliver by C-section (30.7 percent). Hispanic women's rates are lower (31.7 percent nationally vs. 26.2 percent in Strong Start), and white women are the least likely to have a C-section (30.9 percent nationally vs. 23.5 percent in Strong Start) (Martin et al. 2018).

Low risk C-sections—among women with a singleton gestation, without a prior birth, and who carried their babies to term – were slightly lower among Strong Start participants (24.1 percent) compared with a low-risk C-section rate of 25.7 percent, nationally (national rates also account for vertex presentation, which we were not able to assess for Strong Start participants; which may create higher "low risk" rates in Strong Start than we would find if we were able to eliminate breech presentations). They are especially low among Birth Center participants (16.7 percent), compared with Group Prenatal Care (27.7 percent) and Maternity Care Home participants (25.3)—which are on par with or slightly higher than the national estimate. Vaginal Birth after Cesarean (VBAC) rates are higher among Strong Start participants than nationally. As presented in Figure 19, nearly 20 percent of women with a prior C-section enrolled in Strong Start had a VBAC compared with 12.4 percent of women with a prior C-section nationally in 2016 (Martin et al. 2018). The Strong Start rate exceeds the Healthy People 2020 goal of increasing VBAC deliveries to 18.3 percent, and is especially robust (though still within the recommended bounds) among Birth Center participants at29.4 percent (ACOG 2017).

FIGURE 19: VAGINAL BIRTH AFTER C-SECTION AND REPEAT C-SECTION AMONG WOMEN WITH A PRIOR C-SECTION, BY MODEL AND OVERALL



Notes: Missing data are excluded from these calculations. Rates of missing or not in universe for delivery method in this population are as follows: 96.1 percent for Birth Centers, 88.9 percent for Group Prenatal Care, 86.6 percent for Maternity Care Homes, and 89.0 percent for All Approaches. Rates of missing by measure can also be found in Appendix H. Ns are based on women for whom Exit Forms were submitted and had nonmissing data for these measures.

LIMITATIONS

The PLPE data collected for this evaluation provided a unique opportunity to conduct timely analysis of socioeconomic and demographic characteristics, risk factors, pregnancy conditions, and birth outcomes among Strong Start participants. However, as with most survey data, aspects of PLPE data quality may limit the accuracy and generalizability of the results.

First, PLPE forms were not submitted for all Strong Start participants. Rates of submission were quite high for Intake Forms (95 percent) and Exit Forms (98 percent). These high submission rates reduce concerns about potential bias due to missing forms. Form submission rates were much lower for the Third Trimester and Postpartum Surveys—only 60 percent of all women and 70 percent of women who did not exit Strong Start prior to delivery, and thus we do not discuss the measures collected from these surveys in this section. Women who did not continue the Strong Start program, who attended care irregularly or not at all in their third trimester, or who did not attend a postpartum visit are most unlikely to have completed these two forms. However, because these forms were the only source of information on patient satisfaction, breastfeeding, and family planning, we do present targeted analyses of these rates in Appendix J and Appendix K. Because the low submission rates almost certainly created selection bias, caution should be used when interpreting these results.

Second, while rates of form submission were quite high for Intake and Exit Forms, overall rates of missing data due to item nonresponse on submitted forms are 5.2 percent for Intake Forms and 11.6 percent for Exit Forms. Again, if item nonresponse to form questions is systematic, our results may be biased. Where possible, we have defined measures using data from multiple sources (Intake Form, Exit Form, crosswalk file) to reduce the rates of missing data. For example, our measure of prior preterm birth uses the prior preterm birth questions on both the Intake Forms and Exit Forms, so women are only missing data if they do not have a response for either of these questions. Where possible, we also use nonmissing responses to other questions to reduce rates of missing. For example, women with

missing data for the prior pregnancy question are coded as having had a prior pregnancy if they reported any of the following: prior live birth, prior preterm birth, date of birth for prior pregnancy, risk factors for a prior pregnancy, prior low birth weight birth, prior miscarriage, prior termination, prior stillbirth, VBAC, repeat C-section, or receipt of 17P. Although these coding decisions helped us reduce rates of missing data, they were not possible for all measures. We report the rates of missing data for each variable in Appendix H; caution should be used when interpreting measures with high rates of missing data. We also note that data quality also varied by awardee (see Appendix G) and that the results presented in this section are limited to nonmissing data. Therefore, these results may not be representative of awardees with high rates of missing data. Volume 2 of this report also presents PLPE data for each awardee in greater detail as well as a discussion of awardee data quality.

Finally, our reported rates of interim and birth outcomes by model should not be interpreted as estimates of the effects of each Strong Start intervention model; they are descriptive statistics only. As discussed above, differences in outcomes may be attributable to differences in the characteristics of women enrolled in each model type, which were often substantial, with Birth Center participants having lower risk levels overall and Maternity Care Home participants generally presenting the highest risks. Risks with differences among models included mental health status, BMI, risk factors from prior pregnancies, and conditions developed during the Strong Start pregnancy. There may have also been unobserved differences. Estimates of the effects of Strong Start are presented in the Impact Analysis section later in this report. In addition, we present multivariate analyses using the PLPE data in the Regression Adjusted Outcomes Analyses section. These compare effects by model, but do not estimate the effects of Strong Start relative to typical prenatal care.

Despite these limitations, there are important benefits to the collection and analysis of participant-level data such as the PLPE data used in this evaluation. The PLPE data have allowed us to report on the characteristics of Strong Start participants throughout the evaluation and to report data on birth outcomes as they came available. Furthermore, the collection of PLPE data provided us with consistent data on Strong Start participants across all awardees, allowing us to offer descriptive statistics on all participants and their differences across models. And lastly, because awardees could rely on patient medical records to answer Exit Form questions, the PLPE data provide more complete and reliable data on women's medical histories than is available from survey sources or what is reported on the birth certificate. Furthermore, we were able to compare PLPE reported data with the vital records data collected from states to assess the reliability of variables used in the Impact Analysis.

DISCUSSION

This chapter provides a rich description of the nearly 46,000 women who participated in Strong Start, derived from the Participant Level Process Evaluation (PLPE) data set. These data show that women enrolled in Strong Start experienced a multitude of social and economic challenges, confirming similar findings from the case studies. Strong Start participants were disproportionately black (40 percent) and Hispanic (30 percent) compared with Medicaid beneficiaries overall—characteristics associated with increased risk for poor birth outcomes (e.g., preterm birth) and certain pregnancy conditions (e.g., gestational diabetes). Strong Start mothers were also less likely than pregnant women in the U.S. generally to be married and had low levels of educational attainment. Many Strong Start participants experienced everyday struggles, including food insecurity, barriers to accessing prenatal care (most commonly not having a car or money to afford a ride), and poor mental health. Nearly 28 percent of

women screened positive for depression—a rate more than two times the highest rate typically cited in the literature among pregnant women—and more than 35 percent had some level of anxiety.

In addition to high levels of social and emotional need, many Strong Start participants had physical health conditions that increased their risk for poor birth outcomes. A majority of participants were overweight or obese, and many had a prior preterm birth. A majority of participants reported that their pregnancies were unplanned, and almost 30 percent of women reported a short interpregnancy interval (less than 18 months) between their Strong Start pregnancy and a prior birth.

Participant risk factors varied, however, across Strong Start models. For example, the racial/ethnic composition of participants was quite different across models, with a majority of Birth Center participants being white, Group Prenatal Care serving a higher proportion of Hispanic women than the other models, and Maternity Care Homes serving a majority of black women (though there were also substantial variations by awardee within models; see Volume 2 for more information). Mothers receiving care in Birth Centers were about twice as likely to be married and college educated as women enrolled in the other two models, though even among Birth Center participants, the majority were unmarried and only 15 percent had a college degree. They also reported less depression and anxiety and had lower rates of obesity. The highest rates of obesity and mental health needs were reported by Maternity Care Home mothers, who were often served at sites such as academic medical centers designed to serve higher risk women.

The number of prenatal encounters women received also varied across the models. In terms of routine prenatal care visits, Birth Center participants received the most (average of 9.3 visits), while Group Prenatal Care participants received fewer individual visits (average of 5.3). However, Group Prenatal Care participants also participated in an average of 5.7 group care visits, giving them a higher average number of total prenatal care visits. The average for group visits, however, was well short of the 10 visits prescribed by the *CenteringPregnancy* curriculum employed by most awardees. Case study findings suggest that Birth Center midwifery visits lasted longer than typical Maternity Care Home visits (30 minutes or more vs. 15 minutes or less), as did Group Prenatal Care sessions, which were scheduled for two-hour time blocks, suggesting that women enrolled in these two transformative forms of prenatal care spent more time with their health providers. Maternity Care Home participants, on the other hand, had more care coordinator encounters (where counseling, education, and referrals occurred) and mental health encounters than participants in either of the other models. These variations in types of services received confirm and further enlighten the case study findings that identified wide variations in services provided across models and the intensity of services received.

The PLPE data also provide descriptive data on birth outcomes for participants. These do not compare Strong Start rates to those of women not participating in Strong Start (as is presented later in the Impact Analysis section), but give us a general sense of the trends. Furthermore, these data are for all Strong Start participants, not just those included in the states for which the impact analysis was able to obtain data, and so provide a more comprehensive description of Strong Start birth outcomes.

PLPE data show that the overall rate of preterm birth among Strong Start participants was 11.1 percent, varying by model. The highest rate was observed among Maternity Care Home mothers, 12.9 percent, who descriptively possessed higher social and medical needs. Given that the PLPE data provide a rich set of risk factors which can be used to adjust for differences across models, we performed regression analyses to further explore the differences. Results are presented in the next chapter.

REGRESSION ADJUSTED OUTCOMES ANALYSES

Descriptive findings from the PLPE data indicate that many women enrolled in Strong Start had high levels of need (psychosocial and medical risk) that could affect pregnancy conditions and birth outcomes. To examine how each Strong Start model might influence participant outcomes, we ran risk-adjusted analyses that controlled for a host of participant characteristics commonly associated with health conditions developed during pregnancy (e.g., gestational diabetes and preeclampsia) and poor birth outcomes (preterm birth, low birthweight). We also were able to control for participant characteristics not commonly available in birth certificate or claims data that may affect health outcomes, particularly social and mental health risks such as food insecurity, depression, anxiety, and intimate partner violence.

Readers should keep in mind that these regression results consider Strong Start participants only. There is no external (non-Strong Start) comparison group in this analysis as there is in the Impacts Analysis presented later in this report. While these regression results do not convey the impacts of Strong Start enhanced prenatal care compared to typical care, they do provide an opportunity to examine a different research question: "Do Strong Start participant outcomes vary across models?"

Descriptive analyses of the PLPE data presented in the prior Participant-Level Process Evaluation section suggest that there are differences in the risk profiles of women enrolled in each of the three models. Birth Centers generally enrolled the healthiest group of women with the fewest demographic and social risks, while Maternity Care Home awardees enrolled a population with more medical challenges and substantial psychosocial needs. Group Prenatal Care participants appeared to be higher risk than Maternity Care Home and Birth Center participants on some measures, but lower risk on others. These differences point to the importance of controlling for participant characteristics when comparing birth outcomes across models.

In this chapter, we estimate linear probability models to examine the relationship between each Strong Start model and participant outcomes. We use Maternity Care Homes as the reference category (the baseline group against which comparisons are made) because it has the largest number of Strong Start enrollees and is the most similar to typical modes of prenatal care. All analyses are risk-adjusted to control for the demographic, psychosocial, and medical risk factors and other characteristics as listed in Table 15. Standard errors are clustered at the Strong Start site level to account for unobserved factors likely shared by all participants at a site, such as seeing the same case manager or group prenatal care facilitator. Technical details of the models and descriptive statistics for the analytic samples are presented in Appendix M, and full regression results can be found in Appendix N.

TABLE 15: MEASURES INCLUDED IN RISK-ADJUSTED REGRESSION MODELS

Demographic and Socioeconomic	Psychosocial Risk	Medical Risk	Location and Time
• Race/Ethnicity • Age • Education • Relationship Status • Employment/Education Participation • Food Insecurity	• Depression • Anxiety • Pregnancy Intention • History of Intimate Partner Violence	• Prior Preterm Birth • Prior Low Birthweight Baby • Prior C-Section • Interpregnancy Interval • Pre-Pregnancy Hypertension • Pre-Pregnancy Diabetes • BMI at First Prenatal Visit • Smoked Cigarettes at Intake	• Strong Start Site Region • Year of Delivery

In the remainder of this section we present results for three sets of regressions:

- In the first set, we look at differences in two pregnancy conditions (gestational diabetes and preeclampsia) by Strong Start model.
- In the second set, we consider differences in Strong Start birth outcomes (gestational age, birthweight, and delivery method (both C-Section and VBAC) by Strong Start model.
- In the final set, we analyze the relationship between depression and participant outcomes among all Strong Start participants.

Methods vary slightly among these analyses and are described as follows.

INTERMEDIATE OUTCOMES

Our analytic sample for the risk-adjusted analyses of intermediate outcomes includes 32,593 women out of 45,316Strong Start participants with PLPE data. We exclude 28 percent of our total sample because these women were missing data (27 percent) or because women had multiple gestations (e.g., twins, 1 percent). The steps involved in constructing the analytic sample and summary statistics for the sample included in the regression are detailed in Appendix M. We performed chi-square and t-tests to compare the 7,678 women excluded from the analysis because of missing outcome variables or missing covariates to those who remained in the final analytic sample within each model. The participants dropped do not follow clear or consistent patterns, but overall, it appears they may be at greater sociodemographic and psychosocial risk but lower medical risk due to prior adverse birth outcomes than women included in the analysis.[27] Though there are significant differences ($p < 0.01$) between the women included and those dropped that indicate the findings presented in these regressions may not be representative of the full sample of Strong Start participants, the regressions still provide important insights about the women for whom we have data.

Additionally, we conducted pairwise statistical tests to compare means across models and observed that the populations enrolled in each Strong Start model do vary significantly ($p < 0.01$). Consistent with the descriptive PLPE findings presented in the prior section (Participant-Level Process Evaluation Findings: A Descriptive Look at Participant Risk Profiles, Service Use and Outcomes), Birth Center participants were disproportionately white and Group Prenatal Care participants were disproportionately Hispanic. Whereas Group Prenatal Care and Maternity Care Home awardees had similar rates of black participants in the full Strong Start population, Maternity Care Home participants were disproportionately black in the regression sample. Birth Center participants were more likely to be married and between 20 and 34 years of age and their pregnancies were more often intended; however, they were more likely to have short interpregnancy intervals than participants in the other two models. Group Prenatal Care participants were significantly more likely to be first-time mothers than participants in the other models, were more likely than participants in the other two models to be neither working nor in school, and had the highest rates of depression, anxiety, and food insecurity.

[27] We find that disproportionately fewer Birth Center participants were dropped from the sample than expected given the share of enrollees overall. Not surprisingly, women who are dropped from the sample are more likely than excluded women to have missing data for covariates. Where covariates are reported, excluded women are more likely to be younger than 20 years old and nulliparous; be black; have a high school degree; be in school; and either not be in a relationship or be living apart from their partner. Excluded women are also more likely to be depressed, have anxiety, have an unintended pregnancy, and smoke cigarettes. While the overall excluded sample is more likely to be black, dropped Maternity Care Home participants are more likely to be white; they are also less likely to be depressed or have anxiety. While the overall dropped sample had similar rates of food insecurity to those included in the analysis, dropped Group Prenatal Care participants were more likely to be food insecure.

Maternity Care Home participants were significantly more likely to have had a prior preterm or low birthweight birth than women enrolled in Birth Centers or Group Prenatal Care. Because of these differences, outcomes must be risk-adjusted before any valid comparisons can be made. In Table 26, we present unadjusted and risk-adjusted rates of intermediate outcomes across models. When rates are unadjusted (meaning they describe what was found in each model without accounting for women's characteristics), as with the descriptive statistics in the Participant-Level Process Evaluation Findings: A Descriptive Look at Participant Risk Profiles, Service Use and Outcomes section, we find that Maternity Care Home participants had significantly higher unadjusted rates of gestational diabetes (8 percent) than Group Prenatal Care participants (6 percent) and Birth Center participants (3 percent). Maternity Care Home and Group Prenatal Care participants had the same rates of preeclampsia (6 percent), but both these rates were significantly higher than the Birth Center preeclampsia rate of 2 percent.

After adjusting for the observed characteristics and risk factors listed in Table 15, we find that women enrolled in Birth Center and Group Prenatal Care models remain significantly less likely to develop gestational diabetes than women in Maternity Care Homes (by 4 percentage points, $p < 0.01$ and by 2 percentage points $p < 0.05$ respectively). Women enrolled in Birth Center care are also significantly less likely to develop preeclampsia than Maternity Care Home participants when controlling for specified covariates (2 percentage point difference; $p < 0.01$). These findings are presented in Table 16.

TABLE 16: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, FULL SAMPLE

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.05****	**-0.04****	0.06	**-0.03****	**-0.02***	0.08
Preeclampsia	0.02	**-0.04****	**-0.02****	0.06	0.00	0.00	0.06

Notes: N = 32,593. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

Because the Medical College of South Carolina (MUSC), the University of Alabama (UAB), and the University of Puerto Rico (UPR) serve as the primary source of prenatal care for high risk Medicaid beneficiaries in their area and therefore serve a disproportionately higher risk population than the other Strong Start awardees, we repeat the same analysis on a sample excluding participants enrolled by these awardees. When we exclude MUSC, UAB, and UPR from our sample, we observe similar results, though the magnitude of the difference in gestational diabetes between Group Prenatal Care and Maternity Care Home participants increases by 1 percentage point while the difference in preeclampsia between Birth Center and Maternity Care Home participants decreases by 1 percentage point. Findings for the model excluding high-risk awardees in Table 17.

TABLE 17: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.05****	**-0.04****	0.06	**-0.02****	**-0.03***	0.08
Preeclampsia	0.02	**-0.04****	**-0.01****	0.06	**0.01****	0.01	0.05

Notes: N = 29,902. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

Differences by Race

Given well-documented racial disparities in birth outcomes in the U.S., we also conducted a set of sensitivity analyses that stratify our analytic sample by race/ethnicity (Blumenshine et al. 2010). These models estimate the risk-adjusted differences in outcomes between Birth Centers and Maternity Care Homes and between Group Prenatal Care and Maternity Care Home models separately for different groups of women and allow us to assess whether the patterns we observed across models are consistent for 1) white women, 2) black women, 3) Hispanic women, and 4) women with other or multiple races (including the very small proportion of Asian Strong Start enrollees—about one percent).

Our results from this analysis show that the significant difference in gestational diabetes for Group Prenatal Care participants is only observed among black women, who have a 3-percentage point lower likelihood of developing gestational diabetes than black women in the Maternity Care Home model ($p < 0.01$; see Table 18 through Table 25). Birth Center differences, however, are generally consistent across racial/ethnic groups.

TABLE 18: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, WHITE WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.04****	**-0.03****	0.06	-0.01	-0.01	0.07
Preeclampsia	0.01	**-0.04****	**-0.02****	0.03	**-0.02****	-0.02	0.05

Notes: N = 8,553. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 19: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, WHITE WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.04****	**-0.03****	0.06	-0.01	-0.01	0.07
Preeclampsia	0.01	**-0.03****	**-0.02***	0.03	**-0.02****	-0.01	0.04

Notes: N = 8,170. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 20: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, BLACK WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.01	**-0.05****	**-0.04****	0.04	**-0.02****	**-0.03****	0.06
Preeclampsia	0.02	**-0.05****	**-0.02****	0.08	**0.02****	0.01	0.07

Notes: N = 12,354. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 21: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, BLACK WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.01	**-0.05****	**-0.04****	0.04	**-0.02****	**-0.03****	0.06
Preeclampsia	0.02	**-0.04****	**-0.02***	0.08	**0.03****	0.02	0.06

Notes: N = 10,947. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 22: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, HISPANIC WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.04	**-0.07****	**-0.04****	0.09	**-0.02****	0.00	0.11
Preeclampsia	0.02	**-0.04****	**-0.01***	0.05	0.00	0.00	0.05

Notes: N = 10,194. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 23: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, HISPANIC WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.04	**-0.07****	**-0.03****	0.08	**-0.02****	0.00	0.11
Preeclampsia	0.02	**-0.04****	**-0.01***	0.05	0.00	**0.03^**	0.05

Notes: N = 9,307. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 24: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, OTHER WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.08****	**-0.06****	0.07	**-0.5***	-0.01	0.11
Preeclampsia	0.02	**-0.03***	0.00	0.04	-0.01	-0.02	0.05

Notes: N = 1,492. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 25: DIFFERENCES IN INTERMEDIATE OUTCOMES BY STRONG START MODEL, OTHER WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Gestational diabetes	0.03	**-0.08****	**-0.06****	0.07	**-0.05****	-0.02	0.11
Preeclampsia	0.02	**-0.03***	0.0	0.04	-0.01	-0.02	0.05

Notes: N = 1,478. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

BIRTH OUTCOMES

More women are missing data for the birth outcomes variables than the intermediate outcome variables, and thus the analytic sample is smaller with 28,332 women out of the -45,316 Strong Start participants with PLPE data. We exclude 37 percent of our total sample because these women were missing large amounts of data (36 percent) or because women had multiple gestations (e.g., twins, 1 percent). The steps involved in constructing the analytic sample and summary statistics for the sample included in the regression are detailed in Appendix M. As with the intermediate outcomes sample, we performed chi-square and t-tests to compare the 11,327 women excluded from the analysis because of missing outcome variables or missing covariates to those who remained in the final analytic sample within each model and again find that the dropped participants do not follow clear or consistent patterns but, overall, may be at greater sociodemographic and psychosocial risk but lower medical risk due to prior adverse birth outcomes than women included in the analysis.[28] We again conducted pairwise statistical tests to compare means across models and, despite dropping more women from the sample, observed similar patterns to those described in the Intermediate Outcomes section.

[28] We find that slightly more Maternity Care Home participants are dropped from the sample than expected given the share of the enrollees overall, while disproportionately fewer Birth Center participants were dropped. Not surprisingly, women who are dropped from the sample are more likely than excluded women to have missing data for covariates. Where covariates are reported, excluded women are more likely to be 18 or 19 years old and nulliparous; less likely to be white, married, working, or in school; and more likely to be food insecure, to smoke, to have experienced intimate partner violence, to be depressed, and to have anxiety. While the overall dropped sample is less likely to be white, dropped Group Prenatal Care participants are less likely to be Hispanic. Differences in education also vary by model, with dropped Birth Center participants reporting lower educational attainment than included women. Dropped Maternity Care Home participants appear to have higher educational attainment than included women.

In Table 26, we present unadjusted and risk-adjusted rates of birth outcomes across models. When rates are unadjusted, we find that Maternity Care Home participants had significantly higher ($p < 0.01$) unadjusted rates of preterm birth (13 percent) and low birthweight (11 percent) than Group Prenatal Care participants (11 percent and 10 percent, respectively) and Birth Center participants (4 percent for both preterm and low birthweight). Maternity Care Home and Group Prenatal Care participants had similar rates of C-section (31 percent and 30 percent, respectively), but both these rates were significantly higher than the Birth Center C-section rate of 13 percent.

After we control for risks and other covariates specified in Table 15, the risk-adjusted differences continue to show that Birth Center participants are significantly less likely to have a preterm birth (a 5-percentage point lower rate than Maternity Care Home participants, $p < 0.01$), consistent with findings in in prior Strong Start evaluation reports (Hill et al. 2018). Birth Center participants are also less likely than Maternity Care Home enrollees to deliver a low birthweight infant (4-percentage point difference, $p < 0.01$) and are less likely to have a Cesarean delivery than Maternity Care Home participants (7 percentage point difference, $p < 0.01$).[29] In contrast to prior Strong Start annual reports, we no longer observe significant differences between Group Prenatal Care participants and Maternity Care Home participants now that the participant level data set is complete.

TABLE 26: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, FULL SAMPLE

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.04	**-0.08****	**-0.05****	0.11	**-0.01****	-0.02	0.13
Low birth weight	0.04	**-0.07****	**-0.04****	0.10	**-0.01^**	-0.01	0.11
C-Section	0.13	**-0.18****	**-0.07****	0.30	0.00	0.00	0.31
VBAC[1]	0.29	**0.13****	**0.10***	0.21	**0.04****	0.02	0.17

Notes: N = 28,332. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.
[1]VBAC sample is limited to women with a prior C-Section, N=4,141

Again, we repeat the same analysis on a sample excluding participants enrolled by the three awardees that served as the primary source of care for women with high risk pregnancies in their areas (MUSC, UAB, and UPR). When we exclude participants enrolled by these awardees, the adjusted difference between Birth Center and Maternity Care Home participants remains generally consistent with our full sample analysis, although both preterm birth and low birth weight estimates decrease by 1 percentage point (see Table 27). In contrast to the full sample analysis, however, we do observe that Group Prenatal Care participants have significantly lower rates of preterm birth and low birthweight (each by 2 percentage points; $p<.05$ and $p < 0.01$, respectively) than Maternity Care Home participants when MUSC, UAB and UPR participants are excluded.

[29] When we limit the C-section model to women without a prior birth, the difference in rate of C-section between Birth Center and Maternity Care Home participants increases to 9 percentage points (data not shown).

TABLE 27: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.04	**-0.07****	**-0.04****	0.10	**-0.02****	**-0.02***	0.12
Low birth weight	0.04	**-0.06****	**-0.03****	0.19	**-0.01***	**-0.02****	0.10
C-Section	0.13	**-0.18****	**-0.07****	0.28	**-0.03****	-0.02	0.30
VBAC[1]	0.29	**0.13****	**0.10***	0.22	**0.06****	0.05	0.17

Notes: N = 25,792. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.
[1]VBAC sample is limited to women with a prior C-Section, N=3,586

For both the full and limited samples and for both Birth Center and Group Prenatal Care models, the magnitude of the differences in outcomes from Maternity Care Home participants decreases considerably after adjusting for participant characteristics, and differences for the Group Prenatal Care model are no longer significant. The change after controls are introduced indicates that some of the unadjusted difference between these groups is attributable to differences in women's observable characteristics across models, which put Birth Center (and in some cases, Group Prenatal Care participants) at lower risk of poor birth outcomes than Maternity Care Home participants. Still, after observable risk factors are controlled for, Birth Center participants remain significantly less likely to experience poor outcomes in both samples, and Group Prenatal Care participants are significantly less likely to experience preterm birth or low birth weight when high-risk sites are excluded from the analysis.

Considering only the sample of women with a prior C-section and a current singleton pregnancy (N = 4,141), we look at rates of vaginal birth after C-section (VBAC). [30] The unadjusted rates of VBAC in this sample, by model, are 29 percent for Birth Center participants, 21 percent for Group Prenatal Care participants, and 17 percent for Maternity Care Home participants (all significantly different from one another, see Appendix M). After controls are included in the model, we find that Birth Center participants remain significantly more likely to have a VBAC than Maternity Care Home participants—by 10-percentage points ($p < 0.05$) (see Table 26).[31] The rate for Group Prenatal Care participants is not significantly different. Results do not change when we exclude MUSC, UAB, and UPR from the sample (see Table 27).

Differences by Race

As with our analysis of intermediate outcomes, we repeat these analyses stratifying by race/ethnicity to consider whether there are differences by model for women within each race/ethnicity category. Consistent with our main findings, unadjusted rates of preterm birth, low birthweight, and C-section are lower for Birth Center participants of all racial/ethnic categories than for women of the same race/ethnicity who participated in Group Prenatal Care or Maternity Care Homes. Differences between Group Prenatal Care and Maternity Care Home participants are more limited but do vary by race.

[30] Women with a prior C-section are defined as those who were reported to have a VBAC or repeat C-section.
[31] The overall VBAC rate among Strong Start participants enrolled in Birth Centers substantially surpasses Healthy People 2020 goals. It should be noted that these goals are not set at top thresholds but are progressive goals that are set at thresholds thought to be attainable over a 10-year period. The American College of Obstetricians and Gynecologists states that most women with a prior low-transverse cesarean are good candidates for attempted VBAC (see AGOG practice bulletin #184).

After adjusting for risk, we continue to see significant differences in these outcomes between Birth Center and Maternity Care Home participants, and the size of these differences again varies by race/ethnicity. When comparing Group Prenatal Care participants and Maternity Care Home participants we find fewer significant differences after adjusting for risk, but significant differences by race/ethnicity remain (see Table 28 through Table 35).

TABLE 28: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, WHITE WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.04	**-0.08****	**-0.06****	0.09	**-0.03***	**-0.05****	0.11
Low birth weight	0.03	**-0.06****	**-0.04****	0.08	-0.01	**-0.02^**	0.09
C-Section	0.10	**-0.20****	**-0.08****	0.31	0.01	0.03	0.31

Notes: N = 7,453. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 29: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, WHITE WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.04	**-0.06****	**-0.05****	0.09	-0.02	**-0.04****	0.10
Low birth weight	0.03	**-0.05****	**-0.03****	0.08	0.00	-0.01	0.08
C-Section	0.10	**-0.20****	**-0.08****	0.31	0.01	0.03	0.30

Notes: N = 7,067. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 30: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, BLACK WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.08****	**-0.05****	0.12	**-0.02***	-0.02	0.14
Low birth weight	0.06	**-0.08****	**-0.05****	0.11	**-0.02****	**-0.03***	0.13
C-Section	0.18	**-0.14****	**-0.05****	0.30	**-0.02***	-0.03	0.32

Notes: N = 11,043. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 31: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, BLACK WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.07****	**-0.04****	0.12	-0.01	-0.01	0.13
Low birth weight	0.06	**-0.06****	**-0.04****	0.11	**-0.01^**	**-0.02***	0.12
C-Section	0.18	**-0.14****	**-0.06****	0.30	**-0.03***	**-0.03***	0.33

Notes: N = 9,673. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 32: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, HISPANIC WOMEN

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.07****	**-0.05****	0.11	**-0.01**	0.00	0.12
Low birth weight	0.04	**-0.04****	**-0.02****	0.09	**0.01^**	0.02	0.08
C-Section	0.13	**-0.14****	**-0.04***	0.31	**0.03****	0.04	0.27

Notes: N = 8,619. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 33: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, HISPANIC WOMEN EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.07****	**-0.05****	0.07	**-0.05****	**-0.04****	0.12
Low birth weight	0.04	**-0.04****	**-0.02****	0.05	**-0.02****	**-0.02***	0.08
C-Section	0.13	**-0.14****	**-0.05***	0.24	**-0.03****	-0.01	0.27

Notes: N = 7,849. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 34: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, WOMEN OF OTHER RACE-ETHNICITY

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.04***	-0.02	0.10	0.01	0.02	0.09
Low birth weight	0.03	**-0.06****	-0.03	0.13	**0.04^**	0.04	0.09
C-Section	0.16	**-0.15****	**-0.04^**	0.26	-0.05	-0.02	0.31

Notes: N = 1,217. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

TABLE 35: DIFFERENCES IN BIRTH OUTCOMES BY STRONG START MODEL, WOMEN OF OTHER RACE-ETHNICITY EXCLUDING MUSC, UAB, AND UPR

Outcome	Birth Center			Group Prenatal Care			Maternity Care Home
	Mean	Unadjusted Difference	Adjusted Difference	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.05	**-0.04***	-0.02	0.10	0.01	0.02	0.09
Low birth weight	0.03	**-0.06****	-0.02	0.13	**0.04***	0.04	0.09
C-Section	0.16	**-0.15****	**-0.05^**	0.26	-0.05	-0.02	0.31

Notes: N = 1,203. Differences are from Maternity Care Home model. Cells that contain a caret (^) indicate marginal significance at the 0.1 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain two asterisks (**) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.

White, black, and Hispanic women who participated in Birth Centers were all between 5 and 6 percentage points less likely to have a preterm birth than Maternity Care Home participants ($p < 0.01$) in risk-adjusted regression analyses. For Group Prenatal Care, however, only white women are significantly less likely to have experienced a preterm birth. After excluding high-risk awardees, the risk-adjusted differences decreased slightly. With the limited sample (excluding high risk awardees), white, black and Hispanic Birth Center participants continued to have lower rates of preterm birth. In

addition, with this limited sample we observe that both white and Hispanic participants enrolled in Group Prenatal Care experienced significantly lower rates of preterm birth, but black women did not.

Race-specific analyses of low birthweight, on the other hand, reveal more variation. For example, while we found an overall difference of 4 percentage points in low birthweight between Birth Center and Maternity Care Home participants, when looking at the race-specific models, we observe differences are largest for black women (5 percentage points, $p < 0.01$), followed by white women (4 percentage points, $p < 0.01$) and then Hispanic women (2 percentage points, $p < 0.01$). Additionally, while we did not find an overall difference between Group Prenatal Care and Maternity Care Homes, we do observe a significant difference in low birthweight (3 percentage points lower, $p < 0.05$) for black women. We also observe significant differences for black and Hispanic women when we exclude high-risk awardees (2 percentage points lower for both groups, $p < 0.05$).

The 7-percentage point lower rate of C-section we observe in the overall models between Birth Center participants compared to Maternity Care home participants is largest among white women (8 percentage points, $p < .01$). Race-specific models reveal smaller effects for black women (5 percentage points, $p < .01$) and Hispanic women (4 percentage points, $p < .05$) enrolled in Birth Center care compared with the same groups enrolled in Maternity Care Homes. Though we did not find an overall difference in rates of C-section between Group Prenatal Care and Maternity Care Homes, when high-risk awardees are excluded from the analyses, results reveal a 3-percentage point lower rate of C-section for black women in Group Prenatal Care ($p < 0.05$). We do not observe differences for women of other races.

DEPRESSION

Given the high rates of depression among the Strong Start population (reported in the Participant-Level Process Evaluation Findings: A Descriptive Look at Participant Risk Profiles, Service Use and Outcomes section), and as noted earlier, indications that depression is associated with a multitude of poor birth outcomes, including preterm birth and low birth weight, we conducted a series of bivariate and multivariate analyses to examine whether positive depression screening is associated with preterm birth, low birthweight, C-section deliveries, and postpartum breastfeeding initiation among all Strong Start participants. The analytic sample construction for these analyses (N = 23,980) differs slightly from the models specified previously and is presented in Appendix M. Due to missing data on depression (11 percent), a larger share (47 percent) of Strong Start participants are excluded from this analysis than from the other two analyses. We again performed chi-square and t-tests to compare the 21,447 women excluded from the analysis because of missing outcome variables or missing covariates to those who remained in the final analytic sample and again find that the dropped participants do not follow clear or consistent patterns. Overall the women who were excluded from the risk-adjusted analyses may be at greater sociodemographic and psychosocial risk than those included in the analysis, but they are also less likely to be high risk due to prior adverse birth outcomes; when outcome variables are nonmissing, they are worse than for the women included in the analytic sample.[32] We conducted pairwise statistical

[32] We find that disproportionately fewer Birth Center participants were dropped from the sample than expected given the share of the enrollees overall. Not surprisingly, women who are dropped from the sample are more likely than excluded women to have missing data for covariates. Where covariates are reported, excluded women are more likely to be black, less than 20 years old

tests to compare means between women with and without depression and find that, overall, depressed women have higher risk of poor outcomes due to demographic characteristics, risk factors from prior births, and risk factors from their current pregnancy.[33]

When comparing unadjusted differences, we find significant and positive relationships between depression and the likelihood of having a preterm birth, a low birthweight infant, and a C-section delivery ($p < 0.01$, see Table 36). We also find that depression is associated with being less likely to initiate breastfeeding. However, after controlling for risk factors (specified in Table 15), the only significant difference is that depression is associated with a one percentage point higher rate of preterm birth ($p < 0.05$, see Table 36). That we observe a weaker association between depression and poor birth outcomes after adjusting for risk is not surprising. Depression is highly correlated with participant characteristics controlled for in the regression models—including history of IPV, food insecurity, relationship status, pregnancy intention, among others. We again conducted analyses stratified by race/ethnicity and, after adjusting for the specified covariates, found only a one percentage point higher rate of preterm birth among depressed women for the analysis limited to black women, and no other differences for the other models.[34]

TABLE 36: DIFFERENCES IN BIRTH OUTCOMES BY DEPRESSION STATUS, FULL SAMPLE

Outcome	Depressed			Not Depressed
	Mean	Unadjusted Difference	Adjusted Difference	Mean
Preterm birth	0.13	**0.03****	**0.01***	0.10
Low birth weight	0.11	**0.02****	0.01	0.08
C-Section	0.29	**0.03****	0.00	0.26
Postpartum breastfeeding initiation[1]	0.78	**-0.04****	0.00	0.82

Notes: N = 23,980. Differences are from Maternity Care Home model. Cells that contain one asterisk (*) indicate significance at the 0.1 level; cells that contain two asterisks (**) indicate significance at the 0.05 level; and cells that contain three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. Full regression results are presented in Appendix N.
[1]Postpartum breastfeeding initiation sample is further limited to women with a postpartum survey, N=16,428

LIMITATIONS

These regression analyses do not tell us how Strong Start women fare compared with similar women not enrolled in Strong Start who received typical prenatal care through Medicaid; estimates of the impacts of Strong Start were presented in the Impact Analysis section of this report. Though these results are not generalizable to Medicaid-enrolled women as a whole as the impacts are, it is still useful to understand how outcomes differ among Strong Start participants depending on their characteristics and the type of enhanced prenatal care they received.

As noted above, the analytic sample for these analyses excludes 28 percent of Strong Start participants in the intermediate outcomes models, 37 percent in the birth outcomes models, and 47 percent in the depression models. Further, where data are available, there is evidence that the excluded women may differ on some factors from those included in the sample, which means that the results

and nulliparous; less likely to be married or working; and more likely to be food insecure, to smoke, to have experienced intimate partner violence, and to have an unintended pregnancy.

[33] Depressed women are more likely to be black, have a high school degree or less education, to not be in a relationship, to not be working or in school, to be food insecure, to have an unintended pregnancy, to smoke, to have experienced intimate partner violence, to be overweight or obese, and to have had a prior poor birth outcome birth.

[34] We also ran these analyses stratifying by model and only find marginally significant effects of 0.01 for MCH model women for preterm birth. This could be attributable to the fact MCH also has 3 times the sample size of the other models.

presented here may not be generalizable to Strong Start participants who were excluded from the analytic sample because of missing data. If the excluded women have significant birth outcome differences by model, the differences reported above may be biased. For example, if excluded Birth Center participants are more likely to have a poor birth outcome than those included in the analysis, while excluded Maternity Care Home participants are less likely to have a poor birth outcome than those included in the analysis, we may have overstated the differences in outcomes between these two models. Another consideration is that the rate of exclusion from the analytic sample varies by awardee, with between 28 percent and 88 percent of each awardee's participants excluded. This may further bias our results if awardees with particularly good outcomes or particularly poor outcomes are more likely to be missing from the analysis and limit the generalizability of the findings to all Strong Start women. Each awardee's data quality is discussed further in Volume 2.

Finally, though we account for observable differences in risk by including a variety of controls in our models, our findings are subject to omitted variable bias, which is of particular concern if unobserved characteristics that are associated with our outcomes of interest vary systematically by model. These concerns, particularly selection bias in Group Prenatal Care awardees (where women were sometimes allowed to choose between group and standard care) and in the UAB and MUSC Maternity Care Home awardees (which disproportionately served their states' highest risk women), are described in detail in the Impact Analysis section. To address concerns about selection bias for our high-risk awardees, MUSC, UAB, and UPR, we conducted separate analyses excluding them.

Although the differences in birth outcomes between Birth Center and Maternity Care Home participants decrease when we control for risk factors, Birth Center participants may be at lower risk for these outcomes for other reasons that we could not control for in our analysis—reasons that may also lead them to choose Birth Center care in the first place. If this is the case, differences observed between models may be attributable to such unobserved characteristics rather than to the models themselves.

DISCUSSION

As noted in both the case study findings and the descriptive PLPE results provided in the previous chapters, demographic, social, medical and emotional risk factors vary substantially across the three Strong Start models. Consequently, it is critical to take these variations into account when comparing birth outcomes across models. This chapter provided regression-adjusted outcomes, using the rich array of control variables available in the PLPE data for all awardees, and inclusive of awardees for which we do not have impact findings. Because the case studies showed that Maternity Care Homes provided services that were closer to typical Medicaid maternity care than the other two models, the regressions used Maternity Care Home women as the reference group. We ran analyses in two ways: 1) including all awardees participating in Strong Start; and 2) excluding three awardees that served an extremely high-risk population (Medical College of South Carolina, University of Alabama, and University of Puerto Rico), as including these mothers likely overstates the differences between models.

After adjusting for a range of risk factors, Birth Center participants continued to have significantly lower rates of preterm birth and low birthweight, suggesting that the midwifery model of care with additional peer counseling was likely more effective than care in Maternity Care Homes for preventing

these outcomes. In addition, we observed large and significant effects on C-Section and Vaginal Birth After C-Section (VBAC) rates among Birth Center participants compared to women enrolled in Maternity Care Homes, even after controlling for risk. These results suggest that Birth Center care may offer important lessons when tackling the national goal of reducing C-section rates (both primary and repeat), which have skyrocketed in recent decades, while VBAC rates have sharply declined.

The differences observed between Group Prenatal Care and Maternity Care Home participants after controlling for observable risk factors are more modest. Group Prenatal Care participants did not have significantly lower rates of C-Section, and the differences in preterm delivery and low birth weight, while significant, were smaller than for Birth Centers and only observed in the limited sample (when awardees serving especially high-risk participants were excluded).

Further examination of regression results by race and ethnicity revealed that the differences between Birth Centers and Maternity Care Homes were generally consistent across all outcomes, but with some variation in the size of the difference among racial and ethnic groups. However, in the case of Group Prenatal Care, we observed especially strong results among black and Hispanic women enrolled in the model compared with black and Hispanic women who received Maternity Care Home services, suggesting the features of Group Prenatal Care (including enhanced education, social support, self-efficacy, etc.) may be important ingredients in improving birth outcomes among minority women.

The case study and PLPE results described the context in which Strong Start programs operated and the type of services they provided. Birth Centers provided a very different model of prenatal care than that provided in Maternity Care Homes. Holistic, individualized care was consistently provided by midwives in settings that were removed from hospitals and interventionist technologies, and midwifery care was enriched by peer counseling to bolster Birth Centers' capacity to address the psychosocial needs of pregnant Medicaid beneficiaries. These results suggest that Birth Centers succeeded more than Maternity Care Homes in achieving the outcomes that Strong Start aspired to. This was also true, but to a lesser extent, for Group Prenatal care awardees, though minority women appeared to especially benefit from care provided in a group setting. However, case study results and PLPE data show that the three models served very different populations, and it is possible that the comparisons were biased by selection into the different models of care. The impact analysis presented in the subsequent chapter used more rigorous econometric methods to attempt to adjust for selection bias, and compared Strong Start enrollees from all three models to Medicaid women who were not served by Strong Start.

TECHNICAL ASSISTANCE AND DATA ACQUISITION

INTRODUCTION

The objective of the State Data Linkage Technical Assistance (TA) task of the Strong Start evaluation was to obtain linked birth certificate, Medicaid eligibility, and Medicaid claims and encounter data from states with Strong Start awardees. The data were used to support the impact analysis component of the evaluation, which assessed whether and to what extent Strong Start had an impact on birth outcomes and Medicaid costs through pregnancy and the first year after birth. The TA task was designed to "meet states where they are," either by facilitating the transmission of these data to the Urban Institute so that they could be linked, or by assisting states as needed to conduct the data linkage themselves. Building on the progress made in prior years, during Year 5 of the Strong Start evaluation we continued to (1) nurture relationships with state officials in agencies responsible for Vital Records and Medicaid data; (2) complete, update or renew the various applications and agreements needed to secure approval to obtain the data, including progress reports to maintain data use agreements and IRB approval; and (3) facilitate the transfer of data from state agencies to Urban.

SUMMARY OF PROGRESS: DATA APPROVAL AND RECEIPT

CMMI did not contract with states or state Medicaid agencies[35] under Strong Start, and thus could not compel state officials to share their data with the evaluation. Still, states were overall quite supportive of the Strong Start evaluation and were willing to share data for the Impact Analysis. This positive response suggested that states were interested in participating in an evaluation that intended to examine the impacts of strategies to improve maternal and infant health outcomes.

By the end of Year 5, we had worked with both the Medicaid and Vital Records agencies in the 20 states that we initially judged to have sufficient Strong Start enrollment to support a rigorous impact analysis and to merit the large investment in time and resources needed to obtain the necessary data. Ultimately, the technical assistance team received birth certificate, Medicaid eligibility, and claims data from nine states: Alabama, Arizona, District of Columbia, Florida, Louisiana, Missouri, New Jersey, South Carolina, and Tennessee. In four states — Maryland, Mississippi, Nevada and Pennsylvania — the evaluation team received birth certificates and Medicaid eligibility data, but not claims/encounter data, usually either because of time lags that occurred during negotiations surrounding the data acquisition process or because original data requests were too burdensome for the states. In two states – Georgia and Michigan – we received requested data, but problems with the samples meant that we were unable to include them in our impact analysis. Despite efforts to modify our data requests to ease burden on states, we were not able to collect any data in five states: California, Kentucky, Illinois, Texas, and Virginia. Finally, we pursued (though ultimately did not obtain) data from the Children's Health Insurance Programs in two states, Tennessee and Texas, the only states that had large numbers of Strong Start enrollees insured through that program.

[35] The only exception was the award to the Oklahoma Healthcare Authority, which administers the state Medicaid program. Given low enrollment in this award, however, the evaluation did not seek to obtain data from Oklahoma.

Table 37displays these states into the four groups defined as follows:

- **Group 1**: States from which all data were received, meaning that 2014, 2015, and 2016 birth certificate data and Medicaid eligibility, and 2014 and 2015 Medicaid claims/encounter data were submitted to the Urban Institute for analysis.[36] We obtained all data from Vital Records and Medicaid agencies in nine states: Alabama, Arizona, District of Columbia, Florida, Louisiana, Missouri, New Jersey, South Carolina, and Tennessee.
- **Group 2**: States from which all data were received (birth certificates, eligibility, and claims), but we could not analyze the data due to sample problems. [37] This applies to Georgia and Michigan.
- **Group 3**: States from which we did not receive claims data, meaning that ONLY 2014, 2015, and 2016 birth certificate and Medicaid eligibility data were submitted to Urban for analysis. This applies to: Maryland, Mississippi, Nevada, and Pennsylvania.
- **Group 4**: States from which we did not receive any data: California, Illinois, Kentucky, Texas, and Virginia.

Table 37 also indicates that Urban performed the data linkage in five states, while state officials (or a contractor to the state) did so in 12 states. Urban performed the linkage in Alabama, the District of Columbia, Florida, and Nevada. State officials performed the linkage in Louisiana, Missouri, Mississippi, New Jersey, Pennsylvania, South Carolina, and Tennessee. State contractors performed the linkage in Arizona and Maryland.

TABLE 37: STATUS OF DATA ACQUISITION, BY STATE

State	Linkage Responsibility	Group 1: Received/Used Birth Certificate, Medicaid Eligibility, and Claims Data	Group 2: Received Birth Certificate, Medicaid Eligibility, and Claims Data: Limited Use[1]	Group 3: Received/Used Birth Certificate and Medicaid Eligibility Data ONLY	Group 4: Did Not Receive Any Data
Alabama	Urban	**Yes**	No	No	No
Arizona	State	**Yes**	No	No	No
California	N/A	No	No	No	**Yes**
District of Columbia	Urban	**Yes**	No	No	No
Florida	Urban	**Yes**	No	No	No
Georgia	Urban	No	**Yes**	No	No
Illinois	N/A	No	No	No	**Yes**
Kentucky	N/A	No	No	No	**Yes**
Louisiana	State	**Yes**	No	No	No
Maryland	State	No	No	**Yes**	No
Michigan	State	No	**Yes**	No	No
Mississippi	State	No	No	**Yes**	No
Missouri	State	**Yes**	No	No	No
Nevada	Urban	No	No	**Yes**	No
New Jersey	State	**Yes**	No	No	No
Pennsylvania	State	No	No	**Yes**	No
South Carolina	State	**Yes**	No	No	No
Tennessee	State	**Yes**	No	No	No
Texas	N/A	No	No	No	**Yes**
Virginia	N/A	No	No	No	**Yes**

Notes: [1] States in Group 2 provided all data (birth certificates, eligibility, and claims) for all years, but the data were not used in the Impact Analysis due to sample problems.

[36] Medicaid claims/encounter data were not requested for births occurring in 2016 because these data would not have been ready from states in time for inclusion in the evaluation.

[37] We were unable to use these data because of significant numbers of missing individuals in the samples provided. In Michigan, approximately 25 percent of Strong Start participants matched to the birth certificate file were missing from the Medicaid eligibility and claims files. Those missing from the Medicaid files also had significantly worse birth outcomes compared to those who were matched (data not shown). In Georgia, we were unable to merge most Strong Start Participants to the Medicaid data. The state was unable to provide an updated file that corrected the issue in time for us to process and analyze the claims data.

SUMMARY OF TECHNICAL ASSISTANCE & DATA ACQUISITION PROCESS AND TIMELINE

The TA task spanned a four-year period, beginning in mid-2014 and concluding in the spring of 2018. During those four years, the evaluation team engaged in numerous activities to develop and maintain productive relationships and agreements with state agencies and staff and ultimately secured Medicaid and birth certificate data from 15 states for the impact analysis (see Table 37). To start, the Urban team participated in one in-person and numerous web-based data linkage workshops hosted by AcademyHealth and co-sponsored by the Center for Medicaid and CHIP Services (CMCS) and the Centers for Disease Control (CDC) designed to support states working to link their Medicaid and Vital Records data in support of federal and state reporting initiatives and policy goals. In addition, we drew on the experiences of the Mother and Infant Home Visiting Program/Strong Start (MIHOPE) evaluation to identify strategies for reaching out to and acquiring birth certificate and Medicaid data. Following these learning opportunities, Urban conducted initial outreach to Vital Records and Medicaid agencies in the eight MIHOPE/Strong Start states with data linkage experience and then, over time, expanded our reach to these agencies in 20 states.

Although our experiences with each state agency were unique, we did undertake a core set of activities with each agency that included initial outreach and education about the Strong Start for Mothers and Newborns evaluation and our data request, identifying and completing the appropriate steps and materials to secure approval for the requested data, and ongoing communications to receive the requested data in the appropriate format.

This section summarizes and describes our activities into five phases of data acquisition:

1. Initial Outreach and Relationship Building with State Agency
2. Preparing and Submitting Data Request Applications and/or IRB Applications to State Agency
3. Securing Approval and Finalizing Agreements with State Agency
4. State Agency Data Preparation and Transfer of Initial Data File to Evaluator; and
5. Review and Approval of All Data by Evaluator.

Additional information on these phases is available in the first four Strong Start for Mothers and Newborns Evaluation Annual Reports, (Hill et al, 2015; Hill et al, 2016; Hill et al, 2017; and Hill et al, 2018) and in the MIHOPE-Strong Start second annual report (Lee et al. 2015).

Figure 20 illustrates these five phases of the data acquisition process in more detail, and the length of time needed to successfully complete each phase to ultimately receive the requested data.

FIGURE 20: PHASES OF DATA ACQUISITION

- **Phase 1. Initial Outreach and Relationship-Building with State Agencies (from less than 1 to 18 months; average = 2.4 months per state agency; Number of states involved in this phase = 20).** This phase involved several key steps, including:
  - conducting background research on both the Vital Records and Medicaid agencies in each state, including identifying the most appropriate contacts and assessing the agencies' prior experience sharing and/or linking data with outside organizations;
  - developing written materials for the state agencies to provide information on the project and how participation in the project could potentially benefit the state and its recipients; and
  - developing an interview protocol with specific questions to learn about the availability of data, the agencies' processes for approving data requests, whether any fees would be incurred, whether they could accept a stipend to help defray the cost of their efforts, and with whom to communicate going forward.

  Overall, this preparation allowed us to complete this phase in a fairly short period of time, with the exception of a few states with which we struggled to connect with the appropriate officials at the state agencies.
- **Phase 2. Preparing and Submitting Data Request Applications and/or IRB Applications to State Agencies (from less than 1 to 13 months; average = 4 months per state agency; number of states involved in this phase = 18).** Most state agencies – both Vital Records and Medicaid – required the team to complete an application to secure a Data Use Agreement (DUA), a Business Associate Agreement (BAA), and/or approval from the state's Institutional Review

Board (IRB). Thus, this phase largely involved completing the applications and corresponding with staff at the state agencies to clarify questions and information requested as needed. In cases where it took longer than the average 4 months to submit an application, delays were due in part to state staff's long internal discussions about whether or not to participate, clarification regarding the data request itself, and/or the involvement of an external agency or governing body that provided the application forms.

- **Phase 3. Securing Approval and Finalizing Agreements with State Agencies (from 2 weeks to 16 months; average = 6 months per state agency; number of states involved in this phase = 18).** Because state agencies had competing priorities and limited resources, this phase involved maintaining regular and ongoing contact with state agencies regarding the approval process for a DUA, BAA, and/or IRB. During this phase, our collaboration with several states came to an end. For example, despite a signed agreement with Kentucky, the agency could not get past privacy and confidentiality concerns related to sharing claims data. In Texas, the delay between submitting our application and receiving approval was so long, that it was too late to receive and including any data in the impact analysis. Lastly, staff turnover and consequential policy changes regarding data requests also delayed approval in some states.
- **Phase 4. State Agency Data Preparation and Transfer of Initial Data Files to Evaluator (from 1 to 27 months; average = 8 months per state agency; number of states involved in this phase = 16).** To help facilitate the delivery of the requested data, this phase included several key steps:
    - hosting calls to review data requests with the data analysts (to get ahead of potential challenges, calls were conducted prior to agencies beginning any work);
    - making adjustments to the data requests (e.g., changes to variables requested), providing additional guidance on how the linkage is conducted, and verifying the process for secure data transfer and timing for receiving the data;
    - requesting, receiving and reviewing a test files and asking for clarification from the agencies as needed, including questions about missing data; and
    - receiving the initial data files.

    While all of these interim steps proved helpful in securing the requested data, competing priorities in many state agencies often took priority over our data requests. In addition, it took time for the data analysts to be "brought up to speed" on the request.
- **Phase 5. Review and Approval of All Data by Evaluator (from 1 to 18 months; average = 6.5 months per state agency; number of states involved in this phase = 16).** Upon receipt of the initial data files, Urban reviewed the files for any outstanding questions/clarifications, and then requested revised, final files as needed. Again, due to competing priorities at state agencies, it was not uncommon for several months to pass before Urban received clarification on the data provided, allowing Urban to provide additional guidance as needed, and then receive the final file.

In summary, the duration of the data acquisition process that resulted in data submitted to Urban varied considerably, with an average of 21 months per state agency, and a typical (median) span of 27 months per state agency. The range was approximately 9 to 37 months.

LESSONS LEARNED

Over the four-year period, Urban identified a number of lessons learned regarding how best to collaborate with state agencies to access individual-level data in a timely and secure manner. These lessons reflect the nature and environment of state agencies, as well as the nature of our data request. Additional information on our lessons learned is available in four previous Strong Start for Mothers and Newborns Evaluation Annual Reports and the MIHOPE-Strong Start Second Annual Report (Hill et al, 2015; Hill et al, 2016; Hill et al, 2017; and Hill et al, 2018; Lee et al. 2015).[38] This section presents a high-level summary of the lessons learned across all years of the evaluation.

1. **There is no "one-size fits all" approach to securing approval to access data.** As shown in Figure 20, this process can take 7 months (on average) to develop and submit an application and another 10 months (on average) to secure approval. This lengthy process results from many factors, including:

    a. **Each state's organizational structure is different, inhibiting the use of a standardized approach to secure approval.** Each state agency has its own process for approving data requests from outside organizations. These guidelines can also change mid-effort due to changes in organizational leadership who identify a need for different data sharing protocol. For example, upon submitting an approved DUA and Scope of Work to Urban Institute for signature, the leadership of the Texas Health and Human Services (HHSC, the Medicaid agency) changed and identified new protocols in the last six months of the evaluation for the agency to follow regarding data requests.

    b. **States' prior experiences sharing and linking data vary tremendously.** State agencies generally fell into one of two categories with respect to prior experience in sharing and linking data. More experienced states, including those that participated in the MIHOPE Strong Start evaluation, tended to have existing and productive relationships between Vital Records and Medicaid agencies, and had prior experience sharing and/or linking data with outside entities for evaluation purposes. These states typically had established forms and process for handling data request applications and identified lead staff that handle such requests and/or performs data linkages. Less experienced states, in contrast, tended to require more education and support, including multiple meetings to answer questions and address concerns, particularly around data privacy and confidentiality.

    c. **Privacy and confidentiality concerns can slow progress in some states.** Personally identifiable information (PII) was needed to link the Medicaid and birth certificate data. Thus, almost all states required detailed information about Urban's policies and procedures to protect the privacy and confidentiality of the individual level data. To secure approval, states required detail information regarding how Urban would ensure that (1) all data would be securely transferred to and stored at Urban's office and (2) that individual women and infants could not be identified in any reports/materials developed by Urban as part of the evaluation. In addition, at least one state expressed concerns about sharing Medicaid claims data for pregnant women with HIV/AIDs, mental health, and/or substance abuse. While we were able to meet privacy and confidentiality requirements in most states, these

[38] The Mother and Infant Home Visiting Program Evaluation-Strong Start Second Annual Report, Cheaper, Faster, and Better: Are State Administrative Data the Answer? (January 2015).

concerns proved insurmountable in three states (California, Kentucky, and Illinois) (Hill et al. 2018). Although we explored "workarounds" to satisfy these concerns, such as only providing aggregated data, we were ultimately unable to obtain data from either state.

2. **Challenges receiving the requested data in a timely manner can occur even when clear guidance is provided.** In some states, a number of factors contributed to state agencies sending incomplete and/or significantly delayed data. These factors included varied experiences in pulling and/or merging data (as described above), staff who face competing demands for their time and support with this voluntary effort, and staff turnover. Thus, once data sharing/use agreements were fully executed, it was necessary to build relationships with the state data analysts and IT staff that were directly involved in developing and transferring the data files. These staff members were likely not as familiar with the specifics of the data request and, thus, needed to be brought "up to speed." In addition, states that were unaccustomed to sharing data with external entities could struggle with how to ensure HIPAA- and IRB-compliant data transfers.
3. **Exercising patience and flexibility, and offering alternatives as needed, helps ease the burden on state officials.** Over the course of the evaluation, many state agencies identified competing priorities (e.g., requests from the legislature) and limited resources (e.g., staff). Thus, it was critical to maintain ongoing communication with staff while also offering to work with them to ease the burden, particularly in the last two years of the evaluation when time constraints became a concern. For example, in some states, Urban offered to perform the data linkage on behalf of the states or to receive Medicaid eligibility data (needed to identify Medicaid participants and reasons for Medicaid eligibility in the vital records data), but not claims and encounter data. However, it is important to recognize that no matter the extent of flexibility and patience, some state agencies were unable to share their data.
4. **Administrative data lags are routine and to be expected.** Beyond the lessons learned and challenges described above data lags existed in every state agency. More specifically, state agencies need time to clean and prepare administrative data for analysis, either internally for their state or externally for a research organization. The average length of time required to receive a full data set for Strong Start evaluation was 27 months per state agency, in part because of the typical lag time that exists between when the data collection year ends and when state agencies have completed their cleaning and compiling the data for public release. For example, in many states, final birth certificate data for a calendar year are not available until 9 months after the end of that year. Lags for Medicaid data—in particular, claims and encounter data—can be even longer (typically 18 months)—which, as noted above, is the reason that Urban did not request claims associated with 2016 births.

SUMMARY OF BEST-PRACTICES FOR ACQUISITION OF STATE AGENCY DATA

While a key lesson learned via the technical assistance offered for the Strong Start program evaluation is that there is no "one size fits all" approach, there are best-practices that can be considered and adapted to help other organizations secure state agency data for evaluation purposes. Table 38 summarizes the best-practices by phase. Each best-practice is described in more detail following the table.

TABLE 38: SUMMARY OF BEST PRACTICES TO FACILITATE DATA APPROVAL AND ACQUISTION FROM STATE AGENCIES

Phases	Best-Practices
Phase 1: Initial Outreach and Relationship Building with State Agency Table Text Indent	1. Do your "homework" prior to contacting the state agency. 2. Develop a clear agenda for initial meetings with specific "asks." 3. Provide resource materials for the state agency prior to and after the initial meeting. 4. Offer a financial stipend to help offset the costs of sharing and linking data. 5. Develop a state-level database to track contacts and progress. 6. Facilitate transfer of knowledge in the event of turnover at the state agency.
Phase 2: Preparing and Submitting Data Request and/or IRB Applications to State Agency	1. Develop a "standard" set of application questions and answers. 2. Correspond with state agency staff to clarify any questions/requests for information in the application prior to submission.
Phase 3: Securing Approval and Finalizing Data Use Agreements with State Agency	1. Stay engaged during the review and approval process. 2. Be flexible and patient. 3. Be prepared to implement alternative approaches to secure participation when time and other resources are constrained. 4. As needed, employ strategies to exert increased pressure on agencies to get them to act.
Phase 4: State Agency Data Preparation and Transfer of Initial Data to Evaluator	1. Reiterate the specific data request, including transfer protocols, often and regularly to ensure that all parties are on the same page and to minimize potential issues with the data pull and transfer, while also reassuring state agencies about the project's various privacy and security protections. 2. Develop relationships with data analysts and IT staff at the state agency to help ensure that the requested data are transferred securely and in the appropriate format. 3. Request test files to address any potential data issues prior to the state agency sending the complete file.
Phase 5: Review and Approval of All Data by Evaluator	1. Facilitate open and ongoing communication between the data analysts at the project team and the state agency.

Phase 1: Initial Outreach and Relationship Building with State Agency

1. **Do background research prior to contacting the state agency.** Prior to initiating any contact with a state agency, it is helpful to conduct background research to educate the project team about each state's history, experience, and capacity related to sharing and linking data. This information can be used to group the states into tiers based on a specific characteristic (for example, data linkage experience), to help inform which states to contact first and/or to determine types of support the agency is expected to need throughout the process. Such preparation will help to facilitate a smoother and more productive initial meeting as well as subsequent meetings.
2. **Develop a clear agenda for initial meetings with specific "asks."** It is most efficient – for both the evaluation team and the state agency – to have defined agendas and questions for initial meetings to ensure that contact information and roles for agency staff, as well as clear lines of accountability to the data request, are consistently collected. It is also helpful to develop a form to guide the conversation regarding the kinds of agreements and materials (DUA, MOU, IRB, SOW, etc.) that may be required and have the agency clarify what is required, by whom, and by when. It is also helpful to request a data dictionary as early as possible to guide the specific request and minimize "surprises" later on.
3. **Provide resource materials for the state agency prior to and after the initial meeting**. Prior to and after the initial meeting, state agency directors and staff find it useful to refer to written materials describing the purpose and goals of the program evaluation and the potential benefits of the evaluation at both a national and state-level, if applicable (Hill et al. 2017). Such materials can also be used to help the project team make the case for sharing data and moving forward in the process.

4. **Offer a financial stipend to help offset the costs of sharing and linking data**. If project budget and contract allow it, offer a financial stipend to states to help offset the time and resources needed to share (and link) the requested data. Some states may charge a fee for providing the data. For this project, eight of the 21 states we initially worked with requested fees that ranged from $300 to just under $41, 000. Across those eight states, the average fee was $11,800 and the median fee was $5,324.
5. **Develop a state database to track contacts and progress**. When working with multiple states and state agencies, it is critical to develop and maintain a database or "tracker" to summarize progress, meeting notes, next steps, and contact information for each state agency. Such documentation can also be useful in the event of staff turnover at the state agency, which is not uncommon, particularly if working with a state agency over a prolonged period of time.
6. **Facilitate transfer of knowledge in the event of turnover at the state agency.** When a point of contact indicates s/he will be leaving the agency or moving to a different role within the agency, work with the outgoing point of contact to identify the new point of contact and set up a meeting with both individuals to discuss the data request process and smooth the transition.

Phase 2: Preparing and Submitting Data Request and/or IRB Applications to State Agency

1. **Develop a "standard" set of application questions and answers.** Although each state agency will have its own data request forms and/or IRB application, many of the questions will be the same or similar across these forms. For example, common components across applications included descriptions of the research project, the specific data request (including years of data and variables), data security protocols, PHI and PII protections, and prior IRB approval. Therefore, it is efficient for the project team to develop a set of "Frequently Asked Questions" that assembles common facts, figures, variables, and answers to questions, allowing applications to be completed more quickly, efficiently, and consistently. (Appendix O provides a list of the FAQs typically included in state data applications.)
2. **Correspond with state agency staff to clarify any questions/requests for information in the application prior to submitting data requests.** It can be helpful to request additional meetings and/or send draft responses to questions to ensure that the information provided fulfills the request. This will save time in the long-run by reducing the likelihood of being asked to re-submit the application.

Phase 3: Securing Approval and Finalizing Data Use Agreements with State Agency

1. **Stay engaged during the review and approval process.** State agency officials and staff are very busy with normal day-to-day program responsibilities; therefore, it is often necessary to send regular, friendly, reminders regarding the status of the application. Also, be prepared to provide additional clarification and documentation to your application.
2. **Be flexible and patient.** It can take from several months to more than a year to receive approval from a state agency. As a result, the project team may need to revise its request to decrease burden on state agencies to obtain approval as the project evolves and/or project staff change.
3. **Be prepared to implement alternative approaches to secure participation when time and other resources are constrained.** In the case of the Strong Start data request, modifications

were made to eliminate the request for claims data when it was identified to be too burdensome to some agencies and/or the approval process was taking longer than anticipated.

4. **Identify and employ strategies to exert increased pressure on agencies to get them to act.** It may be important at times to "turn up the pressure" on the state agency by sharing updates with highly-regarded agency leaders or decision-makers to ensure state resources are provided and priorities are communicated to a legal and/or data analyst team. Sometimes it is beneficial to involve federal officials in such conversations, as well.

Phase 4: State Agency Data Preparation and Transfer of Initial Data to Evaluator

1. **Reiterate the specific data request often and regularly.** Urban created and distributed documents that specifically laid out the requested birth certificate variables and/or the data needed to create the Medicaid eligibility, claims, and encounter variables for the Impact Analysis (see Appendices X and Y). In addition, Urban staff repeatedly communicated (via email and phone) how best to transfer the data via secure FTP sites to ensure privacy and confidentiality. It is critical to share such information often and regularly to ensure that all parties are on the same page and to minimize potential issues with the data pull and transfer, while also reassuring state agencies about the project's various privacy and security protections.
2. **Develop relationships with data analysts and IT staff at the state agency.** Once agreements are fully executed, it is necessary to bring new staff into the process—both from the evaluation contractor (e.g., staff from the Urban Impact analysis team and IT department) and the state agencies (e.g., data analysts and IT staff)—to ensure that the requested data are transferred securely and in the appropriate format. At the same time, it is important to maintain existing relationships to help ensure that the state agency is working in a timely manner to prepare and send the data.
3. **Request test files to address any potential data issues.** It is helpful and efficient to request "test files" with de-identified data to identify any potential issues with the data prior to the state agency sending the complete file. Having a smaller test will save both the project team and the state agency time and minimize frustration for either or both parties.

Phase 5: Review and Approval of All Data by Evaluator

1. **Facilitate open and ongoing communication between the data analysts on the evaluation team and at the state agency**. It is critical that the data analysts at both parties are engaged in ongoing communications to ensure that the project team fully understands the data and can verify that the data files are complete.

In conclusion, the Strong Start for Mothers and Newborns evaluation undertook the daunting task of attempting to obtain and link birth certificate and Medicaid eligibility and claims/encounter data from 20 states, representing the largest effort of its kind by a CMS-supported research organization. Ultimately, the persistent efforts of the Technical Assistance and Data Acquisition team were successful in obtaining these data from 15 of the 20 states with whom we worked, with data quality high enough for evaluation use from 13 states. Although the data acquisition process was time consuming, the data offered invaluable information for the analysis of Strong Start. We hope that the many important lessons learned can be helpful to other entities undertaking similar evaluation efforts.

IMPACT ANALYSIS

The impact analysis compares outcomes for women participating in Strong Start and their infants to outcomes for non-participating, Medicaid-enrolled women with similar risk profiles and their infants. This assessment relies on quantitative methods to account for confounding factors that may drive differences in outcomes and could otherwise be incorrectly attributed to Strong Start.

The impact analysis aims to answer the following broad evaluation questions:

- What are the combined impacts of the enhanced services supported by Strong Start and the care delivered in a Birth Center, Group Prenatal Care practice, or a Maternity Care Home relative to typical Medicaid prenatal care[39] on gestational age, birthweight, cost, and utilization?
- Do impacts differ across the three Strong Start delivery models and across awardees? If so, how?
- How does the implementation analysis explain the impact findings? Specifically, does the intensity of the intervention (such as the level and types of services offered) lead to greater program impacts?

This section first reviews the analytic approach and data sources associated with the impact analysis, then discusses limitations to the methodology. After offering this context, using all valid data available, the section presents results for each model (i.e., Birth Centers, Group Prenatal Care, and Maternity Care Homes) and also includes results for individual awardees if they had sufficient sample sizes. Full awardee-level and site-level impact estimates are reported in individual awardee chapters in Volume 2.

ANALYTIC APPROACH AND DATA SOURCES

To assess the impact of Strong Start and address the evaluation questions, we compared women participating in Strong Start to a group of women with Medicaid coverage who were receiving care in typical (i.e. non-Strong Start) prenatal care practices in the same or similar geographic areas. For each awardee or site with sufficient sample size, we used propensity score reweighting to develop a comparison group of women with similar risk profiles to those of women enrolled in Strong Start. We obtained:

- birth outcomes, process outcomes, demographic characteristics, and medical risk factors from birth certificates;
- Medicaid eligibility of the mother and infant from state Medicaid eligibility files; and
- costs of care, utilization, and non-pregnancy-related diagnoses from Medicaid claims and encounter data.

[39] The vast majority of typical Medicaid prenatal care is practiced in such settings as private solo and/or group practices, Federally Qualified Health Centers, hospital outpatient department clinics, and (to a smaller extent) public health department clinics.

As described in the Technical Assistance and Data Acquisition section, we obtained birth certificates and Medicaid eligibility data for 14 states and the District of Columbia and claims data for 9 states and the District of Columbia (see Table 15). Concerns about the quality of the link between Strong Start participants, birth certificates in Georgia and Michigan precluded the use data from these states in the impact analysis. For the analysis of birth outcomes, the sample includes awardees and sites in 12 states—Alabama, Arizona, Florida, Louisiana, Maryland, Mississippi, Missouri, Nevada, New Jersey, Pennsylvania, South Carolina, and Tennessee—and the District of Columbia. While claims data were initially requested from all states, only eight states—Alabama, Arizona, Florida, Louisiana, Missouri, New Jersey, South Carolina, and Tennessee—and the District of Columbia provided detailed claims data within the time frame necessary for completing the analysis.[40]

In this section, we describe the analytic approach, including the propensity score reweighting strategy, impact estimation methods, and comparison group selection. Next, we present detailed information on the key outcomes and matching variables for the propensity score reweighting approach.

Analytic Approach

There were three main steps to conducting the impact analysis:

1. Create propensity-score-based weights for the comparison group.
2. Confirm there are no remaining meaningful differences in control variables between Strong-Start participants and comparison observations after the weights have been applied.
3. Estimate impacts as the difference in outcomes between Strong-Start participants and propensity-score weighted comparison group observations.

Propensity score reweighting yields statistically efficient estimates (Hirano, Imbens, and Ridder, 2003), and Monte Carlo simulation has shown evidence that it performs very well among alternative propensity-score-based methods in terms of minimizing bias, but has lower variance than pairwise matching across a range of scenarios (Busso, DiNardo, and McCrary, 2014). Because our intent was to estimate treatment effects at the awardee- and site-levels (with many awardees and sites having only a modest number of treated cases), we determined that a statistically efficient method that makes full use of available data would have the best chance of detecting true treatment effects. Given the statistical efficiency of propensity score reweighting and evidence of its good performance relative to alternatives, we decided to use the propensity score reweighting approach as our estimation method for the impact analysis.[41] Appendix R provides a detailed discussion about the choice between propensity score reweighting and matching and Appendix P provides a more detailed description of the methods. Awardee data and, in some cases, site-specific data are developed first and then pooled to produce model-level impacts.

[40] Michigan also provided claims data, which could not be used because of the quality of the linkage between Strong Start participants, birth certificates, and eligibility records.
[41] Selection of propensity score reweighting over matching methods is discussed in more detail in Appendix H of the Year 3 Annual Report.

Computing Propensity Scores and Propensity Score-Adjusted Weights

We created propensity scores by estimating logistic regressions in which the dependent variable indicates whether the woman is a Strong Start participant or in the comparison group. The regressions control for a variety of factors (described in detail in Table 40 of the data section) including demographic characteristics, behavioral risk factors, medical risk factors, Medicaid eligibility type[42], hospital characteristics, and, when available, diagnoses reported on the claims data. We construct weights for the comparison group observations from the predicted probabilities of these models, with those more similar to Strong Start participants receiving larger weights. After weighting, comparison group observations look very similar to participants in terms of the control variables in Table 40 (see Table P. 1 in Appendix P).

Estimating Impacts

We produced impact estimates at the awardee-, site-, and model- levels, each of which is described in the following subsections.

Awardee and Site-Specific Impacts

After the propensity score reweighting, we estimated impacts by comparing mean outcomes for Strong Start participants and reweighted comparison group women. In the impact tables, we report differences for each outcome and the statistical significance of the differences. The differences represent the impacts of enrolling in Strong Start and receiving care at a specific awardee or Birth Center, Group Prenatal Care provider, or Maternity Care Home site relative to women of similar risk profiles served by typical Medicaid providers.

Impacts by Strong Start Delivery Model

To estimate impacts for each Strong Start model (i.e., Birth Center, Group Prenatal Care, and Maternity Care Home), we combined observations from awardees associated with each model in turn. Because comparison group cases are already weighed to be similar to Strong Start participants within each awardee's data, they are also similar when the data for awardees are combined. The differences between women enrolled in Strong Start and women in the comparison group represent the impacts of enrolling in Strong Start in combination with having prenatal care delivered at a Birth Center, a Group Prenatal Care practice, or a Maternity Care Home compared to care received in typical Medicaid maternity care practices.

[42] States have numerous mandated and optional pathways to Medicaid eligibility.

Identifying the Comparison Group

Identifying women who could serve as a comparison group for women enrolled in Strong Start was among the most challenging aspects of the evaluation. To estimate the impact of Strong Start *in combination* with one of the three delivery models of care (i.e., Birth Centers, Group Prenatal Care, or Maternity Care Homes), we had to identify women who received care in typical Medicaid maternity care practices, but were otherwise similar to Strong Start enrollees. The vast majority of typical Medicaid prenatal care is practiced in such settings as private solo and/or group practices, Federally Qualified Health Centers, hospital outpatient department clinics, and (to a smaller extent) public health department clinics. Common criticisms of typical care cited in the literature are that it is medical in focus, interventionist, not sufficiently focused on education, and does not offer provider continuity. In addition, some "typical" practices also offer enhanced services similar to those funded by Strong Start or provide care through one of the three delivery models offered through Strong Start.

Ideally, a comparison group of women would be drawn from the same counties or parishes where Strong Start participants reside so that treatment and comparison group cases had been exposed to the same contextual factors. However, there were two scenarios that necessitated drawing the comparison group from a different county than that where Strong Start sites or participants were located:

1. The demonstration, through a single site or multiple demonstration sites, "saturated" the area.
2. There were some typical Medicaid maternity practices in the local area, but the Strong Start site was the only source of care for high-risk pregnant women enrolled in Medicaid.

To determine which Strong Start awardees and sites fall under each of these categories, the impact analysis team reviewed case study memos and followed up with site visit teams to gather information prior to conducting any analyses. Appendix Q summarizes findings regarding whether valid comparison groups could be obtained from the local area surrounding each Strong Start site or whether matched comparison counties needed to be identified.

For 12 awardees, we were able to pull the comparison group from the same counties where Strong Start participants resided. For five awardees, we needed to find matched counties to select the comparison group for at least one of the sites associated with the awardee. For three of these awardees, this was due to scenario 1 (i.e., Strong Start saturation). Although qualitative data suggested that at least one of these awardees' sites "saturated" the local area, a review of birth certificate and Medicaid eligibility data found enough Medicaid-covered pregnant women in each county that were **not** enrolled in Strong Start to conduct within-county analyses. For these awardees and sites, we estimated impacts using within- county comparison groups, as this strategy best controlled for the local area context. However, we assessed the consistency of these results with those obtained using an outside-of-county comparison group. For two of these awardees, we needed to find matched counties due to scenario 2 (i.e., Strong Start awardees being the only source for Medicaid high-risk care in the area).

To construct our within-county comparison groups, we geocoded Strong Start enrollment data and identified the county of residence for women enrolled in Strong Start. Using the dataset that links birth certificates to Medicaid eligibility files, we drew a comparison group of Medicaid-covered pregnant women for each awardee and site from the same counties in which Strong Start participants reside.[43] We applied propensity score reweighting to construct a group of observably similar women who enrolled in Medicaid but did not participate in Strong Start.

For each case for which there was a need to go outside the local area to find a comparison group, we used a statistical matching technique, nearest neighbor matching using the Mahalanobis distance measure, to find the most similar county within the same state, based on observable characteristics of the county.[44] Matching variables included: urban-rural continuum, personal income per capita, percent in poverty, percent black, percent Hispanic, percent of children covered by Medicaid, number of doctors per capita, number of certified nurse midwives and certified midwives per capita, number of hospital beds per capita, percent of births with low birth weight. Using this matching technique, we paired treatment counties where Strong Start participants resided with the closest matched county in the state without Strong Start participants. With the comparison group drawn from Medicaid-covered births in the counties identified through this process, we used the same methods as those we applied to within-county comparison groups. The statistical details of the county matching method can be found in the Year 3 Annual Report.[45]

Data

In this section, we describe key outcome and control variables constructed from birth certificate and Medicaid data files. Appendix S contains detailed information on how we constructed the analytic files, including the linking process between Strong Start enrollment information, birth certificates, and Medicaid eligibility and claims data, as well as the processes to create consistent variables across states. Appendix T contains an analysis of the quality of the linking process. Appendix U provides a description of the number and share of Strong Start awardees, sites, and participants included in the impact analysis.

Outcome Variables

We assess three major categories of outcomes in the impact analysis (see Table 39 for specific variables):

1. birth outcomes
2. process outcomes
3. mother and infant costs of care and utilization

[43] In order to reduce state burden in developing analytic files, we excluded comparison group women from counties in which less than 5 percent of the women enrolled in Strong Start resided, as long as over 90 percent of enrolled women were included. This led to a reduction in the Strong Start sample of about 5 percent. For a more detailed discussion of this issue, see the Year 3 Annual Report.

[44] See Rubin, D.B. (1979). "Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies." *Journal of the American Statistical Association* 74, 318–328

[45] Hill, I., Benatar, S., Courtot, B., Dubay, L., Blavin, F., Garrett, B., … Sinnarajah, B. (2017). *Strong Start for Mothers and Newborns Evaluation: Year 3 Annual Report*. Washington (DC): The Urban Institute. Retrieved from https://downloads.cms.gov/files/cmmi/strongstart-enhancedprenatalcare_evalrptyr3v1.pdf

The first two categories come from birth certificates, and the third category comes from Medicaid claims/encounter data, which was only available in eight states and the District of Columbia. Table 39 describes the parameters of each outcome.

TABLE 39: OUTCOME VARIABLES FOR THE IMPACT ANALYSIS

Variable	Specification	Source
Birth Outcomes		
Clinical gestational age	Based on obstetrician's estimate in weeks	Birth Certificate
Preterm birth	Clinical gestational age < 37 weeks	Birth Certificate
Very preterm birth	Clinical gestational age < 34 weeks	Birth Certificate
Birth weight	Infant weight at birth in grams	Birth Certificate
Low birth weight	Infant birth weight < 2,500 grams	Birth Certificate
Very low birth weight	Infant birth weight < 1,500 grams	Birth Certificate
Apgar score	Apgar score at 5 minutes greater than or equal to 7	Birth Certificate
Birth Process Outcomes		
C-section	Infant delivered by cesarean section	Birth Certificate
VBAC	Infant delivered vaginally after previous C-section delivery	Birth Certificate
Weekend delivery	Infant delivered on Saturday or Sunday	Birth Certificate
Cost Outcomes		
Prenatal period expenditures	During 8 months prior to delivery month	Medicaid Claims
Total expenditures during delivery period	Includes mother and infant costs	Medicaid Claims
Total delivery and post-delivery expenditures	Includes mother and infant costs during delivery period and first year of life	Medicaid Claims
Utilization Outcomes		
Number of ED visits in prenatal period	Number of ED visits 8 months before delivery month	Medicaid Claims
Number of hospitalizations in prenatal period	Number of hospitalizations 8 months before delivery month	Medicaid Claims
NICU days	Number of days in NICU	Medicaid Claims
Number of ED visits for mother post-delivery	Number of ED visits for mother 11 months after delivery month	Medicaid Claims
Number of hospitalizations for mother post-delivery	Number of hospitalizations for mother 11 months after delivery month	Medicaid Claims
Number of ED visits for infant post-delivery	Number of ED visits for infant in first year of life	Medicaid Claims
Number of hospitalizations for infant post-delivery	Number of hospitalizations for infant in first year of life	Medicaid Claims

Birth outcomes from the birth certificate include gestational age, birthweight, and Apgar score. We analyzed gestational age and birthweight as both continuous variables and as categorical variables indicating preterm birth (or very preterm birth) or low birthweight (or very low birthweight), respectively. The Apgar score reflects the health of infants immediately after birth and is based on an infant's heart rate, respiratory effort, muscle tone, reflex irritability, and color. We analyzed Apgar scores as a variable indicating whether the score is greater than or equal to 7 at 5 minutes after birth, which reflects that the baby's condition is good to excellent across these dimensions.[46]

[46] https://www.nejm.org/doi/pdf/10.1056/NEJM200102153440701

Upon review of the birth certificate data for gestational age and birthweight, we observed outlier values for ages and weights. To best approximate a sample of women with a live birth, we trimmed both variables using standard cut points from the field and the distribution of values in the data. For estimated gestational age, we relied on ACOG definitions and excluded observations with gestational age less than the periviable age of 20 weeks and those with gestational age above 45 weeks, which is three weeks beyond post-term.[47] For birthweight, we excluded observations below 500 grams and above 6,800 grams.[48] These exclusions represent no more than 2 percent of the sample in any state and typically represent less than 1 percent. After removing these observations, we also trimmed very low and very high values of gestational age and birthweight to limit the influence of outlier cases.[49] For example, in the Florida data, the small number of cases with gestational age of less than 29 weeks (the 1st percentile) were set to 29 weeks; cases with gestational age of more than 41 weeks (the 99th percentile) were set to 41 weeks.

Process outcomes from the birth certificates include:

- whether the infant was delivered by cesarean section (C-section);
- whether the mother had a vaginal birth after a previous cesarean section (VBAC); and
- whether the baby was delivered on a weekend, which is a proxy for the extent to which scheduled and/or elective inductions or C-sections are occurring.

In the states where we obtained claims and encounter data, we analyzed the impact of Strong Start on three cost measures and seven utilization measures that may drive costs. The cost measures include:

- expenditures in the 8 months prior to the delivery month;
- expenditures for the mother and infant during the delivery period (i.e., the time between the mother entering the hospital for delivery and the discharge of the infant); and
- expenditures for the mother and infant during the delivery period and first year of life.

As described in more detail in Appendix S, it is not always possible to disentangle the costs of the mother and infant during the delivery period. Thus, mother and infant costs are pooled for the delivery period and for the year after the delivery. [50]

[47] https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Definition-of-Term-Pregnancy; https://www.acog.org/Clinical-Guidance-and-Publications/Obstetric-Care-Consensus-Series/Periviable-Birth

[48] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3658983/; https://www.ncbi.nlm.nih.gov/pubmed/18446176

[49] Using each state's data separately, these variables are bottom-coded to their 1st percentile values and top-coded to their 99th percentile values.

[50] In examining expenditure outcomes, the main focus is on total expenditures. However, we considered examining average expenditures, which divides total expenditures by the number of Medicaid eligibility months. The effects of Strong Start on total expenditures capture the effects on average expenditures per eligibility month, as well as any effects on months of eligibility. Effects of Strong Start on the number of months of eligibility were examined, and they were typically small and statistically insignificant. We concluded that any effects on total expenditure are mostly driven by effects on average expenditures per month and do not report effects on average expenditure separately. In addition, because infant and mother costs are combined, it is not clear which eligibility information to use in the denominator of an average expenditure per month variable.

The utilization measures include the:

- number of emergency department (ED) visits in the 8 months prior to the delivery month;
- number of hospitalizations in the 8 months prior to the delivery month;
- number of days in neonatal intensive care unit (NICU);
- number of ED visits for the mother 11 months following the delivery month;
- number of hospitalizations for the mother 11 months following the delivery month;
- number of ED visits for infant in the first year of life; and the
- number of hospitalizations for the infant in the first year of life.

The cost measures are subject to extreme outlier values at both the high and low ends of the distribution. The utilization measures, which are limited to zero at the bottom, are subject to extreme outliers at the high end of the distribution. To reduce the undue influence of outlier values, very high and very low values are trimmed, and very high values for utilization measures are also trimmed.[51]

Control Variables

Table 40 describes the control variables used in the propensity score reweighting process and whether they were derived from birth certificates, Medicaid eligibility files, or Medicaid claims and encounter data.

TABLE 40: PROPENSITY SCORE REWEIGHTING VARIABLES FOR IMPACT ANALYSIS

Variable	Specification	Source
Demographic Factors		
Mother's age	Age of mother in years	Birth Certificate
Mother's race	White, Non-Hispanic; Black, Non-Hispanic; Other, Non-Hispanic; Hispanic; Race Unknown	Birth Certificate
Mother's education	< High School; High School Degree/GED; Some College; Associate's Degree; Bachelor's Degree or Higher; Missing	Birth Certificate
Marital status	Married; Unmarried	Birth Certificate
Infant's quarter of birth	Quarter that infant was born	Birth Certificate
Infant's year of birth	Year that infant was born	Birth Certificate
County	Mother's county of residence	Birth Certificate
Behavioral Risk Factors		
Smoking	Mother's smoking habits in 3 months prior to pregnancy	Birth Certificate
Prenatal care initiation	Trimester in which prenatal care began	Birth Certificate
Medical Risk Factors		
Plurality	Singleton; Twin; Triplet; Four or more	Birth Certificate
Parity	Number of previous live births	Birth Certificate
Previous preterm birth	Mother had a precious preterm birth	Birth Certificate
Previous other poor pregnancy outcome	Mother had another previous poor outcome	Birth Certificate
Interpregnancy interval	Months between date of last birth and beginning of current pregnancy	Birth Certificate
Pre-pregnancy diabetes	Mother had diabetes prior to pregnancy	Birth Certificate
Pre-pregnancy hypertension	Mother had hypertension prior to pregnancy	Birth Certificate
Mother's BMI pre-pregnancy	Underweight; Normal Weight; Overweight; Obese	Birth Certificate

[51] For all cost measures, the high outlier values are set to equal the value corresponding to the 99th percentile and low outlier values are set to equal the value corresponding to the 1st percentile. For all utilization measures, the high outlier values are set to equal the value corresponding to the 99th percentile.

Variable	Specification	Source
Hospital Characteristics		
HEN hospital	Hospital of delivery is in a Hospital Engagement Network (HEN)	Birth Certificate
Medicaid Eligibility		
Basis of Medicaid eligibility	Hierarchy of eligibility in the 8 months before delivery: disabled; foster care; low-income families; poverty-related children; Children's Health Insurance Program (CHIP); Affordable Care Act Medicaid expansion; poverty-related pregnant women; medically needy; Medicare; emergency Medicaid/CHIP for unborn children; family planning; other; not eligible; not in the eligibility file	Medicaid Eligibility Files
Number of months eligible	Number of months the mother was enrolled in Medicaid in the 12 months before delivery	Medicaid Eligibility Files
Infant not eligible	Infant was not enrolled in Medicaid in the year after birth	Medicaid Eligibility Files
Diagnostic Risk Factors		
Diagnosis of pre-pregnancy diabetes	Identified in the prenatal period	Medicaid Claims
Diagnosis of pre-pregnancy hypertension	Identified in the prenatal period	Medicaid Claims
Number of unique diagnoses	Number of unique non-pregnancy-related multi-level Clinical Classification Software diagnosis categories identified in the prenatal periods. See https://www.hcup-us.ahrq.gov/toolssoftware/ccs/CCSUsersGuide.pdf.	Medicaid Claims
Indicators for unique non-pregnancy-related diagnoses in prenatal period	Clinical Classification Software diagnosis codes for Tuberculosis; HIV, hepatitis, any neoplasms; endocrine; nutritional and metabolic disease; diseases of the blood and blood-forming organs; mental illness; diseases of the nervous; circulatory; and digestive systems; nephritis; acute and unspecified renal failure; chronic renal failure; urinary tract infections; calculus of the urinary tract; hydronephrosis; other diseases of the bladder and urethra; other and genitourinary symptoms and ill-defined conditions; diseases of the skin; diseases of the musculoskeletal system; and congenital abnormalities	Medicaid Claims

The birth certificate variables used for reweighting include:

- demographic factors (characteristics of the mother, quarter and year of infant's birth, and county of residence for the mother);
- behavioral risk factors of the mother;
- medical risk factors of the mother; and
- whether the delivery hospital participated in a Hospital Engagement Network (HEN).

We included the HEN variable in the propensity score reweighting model to try to account for the impact of hospitals' participation in a HEN focused on reducing elective deliveries. These HENs were implemented at approximately 3,700 hospitals over the same period as Strong Start.[52]

We used Medicaid eligibility files to create the following variables for reweighting:

- Medicaid eligibility type in the 8 months before delivery
- number of months mother is enrolled in Medicaid in the 12 months before delivery
- whether the infant is enrolled in Medicaid in the year after delivery

To determine the mother's eligibility in the 8 months before delivery, and because many women have multiple types of eligibility over time, we created a hierarchy of eligibility types. We grouped the numerous eligibility categories contained in each state's eligibility files, which vary considerably across states, into 12 broad categories of eligibility.

[52] https://www.medicaid.gov/medicaid/quality-of-care/downloads/eed-brief.pdf

For women who were eligible for more than one category in the 8 months prior to delivery, we used a hierarchy that first placed women in one of the following categories:

- disabled
- foster care
- low-income families
- poverty-related children
- Medicaid expansion Children's Health Insurance Program (CHIP)
- Affordable Care Act Medicaid Expansion
- poverty-related pregnant women
- medically needy
- Medicare- and Medicaid- enrolled
- emergency Medicaid/CHIP for unborn children
- family planning
- other[53]

To further control for health status, we estimated alternative models that add diagnoses reported on the claims data to the propensity score reweighting models. We could only do this in the subset of states where Medicaid claims data are available. The addition of diagnosis variables from claims added significantly to the predictive power of the logistic regressions. We used Medicaid claims and encounter data to create the following variables for propensity score reweighting:

- whether mother had diagnoses of pre-pregnancy diabetes or hypertension
- number of unique non-pregnancy-related multi-level Clinical Classification Software (CCS) diagnosis categories that were identified in the prenatal period[54]
- whether any of a variety of non-pregnancy-related diagnoses based on CCS diagnosis categories are present on the claims file in the 8 months prior to delivery and are included in the model[55]

In some cases, not all applicable control variables are included in all propensity score models:

- Indicator variables with very low frequency (e.g., plurality and pre-pregnancy diabetes) may be perfect predictors of treatment status and cannot be included in the logistic regression models in some samples.
- The HEN variable is sometimes strongly aligned with Strong Start participation and is dropped in cases in which its inclusion creates a lack of overlap in the distribution of propensity scores for treated and comparison groups.
- In some cases, with relatively small sample sizes, control variables with low frequency are dropped or merged with other categories.

[53] Women only eligible for family planning and breast and cervical cancer programs are considered not-eligible as the benefits they are eligible for are quite limited. In some states, we combine the following categories that had small sample sizes within the state: Foster care, CHIP and medically needy.
[54] Clinical Classifications Software (CCS) is a method of clustering patient diagnoses and procedures into a manageable number of clinically meaningful categories. For a full description see: https://www.hcup-us.ahrq.gov/toolssoftware/ccs/CCSUsersGuide.pdf.
[55] Diagnoses in CCS single level diagnosis category 11–complications of pregnancy, childbirth, and the puerperium – and category 15 – certain conditions originating in the perinatal period – are excluded.

LIMITATIONS OF THE DESIGN

Strong Start funded enhanced services through three evidence-based prenatal care models—Birth Centers, Group Prenatal Care, and Maternity Care Homes. The gold standard design for estimating program treatment effects is a randomized control trial. However, Strong Start was not designed to assign either awardees or participants to treatment and control groups through intentional randomization. Many CMMI evaluations rely on quasi-experimental designs that use a difference-in-difference approach, but the particular question asked regarding Strong Start does not lend itself to this strategy. That is because the program layered enhancements upon existing models of care rather than implementing entirely new models of care, and therefore, there was no pre-period with which to compare. In order to assess the *combined effect* of Strong Start funded enhanced services *and* receiving care in these three prenatal care models relative to care received in practices that typically care for Medicaid covered women, an observational approach was necessary. Appendix V provides a complete discussion of the analytic options considered to evaluate Strong Start.

To assess the combined effect of Strong Start enhanced services provided in Birth Centers, Group Prenatal Care, and Maternity Care Homes, we have applied observational study methods with propensity score reweighting to achieve a comparison group with similar observed characteristics as participants. A primary concern is whether the estimated effects capture the causal impact of Strong Start enrollment in combination with care in Birth Centers, Group Prenatal Care providers, or Maternity Care Homes relative to typical Medicaid maternity care practices. There are several sources of potential bias that could threaten the validity of the impact estimates.

Selection Bias

There are several ways that selection could bias the impact estimates. Selection happens at many points, including when women choose their site of care. Some women may prefer a certain type of provider. For example, they may want midwifery care and the option to deliver at a Birth Center, or they may or may not be interested in receiving Group Prenatal Care. Other women may want to receive care from a specific provider because of convenience or because they are familiar with the provider. Selection also occurs when sites add women to the Strong Start program based on pregnancy risk. Some Strong Start sites will select enrollees based on elevated risk, while others, particularly Birth Centers, might exclude some women with high medical risk. To the extent that the factors that drive what type of care women receive cannot be captured in the propensity score models and also affect birth outcomes, the impact estimates may be biased in one direction or the other.

Selection also happens when women offered Strong Start enrollment decide whether to participate. Sites vary in terms of the procedures they used to enroll individuals in Strong Start, with some sites using opt-out and others using opt-in strategies. Sites that used opt-out procedures enrolled all women in Strong Start unless they expressly elected not to participate and “opted out." Sites that used opt-in procedures offered women the choice to enroll, and women had to “opt in” to participate in Strong Start. When women were asked whether they wanted to participate in Strong Start, some chose to enroll and some did not. To the extent that a large share of women in the opt-in sites declined to enroll in Strong Start on the basis of factors that were not captured in our propensity score models, our impact estimates could be biased. The same concern applies to a lesser extent to the opt-out sites. We reviewed the case study reports to determine the extent to which women who were given the option of

enrollment in Strong Start participated (i.e., "opt in"). While some awardees reported that acceptance of offers of enrollment was low at first, many reported that they changed their strategy to an opt-out policy, and others implemented different strategies to encourage women to participate. Overall, it seemed that most sites ultimately had relatively high acceptance among women who were offered enrollment in Strong Start.

Other than the previously described issues, there are two special cases of selection bias that deserve discussion:

- awardees that serve a large proportion of high risk women from across the state
- awardees offering Group Prenatal Care

The following sections outline specific issues and our strategies to address them.

Selection Bias for Awardees Serving High-Risk Women

Both the University of Alabama (UAB) and the Medical University of South Carolina (MUSC) are academic medical centers located within larger metropolitan areas that are quite different from other communities in the state. Both attract publicly and privately insured high-risk women throughout their respective states and, for each, one of the Strong Start sites is the only source of care for high-risk pregnant women on Medicaid in the local area and much of the state.[56] Due to this combination of factors, there was concern, a priori, that neither similar counties nor women in the state with risk profiles similar to those of Strong Start participants could be found to construct a valid comparison group for these awardees. As an alternative, for each of these awardees, we drew women for the comparison groups from the local area and from the best comparison county identified, and then tested the sensitivity of the results. In addition, rather than relying solely on birth certificates to assess risks, we estimated models that include diagnoses from the claims and encounter data to better control for health status than can be achieved using just the birth certificates. However, we found neither approach to be sufficient to adequately control for the pronounced selection bias for these awardees. Consequently, these awardees are not included in the Maternity Care Home model-level estimates of impacts. Awardee- and site-level analyses are presented in Volume 2; but the findings should not be interpreted as estimates of the program impacts.

Selection Bias for Group Prenatal Care

Maternity Care Home and Birth Center awardees had relatively high rates of acceptance among women offered enrollment in Strong Start. This was not always the case among Group Prenatal Care awardees. Many Group Prenatal Care sites also offered women a choice of their site's standard care, generally short, one-on-one visits with a clinical prenatal care provider; therefore, the decision to enroll in Group Prenatal Care could lead to selection bias. This is a particular concern in sites where the acceptance rate of Group Prenatal Care is less than 75 percent, as sites with lower rates of acceptance may be more contaminated by bias. Of the 7 awardees offering Group Prenatal Care in states where we are conducting impact analysis, 1 had acceptance rates of at least 75 percent in all sites; 3 had acceptance rates of less than 75 percent in all their sites; and 3 had acceptance rates of less than 75 percent in some

[56] University of South Alabama (USA) is another location, other than UAB, where women in the state can go for high-risk maternity care. However, USA is different from UAB because their high-risk clinic is not a Strong Start site, although Strong Start women can be referred there if they become high-risk. At UAB, the high-risk clinic is one of the Strong Start sites.

sites. See Appendix W for data on which sites used an opt-in or opt-out approach and the extent to which enrollment in Group Prenatal Care was low.

When a Group Prenatal Care site had low Strong Start acceptance rate, women who enrolled in Group Prenatal Care may have been systematically different than those who chose not to enroll. Moreover, it is not clear what the direction of the bias would be. To address this issue, only awardees or sites deemed to have acceptance rates over 75 percent are included in the model-level estimates. Awardee-level analyses that include all sites in the model, regardless of acceptance rates, are presented in Volume 2. However, these analyses should not be interpreted as impact estimates.

Contamination Bias

Ideally, our design would rely on comparing Strong Start enrollees to pregnant women receiving prenatal care services in typical Medicaid maternity practices. Achieving this goal would require that the comparison group exclude women who obtain prenatal care from providers delivering care through the Strong Start models and offering enhanced services similar to those offered through Strong Start. However, it was not possible to exclude such women using only birth certificate and Medicaid data. To the extent that women receiving intervention-like services or care ended up in the comparison group, there is uncontrolled "contamination bias" which may have resulted in an underestimation of Strong Start's effects. Therefore, the impact estimates may offer overly conservative estimates to an unknown extent.

Omitted Variable Bias

Problems of data availability may result in omitted variable bias. While omitted variable bias could come from a variety of sources, three issues are especially relevant for the impact analysis.

First, birth certificates do not contain information on a variety of medical, behavioral, and social risks that may affect birth outcomes for low-income women. Moreover, the medical and behavioral risks that are on the birth certificate are underreported. To better address the medical risk issue, we estimated alternative models that included a range of variables based on diagnoses codes in order to capture underlying health status. However, this was only feasible in the 9 states with claims data and is limited to births from 2014 and 2015.

Second, we cannot identify the hospitals where women delivered their babies. To the extent that cesarean section rates are driven by hospital practice patterns for which we cannot control, we may falsely attribute differences in cesarean section rates to Strong Start.

Finally, our expenditure analysis relies exclusively on payment information from claims and encounter data. Some states pay supplemental payments to managed care organizations and providers to account for high-risk patients or very sick infants, which are not accounted for in our analysis. To the extent that Strong Start women have better (worse) birth outcomes than women in the comparison group, the absence of these supplemental payments may understate (overstate) any cost savings due to Strong Start.

Omitted Awardee Bias

The model level impact analyses were based on 14 awardees in 84 sites that served close to 15,000 Strong Start women. Overall 51.9 percent of awardees, 38.5 percent of sites, and 32.9 percent of participants were included in the impact analysis, which raises the question of whether the model level impact estimates reflect the overall impacts of Strong Start. This evaluation set out to assess whether Strong Start funded enhanced services provided in one of three delivery models could improve birth outcomes and reduce costs relative to care Medicaid covered women typically receive. While not all Strong Start awardees or sites were included in the analysis, we have no reason to believe that the effects estimated at the model level for Birth Centers, Group Prenatal Care, or Maternity homes are biased. This is because the main reason that awardees and sites were excluded is that they were located in a state for which we did not obtain birth certificate and Medicaid eligibility data. Our inability to obtain birth certificate and Medicaid eligibility data is unlikely related to the impact of Strong Start on our outcomes of interest. Consequently, we believe that our estimates are unbiased.

In addition, the awardees included in this analysis represent a broad range of the types of organizations that participated in Strong Start (e.g., hospital and health systems, health plans, and community-based organizations) and provider sites (e.g., FQHCs, outpatient clinics, nationally certified Birth Centers, local health departments, and physician groups) – the inclusion of a diverse mix of awardee and site types in the impact analysis further reduces the risk that the reported model level estimates are biased. This leads us to believe our results would be robust to the inclusion of awardees in the other states.

Two exceptions are worth noting, however. We were not able to estimate the impact of Strong Start in the two Maternity Care Homes where the Strong Start clinic served high risk women from across the state because we did not believe we could identify a credible comparison group. Similarly, we were not able to assess Group Prenatal Care practices that gave women a choice between standard care and Strong Start enrollment in Group Prenatal Care. While a small share of Group Prenatal Care sites is included in the model level analysis, the strategy we chose provided the best chance at estimating the unbiased effect of enrollment in Strong Start and receiving Group Prenatal Care.

MODEL-LEVEL RESULTS

This section presents our model-level estimates of the effect of Strong Start enrollment on outcomes separately for women receiving care in each of the three delivery models (i.e., Birth Centers, Group Prenatal Care, and Maternity Care Homes). For all estimates that follow, we report differences between Strong Start women and women in the comparison group that are statistically significant at the $p<0.01$ and $p<0.05$ levels and note those that are marginally statistically significant at the $p<0.10$ level. All standard errors in the model-level analysis are clustered at the county level.

Birth Centers

The model-level analysis includes 21 Birth Center sites (see Table 41). These 21 sites represent 46 percent of all Birth Center sites that participated in Strong Start and served 40 percent of all Strong Start women receiving care in Birth Centers. The assessed differences reflect the effect on outcomes of Strong Start enrollment and receiving care in a Birth Center site in contrast to typical prenatal care.

TABLE 41: SITES IN BIRTH CENTER MODEL-LEVEL ANALYSIS

By State and Awardee
Arizona: American Association of Birth Centers
El Rio Birth and Women's Health Center
District of Columbia: Providence Health Foundation of Providence Hospital
Community of Hope's Family Health and Birth Center
Florida: American Association of Birth Centers
Birth & Beyond
The Birth Place
Rosemary Birthing Home
Breath of Life Women's Health & Birth Center
Heart 2 Heart Birth Center
Birthways Family Birth Center
Tree of Life Birth & Gynecology Center
Childbirth Options Birth and Wellness Center
Agape Midwifery Services
Tree of Life Birth & Gynecology Center - Orlando
Maryland: American Association of Birth Centers (No Medicaid Claims)
Special Beginnings Birth and Women's Center
Missouri: American Association of Birth Centers
New Birth Company
Birth & Wellness Center
Pennsylvania: American Association of Birth Centers (No Medicaid Claims)
Reading Birth & Women's Center
The Midwife Center for Birth & Women's Health
South Carolina: American Association of Birth Centers
Charleston Birth Place
Tennessee: American Association of Birth Centers
Women's Wellness & Maternity Center
Lisa Ross Birth & Women's Center
Infinity Birthing & Wellness Center

Birth Outcomes

Across most birth and process outcomes, women who enroll in Strong Start and receive care in Birth Centers have more positive outcomes than women in the comparison group (see Table 42). Infants born to women who enroll in Strong Start and receive care at a Birth Center have an average clinical estimate of gestation of 39.0 weeks, which is almost half a week (0.4 weeks) longer than that of infants born to women in the comparison group. Infants born to Strong Start-enrolled women are also 2.2 percentage points less likely to be preterm than infants born to comparison group women (6.3 percent versus 8.5 percent). There were no significant differences in the share of infants born very preterm between the two groups.

TABLE 42: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, BIRTH CENTER MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2016, Strong Start (N=3,432)	Main Model: 2014 - 2016, Comparison Group Reweighted (N=325,647)	Main Model: 2014 - 2016, Difference†	Alternative Specification 1: Claims Sample, Birth Certificate Controls Only, Difference† (N=1,853, N=114,409)	Alternative Specification 2: Claims Sample, Claims Controls, Difference† (N=1,853, N=114,409)
Birth Outcomes					
Clinical gestational age (weeks)	39.0	38.6	**0.4****	**0.4****	**0.4****
Preterm birth rate	6.3%	8.5%	**-2.2****	**-2.7****	**-2.5****
Very preterm birth rate	1.7%	2.2%	-0.4	**-0.5^**	-0.4
Birthweight (grams)	3,342.8	3,263.8	**79.0****	**78.2****	**71.9****
Low birthweight rate	5.9%	7.4%	**-1.5***	**-1.5***	**-1.2^**
Very low birthweight rate	1.0%	1.1%	-0.1	-0.2	-0.2
Rate of Apgar score greater than or equal to 7	98.2%	98.2%	0.0	-0.1	-0.2
Process Outcomes					
C-section rate	17.5%	29.0%	**-11.5****	**-11.7****	**-11.3****
VBAC rate[1]	24.2%	12.5%	**11.6****	**11.5****	**11.0****
Weekend delivery rate	23.7%	19.8%	**4.0****	**4.2****	**4.1****

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: VBAC = vaginal birth after C-section. Claims sample excludes 2016 births, multiples births, and births with missing delivery claims. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level. All columns marked with a dagger symbol (†) indicate that the difference is a percentage point change in the rate between Strong Start and comparison group women for all outcomes except for clinical gestational age and birthweight, for which the difference is measured in weeks or grams, respectively.

[1] Estimates are among women with a previous C-section. The sample sizes are 1,512 Strong Start women and 58,860 comparison group women.

Consistent with the lower rates of preterm births, infants born to women participating in Strong Start and receiving care in a Birth Center on average weigh 3,343 grams, which is 79.0 grams more than infants born to women in the comparison group. Infants born to Strong Start women are also 1.5 percentage points less likely to be of low birthweight compared to infants in the comparison group (5.9 percent versus 7.4 percent, respectively). There are no significant differences between infants born to women who enroll in Strong Start and infants born to women in the comparison group in the rate of very low birthweight and in the share with an Apgar score of seven or above.

Rates of cesarean section are 11.5 percentage points lower for women who enroll in Strong Start and receive care in a Birth Center (17.5 percent) than for women in the comparison group (29.0 percent), regardless of whether they planned to birth at the birth center, hospital, or at home. Similarly, rates of vaginal births after cesarean section (VBAC) are 11.6 percentage points higher for women who enroll in Strong Start (24.2 percent) compared to women in the comparison group (12.5 percent). Consistent with lower rates of planned inductions or cesarean sections relative to typical care, 23.7 percent of women who enroll in Strong Start have weekend deliveries compared to 19.8 percent of women in the comparison group. With no planned inductions or cesarean sections, 28.6 percent (two-sevenths) of deliveries would occur on the weekend.

Table 42 also shows that these birth outcome results are consistent across the alternative specifications. Alternative specification #1 limits the sample to observations for which claims data are available in 2014 and 2015. This specification holds the set of control variables the same as in the main model specification. Alternative specification #2 adds additional controls for diagnoses that are captured in the claims/encounter data. For all outcomes in the alternative specifications, the direction, magnitude, and significance levels are nearly identical to those in the main model specification, which makes us more confident that the results from the main analysis are not biased by unobserved health conditions.

Expenditure and Utilization Outcomes

Table 43 reports expenditure and utilization findings for women who enrolled in Strong Start and received care in Birth Centers for the 2014 - 2015 claims sample. Birth Centers in Maryland and Pennsylvania are excluded from this analysis because neither state could provide Medicaid claims data.

TABLE 43: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, BIRTH CENTER MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2015 Births, Strong Start (N=1,853)	Main Model: 2014 - 2015 Births, Comparison Group Reweighted (N=114,194)	Main Model: 2014 - 2015 Difference
Expenditure Outcomes (Means)			
Total expenditures during prenatal period[1]	$2,203	$2,192	$10
Total expenditures during delivery period	$6,527	$8,286	**-$1,759****
Total delivery and post-delivery expenditures[2]	$10,562	$12,572	**-$2,010****
Utilization Outcomes (Means)			
Number of ED visits 8 months before delivery month	1.19	1.16	0.03
Number of hospitalizations 8 months before delivery month	0.03	0.03	0.0
Number of days in NICU	0.71	0.95	-0.24
Number of ED visits for mother 11 months after delivery month	0.63	0.67	-0.04
Number of hospitalizations for mother 11 months after delivery month	0.04	0.04	0.01
Number of ED visits for infant in the first year of life	0.86	0.99	**-0.13****
Number of hospitalizations for infant in the first year of life	0.07	0.08	**-0.01***

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: ED = emergency department; NICU = neonatal intensive care unit. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level.

[1] During the 8 months before birth.

[2] Includes expenditures during the delivery period; infant expenditures during the 11 months after the delivery month; and mother expenditures during the 11 months after the delivery month.

Delivery expenditures for women who enrolled in Strong Start and received prenatal care at a Birth Center and their infants are $6,527, on average, which is $1,759 less than expenditures for women in the comparison group and their infants. Total expenditures from delivery until the infant's first birthday are $10,562 for women who enrolled in Strong Start at a Birth Center site and their infants, and $12,572 for women and infants in the comparison group, which is a difference of $2,010. There are no significant differences between the two groups in mean expenditures in the 8 months before the delivery period.

To better understand what may be driving observed expenditure differences, several additional potential cost drivers are examined: emergency department visits for mothers and infants, hospital stays for mothers and infants, and NICU days.[57] Infants born to women who enroll in Strong Start have on average 0.86 emergency department visits in the year after their births compared to 0.99 visits for infants born to women in the comparison group. Infants born to women enrolled in Strong Start also have somewhat fewer hospitalizations (-0.01) compared to infants in the comparison group. There are no other statistically significant differences between the two groups in the other utilization outcomes in Table 43.

Summary

Women who participate in Strong Start through Birth Centers have more positive birth outcomes and improved care processes relative to women in the comparison group who receive care from typical Medicaid providers. Across the board, observed impacts are large and likely represent meaningful improvements in health and process outcomes that have been targeted by Healthy People 2020 and other public health efforts. Overall, our results suggest that receiving prenatal care in a Birth Center is an effective and high-quality option for low-risk women served by the Medicaid program.

These improved outcomes are achieved at a lower overall cost of care. Lower costs are likely driven in part by improvements in care processes such as lower cesarean section rates and increased VBACs. However, little is known about the extent to which Medicaid programs and Medicaid managed care organizations reimburse differentially for vaginal versus cesarean section births. The small reductions in emergency room use and hospital visits for the infant in the first year of life likely contribute to lower costs as well. In addition, midwives and birth centers are paid less for deliveries than physicians and hospitals and this differential reimbursement surely accounts for some part of the lower costs. Importantly, the case studies found that many birth centers felt that the Medicaid reimbursement rates were too low. Nonetheless, our results suggest that allowing prenatal care to be provided by midwives in birth centers is an efficient policy for Medicaid programs and managed care plans to consider.

The main concern regarding the estimates of the impact of Strong Start for women receiving care in Birth Centers is that these women may be healthier or otherwise different from women who seek care in traditional settings. If the factors that lead women to seek prenatal care in a Birth Center are also related to positive health outcomes and we cannot control for these factors in our model because they are unobserved, our estimates may be biased upwards by selection. We try to address this issue by controlling for a wide variety of characteristics of women that may drive selection into or away from Birth Centers. In addition, using claims data, we controlled for a wide range of health conditions in an effort to better capture health status. Our results remained consistent with these controls in place, which provides strong support that our results are robust.

[57] NICU days are only available for six of the nine states that provided Medicaid claims data.

Group Prenatal Care

Eleven Group Prenatal Care sites are included in the model-level analysis (see Table 44). These 11 sites account for 18 percent of all Group Prenatal Care sites and 23 percent of Strong Start participants enrolled in Group Prenatal Care sites. For some Group Prenatal Care awardees, only a subset of sites is included in the model-level estimates. As previously discussed, excluded sites offered both traditional and Group Prenatal Care and had opt-in policies that resulted in low acceptance rates, which may produce estimates that are biased by selection. The following described differences reflect the impact on outcomes of enrollment in Strong Start and receiving care Group Prenatal Care compared to typical care.

TABLE 44: SITES IN GROUP PRENATAL CARE MODEL-LEVEL ANALYSIS

By State and Awardee
District of Columbia: Providence Health Foundation of Providence Hospital (No Medicaid Claims)
Providence Hospital
Louisiana: Amerigroup Corporation
Associates in Women's Health Baton Rouge
New Jersey: Central Jersey Family Health Consortium
JFK Medical Center / Family Practice
Newark Community Health Center
Nevada: HealthInsight of Nevada
Renown Pregnancy Center
Women's Specialty Care
Women's Health Associates of Southern Nevada
Pennsylvania: Albert Einstein Healthcare Network (No Medicaid Claims)
Einstein Medical Center Philadelphia
Montgomery Hospital Medical Center
Tennessee: University of Tennessee Medical Group
The Med Hollywood Health Loop

Birth Outcomes

Table 45 presents the effects of enrollment in Strong Start on birth outcomes for awardees and sites implementing the Group Prenatal Care model. Overall, there are a few positive differences in birth outcomes at the model level between women who enroll in Strong Start and receive Group Prenatal Care and women in the comparison group.

TABLE 45: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, GROUP PRENATAL CARE MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2016, Strong Start (N=2,436)	Main Model: 2014 - 2016, Comparison Group Reweighted (N=176,822)	Main Model: 2014 - 2016, Difference†	Alternative Specification 1: Claims Sample, Birth Certificate Controls Only, Difference† (N=529, N=39,618)	Alternative Specification 2: Claims Sample, Claims Controls, Difference† (N=529, N=39,618)
Birth Outcomes					
Clinical gestational age (weeks)	38.5	38.5	0.0	0.0	0.0
Preterm birth rate	10.4%	10.0%	0.4	1.6	1.5
Very preterm birth rate	2.5%	2.9%	-0.4	-0.4	-0.3
Birthweight (grams)	3,141.8	3,149.4	-7.6	-9.3	-3.1
Low birthweight rate	10.9%	10.4%	0.5	0.4	0.2
Very low birthweight rate	1.1%	1.5%	**-0.4^**	0.1	0.2
Rate of Apgar score greater than or equal to 7	98.2%	97.6%	0.6	-0.2	-0.2
Process Outcomes					
C-section rate	30.5%	29.5%	1.1	0.2	-0.5
VBAC rate[1]	20.7%	17.7%	**3.1^**	0.2	0.7
Weekend delivery rate	25.5%	23.4%	**2.2***	-0.3	-0.2

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: VBAC = vaginal birth after C-section. Claims sample excludes 2016 births, multiples births, and births with missing delivery claims. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level. All columns marked with a dagger symbol (†) indicate that the difference is a percentage point change in the rate between Strong Start and comparison group women for all outcomes except for clinical gestational age and birthweight, for which the difference is measured in weeks or grams, respectively.

[1] Estimates are among women with a previous C-section. The sample sizes are 362 Strong Start women and 28,671 comparison group women.

There are no significant effects of enrollment in Strong Start at a Group Prenatal Care practice on the clinical estimate of gestation, rates of preterm or very preterm birth, average birthweight, rates of low birthweight, or having an Apgar score greater than or equal to seven. However, women participating in Strong Start's Group Prenatal Care model are 0.4 percentage points less likely to have a very low birthweight infant than women in the comparison group. This difference is only marginally significant ($p<0.10$).

For process outcomes, women participating in Strong Start and receiving care at a Group Prenatal Care site are more likely to have a VBAC than women in the comparison group (20.7 percent compared to 17.7 percent), a marginally significant difference ($p<0.10$). In addition, 25.5 percent of women participating in Strong Start's Group Prenatal Care model have a weekend delivery, which is 2.2 percentage points higher than the rate for women in the comparison group. This suggests that awardees implementing the Group Prenatal Care model may be less likely to plan inductions for Strong Start patients than for women in the comparison group; however, there were no significant differences for the likelihood of having a cesarean section.

These results are consistent in direction across the alternative models examined but the effect sizes are much smaller. While no significant differences in Apgar scores, VBAC, and weekend deliveries are observed in the alternative models, this appears to be due to the different sample and not to the addition of diagnostic controls from the claims data.

Expenditure and Utilization Outcomes

Table 46 presents the effects of enrollment in a Strong Start Group Prenatal Care model on expenditures and utilization for the 2014 - 2015 claims sample. Group Prenatal Care awardees in Pennsylvania and Nevada are excluded from the analysis because Medicaid claims could not be obtained for these states.

TABLE 46: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, GROUP PRENATAL CARE MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2015 Births, Strong Start (N=529)	Main Model: 2014 - 2015 Births, Comparison Group Reweighted (N=39,618)	Main Model: 2014 - 2015 Difference
Expenditure Outcomes (Means)			
Total expenditures during prenatal period[1]	$2,637	$3,064	**-$427***
Total expenditures during delivery period	$11,645	$12,282	-$637
Total delivery and post-delivery expenditures[2]	$16,286	$17,464	-$1,177
Utilization Outcomes (Means)			
Number of ED visits 8 months before delivery month	1.42	1.44	-0.02
Number of hospitalizations 8 months before delivery month	0.02	0.04	**-0.03****
Number of days in NICU	0.86	1.09	-0.22
Number of ED visits for mother 11 months after delivery month	0.82	0.92	**-0.10****
Number of hospitalizations for mother 11 months after delivery month	0.03	0.05	**-0.02^**
Number of ED visits for infant in the first year of life	1.62	1.52	0.10
Number of hospitalizations for infant in the first year of life	0.08	0.09	**-0.01^**

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: ED = emergency department; NICU = neonatal intensive care unit. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level.

[1] During the 8 months before birth.

[2] Includes expenditures during the delivery period; infant expenditures during the 11 months after the delivery month; and mother expenditures during the 11 months after the delivery month.

Overall, there are some positive effects of Strong Start on expenditures and utilization. Expenditures in the 8 months before the delivery period for women who enroll in Strong Start and receive Group Prenatal Care are $2,637, on average, which is $427 less than the average for women in the comparison group. As can be seen in subsequent sections, this effect appears to be driven by large savings in prenatal care costs in New Jersey. There are no differences between women who enroll in Strong Start and receive Group Prenatal Care and women in the comparison group for delivery expenditures alone and for expenditures for delivery and the first year after birth for mother and infant combined.

There are some relative reductions in hospitalizations and ED visits for Strong Start women receiving Group Prenatal Care. Strong Start women have 0.03 fewer hospitalizations in the prenatal period than women in the comparison group (0.02 versus 0.04 hospitalizations) and 0.10 fewer emergency department visits in the 11 months after the delivery month (0.82 versus 0.92). Relative to the comparison group, women enrolled in Strong Start also have 0.02 fewer hospitalizations in the 11 months after the month their infant was born, and infants born to women enrolled in the Strong Start Group Prenatal Care model have 0.01 fewer hospitalizations. However, these results are only marginally significant ($p<0.10$). There are no other significant differences in the use of services between mothers enrolled in Strong Start and receiving Group Prenatal Care and their infants and mothers in the comparison group and their infants.

Summary

No evidence emerged that enrollment in Strong Start in Group Prenatal Care practices affects birth outcomes. However, it does appear to increase the use of VBAC and weekend deliveries and lower use of emergency room and hospital stays. Enrollment in Strong Start at a Group Prenatal Care setting is also associated with a reduction in claims costs in the prenatal period due to a variety of factors, including lower hospitalization rates and lower reimbursement payments relative to non-group care.

The chief methodological concern regarding the assessment of the impact of enrolling in Strong Start and receiving Group Prenatal Care is that some awardees offered both typical prenatal care and group care. In these sites, only women choosing Group Prenatal Care could be enrolled in Strong Start so were concerned that our estimates may be biased by selection. To address this issue, we limited the model-level analysis to awardees or sites within awardees that implemented "opt-out" enrollment policies and had opt-in rates that are greater than 75 percent. As a result, only 18 percent of all Strong Start Group Prenatal Care sites and 36 percent of the sites in the states included in the impact analysis were represented in the model-level analysis. While this is a small share of the total Group Prenatal Care sites, we believe that our strategy offers the best possibility of an unbiased estimate of the impact of Group Prenatal Care.

Maternity Care Homes

Fifty-two sites are included in the model-level analysis of Maternity Care Homes (see Table 47). These 52 sites represent 47.3 percent of the Maternity Care Home sites and provide care to 33 percent of women enrolled in Strong Start and receiving care at a Maternity Care Home. The following described differences reflect the effect on outcomes of Strong Start enrollment in a Maternity Care Home compared to typical care.

TABLE 47: SITES IN MATERNITY CARE HOME MODEL-LEVEL ANALYSIS

By State and Awardee
Alabama: University of South Alabama
USA Center for Women's Health
USA OB/GYN Center Street Clinic
Mostellar Medical Center
Kendal Foster, MD
Jean A. Sansarinq, PC
Mobile County Health Department - The Women's Center
Arizona: Maricopa Special Health Care District
Maricopa Integrated Health System's Comprehensive Healthcare Center
South Central Family Health Center
7th Avenue Family Health Center
Maryvale Family Health Center
Sunnyslope Family Health Center
District of Columbia: Providence Health Foundation of Providence Hospital (No Medicaid Claims)
MedStar Washington Hospital Center
Howard University Hospital
Mary's Center
Unity Health Care
Florida: Florida Association of Healthy Start Coalitions
Tampa Obstetrics Exodus Clinic - MLK Jr. Blvd. Tampa
Tampa General Hospital Genesis Clinic
Community Health Centers of Pinellas - Clearwater
Community Health Centers of Pinellas - Pinellas Park
Polk County Health Department—Bartow
Tampa Obstetrics Exodus Clinic - Tampa Palms
Tampa Obstetrics Exodus Clinic - North Lakeland
Tampa Obstetrics Exodus Clinic - 22nd Street
Maryland: Johns Hopkins University (No Medicaid Claims)
East Baltimore Medical Center
Johns Hopkins Outpatient Center
Bayview Medical Center
Wyman Park
Center for Addiction and Pregnancy
Missouri: Signature Medical Group
Allied Associates in OB/GYN
Bolivar OB/GYN
Genesis OB/GYN
OB/GYN Physicians
The Healthcare Group for Women
Women's Health Partners
Independence Women's Clinic
Northland OB/GYN
McCaffrey
Mississippi: Mississippi Primary Health Care Association (No Medicaid Claims)
Central MS Civic Improvement (Jackson-Hinds Comprehensive Health Center, Inc.)
Delta Health Center, Inc.
Family Health Care Clinic, Inc.
Family Health Center
G.A. Carmichael Family Health Center, Inc.
Greater Meridian Health Clinic, Inc.
Mallory (Arenia C) Community Health Center, Inc.
Southeast Mississippi Rural Health Initiative, Inc.
Tennessee: United Neighborhood Health Services
Cayce Clinic
Main Street Clinic
Dickerson Road Clinic
Madison Clinic
Southside Clinic
Unity Clinic
Waverly Clinic

Birth Outcomes

Table 48 presents the birth outcomes findings for Maternity Care Homes. There are no positive effects of enrollment in Strong Start in a Maternity Care Home on birth outcomes and improvement in only one process outcome (weekend delivery).

TABLE 48: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, MATERNITY CARE HOME MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2016, Strong Start (N=9,252)	Main Model: 2014 - 2016, Comparison Group Reweighted (N=372,905)	Main Model: 2014 - 2016, Difference†	Alternative Specification 1: Claims Sample, Birth Certificate Controls Only, Difference† (N=3,358, N=147,143)	Alternative Specification 2: Claims Sample, Claims Controls, Difference† (N=3,358, N=147,143)
Birth Outcomes					
Clinical gestational age (weeks)	38.3	38.3	0.0	**-0.1***	**-0.1^**
Preterm birth rate	11.9%	11.3%	0.5	0.7	0.4
Very preterm birth rate	3.8%	3.4%	0.4	0.4	0.3
Birthweight (grams)	3,129.7	3,145.5	**-15.7***	-15.6	-8.2
Low birthweight rate	11.7%	10.9%	**0.8^**	0.7	0.4
Very low birthweight rate	2.0%	1.8%	0.2	**0.3***	**0.3***
Rate of Apgar score greater than or equal to 7	96.4%	96.4%	0.0	0.3	**0.4^**
Process Outcomes					
C-section rate	30.9%	31.5%	-0.7	0.0	-0.3
VBAC rate[1]	13.2%	12.5%	0.7	-0.6	-0.3
Weekend delivery rate	20.7%	19.5%	**1.1***	1.0	1.1

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: VBAC = vaginal birth after C-section. Claims sample excludes 2016 births, multiples births, and births with missing delivery claims. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level. All columns marked with a dagger symbol (†) indicate that the difference is a percentage point change in the rate between Strong Start and comparison group women for all outcomes except for clinical gestational age and birthweight, for which the difference is measured in weeks or grams, respectively.

[1] Estimates are among women with a previous C-section. The sample sizes are 1,512 Strong Start women and 58,860 comparison group women.

There is no significant difference in preterm birth rates between Strong Start women receiving care in Maternity Care Homes and women in the comparison group. Women who enroll in Strong Start and receive care in maternity homes have infants that weigh 3,130 grams, on average, which is 15.7 grams less than infants born to mothers in the comparison group. Twelve percent of Strong Start infants have low birthweights, which is 0.8 percentage points higher than the rate for infants in the comparison group; however, this result is only marginally significant ($p<0.10$). There are no effects of enrollment in Strong Start on rates of very low birthweight or having an Apgar score of seven or higher.

There are no significant differences in the rate of cesarean section or VBAC between women who enroll in Strong Start and those in the comparison group, but women who enroll in Strong Start are 1.1 percentage points more likely to deliver on the weekend (20.7 percent) compared to women in the comparison group (19.5 percent).

The main results are broadly consistent with the alternative specifications with two exceptions. First, there is a small negative association (-0.1 weeks) between Strong Start and clinical estimate of gestation in the sample that has claims, but not in the sample that adds diagnosis controls in the claims data. Second, based on the claims-level analysis, it may be the case that the small, negative, and significant effect on birthweight in grams and the marginally significant increase in the rate of low-birthweight infants might not be significant in the main model and that Apgar scores may have improved if diagnoses are included as controls.

Expenditure and Utilization Outcomes

Table 49 presents the results for expenditure and utilization outcomes for Maternity Care Homes in the 2014 - 2015 claims sample. Maternity Care Home awardees in Maryland and Mississippi are excluded because Medicaid claims and encounter data could not be obtained for these states. In general, women who enroll in Strong Start and receive care in Maternity Care Homes have higher expenditures and use more services than women and infants in the comparison group.

TABLE 49: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, MATERNITY CARE HOME MODEL-LEVEL ANALYSIS

Outcomes	Main Model: 2014 - 2015 Births, Strong Start (N=3,358)	Main Model: 2014 - 2015 Births, Comparison Group Reweighted (N=147,143)	Main Model: 2014 - 2015 Difference
Expenditure Outcomes (Means)			
Total expenditures during prenatal period[1]	$2,512	$2,527	-$15
Total expenditures during delivery period	$9,071	$8,526	$546
Total delivery and post-delivery expenditures[2]	$13,958	$12,968	**$991^**
Utilization Outcomes (Means)			
Number of ED visits 8 months before delivery month	1.33	1.36	-0.03
Number of hospitalizations 8 months before delivery month	0.06	0.07	**-0.01***
Number of days in NICU	1.40	1.23	0.17
Number of ED visits for mother 11 months after delivery month	0.71	0.75	-0.04
Number of hospitalizations for mother 11 months after delivery month	0.05	0.05	0.0
Number of ED visits for infant in the first year of life	1.33	1.24	**0.09^**
Number of hospitalizations for infant in the first year of life	0.12	0.10	**0.01***

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Notes: ED = emergency department; NICU = neonatal intensive care unit. Reported sample sizes refer to the number of cases for which gestational age and birthweight are reported. Sample sizes for other outcomes may slightly vary due to differences in item non-response rates. Same sizes listed for the alternative specification models are for Strong Start and comparison group women, respectively. For cells that contain asterisks or carets, the Strong Start estimate differs significantly from the comparison group using two-tailed tests. Cells that contain two asterisks (**) indicate significance at the 0.01 level; cells that contain one asterisk (*) indicate significance at the 0.05 level; and cells that contain a caret (^) indicate marginal significance at the 0.10 level. All standard errors in the model-level analysis are clustered at the county level.

[1] During the 8 months before birth.

[2] Includes expenditures during the delivery period; infant expenditures during the 11 months after the delivery month; and mother expenditures during the 11 months after the delivery month.

There are no differences in expenditures for the prenatal or delivery periods between women enrolled in Strong Start Maternity Care Homes and women in the comparison group. However, total expenditures for the delivery and year after birth for the mother and infant are $13,958 for women who enroll in Strong Start, which is $991 higher than expenditures for mothers and infants in the comparison group. This difference is only marginally significant (p<010).

Women who enroll in Strong Start and receive care in a Maternity Care Home have 0.01 fewer hospitalizations in the prenatal period than women in the comparison group (0.06 versus 0.07 hospitalizations). Women who enroll in Strong Start and receive care in a Maternity Care Home have emergency department and hospital use in the post delivery period that is no different than women in the comparison group. However, infants born to women who enroll in Strong Start visit the emergency department more often and have more hospitalizations than infants of women in the comparison group (1.33 versus 1.24 ED visits and 0.12 versus 0.10 hospitalizations). The difference for emergency room visits is only marginally significant (p<010). There are no significant differences in NICU use.

Summary

There is no evidence that enrollment in Strong Start in a Maternity Care Home improves birth outcomes or reduces costs relative to typical care. In fact, this Strong Start model is associated with somewhat worse birth outcomes and higher claims costs, but these results are only marginally significant and/or were inconsistent across our alternative models. There is a small increase in weekend deliveries, but no other improvements in process outcomes. There is also a small reduction in hospitalizations in the prenatal period but no other effects on utilization.

Many Strong Start awardees, particularly in the Maternity Care Home model, intentionally targeted women at increased medical risk for poor outcomes or offered stronger encouragement to at-risk women to enroll. If we cannot perfectly account for differences in medical risk between Strong Start women and the comparison group in our propensity score model, the estimated effects of Strong Start may be biased downwards. We did, however, obtain similar results when we better controlled for health status using claims data, providing added confidence to our results. However, Maternity Care Homes are the delivery model that is closest to typical prenatal care, generally women received typical care with care coordination and other services added on. That there is generally no improvement in outcomes or costs suggests Strong Start enhanced services layered on top of typical care, the general model followed by Strong Start Maternity Care homes, are not sufficient to drive an increase in positive outcomes for women served by the Medicaid program.

AWARDEE-LEVEL RESULTS

This section uses graphics to present awardee-level results for awardees included in the model level analysis and with sufficient sample size to analyze the three key birth outcomes (rates of preterm, low-birthweight, and cesarean section) and the three expenditure and utilization measures (expenditures in the prenatal period; total expenditures in the delivery period and year after birth for the mother and infant; and infant NICU days). Only key measures are presented here, but impact estimates for all outcomes for awardees and sites with sufficient sample size can be found in individual awardee sections in Volume 2.[58] We present results for each Strong Start delivery model separately, and awardees are arrayed based on the intensity of their intervention (as described in the Case Studies section of this report). For all estimates that follow, differences between Strong Start women and women in the comparison group that are statistically significant (p<0.01 or p<0.05) are discussed and marginally significant effects noted (p<0.10).

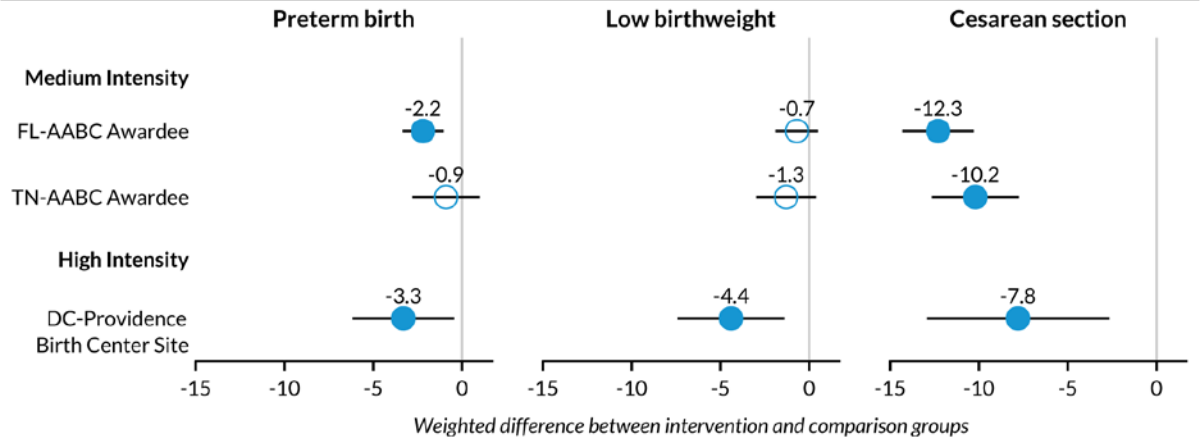
[58] For example, estimate for the Lisa Ross AABC site in Tennessee can be found in Volume 2.

Birth Centers

Birth Outcomes

Figure 21 shows the effect of Strong Start enrollment and receiving care in Birth Centers on the rates of preterm birth, low birthweight, and cesarean section for awardees included in the model-level estimates and with sufficient sample size to support the analysis. AABC sites are pooled at the state level, and the awardees are arrayed according to the intensity of the intervention.[59]

FIGURE 21: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, BIRTH CENTER AWARDEE-LEVEL ANALYSIS



Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level.

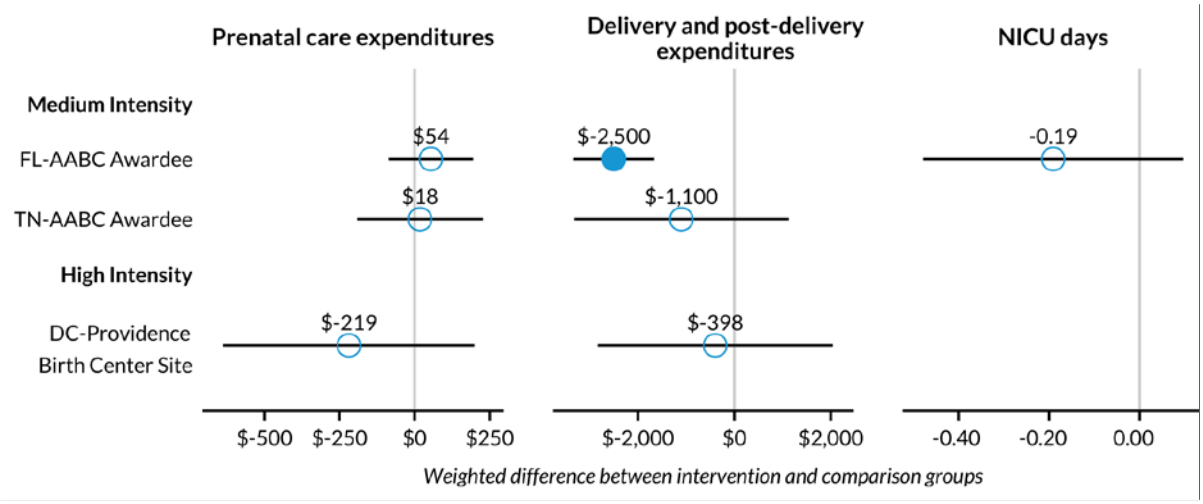
Two of the three birth center awardees show positive impacts of enrolling in Strong Start on preterm birth, with a 2.2 percentage point reduction in the rate for Strong Start women at the Florida AABC awardee and a 3.3 percentage point reduction in the rate for women at the Providence Health Foundation awardee's Birth Center in DC. There is also variation in the effect of enrollment in Strong Start on low birthweight. Strong Start women at the Providence Health Foundation awardee's site have a 4.4 percentage point lower rate of low birthweight than women in the comparison group; there is no effect on low birthweight for the pooled AABC sites in Florida and Tennessee. All awardees showed lower rates of cesarean rates for women enrolled in Strong Start that range from a 7.8 percentage point lower rate at Providence's Birth Center site to a 12.3 percentage point lower rate for the pooled AABC sites in Florida. High rather than medium intensity of the Strong Start intervention shows no consistent relationship with outcomes.

[59] As described in an earlier section, for birth center awardees, Strong Start interventions that do not include peer-counselor encounters beyond visits with the midwife or that include fewer than four encounters are classified as low-intensity. Medium-intensity interventions include four encounters and no additional enhancements, while interventions with more than four encounters or additional enhancements are classified as high-intensity.

Expenditure and Utilization Outcomes

Figure 22 shows the effect of Strong Start enrollment and receiving care at a Birth Center on prenatal care expenditures, total expenditures for delivery and the year after delivery for mother and infant, and NICU days. Awardees are arrayed by intensity of their intervention.

FIGURE 22: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, BIRTH CENTER AWARDEE-LEVEL ANALYSIS



Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level.

There is only one statistically significant effect in this figure: for the AABC sites in Florida, women in Strong Start and their infants have $2,500 lower delivery and year-after-birth expenditures. The intensity of the intervention does not appear to be related to the effect size for these outcomes.

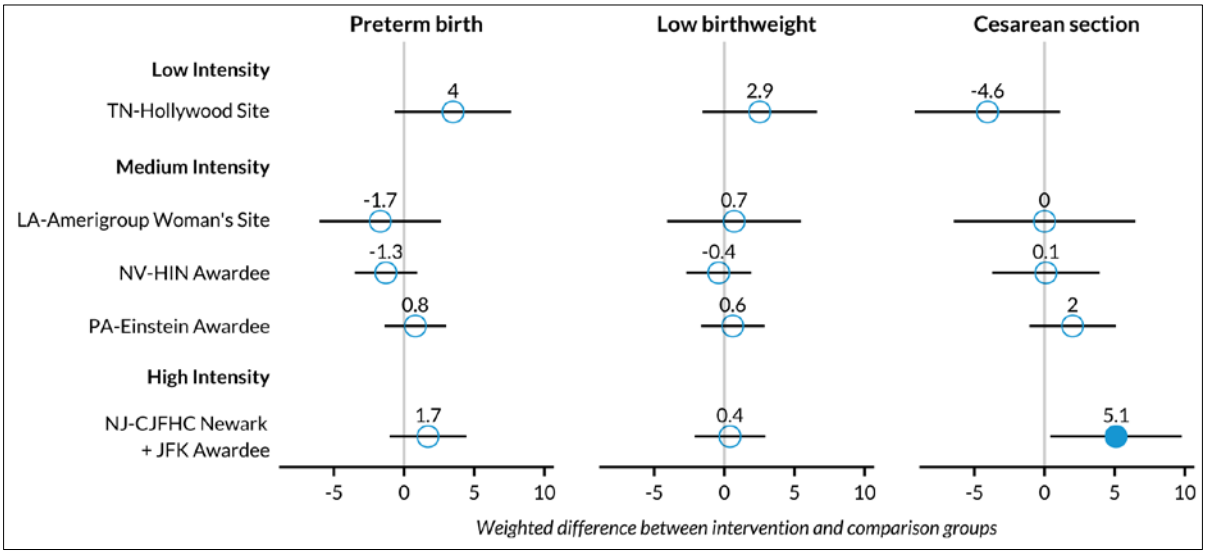
Group Prenatal Care

Birth Outcomes

Figure 23 shows the effects of enrollment in Strong Start on rates of preterm birth, low birthweight, and cesarean sections for awardees included in the model-level estimates and with sufficient sample size to support the analysis. The awardees are arrayed by intensity of their intervention.[60] Consistent with the model-level findings, no awardees show significant differences between women who enroll in Strong Start and receive Group Prenatal Care and women in the comparison group in the rate of preterm and low birthweight births. The only significant effect of enrollment in Strong Start Group Prenatal Care is that women enrolled in Central Jersey Family Health Consortium sites have cesarean section rates that are 5.1 percentage points higher than women in the comparison group. There is no pattern of effect related to the intensity of the intervention.

[60] As mentioned previously, for group prenatal care awardees, interventions are classified as low-intensity if they are less than full implementation of the Centering Healthcare Institute's (CHI) *CenteringPregnancy* curriculum. Interventions implementing CHI *CenteringPregnancy* or an equivalent are classified as medium-intensity, and interventions implementing CHI *CenteringPregnancy* or an equivalent and additional services or content are classified as high-intensity.

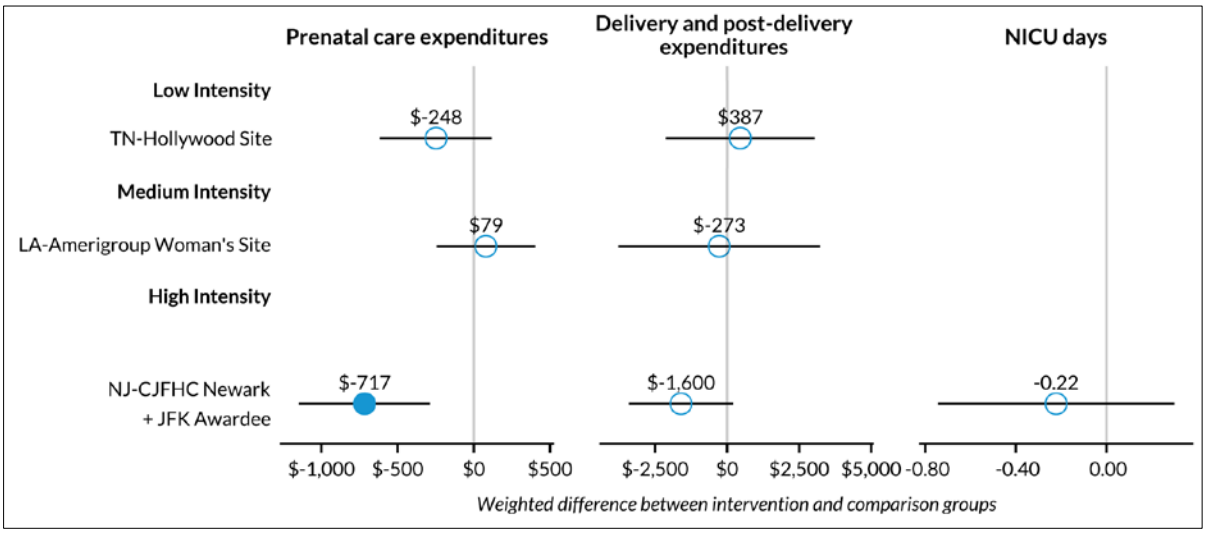
FIGURE 23: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, GROUP PRENATAL CARE AWARDEE-LEVEL ANALYSIS



Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level. Expenditure and Utilization Outcomes

Figure 24 presents the awardee effects of Strong Start on expenditures in the prenatal period; total expenditures for delivery and the year after delivery for mother and infant; and NICU days for awardees that are included in the model-level analysis and had sufficient sample size to make estimates. For the two sites from the Central Jersey Family Health Consortium awardee included in the model-level analysis, enrolling in Strong Start's Group Prenatal Care model is associated with $717 lower prenatal care expenditures and $1,581 lower delivery and year-after-birth expenditures. However, the lower delivery and post-delivery costs are only marginally significant (p-value<0.10). There are no other significant effects for this awardee or any other Group Prenatal Care awardee.

FIGURE 24: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, GROUP PRENATAL CARE AWARDEE-LEVEL ANALYSIS



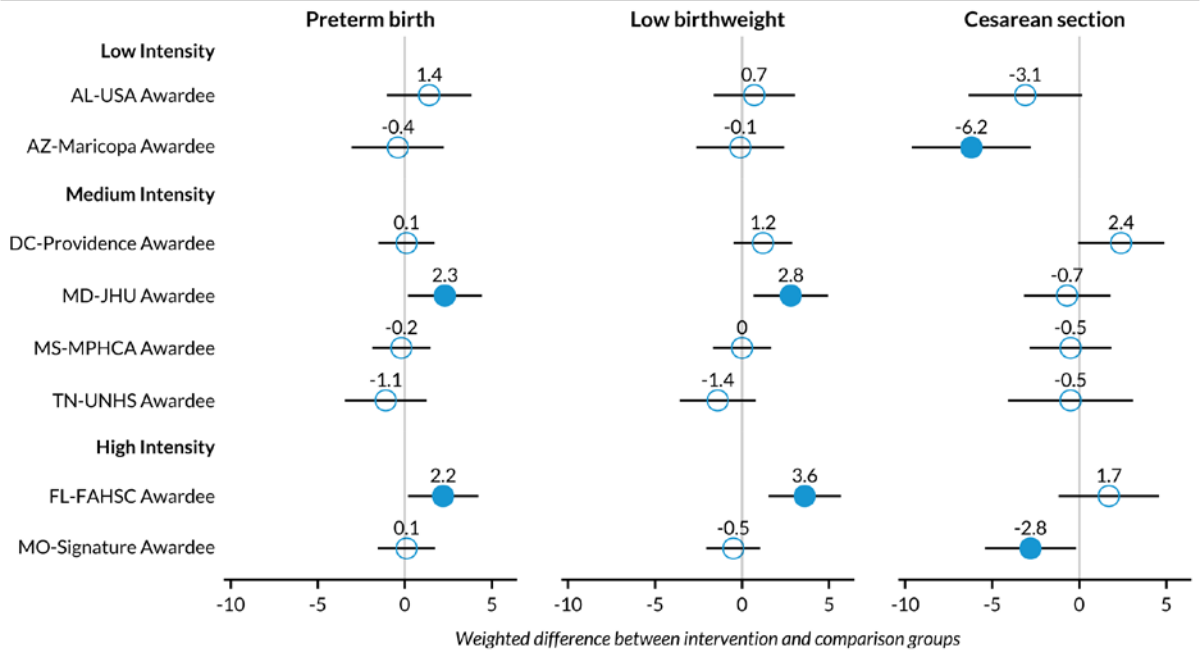
Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level.

Maternity Care Homes

Birth Outcomes

Figure 25 presents awardee-specific effects of enrollment in Strong Start on the rate of preterm birth, low birthweight, and cesarean section for awardees included in the model-level estimates. Consistent with the model-level results, there are few positive effects at the awardee-level. Awardees are arrayed by the intensity of their intervention.[61]

FIGURE 25: EFFECT OF STRONG START ON MATERNAL AND INFANT BIRTH OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, MATERNITY CARE HOME AWARDEE-LEVEL ANALYSIS



Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level. When diagnoses controls are employed, the difference in the rate of preterm birth between Strong Start and comparison group women was not significant for the Florida Association of Health Start Coalition.

Strong Start women at two awardees, the Florida Association of Healthy Start Coalitions and the Johns Hopkins University, have rates of preterm birth rates that are more than 2 percentage points higher than women in the comparison group. However, when diagnoses controls from the claims analyses are employed, for the Florida Association of Health Start Coalitions awardee the difference is reduced and is not significantly different than zero (data not shown). Both the Florida Healthy Start Coalition and Johns Hopkins University awardees show higher rates of low birthweight for infants of women who enroll in Strong Start relative to infants of women in the comparison group.

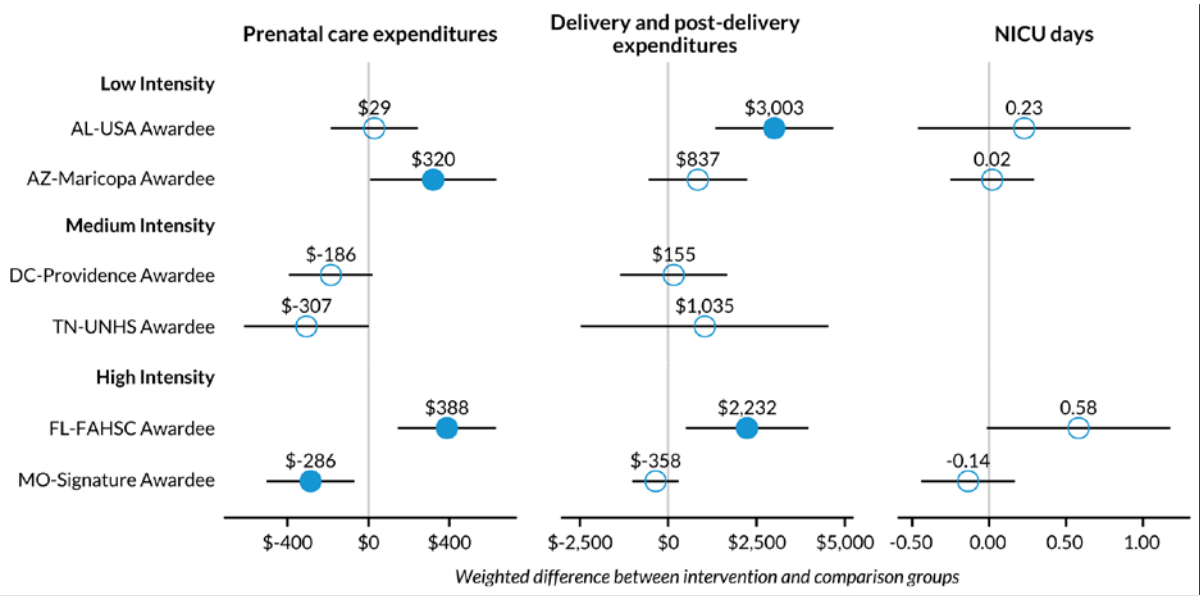
[61] As mentioned previously, for maternity care home awardees, interventions are classified as low-intensity if they include fewer than four encounters. Interventions with four or more encounters that only provide education and referral services or interventions with fewer than four encounters that provide direct services are classified as medium-intensity. High-intensity interventions include four or more encounters and the provision of direct services.

Lower rates of cesarean sections associated with Strong Start enrollment are found for three awardees,[62] with reductions ranging from 2.8 percentage points for women enrolled at the Signature Medical Group awardee to 6.2 percentage points for women enrolled at the Maricopa Special Health Care District awardee. Reductions in cesarean section rates are greatest among awardees with low-intensity interventions.

Expenditure and Utilization Outcomes

Figure 26 presents awardee-level estimates of the effect of Strong Start enrollment on expenditures in the prenatal period, expenditures for the delivery and year after birth, and NICU days. Overall, there are few positive significant effects at the awardee level.

FIGURE 26: EFFECT OF STRONG START ON MATERNAL AND INFANT EXPENDITURE AND UTILIZATION OUTCOMES, DIFFERENCES BETWEEN STRONG START AND COMPARISON GROUP, MATERNITY CARE HOME AWARDEE-LEVEL ANALYSIS



Notes: Solid circles indicate that the difference is significant at the p<= 0.05 level.

Enrollment in Strong Start is associated with higher prenatal care expenditures at the Maricopa Special Health Care District awardee site (marginally significant at p<0.10) and lower prenatal care expenditures at Providence Health Foundation (marginally significant at p<0.10) and Signature Medical Group awardee sites. Strong Start enrollment at the Florida Healthy Start Coalition awardee was associated with expenditures that are $388 higher during the prenatal periods and $2,232 higher for total delivery and the year after birth, with higher NICU use (0.58 days and marginally significant at p<0.10) relative to the comparison group. The University of South Alabama awardee also had effects on total expenditures for delivery and the first year of life that are around $3,000 higher than those for women and infants in the comparison group.

[62] The estimated effect at the USA Awardee is only marginally significant (p-value<0.10).

DISCUSSION

The previous chapter showed that, after adjusting for maternal risk factors, birth outcomes varied across the Strong Start models. However, one of the most basic research questions this evaluation intended to answer is "What is the impact of Strong Start on infant gestational age, birth weight, rate of Cesarean Section, and cost for women and infants during pregnancy and the first year of life?" Answering this question required an impact analysis with an external comparison group of women not served by Strong Start. This impact analysis, using linked birth certificate, Medicaid eligibility, and Medicaid claims/encounter data, compared birth and cost outcomes for women participating in Strong Start enhanced prenatal care to outcomes for non-participating Medicaid-enrolled women with similar risk profiles. The analysis employed propensity score reweighting to develop comparison groups of women with closely matched risk profiles to the women enrolled in Strong Start. Awardees in 15 states were included in the estimate of impact of Strong Start on birth outcomes; nine of these states provided claims data for the cost analysis. We estimated the impact of Strong Start on birth outcomes and costs at the model level for Birth Centers, Group Prenatal Care providers, and Maternity Care Homes and at the awardee-level when sufficient sample size supported the analysis. It is important to note that the impact analysis could not examine outcomes for all Strong Start participants, as data could not be obtained from some states on a timely basis. As a result, 40 percent of Birth Center participants, 23 percent of Group Prenatal Care participants, and 23 percent of Maternity Care Home participants are included in this analysis.

The impact analysis complements the results of the PLPE regression analysis of Strong Start outcomes presented in the previous chapter. With an analysis that includes a comparison group of women with similar risks who did not participate in Strong Start, the impact analysis finds that Birth Center participants had consistently more positive birth outcomes than women in the comparison groups. Specifically, infants born to Birth Center participants had an average gestational age of 39.0 weeks, almost half a week longer than that of infants born to comparison group women. Strong Start Birth Center infants were also 2.2 percentage points less likely to be preterm than comparison group infants (6.3 percent vs. 8.5 percent). This difference between Birth Center women and non-Strong Start women is substantially less than the 7-percentage point difference between Birth Center and Maternity Care Home Strong Start participants observed in the previous chapter, but the size of the difference is consistent with an earlier study comparing Birth Center participants to Medicaid enrollees in the District of Columbia using similar methods (Benatar et al.). That the model level estimate was similar to what was found in the single District of Columbia study provides further support for our contention that the results are robust and likely unbiased. Strong Start Birth Center infants were also 1.5 percentage points less likely to be born at low birthweight. Rates of C-section deliveries were 11.5 percentage points lower for Strong Start women who received care in a Birth Center (17.5 percent) than for women in the comparison group (29.0 percent). The differences in C-section rates were actually larger than those observed when Birth Center deliveries were compared to Maternity Care Home deliveries. Overall, our results suggest that receiving prenatal care in a Birth Center is an effective and high-quality option for medically low-risk women served by the Medicaid program. Because Birth Centers screened out most women at moderate to high medical risk, these results cannot be applied to such women.

In the previous chapter we observed some differences in outcomes when Group Prenatal Care participants were compared to Maternity Care Home participants. However, these differences were not observed in the impact analysis when these participants were compared to non-Strong Start women. There were no significant effects of Strong Start enrollment on gestational age, rates of preterm birth, average birthweight, or rates of low birthweight. Thus, the findings from the regression analyses in the previous chapter showing differences between Group Prenatal Care and Maternity Care Homes were not generally confirmed when Group Prenatal care is compared to routine Medicaid maternity care.[63] However, we found one positive difference in birth outcomes for Strong Start Group Prenatal Care participants compared to women receiving typical Medicaid prenatal care. Women in Group Prenatal Care are more likely to have a weekend delivery (25.5 percent) than women in the comparison group (22.0 percent), suggesting that awardees may have been less likely to plan inductions for Strong Start women than typical prenatal care providers were with their patients. This is consistent with a similar finding for Birth Centers. It is possible that education provided in Group Prenatal Care visits or by peer counselors in Birth Centers encourage women to not ask for and reject some provider's preference for scheduled deliveries.

There is no evidence from the impact analysis that enrollment in Strong Start Maternity Care Homes improved birth outcomes. The fact that Maternity Care Homes provided such a diverse array of services meant that outcomes might have improved in some places and not in others. However, the examination of awardee-specific outcomes also showed no birth outcome improvements with two exceptions. C-Section rates were lower for two Maternity Care Homes.

If preterm delivery and birth weight rates are both lower in Birth Centers, along with lower rates of C-Section, it seems likely that Medicaid costs for Birth Center enrollees would also be lower than those in traditional prenatal care. Indeed, the impact analysis found that Birth Center participants in Strong Start had a lower cost to Medicaid. Delivery expenditures for women enrolled in Strong Start Birth Centers and their infants were $6,527 on average, which was $1,759 less (or 21 percent) than for women in the comparison group and their infants. Total expenditures for the mother and infant from delivery until the infant's first birthday were $10,562 for women enrolled in Strong Start Birth Centers on average, which was $2,010 less (or 16 percent) than for women and infants in the comparison group. Lower costs appeared to be driven by differences in lower C-Section rates, and small reductions in the number of infant emergency department visits and hospitalizations following delivery. Lower costs were also likely due to lower reimbursement rates for deliveries in Birth Centers relative to hospitals given that 46 percent of Birth Center participants delivered at a Birth Center. The case studies found that many birth centers felt that Medicaid reimbursement rates were too low to incentivize extensive participation in Medicaid, and some found them too low to cover costs. Nonetheless, our results suggest that ensuring women have access to prenatal care to be provided by midwives in birth centers is an efficient policy for Medicaid programs and managed care plans to consider.

[63] Importantly, the impact analysis included only Group Prenatal Care Sites with high acceptance rates while the PLPE data included all sites.

It is not surprising that Group Prenatal Care enrollees did not have lower delivery and postnatal Medicaid costs than comparison group Medicaid women and infants, given that their outcomes were not significantly different. However, prenatal care expenditures were lower for Strong Start Group Prenatal Care enrollees compared to women in typical Medicaid prenatal care. Expenditures in the eight months prior to delivery for women enrolled in Strong Start Group Prenatal Care were $2,637 on average, which was $427 less than the average for women in the comparison group. Since much of the care is provided in a group setting, and with equivalent outcomes to other Medicaid women, Group Prenatal Care may offer a lower cost alternative to traditional Medicaid prenatal care. Again, these findings apply only to those enrollees included in the impact analysis, a relatively small subset of all Group Prenatal Care enrollees. Still, the findings were substantially similar across the Group Prenatal Care awardees included in the impact analysis, lending credibility to the analysis.

There is no evidence from the impact analysis that enrollment in Strong Start Maternity Care Homes reduced costs relative to typical Medicaid prenatal care. This is consistent with the lack of significant differences in birth outcomes between women served in Maternity Care Homes and other Medicaid women.

Conclusion

Strong Start funded three alternative enhanced prenatal care models to determine whether they could lead to better outcomes and reduce costs. In the case of one of the models, Birth Centers, we found consistent evidence—both in comparisons to outcomes for other Strong Start women and non-Strong Start women with similar risks—that implementing a Birth Center model of care improved outcomes and reduced costs for Medicaid maternity care. The evaluation's case studies suggest that these improvements may grow from Birth Centers' more holistic midwifery model of care that focuses more time on education and psychosocial support. Of the three models, this is the one that is most different from the typical care received by Medicaid covered women. Regardless, there are serious issues concerning the generalizability of these findings to other places and to more Medicaid women because currently Birth Centers serve primarily women at low medical risk, as evidenced by the PLPE data. Such a model would need to be vastly expanded beyond its current scope.

Group Prenatal Care also showed some promise, particularly with lowering the cost of prenatal care. As is true of Birth Centers, Group Prenatal care offers a model of care that is qualitatively different from typical care. However, the case studies found that the model can be challenging to implement for Medicaid-enrolled women. In particular, awardee respondents told us that it was difficult for patients to commit to the fixed schedule of two-hour sessions, and the PLPE data bore this out, with women receiving 5.7 group visits on average compared to the standard 10 sessions in the *CenteringPregnancy* curriculum. Many women missed group appointments because of transportation issues and other barriers.

The model that seems most easily generalizable to many different settings is the Maternity Care Home, which generally layered the services of a care manager onto a more typical model of obstetric care. However, the Strong Start evaluation, consistent with many (though not all) previous evaluations of enhanced are models that emphasize maternity care case management, such as Healthy Start in the 1990s (Devaney et al.), found that Maternity Care Homes did not lead to changes in birth outcomes in most places. This is perhaps due to the challenges both inside and outside the health care system that

make it difficult to address the large array of intractable social, physical, and mental health problems that faced high risk women served by Maternity Care Homes, and in general the highest risk women enrolled in Medicaid.

Finally, our analytic approach is observational and therefore has potential limitations. While the design faces challenges from selection, contamination, and omitted variable bias, we used a propensity score reweighting strategy to assure that women in the comparison group were similar to women enrolled in Strong Start along a wide variety of characteristics and limited our analysis to the awardee sites that represented a good experiment. We also analyzed a relative small share of all Strong Start enrollee sites, for the most part, because birth certificate and Medicaid data could not be obtained from the state in which they were located. We have no reason to believe that our results are biased by the exclusion of these awardees or sites, especially given the diverse nature of the awardee sites that are included in the analysis. Finally, the impact analysis was limited in the outcomes that were available on birth certificates and Medicaid claims and encounter data. There are many other outcomes such as satisfaction with care, initiation and continuation of breastfeeding, depression and anxiety and family planning that could not be examined by this evaluation, but for which our case studies and focus groups suggest may have improved as a result of Strong Start.

Summary of Findings

The Strong Start for Mothers and Newborns initiative, which funded enhanced services through three evidence-based prenatal care models—Birth Centers, Group Prenatal Care, and Maternity Care Homes—aimed to improve maternal and infant outcomes for pregnancies covered by Medicaid and CHIP. We synthesize five years of findings regarding the program's implementation and impacts to determine its effects on birth outcomes, health care delivery, and the cost of care. This final report from the evaluation presents results from the study's qualitative and quantitative data collection and analysis, and a summary of key findings is presented in the following sections.

WHO WAS SERVED BY STRONG START?

The Strong Start evaluation's Participant Level Process Evaluation (PLPE) collected detailed information on the demographic profiles and risk characteristics of every woman that was served under the initiative, as summarized below.

Strong Start provided enhanced prenatal care for a large and diverse group of women. The Strong Start for Mothers and Newborns initiative touched the lives of nearly 46,000 women and their infants. According to the PLPE data collected by the evaluation, Strong Start participants were disproportionately black (40 percent) and Hispanic (30 percent) compared with pregnant Medicaid beneficiaries overall (who are 25 percent black and 20 percent Hispanic) (Kaiser Family Foundation, 2016). The overrepresentation of black women was driven, in part, by the large number of awardees in the southeastern U.S. where there is a concentration of black residents overall, and is notable because black women across all income levels are more likely than white or Hispanic women to experience adverse pregnancy outcomes (Zhang et el. 2013; Martin et al 2015). The vast majority of Strong Start participants were between 20 and 34 years old (76 percent)—the healthiest age range for pregnancy—with a mean age of women having their first birth considerably younger than for women across the U.S. (22.6 vs. 26.6 years of age). Meanwhile, the share of Strong Start participants who were married (one-quarter) was substantially lower than reported in other studies of low-income mothers, though larger shares did report either living with or having a partner. These factors are important as studies have shown that both the type and quality of a woman's relationship can have bearing on pregnancy and birth outcomes.

Strong Start participants faced a large number of social and medical challenges that placed them at risk of experiencing poor birth outcomes. Women enrolled in Strong Start experienced a multitude of social and economic challenges. Nearly half were neither employed nor in school, more than a quarter had not completed high school or a GED, and just 15 percent possessed a college degree. A fifth experienced food insecurity, and more than one-third reported one or more barriers to accessing prenatal care (most commonly not having a car or money to afford a ride). Nearly 28 percent of Strong Start participants screened positive for depression—a rate more than twice what is reported in the literature for pregnant women generally—while more than 35 percent had some level of anxiety. (Bennett et al. 2004; Melville et al. 2010; Katon et al. 2011; Gavin et al. 2005).

In addition to considerable psychosocial needs that placed Strong Start participants at risk of poor birth outcomes, many also suffered from chronic health conditions that can make pregnancy risky. In line with national trends that indicate increasing rates of overweight and obesity among women of reproductive age, participant-level data show that more than a third of Strong Start participants were obese and another 26 percent were overweight. The majority of women in Strong Start had previously given birth (61 percent) and many of these women had experienced a prior poor birth outcome. More than 20 percent had a prior preterm birth (before 37 completed weeks of gestation), the strongest predictor of subsequent preterm birth. Almost 30 percent of program participants reported a short interpregnancy interval (measured as less than 18 months) between their Strong Start pregnancy and their prior birth. Closely spaced pregnancies do not allow sufficient time for a woman's body to heal, increase the risk of maternity complications, and also increase the risk that infants will be born preterm, at low birthweight, or small for gestational age.

WHAT WERE THE STRONG START INTERVENTIONS?

The Strong Start enhanced prenatal care models were designed to address perceived weaknesses in "typical" prenatal care delivery models. The vast majority of Medicaid maternity care is offered in settings such as private solo and/or group physician practices, Federally Qualified Health Centers, hospital outpatient department clinics, and is delivered under prepaid managed care arrangements. Criticisms of typical care include that it is overly medical in focus, paying insufficient attention to psychosocial risks that contribute to poor birth outcomes, such as poverty, unsafe housing, food insecurity, intimate partner violence, and mental health; overly interventionist (in that providers may induce labor or perform C-section deliveries without medical indication—rather than wait for natural labor—at the first hint that waiting could endanger the health of mother or infant); insufficiently focused on education on such critical issues as nutrition, exercise, childbirth preparation, breastfeeding, and family planning; and lacking in continuity, in that pregnant women will usually be seen by many, different health care providers over the course of their prenatal, delivery, and postpartum care, thus undermining the establishment of a strong, trusting relationships between each woman and her provider.

The evaluation's case study component involved site visits to Strong Start awardees (and selected provider sites) in years one and three of the investigation, and telephone interviews with awardee and site staff in years two and four. Taken together, this qualitative data collection allowed the evaluation to develop a nuanced understanding of the three Strong Start interventions, how they differed from "typical" Medicaid prenatal care, and how they were implemented, as highlighted as follows.

Birth Centers provided the midwifery model of care supplemented by peer counselors who provided support, health education, and referrals. Two Strong Start awardees implemented the Birth Center model in 47 sites and served approximately 20 percent of all Strong Start participants, who received their prenatal care at the Birth Center, regardless of where they gave birth. In the evaluation's case studies, we found that all sites reflected two key components in their models: 1) prenatal care following the midwifery model, and 2) psychosocial support, health education, and referrals to additional resources provided by a "peer counselor." The midwifery model of care, an inherent feature of birth centers, involves a holistic and wellness approach to pregnancy and birth that is usually more time-intensive than typical OB/GYN care. The peer counseling service added under Strong Start varied somewhat across sites in terms of the number of contacts counselors had with women during pregnancy, whether those contacts were in person or by phone, and what qualifications counselors possessed. Most peer counselors were hired because they reflected the community and patient population served by Strong Start, and many also had clinical or health education backgrounds as nurses, social workers, lactation consultants, doulas, or other community health workers.

Group Prenatal Care engaged groups of women about 10 times over their pregnancies and provided in-depth education during two-hour facilitated sessions. Fifteen awardees implemented Group Prenatal Care in 60 sites and served approximately 23 percent of Strong Start participants. All of these awardees provided prenatal care in a group setting via a series of facilitated, face-to-face sessions covering a broad range of issues, including health assessment, education, and support. Group Prenatal Care awardees were also uniform in their emphasis on building strong peer relationships among enrolled pregnant women. The majority of awardees followed the Centering Healthcare Institute's *CenteringPregnancy* curriculum and standards closely (i.e., providing 10 sessions, using co-facilitators, and creating cohorts of women with similar gestational age). But individual sites affiliated with roughly one-third of awardees adopted approaches that significantly departed from Centering. One site conducted 12 sessions, while another held just six, for example. Several awardees grouped women based on demographic features or risk factors rather than (or in addition to) gestational age. Examples of this included sites that formed groups for women who were Spanish speakers, adolescents, or who had gestational diabetes, opioid addiction, HIV, Zika virus, or rheumatic diseases.

Maternity Care Homes augmented typical prenatal care with the addition of "care managers" to facilitate coordination and provide psychosocial support services. Maternity Care Homes, which served 57 percent of Strong Start participants through 17 awardees and 112 sites, were the most varied in their approach and the intensity of their interventions. Their most consistent feature was the addition of "care managers" to provide care coordination and psychosocial support to enrolled pregnant women, in addition to the typical obstetrical care they received. Beyond this, Maternity Care Homes varied in the types of individuals who acted as care managers, the number and mode of encounters, and the types of services they provided. Most assigned women to a single care manager, but some used teams of two managers with complementary skills, such as a nurse (for clinical matters) and a social worker or community health worker (for psychosocial needs). Some awardees featured additional Strong Start components beyond care management, including providing dental care, childcare, and nutrition education classes during prenatal visits.

Intensive education, psychosocial support, and referrals to non-medical services were primary attributes of all Strong Start models. Though the three Strong Start models were distinct in their approaches to enhancing the scope and quality of prenatal care, we learned through the case studies that they also shared many similar features. Each went beyond an exclusively medical focus to provide a range of educational interventions designed to improve outcomes, addressing such topics as nutrition, exercise, family planning/birth spacing, breastfeeding, stress management, smoking cessation, oral hygiene, normal and abnormal pregnancy symptoms, preterm birth prevention, childbirth preparation, and infant care and safety, among others. In Birth Centers and Maternity Care Homes, education was generally delivered one-on-one as part of midwife and peer counselor, or care manager encounters, respectively. In Group Prenatal Care, education occurred during group sessions and facilitated discussions.

Furthermore, across models, Strong Start staff strived to make referrals (as possible) to non-medical services not provided during prenatal visits that could support healthy pregnancies. Participants, often not aware of what resources were available, were referred to services that commonly included food support programs like SNAP and WIC, behavioral health providers, dental care, domestic violence services, housing support, transportation services, childcare resources, and utility assistance programs, for example. At Birth Centers and Maternity Care Homes, referrals were made directly by midwives and peer counselors, and care managers (respectively), often based on the results of a needs assessment conducted with the evaluation's Intake Form. Group Prenatal Care awardees, in contrast, often invited guest speakers to join group sessions who provided information about programs and resources, as well as supplemental materials with contact information. Guest speakers commonly included pediatricians, social workers, doulas, domestic violence counselors, lactation counselors, family planning counselors, and WIC staff.

Finally, the three models shared an emphasis on psychosocial support through relationship-based care. For Group Prenatal Care awardees, this support was provided by group facilitators, but also—perhaps more importantly—by the participants themselves. Case studies found that group members respected and learned from each other's experiences and felt both supported by and accountable to one another. For Birth Centers, the midwife and peer counselor provided psychosocial support; in Maternity Care Homes, this role was filled by the care manager. Peer counselors and care managers were sometimes licensed clinical social workers, expert at providing counseling. More often, however, they were less formally educated peers who took time to sit with women, check in on how their pregnancies were going, and provide a welcoming ear, or shoulder to lean on, if they were experiencing life difficulties. Awardees across all three models strove for continuity and consistency in Strong Start staff, as having women meet with the same group facilitator, peer counselor, or care manager throughout their pregnancies resulted in more trusting relationships.

Strong Start awardees worked hard to address a broad range of implementation challenges through creativity, adaptability, and persistence. Across models, common implementation challenges included identifying and enrolling eligible women into Strong Start, integrating enhanced prenatal care services into existing models of care, and handling program- and evaluation-related data burdens. Early in the demonstration period, many awardees perceived that prenatal care providers did not support Strong Start because they made few referrals to the program. Some women resisted joining the initiative because they had given birth before and did not believe they needed extra help. Maternity Care Home care managers and Birth Center peer counselors often struggled to integrate Strong Start encounters into providers' normal patient work flow, while Group Prenatal Care programs faced challenges establishing schedules for group care appointments within a traditional obstetrical office setting. Strong Start program and evaluation data collection requirements were significant and could take valuable time away from patient care. More intractable was the challenge that awardees often struggled to address the full scope of their clients' needs because most communities had insufficient resources to help women with mental health, substance abuse, transportation, affordable childcare, and housing.

Over time, however, Strong Start awardees refined their approaches to care, often "hitting their stride" by the midpoint of the demonstration. Positive adaptations included: adopting "opt out" recruitment systems that automatically enrolled women into Strong Start unless they explicitly requested to not be involved; establishing clearer and more coordinated staff roles and responsibilities; adjusting enhanced service delivery practices to better fit the needs of patients and provider practices; building stronger relationships with obstetrical providers that enhanced both coordination of services and referrals; and hiring additional administrative staff to help with data collection and reporting.

WHAT DID WOMEN SAY ABOUT THEIR EXPERIENCES WITH STRONG START?

Participant focus groups gave voice to the experiences of pregnant and postpartum women who enrolled in Strong Start. As part of the evaluation's case studies, we conducted 120 focus groups with nearly 900 pregnant and postpartum women during Years 1 and 3 of the evaluation (Hill et al, 2014; Hill et al, 2017). These groups, conducted in either English or Spanish as appropriate, explored a broad range of topics relating to their experiences and satisfaction with enhanced prenatal care under the program, and their feelings about Strong Start compared to experiences with more typical prenatal care under Medicaid with prior pregnancies. Key themes from what we learned and selected quotes are provided below.

Women praised the additional time and attention received under Strong Start.

> *"Here I get more time with [my midwife]. I definitely have more time to ask a question." (Birth Center participant)*

Women valued the emotional support received from Strong Start providers.

> *"[The peer counselor] has an ability to relate to you on a personal level that is…very unique…feeling like you're important, like your needs really matter." (Birth Center Participant)*

Intensive education on breastfeeding and family planning were highly valued.

> *"My care coordinator motivated me to breastfeed my daughter. Breastfeeding didn't work with [my] other two [children], but it's working now." (Maternity Care Home participant)*

> *"They ask you as soon as you come in what kind of birth control you are planning to use. They don't force you or anything…they just want you to know about the options." (Group Prenatal Care participant)*

Participants liked that partners were welcome to attend and participate in visits.

> *"My partner gets to ask the questions he's curious about. The participation is good for him…" (Birth Center participant)*

Women appreciated the referrals they received for community-based services and resources.

> *"I didn't have money for my lights, so [the care coordinator] got in touch with someone to help me with that. She helped with getting a baby crib, car seat, clothes, and diapers." (Maternity Care Home participant)*

Women felt more prepared for childbirth under Strong Start.

> *"I felt a lot more prepared [with this pregnancy], not just because I knew what I was going through, but because I felt I had more support through the Centering group." (Group Prenatal Care participant)*

Women's experiences under Strong Start were more positive than with prior pregnancies.

> *"With my OB/GYN, there was more alarm and anxiety that make me on edge. [At the birth center] I feel relaxed, comforted, [and] more personal." (Birth Center participant)*

WHAT OUTCOMES DID STRONG START PARTICIPANTS EXPERIENCE?

The evaluation's PLPE component also collected detailed, individual-level data for all Strong Start participants on a wide range of measures, including breastfeeding, family planning, delivery intentions, service use, satisfaction, and birth outcomes.

With regard to birth outcomes, descriptive analyses of the PLPE data highlight a number of important findings by model. For example, rates of preterm birth varied considerably across the three Strong Start models, with women served by Birth Centers experiencing dramatically lower rates of preterm birth (4.5 percent) than women served by either Group Prenatal Care sites (12 percent) or Maternity Care Homes (12.9 percent). Similarly, rates of low birthweight among Birth Center participants were much lower (3.6 percent) than for Group Prenatal Care and Maternity Care Home participants (10 percent and 10.5 percent, respectively). Finally, the rate of Cesarean section deliveries for Strong Start participants was, by far, lowest for women enrolled in Birth Centers (13 percent). In

contrast, approximately 30 percent of Group Prenatal Care and Maternity Care Home participants had C-sections.

HOW DID WOMEN'S OUTCOMES COMPARE ACROSS STRONG START MODELS?

Regression adjusted analysis using the PLPE data compared the outcomes for all women who participated in Strong Start across the initiative's three models. Comparisons were made by running risk-adjusted analyses that controlled for a host of participant characteristics and medical and social risk factors commonly associated with poor birth outcomes, some of which were not available in data sources such as viral records (e.g., depression, food insecurity). These results cannot convey the *impacts* of Strong Start enhanced prenatal care compared to typical Medicaid prenatal care (impact analysis is presented in the next section), but they can describe how mothers and infants in the three Strong Start models fared relative to one another. Importantly, this analysis included outcomes for *all* awardees and their participants, including those that were not included in the Impact analysis. Linear regression models used Maternity Care Homes as the reference category when comparing across models because this model had the largest number of Strong Start enrollees and was, arguably, the most similar to typical models of prenatal care.

Regressions of participant data show that Birth Center participants experienced significantly better outcomes than their counterparts in Maternity Care Homes, but Group Prenatal Care enrollees (overall) did not. After demographic, medical, ad social risks were controlled for, women enrolled in Birth Centers were five percentage points less likely to have a preterm birth than women enrolled in Maternity Care Homes. Birth Center participants were also four percentage points less likely to deliver a low birthweight infant, and seven percentage points less likely to have a C-section delivery than Maternity Care Home enrollees. While overall, there were no significant differences in outcomes between women in Group Prenatal Care and their counterparts served by Maternity Care Homes, black Group Prenatal Care participants were three percentage points less likely to deliver a low birthweight baby, and white participants were five percentage points less likely to have a preterm birth.

When awardees that served as the primary source of prenatal care for high risk Medicaid mothers were excluded from the analysis, both Birth Center and Group Prenatal Care enrollees had better outcomes than Maternity Care Home participants. Awardees at the Medical College of South Carolina, the University of Alabama at Birmingham, and the University of Puerto Rico all served a disproportionately higher risk population than other Strong Start awardees. When these awardees were removed from the model, better outcomes among Birth Center participants remained (though they shrunk by one percentage point), and Group Prenatal Care participants were observed as having significantly lower rates of preterm birth and low birthweight (by two percentage point each) compared to Maternity Care Home participants.

WHAT WERE THE IMPACTS OF STRONG START ON BIRTH OUTCOMES AND COST OF CARE?

In the largest study of its type conducted to date, the evaluation used linked birth certificate, Medicaid eligibility, and Medicaid claims/encounter data to compare birth and cost outcomes for women participating in Strong Start enhanced prenatal care to outcomes for comparable non-participating Medicaid-enrolled women with similar risk profiles. To assess the initiative's impacts, Strong Start participants were compared to women with Medicaid coverage who received care in "typical" prenatal care practices in the same or similar geographic areas. For each awardee and for individual sites with sufficient sample size, we used propensity score re-weighting to develop a comparison group of women with closely matched risk profiles to those of women enrolled in Strong Start. We included awardees and sites in 13 states[64] to estimate the impacts of Strong Start on birth outcomes, with nine of these states also included in the cost outcomes analysis. We estimated the impact of Strong Start on birth outcomes and costs[65] at the model level—for Birth Centers, Group Prenatal Care providers, and Maternity Care Homes—and at the awardee-level only when sufficient samples supported this analysis.[66]

Strong Start participants cared for in Birth Centers had significantly more positive birth outcomes than women in comparison groups who received care from typical Medicaid providers. Positive impacts of participation were observed for a large number of birth outcomes, regardless of whether women gave birth at the Birth Center or in a hospital, including gestational age, preterm birth rates, birthweight, rates of low birthweight, and rates of C-Section, weekend, and VBAC deliveries. Specifically, infants born to Birth Center participants had an average clinical estimate of gestation of 39.0 weeks, which was almost half a week longer than that of infants born to comparison group women. Birth Center infants were also 2.2 percentage points less likely to be preterm than comparison group infants (6.3 percent vs. 8.5 percent). Consistent with the lower rates of preterm births, infants born to women participating in Strong Start Birth Centers weighed, on average, 3,343 grams, which was 79.0 grams more than infants born to comparison group women. These Strong Start infants were also 1.5 percentage points less likely to be born at low birthweight compared to infants in the comparison group (5.9 percent vs. 7.4 percent). Rates of C-section deliveries were 11.5 percentage points lower for Strong Start women who received care in a Birth Center (17.5 percent) than for women in the comparison group (29.0 percent). Strong Start participants who enrolled in Birth Centers were significantly more likely to have a weekend delivery (23.7 percent) compared to women in the comparison group (19.8 percent), indicating lower incidence of planned inductions or C-section.[67] Finally, rates of vaginal birth after C-section (VBAC) were 11.6 percentage points higher for women enrolled in Strong Start Birth Centers (24.2 percent)

[64] As discussed in the Impact Analysis section, birth certificate and Medicaid data were received from two additional states – bringing the total number to 15 states – but these states' data were not included in our impact analysis because of various problems related to data quality and samples.
[65] Reported differences are statistically significant at the $p<0.01$ and $p<0.05$ levels unless otherwise noted.
[66] Because birth certificate and Medicaid data were not obtained from all states that had Strong Start awardees, model level results (by definition) do not reflect the experiences of all Strong Start participants. Among Birth Centers, the impact analysis included 21 provider sites, or 45 percent of all Birth Centers that participated in Strong Start and 39 percent of all Strong Start women receiving Birth Center care. Eleven Group Prenatal Care sites were included in the model-level analysis, accounting for 18 percent of all Group Prenatal Care sites and 23 percent of Strong Start participants enrolled in Group Prenatal Care. Finally, 52 Maternity Care Home sites were included in the impact analysis, representing 38 percent of all Maternity Care Home sites and 33 percent of all Maternity Care Home enrollees in Strong Start.
[67] With no planned inductions or cesarean sections, 28.6 percent (2/7ths) of deliveries would occur on the weekend.

compared to women in typical Medicaid prenatal care (12.5 percent). In fact, the only two birth outcomes for which no significant effects of Birth Center participation were found were rates of very low birthweight and Apgar scores.

Birth Center participants in Strong Start achieved better birth outcomes at an overall lower cost. Delivery expenditures for women enrolled in Strong Start Birth Centers and their infants were $6,527 on average, which was $1,759 less (or 21 percent lower) than for women in the comparison group and their infants. Total expenditures for the mother and infant from delivery until the infant's first birthday were $10,562 for women enrolled in Strong Start Birth Centers on average, which was $2,010 less (or 16 percent lower) than for women and infants in the comparison group. Lower costs appeared to be driven, in part, by changes in the approach to prenatal care and associated outcomes (such as lower rates of C-sections), and small reductions in the number of infant emergency department visits and hospitalizations following delivery. Lower costs were also likely due to lower reimbursement rates for deliveries in Birth Centers relative to hospitals.

Group Prenatal Care participants were more likely to have a weekend delivery compared to women receiving typical Medicaid prenatal care. Just over a quarter (25.5 percent) of women in Group Prenatal Care had a weekend delivery, as compared to 22.0 percent of women in the comparison group, suggesting that women in Group Prenatal Care were less likely to have scheduled inductions of C-sections. There were no significant effects of Strong Start enrollment on the clinical estimate of gestation, rates of preterm or very preterm birth, average birthweight, rates of low birthweight, or the probability of having an Apgar score greater than or equal to seven.

Prenatal care expenditures were lower for Strong Start Group Prenatal Care enrollees compared to women in typical Medicaid prenatal care. Expenditures in the eight months prior to delivery for women enrolled in Strong Start Group Prenatal Care were $2,637 on average, $427 less than the average for women in the comparison group. However, there were no significant differences between women enrolled in Group Prenatal Care and women in the comparison group for delivery expenditures or for expenditures for delivery and the first year after birth for mother and infant. This lower cost may have been driven, in part, by a reduction in the number of maternal hospitalizations during the prenatal period. Mothers who participated in Group Prenatal Care also had fewer emergency department visits in the 11 months after delivery relative to comparison group mothers.

Maternity Care Home participants were also more likely to have a weekend delivery compared to women in typical Medicaid prenatal care, but there was no evidence that Strong Start Maternity Care Homes improved birth outcomes or reduced costs relative to typical Medicaid prenatal care. There was a small increase in weekend deliveries for women enrolled in Strong Start Maternity Care Homes, suggesting that awardees may have been less likely to plan inductions for Strong Start women than typical prenatal care providers were with their patients. However, we found no other positive effects of enrollment in a Strong Start Maternity Care Home on birth outcomes or cost of care. More than the other Strong Start models, there was considerable variation in effects across Maternity Care Homes, with some awardees or sites demonstrating some positive outcomes even though the pooled analysis did not. Findings did not appear correlated with the intensity of the intervention.

WHAT LESSONS DID EVALUATORS LEARN FROM CONDUCTING THE STRONG START EVALUATION?

The evaluation of the Strong Start for Mothers and Newborns initiative was complex and multi-faceted, and arguably "pushed the envelope" beyond many previous such studies in terms of its qualitative and quantitative data collection and analysis. Lessons learned by the evaluators that might be valuable to other future research efforts are summarized below.

Maximizing the Value of Mixed Methods. The Strong Start for Mothers and Newborns evaluation was designed, from the outset, to employ mixed data collection and analysis methods. A rich qualitative case study component, spanning all four years of program operations, involved conducting 739 key informant interviews with a total of 1074 Strong Start providers and staff, and 123 focus groups with a total of 892 women participating in Strong Start. Qualitative data collection allowed us to develop a very detailed and nuanced understanding of how Strong Start was implemented, what challenges were faced, and what successes (and failures) were perceived by those implementing the initiative. Critically, focus groups amplified the voices of consumers, whose input could be compared with the views of key informants.

Quantitative data collection was equally robust, with extensive individual-level data obtained from nearly *all* program participants—at intake, in the third trimester, postpartum, and upon women's exit from Strong Start. These data allowed us to describe a broad range of characteristics of enrollees, services received, and pregnancy conditions and outcomes on a timely, ongoing basis, and included some measures that were not available elsewhere in the evaluation.

Finally, the collection and linkage of valid birth certificate and Medicaid data from 13 states allowed the evaluation to design and execute a rigorous impact analysis of the birth outcomes and costs of care for women in Strong Start compared to the outcomes and costs for women who received typical Medicaid prenatal care. These analyses provided insights on how impacts differed across the three Strong Start delivery models – Birth Centers, Group Prenatal Care, and Maternity Care Homes.

Overall, triangulating the findings from each source of data in our mixed methods approach strengthened our confidence in the robustness of our findings. Each data source for the evaluation informed the others. Case studies helped us understand what individual program participant data were telling us. For example, when we saw awardees placing particular emphasis on prenatal care education, we could look to the PLPE findings related to breastfeeding, family planning, or gestational diabetes for potential effect. We could also verify staff perceptions about services offered and accessed. Case study findings on enrollment processes helped the impacts team identify where selection bias problems might exist and adjust their models accordingly. Results from case studies also helped us interpret and refine findings from the impacts analyses and to analyze how the intensity of the interventions may have affected outcomes. Individual-level program data on outcomes were generally reinforcing of the outcomes found in the impact analysis.[68]

[68] Appendix X through Appendix DD present additional Strong Start evaluation data that were analyzed in support of the development of several "special study" manuscripts. Specifically, Appendix X presents data on Enhanced Prenatal Care Education; Appendix Y presents Characteristics of Birth Center Participants with a Home Birth or LPM as their Routine Prenatal Care

Lessons Drawn from Acquiring State Birth Certificate and Medicaid Data. The Technical Assistance/Data Acquisition task's objective was ambitious: to obtain birth certificate, Medicaid eligibility, and Medicaid claims and encounter data from states with Strong Start awardees in support of the Impact Analysis. As noted in the Introduction, CMMI did not contract with states or state Medicaid agencies[69] under Strong Start, and thus could not compel state officials to share their data with the evaluation. Still, in the end, the vast majority of both Vital Records and Medicaid officials expressed willingness to share needed data, many were already familiar and had prior experience with linking these data sets, and all understood the value and importance of linking the data to assess the impacts of prenatal innovations that could improve birth outcomes for Medicaid enrollees. Applying for and obtaining state data required concerted, ongoing, and persistent work with Medicaid and Vital Records agencies that faced many competing demands. Ultimately, we worked closely with 20 states that had sufficient Strong Start enrollment to support a rigorous analysis of impacts and to merit the large investment in time and resources needed to obtain the data. While privacy concerns and other challenges were ultimately insurmountable in five states, we succeeded in obtaining data from 15 other states, 13 of which provided data usable in the analysis. This is the largest study conducted to date that relies on linking and analyzing birth certificate and Medicaid data.

Maximizing the Potential of an Observational Impact Analysis Design. The gold standard design for estimating program treatment effects is a randomized control trial. However, Strong Start was not designed to assign either awardees or participants to treatment and control groups through intentional randomization. Many CMMI evaluations rely on quasi-experimental designs that use a difference-in-difference approach, but the particular questions asked of this evaluation did not lend themselves to this strategy because Strong Start layered enhancements upon existing models of prenatal care rather than implementing entirely new models of care, or they used Strong Start funds to continue enhancements previously in effect. Therefore, there is no pre-period with which to compare. As a result, we needed to take an observational approach that compared outcomes for women participating in Strong Start and their infants to outcomes for non-participating Medicaid enrolled women with similar risk profiles and their infants.

The assessment incorporated the best available data and quantitative methods to account for possible confounding factors that may have driven differences that could have otherwise been incorrectly attributed to Strong Start. Strengths of the design were numerous, including linking birth certificate and Medicaid data in a rigorous manner that achieved high rates of matching across files; constructing consistent birth outcome and cost variables from data obtained from numerous states and multiple agencies within each state; creating propensity score reweighted comparison groups of women for every Strong Start awardee and site selected from the same or similar counties; and estimating the impacts of Strong Start for every awardee and site with sufficient numbers of women in the program while controlling for a wide range of factors, including demographic characteristics, behavioral risk factors, medical risks, Medicaid eligibility category, hospital characteristics, and (when available) diagnoses identified on Medicaid claims.

Provider; Appendix Z presents PLPE data by AABC Site; Appendix AA presents analysis of Gestational Diabetes Mellitus and Nutrition Counseling; Appendix BB presents analysis of Mental Health Services in Maternity Care Homes; Appendix CC presents analysis of Maternal and Infant Birth, Utilization, and Expenditure Outcomes Among Twin Pregnancies; and Appendix DD presents data on Substance Use Disorders Among Women Who Delivered Infants in 2014-2015.

[69] The only exception was the award to the Oklahoma Healthcare Authority, which administers the state Medicaid program. Given low enrollment in this award, however, the evaluation did not seek to obtain data from Oklahoma.

Finally, the evaluation went to great lengths to identify potential sources of selection bias (by model), contamination bias, and omitted variable bias to maximize the possibility that we estimated the causal impacts of Strong Start enrollment in combination with care in Birth Centers, Group Prenatal Care, or Maternity Care Homes relative to typical Medicaid prenatal care practices.

Concluding Discussion

Strong Start for Mothers and Newborns was designed to explore whether alternative models of "enhanced" prenatal care could succeed in improving birth outcomes for pregnant women covered by Medicaid and CHIP. The initiative supported three models – Birth Centers, Group Prenatal Care, and Maternity Care Homes – that each promised (through different means) to go beyond typical, medically-focused prenatal care to address the many psychosocial risks that Medicaid-enrolled women face and that contribute to poor birth outcomes. It was the goal of the Center for Medicare and Medicaid Innovation to see whether Strong Start could move the needle on one of the most persistent and paradoxical problems with the U.S. health care system: that we spend more on maternity care than any nation in the world, yet we consistently experience among the worst maternal and infant outcomes compared to similarly wealthy countries.

The five-year Strong Start evaluation was charged with studying the implementation and impacts of the initiative on birth outcomes, health care delivery, and costs. As discussed throughout this final report, we employed a rigorous mixed-methods design that included case studies of implementation, the collection and analysis of detailed participant data, and an impact analysis. This last component considered linked birth certificate and Medicaid data from 15 states—making it the largest study of its kind conducted to date—to compare outcomes among Strong Start women, by model, to those of closely matched Medicaid-enrolled mothers who received typical prenatal care. Indeed, with the evaluation now complete, we can contribute important new findings to the field and demonstrate the utility of a triangulated approach to evaluation, including linking data sources to assess birth outcomes and costs.

First, we find that women who received prenatal care in Strong Start's Birth Centers experienced significantly improved birth outcomes compared to their counterparts in typical care, regardless of where they gave birth. Furthermore, these better outcomes were achieved at lower cost. Lower rates of preterm birth, low birthweight, and C-section were all observed, along with higher rates of VBAC and weekend deliveries, while expenditures for Strong Start women and their infants were 21 percent lower than for those in the comparison group. Our confidence in these findings is bolstered by very similar findings from another evaluation component – risk adjusted regression analyses of participant data – which found that, when comparing Strong Start participants to one another after controlling for risks, Birth Center participants fared significantly better than did women cared for in Maternity Care Homes, a model much closer to typical Medicaid prenatal care. Our impact analysis accounted for the low levels of medical risk among Birth Center participants by creating comparison groups of similarly low-risk women. The Birth Centers' Strong Start model, which was more holistic, individualized, time intensive, and focused on education than traditional medically-focused prenatal care, made a significant difference in the pregnancy outcomes of the women they served.

The second Strong Start model – Group Prenatal Care – was also fundamentally different from "typical" care in that prenatal appointments lasted two hours, facilitators (often midwives) led groups of 8 to 10 women through clinical assessment and in-depth educational sessions on such topics as nutrition and exercise, breastfeeding, family planning, and childbirth preparation, and pregnant women developed supportive relationships as they proceeded together through their pregnancies. Yet in this

instance, the impact analysis found few significant improvements among Strong Start participants in relation to comparison group women. Rates of weekend deliveries were higher for Group Prenatal Care participants, which suggests that Strong Start women may have had fewer planned inductions and scheduled C-sections. The model was also found to reduce prenatal care costs to Medicaid by about 15 percent. The evaluation's cross-model comparison of outcomes using risk-adjusted regression models of Strong Start participants only suggested that Group Prenatal Care may have had beneficial effects for black women, who were significantly less likely to have a low birthweight baby than black women cared for in Maternity Care Homes, while white women were less likely to have a preterm birth. Our case studies and participant data help explain why we might not have observed greater quantitative effects of the group model. Qualitative data show that women receiving group care strongly praised the extra time, support, and education they received under Strong Start, saying that they were more prepared for childbirth and that they much preferred their experiences under Strong Start compared with prior pregnancies and traditional prenatal care. On the other hand, women attended on average just six of the 10 visits prescribed by the curriculum most commonly used by Group Prenatal Care awardees, *CenteringPregnancy*, most often because of problems women had securing transportation or childcare for their group appointments. Thus, most women enrolled in Strong Start Group Prenatal Care did not receive the full intervention as intended.

Finally, Maternity Care Homes, which most often added care managers to existing medical practices to facilitate coordination, support, and referrals to community services, did not produce either significant improvements in birth outcomes or reductions in cost. Though the case studies found clear evidence that Maternity Care Home participants appreciated and were very satisfied by the extra care they received from care managers under Strong Start, it seems clear that this relatively small enhancement to typical care was not sufficient to meaningfully impact birth outcomes for participating women who often faced high levels of both social and medical risk.

Beyond the evaluation's impact and regression analyses, we observe other important positive results from Strong Start in the case study and participant-level data. For example, we learned from Strong Start staff and program participants in our focus groups that Strong Start helped women to understand the importance of carrying their pregnancies to term, breastfeeding their babies, eating nutritious foods and getting exercise, using family planning to safely space their pregnancies (especially by using long acting, reversible contraception methods, or LARCs), and preparing for childbirth. Overwhelmingly, women expressed very high levels of satisfaction with their Strong Start experience, especially in comparison to any previous pregnancies, for which they had generally received more typical care.

Even before this evaluation's impact results were known, but surely influenced by the positive experiences previously reported, a majority of Strong Start programs chose to sustain some or all of their enhanced services. The primary reason for sustaining was providers' beliefs that they were improving the quality and scope of prenatal care, as well as the lives and health of women and infants they served. In our case study interviews, staff for more than half of Strong Start awardees reported that they were either fully or partially sustaining their enhanced prenatal care models after the end of the demonstration period. All Birth Centers were continuing the midwifery model of care as had been in place prior to and during Strong Start, and most had decided to continue (at least in part) the peer counseling services added under the initiative. A majority of both Group Prenatal Care and Maternity Care Home awardees were also sustaining their full Strong Start programs, including nine of 17

Maternity Care Homes and seven of 13 Group Prenatal Care programs. Indeed, most Maternity Care Home awardees were expanding their care management efforts to additional sites or populations. Finally, a considerable proportion of awardees, including some who were not sustaining their programs, reported that they had improved their standards of practice in delivering prenatal care in ways that could be directly attributed to their experiences with Strong Start (e.g. by offering universal depression screening to prenatal patients).

The results from the Strong Start evaluation hold a range of implications both for Medicaid and for prenatal care practice more generally. For Medicaid, the clear take-away is that if more pregnant beneficiaries accessed Birth Centers for their maternity care, on average they would likely experience significantly better birth outcomes and, as a result, the Medicaid program could save money. Unfortunately, many barriers stand in the way of obtaining Birth Center care. Today, only a small fraction of pregnant Medicaid beneficiaries can access maternity care in Birth Centers, and the Strong Start evaluation's case studies identified many reasons that, combined, can cause many Birth Centers to limit the number of Medicaid beneficiaries they serve:

- While managed care has become the dominant service delivery and payment model for Medicaid, Birth Center providers told us that they often have difficulty contracting with Medicaid managed care organizations (MCOs).
- Even when Birth Centers succeed in obtaining contracts, reimbursement rates are often too low to cover the actual cost of care, especially given the time-intensive nature of the midwifery model. Traditional Medicaid fee-for-service reimbursement for professional and facility fees are a fraction of what the program pays obstetricians and hospitals. The large savings in the first year, in addition to potential subsequent savings, would likely outweigh higher reimbursement.
- The financial strain of low payment rates can be exacerbated when Medicaid payments are delayed.
- Other Medicaid policies also created challenges for Birth Centers, including lengthy eligibility determination processes that can delay pregnant women's enrollment into the program until late in their pregnancies.

More broadly, state regulations can limit the supply of Birth Centers available to all pregnant women. In some states, scope of practice laws and licensing policies make it difficult for Birth Centers and midwives to practice at all, which can further limit the availability of Birth Center care for pregnant women, regardless of Medicaid status. Some states require Birth Centers to have hospital-based physician medical directors, a role that does not appeal to many physicians because it increases their malpractice exposure without providing sufficient additional income.

Existing Medicaid policies can also hinder the development of enhanced prenatal care models generally, such as Group Prenatal Care and Maternity Care Home models. This evaluation's telephone survey with Medicaid and CHIP officials in select states revealed that, while program policies generally support financial access to prenatal care, they rarely offer explicit coverage of or incentives for prenatal care enhancements. States currently retain the flexibility to adopt Targeted Case Management programs for pregnant women or Enhanced Prenatal Care services through the State Plan Amendment process, but these options were more widely used by states when Medicaid was a fee-for-service program and appear to be less viable in the program now dominated by prepaid managed care (Hill et al, 2009). The proprietary nature of Medicaid managed care health plan information creates barriers to accessing information about how managed care organizations operate with regard to their provider networks, payments to providers, and the specific content of prenatal care services delivered under

bundled payment arrangements. The proliferation of managed care thus means that state and federal officials have fewer direct policy levers to influence changes in health plan and provider service delivery.

In conclusion, this evaluation provides clear evidence that prenatal care in Strong Start's Birth Centers – with their holistic model of care – succeeded in significantly improving almost every outcome we measured, most importantly rates of preterm birth, low birthweight, and C-section deliveries, when participants were considered against a comparison group with similar risks. Improved outcomes, as well as reductions in health care utilization, likely contributed to reduced expenditures. It seems quite likely that, if progress could be made in addressing the barriers to Birth Center care described above, more Medicaid-covered pregnant women could experience positive births, more infants born to Medicaid mothers could start their lives healthy, and the Medicaid program—at both the federal and state levels—could reap significant savings.

It is unrealistic for Birth Centers to become the dominant maternity care provider under Medicaid or in the U.S. any time soon, however. Thus, more typical maternity care settings, where the vast majority of women of all incomes and insurance types still receive care, will continue to face the challenge of improving outcomes for women and infants. The Strong Start evaluation's findings provide insights that may be helpful in this regard. Namely, the midwifery model of care, which can be practiced by any provider in any setting, offers lessons for how to structure prenatal care to improve outcomes for women who face poverty, relationship instability, depression, and a host of other life-challenges.

Across all Strong Start models, providers such care managers, group care facilitators, midwives, and peer counselors were praised for spending more time with patients and focusing on health education and psychosocial support services, areas often not addressed in typical clinical visits. However, Strong Start providers and staff also described the difficulties they encountered in addressing the most pressing needs of participants, in particular needs for mental health treatment, opioid and other substance use treatment, stable housing, healthy food, transportation, and personal safety (especially with regard to intimate partner violence), because resources to mitigate these needs were so often in short supply in their communities. Given the complex needs and high levels of medical and social risk among many Medicaid-enrolled women, accompanied by inadequate community resources, it is unsurprising that relatively small changes in clinical care practice, such as those adopted by Maternity Care Homes, were not sufficient to improve birth outcomes. Moving forward, comprehensively attending to the broader needs faced by low-income women, including many social determinants of health, will be necessary to achieve reductions in preterm birth and other improved outcomes. No model of care can sufficiently address the myriad needs of Medicaid-enrolled women, particularly those at higher risk, without broad community support and robust social support systems.

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Technical Appendices

APPENDIX A: INTRODUCTION – MEDICAID AND CHIP ELIGIBILITY, BY STRONG START STATE

TABLE A. 1: MEDICAID AND CHIP ELIGIBILITY POLICIES FOR CHILDBEARING WOMEN, BY STRONG START STATE

Location	Income Eligibility (Percent of FPL) – Pregnant Women		Medicaid Income Eligibility – Parents of Dependent Children	Medicaid Income Eligibility – Other Adults	Family Planning Program	ACA Plans	
	Medicaid (Title XIX)	CHIP (Title XXI)				Medicaid Expansion	Marketplace Type
Alabama	146%	N/A	18%	Not Eligible	Yes	Not Participating	FFM
Alaska	205%	N/A	141%	138%	No	Not Participating	FFM
Arizona	161%	N/A	138%	138%	No	Participating	FFM
California	214%	N/A	138%	138%	Yes	Participating	SBM
District of Columbia	324%	N/A	221%	215%	No	Participating	SBM
Florida	196%	N/A	33%	Not Eligible	Yes[1]	Not Participating	FFM
Georgia	225%	N/A	37%	Not Eligible	Yes	Not Participating	FFM
Idaho	138%	N/A	26%	Not Eligible	No	Not Participating	SBM
Illinois	213%	N/A	138%	138%	No	Participating	Partnership
Kansas	171%	N/A	38%	Not Eligible	No	Not Participating	FFM[2]
Kentucky	200%	N/A	138%	138%	No	Participating	SBM-FP
Louisiana	138%	N/A	138%	138%	Yes	Not Participating	FFM
Maryland	264%	N/A	138%	138%	Yes	Participating	SBM
Michigan	200%	N/A	138%	138%	Yes	Participating[3]	Partnership
Minnesota	283%	N/A	138%	138%	Yes	Participating[4]	SBM
Mississippi	199%	N/A	27%	Not Eligible	Yes	Not Participating	FFM
Missouri	201%	N/A	22%	Not Eligible	Yes[5]	Not Participating	FFM
Nebraska	199%	N/A	63%	Not Eligible	No	Not Participating	FFM[6]
Nevada	165%	N/A	138%	138%	No	Participating	SBM[7]
New Jersey	199%	205%	138%	138%	No	Participating	FFM
New Mexico	255%	N/A	138%	138%	Yes	Participating	SBM-FP[8]
New York	223%	N/A	138%	138%	Yes	Participating	SBM
North Carolina	201%	N/A	44%	Not Eligible	Yes	Not Participating	FFM
Oklahoma	138%	N/A	44%	Not Eligible[9]	Yes	Not Participating	FFM
Oregon	190%	N/A	138%	138%	Yes	Participating	SBM-FP[10]
Pennsylvania	220%	N/A	138%	138%	Yes	Participating[11]	FFM
South Carolina	199%	N/A	67%	Not Eligible	Yes	Not Participating	FFM
Tennessee	200%	N/A	99%	Not Eligible	No	Not Participating	FFM
Texas	203%	N/A	18%	Not Eligible	Yes[12]	Not Participating	FFM
Virginia	148%	205%	38%	Not Eligible	Yes	Not Participating	FFM[13]

Sources: Medicaid eligibility: http://www.kff.org/health-reform/state-indicator/medicaid-and-chip-income-eligibility-limits-for-pregnant-women-as-a-percent-of-the-federal-poverty-level/; http://www.kff.org/health-reform/state-indicator/medicaid-income-eligibility-limits-for-adults-as-a-percent-of-the-federal-poverty-level/; Family Planning: http://www.guttmacher.org/statecenter/spibs/spib_SMFPE.pdf; Health Reform: http://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/; http://www.kff.org/health-reform/state-indicator/state-health-insurance-marketplace-types/

Notes: [1]Florida will provide two years of family planning benefits to women losing coverage for any reason.
[2] Kansas has received federal approval to conduct plan management activities to support certification of qualified health plans in FFMs.
[3] Michigan has approved Section 1115 waivers for Medicaid expansions.
[4] Minnesota received approval to implement a Basic Health Program (BHP) established by the ACA in December 2014 and transferred coverage for Medicaid enrollees with incomes between 138 and 200% FPL to the BHP as of January 1, 2015.
[5] Missouri provides coverage to women with incomes up to 185% FPL.
[6] Nebraska has received federal approval to conduct plan management activities to support certification of qualified health plans in FFMs.
[7] Nevada is operating SBMs with federal support.
[8] New Mexico is operating SBMs with federal support.
[9] In Oklahoma, individuals without a qualifying employer with incomes up to 100% FPL are eligible for more limited subsidized insurance though the Insure Oklahoma Section 1115 waiver program. Individuals working for certain qualified employers with incomes at or below 200% FPL are eligible for premium assistance for employer-sponsored insurance.
[10] Oregon is operating SBMs with federal support.
[11] Pennsylvania has approved Section 1115 waivers for Medicaid expansions. In February 2015, Pennsylvania announced it will withdraw the Healthy Pennsylvania waiver to implement a traditional Medicaid expansion called Health Choices. The transition from Healthy Pennsylvania to Health Choices is planned to be completed by September 30, 2015.
[12] Texas operates an entirely state-funded program that provides family planning services to women at least 18 years of age. Texas and Missouri provide coverage to women with incomes up to 185 percent FPL.
[13] Virginia has received federal approval to conduct plan management activities to support certification of qualified health plans in FFMs.

APPENDIX B: QUALITATIVE CASE STUDY - METHODOLOGY

DATA COLLECTION

The evaluation's qualitative case studies involved four primary methods of data collection:

- **Document review** to inform the analytical framework used to describe program design components, understand policy background, and consider potential implementation issues.
- **Interviews** with a variety of key informants (e.g., Strong Start awardee and site-level program staff, prenatal care providers, and community partners) to document program implementation and key features of the Strong Start interventions, perspectives on outcomes, and Strong Start–related successes and challenges. Interviewers relied on semi-structured protocols tailored to the type of respondent, and which allowed for both flexibility and thoroughness.
- **Focus groups** with pregnant and postpartum Strong Start enrollees (and, in the first evaluation year, a limited number of pregnant Medicaid/CHIP beneficiaries not enrolled in the program[70]) to obtain information about women's experiences in Strong Start and how they compared to experiences with traditional prenatal care. Researchers used semi-structured moderator's guides tailored to each type of group (e.g., pregnant or postpartum, enrolled in Strong Start or not).
- **Structured observations** to collect data on the content and structure of enhanced prenatal services (e.g., how, when, and where services were delivered). This method was most often used to observe Group Prenatal Care sessions, and researchers used a standardized form to record their observations.

The case study team collected data annually during the first four years of the Strong Start evaluation. The first (2013–14) and third (2015–16) case study rounds included all five types of data collection: document review, key informant interviews, focus groups, and structured observations. Most data collection was in person for these rounds. The second (2015) and fourth (2016–17) case study rounds included document review and key informant interviews, and nearly all data collection was by phone. All researchers on the team completed training on data collection methods and instruments prior to each round of case studies. Following each case study, findings from all four methods of data collection were summarized in awardee- and AABC-site specific memos that were shared with CMMI, the broader evaluation team, and the Strong Start awardees.

CODING AND ANALYSIS

The key informant interviews and focus groups were recorded and transcribed, and the resulting text files were analyzed using qualitative software NVivo version 10.0. Before uploading and coding the files, personally identifiable information was removed. Researchers used a comprehensive coding structure (included in this appendix, after the interview guide) to organize data based on interview and focus group guide themes, as well as key informant or group participant type, state, awardee and intervention model type, and implementation year. The structure was updated with each round of data collection to ensure that all interview and focus group topics were represented. All coders attended a uniform training session on NVivo and the Strong Start evaluation coding structure, and multiple

[70] The case study team conducted 10 focus groups with a total of 59 pregnant and postpartum women who were not participating in Strong Start in the first evaluation year. The primary purpose of these groups was to gather information on the standard models of care (without Strong Start enhancements) available at provider sites. As this was a research focus only for the first round of case study data, groups with non-participants were not repeated in later evaluation years.

rounds of testing were conducted using several coders to obtain high inter- and intra-coder reliability. Using the coding structure, researchers queried the qualitative database to identify themes across models, key informant types, and data collection type, and key features present or absent in awardees' Strong Start interventions. Qualitative findings have been reported via cross-cutting analyses included in each evaluation annual report and in awardee-specific (and in some cases site-specific) memos which are summarized in annual reports from evaluation years two, three, and four.[71]

Strong Start Qualitative Coding Structure

Overarching (Whole Document) Codes:

Data Collection Method

- Key Informant Interview
    - Awardee Staff
    - Site Staff (Program and Provider)
    - Non-Strong Start Provider
    - Community Partner
- Focus Group
    - Strong Start Participants
        - Pregnant
        - Postpartum
    - Strong Start Non-Participants
        - Pregnant
        - Postpartum

State

Model

- Maternity Care Home
- Group Prenatal Care
- Birth Center

Year

- Year 1
- Year 2
- Year 3
- Year 4

[71] Year Two: https://downloads.cms.gov/files/cmmi/strongstart-enhancedprenatalcare_evalrptyr2v1.pdf; Year Three: https://downloads.cms.gov/files/cmmi/strongstart-enhancedprenatalcare_evalrptyr3v1.pdf; Year Four: https://downloads.cms.gov/files/cmmi/strongstart-snhancedprenatalcaremodels_evalrptyr4v1.pdf

Mode of Data Collection

- In Person
- Phone

Substantive Text Codes

Key Informant Interview (KII) Codes

Background

- Provider Site Overview

Strong Start Program Implementation

- Enhanced Services
- Changes Needed to Implement
- Other Strong Start-Like Services
- Strong Start Patient Population
- Preterm Risk Factors and Eligibility Criteria
- Outreach
- Enrollment
- Retention
- Consistency in Implementation Across Sites
- 17P
- Depression
- Provider Continuity
- Links to *CenteringPregnancy*
- Aspirin Treatment to Treat Preeclampsia

Strong Start Program Outcomes

- Preterm Birth
- Low Birth Weight
- Breastfeeding
- Delivery Method
- Family Planning
- Health Care Costs
- Other Outcomes

Barriers to Care

- Transportation
- Childcare
- Communication

Lessons Learned and Best Practices

- Successes
- Challenges
- Recommendations for CMS and Evaluators

Sustainability

Replicability

- Opinion About Replicability of Own Program
- Practice Level Factors
- Provider Level Factors
- Patient Level Factors
- Community of Policy Level Factors
- Any Other Factors

Medicaid/CHIP Policy

Affordable Care Act

Focus Group (FG) Codes

Background

Health Care Provider Choice

Barriers to Care

- Transportation
- Childcare
- Communication

Maternity Care Experience

- Enrollment
- Strong Start Enhanced Services

Comparison to Previous Maternity Care Experiences

Birth Experience

Postpartum Experience

- Breastfeeding
- Family Planning
- Coverage Continuity

Satisfaction

Recommendations

CASE STUDY INTERVIEW GUIDES

Year One Interview Guide

Background and Overview

1. What is your position (at your organization) and what are your current responsibilities?
2. What was your role, if any, in the decision to apply for Strong Start? [If involved]:
    a. Who was most involved with or initiated the idea to apply to the Strong Start program? Is this person in a leadership (or very visible) role?
    b. Why did you decide to apply for Strong Start? How and where does Strong Start fit into the work your organization does?
    c. How were your sites selected?

Access to Maternity Care

3. How would you describe access to maternity care for low-income women in the areas your sites operate?
    a. Have the number of places offering maternity care increased/decreased over time?
    b. What resources (if any) are available to help Medicaid/CHIP enrollees with access to maternity care?
4. Are you familiar with Medicaid/CHIP policy in your state? [If yes] We're aware of the following recent changes that might influence access to care: [*Summarize background information on recent state policy changes such as: Medicaid expansion, eligibility requirements, enrollment or renewal processes, managed care options, benefits coverage.*] Are there any other changes to Medicaid/CHIP that we should know about?
    a. Is there community outreach about new coverage options in your area, like expanded Medicaid [if relevant] or the new Health Insurance Marketplaces?

Overview of Awardee Patient Population and Sites

5. Let's discuss the care typically provided before Strong Start. What is the typical staffing model?
6. Besides maternity services—which we'll discuss next—what other types of health care or other services do the sites provide?
7. Have any of your sites received—or are they actively pursuing—recognition as a patient-centered medical home (PCMH) by the National Committee for Quality Assurance (NCQA) or a similar entity? Please describe.
8. How would you describe the volume of pregnant patients at the sites—high or low?
    a. About how many births do the sites see, annually? (Your best guesses are fine.)
    b. What proportion (roughly) of patients has a high-risk pregnancy?
9. Please describe the pregnant patient population at your sites, in terms of socioeconomic status, race/ethnicity, health status, citizenship, age, and insurance coverage.

10. At what stage of pregnancy do most patients first present themselves for a prenatal visit?
    a. If later than first trimester, why not sooner?
11. What challenges do the sites encounter in caring for their pregnant patient population?
12. Were you tracking birth outcomes (preterm, low birth weight, etc.) prior to Strong Start?
13. Putting Strong Start-related changes aside for the moment, in recent history have there been any major changes to the way your sites deliver maternity care? These can be internal or external changes.

Strong Start Program Implementation

14. How would you describe your Strong Start model of care?
    a. What are the key components of the model?
    b. How often are enhanced service delivered, and in what setting?
    c. Which providers or other care team members are involved?

    [Additional questions if enhanced services include peer support]:

    d. How are peer supports selected and trained? What are their qualifications?
    e. [If there are multiple peer supports available] How are peer support relationships determined? Please describe any efforts to "match" women with a specific peer for support.
    f. What materials or tools do peer supports have available for use during the encounter? How were these created? Are they used consistently?

    [Additional questions if enhanced services include Group Prenatal Care or other group activities]:

    g. How did you choose a curriculum? [Note that most but not all group care models have opted to use the Centering Healthcare Institute approach and curriculum.]
    h. [If using the Centering approach] How closely do your sites adhere to the Centering curriculum? For instance, have you added or eliminated any sessions? Have you made any other adaptations?
    i. [If not using the Centering approach] Tell me about your curriculum. How many sessions are there and what is covered during each? Who facilitates the groups?
    j. [If more than one person facilitates a group] How do co-facilitators coordinate with each other and divvy up responsibilities?
    k. How are women assigned to groups?
    l. How many Strong Start participants are there per group, on average?
    m. What is the average group attendance rate—high, low, or moderate?

    [Additional questions if enhanced services include care coordination or referrals]:

    n. How are care coordinators or care navigators selected and trained?
    o. How do providers at your sites communicate or share information about Strong Start patient care with other providers, both health care and social service providers? How often does communication occur? Is there a designated 'care team' and who is on it? How does the electronic medical record (EMR) factor into communication, if at all?
    p. If your approach involves creating a care plan, how is it created and used?

q. What follow-up steps—if any—do sites take to determine whether Strong Start participants access the services that are referred?
r. How are linkages to community-based resources made?

15. What changes were required in order to implement Strong Start enhanced prenatal services? How would you describe the level of effort that these changes entailed?
16. Please describe your implementation timeline. How long did it take between receiving the Strong Start award and actually enrolling your first participant?
    a. Did it take more or less time than anticipated? Why?
17. How are sites reimbursed for the Strong Start services they provide?
    a. How do Strong Start payments compare to the Medicaid/CHIP reimbursements sites receive for providing prenatal care?
18. How have sites responded to their new roles and responsibilities?
19. In the area(s) where your sites operate, are you aware of any other providers offering enhanced prenatal services like what is provided under Strong Start? Please describe.
20. Are any of your sites providing enhanced prenatal services that are like the other Strong Start models (but that aren't being funded by Strong Start)?
21. A moment ago, you described the demographics of the pregnant population your sites serve. Is this also how you would describe your Strong Start population?
    a. Are there any key differences?
    b. Has the Strong Start program attracted new or different patients to your site?
22. When determining eligibility for Strong Start, how is preterm birth risk assessed?
    a. If a specific form or tool has been created, can you provide the case study team with a copy?
    b. Have you made any adjustments to the risk assessment process? Please describe?
    c. Which risks are most prevalent?
23. Please describe how patients are enrolled in Strong Start, and any changes you have made to your enrollment process (including reasons for the change).
24. What proportion (roughly) of eligible patients chooses to participate? What are your thoughts on why patients choose to (or choose not to) participate?
    a. What could help encourage reluctant patients to participate in Strong Start?
25. Are you (or any of your sites) doing direct outreach to potential Strong Start enrollees? Please describe.
    a. How successful have these outreach methods been, so far?
26. Why do pregnant patients drop out from Strong Start before the intervention has been completed?
    a. What could help keep patients enrolled in Strong Start?
27. Please describe any technical assistance you've received from external organizations while implementing Strong Start.
    a. Are you satisfied with the help you have had?

28. Is Strong Start being implemented similarly across all the sites involved in your program?
    a. What are the key differences in implementation across sites?
    b. What steps (if any) have you taken to ensure consistent implementation across sites? (Probes: trainings/re-trainings, site visits or frequent check-ins)
29. How frequently do you communicate with your sites, and by what means? Do sites communicate with each other, for instance about implementation challenges and best practices?

Strong Start Program Outcomes

30. What are your impressions of how the Strong Start enhanced services are affecting the physical health of Strong Start enrollees? The psycho-social health of enrollees?
31. What evidence have you collected or seen to date that the health of mothers and newborns is better or worse? We are interested in anecdotes as well as any data you've collected or analyzed.
32. In your opinion, which of the Strong Start enhanced services provided by your sites have the greatest impact or potential impact on improving maternal and infant outcomes? Why?
33. Do you expect (or have you seen) any other positive or negative consequences, either for patients or for the sites themselves? Any unintended consequences? Please describe.

Lessons Learned and Best Practices

34. What do you think has worked well in implementing Strong Start?
    a. Have you identified any particular features of your sites that have made implementation easier? What have been the key factors in your success?
35. Do you have any advice for CMS if they decide to implement Strong Start with other health care providers?
    a. What would you like CMS to do differently?
    b. Do you need more hands-on technical assistance or clearer guidance/instructions/rules? What learning sessions would you like to have?
36. Do you have any thoughts you'd like to share specifically about the evaluation?
37. Do you have any final thoughts about Strong Start that you'd like to share?

Year Two Interview Guide

Strong Start Implementation – Changes and Updates

1. We'll get into some more specific program areas in a moment, but first—how would you say Strong Start implementation has been going, overall? What would you say are some of the biggest "highlights" (or "lowlights") from this last year that you'd like to share?
    a. Are you satisfied with your progress, or not? Why?
2. Is your role in the Strong Start program still [*Fill in*]? If your role or responsibilities have changed since we last spoke with you, please explain.
3. Have there been any other changes to the way the Strong Start program is administered (e.g., organizations affiliated with the award, personnel changes not already mentioned)?
    a. [If yes] What were the changes and what prompted them? What influence, if any, has it had on overall program operations?
4. Do [*Fill number*] sites still participate in Strong Start?
    a. Have any sites joined or exited the program?
    b. [If yes] What prompted this addition/exit?
5. Do the sites still provide [*Summarize enhanced prenatal care services*] under the Strong Start program? [*Clarify site-specific variations in Strong Start services if necessary.*] Have there been changes to the content or scope of sites' Strong Start services?
    a. [If yes] What were the changes, and why did you make them?
    b. What has been the result of this change?
6. Have there been any particular changes to how sites provide breastfeeding support to Strong Start enrollees? How about family planning services—are there any noteworthy changes to how these services are incorporated (or not) into your Strong Start intervention?
    a. [If yes] Are you able to effectively track and follow-up on those referrals? Why or why not?
7. Have you made any adjustments to your community outreach or Strong Start marketing approach?
    a. [If yes] Why did you make this change?
    b. What has been the result of this change?
8. How do you think your sites' methods for identifying eligible patients are working? Please explain.
9. Are you using the same eligibility criteria for Strong Start, and enrolling patients who show the following risk factors: [*Fill with risk criteria*]?
    a. [If criteria changed] Why did you make this change? Was it in response to changes in CMMI requirements issued in summer 2014?
    b. What has been the result of this change?

10. Are you actively seeking out and enrolling patients in their third trimester of pregnancy?
    a. [If yes] How (if at all) is the scope or content of Strong Start services different for patients who enroll in their third trimester, compared to those who enroll earlier?
11. Do you still use an [*Fill opt-in/opt-out*] enrollment approach for Strong Start? Have you changed the guidelines for sites in terms of how they can enroll patients in the program?
    a. [If approach changed] Why did you make this change? What has been the result?
12. How do you think your sites' methods for enrolling eligible patients are working?
    a. Are you encouraging your sites to enroll patients with "pending" Medicaid or CHIP applications?
    b. Are sites using incentives to boost enrollment? How are these funded?
    c. How often do women decline (or opt out of) enrollment in Strong Start? What are the reasons?
13. How have sites done in terms of retaining Strong Start participants until the intervention is completed? Has retention improved?
    a. Are there particular persistent reasons why participants drop out (or are lost to follow-up) of Strong Start?
14. Have you promoted any new retention strategies among your sites, in an effort to keep patients enrolled and actively participating in Strong Start? Please describe.
15. Have you used text messaging or social media to promote Strong Start, either as a recruitment tool or to engage and retain current enrollees? (Please describe) Has this approach been effective?
16. How would you describe the continuity of maternity care for Strong Start enrollees? Do they see a consistent set of providers throughout the prenatal, delivery, and postpartum periods?
    a. How does this affect patients' overall care experience?

[Questions for Maternity Care Home awardees/sites]

1. Have there been any changes made to the roles and responsibilities of care coordinators in the past year? What are care coordinators' main responsibilities, currently?
2. Have care coordinators' caseloads grown with program enrollment? Are current caseloads manageable?
3. Do your care coordinators still have the following qualifications and credentials: [*Fill in*]?
4. Do you think these are appropriate qualifications for a Strong Start care coordinator? Why or why not? What other types of qualifications might be beneficial?

[Questions for Group Prenatal Care awardees/sites]

5. How many of your sites (if any) have been "approved" as Centering Healthcare Institute (CHI) sites? How many of your sites (if any) are working towards approval?
    a. [If not approved or working towards it] What are the reasons behind sites' decisions not to seek CHI approval?

6. [If not following CHI approach] How does your Group Prenatal Care program deviate from CHI protocols? Please describe the reasoning behind these deviations.
7. Do the sites' Group Prenatal Care cohorts include patients of different coverage types (e.g., privately-insured and Medicaid-insured in one group)? What are the advantages and disadvantages of this approach?
8. What influence has the Group Prenatal Care schedule had on sites' overall clinic schedule? For instance, have you observed any "downstream" effects of group scheduling, such as increased appointment slots for gynecology or other non-prenatal care services?

[Questions for Birth Center awardees/sites]

9. [For AABC] AABC made a deliberate decision to provide Birth Centers with significant flexibility when implementing Strong Start's peer counselor component, e.g., giving sites the option of hiring from within or not, allowing sites to determine the qualifications of their peer counselor. At this point in the award period, what do you think of that approach? Why?
    a. Does it matter whether a peer counselor or navigator is a true "peer" of Strong Start enrollees (e.g., sharing the same demographic or other characteristics)? What influence does this have on service delivery? Please explain.
10. More generally, which risk factors would exclude a patient from Birth Center care and/or delivery?
    a. Do you consider overweight (distinguished from obese) women ineligible for Birth Center care?
    b. Do you consider women with substance abuse problems ineligible for Birth Center care? What about women who smoke cigarettes?

Strong Start Program Outcomes

11. What are your impressions of how the Strong Start enhanced services are affecting the physical health of Strong Start enrollees, both during pregnancy and after delivery? What about the psychosocial health of enrollees?
    a. Which maternal and newborn health outcomes do your Strong Start enhanced services have the greatest potential to influence?
12. How are patients responding to the Strong Start enhanced services?
13. Have you observed differences in outcomes between Strong Start patients and similar women not enrolled in Strong Start?
14. Have you extended any Strong Start enhanced services to other (non-enrolled) patients? Please describe.
15. What effects—positive or negative—has Strong Start had on prenatal care providers?

Lessons Learned, Best Practices, and Sustainability

16. At this point in program implementation, what top two or three elements of your Strong Start program would you say have had the biggest effect, in terms of improving care for pregnant Medicaid and CHIP beneficiaries?
    a. What parts of your program are you most proud of?
17. What program area(s) could use the most improvement?
    a. Based on what you know now, what might you have done differently?
18. Do you think Strong Start will be sustained after the award period is over? Why or why not?
    a. What plans have you made (if any) with regard to sustainability?
19. Do you have any thoughts you'd like to share specifically about the evaluation?
    a. How have you incorporated evaluation-related activities into your work?
    b. Have you used any of the evaluation products (e.g., awardee-level PLPE reports, case study memos) at all? Please explain.
20. Do you have any final thoughts about Strong Start that you'd like to share?

Year Three Interview Guide

Interviewee/Awardee Background

1. Is your role here still [*Fill in*]? Please tell us about any changes in your position or responsibilities.
2. We understand that you are implementing the [*Maternity Care Home/Group Prenatal Care/Birth Center*] approach in [*fill number*] sites, and your Strong Start intervention includes [*summarize in 2 or 3 sentences based on previous years' memos*]. Is this right?
    a. Have there been any major changes to your intervention (e.g., adding/eliminating sites, adding or changing approach)? Please describe.
    b. Have there been any significant changes to your organization or to the management of the Strong Start award?

Strong Start Program Outcomes

3. Which maternal and newborn outcomes do you think your Strong Start program has influenced? For instance, let's discuss:
4. Preterm Births: Through *[Fill participant-level data time period], [Fill data point from participant-level data]* percent of Strong Start births were preterm (prior to 37 weeks).
    a. Does this sound right to you?
    b. Are you satisfied with this rate? Why, or why not?
    c. Do you think Strong Start services have influenced these rates? Which ones, and how?
    d. Are there other, non-Strong Start services you/your sites provide that might be influencing this outcome? Please explain.
5. Low Birth Weight: Through [*Fill participant-level data time period], [Fill data point from participant-level data*] percent of babies born to Strong Start participants had a low birth weight (<2500 grams).
    a. Does this sound right to you?
    b. Are you satisfied with this rate? Why, or why not?
    c. Do you think Strong Start services have influenced these rates? Which ones, and how?
    d. Are there other, non-Strong Start services you/your sites provide that might be influencing this outcome? Please explain.
6. Breastfeeding: Through *[Fill participant-level data time period], [Fill data point from participant-level data]* percent of Strong Start participants were breastfeeding after delivery (according to postpartum data) and [*Fill*] percent were not. [*Fill*] percent who planned to breastfeed reported that they were doing it.
    a. Does this sound right to you?
    b. Are you satisfied with this rate? Why, or why not?
    c. Are you satisfied with how breastfeeding outcomes compare to women's intentions? Why or why not?

d. Do you think Strong Start services have influenced these rates? Which ones, and how?
e. Are there other, non-Strong Start services you/your sites provide that might be influencing this outcome? Please explain.

7. Delivery: Through [*Fill participant-level data time period*], [*Fill data point from participant-level data*] percent of your Strong Start births were vaginal and [*Fill]* percent were by C-section. Of participants who said they planned a vaginal birth, [*Fill*] percent had one.

    a. Does this sound right to you?
    b. Are you satisfied with the rates of various delivery methods? Why or why not?
    c. Are you satisfied with how delivery outcomes compare to women's intentions? Why or why not?
    d. Do you think Strong Start services have influenced these rates? Which ones, and how?
    e. Are there other, non-Strong Start services you/your sites provide that might be influencing this outcome? Please explain.

8. Family planning: Through [*Fill participant-level data time period*], [*Fill data point from participant-level data]* percent of Strong Start participants had birth control counseling after delivery and [*Fill*] percent did not.

    a. Does this sound right to you?
    b. Are you satisfied with this rate? Why or why not?
    c. Do you think Strong Start services have influenced this rate? Which ones, and how?
    d. Are there other, non-Strong Start services you/your sites provide that might be influencing this outcome? Please explain.
    e. Do you think that birth control counseling or other family planning care has had an influence on the inter-pregnancy interval (birth spacing) for subsequent pregnancies among Strong Start participants? Why or why not?

9. What aspects of your prenatal care approach may be reducing Medicaid costs (if any)?
10. Anecdotally, what are your views on the economics of your Strong Start approach? Are there savings, or only costs? Is there a return on investment, and for whom?

    a. Do you have any data that supports your impressions?

Program Enrollment and Outreach

11. Are you making progress toward meeting revised enrollment goals? Why or why not?
12. As we begin our analysis of impacts, we want to explore the extent to which any selection bias may exist surrounding your program's enrollees. Specifically, can you tell us about patients who are offered the program but decline to enroll?

    a. How often does this happen (i.e., proportion of women who decline)?
    b. For what reasons do they decline?
    c. Does there seem to be any consistent 'type' of patient who is more likely to agree vs. decline to participate?

13. Are there patients who you are missing, who are eligible but not enrolled—why?

14. [Keep if awardee's data shows at least 10% are enrolled at 29 weeks gestation or later] Based on your quarterly program monitoring reports, through [*Fill participant-level data time period*], around [*Fill*] percent of participants have been enrolled in the third trimester.
    a. How does late entry into Strong Start influence the intervention and its ability to have an impact?
15. Ideally, how would you handle enrollment processes to ensure more robust enrollment and a healthy-sized program?

Strong Start Program Services and Features

16. To what extent have you used social media in your Strong Start intervention?
    a. For example, have you used it to market Strong Start, link patients to one another (for support), remind women of appointments, etc.?
    b. What have been the advantages/disadvantages of social media for Strong Start?
17. Do your sites use an electronic medical record system? If so, to what extent has Strong Start service delivery been incorporated into this system?
    a. For instance, has it been used to identify eligible participants for enrollment, to identify needs or patterns among women enrolled in Strong Start, or as a way for Strong Start staff to communicate with providers?
    b. If it has not been used as tool for Strong Start, why not? What could be done to make the system more accessible?
18. How (if at all) have you used incentives to modify behavior? We are interested in both incentives for participants (to encourage enrollment and keep them engaged) as well as incentives for providers (for referrals to the program, for instance).
    a. Did the incentives achieve their purpose, or not? If not, why not?
    b. What resources were you able to use to support incentives?
19. We are trying to learn more about Strong Start sites' use of 17P (17-alpha-hydroxyprogesterone caproate) to prevent preterm births. Does 17P administration play a role in your Strong Start intervention? Please describe.
    a. Based on your participant-level data, through *[Fill participant-level data time period]* around [*Fill]* percent of participants with a history of preterm birth had received 17P treatment during their pregnancy. Does this reflect your experience? Please explain.
    b. Is Medicaid/CHIP reimbursement an issue? How about patient compliance?
20. We reviewed your participant-level data on family planning counseling earlier, and now we have a few more questions about how family planning fits into Strong Start. Do you think that the Strong Start approach meets these needs more effectively than traditional prenatal care? If so, how?
    a. At what point during prenatal or postpartum care is family planning discussed?
    b. Which methods are offered (e.g., oral contraceptives, the birth control patch, injections [Depo-Provera], long-acting reversible contraception [also called LARCs, including IUDs or implants], tubal ligation)?

c. How do patients select a method?
d. Are certain methods encouraged or discouraged? If so, why?
e. Have you observed any contraceptive access barriers? For instance, can LARCs be placed at hospital following delivery? Does Medicaid cover the full range of contraceptive options?

21. Evaluation data have revealed that women enrolled in Strong Start experience notably high rates of depression. Based on participant level data you've submitted, through *[Fill participant-level data time period*], *[Fill*] percent exhibited depressive symptoms at intake.

    a. Does this sound right to you?
    b. To what extent does your Strong Start intervention address depression?

22. We would like to learn more about the training, qualifications, and turnover among your Strong Start staff. Now with 2+ years of program experience, what have been the advantages and disadvantages to the staffing decisions you made?

    a. Has Strong Start staff had adequate training? What could improve? What works best?
    b. Is the mix of skills necessary to be successful at Strong Start service delivery easy or difficult to find in the workforce? What are the implications for replicating your approach in other communities?
    c. Do your Strong Start staff qualifications facilitate/hinder getting Medicaid reimbursement for enhanced prenatal care services?
    d. Has Strong Start staff turnover had an impact on enrollment or operations? How has this been addressed?
    e. Has your team "cross-trained" to ensure turnover doesn't impact the program work?

Model-Specific Questions

[Maternity Care Home-Specific Questions]

23. How do referrals from care managers differ from the referrals a prenatal care provider might give during a typical OB visit?
24. Has the care manager had an impact on the practice/office functioning? On prenatal care providers' efficiency?
25. Does the care manager know (or do anything in particular to find out) if women use the services they are referred to? Do they have a system for monitoring and following up?
26. How do care managers help prepare participants for discussions with their prenatal provider?

[Group Prenatal Care-Specific Questions]

27. Have there been any persistent challenges securing appropriate space for group sessions?
28. Do you allow children to attend group sessions if a woman does not have childcare options?
29. Are you using a specific Group Prenatal Care curriculum (e.g., *CenteringPregnancy*)?
30. [If awardee uses Centering approach] Does your model depart from *CenteringPregnancy*? In what ways? Why?
31. [If awardee uses something other than Centering] How did you decide on a curriculum?

[Birth Center-Specific Questions]

32. How do the referrals, education, and support provided by peer counselors differ from the services midwives provide?
33. Has the peer counselor influenced Birth Centers' functioning? Midwives' efficiency?
34. Does the peer counselor know (or do anything in particular to find out) if women use the services they are referred to? Do they have a system for monitoring and following up?
35. [For AABC] Do you track whether participants are using AABC's Strong Start Facebook page? Any feedback or elements most utilized?
36. [For AABC] Do you track whether participants are using the AABC Maternity Care Guide? Any feedback or elements most utilized?
37. [For AABC] Are participants completing AABC's Maternity Care Surveys? Tell us about any survey results you've received—what were they, and how have they been used?

Overcoming Barriers to Care

38. To what extent has lack of transportation presented barriers to your clients seeking prenatal care? How have you specifically tried to address this challenge? Has it worked?
39. To what extent has lack of childcare presented barriers to your clients seeking prenatal care? How have you specifically tried to address this challenge? Has it worked?
40. Has communicating (keeping in touch) with Strong Start patients been a challenge? How have you specifically tried to address this challenge? Has it worked?
41. Could the Strong Start intervention be adjusted to better address these barriers?

Provider Relations

42. What role do obstetrical care providers play in your Strong Start program?
    a. What kind of involvement and/or support is needed from them to successfully conduct the intervention?
43. What concerns, if any, have providers had about implementing Strong Start?
44. Have you developed any strategies to foster provider engagement? Please describe.
    a. How can providers be convinced that Strong Start services are valuable?
    b. How can providers be convinced to change practice patterns to incorporate enhanced prenatal care?
45. To what extent have you involved medical residents in your Strong Start program? How has that worked?
    a. Have you identified any successful ways to involve residents?
    b. Has involving residents presented any particular challenges?

Sustainability and Replicability

46. Are you planning to sustain your Strong Start program?
    a. Which aspect(s) are you particularly interested in sustaining?
47. Tell us about any progress you've made in planning for program sustainability.
    a. What funding avenues have you explored, or do you plan to explore?
    b. What kind of feedback are you getting?
48. To what extent have you explored Medicaid reimbursement (or enhancements to Medicaid reimbursement) to support Strong Start in the future?
49. What current Medicaid policies either facilitate or hinder sustainability?
    a. Are there policies or practices of Medicaid managed care organizations that present particular opportunities or barriers to sustainability?
50. Is successful implementation contingent on women entering program at certain point in pregnancy? Please explain.
    a. What would sustainable intervention look like for someone who enters prenatal care late? Is it even feasible?
51. Will sustaining the program be easier when you are no longer required to submit program and evaluation data, after the award period is over? Please explain.
52. Have program or evaluation data been useful in supporting program operations and development? In obtaining funding to sustain Strong Start-type services?
53. What Strong Start care elements or lessons can be applied to other types of care (beyond prenatal care) such as primary care, chronic disease management, and so on?

Wrap-Up

54. What are the key differences between Strong Start-enhanced prenatal care and other "traditional" prenatal care being delivered in the area?
55. If Strong Start is not sustained, what kind of care will pregnant women with Medicaid/CHIP get in its absence? In other words, what are they losing?
56. How are you winding down Strong Start services? What is your schedule for completing the demonstration?
57. Looking back at your experiences to date, what have been the most important lessons you've learned about "what works" in improving prenatal care and birth outcomes?
58. Looking back, what have been the most persistent challenges you've faced in improving prenatal care and birth outcomes? What have you succeeded in overcoming, and what challenges have not been overcome?
59. Anything else?

Year Four Interview Guide

Current Status and Sustainability

1. First, please update us on the current status of your Strong Start award.
    a. When did/will enrollment end?
    b. Are any participants still receiving services? If so, how many?
    c. When [month/year] did/will the last Strong Start deliveries occur?
    d. When did/will you submit the last data you have for the evaluation (forms and surveys)?
2. Could you please update us on your plans for sustaining Strong Start after the award period is over? Last year, you told us *[Summarize sustainability plans from Year 3 memo, in one or two sentences.]*
    a. Which enhanced services will you sustain, if any?
        i. Which sites will offer the services?
        ii. Which population(s) will receive the services?
        iii. Who will deliver the services?
        iv. Are you making any [other] modifications to the way services are structured?
    b. Are there any elements of Strong Start *data collection* that you plan to continue?
        i. For example, using the Intake form as an initial risk assessment?
    c. [*If relevant*] How will you fund the services/additional data collection?
3. *[If relevant*] If you are <u>not</u> planning to sustain Strong Start enhanced services or data collection, which factors have most influenced this decision?
    a. For example, lack of funding or lack of provider or administrator support? Or have you determined that Strong Start services were not effective?

Replicability

4. Beyond the sustainability of your own program, we'd like your thoughts on whether a Strong Start program like yours could be replicated on a larger scale. First, do you think a program like yours *should* be replicated? Why or why not?
5. We're interested in which factors you think are most important when it comes to successful program replication, based on your experiences implementing Strong Start at various sites. These factors could be related to the specific way you implemented your Strong Start intervention, or they might be related to the environment in which your sites are operating. As we explore these different factors, we'd like you to consider whether your program can be replicated in other parts of your state or the country, or in settings that are not like yours.
    a. First, at the <u>practice level</u>, which factors make a difference in whether a program like Strong Start succeeds?
    b. At the <u>provider level</u>, which factors make a difference?
    c. At the <u>patient level</u>, which factors make a difference?

d. Finally, at the community or policy level, which factors make a difference?
e. Are there other factors we haven't mentioned that you feel are important?

6. Have you seen any evidence that enhanced prenatal care programs like Strong Start are becoming more prevalent in your area? Please explain.

Program Outcomes

7. Last year during our interviews with you and your Strong Start team, we spent a lot of time discussing specific program outcomes. Your team told us: [*Summarize perceptions of impacts on outcomes from Year 3 memo, in a few sentences.]* Does this still seem right to you? Do you have anything to add about whether and how your Strong Start program has influenced maternal and newborn outcomes?
    a. [*If relevant*] Do you have any specific evidence of this impact, or is it more of a gut feeling?
        i. [*If evidence indicated]* What is the evidence? Can you share it with us?
    b. [*If relevant]* Which parts of the program do you think are most responsible for the improvements in outcomes you just discussed?
8. [*If Strong Start services have ceased*] Have you observed any changes in maternal and newborn outcomes among your Medicaid/CHIP patient population since you stopped offering Strong Start services? Please explain.
    a. Do you have any specific evidence of changes, or is it more of a gut feeling?
        i. [*If evidence indicated]* What is the evidence? Can you share it with us?
9. Do you think your Strong Start program has resulted in any cost-savings? If so, where do you think those savings come from? How exactly did Strong Start services contribute to these savings?

Program Features

[For Maternity Care Home awardees/sites]

10. Do Maternity Care Home participants see the same prenatal care providers at each visit? Do the same providers that provide prenatal care also attend the deliveries of the participants? Do they provide their postpartum care?
    a. If not, which providers attend deliveries? Which providers are responsible for postpartum care?
        i. Do patients have a prior relationship with these providers? When does the transfer of care occur?
    b. Do you think having provider continuity—meaning a consistent provider throughout pregnancy, delivery, and postpartum—makes a difference in patient outcomes or patient experience?
    c. Has Strong Start in any way influenced or improved provider continuity?

11. A common feature of Strong Start Maternity Care Homes is adding a "care manager" to the traditional prenatal care approach, but we found that the qualifications of these "care managers" vary from one awardee to the next. Considering your experiences, which qualifications do you think are most important for a prenatal "care manager" to be effective?
12. The Strong Start Maternity Care Home awardees have taken different approaches to "care manager" encounters, both in how often these encounters occur and in whether they are in-person or by some other means (e.g., telephone or text message). Our understanding is that your "care managers" [*Summarize encounters based on Y1-Y3 memos, in one to two sentences. Include average number or range of encounters and whether encounters were in-person, by phone, or text/email.*] In hindsight, would you make different decisions about how you structured the "care manager" encounters? Please explain.

[For Group Prenatal Care awardees/sites]

13. Do the same providers that participate in Group Prenatal Care sessions also attend the deliveries of the group participants? Do they provide their postpartum care?
    a. If not, which providers attend deliveries for Group Prenatal Care members? Which providers are responsible for their postpartum care?
        i. Do group members have a prior relationship with these providers? When does the transfer of care occur?
    b. Do you think having provider continuity—meaning a consistent provider throughout pregnancy, delivery, and postpartum—makes a difference in patient outcomes or patient experience?
    c. Has Strong Start in any way influenced or improved provider continuity?
14. Either before or during Strong Start, did you reach out to the Centering Healthcare Institute (CHI) for technical assistance or guidance on implementing Group Prenatal Care? If yes, please explain.
    a. Did you think this made a difference in your implementation success? Why/why not?
15. Most Strong Start Group Prenatal Care awardees have followed CHI's *CenteringPregnancy* model to some degree. Considering your experiences, which aspects of the Centering model do you think are most important to "keep" when implementing Group Prenatal Care, and which ones can be modified and still allow for successful program implementation?

[For Birth Center awardees/sites]

16. We are asking awardees and sites about provider continuity throughout prenatal, labor and delivery, and postpartum care. How would you describe continuity in the Birth Center model?
    a. What role, if any, does provider continuity play in women's decision to choose Birth Center care?
    b. Has Strong Start in any way influenced or improved provider continuity?
17. We found that the qualifications of peer counselors/navigators varied from one Birth Center site to the next. Considering your experiences, which qualifications do you think are most important for a prenatal peer counselor to be effective?

18. Birth center sites have also taken different approaches to peer counselor/navigator encounters, both in how often these encounters occur and in whether they are in-person or by some other means (e.g., telephone or text message). Our understanding is that your peer counselor/navigator(s) [*Summarize encounters based on Y1-Y3 memos, in one to two sentences. Include average number or range of encounters and whether encounters were in-person, by phone, or text/email.*] In hindsight, would you make different decisions about how you structured the peer counselor/navigator encounters? Please explain.

[For all awardees/sites]

19. We're trying to learn more about the use of aspirin treatment for women at risk for pre-eclampsia during pregnancy. What role, if any, does aspirin play in your prenatal care approach?

Lessons

20. Looking back at the last three years, which part of your Strong Start program are you most proud of?
21. What was the most challenging aspect of Strong Start implementation?
    a. Were you able to overcome this challenge? If yes, how? If not, why?
22. If you had to identify a single factor that had the biggest impact on how well your Strong Start program worked, what would it be? Would you do anything differently?

APPENDIX C: QUALITATIVE CASE STUDY – CASE STUDY INTERVIEWS CONDUCTED IN YEAR 5

QUALITATIVE CASE STUDY: SUMMARY OF FINDINGS FROM SOUTH CAROLINA MEDICAID INTERVIEW

The Strong Start evaluation team interviewed representatives from the South Carolina (SC) Department of Health and Human Services (DHHS) in May 2018 as part of a special study of the barriers to Group Prenatal Care (GPC)/*CenteringPregnancy* (CP) and solutions to overcome them. Table C. 1 summarizes the interview findings by topic.

TABLE C. 1: SUMMARY OF FINDINGS FROM SOUTH CAROLINA MEDICAID INTERVIEW

Interview Topic	Summary of Findings
Billing and payment for GPC prior to enhanced payment	A total of 85-90 percent of Medicaid births and most obstetrical care are through managed care (MC) capitated arrangements. SC uses a standard rate setting methodology, with a couple of nuances: births are not included in the risk calculation of the child bearing population, and every birth triggers a kick payment to the Medicaid managed care organization (MCO) to address risk transfer; and there is a target mix of C-section vs. vaginal births that in the rate setting methodology. Until recently, GPC was not a covered benefit. If a GPC service was billed, it would not be reimbursed. Providers were just billing for traditional prenatal care.
Evolution of enhanced payment	"Phase 1": Believing that the evidence around GPC was not sufficiently robust to obtain buy-in from MCOs, SC created a financial incentive to steer members to GPC. SC issued payments through incentive authority rather than articulate GPC as part of the capitation rate; there was a quarterly pay-up, at a rate of 25% as a pass through. "Phase 2": With the 2017 Medicaid managed care Final Rule preventing states from increasing or adding direct pass-through payments to providers contracted to MCOs, along with greater acceptance in the MCO community of the GPC model, adding GPC to the standard rate setting made the most sense. Building GPC into the rate protects integrity of the model and reimbursement without being "heavy handed." In other words, SC created a mechanism for GPC to be paid under the FFS system, even though small percentage of deliveries are through FFS. Adding GPC to the Policies and Procedures Manual as a FFS procedure meant that MCOs must cover it, and secured compliance with the Final Rule (no longer a pass through/incentive). The provider reimbursement component is based on the standard network agreement between MCO and provider office. Under the "Phase 1" incentive, they were getting $30/visit up to $150 (i.e., 5 visits); now $30/visit up to $300 (i.e., 10 visits). Also, one MCO (BCBS' Blue Choice plan) initiated a retention bonus for their physicians of $175 for each patient verified as attending 5 group sessions.
Determining the enhanced payment	The actuaries used a utilization pattern that trended off current utilization and assumptions of likely trajectory based on trends and the availability and access to the GPC model that is spreading throughout the state, and the need to train additional sites, etc. Savings projections have not been incorporated in rates. The actuarial processes do not have any appreciation for future savings that can be derived from those costs, like smoking cessation, or immunizations, if it is outside the actuarial benefit window of 12 months. In the scheme of a $3 billion overall MCO spend, even though there is an appreciable amount of dollars related to GPC/savings, it doesn't compare to the magnitude of other things.
Promoting GPC beyond the enhanced payment	Since Medicaid can draw down the federal match, SC developed an administrative contract between DHHS and Greenville Health System (GHS) as a consultant. This laid out the expectations of how SC would expand GPC throughout the state, at what rate, and how a practice would apply to become a Centering site. Representatives of GHS, the March of Dimes (MOD), the Centering Healthcare Institute (CHI) and the Birth Outcomes Initiative (BOI, a multi-stakeholder collaborative aimed at improving birth outcomes in South Carolina) reviewed a site's application, and GHS would provide the technical assistance to get it up and running. The contract included the startup costs for each practice, including the $35,000-40,000 for a site to become certified by the Centering Healthcare Institute (CHI). Generating the interest was not that difficult, but convincing physicians that it would be better for patients was a bit harder, because they did not have a lot of data at that time. Clemson University is now under GHS contract to evaluate more data. Ten sites were included in the first 3 years (2013-2016). Then in 2016 when the contract was renewed, emphasis was not on the number of new practices, but on providing additional TA to practices that were up and running and had staff turnover. There was funding for 5 new sites, and they have already received applications and approved all 5. They were also able to open the opportunity to more than just the practices that GHS could support, because of CHI interest in SC, and have also provided additional financial support for other practices to open in the state. At end of 2018, there will be about 24 practices with CP. A lot of this work has been centered around the direct energies of Dr. Amy Crockett (GHS) and the networking of the BOI.
Uptake of GPC	The University of South Carolina's Institute for Families in Society conducted formalized studies of deliveries after GPC vs. routine prenatal care, and the state's dashboard/analytics is tracking GPC, LARCS, and C-sections. In 2013-2016, about 2,000 women enrolled in SC Medicaid were in GPC, of 30,000 births annually. This is viewed as close to their maximum potential, as practices that want to provide CP are already doing so. If others express interest, they would be referred to CHI for assistance.

Interview Topic	Summary of Findings
Feedback regarding enhanced payment	When SC changed the program in 2016/2017 via FFS rates, and increased the coverage from 5 to 10 visits, they were recognizing what it takes for the physician. No physicians have said to the state that the reimbursement is not enough. Providers are "absolutely thrilled" at the convenience of 8-10 patients in a group at a time. Patients are happy also—they get to talk as much as they want, get to socialize, and have a 6-week postpartum get together where moms come back with babies. There is a lot of positive feedback on both sides, from providers and patients.
Sustainability	SC is not planning any changes to the current FFS-based payment model for GPC, which is viewed as necessary for sustainability. CHI certification lasts for 3 or 5 years, a good period of time, and it is hoped the practices will want to be recertified because they are happy with the results and the income they get from GPC.
Results	It is a "work in progress" to get physicians engaged, because the substantial cost savings are to the payer—Medicaid, MCOs, BCBS. They have seen a 36% reduction in preterm births, 44% reduction in low birth weight (LBW), and 28% reduction in NICU admissions. GPC has also shown positive results in terms of health disparities. Data for African Americans is extremely positive for outcomes and does not show the usual disparities.

QUALITATIVE CASE STUDY: SUMMARY OF FINDINGS FROM DR. AMY CROCKETT INTERVIEW

The Strong Start evaluation team interviewed Amy Crockett, MD, MSPH, a South Carolina (SC) Maternal-Fetal Medicine specialist and champion of SC Medicaid's enhanced reimbursement for *CenteringPregnancy* (CP) program in May 2018 as part of a special study of the barriers to Group Prenatal Care (GPC)/CP and solutions to overcome them. Table C. 2 summarizes the interview findings by topic.

TABLE C. 2: SUMMARY OF FINDINGS FROM DR. AMY CROCKETT INTERVIEW

Interview Topic	Summary of Findings
Background and involvement in program	Dr. Crocket had a funding opportunity from the March of Dimes (MOD) to do GPC start-ups in 2008. She is also the clinical lead for the Birth Outcomes Initiative (BOI)[72], and the Medical Director of Greenville Health System (GHS), a large outpatient group practice in Greenville, SC, serving medically underserved patients. There are 3-4 CP groups per month at that practice. The first few years of MOD projects were funded for training and materials on an annual basis ("hand-to-mouth"). An evaluation found substantial reductions in preterm birth and racial disparity. In 2011, Dr. Crockett approached the South Carolina (SC) Medicaid Director with the findings, and he decided to do a Medicaid demonstration to expand access to CP.
How the program works	Built under the BOI, SC looked to leverage GHS' experience to expand access to CP, with GHS providing training, technical assistance (TA), and evaluation. SC Medicaid provides enhanced reimbursement to practices; SC requires the CP model, and contracted with the Centering Healthcare Institute (CHI) because the model is evidence-based. In the first year, SC paid $200 per CP patient to the Medicaid managed care organization (MCO), with $150 meant to be passed to the practice. Basic Excel spreadsheets were initially used for payment requests. In the 2nd year, SC Medicaid helped developed a code for the group visit: 99078 code, along with 99213 with TH modifiers. The 1st contract with GHS was for 3 years to start up new practices with CP. After 3 years, the state extended the program another 3 years to focus on sustainability, and 2018 is last year. GHS has applied for an extension to solidify the practices currently offering CP (e.g., there's a lot of turnover and it is free for new providers/office staff to come to local trainings) and to continue the evaluation. It takes about 18 months from the time a practice is awarded the CP grant to the 1st Centering group's deliveries (6 months pre-training, then training, then 6-9 months to deliver), and it takes time to ramp to volume. The outcome data lags behind. Currently 24 practices are engaged. Blue Choice (parent is BCBS) did its own evaluation and was impressed with savings; it offered enhanced reimbursement to practices for up to 10 visits ($300), plus a retention bonus of $150. In the $450 range, it seems to start to incentivize adoption. Commercial BCBS offers practices the same CP reimbursement program. BCBS and Medicaid cover 80% of state deliveries.

[72] BOI is a multi-stakeholder collaborative aimed at improving birth outcomes in South Carolina.

Interview Topic	Summary of Findings
Identification and recruitment of practices	GHS identifies and recruits practices. There are 3 major residency programs in SC. Dr. Crockett uses relationships with other providers to discuss CP, and raises CP at BOI, ACOG events, and grand rounds at all major teaching hospitals. There is a lot of skepticism about CP, and it is important to have a physician champion who can say, "I work in SC too and this is why CP is good for my patients." Practices interested in applying for the enhanced payments are required to attend a bidders' conference – a day-long seminar to help determine site readiness, hosted by CHI, that describes the CP model and its benefits, and asks if practice has space, enough volume, etc. They ensure practices understand what is involved and are committed to it. The program pays for the CHI certification process ($35,000-40,000) and supplies, helping to address a major financial barrier to start up. It takes 18 months to "get anything back"– without the funding, it is cost prohibitive right now for a practice to implement CP and the program would not work. GHS provides statewide data to explain to practices' administrators the background and importance of GPC, which helps some practices address internal resistance. GHS also conducts ongoing regional trainings, which is deemed critical to success. GHS manages the data, and gives practices report cards showing differences between CP and non-CP outcomes, which is "inspiring." These are the most engaged practices, from providers to front desk staff. Giving them data they can see is encouraging and part of success. Pulling back the TA could jeopardize this.
Identification and recruitment of patients	There are no specific criteria for member eligibility (following the CHI model, which does not specify criteria). At GHS, NPs/midwives facilitate CP, so they include patients they are comfortable managing. Other practices have groups run by physicians, so they can see more types of patients – "it's a mixed bag across the state." Recruitment of women—convincing them that group care is a good thing to do—is a challenge. Each MCO sends publications when a member gets pregnant, but SC did not expand Medicaid under the Affordable Care Act; so, women are enrolled in Medicaid only after they become pregnant, at which point they have 90 days to join a plan, making it generally too late to start CP when an MCO finally reaches them. The focus on recruitment is at the practice level, and each practice has its own strategies; e.g., through videos. The Communications Director at Medicaid has connections with the press and sends press releases when a practice opens a CP site. The local newspaper sends a photographer over so there is publicity in local papers, leveraging state resources. However, recruitment remains a struggle and ideas for recruitment are discussed at consortium meetings each year.
Percentage of prenatal Medicaid beneficiaries included	A small percentage of Medicaid beneficiaries receive CP – "barely scratching the surface." Problems come on the patient side; the rigidity of the group model does not work well and there is a need to work through the model's shortcomings. For example, GHS can only offer 2-3 groups per month, and many patients are not able to attend. Even getting 30% of a practice's patients into group care may not be realistic.
What is needed going forward	GPC leaders are "figuring it out as they go." All physicians in SC know about CP, and agree patients like it but acknowledge the reasons they cannot do it. "We've made huge strides in 6 years, but don't know where we'll be in 3 years, and whether there will be support for infrastructure to support practices with ongoing training and evaluation."
Public policies that could mitigate the barriers to GPC	Solidifying the reimbursement modifier to ensure enhanced payment, and the adoption of enhanced payment for CP by all payers (Medicaid, commercial, Tricare) would help promote GPC. The payment level is important; at $450-700/patient, practices would look more closely. There is a need to switch where healthcare dollars go (i.e., from acute care to CP).

QUALITATIVE CASE STUDY: SUMMARY OF FINDINGS FROM CENTERING HEALTHCARE INSTITUTE INTERVIEW

The Strong Start evaluation team interviewed officials from the Centering Healthcare Institute (CHI) in April 2018 as part of a special study of the barriers to Group Prenatal Care (GPC)/*CenteringPregnancy* (CP) and solutions to overcome them. Table C. 3 summarizes the interview findings by topic.

TABLE C. 3: SUMMARY OF FINDINGS FROM CENTERING HEALTHCARE INSTITUTE INTERVIEW

Interview Topic	Summary of Findings
Implementation barrier: lack of buy-in	Buy-in is primary for successful GPC. A practice needs to have buy-in from all providers that will be doing GPC, leadership to make the logistics happen, and early on, buy-in from support/front line staff. Without buy-in, it will make for a rocky implementation. CP is fundamentally a provider-driven model—most, if not all, providers need to be on board and actively support CP. How patients are assigned has a huge impact—providers cannot hold onto patients. Leadership support is needed. Budget line items are fundamental—GPC cannot just be supported by grant funding. Lack of buy-in stems from lack of education about GPC. When medical students have not heard of GPC until they are in practice, there is resistance to change. Education is needed to understand GPC and that it positively impacts their own experience of care, patient experience of care and outcomes. Without that, it is a hard sell. GPC changes how providers engage with patients, and it is a big business practice change. There is a lot more support and interest from younger providers than from well-established providers. But there are also a lot of providers burning out and looking for new and better ways. GPC is a practice change journey. For support staff, getting CP set up is extra work—it requires a longer conversation with patients to describe what it offers. Support staff need to be part of clinic-wide education and movement from one-on-one care to CP. A new model requires new administrative processes.
Implementation barrier: traditional/ training programs	Incorporating GPC into residency programs is challenging because of schedules. The director needs to be able to change the schedules so residents can participate in the majority of group sessions. It takes a dedicated residency director to support that, and where you have that, it is really successful. All residency programs and CP integration methods are different. It works well when CP is the OB/GYN rotation for residents, and a CP trainer does training with residents—i.e., where CP has become institutionalized. Getting group facilitation to be part of the health care provider education and institutionalized for the new generation of healthcare workforce is needed for GPC to flourish and be sustained. Working with residency programs around country is a strategy that can't be overstated enough. Residents enjoy providing CP. It has worked successfully in places like Dartmouth Hitchcock (Dartmouth, NH), Einstein (Philadelphia, PA), and Greater Lawrence Family Health (Lawrence, MA). Wake Forest trains residents through mock groups where other residents act as patients. Residents specifically choose to go these programs because of the CP offering. Training programs are also needed to continue educating other practice staff and new staff.
Implementation barrier: patients declining to participate	Patients know what an individual group visit is, and do not understand group care, resulting in patient resistance to GPC. Educating and making patients feel comfortable about trying GPC fall on the provider team. Experience can be built, for example, by using group intake for the initial visits. Most successful sites use an opt-out model (whereby patients are declining to participate automatically assigned to GPC and may opt out). It allows for a binary, unforced choice, but with a baseline of GPC. Patients gravitate toward what they are familiar with. Expose first, and then allow opt-out. Transportation and childcare are fundamental to attending sessions (an issue for individual appointments as well), and groups need to be scheduled when patients are available to attend them. When evening sessions are offered, they fill up faster because they don't conflict with work and another parent is often available for childcare. It is a structural challenge for practices (particularly those with labor contracts and set hours), with resistance from many providers.
Implementation barrier: inadequate funding for start-up costs	Through a grant from a charitable foundation, CHI has had the opportunity to "pressure test" whether practices are interested in CP when funding is not a barrier. There has been a highly positive response, indicating that practices are interested in CP when funding is available. CHI is looking at ways to reduce the costs through economies of scale, targeting geographically to guide a community of local practices.
Implementation barrier: lack of enhanced reimbursement	A commonly voiced concern is that GPC is not as profitable as traditional prenatal care, but there is no evidence to support this. Clinics must take time and invest in things that are not needed in traditional care, so it may appear that CP costs more, even if productivity is better than or consistent with traditional care. In that regard, a financial incentive can be important to a practice—higher reimbursement for better care makes the case for sustainability and encourages providers to get more patients into CP. The "carrot" encourages them to build the CP practice.
Successful strategies to mitigate barriers	Knowing what the pitfalls can be and what a successful CP practice looks like, CHI has a well-developed pathway and implementation plan for providers. Whether providers trust and follow the start-up process in a slow and deliberate manner can make or break whether a practice implements and sustains CP. It starts with a champion, and building an effective steering committee that can oversee and get reports on the successes and barriers. Normalizing CP requires engaging leadership and including everyone who has a touch point with patients.

Interview Topic	Summary of Findings
Challenges to sustaining or expanding CP	About 7-8% of organizations do not renew their CP licenses with CHI annually. This is related to the large degree of turnover in healthcare. It is very rare have someone in leadership for more than 3-4 years, and there is even more frequent turnover among other staff, which creates an ebb and flow for how normalized CP is within the organization. Also, the practice needs to budget for training and extra items as part of their normal operating budget. The most successful sites make CP the standard of care ("This is how we do care here"), normalizing CP through an opt-out process as early as possible.
Relative profitability for providers of GPC vs. traditional prenatal care	Most important for achieving profitable GPC is getting adequate group numbers (10-12) and having patients attend the majority of sessions. Practices will struggle with this if they can only enroll 6-7 women, and some women are absent from sessions. Then it is no longer cost effective. So, practices need to pay attention to enrollment, and perhaps over enroll to account for no shows. Providers can also adapt the length of the visit; smaller groups can be done in 90 minutes rather than 2 hours. If a practice is creative and bold in enrolling women, profitability should not be an issue.
Examples of differential payments for GPC	The vast majority of providers bill for GPC as they would for traditional care. In some states, they can add modifiers codes for certain components (e.g., education, breast feeding). South Carolina (SC) Medicaid is the most well documented example of a state making differential payments for GPC. The providers receive an additional payment per visit for women in CP (an additional $30 per patient up to $300 total), and, in some cases, an additional individual payment for each woman coming to 5 sessions (i.e., good attendance). This is the most common, and what other states are adopting as well. From a practice's perspective, the enhanced payment is enough of an incentive to cover ongoing training and notebooks. Since SC started the program with its first set of grantee sites, it has not lost a single practice (no attrition). Montana Medicaid just rolled out a program. In New York, the "First 1000 days on Medicaid," will replicate South Carolina in target areas of poor outcomes. There are also some differential payments by MCOs, such as CareSource and Anthem.
Public policies that could mitigate barriers to GPC	Lawmakers become critical partners where public policy can affect funding and availability of GPC, and Medicaid payment structures. In Ohio, there are Department of Health funds for programs that are targeting hard-hit areas, and support for CP is part of that initiative. Changing policy takes time and is a longer-term strategy.

QUALITATIVE CASE STUDY: SUMMARY OF FINDINGS FROM BABY+CO. INTERVIEW

The Strong Start evaluation team interviewed officials from Baby+Co.[73] in May 2018 as part of a special study of access to midwifery and birth center care under state Medicaid programs. Table C. 4 summarizes the interview findings by topic.

TABLE C. 4: SUMMARY OF FINDINGS FROM BABY+CO. INTERVIEW

Interview Topic	Summary of Findings
Background on Baby+Co.	Initial Baby+Co. birth center built "from scratch" in Arkansas, a state without a significant midwifery infrastructure and no other birth centers. Model morphed and evolved but resembles standard birth center setup with significant attention paid to financial sustainability. Baby+Co. used a primary investor for startup costs and infrastructure development. The Baby+Co. prenatal care model is centrally controlled and disseminated across centers, which are all owned and operated by Baby+Co. The care model incorporates elements from all three Strong Start enhanced care approaches—a group prenatal care component, the standard birth center approach which is very education heavy, and partnership with community programs to implement a maternity care home including educational offerings and community offerings. Baby+Co. does a lot of data collection—running a whole set of data every week. Baby+Co. centers are staffed by nurse-midwives (with support from nurses). Because the company operates largely in southern states [that have more restrictions related to other types of midwives] nurse-midwives were the only real option. Baby+Co. has worked to get nurse-midwives privileges in hospitals so women can get prenatal care at the birth center and then choose their place of birth (center or hospital). If midwives don't have privileges [at the hospital] then patients feel they must commit to their place of birth early in pregnancy, when it is not developmentally appropriate to ask somebody to make that decision. We want women to have the best prenatal care and then worry about where the baby will be born. The centers do not use birth assistants or doulas in any routinely-staffed way, but do use health coaches (who provide care coordination and navigation) and educators (who run the curriculum). Professional qualifications of these individuals vary.

[73] http://www.babyandcompany.com

Interview Topic	Summary of Findings
Acquiring/ Developing New Baby+Co. Birth Centers	Baby+Co. has opened some birth centers (like the initial Arkansas center) from scratch and acquired other centers that already existed (like the Lisa Ross birth center in Knoxville, TN, which was part of the Strong Start demonstration). The most important factors that influence the company's decision to build or buy a new center are population size and then reimbursement and economics. We look for a big enough population that there must be only a very small market penetration for the center to be full. And we look for high rates of commercial payment, because we have not had success working with Medicaid programs yet, and not for lack of effort.
Challenges related to working with Medicaid program	For commercial payers, we set up a case rate that includes both professional and facility aspects of what we do to make the business model work, which requires a rate of $8,000-$9,000 per case. We have a tool, case builder, that gives them the list of codes to run internally to match against what we would bill them to help them see the savings. That's a long process because there is little will or motivation on their side, and the initial reaction to the $8K-9K rate is to say they only pay doctors in hospitals $2500 (or similar). But that is not true, because their reference does not include the [hospital] facility fees and newborn care. Payers [do not take] that longitudinal aspect of care, they are not at a place yet where they can see avoided costs for [as examples] reducing the preterm birth rate or decreasing NICU admissions. They're still trying to compare on a fee-for-service, apples to apples, this code set to this code set. But the savings are real. Baby+Co. has done active marketing and outreach to our commercially-insured target population. It has been very difficult to even get meetings on the books with the Medicaid managed care organizations (MCOs). The governor's office may be very interested but you must work with MCOs to actually get anywhere. And in Tennessee [as an example] birth centers have historically taken very low reimbursement rates so it is like pushing a boulder uphill to get past what the historical were. The Baby + Co. model certainly works. It works financially with great health outcomes but that may not be sustainable if we do not find a way to work with the Medicaid programs. It is not a data problem, it is a political will issue. Nobody we have interacted with on the commercial or the Medicaid side does not understand that [the birth center model] is good for people. They all understand that it is good for people. Baby+Co. could have accepted the very low rates that some birth centers [as in Tennessee example] had always taken from Medicaid, but we are trying to move the needle and say this is worth paying for and here is why. You are paying hospitals more than this and getting an inferior product, outcomes are not as good. But at the end of the day the people making the decision are the contract negotiators. Leadership may agree but things get stuck in the mechanics. And often the people who operate at that contract negotiation and implementation level, their personal bonus structure is set up against fee-for-service line items and they get penalized for increasing costs. If they increased the case rate for birth centers based on Baby+Co. negotiations, there could be negative repercussions related to their annual bonus. They have no incentive to make it happen and every incentive to stop it from happening. We do not have success stories about working with Medicaid programs. Those stories exist for commercial payers, but for Medicaid there is inertia in a variety of directions. The 2016 elections and uncertainty around the future of the Affordable Care Act put people into absolute stalemate, waiting to see how things were going to shake out. [Payers] have had bigger fish to fry, and are more worried about what is happening with payment for hip or knee replacements, or cardiac surgery.
Opportunities related to working with Medicaid program	There are tons of opportunities. The Medicaid programs have many good services aimed at moms and babies. But pulling all the disparate, siloed, pieces and parts together to make it work…there is neither the political will nor the ability to change the granular systems that require a claim submitted and then paid. Some of the delivery system reforms related to risk and gain sharing could work well for birth centers. It is at the implementation level that things fall apart. [I often wish] births were paid for by Medicare so that I would have one set of people to talk to instead of 50 different state Medicaid programs. There is a lot of interest in maternity-related delivery reforms. Arkansas did a lot of work [on value-based reimbursement] and two things happened. One, births are considered inpatient services, so when you try to flip it and apply the reimbursement methodology to an "outpatient setting" which birth centers are considered, there's no mechanism for it. Also, in almost all instances the primary accountable provider for the reimbursement arrangements had to be physician. And even though the birth centers all have medical directors, that person is never going to see the patient, yet the arrangements require the accountable provider to have seen the patient a certain number of times. There was no mechanism for midwives to be the primary accountable provider and there was no mechanism for a non-hospital to be associated with a birth.
Factors that could facilitate birth center participation in Medicaid	Patient recruitment is not very hard because health care is still very much a local thing and if you take good care of people that spreads in their communities. It also [helps] when place of birth can be determined later in pregnancy, for people who do not necessarily see themselves as the "birth center mom." We did a lot of market research in various areas, typical marketing, focus groups and stuff, asking questions of women who were thinking about a hospital birth and those who were not and that sort of thing. And the myths and preconceptions around what happens in a birth center and what sort of woman would go there exists broadly across women from different demographic backgrounds. In the existing environment, most birth centers who accept Medicaid patients are limited so their economics do not end up upside down. It is a chicken and egg thing: if there was a sustainable Medicaid rate the demand would be there, but there is no demand when centers set quotas or minimize exposure on the Medicaid side. From a mechanism standpoint, the thing that would help birth centers grow the most would be some sort of front end population management payment because traditionally maternity care is paid for retrospectively. Birth centers find themselves in a debt hole all the time. A per member per month payment [similar to primary care case management] could really help birth centers grow because they wouldn't be chasing the billing cycle all the time.

Interview Topic	Summary of Findings
Comfort and pain relief options at Baby+Co. centers	All the midwives have prescriptive privileges and we do use nitrous oxide in all the centers, but outside of that they offer mostly non-pharmacological options. We have spent a bunch of time with a variety of startups around things like using virtual reality for comfort in labor and some of the biomechanical options around biofeedback—these options are not ready for primetime yet. We do use the occasional IM or IV narcotic but that is not standard. We typically we do not use those options because of the side effects (nausea, vomiting). But all centers can provide narcotics, centers have DEA licenses and the providers all have the DEA numbers. The most common narcotic used would be morphine for therapeutic rest in early labor.
Demographics at Baby+Co. centers	They mirror the demographics in whatever the settings are, though in some cases (Cary, NC and Nashville, TN centers) there is a slightly higher proportion of non-white women in the birth center than in the cities where the centers are located. [Differences in] birth center recruitment is not about race and ethnicity as much as it is about exposure and education. We have women of all races and ethnicities who are typically all very well educated. We have fewer patients of lower socioeconomic status. I wish there were a way for me for me to talk more specifically about the people we turn away all the time because we do not have a way to pay for their care. We turn away Medicaid beneficiaries all day every day. It is not because they are not asking. They call, they come in for tours. We just cannot take care of them [because of the low reimbursement levels].
Patient risk levels and co-management with physicians	The risk criteria Baby+Co. uses are AABC standards. We fall right in the middle of the pack in terms of birth centers in terms of caring for high-risk or low-risk patients. We can do a lot of co-management because the midwives have hospital privileges. So, for example, someone who has gestational diabetes or pregnancy-induced hypertension, we're typically able to co-manage them prenatally with a physician and then attend the birth at the hospital. They risk out of delivery at the birth center but they do not typically risk out of care with us. Currently the Baby+Co. centers do not care for women with substance use disorders, though with birth centers' focus on patient engagement they would be a great platform for this. We have talked with some private funders who were interested in addicted moms about setting about pilots. It would be great thing to do but we have not had a partner to help fund it. A Boston-based OB/GYN recently gave a talk at ACNM and made a good point that was well-received by the audience, which was that just because your pregnancy is high risk doesn't mean your labor and/or birth is going to be high risk. We need to decouple those things more systematically so that women with medically-complicated pregnancies do not end up delivering with an MFM by default and can still have their midwives there at birth. The system is just not set up for that reverse transfer, it is set up in an escalating way that when you get to the top there are not good ways to de-escalate.

APPENDIX D: PARTICIPANT-LEVEL PROCESS EVALUATION – INSTRUMENTS

Strong Start for Mothers and Newborns Initiative Patient Intake Form

Study ID Label: _____

Instructions: Please mark your answer by placing a ☒ in the appropriate box with a black pen.

Correct ☺	Incorrect ☹
☒	[☐ no] or [☒] or [☐] or [☐ X]

Enter Today's Date, using the following number format: MM/DD/YYYY. _____/_____/_____

1. Were you on Medicaid when you became pregnant with this pregnancy?
   ☐ Yes ☐ No ☐ Not Sure

2. Did you have other health insurance when you became pregnant with this pregnancy?
   ☐ Yes ☐ No ☐ Not Sure

3. Are you in the WIC program right now (do you get food for yourself from WIC)? ☐ Yes ☐ No

4. Are you of Hispanic, Latina, or Spanish origin?
   (One or more categories may be selected)
   - ☐ No, not of Hispanic, Latina, or Spanish origin
   - ☐ Yes, Mexican, Mexican American, Chicana
   - ☐ Yes, Puerto Rican
   - ☐ Yes, Cuban
   - ☐ Yes, another Hispanic, Latina, or Spanish origin

4a. What is your race?
   (One or more categories may be selected)
   - ☐ White
   - ☐ Black or African American
   - ☐ American Indian or Alaska Native
   - ☐ Asian Indian
   - ☐ Chinese
   - ☐ Filipino
   - ☐ Japanese
   - ☐ Korean
   - ☐ Vietnamese
   - ☐ Other Asian
   - ☐ Native Hawaiian
   - ☐ Guamanian or Chamorro
   - ☐ Samoan
   - ☐ Other Pacific Islander

5. Do you speak a language other than English at home? ☐ Yes ☐ No

   5a. If yes, what is this language? ☐ Spanish ☐ Other language (Identify) _____

6. How many adults (people 18 and older) live in your home besides you? _____

7. How many children (people 17 and younger) live in your home? _____

7a. What are the ages (in years) of those children?

Child 1: _____ Child 2: _____ Child 3: _____ Child 4: _____

Child 5: _____ Child 6: _____ Child 7: _____ Child 8: _____

7b. If more than 8 children live in your home, please list their ages here: _____

8. Check here if you are homeless or living in a shelter right now: ☐

9. Do you have a job right now? ☐ Yes ☐ No

9a. If yes, what is your job? _____

9b. 11.b. How many hours (#) do you usually work each week? _____

10. Are you in school right now? ☐ Yes ☐ No

10a. If yes, are you in: ☐ High School ☐ GED ☐ Training ☐ College

☐ Other (please explain) _____

10b. If you are in school, are you: ☐ Full time ☐ Part time

11. Do you have: ☐ A high school diploma ☐ A GED ☐ Neither

12. Do you have a college degree? ☐ Yes ☐ No

12a. If yes, what college degrees do you have? (Please check all that apply.)

☐ Associate's Degree (from a community college or other two year college program)

☐ Bachelor's Degree (from a four year college or university)

☐ Yes, other (please explain) _____

13. Please put a check next to any of these things that make it hard for YOU to come to appointments.

- ☐ I do not have a car
- ☐ The bus or train is hard to use to get to my appointment
- ☐ I do not have enough money to pay for a ride to the appointment
- ☐ My work hours make it hard to come to appointments
- ☐ I do not always have someone I trust to watch my older children
- ☐ My spouse/partner/boyfriend does not want me to come to appointments
- ☐ Other reason(s) (Please list them below.)

13a. Other reason 1: _____

13b. Other reason 2: _____

13c. Other reason 3: _____

14. What is your relationship status now?

- ☐ Married, living with spouse
- ☐ Married, not living with spouse
- ☐ In a relationship but not living together
- ☐ Not in a relationship right now
- ☐ Living with a partner

14a. If yes, have you been living together for more than one year? ☐ Yes ☐ No

15. Have you ever been divorced? ☐ Yes ☐ No

16. Have you ever been widowed? ☐ Yes ☐ No

16a. If yes, year spouse died: _____

17. During the last 12 months, have you been to the dentist and had a dental check-up? ☐ Yes ☐ No ☐ Not Sure

18. Were you using birth control when you became pregnant with this pregnancy? ☐ Yes ☐ No ☐ Sometimes

19. Were you trying to become pregnant? ☐ Yes ☐ No

20. When you have this baby, do you hope to have a: ☐ Vaginal birth ☐ Cesarean (c-section) ☐ Unsure

21. How many times have you been pregnant before this pregnancy? _____

21a. How many babies did you have who were born alive? _____

22. Did you ever have a baby who was born too early (preterm or "preemie," before 37 weeks)? ☐ Yes ☐ No

23. If you have had a baby, when was your last baby born (using the following number format: MM/DD/YYYY)? _____/_____/_____

The following questions address how you have been feeling during the past week (7 days).				
Question	**Rarely or none of the time (less than 1 day)**	**Some or a little of the time (1-2 days)**	**Occasionally or a moderate amount of time (3-4 days)**	**Most or all of the time (5-7 days)**
24. I felt depressed.	☐	☐	☐	☐
25. I felt that everything I did was an effort.	☐	☐	☐	☐
26. My sleep was restless.	☐	☐	☐	☐
27. I was happy.	☐	☐	☐	☐
28. I felt lonely.	☐	☐	☐	☐
29. People were unfriendly.	☐	☐	☐	☐
30. I enjoyed life.	☐	☐	☐	☐
31. I felt sad.	☐	☐	☐	☐
32. I felt that people disliked me.	☐	☐	☐	☐
33. I could not get "going."	☐	☐	☐	☐

Over the last 2 weeks (14 days), how often have you been bothered by the following problems?				
Question	**Not at all**	**Several days**	**Over half the days**	**Nearly every day**
34. Feeling nervous, anxious, or on edge.	☐	☐	☐	☐
35. Not being able to stop or control worrying.	☐	☐	☐	☐
36. Worrying too much about different things.	☐	☐	☐	☐
37. Trouble relaxing.	☐	☐	☐	☐
38. Being so restless that it's hard to sit still.	☐	☐	☐	☐
39. Becoming easily annoyed or irritable.	☐	☐	☐	☐
40. Feeling afraid as if something awful might happen.	☐	☐	☐	☐

41. If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?

- ☐ Not difficult at all
- ☐ Somewhat difficult
- ☐ Very difficult
- ☐ Extremely difficult

Relationships can be hard. Sometimes arguments get out of control. Sometimes a woman might be afraid of her partner, or she might get hurt. The next questions will ask about things like this that might have happened to you.

42. Have you ever been in a relationship where your partner has pushed or slapped you? ☐ Yes ☐ No

43. Have you ever been in a relationship where your partner threatened you with violence? ☐ Yes ☐ No

44. Have you ever been in a relationship where your partner has thrown, broken, or punched things? ☐ Yes ☐ No

If you have a spouse, partner, or boyfriend right now, please answer the following questions.

Question	Disagree strongly	Disagree somewhat	Disagree a little	Agree a little	Agree somewhat	Agree strongly
45. My spouse/partner/boyfriend makes me feel unsafe even in my own home.	☐	☐	☐	☐	☐	☐
46. I feel ashamed of the things he does to me.	☐	☐	☐	☐	☐	☐
47. I try not to rock the boat because I am afraid of what he might do.	☐	☐	☐	☐	☐	☐
48. I feel like I am programmed to react a certain way to him.	☐	☐	☐	☐	☐	☐
49. I feel like he keeps me prisoner.	☐	☐	☐	☐	☐	☐
50. He makes me feel like I have no control over my life, no power, no protection.	☐	☐	☐	☐	☐	☐

51. If you do smoke cigarettes, how many cigarettes or packs do you smoke on most days?

_____ cigarettes _____ packs of cigarettes ☐ I do not smoke cigarettes

52. Which best describes the rules about smoking inside your home now?

- ☐ No one is allowed to smoke anywhere inside my home
- ☐ Smoking is allowed in some rooms or at some times
- ☐ Smoking is permitted anywhere inside my home
- ☐ I am homeless or live in a shelter right now

Note: 1 Drink = 12 oz beer (1 regular can)= 12 oz cooler = 5 oz wine = 1 mixed drink (1.5 oz. hard liquor)

53. How many drinks does it take to make you feel high?

☐ One or 2 drinks ☐ More than 2 drinks ☐ I do not drink alcohol

54. Have people annoyed you by criticizing your drinking? ☐ Yes ☐ No

55. Have you felt you ought to cut down on your drinking? ☐ Yes ☐ No

56. Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover?
☐ Yes ☐ No

57. Did any of your parents have a problem with drug use? ☐ Yes ☐ No

58. Does your partner have a problem with drug use? ☐ Yes ☐ No

59. In the past, have you had problems in your life because of drugs? ☐ Yes ☐ No

How true were each of these statements for you and your household during the past 12 months (since this time last year)?

60. I worried about whether {my/our} food would run out before {I/we} got money to buy more.
☐ Often true ☐ Sometimes true ☐ Never true

61. The food that {I/we} bought just didn't last, and {I/we} didn't have enough money to get more food.
☐ Often true ☐ Sometimes true ☐ Never true

62. {I/we} couldn't afford to eat balanced meals.
☐ Often true ☐ Sometimes true ☐ Never true

63. Since this time last year, did {you/you or other adults in your household} ever cut the size of your meals or skip meals because there wasn't enough money for food? ☐ Yes ☐ No

63a. How often did this happen?
☐ Almost every month ☐ Some months but not every month ☐ In only 1 or 2 months

64. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
☐ Yes ☐ No

65. In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?
☐ Yes ☐ No

FOR OFFICE USE ONLY

Completed by:

☐ Patient on paper
☐ With Assistance

☐ Patient electronically
☐ With Assistance

☐ Healthcare worker in person

☐ Healthcare worker on the phone

☐ Other

"The project described was supported by Funding Opportunity Number CMS-1D1-12-001 from the Centers for Medicare & Medicaid Services, Center for Medicare & Medicaid Innovation. The contents of this Intake Form do not necessarily represent the official views of HHS or any of its agencies. This project does not limit a fee-for-service Medicare, Medicaid, or CHIP patient's freedom to choose a particular health care provider."

Strong Start for Mothers and Newborns Initiative Third Trimester Survey

Study ID Label: _____

Instructions: Please mark your answer by placing a ☒ in the appropriate box with a **black pen**. When appropriate, use numbers (0, 1, 2, 3, etc.) to answer questions.

Correct ☺	**Incorrect** ☹
☒	[☐ no] or [X] or [☐] or [☐ X]

Your responses are voluntary and will be kept confidential.

Today's Date	Estimated Due Date
_____/_____/_____	_____/_____/_____
MM/DD/YYYY	MM/DD/YYYY

1. How many adults (people 18 and older) live in your home? (Do not count yourself.) _____

2. How many children (people 17 and younger) live in your home? (Do not count yourself.) _____

3. Are you homeless or living in a shelter right now? ☐ Yes ☐ No ☐ Prefer not to answer

4. Please choose the statement that best describes you. (Select one answer.)
   - ☐ I have never smoked or I stopped smoking before I became pregnant.
   - ☐ I stopped smoking when I found out I was pregnant.
   - ☐ I have cut down on my smoking since I found out I was pregnant.
   - ☐ I smoke about the same as before I found out I was pregnant.
   - ☐ Prefer not to answer

5. What is your relationship status now? (Select one answer.)
   - ☐ Married, living with spouse
   - ☐ Married, not living with spouse
   - ☐ Living with a partner/boyfriend
   - ☐ In a relationship but not living together
   - ☐ Not in a relationship
   - ☐ Prefer not to answer

6. Do you have a spouse, partner, or boyfriend right now? ☐ Yes ☐ No ☐ Unsure

If you have a spouse, partner, or boyfriend right now, please select one answer the following questions.

Question	Disagree strongly	Disagree somewhat	Disagree a little	Agree a little	Agree somewhat	Agree strongly	Prefer not to answer
6a. My spouse/partner/boyfriend makes me feel unsafe even in my own home.	☐	☐	☐	☐	☐	☐	☐
6b. I feel ashamed of the things he does to me.	☐	☐	☐	☐	☐	☐	☐
6c. I try not to rock the boat (cause trouble) because I am afraid of what he might do.	☐	☐	☐	☐	☐	☐	☐
6d. I feel like I am programmed to react a certain way to him.	☐	☐	☐	☐	☐	☐	☐
6e. I feel like he keeps me prisoner.	☐	☐	☐	☐	☐	☐	☐
6f. He makes me feel like I have no control over my life, no power, no protection.	☐	☐	☐	☐	☐	☐	☐

7. Where do you plan to deliver this baby?
☐ Hospital ☐ Birth Center ☐ Home ☐ Unsure

8. Do you plan to have a support person with you during labor? ☐ Yes ☐ No ☐ Unsure

8a. If yes, select all that apply: ☐ Doula ☐ Spouse/Partner/Boyfriend ☐ Other family member
☐ Someone else (specify) _____

9. Do you plan to take something for pain during labor? ☐ Yes ☐ No ☐ Unsure

9a. If yes, do you plan to get an Epidural? ☐ Yes ☐ No ☐ Unsure

10. How do you plan to deliver this baby? ☐ Vaginally ☐ Cesarean Section (C-Section) ☐ Unsure

11. Have any of your prenatal care providers suggested scheduling your delivery prior to your due date?
☐ Yes ☐ No ☐ Unsure

12. How do you plan to feed your baby in the first few weeks?
☐ Breastfeed only ☐ Formula feed only ☐ Both breast and formula feed ☐ I haven't decided

13. How would you rate your level of overall satisfaction with the prenatal care you are receiving? Would you say you are:

Not at all satisfied	Slightly satisfied	Moderately satisfied	Very satisfied	Extremely satisfied
☐	☐	☐	☐	☐

Strong Start for Mothers and Newborns Initiative Postpartum Survey

Study ID Label: _____

Instructions: Please mark your answer by placing a ☒ in the appropriate box with a **black pen**. When appropriate, use numbers (0, 1, 2, 3, etc.) to answer questions.

Correct ☺	**Incorrect** ☹
☒	[☐ no] or [☒] or [◯] or [☐ X]

Your responses are voluntary and will be kept confidential.

Today's Date	Delivery Date
_____/_____/_____	_____/_____/_____
MM/DD/YYYY	MM/DD/YYYY

1. Where did you deliver this baby? ☐ Hospital ☐ Birth Center ☐Home
   ☐ Other (please specify) _____

2. Did you have a support person with you during labor? ☐ Yes ☐ No ☐ Unsure
   2a. If yes, please specify who supported you during labor. (Select all that apply.)
   ☐ Doula ☐ Spouse/Partner/Boyfriend ☐ Other family member
   ☐ Someone else (specify) _____

3. Did you have any medicine during labor to help you with pain? ☐ Yes ☐ No ☐ Unsure
   3a. If yes, did you receive an Epidural? ☐ Yes ☐ No ☐ Unsure

4. How did you deliver this baby? ☐ Vaginally ☐ Cesarean Section (C-Section) ☐ Refused

5. Did a doctor, nurse, or midwife try to speed up your labor using medicine? ☐ Yes ☐ No ☐ Unsure

6. Did a doctor, nurse, or midwife break your bag of water to start or speed up your labor?
   ☐ Yes ☐ No ☐ Unsure

7. How satisfied were you with your delivery experience? (Select one.)

Not at all satisfied	**Slightly satisfied**	**Moderately satisfied**	**Very satisfied**	**Extremely satisfied**
☐	☐	☐	☐	☐

8. How would you rate your overall level of satisfaction with the prenatal care you received? (Select one.)

Not at all satisfied	Not at all satisfied	Not at all satisfied	Not at all satisfied	Not at all satisfied
☐	☐	☐	☐	☐

9. What is your relationship status now? (Select one answer.)

- ☐ Married, living with spouse
- ☐ Married, not living with spouse
- ☐ Living with a partner/boyfriend
- ☐ In a relationship but not living together
- ☐ Not in a relationship
- ☐ Prefer not to answer

10. Did you ever breastfeed or pump breast milk to feed your baby after delivery, even for a short period of time?

☐ Yes ☐ No ☐ Prefer not to answer

10a. If yes, are you currently breastfeeding or feeding pumped breast milk to your new baby?

☐ Yes ☐ No ☐ Refused

11. After your new baby was born, did a doctor, nurse, or other health care worker talk with you about using birth control? ☐ Yes ☐ No ☐ Unsure

12. Are you or your spouse/partner/boyfriend doing anything now to keep from getting pregnant?

☐ Yes ☐ No ☐ Unsure

13. If yes, what kind(s) of birth control are you using to keep from getting pregnant? (Select all that apply.)

- ☐ Condom or rubber
- ☐ Withdrawal or pulling out
- ☐ Vasectomy or male sterilization
- ☐ Birth Control Pills
- ☐ IUD (for example, Mirena/Paragard)
- ☐ Tubal ligation or female sterilization (Tubes Tied)
- ☐ Spermicidal foam/jelly/cream/film/suppository
- ☐ Hormonal implant or injection (Implannon/Nexplanon)
- ☐ Injection (The Shot/Depo)
- ☐ Rhythm or safe period
- ☐ Breastfeeding
- ☐ Something else (please specify)

_____

Strong Start for Mothers and Newborns
Exit Data Collection Form

Study ID Label: _____

Instructions: Please mark your answer by placing a ☒ in the appropriate box with a **black pen**.
For statements that ask for a number, please answer with a number only (e.g., 5). Do not include any text with or instead of the numbers (e.g., five, five feet, 5, feet).

Important:

☐ **If you have submitted all Exit Form information electronically** *except* details regarding enhanced services, please mark the box to the left and skip to Section VII of this form.

Note: For the purposes of this form, past and current pregnancies are defined as follows:

- **Past Pregnancy:** The pregnancy or pregnancies that occurred prior to this Strong Start pregnancy.
- **Current Pregnancy:** The pregnancy during which most recent enrollment in Strong Start occurred.

Participant Information	
14. Today's date	_____/_____/_____ MM/DD/YYYY
15. Date participant enrolled in Strong Start	_____/_____/_____ MM/DD/YYYY
16. Participant's Estimated Date of Delivery (EDD)	_____/_____/_____ MM/DD/YYYY

17. Did the participant stop receiving Strong Start services prior to delivery? ☐ Yes ☐ No

17a. If yes, please select the reason she stopped receiving Strong Start services.

☐ Loss of Medicaid/CHIP eligibility
☐ Move/Relocation
☐ Lost to follow-up
☐ Other (please specify) _____
☐ Voluntary withdrawal from the program
☐ Elective pregnancy termination
☐ Miscarriage/Spontaneous abortion

I. Past Pregnancy History and Complications

18. Did the participant have any past pregnancies (pregnancies that occurred prior to this Strong Start pregnancy)?

☐ Yes *(If yes, continue to question 5a.)*

☐ No *(If no, skip to question 12.)*

18a. If yes, how many prior pregnancies did the participant have? _____

Instructions: Please place a ☒ in the appropriate box to indicate if the participant had risk factors from past pregnancies. For previous birth outcomes, indicate the number of times the risk factor occurred.

Risk factors from past pregnancy (pregnancies)

19. Please indicate if participant had any of the following risk factors during a previous pregnancy:
    - ☐ Preeclampsia or pregnancy-induced hypertension
    - ☐ Gestational diabetes
    - ☐ Cervical incompetence
    - ☐ Placental abnormalities
    - ☐ Congenital abnormalities of the fetus
    - ☐ None
    - ☐ Not known
    - ☐ Other risk factor(s): _____

Previous birth outcome(s)	Yes	No	Not Known	If yes, number of occurrences
20. Previous preterm birth(s) (20 weeks≥36 weeks, 6 days Estimated Gestational Age [EGA])	☐	☐	☐	_____
20a. If participant had previous preterm birth(s), please specify the reason(s). If unknown, indicate "Not known." ☐ Other reason(s): _____				
21. Previous birth(s) less than 2,500 grams	☐	☐	☐	_____
22. Previous miscarriage(s) (< 20 weeks EGA)	☐	☐	☐	_____
23. Previous elective termination(s)	☐	☐	☐	_____
24. Previous stillbirth(s) (fetal death ≥ 20 weeks EGA)	☐	☐	☐	_____

II. General Medical Risk Factors

Instructions: Please place a ☒ in the appropriate box to indicate if the participant had any of the risk factors prior to her current pregnancy.

Participant risk factors prior to current pregnancy	Yes	No	Not Known
25. Type I diabetes	☐	☐	☐
26. Type II diabetes	☐	☐	☐
27. Hypertension	☐	☐	☐

III. Risk Factors During Current Pregnancy

Instructions: Please enter the mother's height and weight in the appropriate boxes. Respond in only one type of measurement (e.g., centimeters OR inches; kilograms OR pounds).

Height	Height in Centimeters	OR	Height in Inches
28. Height of mother at first prenatal visit	___ ___ ___ . ___		___ ___ . ___
Weight	**Weight in Kilograms**	**OR**	**Weight in Pounds**
29. Weight of mother at first prenatal visit	___ ___ ___ . ___		___ ___ ___ . ___
30. Weight of mother at last prenatal visit	___ ___ ___ . ___		___ ___ ___ . ___

Instructions: Place a ☒ in the appropriate box to indicate if the participant had a risk factor during her current pregnancy.

Risk factors during current pregnancy		Yes	No	Not Known
31. Urinary tract infection(s) during last 6 months of pregnancy		☐	☐	☐
32. Cervical incompetence		☐	☐	☐
33. Placenta previa		☐	☐	☐
34. Placental abruption		☐	☐	☐
35. Gestational diabetes		☐	☐	☐
36. Pregnancy-related hypertension		☐	☐	☐
37. Preeclampsia		☐	☐	☐
38. Syphilis		☐	☐	☐
39. Human immunodeficiency virus (HIV)		☐	☐	☐
40. Congenital abnormalities of the fetus		☐	☐	☐
41. Other risk factor(s):	_____	☐	☐	☐

IV. Delivery Information – Current Pregnancy

Instructions: Please place a ☒ in the appropriate box to indicate the place and method of delivery for the participant.

Place of delivery

42. Please indicate the type of facility where the participant's delivery occurred.
☐ Hospital ☐ Birth center ☐ Home birth ☐ Other

Method of delivery

43. Please indicate the method of delivery. (Check all that apply for this pregnancy.)
☐ Vaginal
☐ Cesarean section (C-section)

If vaginal:

43a. Was it a vaginal birth after Cesarean (VBAC)? ☐ Yes ☐ No ☐ Not known

If C-section:

43b. Was it a repeat C-section? ☐ Yes ☐ No ☐ Not known
43c. Was it a scheduled C-section? ☐ Yes ☐ No ☐ Not known

Instructions: Please place a ☒ in the appropriate box to indicate whether the participant received the following treatments prior to or during labor.

Treatment prior to or during labor	Yes	No	Not Known
44. Antenatal steroids for impending preterm delivery	☐	☐	☐
45. Progesterone injections to prevent preterm birth (e.g., 17P, P17 or 17-OHP; hydroxyprogesterone caproate)	☐	☐	☐
46. Vaginal progesterone to prevent preterm birth	☐	☐	☐
47. Tocolytics to prevent preterm birth	☐	☐	☐
48. Was the participant's labor induced?	☐	☐	☐
48a. If participant was induced, was Pitocin used?	☐	☐	☐

48b. If participant had previous preterm birth(s), please specify the reason(s). If unknown, indicate "Not known."
☐ Not known
☐ Other reason(s):

_____

V. Delivery Outcomes – Current Pregnancy

Instructions: Please complete the tables below by entering numbers to indicate number of fetuses identified and born. In the second table, please report the weight of all infants born.

Number of fetuses identified and born	Number
49. How many fetuses were identified?	_____
50. How many infants were live born?	_____
51. How many infants were still born?	_____

52. What was the infant weight at birth (grams or pounds or ounces)?
Note: If multiple births, record the weight for each newborn baby.

	Grams	OR	Pounds and Ounces
52a. Baby #1	___ , ___ ___ ___		___ ___ lbs. ___ ___ oz.
52b. Baby # 2 (if multiple births)	___ , ___ ___ ___		___ ___ lbs. ___ ___ oz.
52c. Baby #3 (if multiple births)	___ , ___ ___ ___		___ ___ lbs. ___ ___ oz.
52d. Baby #4 (if multiple births)	___ , ___ ___ ___		___ ___ lbs. ___ ___ oz.

VI. Information on Routine Prenatal and Postpartum Care – Current Pregnancy

Instructions: Please place an ☒ in the appropriate box to indicate who provided routine obstetric care to the participant.

Routine prenatal service provider

53. Please indicate who provided routine obstetric care to the participant. (Select one.)

- ☐ Obstetrician
- ☐ Nurse Practitioner
- ☐ Family Medicine Physician
- ☐ Licensed Professional Midwife
- ☐ Certified Nurse Midwife/Certified Midwife
- ☐ Other _____

Instructions: Please list the dates of all routine clinical prenatal AND postpartum follow up visits in the table below. List dates of all routine visits that occurred during the current pregnancy[45].

	54. **Dates of Individual Prenatal and Postpartum Follow-Up Visits (MM/DD/YYYY)**	55. **Dates of Group Prenatal and Postpartum Follow-Up Visits (MM/DD/YYYY)**
Visit 1.	_____/_____/_____	_____/_____/_____
Visit 2.	_____/_____/_____	_____/_____/_____
Visit 3.	_____/_____/_____	_____/_____/_____
Visit 4.	_____/_____/_____	_____/_____/_____
Visit 5.	_____/_____/_____	_____/_____/_____
Visit 6.	_____/_____/_____	_____/_____/_____
Visit 7.	_____/_____/_____	_____/_____/_____
Visit 8.	_____/_____/_____	_____/_____/_____
Visit 9.	_____/_____/_____	_____/_____/_____
Visit 10.	_____/_____/_____	_____/_____/_____
Visit 11.	_____/_____/_____	_____/_____/_____
Visit 12.	_____/_____/_____	_____/_____/_____
Visit 13.	_____/_____/_____	_____/_____/_____
Visit 14.	_____/_____/_____	_____/_____/_____
Visit 15.	_____/_____/_____	_____/_____/_____
Visit 16.	_____/_____/_____	_____/_____/_____
Visit 17.	_____/_____/_____	_____/_____/_____
Visit 18.	_____/_____/_____	_____/_____/_____
Visit 19.	_____/_____/_____	_____/_____/_____
Visit 20.	_____/_____/_____	_____/_____/_____
Or, indicate total number of visits if visit dates are not available.		
Totals	41a. Number of individual visits per trimester: First Trimester: _____ Second Trimester: _____ Third Trimester: _____	42a. Number of group visits per trimester: First Trimester: _____ Second Trimester: _____ Third Trimester: _____

[45] **For individual visits**: include routine clinical prenatal visits with a physician, midwife, nurse practitioner or similar care provider that occurred during the current pregnancy. **For group visits**: Include group prenatal care visits, such as centering visits only. Do not include specialist visits related to the pregnancy or other medical reasons or "enhanced" services such as group education, peer counseling, or smoking cessation.

VII. Number of Encounters for Enhanced Services

Instructions: Please place an ☒ in the appropriate box to indicate whether the participant received an enhanced service. For each enhanced service received, enter the number of encounters that occurred.

Note: An **enhanced** encounter or service is a face-to-face or phone encounter that is **not part of routine clinical prenatal care**. *These visits do not need to be funded by Strong Start.*

Select "No" if the participant did not receive the service because it was not needed or the service is not offered. *Also select "No" if the participant receives the service as part of routine prenatal care.* For example, if care coordination is provided for all patients during routine prenatal care visits, and does not involve meeting with a separate individual, select "No." Select "Yes" only if the service involves an additional encounter.

Do not double count services. For example, if a care coordinator visit includes health education, select only the care coordinator visit. We will understand from our case study work and your operational plan what is encompassed in those visits.

Enhanced encounters	Yes	No	Not Known	If yes, indicate the number of enhanced encounters
56. Care coordinator encounters (e.g., encounters with a social worker, case manager, nurse or community health worker)	☐	☐	☐	_____
57. Mental health care encounters	☐	☐	☐	_____
58. Doula encounters	☐	☐	☐	_____

If all encounters where enhanced services were provided have been counted in question 43 to 45, skip to question 51. Otherwise, continue to question 46.

Enhanced services not counted in questions 43 - 45	Yes	No	Not Known	If yes, indicate the number of enhanced encounters
59. Health education (not centering)	☐	☐	☐	_____
60. Home visits	☐	☐	☐	_____
61. Self-care (not centering)	☐	☐	☐	_____
62. Nutrition counseling	☐	☐	☐	_____
63. Substance abuse services	☐	☐	☐	_____
64. Referrals for non-medical services outside of the Strong Start program	☐	☐	☐	_____
65. Referrals for high risk medical services	☐	☐	☐	_____

65a. If referred for high-risk services, please indicate type of referral(s).

☐ Maternal Fetal Specialist ☐ Pulmonologist ☐ Endocrinologist ☐ Cardiologist

☐ Other _____

65b. If known, please indicate the number of high-risk encounters the participant had: _____

Thank you for completing the Exit Form.

APPENDIX E: PARTICIPANT-LEVEL PROCESS EVALUATION – MEASURES: SCORING PROCEDURES

CES-D

The shortened version of the Center for Epidemiological Studies—Depression (CES-D) scale used on Strong Start for Mothers and Newborn Intake Form, which can be found at https://downloads.cms.gov/files/cmmi/strongstart-enhancedprenatalcare_evalrptyr3v1.pdf, is a four-category response form with 10 items developed by Andresen and colleagues [1994]).[74] Each item has a value of 0 to 3, which corresponds to the frequency over the past week the respondent has felt a particular way:

- 0 = Rarely or none of the time (less than 1 day)
- 1 = Some or a little of the time (1–2 days)
- 2 = Occasionally or moderate amount of time (3–4 days)
- 3 = Most of the time (5–7 days)

The "positive mood" items (items d ["I was happy"] and g ["I enjoyed life"]) are reverse scored.

The score is then the sum of all item scores, resulting in a range of 0 to 30. The threshold for characterizing individuals as having depressive symptoms varies across studies, with typical cutoffs of 8, 9, or 10. For Strong Start for Mothers and Newborns, individuals who score 8 or higher on the CES-D 10 are characterized as exhibiting depressive symptoms.

GAD-7

GAD-7 is a seven-item screener to identify Anxiety Severity developed in 2006 by Spitzer et al., and publicly available here: http://www.phqscreeners.com/sites/g/files/g10016261/f/201412/GAD-7_English.pdf.

Results of the screener are calculated by assigning scores in the following manner:

- 0 = Not at all
- 1 = Several days
- 2 = More than half the days
- 3 = Nearly every day.

GAD-7 total score for the seven items ranges from 0 to 21. Scores of 5, 10, and 15 represent cutpoints for mild, moderate, and severe anxiety, respectively. When using the GAD-7 to screen for anxiety disorders, it is recommended that individuals with a score of 10 or greater be referred for further evaluation.

FOOD SUFFICIENCY

We are using a USDA six-item scale that can have distinguished different levels of food security.[75] The sum of Participants with a raw score 0–1 are considered to be experiencing food insecurity.

[74] Björgvinsson, T., Kertz, S.J., Bigda-Peyton, J.S., McCoy, K.L., Aderka, I.M. (2013). Psychometric properties of the CES-D-10 in a psychiatric sample. Assessment, 20, 429-436.
[75] https://www.ers.usda.gov/media/8282/short2012.pdf

WOMEN'S EXPERIENCE OF BATTERY (WEB)

The Strong Start Intake Form includes a six-item scale (short form of the 10-item WEB).

The scoring includes the following steps:

- Score each item from 1–6 (1 for strongly disagree, 6 for strongly agree)
- This creates a range from 6–36, with higher scores meaning higher psychological vulnerability (i.e., more battered).
- To dichotomize the scores, women who score 12 or lower are not battered.

SLAPPED THREATENED AND THROW (STaT)

STaT is a three-question screener designed to be a simple, sensitive, self-administered questionnaire for identifying if a woman has a history of being subject to intimate partner violence (IPV). The three questions are:

- Have you ever been in a relationship where your partner has pushed or slapped you?
- Have you ever been in a relationship where your partner threatened you with violence?
- Have you ever been in a relationship where your partner has thrown, broken, or punched things?

Answering yes to one question results in a score of 1, with a maximum score of 3 possible. All participants who scored 1 or greater were coded as having had a history of IPV.

APPENDIX F: PARTICIPANT-LEVEL PROCESS EVALUATION – PROGRAM MONITORING QUARTERLY PROGRESS REPORT

Separate from the Participant-Level Process Evaluation (PLPE) data collection effort, developed by the Evaluation Team, CMMI's Strong Start program team had developed a quarterly program monitoring data collection effort, seeking aggregated counts of enrollment, deliveries and a handful of other measures prior to the evaluation team being hired. Early in the evaluation, awardees expressed frustration that some of the data being requested through the monitoring reports and via the PLPE data were duplicative. Additionally, awardees indicated that the data request format—Excel spreadsheets that varied from quarter to quarter—was burdensome. After the evaluation contract began, the evaluation and program teams attempted to implement a more streamlined program monitoring reporting system. Urban Institute and our subcontractor, Briljent, with input from CMMI, created a web-based program monitoring tool that saved data from the prior quarter to ease data reporting and amending. We worked with CMMI to ensure all measures were collected in the manner they preferred and developed tools for reporting the quarterly results by awardee and by model.

Some features of the system developed included:

- Data collection forms that could be pre-populated with prior quarter data to reduce the amount of entry required of awardees and ensure data consistency;
- Navigation control to ensure that all pertinent data are entered before the user can continue to the next step;
- Survey design features to improve data quality and accuracy;
- Survey tracking on a real-time, ongoing basis, allowing us to remind users that have not completed the survey that the deadline is approaching;
- Data ready for immediate review;
- Automate communication and reporting.

This process was implemented for one quarter (Quarter 4 2013), but the data was reported in a format that the program team couldn't use on their own (e.g. to construct graphs) without re-entering the data into a different format. The CMMI program team thus decided that they'd prefer to return to the original Excel-spreadsheet reporting system.

Because of the time it took to establish the systems and the fact that awardees ultimately reported monitoring and evaluation data to separate systems for most of the program's duration, there is some inconsistency across awardees in the accuracy and format of certain data elements. In particular, enrollment totals reported by some awardees in program monitoring reports the program team received and reviewed are of concern. In a few cases, there was a substantial discrepancy between the number of individuals with PLPE data and the number of individuals awardees report were enrolled that the program and evaluation teams were not able to resolve. For consistency sake, we have relied on the number of individuals with PLPE data (at least one form) to represent the universe of Strong Start enrollees. This approach has been confirmed during conversations with enrollees, who have indicated that having at least one PLPE form submitted offers the most accurate enrollment count.

APPENDIX G: PARTICIPANT-LEVEL PROCESS EVALUATION – DATA QUALITY SUMMARY

DATA QUALITY TABLES

There are two kinds of missing PLPE data: 1) data missing due to a missing form, and 2) data missing due to item nonresponse on a form that was submitted. Table G. 1 and Table G. 2 present information on how much PLPE data were missing, by awardee, to provide an overall sense of data quality. Form submission rates are presented in the Participant-Level Process Evaluation Findings: A Descriptive Look at Participant Risk Profiles, Service Use and Outcomes section; here, we present information on item nonresponse. Table G. 1 presents the proportion of items on forms submitted to the evaluation team that were missing. For example, among Intake Forms submitted by awardees, MUSC had the fewest items left blank (0.9 percent), and University of Tennessee Medical Group had the highest rates of missing items (27.4 percent). Table G. 2 presents an overall assessment of missing data combining information about items missing because a form was not submitted with items missing because the information on a submitted form was left blank, for a complete picture of missing data regardless of why it is missing.

TABLE G. 1: AVERAGE RATE OF ITEM NONRESPONSE, BY FORM AND AWARDEE

Awardee	Nonresponse Rate, Intake Form Measures (%)	Nonresponse Rate, Exit Form Measures (%)	Nonresponse Rate, Third Trimester Form Measures (%)	Nonresponse Rate, Postpartum Form Measures (%)
Access Community Health Network	3.9	7.4	1.3	3.9
Albert Einstein Healthcare Network	5.3	5.5	3.0	9.1
American Association of Birth Centers (AABC)	2.6	11.8	1.1	4.5
Amerigroup Corporation	10.3	20.8	5.3	22.3
Central Jersey Family Health Consortium	6.4	4.9	2.9	6.3
Florida Association of Health Start Coalitions	2.1	14.3	1.0	18.5
Grady Memorial Hospital Corporation	3.3	17.2	2.6	0.5
Harris County Hospital District	1.7	3.3	0.2	22.8
HealthInsight of Nevada	6.1	5.7	6.8	3.4
Johns Hopkins University	2.0	8.9	1.0	19.1
Los Angeles County Department of Health Services	3.1	8.5	1.0	1.4
Maricopa Special Health Care District	1.5	5.9	0.7	0.4
Medical University of South Carolina	0.9	11.3	0.5	17.9
Meridian Health Plan	1.4	27.8	0.4	0.3
Mississippi Primary Health Care Association	11.5	9.6	1.8	6.8
Oklahoma Health Care Authority	4.1	27.6	0.9	3.7
Providence Health Foundation of Providence Hospital	4.2	11.3	4.6	5.3
Signature Medical Group	13.7	16.5	1.4	2.1
St. John Community Health Investment Corp.	1.5	21.7	2.0	19.2
Texas Tech University Health Sciences Center	7.1	20.3	1.1	0.7
United Neighborhood Health Services	4.1	5.5	1.5	2.0
University of Alabama at Birmingham	1.5	8.5	0.2	19.4
University of Kentucky Research Foundation	5.3	12.8	1.3	1.0
University of Puerto Rico Medical Sciences Campus	6.0	12.4	3.3	1.3
University of South Alabama	4.8	4.8	1.2	12.2
University of Tennessee Medical Group	27.4	28.7	53.9	65.3
Virginia Commonwealth University	14.5	6.7	4.8	23.1
All Awardees	**5.2**	**11.6**	**2.7**	**8.4**

Notes: Rates are based on the variables included in Appendix I and Appendix K. Rate of item nonresponse is limited to received forms.

TABLE G. 2: AVERAGE COMBINED MISSING RATE, BY FORM AND AWARDEE

Awardee	Combined Missing Rate, Intake Form Measures (%)	Combined Missing Rate, Exit Form Measures (%)	Combined Missing Rate, Third Trimester Form Measures (%)	Combined Missing Rate, Postpartum Form Measures (%)
Access Community Health Network	4.2	7.4	29.7	34.6
Albert Einstein Healthcare Network	26.8	11.1	74.8	90.2
American Association of Birth Centers (AABC)	19.4	11.9	39.6	46.8
Amerigroup Corporation	11.2	22.7	46.2	56.9
Central Jersey Family Health Consortium	13.2	11.9	43.9	55.3
Florida Association of Health Start Coalitions	2.1	14.3	34.2	44.6
Grady Memorial Hospital Corporation	6.7	18.2	38.9	75.6
Harris County Hospital District	5.7	3.3	26.4	30.6
HealthInsight of Nevada	8.0	51.2	43.2	56.1
Johns Hopkins University	2.2	8.9	31.3	35.2
Los Angeles County Department of Health Services	3.2	8.5	60.3	67.8
Maricopa Special Health Care District	20.0	5.9	51.5	68.2
Medical University of South Carolina	0.9	11.3	34.2	20.6
Meridian Health Plan	1.8	28.8	36.0	35.1
Mississippi Primary Health Care Association	13.0	10.3	51.5	52.9
Oklahoma Health Care Authority	5.2	38.9	63.4	65.3
Providence Health Foundation of Providence Hospital	4.2	12.5	20.2	24.4
Signature Medical Group	16.7	18.3	51.2	57.0
St. John Community Health Investment Corp.	23.0	24.5	43.7	63.7
Texas Tech University Health Sciences Center	10.1	20.8	41.0	48.1
United Neighborhood Health Services	4.3	5.6	50.8	57.1
University of Alabama at Birmingham	1.5	8.5	48.4	36.7
University of Kentucky Research Foundation	5.3	12.8	46.6	58.9
University of Puerto Rico Medical Sciences Campus	8.1	12.4	38.8	56.7
University of South Alabama	5.0	4.8	41.3	56.3
University of Tennessee Medical Group	28.2	31.3	56.1	67.7
Virginia Commonwealth University	14.7	7.0	58.4	31.4
All Awardees	**10.3**	**13.4**	**42.9**	**48.5**

Notes: Rates are based on the variables included in Appendix I and Appendix K. Combined missing rate includes missing data due to missing form or item nonresponse.

APPENDIX H: PARTICIPANT-LEVEL PROCESS EVALUATION – MAIN FINDINGS, BY MODEL

MAIN FINDINGS BY MODEL AND OVERALL

The following tables present all of the main findings from the PLPE dataset, by model and overall. Rates of missing data reported in these tables include data that are missing because a form was not submitted and data that are missing because the measure was left blank on a submitted form (item nonresponse). Data, particularly on the exit form, are often missing for women who are reported to have left Strong Start prior to delivery – these women are included in our sample and represent about 23 percent of participants. In case where the relevant population represents a subgroup of participants (e.g., women with a prior birth are the only group that could have had a prior preterm birth), we restrict the N to only those women in the universe. Women with nonmissing data (and if relevant, in the universe) are the denominator used for calculating all percentages presented in the tables below. Cells representing fewer than 11 women are censored using a dash (-). Table H. 1 includes all Strong Start participants for whom we have any PLPE forms. All subsequent tables are limited to women with a single gestation (excluding N=607 women with multiple gestations), results for women with a multiple gestation are presented in Appendix S.

TABLE H. 1: FORM SUBMISSION

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Strong Start Participants with PLPE Data	**N**	**8,806**	**10,503**	**26,007**	**45,316**
Intake Forms Received	**N**	**7,392**	**10,020**	**25,687**	**43,099**
Intake Form Submission Rate	%	83.9	95.0	98.5	94.9
Third-Trimester Surveys Received	**N**	**5,489**	**6,042**	**15,578**	**27,109**
Third Trimester Survey Submission Rate	%	62.3	57.5	59.9	59.8
Postpartum Surveys Received	**N**	**5,157**	**5,991**	**15,987**	**27,135**
Postpartum Survey Submission Rate	%	58.6	57.0	61.5	59.9
Exit Forms Received	**N**	**8,798**	**9,863**	**25,824**	**44,485**
Exit Form Submission Rate	%	99.9	93.9	99.3	98.2

TABLE H. 2: DEMOGRAPHICS

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Mother's Age at Intake					
Missing Data	%	16.2	5.5	1.6	5.4
Women with Non-Missing Data	**N**	**7,364**	**9,805**	**25,128**	**42,297**
Less than 18 Years of Age	%	2.7	6.9	5.6	5.4
18 and 19 Years of Age	%	6.5	12.7	9.7	9.8
20 Through 34 Years of Age	%	81.7	72.9	75.1	75.8
35 Years and Older	%	9.1	7.6	9.5	9.0
Race and Ethnicity					
Missing Data	%	16.8	7.1	2.9	6.6
Women with Non-Missing Data	**N**	**7,313**	**9,645**	**24,804**	**41,762**
Hispanic	%	25.4	37.1	28.0	29.7
Non-Hispanic White	%	53.2	12.7	22.5	25.6
Non-Hispanic Black	%	16.1	45.0	44.8	39.8
Other Race/Multiple Races	%	5.4	5.1	4.7	4.9
Ethnicity (Among Hispanic Women)					
Missing Data	%	19.6	12.8	11.3	13.3
Not in Universe	%	59.3	52.6	61.5	59.0
Women with Non-Missing Data	**N**	**1,854**	**3,583**	**6,951**	**12,388**
Mexican, Mexican American, Chicana	%	52.6	36.3	55.8	49.7
Puerto Rican	%	12.5	29.9	3.3	12.4
Cuban	%	1.3	1.1	1.0	1.1

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Other Hispanic, Latina, or Spanish Origin	%	30.7	31.8	38.8	35.6
Multiple Hispanic, Latina, or Spanish Origins	%	2.9	0.9	1.0	1.3
Living in Shelter or Homeless at Intake					
Missing Data	%	16.1	5.0	1.5	5.2
Women with Non-Missing Data	**N**	**7,374**	**9,864**	**25,160**	**42,398**
Yes	%	1.2	1.8	1.5	1.5
Employment and School Status at Intake					
Missing Data	%	17.5	10.4	4.8	8.6
Women with Non-Missing Data	**N**	**7,248**	**9,301**	**24,313**	**40,862**
Employed, Not in School	%	36.6	30.8	35.3	34.5
In School, Not Employed	%	8.7	12.6	11.9	11.5
Employed and in School	%	5.7	5.5	5.4	5.5
Neither Employed nor in School	%	48.9	51.0	47.4	48.5
Education Level at Intake					
Missing Data	%	19.2	16.5	8.6	12.5
Women with Non-Missing Data	**N**	**7,101**	**8,668**	**23,353**	**39,122**
Less than High School	%	15.4	27.8	29.1	26.4
High School Graduate or GED	%	57.5	58.3	57.9	57.9
Associate's Degree	%	8.2	5.2	4.6	5.4
Bachelor's Degree	%	14.5	4.5	3.7	5.8
Other College Degree	%	4.3	4.2	4.7	4.5
Relationship Status at Intake					
Missing Data	%	17.2	14.1	5.0	9.5
Women with Non-Missing Data	**N**	**7,277**	**8,916**	**24,262**	**40,455**
Married	%	42.1	20.4	20.8	24.5
Living with a Partner	%	33.2	34.8	31.1	32.3
In a Relationship but Not Living Together	%	14.7	25.9	29.7	26.1
Not in a Relationship Right Now	%	10.0	18.9	18.4	17.0

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 3: PSYCHOSOCIAL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Insured When Became Pregnant					
Missing Data	%	17.0	6.6	3.4	6.8
Women with Non-Missing Data	**N**	**7,291**	**9,696**	**24,677**	**41,664**
Yes	%	51.8	51.8	59.7	56.5
No	%	44.6	42.3	37.4	39.8
Unsure	%	3.5	5.9	2.8	3.7
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)					
Missing Data	%	17.0	6.6	3.4	6.8
Not in Universe	%	40.0	45.0	38.9	40.5
Women with Non-Missing Data	**N**	**3,778**	**5,026**	**14,735**	**23,539**
Medicaid	%	61.1	72.6	79.9	75.3
Other	%	30.0	18.6	13.5	17.2
Both Medicaid and Other Health Insurance	%	8.9	8.8	6.6	7.4
Smokes Cigarettes at Intake					
Missing Data	%	23.9	24.3	8.4	15.1
Women with Non-Missing Data	**N**	**6,687**	**7,859**	**23,400**	**37,946**
Yes	%	10.7	10.1	13.2	12.1
Food Insecure at Intake					
Missing Data	%	20.4	19.2	10.1	14.3
Women with Non-Missing Data	**N**	**6,996**	**8,383**	**22,953**	**38,332**

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Yes	%	19.1	24.4	19.2	20.3
WIC at Intake					
Missing Data	%	18.4	9.6	5.5	9.0
Women with Non-Missing Data	**N**	**7,165**	**9,387**	**24,145**	**40,697**
Yes	%	42.2	57.2	46.4	48.1
Exhibiting Depressive Symptoms at Intake[1]					
Missing Data	%	23.5	23.9	11.6	16.8
Women with Non-Missing Data	**N**	**6,721**	**7,896**	**22,573**	**37,190**
Yes	%	24.7	34.0	26.0	27.5
Exhibiting Anxiety Symptoms at Intake[2]					
Missing Data	%	19.3	16.5	7.8	12.1
Women with Non-Missing Data	**N**	**7,090**	**8,664**	**23,549**	**39,303**
None	%	67.9	59.0	65.5	64.5
Mild	%	21.4	23.8	20.2	21.2
Moderate	%	6.8	10.3	8.5	8.6
Severe	%	3.0	5.3	5.1	4.8
Incomplete Score but Showing Symptoms of Anxiety	%	0.9	1.7	0.7	1.0
History of Intimate Partner Violence[3]					
Missing Data	%	17.5	14.0	6.4	10.4
Women with Non-Missing Data	**N**	**7,247**	**8,931**	**23,897**	**40,075**
Yes	%	20.7	17.4	19.8	19.4
Experiencing Intimate Partner Violence at Intake (Among Women With a Completed Score or Who Report Being in a Relationship)[4]					
Missing Data	%	18.3	16.3	7.7	11.8
Not in Universe	%	3.7	7.8	7.4	6.8
Women with Non-Missing Data	**N**	**6,849**	**7,881**	**21,691**	**36,421**
Yes	%	2.3	3.2	2.5	2.6
Experiencing Prenatal Care Access Barrier					
Missing Data	%	16.1	5.0	1.5	5.2
Women with Non-Missing Data	**N**	**7,374**	**9,864**	**25,160**	**42,398**
None Reported	%	72.3	61.3	66.5	66.3
Reported One Access Barrier	%	21.1	28.1	24.7	24.9
Reported Two or More Access Barriers	%	6.6	10.6	8.8	8.9
Types of Barriers Reported (Among Women Who Reported Any Barrier)[5]					
No Car	%	48.3	65.0	60.0	59.7
Public Transportation Challenges	%	12.1	13.0	14.1	13.5
Not Enough Money for a Ride	%	16.1	19.9	20.8	19.9
Work Hours Make It Difficult	%	24.6	17.1	15.4	17.2
Childcare Challenges	%	19.8	9.8	7.9	10.1
Partner Objections	%	0.6	0.7	0.7	0.7
Other	%	15.6	11.2	19.0	16.4

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in Appendix E.

[1] Measured by CES-D 10 scale.
[2] Measured by GAD-7 scale.
[3] Measured by STaT scale.
[4] Measured by WEB scale.
[5] Women could report multiple barriers.

TABLE H. 4: PREGNANCY HISTORY AND INTENTIONS

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Prior Pregnancy					
Missing Data	%	0.0	2.2	0.5	0.8

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Women with Non-Missing Data	**N**	**8,785**	**10,156**	**25,427**	**44,368**
Yes	%	73.8	68.8	72.8	72.1
Pregnancy History Among Women with a Prior Pregnancy					
Not in Universe (No Prior Pregnancy)	%	26.1	29.6	27.3	27.6
Prior Miscarriage (<20 weeks EGA)					
Missing Data	%	2.4	21.9	11.6	12.2
Women with Non-Missing Data	**N**	**6,276**	**5,032**	**15,615**	**26,923**
Yes	%	33.0	26.4	35.8	33.4
Prior Elective Termination					
Missing Data	%	2.3	21.8	11.8	12.3
Women with Non-Missing Data	**N**	**6,291**	**5,038**	**15,554**	**26,883**
Yes	%	16.5	20.1	19.6	19.0
Prior Still Birth (Fetal Death >= 20 Weeks EGA)					
Missing Data	%	13.9	31.3	23.3	23.3
Women with Non-Missing Data	**N**	**5,267**	**4,051**	**12,614**	**21,932**
Yes	%	0.9	2.3	4.2	3.1
Prior Preeclampsia					
Missing Data	%	32.3	41.0	43.1	40.5
Women with Non-Missing Data	**N**	**3,651**	**3,050**	**7,574**	**14,275**
Yes	%	6.5	11.7	17.9	13.7
Prior Gestational Diabetes					
Missing Data	%	33.3	42.7	45.4	42.4
Women with Non-Missing Data	**N**	**3,560**	**2,867**	**6,986**	**13,413**
Yes	%	4.1	6.1	11.0	8.1
Prior Cervical Incompetence					
Missing Data	%	34.9	43.8	47.4	44.1
Women with Non-Missing Data	**N**	**3,428**	**2,759**	**6,467**	**12,654**
Yes	%	0.4	2.4	3.8	2.6
Prior Placenta Abnormalities					
Missing Data	%	34.5	43.9	47.8	44.3
Women with Non-Missing Data	**N**	**3,457**	**2,748**	**6,371**	**12,576**
Yes	%	1.2	1.9	2.3	1.9
Prior Congenital Abnormalities of the Fetus					
Missing Data	%	34.2	43.9	47.5	44.0
Women with Non-Missing Data	**N**	**3,487**	**2,741**	**6,449**	**12,677**
Yes	%	2.1	2.0	3.5	2.8

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 5: PRIOR BIRTH OUTCOMES

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Prior Birth (Among Women with a Prior Pregnancy)					
Missing Data	%	1.7	1.5	0.6	1.0
Not in Universe	%	26.2	32.4	27.5	28.4
Women with Non-Missing Data	**N**	**6,337**	**6,857**	**18,350**	**31,544**
Yes	%	88.3	78.6	86.9	85.4
Prior Birth Outcomes Among Women with a Prior Birth					
Inter-Pregnancy Interval with Current Pregnancy Since Last Birth					
Missing Data	%	23.5	18.9	15.2	17.7
Not in Universe	%	30.4	45.8	36.9	37.7
Women with Non-Missing Data	**N**	**4,052**	**3,664**	**12,235**	**19,951**
< 18 months	%	34.6	24.3	27.1	28.1
>= 18 months	%	65.4	75.7	72.9	71.9

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)					
Missing Data	%	0.1	2.5	1.4	1.4
Not in Universe	%	36.3	47.8	37.5	39.7
Women with Non-Missing Data	**N**	**5,588**	**5,150**	**15,608**	**26,346**
Yes	%	13.2	21.3	23.9	21.1
Prior Low Birthweight Infant (< 2,500 Grams)					
Missing Data	%	1.3	20.8	13.1	12.6
Not in Universe	%	36.3	44.3	37.2	38.7
Women with Non-Missing Data	**N**	**5,487**	**3,626**	**12,699**	**21,812**
Yes	%	1.3	12.4	15.6	11.4

Notes: All measures except for prior birth are among women with a prior birth. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 6: PRE-PREGNANCY MEDICAL CONDITIONS

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Pregnancy Intention					
Missing Data	%	18.6	14.5	6.6	10.8
Women with Non-Missing Data	**N**	**7,155**	**8,871**	**23,852**	**39,878**
Trying to Become Pregnant	%	38.4	28.2	27.1	29.4
Not Trying to Become Pregnant, Not Using Contraception	%	48.3	60.8	59.6	57.9
Not Trying to Become Pregnant, Sometimes Using Contraception	%	6.5	3.7	3.6	4.1
Not Trying to Become Pregnant, Using Contraception	%	6.8	7.4	9.6	8.6
Diabetes Pre-Pregnancy					
Missing Data	%	0.4	34.9	15.7	17.2
Women with Non-Missing Data	**N**	**8,750**	**6,757**	**21,525**	**37,032**
Yes	%	0.6	6.8	4.0	3.7
Hypertension Pre-Pregnancy					
Missing Data	%	0.4	22.4	13.7	13.1
Women with Non-Missing Data	**N**	**8,752**	**8,059**	**22,046**	**38,857**
Yes	%	0.8	8.3	7.5	6.1
Mother's BMI at First Prenatal Visit					
Missing Data	%	3.6	32.1	18.1	18.5
Women with Non-Missing Data	**N**	**8,474**	**7,052**	**20,908**	**36,434**
Underweight (BMI < 18.5)	%	4.2	3.7	2.8	3.3
Normal Weight (=>18.5 BMI <25)	%	45.2	33.9	31.0	34.9
Overweight (=>25 BMI <30)	%	25.6	27.3	25.8	26.0
Obese (=>30 BMI < 40)	%	20.8	27.6	29.9	27.3
Very Obese (BMI >= 40)	%	4.3	7.5	10.5	8.5

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, or prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 7: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Preeclampsia					
Missing Data	%	0.7	25.2	21.4	18.2
Women with Non-Missing Data	**N**	**8,722**	**7,767**	**20,070**	**36,559**
Yes	%	1.5	6.0	5.8	4.9
Pregnancy-Related Hypertension					
Missing Data	%	0.7	26.5	20.9	18.2
Women with Non-Missing Data	**N**	**8,722**	**7,631**	**20,216**	**36,569**
Yes	%	1.4	8.1	7.2	6.0
Gestational Diabetes					
Missing Data	%	0.7	24.9	21.1	17.9
Women with Non-Missing Data	**N**	**8,723**	**7,798**	**20,166**	**36,687**
Yes	%	2.8	6.0	7.9	6.3
Cervical Incompetence					
Missing Data	%	0.8	32.7	22.4	20.6
Women with Non-Missing Data	**N**	**8,719**	**6,984**	**19,813**	**35,516**
Yes	%	-	0.9	2.0	1.3
Placenta Previa					
Missing Data	%	0.8	26.2	22.2	18.9
Women with Non-Missing Data	**N**	**8,719**	**7,656**	**19,871**	**36,246**
Yes	%	0.3	0.9	1.6	1.1
Placental Abruption					
Missing Data	%	0.8	26.7	23.3	19.7
Women with Non-Missing Data	**N**	**8,720**	**7,610**	**19,584**	**35,914**
Yes	%	0.4	0.5	0.8	0.6
Congenital Abnormalities of the Fetus					
Missing Data	%	0.6	32.8	22.3	20.5
Women with Non-Missing Data	**N**	**8,737**	**6,974**	**19,854**	**35,565**
Yes	%	1.2	1.5	2.1	1.8
UTI(s) During Last 6 months of Pregnancy					
Missing Data	%	0.8	28.0	23.1	19.9
Women with Non-Missing Data	**N**	**8,717**	**7,473**	**19,635**	**35,825**
Yes	%	5.2	11.8	17.3	13.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 8: TREATMENTS DURING PREGNANCY

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Vaginal Progesterone					
Missing Data	%	6.6	40.0	40.1	33.5
Women with Non-Missing Data	**N**	**8,204**	**6,230**	**15,309**	**29,743**
Yes	%	0.2	0.6	1.1	0.8
17P (Progesterone Injections, Among Women with a Prior Preterm Birth)					
Missing Data	%	0.8	10.0	5.1	5.4
Not in Universe	%	91.5	83.7	84.8	85.8
Women with Non-Missing Data	**N**	**680**	**654**	**2,585**	**3,919**
Yes	%	2.6	10.9	19.2	15.0
Antenatal Steroids					
Missing Data	%	1.3	43.5	46.0	36.7
Women with Non-Missing Data	**N**	**8,673**	**5,862**	**13,786**	**28,321**
Yes	%	0.4	2.4	4.1	2.6

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Tocolytics					
Missing Data	%	1.5	43.7	49.1	38.5
Women with Non-Missing Data	**N**	**8,654**	**5,848**	**13,013**	**27,515**
Yes	%	0.3	1.1	1.8	1.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 9: PRENATAL CARE

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Routine Prenatal Care Provider					
Missing Data	%	0.6	20.4	16.4	14.2
Women with Non-Missing Data	**N**	**8,730**	**8,264**	**21,355**	**38,349**
Obstetrician	%	4.7	29.5	64.5	43.3
Licensed Professional Midwife	%	18.8	2.3	1.0	5.4
Nurse Practitioner	%	-	26.5	5.7	8.9
Certified Nurse Midwife/Certified Midwife	%	74.6	37.5	18.3	35.2
Family Medicine Physician	%	1.7	2.5	1.4	1.7
Other Provider	%	0.1	1.6	9.1	5.4
Routine Prenatal Care (Individual Visits)					
Missing Data	%	0.1	6.2	0.7	1.9
Women with Non-Missing Data	**N**	**8,778**	**9,740**	**25,360**	**43,878**
Received Individual Visits	%	99.7	72.8	90.0	88.1
Average number of Individual Prenatal Visits	Mean	9.3	5.3	8.8	8.3
Routine Prenatal Care (Group Visits)					
Missing Data	%	0.1	6.2	0.7	1.9
Women with Non-Missing Data	**N**	**8,778**	**9,740**	**25,360**	**43,878**
Received Group Visits	%	1.6	79.5	2.3	19.3
Average Number of Group Prenatal Visits	Mean	7.0	5.7	4.8	5.7
Care Coordinator Encounters					
Missing Data	%	0.6	31.8	8.6	12.4
Women with Non-Missing Data	**N**	**8,732**	**7,081**	**23,342**	**39,155**
Received Care Coordinator Encounters	%	99.5	46.1	93.0	86.0
Average Number of Care Coordinator Encounters	Mean	3.2	2.3	4.6	4.0
Mental Health Encounters					
Missing Data	%	5.2	35.2	16.4	18.5
Women with Non-Missing Data	**N**	**8,331**	**6,731**	**21,354**	**36,416**
Received Mental Health Encounters	%	0.7	3.4	8.8	5.9
Average Number of Mental Health Encounters	Mean	1.9	1.7	2.4	2.3
Doula Encounters					
Missing Data	%	89.3	36.1	15.7	34.9
Women with Non-Missing Data	**N**	**939**	**6,635**	**21,542**	**29,116**
Received Doula Encounters	%	75.0	0.6	1.2	3.4
Average Number of Doula Encounters	Mean	2.2	1.0	2.7	2.4
Health Education					
Missing Data	%	98.0	38.9	33.9	47.7
Women with Non-Missing Data	**N**	**172**	**6,347**	**16,873**	**23,392**
Received Health Education, Not Centering	%	16.9	13.4	30.9	26.1
Average Number of Health Education Sessions	Mean	1.5	1.4	2.5	2.4
Home Visits					
Missing Data	%	62.9	42.9	27.8	38.2
Women with Non-Missing Data	**N**	**3,258**	**5,925**	**18,445**	**27,628**

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Received Home Visits	%	55.6	2.5	7.7	12.3
Average Number of Home Visits	Mean	1.4	1.4	1.6	1.5
Self-Care, not Centering					
Missing Data	%	98.2	49.4	36.8	51.8
Women with Non-Missing Data	**N**	**157**	**5,257**	**16,146**	**21,560**
Received Self-Care, Not Centering	%	-	8.8	9.8	9.5
Average Number of Self-Care Sessions	Mean	-	1.2	3.9	3.5
Nutrition Counseling					
Missing Data	%	7.2	38.7	30.7	27.9
Women with Non-Missing Data	**N**	**8,151**	**6,361**	**17,701**	**32,213**
Received Nutrition Counseling	%	0.3	28.6	32.7	23.7
Average Number of Nutrition Counseling Sessions	Mean	1.0	1.5	2.1	2.0
Substance Abuse Services					
Missing Data	%	7.2	37.3	31.6	28.1
Women with Non-Missing Data	**N**	**8,152**	**6,511**	**17,470**	**32,133**
Received Substance Abuse Services	%	-	2.6	3.2	2.3
Average Number of Substance Abuse Services	Mean	-	4.0	2.2	2.4
Referrals for High Risk Medical Services					
Missing Data	%	5.3	37.8	17.1	19.6
Women with Non-Missing Data	**N**	**8,322**	**6,457**	**21,163**	**35,942**
Received Referrals for High Risk Medical Services	%	0.3	24.5	25.8	19.7
Average Number of Referrals for High Risk Medical Services	Mean	1.8	1.7	1.6	1.6
Types of Referrals for High Risk Medical Services (Among Women with Services)					
Maternal Fetal Specialist	%	52.4	70.7	46.7	52.0
Pulmonologist	%	-	1.3	1.5	1.4
Endocrinologist	%	-	4.1	5.1	4.8
Cardiologist	%	-	6.4	6.9	6.8
Other	%	-	32.8	60.8	54.6

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. It is unlikely the women enrolled in Maternity Care Home or Group Prenatal Care were cared for by a Licensed Profession Midwife though this was reported for 1% and 2.3%, respectively. Awardees were "self-care" directed to indicate women conducted "self-care" if they weighed themselves, took their own blood pressure, etc., outside of the context of Group Prenatal Care. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE H. 10: DELIVERY INFORMATION

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Induction of Labor (Among Women Who Delivered, Excluding Planned C sections)					
Missing Data	%	1.4	25.3	23.3	19.5
Not in Universe	%	27.5	21.6	26.2	25.4
Women with Non-Missing Data	**N**	**6,242**	**5,511**	**12,897**	**24,650**
Yes	%	20.5	37.4	35.5	32.1
Induction of Labor with Pitocin (Among Women Who Were Induced)					
Missing Data	%	0.3	7.8	2.9	3.5
Not in Universe	%	85.3	74.0	81.4	80.4
Women with Non-Missing Data	**N**	**1,263**	**1,894**	**4,031**	**7,188**
Yes	%	56.1	89.9	90.7	84.4
Place of Delivery (Among Women with a Delivery)					
Missing Data	%	4.6	11.5	7.3	7.7
Not in Universe	%	25.8	15.8	18.2	19.2
Women with Non-Missing Data	**N**	**6,114**	**7,551**	**19,027**	**32,692**

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Hospital	%	51.8	99.4	99.5	90.6
Birth center	%	43.4	-	0.1	8.2
Home birth	%	4.3	-	0.2	0.9
Other	%	0.5	0.4	0.2	0.3
Delivery Method (Among ALL Women with a Delivery)					
Missing Data	%	0.7	12.0	5.6	6.1
Not in Universe	%	25.8	15.8	18.2	19.2
Women with Non-Missing Data	**N**	**6,454**	**7,497**	**19,466**	**33,417**
Vaginal Only	%	87.1	70.1	69.5	73.1
C-Section Only	%	12.9	29.9	30.5	26.9
Delivery Method (Among LOW RISK Women with a Delivery)[1]					
Missing Data	%	0.4	8.7	2.3	3.4
Not in Universe	%	74.1	61.4	73.0	70.5
Women with Non-Missing Data	**N**	**2,239**	**3,100**	**6,298**	**11,637**
Vaginal	%	83.3	72.9	74.7	75.9
C-Section	%	16.7	27.1	25.3	24.1
Scheduled C-Section (Among Women with a C-Section)					
Missing Data	%	4.7	12.5	6.3	7.4
Not in Universe	%	90.5	72.2	76.1	78.0
Women with Non-Missing Data	**N**	**429**	**1,586**	**4,495**	**6,510**
Yes	%	34.3	38.1	45.6	43.0
VBAC (Among Women with a Prior C-Section)					
Missing Data	%	0.1	6.2	0.7	1.9
Not in Universe	%	96.0	82.7	85.9	87.1
Women with Non-Missing Data	**N**	**343**	**1,160**	**3,426**	**4,929**
Yes	%	29.4	21.7	17.5	19.3

Notes: All measures are among women with a delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).
[1] Low risk is defined as women with nulliparous, singleton, term births.

TABLE H. 11: BIRTH OUTCOMES

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Outcomes of Strong Start Pregnancy[1]					
Missing Data	%	23.2	20.7	14.9	17.9
Women with Non-Missing Data	**N**	**6,745**	**8,227**	**21,734**	**36,706**
Live Birth	%	96.2	97.6	94.4	95.5
Stillbirth	%	0.3	0.9	0.8	0.7
Termination	%	0.3	0.2	0.6	0.5
Miscarriage	%	3.2	1.3	4.1	3.3
Estimated Gestational Age (EGA, Among Women with Live Births)					
Missing Data	%	0.7	15.4	5.8	7.0
Not in Universe	%	26.1	16.4	18.9	19.8
Women with Non-Missing Data	**N**	**6,433**	**7,078**	**19,229**	**32,740**
Very Preterm (20 =< EGA < 34)	%	1.0	3.5	4.3	3.5
Preterm (34 =< EGA < 37)	%	3.5	8.4	8.6	7.6
Term (37 =< EGA < 42)	%	93.4	86.7	85.7	87.4
Post-Term (42+)	%	2.0	1.4	1.3	1.5
Birth Weight (Among Women with Live Births)					
Missing Data	%	2.1	14.3	8.0	8.3
Not in Universe	%	26.1	16.4	18.9	19.8
Women with Non-Missing Data	**N**	**6,312**	**7,189**	**18,672**	**32,173**

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Very Low Birthweight (<1500g)	%	0.5	1.3	1.8	1.5
Low Birthweight (=>1500g < 2500g)	%	3.1	8.7	8.7	7.6
Normal Birthweight (=>2500 < 4000g)	%	85.5	84.9	83.4	84.2
Macrosomic Birthweight (=>4000g)	%	10.9	5.2	6.0	6.8

Notes: All measures are among women with a delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).
[1] For the measure Outcomes of Strong Start Pregnancy, 11 percent of the missing data is attributable to a missing exit form. Among the remaining 89 percent of data missing due to item nonresponse, 67 percent of participants were reported to have left Strong Start prior to delivery and 17 percent are missing information on whether they left Strong Start. Remaining sources of missing data include women missing responses for all of the following variables: number of live births delivered, estimated gestational age, baby date of birth, and infant birth weight.

APPENDIX I: PARTICIPANT-LEVEL PROCESS EVALUATION – MAIN FINDINGS, BY AWARDEE

TABLE I. 1: PLPE FORM SUBMISSION

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Strong Start Participants with PLPE Data	N	2,676	1,429	8,426	976	1,238	1,343	709	1,264	857	1,629	3,142	959	820	1,812	2,628	869	3,458	1,802	247	1,094	1,174	1,322	696	928	1,457	732	1,629	45,316
Intake Forms Received	N	2,668	1,122	7,012	967	1,153	1,343	685	1,214	841	1,627	3,139	782	820	1,804	2,589	859	3,457	1,747	194	1,061	1,171	1,322	696	908	1,455	726	1,626	42,988
Intake Form Submission Rate	%	99.7	78.5	83.2	99.1	93.1	100.0	96.6	96.0	98.1	99.9	99.9	81.5	100.0	99.6	98.5	98.8	100.0	96.9	78.5	97.0	99.7	100.0	100.0	97.8	99.9	99.2	99.8	94.9
Third-Trimester Surveys Received	N	1,917	404	5,178	577	731	898	452	933	545	1,136	1,280	472	544	1,167	1,322	326	2,918	905	144	657	595	684	381	599	873	716	755	27,109
Third Trimester Survey Submission Rate	%	71.6	28.3	61.5	59.1	59.0	66.9	63.8	73.8	63.6	69.7	40.7	49.2	66.3	64.4	50.3	37.5	84.4	50.2	58.3	60.1	50.7	51.7	54.7	64.5	59.9	97.8	46.3	59.8
Postpartum Surveys Received	N	1,855	270	4,863	638	632	992	177	1,166	406	1,367	1,055	309	798	1,182	1,417	334	2,799	812	137	575	528	1,094	293	414	814	714	1,494	27,135
Postpartum Survey Submission Rate	%	69.3	18.9	57.7	65.4	51.1	73.9	25.0	92.2	47.4	83.9	33.6	32.2	97.3	65.2	53.9	38.4	80.9	45.1	55.5	52.6	45.0	82.8	42.1	44.6	55.9	97.5	91.7	59.9
Exit Forms Received	N	2,675	1,350	8,418	958	1,152	1,343	702	1,264	467	1,629	3,142	959	820	1,795	2,611	771	3,416	1,770	240	1,089	1,173	1,322	696	928	1,457	713	1,625	44,485
Exit Form Submission Rate	%	100.0	94.5	99.9	98.2	93.1	100.0	99.0	100.0	54.5	100.0	100.0	100.0	100.0	99.1	99.4	88.7	98.8	98.2	97.2	99.5	99.9	100.0	100.0	100.0	100.0	97.4	99.8	98.2

TABLE I. 2: DEMOGRAPHICS

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Mother s Age at Intake																													
Missing Data	%	0.3	23.0	16.9	1.5	7.1	0.0	4.7	4.0	1.9	0.4	0.1	18.6	0.0	0.4	1.6	1.3	0.1	3.5	20.7	4.6	0.3	0.0	1.0	2.1	0.1	1.5	0.4	5.4
Women with Non-Missing Data	N	2623	1087	6986	931	1142	1305	670	1208	835	1602	3099	773	788	1779	2525	843	3417	1716	191	1025	1155	1280	682	882	1431	719	1603	42297
Less than 18 Years of Age	%	6.5	6.4	2.6	3.7	3.9	7.1	7.8	8.0	6.1	7.4	2.6	11.8	1.8	2.7	8.0	6.6	5.6	4.3	-	5.7	5.3	6.4	5.3	7.4	8.5	13.9	5.7	5.4
18 and 19 Years of Age	%	9.3	12.9	6.3	10.1	9.9	11.9	17.8	9.6	16.9	11.5	5.7	13.7	6.6	9.9	12.2	10.4	8.3	10.9	8.4	11.5	9.0	10.2	12.8	10.3	12.4	18.4	11.2	9.8
20 Through 34 Years of Age	%	70.8	76.1	81.9	80.3	77.9	74.5	71.0	68.8	71.1	73.1	73.6	68.2	82.1	82.9	75.0	74.4	75.6	78.6	79.6	75.5	74.2	76.6	75.2	68.0	73.5	64.8	73.6	75.8
35 Years and Older	%	13.4	4.6	9.2	5.9	8.2	6.5	3.4	13.6	5.9	7.9	18.1	6.3	9.5	4.5	4.8	8.5	10.6	6.3	9.9	7.3	11.5	6.8	6.7	14.3	5.6	2.9	9.5	9.0
Race and Ethnicity																													
Missing Data	%	1.7	22.6	17.5	1.4	8.8	0.3	3.6	4.3	4.0	0.4	0.8	19.2	0.5	1.0	3.8	1.9	2.1	4.8	20.7	7.6	1.9	0.2	1.6	3.9	0.8	8.5	5.9	6.6
Women with Non-Missing Data	N	2586	1093	6938	932	1121	1301	678	1204	817	1602	3077	768	784	1769	2469	838	3347	1694	191	992	1136	1278	678	866	1421	668	1514	41762
Hispanic	%	51.7	16.7	26.4	7.2	49.1	22.4	4.3	83.5	40.1	8.1	64.7	64.7	4.2	3.4	1.2	42.1	28.0	3.4	-	59.6	52.1	2.6	33.5	98.3	1.8	-	23.1	29.7
Non-Hispanic White	%	4.9	8.9	56.0	17.1	9.7	30.1	4.3	2.3	23.3	13.0	5.2	13.3	25.0	83.7	13.1	17.8	1.2	77.9	5.8	23.0	11.3	19.6	50.1	1.4	35.0	1.8	15.0	25.6
Non-Hispanic Black	%	41.3	68.0	12.2	72.7	36.9	42.0	88.8	13.5	24.4	72.6	18.5	18.9	69.4	11.3	84.8	8.7	67.6	15.4	89.5	14.4	34.3	77.5	12.5	-	59.5	96.7	52.1	39.8
Other Race/Multiple Races	%	2.1	6.5	5.4	3.0	4.3	5.6	2.7	-	12.2	6.4	11.7	3.1	1.4	1.5	1.0	31.4	3.2	3.3	-	3.0	2.3	-	3.8	-	3.7	-	9.8	4.9
Ethnicity (Among Hispanic Women)																													
Missing Data	%	10.2	31.2	20.2	12.6	19.2	7.7	9.1	5.6	8.3	2.0	5.6	23.7	0.5	1.7	40.3	11.4	9.9	5.7	22.8	15.0	5.0	0.5	3.5	4.3	20.9	8.5	8.3	13.3

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Not in Universe	%	39.0	55.9	58.1	80.3	36.0	70.0	86.8	14.5	53.1	90.0	30.2	24.0	95.3	94.9	58.6	47.3	62.8	91.1	75.9	30.0	43.9	96.9	63.6	1.2	77.3	90.4	69.9	59.0
Women with Non-Missing Data	**N**	**1338**	**182**	**1831**	**67**	**550**	**291**	**29**	**1005**	**328**	**129**	**1991**	**497**	**33**	**61**	**29**	**353**	**936**	**57**	**-**	**591**	**592**	**33**	**227**	**851**	**26**	**-**	**350**	**12388**
Mexican, Mexican American, Chicana	%	85.0	14.8	53.1	22.4	16.9	16.5	41.4	65.0	71.0	22.5	67.0	87.7	63.6	72.1	48.3	65.7	10.1	-	-	25.0	54.2	69.7	71.8	-	50.0	-	20.9	49.7
Puerto Rican	%	2.5	63.7	12.3	-	15.8	39.9	-	-	-	17.8	-	-	-	-	-	-	2.1	-	-	-	-	-	-	96.1	-	-	9.4	12.4
Cuban	%	-	-	1.3	-	-	14.4	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1
Other Hispanic, Latina, or Spanish Origin	%	10.8	15.9	30.4	65.7	64.2	21.6	-	33.7	24.1	56.6	31.6	10.3	-	23.0	-	31.7	86.9	82.5	-	74.3	44.4	-	25.6	2.7	-	-	67.4	35.6
Multiple Hispanic, Latina, or Spanish Origins	%	1.4	-	2.9	-	-	7.6	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Living in Shelter or Homeless at Intake																													
Missing Data	%	0.3	21.3	16.8	0.8	6.8	0.0	3.4	4.0	1.6	0.1	0.1	18.6	0.0	0.4	1.5	1.2	0.0	3.1	20.7	3.1	0.3	0.0	0.0	2.1	0.1	0.8	0.2	5.2
Women with Non-Missing Data	**N**	**2623**	**1111**	**6996**	**937**	**1145**	**1305**	**679**	**1208**	**837**	**1606**	**3099**	**773**	**788**	**1779**	**2527**	**844**	**3418**	**1724**	**191**	**1041**	**1155**	**1280**	**689**	**882**	**1431**	**724**	**1606**	**42398**
Yes	%	1.1	1.8	0.9	-	1.4	2.5	1.6	-	1.3	1.1	1.2	-	1.4	-	1.5	3.4	3.2	1.2	-	-	1.9	0.9	5.8	3.4	1.2	-	1.3	1.5
Employment and School Status at Intake																													
Missing Data	%	1.6	23.7	18.2	12.1	10.7	1.2	5.8	5.3	6.3	0.9	2.0	19.7	0.3	1.3	9.9	4.6	2.0	14.3	21.6	7.7	2.5	0.7	2.5	9.1	2.8	11.0	13.5	8.6
Women with Non-Missing Data	**N**	**2588**	**1077**	**6876**	**831**	**1098**	**1289**	**662**	**1191**	**797**	**1593**	**3041**	**763**	**786**	**1764**	**2312**	**815**	**3349**	**1524**	**189**	**991**	**1129**	**1271**	**672**	**819**	**1393**	**650**	**1392**	**40862**
Employed, Not in School	%	34.9	36.6	36.9	40.4	34.8	34.1	33.7	21.2	30.5	32.9	36.2	28.7	37.2	33.7	35.6	35.6	35.6	45.3	24.9	36.5	33.8	32.0	27.5	24.4	35.0	20.6	33.3	34.5
In School, Not Employed	%	11.5	12.3	8.2	12.2	9.4	13.7	17.1	10.2	10.5	13.4	10.5	15.7	9.9	10.9	16.0	9.2	14.9	7.7	12.7	8.7	8.4	10.3	10.6	15.8	14.0	18.6	11.7	11.5
Employed and in School	%	4.6	6.9	5.7	7.9	6.0	6.6	8.6	2.1	4.1	5.1	6.6	4.8	5.2	4.6	4.5	6.7	5.8	6.4	-	4.6	4.5	5.8	5.7	4.4	5.6	4.8	4.6	5.5
Neither Employed nor in School	%	49.1	44.3	49.2	39.5	49.8	45.6	40.6	66.6	54.8	48.6	46.7	50.7	47.7	50.7	43.9	48.5	43.7	40.6	57.1	50.2	53.2	51.8	56.3	55.4	45.4	56.0	50.4	48.5
Education Level at Intake																													
Missing Data	%	5.1	25.4	19.9	15.3	21.5	2.9	7.4	7.5	8.3	1.4	1.8	21.7	0.9	1.5	15.3	11.7	7.8	21.1	22.0	10.9	18.7	0.7	32.9	19.6	4.5	8.5	23.4	12.5
Women with Non-Missing Data	**N**	**2497**	**1054**	**6734**	**800**	**965**	**1267**	**651**	**1164**	**780**	**1585**	**3045**	**744**	**781**	**1760**	**2173**	**754**	**3154**	**1403**	**188**	**957**	**941**	**1271**	**462**	**724**	**1368**	**668**	**1232**	**39122**
Less than High School	%	36.1	21.7	15.0	21.6	17.7	34.9	25.5	65.5	34.6	31.8	30.3	43.4	24.6	24.7	20.7	35.9	28.2	13.8	25.0	30.7	38.6	25.5	-	9.9	28.9	28.0	26.3	26.4
High School Graduate or GED	%	50.9	68.6	57.5	63.6	61.8	51.8	61.9	32.2	55.9	61.2	52.8	45.7	60.8	64.5	68.7	49.5	58.8	64.7	65.4	52.9	48.5	65.8	82.9	49.7	59.2	68.9	59.0	57.9
Associate's Degree	%	5.3	4.1	8.4	4.9	7.5	5.1	5.5	-	3.3	2.5	4.4	3.6	5.1	5.0	5.8	5.4	4.3	5.9	-	3.0	1.9	3.4	6.7	15.5	6.4	1.8	5.3	5.4
Bachelor's Degree	%	3.2	2.8	14.8	5.6	7.7	1.6	4.3	-	3.1	2.8	6.6	1.5	4.0	3.4	2.1	5.2	5.2	6.8	-	2.5	3.5	2.1	6.3	8.7	1.9	-	5.9	5.8
Other College Degree	%	4.4	2.8	4.3	4.3	5.4	6.6	2.8	1.1	3.1	1.6	5.9	5.8	5.5	2.4	2.7	4.0	3.6	8.8	-	10.9	7.5	3.2	4.1	16.2	3.5	-	3.5	4.5
Relationship Status at Intake																													
Missing Data	%	1.9	26.3	17.8	13.1	11.5	0.5	6.3	4.6	6.2	1.6	0.7	19.5	0.3	0.9	15.3	3.6	2.5	13.5	20.7	5.1	1.6	0.9	1.6	6.0	4.1	51.8	16.7	9.5
Women with Non-Missing Data	**N**	**2580**	**1040**	**6910**	**821**	**1088**	**1298**	**659**	**1200**	**798**	**1583**	**3080**	**765**	**786**	**1771**	**2173**	**823**	**3332**	**1539**	**191**	**1019**	**1140**	**1268**	**678**	**847**	**1374**	**352**	**1340**	**40455**
Married	%	22.8	11.1	43.7	14.0	23.9	15.1	12.4	29.1	18.3	12.8	27.1	14.9	16.8	26.2	11.5	34.9	17.9	27.7	9.4	23.9	29.6	13.0	29.8	21.6	16.0	8.2	25.6	24.5
Living with a Partner	%	32.5	33.0	33.6	40.1	28.5	35.4	31.0	35.8	43.5	35.0	35.5	37.0	26.3	30.3	19.9	33.8	28.3	35.9	27.2	34.1	34.5	24.4	38.1	46.5	27.7	26.7	28.1	32.3
In a Relationship but Not Living Together	%	28.6	34.0	13.6	28.9	28.8	30.0	33.1	18.2	19.7	29.8	27.5	30.8	41.1	27.6	43.1	17.3	32.4	21.6	23.0	19.2	21.5	38.6	18.9	17.7	31.1	43.2	24.3	26.1
Not in a Relationship Right Now	%	16.1	21.9	9.1	17.1	18.8	19.5	23.5	17.0	18.5	22.5	9.9	17.3	15.8	15.9	25.5	14.1	21.4	14.8	40.3	22.8	14.4	24.0	13.3	14.2	25.1	21.9	22.0	17.0

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 3: PSYCHOSOCIAL

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Insured When Became Pregnant																													
Missing Data	%	1.4	23.2	17.7	7.7	8.2	1.7	4.0	4.5	3.6	1.4	0.8	19.3	0.8	0.6	3.7	1.6	0.8	15.7	22.0	4.2	2.1	1.1	0.9	4.7	1.3	0.8	0.2	6.8
Women with Non-Missing Data	**N**	**2,592**	**1,085**	**6,916**	**872**	**1,128**	**1,283**	**675**	**1,202**	**820**	**1,586**	**3,076**	**767**	**782**	**1,776**	**2,471**	**840**	**3,390**	**1,500**	**188**	**1,029**	**1,134**	**1,266**	**683**	**859**	**1,414**	**724**	**1,606**	**41,664**
Yes	%	65.2	57.9	50.2	51.9	39.9	63.2	45.3	13.1	64.1	70.5	63.9	71.8	59.3	51.7	52.3	37.1	82.2	44.9	87.2	35.1	33.6	72.0	54.2	84.7	51.7	97.5	38.1	56.5
No	%	31.8	34.4	46.2	39.0	54.9	34.8	50.1	86.0	31.5	24.1	33.8	27.9	39.4	48.1	45.1	58.2	15.1	51.3	12.8	63.9	64.6	27.3	42.2	13.5	40.1	2.5	46.0	39.8
Unsure	%	3.0	7.7	3.6	9.1	5.2	1.9	4.6	0.9	4.4	5.4	2.3	-	-	-	2.6	4.6	2.7	3.9	-	-	1.9	-	3.7	1.7	8.2	-	15.9	3.7
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)																													
Missing Data	%	1.4	23.2	17.7	7.7	8.2	1.7	4.0	4.5	3.6	1.4	0.8	19.3	0.8	0.6	3.7	1.6	0.8	15.7	22.0	4.2	2.1	1.1	0.9	4.7	1.3	0.8	0.2	6.8
Not in Universe	%	34.3	32.4	41.0	44.3	55.2	36.2	52.5	83.1	34.5	29.1	35.8	22.7	40.4	48.0	45.9	61.8	17.6	46.5	10.0	62.2	65.0	27.7	45.4	14.5	47.7	2.5	61.8	40.5
Women with Non-Missing Data	**N**	**1,690**	**628**	**3,471**	**453**	**450**	**811**	**306**	**157**	**526**	**1,118**	**1,967**	**551**	**464**	**919**	**1,292**	**312**	**2,787**	**673**	**164**	**361**	**381**	**911**	**370**	**728**	**731**	**706**	**612**	**23,539**
Medicaid	%	86.3	56.1	59.5	62.9	64.9	79.3	65.0	65.6	78.1	82.3	91.0	91.5	90.5	90.6	64.5	48.1	85.4	41.5	79.3	63.2	52.2	86.6	66.8	84.6	69.4	93.2	71.9	75.3
Other	%	6.7	33.3	31.9	27.8	22.9	11.7	26.5	28.0	11.2	11.5	5.8	6.7	5.4	7.2	25.3	45.2	5.6	55.0	-	30.7	35.4	8.7	24.3	8.7	19.3	-	19.1	17.2
Both Medicaid and Other Health Insurance	%	6.9	10.7	8.6	9.3	12.2	9.0	8.5	-	10.6	6.2	3.3	-	4.1	2.2	10.2	6.7	9.0	3.6	14.6	6.1	12.3	4.7	8.9	6.7	11.4	5.5	9.0	7.4
Smokes Cigarettes at Intake																													
Missing Data	%	5.2	35.9	24.4	18.5	19.9	1.0	12.9	9.4	13.9	8.3	4.1	19.3	0.1	1.5	29.7	8.2	7.6	12.9	24.1	8.5	2.7	0.5	0.0	13.2	6.4	81.4	32.1	15.1
Women with Non-Missing Data	**N**	**2,492**	**905**	**6,353**	**770**	**984**	**1,292**	**612**	**1,140**	**733**	**1,474**	**2,975**	**767**	**787**	**1,760**	**1,803**	**784**	**3,158**	**1,550**	**183**	**983**	**1,127**	**1,274**	**689**	**782**	**1,341**	**136**	**1,092**	**37,946**
Yes	%	7.9	14.9	10.6	9.7	3.9	17.0	5.7	-	9.3	17.3	4.4	9.8	12.7	23.8	19.0	11.2	6.6	20.4	8.2	11.5	10.9	19.6	32.4	3.2	20.7	14.0	14.0	12.1
Food Insecure at Intake																													
Missing Data	%	5.2	33.8	21.1	18.4	16.5	1.9	11.8	6.0	12.7	1.7	9.9	23.6	0.9	3.7	16.4	6.0	6.3	30.0	22.8	14.8	7.5	2.3	7.1	10.9	13.1	52.1	26.2	14.3
Women with Non-Missing Data	**N**	**2,494**	**935**	**6,635**	**771**	**1,026**	**1,280**	**620**	**1,183**	**743**	**1,581**	**2,794**	**726**	**781**	**1,720**	**2,145**	**803**	**3,202**	**1,245**	**186**	**915**	**1,071**	**1,250**	**640**	**803**	**1,245**	**350**	**1,188**	**38,332**
Yes	%	28.6	24.0	17.9	23.6	24.3	22.9	23.1	13.8	32.2	15.4	17.8	7.4	16.6	3.6	16.5	22.3	27.0	12.9	28.0	23.2	11.0	28.1	30.9	27.3	21.3	17.4	30.3	20.3
WIC at Intake																													
Missing Data	%	3.2	22.9	19.0	12.1	9.8	2.5	4.0	4.9	5.8	2.5	1.9	19.7	0.9	1.6	7.3	3.0	3.0	21.8	23.2	5.6	6.0	1.9	1.5	3.9	2.8	11.4	12.2	9.0
Women with Non-Missing Data	**N**	**2,547**	**1,088**	**6,808**	**831**	**1,108**	**1,273**	**675**	**1,196**	**802**	**1,568**	**3,043**	**763**	**781**	**1,759**	**2,378**	**828**	**3,315**	**1,392**	**185**	**1,014**	**1,089**	**1,256**	**679**	**866**	**1,393**	**647**	**1,413**	**40,697**
Yes	%	31.8	43.8	42.8	47.4	53.2	47.4	64.7	60.2	48.9	51.5	50.6	44.4	65.3	66.0	55.5	46.9	33.3	56.0	79.5	47.0	24.1	56.0	62.0	87.3	25.6	65.8	53.7	48.1
Exhibiting Depressive Symptoms at Intake[1]																													
Missing Data	%	7.8	35.8	24.1	24.4	26.0	2.6	14.1	6.5	17.6	2.1	1.9	22.8	1.8	5.6	19.8	13.3	11.8	28.3	22.8	25.1	7.7	6.0	11.2	24.1	10.5	53.7	36.2	16.8
Women with Non-Missing Data	**N**	**2,425**	**906**	**6,381**	**714**	**909**	**1,271**	**604**	**1,176**	**701**	**1,574**	**3,042**	**733**	**774**	**1,687**	**2,057**	**740**	**3,016**	**1,275**	**186**	**804**	**1,069**	**1,203**	**612**	**684**	**1,282**	**338**	**1,027**	**37,190**
Yes	%	22.8	44.4	23.8	40.9	30.5	32.4	36.4	12.8	35.8	32.4	21.4	-	12.0	-	35.2	21.4	30.6	24.6	-	-	13.8	51.8	38.7	40.2	34.8	-	40.1	27.5
Exhibiting Anxiety Symptoms at Intake[2]																													
Missing Data	%	3.0	27.0	20.0	16.1	15.3	0.8	6.3	4.5	9.3	0.9	2.0	20.4	0.6	2.7	15.9	4.4	3.8	27.9	21.6	17.5	4.1	1.9	7.1	9.4	4.3	50.1	28.8	12.1
Women with Non-Missing Data	**N**	**2,550**	**1,031**	**6,724**	**793**	**1,041**	**1,295**	**659**	**1,202**	**772**	**1,593**	**3,041**	**756**	**783**	**1,739**	**2,159**	**816**	**3,288**	**1,282**	**189**	**886**	**1,111**	**1,256**	**640**	**816**	**1,371**	**364**	**1,146**	**39,303**
None	%	69.4	48.1	68.8	49.9	59.2	53.4	51.9	86.2	54.3	55.2	67.5	84.8	80.5	87.3	54.9	69.0	62.8	64.5	42.3	64.1	81.0	41.8	57.0	55.9	60.5	64.0	55.2	64.5
Mild	%	18.0	25.4	20.9	27.9	24.5	26.3	27.8	8.8	25.0	26.0	19.7	9.9	14.9	7.0	24.6	19.4	22.5	18.7	36.5	19.9	12.4	36.1	26.1	27.2	22.9	24.2	26.0	21.2
Moderate	%	8.0	14.5	6.6	14.1	9.1	12.3	14.0	3.9	11.8	11.3	7.5	2.8	2.0	2.2	11.9	7.5	8.9	10.2	14.3	7.6	3.3	14.3	9.5	8.9	9.8	7.7	11.7	8.6

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Severe	%	3.8	9.6	2.8	6.1	4.3	7.7	4.7	1.1	7.1	7.1	5.2	2.2	2.6	3.2	7.5	3.6	4.6	-	5.3	6.4	2.6	6.1	6.1	5.9	6.2	-	5.1	4.8
Incomplete Score but Showing Symptoms of Anxiety	%	0.7	2.4	0.9	2.0	2.9	-	1.7	-	1.8	-	-	-	-	-	1.1	-	1.3	-	-	2.0	-	1.6	-	2.1	-	-	1.9	1.0
History of Intimate Partner Violence[3]																													
Missing Data	%	2.1	25.6	18.2	13.0	10.7	5.1	4.8	4.2	5.5	0.5	2.3	19.5	0.5	1.5	10.5	1.9	2.1	27.4	22.0	14.4	4.4	0.4	4.5	4.1	2.0	48.4	23.6	10.4
Women with Non-Missing Data	**N**	**2,576**	**1,050**	**6,876**	**822**	**1,098**	**1,238**	**669**	**1,205**	**804**	**1,600**	**3,032**	**765**	**784**	**1,761**	**2,296**	**838**	**3,348**	**1,291**	**188**	**919**	**1,107**	**1,275**	**658**	**864**	**1,405**	**377**	**1,229**	**40,075**
Yes	%	17.8	17.6	20.4	15.2	16.2	35.1	13.8	17.3	22.5	14.8	26.4	22.5	10.2	15.1	17.4	20.6	16.9	23.7	24.5	19.9	14.9	27.6	26.0	15.6	16.2	11.1	15.9	19.4
Experiencing Intimate Partner Violence at Intake (Among Women With a Completed Score or Who Report Being in a Relationship)[4]																													
Missing Data	%	3.6	26.1	19.0	14.8	16.1	7.0	5.5	4.8	7.5	0.7	2.3	19.9	0.6	2.8	16.0	4.3	4.3	26.2	21.6	14.8	7.1	1.6	9.3	12.0	2.6	49.9	20.8	11.8
Not in Universe	%	9.1	6.2	3.5	5.8	9.8	13.8	5.4	11.4	8.7	4.2	1.8	7.5	5.7	7.4	3.7	6.0	7.2	9.8	19.9	16.3	8.4	10.2	6.5	7.2	6.3	0.4	12.8	6.8
Women with Non-Missing Data	**N**	**2,295**	**957**	**6,515**	**750**	**911**	**1,034**	**626**	**1,053**	**713**	**1,529**	**2,977**	**690**	**738**	**1,605**	**2,061**	**766**	**3,028**	**1,139**	**141**	**740**	**979**	**1,129**	**580**	**728**	**1,306**	**363**	**1,068**	**36,421**
Yes	%	3.6	3.7	2.2	3.3	4.0	2.8	2.6	1.3	2.7	2.4	3.3	0.4	1.8	0.1	3.0	1.7	3.4	2.9	6.4	1.2	1.1	2.1	6.0	4.5	2.1	1.9	3.1	2.6
Experiencing Prenatal Care Access Barrier																													
Missing Data	%	0.3	21.3	16.8	0.8	6.8	0.0	3.4	4.0	1.6	0.1	0.1	18.6	0.0	0.4	1.5	1.2	0.0	3.1	20.7	3.1	0.3	0.0	0.0	2.1	0.1	0.8	0.2	5.2
Women with Non-Missing Data	**N**	**2,623**	**1,111**	**6,996**	**937**	**1,145**	**1,305**	**679**	**1,208**	**837**	**1,606**	**3,099**	**773**	**788**	**1,779**	**2,527**	**844**	**3,418**	**1,724**	**191**	**1,041**	**1,155**	**1,280**	**689**	**882**	**1,431**	**724**	**1,606**	**42,398**
None Reported	%	66.0	51.0	73.5	68.2	56.9	58.9	59.8	68.5	52.3	61.6	50.5	56.8	69.5	81.2	70.0	71.6	55.2	77.6	52.4	71.9	79.6	83.6	54.0	56.1	66.4	78.0	70.0	66.3
Reported One Access Barrier	%	20.9	32.4	20.8	26.4	33.4	25.4	28.1	27.7	31.3	25.0	41.2	42.8	15.9	17.9	24.6	24.3	28.8	11.1	25.7	22.8	17.5	15.3	31.9	29.5	26.8	17.1	18.8	24.9
Reported Two or More Access Barriers	%	13.1	16.6	5.7	5.4	9.6	15.7	12.1	3.8	16.4	13.4	8.3	-	14.6	0.9	5.3	4.1	16.0	11.3	22.0	5.4	2.9	1.1	14.1	14.4	6.8	4.8	11.2	8.9
Types of Barriers Reported (Among Women Who Reported Any Barrier)[5]																													
No Car	%	66.5	65.8	46.1	53.0	66.7	65.9	62.3	76.6	66.9	72.0	25.7	95.8	87.9	79.9	62.5	47.5	65.6	49.6	70.3	47.8	69.5	82.4	59.6	62.3	63.0	69.8	73.2	59.7
Public Transportation Challenges	%	18.6	12.1	11.1	9.7	13.4	16.8	18.3	7.1	18.3	24.8	11.4	-	39.6	-	3.4	9.6	22.2	12.7	33.0	6.1	6.4	-	9.5	15.2	7.9	10.1	16.8	13.5
Not Enough Money for a Ride	%	28.7	25.7	13.4	8.1	14.4	31.2	24.9	10.5	23.6	23.3	7.2	-	27.9	14.7	16.8	12.1	29.1	58.1	34.1	21.5	7.6	11.9	18.6	28.9	18.1	12.6	25.9	19.9
Work Hours Make It Difficult	%	17.6	22.2	25.3	26.5	22.5	16.6	21.2	6.3	16.8	10.0	16.0	-	-	-	17.4	26.7	21.0	23.0	-	18.8	9.7	-	17.7	6.7	18.3	11.9	14.5	17.2
Childcare Challenges	%	11.3	11.9	21.0	11.1	7.7	12.1	8.1	3.9	10.5	6.8	4.1	-	7.1	-	8.5	17.5	9.7	12.7	15.4	12.6	-	-	11.7	14.2	8.3	-	10.4	10.1
Partner Objections	%	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.9	-	-	-	-	-	-	-	-	-	0.7
Other	%	12.0	8.5	16.5	12.8	6.9	12.3	4.4	13.9	9.5	12.2	57.2	-	16.7	9.3	13.7	10.4	3.6	19.6	12.1	16.0	23.7	6.2	20.8	16.3	8.7	17.6	7.3	16.4

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in Appendix E.

[1] Measured by CES-D 10 scale.

[2] Measured by GAD-7 scale.

[3] Measured by STaT scale.

[4] Measured by WEB scale.

[5] Women could report multiple barriers.

TABLE I. 4: PREGNANCY HISTORY AND INTENTIONS

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Prior Pregnancy																													
Missing Data	%	0.1	0.4	0.0	1.5	0.7	0.0	1.1	0.0	5.9	0.0	0.1	0.0	0.0	0.4	0.5	2.0	0.1	0.8	7.9	0.6	0.0	0.0	0.3	0.0	0.0	0.7	10.0	0.8
Women with Non-Missing Data	**N**	**2,628**	**1,406**	**8,407**	**931**	**1,221**	**1,305**	**695**	**1,258**	**801**	**1,608**	**3,100**	**950**	**788**	**1,779**	**2,553**	**837**	**3,414**	**1,765**	**222**	**1,068**	**1,158**	**1,280**	**687**	**901**	**1,433**	**725**	**1,448**	**44,368**
Yes	%	78.0	75.5	73.7	63.5	59.0	70.5	59.4	72.3	60.4	78.9	66.4	68.0	77.9	73.6	70.0	67.7	74.6	72.0	81.5	77.5	73.2	71.5	66.1	71.1	66.5	99.2	71.1	72.1
Pregnancy History Among Women with a Prior Pregnancy																													
Not in Universe (No Prior Pregnancy)	%	22.0	22.4	26.3	36.8	37.8	29.5	40.5	27.7	20.1	21.1	33.7	32.0	22.1	26.2	30.0	29.3	24.9	28.0	22.8	22.8	26.7	28.5	34.1	28.9	33.5	-	35.7	27.6
Prior Miscarriage (<20 weeks EGA)																													
Missing Data	%	3.8	14.0	1.5	21.1	11.8	2.6	22.5	7.3	53.6	4.5	6.4	2.5	2.5	31.8	32.7	47.9	11.9	8.1	26.6	3.7	9.4	2.1	0.1	32.0	3.1	60.7	15.4	12.2
Women with Non-Missing Data	**N**	**1,952**	**899**	**6,075**	**398**	**619**	**886**	**260**	**818**	**224**	**1,196**	**1,861**	**622**	**594**	**750**	**957**	**195**	**2,161**	**1,136**	**122**	**789**	**740**	**888**	**453**	**353**	**908**	**280**	**787**	**26,923**
Yes	%	33.5	25.4	32.9	30.2	32.5	39.4	31.2	33.9	29.9	36.0	39.0	34.9	39.2	34.7	33.6	30.8	33.5	36.2	39.3	35.5	33.2	43.5	-	26.9	36.1	7.9	27.6	33.4
Prior Elective Termination																													
Missing Data	%	3.8	13.7	1.5	21.6	11.7	2.8	22.3	7.4	53.1	3.5	6.3	2.1	2.8	31.8	34.7	48.8	11.5	8.2	27.8	3.8	10.2	2.2	0.1	31.5	3.5	59.7	15.7	12.3
Women with Non-Missing Data	**N**	**1,950**	**903**	**6,075**	**393**	**620**	**884**	**261**	**817**	**228**	**1,213**	**1,863**	**626**	**592**	**749**	**906**	**187**	**2,174**	**1,135**	**119**	**788**	**731**	**887**	**453**	**357**	**903**	**287**	**782**	**26,883**
Yes	%	20.5	42.9	15.1	12.2	34.5	20.2	26.8	4.0	26.3	45.1	30.1	13.1	11.1	13.8	8.3	-	29.9	13.3	33.6	4.2	9.3	10.4	-	-	9.5	13.6	22.8	19.0
Prior Still Birth (Fetal Death >= 20 Weeks EGA)																													
Missing Data	%	19.0	40.2	12.3	26.3	29.0	15.6	32.0	10.0	60.0	36.3	23.7	10.1	10.0	37.4	36.9	50.0	30.0	16.4	44.4	6.6	15.9	9.2	1.5	32.1	9.3	64.7	26.5	23.3
Women with Non-Missing Data	**N**	**1,550**	**528**	**5,162**	**348**	**408**	**717**	**193**	**784**	**169**	**685**	**1,323**	**550**	**535**	**649**	**849**	**177**	**1,543**	**989**	**79**	**758**	**665**	**797**	**444**	**352**	**820**	**251**	**607**	**21,932**
Yes	%	1.2	4.4	0.8	-	3.7	4.3	-	-	-	5.7	6.2	2.5	10.7	2.8	5.7	-	2.9	2.1	-	7.8	2.7	7.4	-	-	3.9	-	2.1	3.1
Prior Preeclampsia																													
Missing Data	%	66.2	32.2	31.5	34.7	33.7	26.4	37.0	16.4	59.5	43.8	43.7	24.9	53.9	44.7	50.5	58.4	26.2	63.2	65.1	43.8	50.0	24.4	63.6	55.2	24.4	86.3	26.3	40.5
Women with Non-Missing Data	**N**	**310**	**641**	**3,549**	**269**	**350**	**575**	**158**	**704**	**174**	**565**	**702**	**409**	**189**	**520**	**500**	**105**	**1,671**	**156**	**29**	**359**	**270**	**603**	**16**	**144**	**603**	**93**	**611**	**14,275**
Yes	%	44.2	15.3	6.2	9.7	4.3	25.2	15.8	7.1	-	23.5	14.7	11.2	50.3	9.6	13.4	11.4	7.8	55.8	-	23.4	16.7	17.9	-	38.9	19.4	18.3	10.3	13.7
Prior Gestational Diabetes																													
Missing Data	%	67.5	38.0	32.4	36.3	34.2	31.0	39.3	16.5	59.6	49.1	43.5	26.7	62.4	45.1	52.1	58.4	28.2	65.4	66.4	43.9	51.5	30.4	61.4	59.3	30.3	88.2	28.5	42.4
Women with Non-Missing Data	**N**	**277**	**560**	**3,473**	**254**	**344**	**516**	**142**	**702**	**173**	**479**	**708**	**392**	**122**	**512**	**459**	**105**	**1,605**	**117**	**26**	**357**	**253**	**526**	**31**	**107**	**519**	**79**	**575**	**13,413**
Yes	%	37.5	3.0	4.1	4.3	-	16.7	-	6.7	-	9.8	15.4	7.4	23.0	8.2	5.9	11.4	4.0	41.0	-	22.7	11.1	5.7	67.7	18.7	6.0	-	5.0	8.1
Prior Cervical Incompetence																													
Missing Data	%	70.2	38.2	34.0	36.5	34.7	36.9	40.5	20.3	60.0	50.6	46.1	29.8	60.3	47.4	52.4	59.7	29.8	67.1	66.0	49.6	53.5	30.8	64.4	60.5	32.0	88.6	28.2	44.1
Women with Non-Missing Data	**N**	**204**	**556**	**3,339**	**252**	**337**	**439**	**133**	**655**	**169**	**455**	**628**	**363**	**139**	**471**	**452**	**94**	**1,550**	**87**	**27**	**296**	**229**	**521**	**-**	**96**	**495**	**76**	**581**	**12,654**
Yes	%	15.2	2.3	-	-	-	-	-	-	-	5.1	4.6	-	32.4	-	4.2	-	-	20.7	-	6.8	-	4.6	-	-	-	-	6.0	2.6
Prior Placenta Abnormalities																													
Missing Data	%	70.9	38.9	33.6	36.2	34.9	37.0	40.5	20.0	59.8	51.4	46.3	29.6	63.3	47.0	52.7	59.7	29.8	66.8	67.2	51.0	53.7	32.5	62.6	61.0	32.0	88.6	29.3	44.3
Women with Non-Missing Data	**N**	**186**	**547**	**3,372**	**255**	**335**	**437**	**133**	**658**	**171**	**443**	**622**	**365**	**115**	**478**	**446**	**94**	**1,550**	**91**	**24**	**281**	**227**	**499**	**23**	**91**	**495**	**76**	**562**	**12,576**
Yes	%	7.0	-	1.2	4.7	-	-	-	-	-	2.5	3.7	-	18.3	-	2.9	-	-	24.2	-	-	-	-	56.5	-	-	-	-	1.9
Prior Congenital Abnormalities of the Fetus																													
Missing Data	%	70.0	38.6	33.2	36.4	34.5	35.8	40.4	20.0	60.2	51.3	46.0	29.5	61.5	46.8	52.8	59.6	29.9	67.1	67.2	50.9	53.5	31.9	64.0	60.9	31.1	88.6	29.8	44.0
Women with Non-Missing Data	**N**	**210**	**551**	**3,402**	**253**	**340**	**453**	**134**	**659**	**168**	**444**	**630**	**366**	**129**	**482**	**443**	**95**	**1,547**	**87**	**24**	**282**	**229**	**507**	**13**	**92**	**507**	**76**	**554**	**12,677**
Yes	**%**	17.6	-	2.1	-	-	5.3	-	-	-	2.7	4.9	-	27.1	2.5	-	-	-	21.8	-	-	-	-	100.0	-	3.7	-	-	2.8

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 5: PRIOR BIRTH OUTCOMES

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Prior Birth (Among Women with a Prior Pregnancy)																													
Missing Data	%	0.8	3.3	1.7	0.8	3.8	0.0	1.4	0.5	2.5	0.1	0.6	2.0	0.1	0.3	1.2	0.5	0.8	1.0	1.2	0.5	0.5	0.0	0.0	0.8	0.3	0.5	0.5	1.0
Not in Universe	%	22.0	24.6	26.3	37.5	41.1	29.5	41.1	27.7	42.0	21.1	33.7	32.0	22.1	26.7	30.3	33.4	25.5	28.6	24.9	22.9	26.8	28.5	34.1	28.9	33.5	-	35.8	28.4
Women with Non-Missing Data	**N**	**2,031**	**1,018**	**6,048**	**583**	**677**	**920**	**404**	**904**	**473**	**1,267**	**2,040**	**627**	**613**	**1,305**	**1,756**	**565**	**2,521**	**1,254**	**178**	**823**	**842**	**915**	**454**	**634**	**948**	**719**	**1,025**	**31,544**
Yes	%	88.5	87.4	88.5	84.2	70.0	87.2	69.1	86.4	78.4	84.0	74.5	90.4	90.9	89.7	90.8	88.3	85.4	89.2	83.1	91.3	89.9	86.1	85.7	87.4	89.9	47.6	85.5	85.4
Prior Birth Outcomes Among Women with a Prior Birth																													
Inter-Pregnancy Interval with Current Pregnancy Since Last Birth																													
Missing Data	%	23.0	33.1	24.0	9.9	17.6	3.2	10.2	15.7	22.7	12.2	22.1	20.3	6.5	5.7	20.3	15.0	11.8	20.6	31.5	19.8	6.7	8.3	14.4	11.5	11.4	47.4	10.8	17.7
Not in Universe	%	31.5	29.1	30.1	47.4	56.8	38.5	58.0	36.9	54.9	33.8	51.0	33.6	29.3	34.2	37.1	40.4	37.0	35.7	28.6	28.7	34.4	38.4	43.5	37.7	40.5	52.5	45.4	37.7
Women with Non-Missing Data	**N**	**1,196**	**534**	**3,855**	**403**	**315**	**760**	**223**	**597**	**191**	**868**	**833**	**438**	**506**	**1,075**	**1,093**	**381**	**1,750**	**777**	**96**	**553**	**682**	**682**	**290**	**457**	**690**	**-**	**705**	**19,951**
< 18 months	%	23.6	24.7	35.2	21.8	17.1	33.3	24.7	17.6	33.5	23.0	18.4	30.8	27.1	31.6	32.1	24.4	19.5	37.6	25.0	36.7	22.4	26.7	27.9	29.5	32.6	-	24.8	28.1
>= 18 months	%	76.4	75.3	64.8	78.2	82.9	66.7	75.3	82.4	66.5	77.0	81.6	69.2	72.9	68.4	67.9	75.6	80.5	62.4	75.0	63.3	77.6	73.3	72.1	70.5	67.4	-	75.2	71.9
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)																													
Missing Data	%	0.2	1.3	0.0	0.5	0.6	0.2	1.1	0.1	1.4	0.1	0.3	0.2	0.0	0.5	8.0	1.2	0.4	2.0	0.8	0.7	0.4	0.0	0.0	1.7	0.1	18.5	6.7	1.4
Not in Universe	%	31.6	36.8	36.3	48.0	61.2	38.5	60.2	37.9	55.2	33.8	51.0	40.3	29.3	34.5	37.8	41.3	37.0	37.0	38.6	30.1	34.6	38.4	43.5	38.5	40.5	52.6	45.4	39.7
Women with Non-Missing Data	**N**	**1,794**	**875**	**5,351**	**486**	**470**	**800**	**272**	**780**	**369**	**1,062**	**1,509**	**565**	**557**	**1,161**	**1,389**	**491**	**2,140**	**1,084**	**146**	**744**	**752**	**788**	**389**	**539**	**851**	**211**	**771**	**26,346**
Yes	%	22.6	25.3	13.2	21.4	15.1	28.1	15.1	12.7	17.1	24.9	23.7	20.0	38.2	14.8	28.9	17.9	15.4	16.8	32.9	29.7	18.4	40.1	24.2	36.2	36.5	26.1	17.3	21.1
Prior Low Birthweight Infant (< 2,500 Grams)																													
Missing Data	%	8.3	11.8	0.2	19.3	10.6	6.0	15.9	3.5	51.9	8.1	8.7	6.2	9.9	29.5	27.6	46.5	11.6	10.0	53.5	9.5	11.2	2.8	54.1	27.9	4.9	23.2	13.7	12.6
Not in Universe	%	31.6	34.3	36.3	47.3	56.6	38.5	59.6	37.9	28.3	33.8	51.0	40.3	29.3	34.1	37.4	35.6	36.3	36.4	36.5	29.8	34.5	38.4	43.5	38.5	40.5	51.5	45.3	38.7
Women with Non-Missing Data	N	**1,580**	**762**	**5,340**	**316**	**404**	**724**	**172**	**737**	**168**	**933**	**1,249**	**508**	**479**	**650**	**899**	**153**	**1,783**	**953**	**24**	**652**	**628**	**752**	**16**	**303**	**782**	**185**	**660**	**21,812**
Yes	%	17.2	16.1	1.1	16.5	6.4	19.8	14.0	12.6	-	13.6	12.9	12.8	35.1	8.2	20.2	-	10.0	8.8	-	16.4	11.5	24.2	100.0	-	23.0	16.2	11.4	11.4

Notes: All measures except for prior birth are among women with a prior birth. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 6: PRE-PREGNANCY MEDICAL CONDITIONS

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Pregnancy Intention																													
Missing Data	%	1.8	25.8	19.1	12.9	11.4	1.0	6.3	4.8	7.6	3.2	2.1	19.2	0.9	1.3	17.2	3.9	3.3	23.7	22.8	6.7	1.7	1.3	3.6	6.9	4.5	49.2	21.6	10.8
Women with Non-Missing Data	N	**2,582**	**1,047**	**6,799**	**823**	**1,089**	**1,292**	**659**	**1,197**	**786**	**1,556**	**3,037**	**768**	**781**	**1,763**	**2,124**	**821**	**3,305**	**1,357**	**186**	**1,002**	**1,138**	**1,263**	**664**	**839**	**1,368**	**371**	**1,261**	**39,878**
Trying to Become Pregnant	%	31.3	23.0	39.3	24.1	31.8	23.7	20.3	41.2	27.0	24.9	42.4	26.6	13.8	24.7	12.8	38.0	29.4	25.1	18.3	27.4	35.5	18.3	36.7	29.3	17.5	12.9	22.0	29.4
Not Trying to Become Pregnant, Not Using Contraception	%	55.3	65.4	47.2	64.6	57.6	65.0	68.7	41.9	61.6	63.8	42.9	64.8	77.0	61.4	59.2	48.5	59.0	65.7	70.4	63.0	57.8	69.9	52.4	64.8	70.6	80.1	69.8	57.9
Not Trying to Become Pregnant, Sometimes Using Contraception	%	5.3	4.1	6.8	3.8	3.2	2.2	4.6	8.1	5.1	2.4	3.3	-	2.8	3.5	11.3	3.7	3.8	-	-	-	-	1.4	-	-	4.3	-	1.0	4.1
Not Trying to Become Pregnant, Using Contraception	%	8.1	7.4	6.8	7.5	7.4	9.1	6.4	8.9	6.4	8.8	11.4	8.1	6.4	10.4	16.8	9.9	7.8	8.7	10.2	8.8	6.2	10.4	10.1	5.1	7.6	-	7.2	8.6
Diabetes Pre-Pregnancy																													
Missing Data	%	0.3	10.7	0.1	33.1	9.1	0.5	24.8	14.6	52.8	4.7	9.3	4.1	3.8	41.0	34.0	64.1	9.3	17.0	34.9	12.6	9.5	1.4	98.5	1.2	4.3	50.5	99.3	17.2
Women with Non-Missing Data	N	**2,623**	**1,261**	**8,399**	**632**	**1,117**	**1,298**	**529**	**1,074**	**402**	**1,533**	**2,813**	**911**	**758**	**1,054**	**1,694**	**307**	**3,100**	**1,477**	**157**	**939**	**1,048**	**1,262**	**-**	**890**	**1,371**	**361**	**12**	**37,032**
Yes	%	4.7	2.0	0.6	1.9	-	3.2	38.2	-	-	2.0	4.6	-	7.1	2.1	3.0	-	1.4	2.2	-	14.8	2.6	7.9	-	13.5	2.8	16.3	100.0	3.7
Hypertension Pre-Pregnancy																													
Missing Data	%	0.5	10.7	0.1	33.1	9.1	0.6	24.2	14.6	52.9	4.4	9.4	4.1	4.2	41.0	31.9	63.6	9.1	16.1	34.4	8.9	9.2	1.2	0.6	0.9	4.5	53.4	34.4	13.1
Women with Non-Missing Data	N	**2,617**	**1,261**	**8,400**	**632**	**1,117**	**1,297**	**533**	**1,074**	**401**	**1,538**	**2,810**	**911**	**755**	**1,055**	**1,748**	**311**	**3,108**	**1,493**	**158**	**978**	**1,052**	**1,265**	**685**	**893**	**1,369**	**340**	**1,056**	**38,857**
Yes	%	5.4	7.0	0.8	6.0	3.0	7.4	46.0	-	3.7	8.5	5.7	5.5	17.6	4.1	13.8	3.9	3.5	2.7	12.7	8.9	5.7	13.1	-	14.8	11.2	12.9	6.5	6.1
Mother's BMI at First Prenatal Visit																													
Missing Data	%	1.6	24.2	3.5	35.6	7.9	2.4	31.3	0.7	56.3	4.8	13.5	2.9	11.9	53.8	32.2	70.1	14.4	21.1	61.0	7.9	1.1	0.6	38.6	19.9	1.0	44.7	94.2	18.5
Women with Non-Missing Data	N	**2,587**	**1,071**	**8,115**	**609**	**1,132**	**1,274**	**483**	**1,249**	**372**	**1,531**	**2,683**	**922**	**694**	**826**	**1,740**	**255**	**2,927**	**1,403**	**94**	**989**	**1,145**	**1,272**	**423**	**722**	**1,419**	**404**	**93**	**36,434**
Underweight (BMI < 18.5)	%	2.4	3.5	4.3	5.6	2.8	4.0	5.0	1.8	4.8	2.5	2.5	3.3	2.3	2.8	2.5	5.1	1.9	3.0	-	2.8	3.2	3.4	3.3	6.2	3.6	-	-	3.3
Normal Weight (=>18.5 BMI <25)	%	26.2	32.1	45.5	33.2	35.4	35.1	34.2	33.5	39.2	31.4	29.6	37.2	23.6	31.5	27.2	32.9	33.5	39.3	37.2	30.2	34.5	31.7	32.6	34.5	28.7	31.2	35.5	34.9
Overweight (=>25 BMI <30)	%	25.4	25.1	25.6	23.8	31.6	24.5	26.1	32.8	25.5	23.7	30.9	25.2	22.8	25.4	23.2	23.9	28.8	25.4	16.0	24.9	29.7	22.6	28.8	22.9	20.1	25.5	21.5	26.0
Obese (=>30 BMI < 40)	%	33.0	29.7	20.6	28.9	24.6	26.4	25.5	27.1	24.7	29.2	30.3	28.1	33.4	29.8	32.9	27.8	27.9	23.7	28.7	33.3	26.2	29.5	28.6	27.6	33.7	30.4	25.8	27.3
Very Obese (BMI >= 40)	%	12.9	9.6	4.0	8.5	5.5	10.0	9.3	4.8	5.6	13.2	6.7	6.3	17.9	10.5	14.3	10.2	7.9	8.6	16.0	8.8	6.4	12.9	6.6	8.9	14.0	10.9	-	8.5

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 7: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Preeclampsia																													
Missing Data	%	0.8	22.3	0.3	34.4	16.6	6.0	27.0	13.7	56.2	9.6	23.1	34.2	13.2	43.6	36.7	69.3	12.8	27.0	34.0	10.1	32.8	7.4	3.5	0.6	19.9	53.0	27.5	18.2
Women with Non-Missing Data	**N**	**2,610**	**1,097**	**8,382**	**620**	**1,025**	**1,227**	**513**	**1,086**	**373**	**1,453**	**2,384**	**625**	**684**	**1,007**	**1,623**	**262**	**2,983**	**1,299**	**159**	**966**	**778**	**1,185**	**665**	**896**	**1,148**	**343**	**1,166**	**36,559**
Yes	%	3.8	6.7	1.5	7.6	3.8	3.6	11.9	8.6	-	5.8	7.7	10.2	7.9	2.1	3.4	-	3.1	5.0	10.7	7.0	3.5	12.9	2.3	4.6	13.0	9.9	5.1	4.9
Pregnancy-Related Hypertension																													
Missing Data	%	0.6	22.5	0.3	34.5	15.5	5.8	26.9	13.7	56.1	9.0	22.7	32.0	13.6	43.7	34.1	69.0	12.7	26.5	34.0	9.5	32.4	7.3	3.5	17.1	19.7	52.7	27.5	18.2
Women with Non-Missing Data	**N**	**2,613**	**1,094**	**8,382**	**619**	**1,039**	**1,229**	**514**	**1,086**	**374**	**1,463**	**2,399**	**646**	**681**	**1,006**	**1,691**	**265**	**2,986**	**1,308**	**159**	**972**	**783**	**1,186**	**665**	**747**	**1,151**	**345**	**1,166**	**36,569**
Yes	%	5.6	8.7	1.3	8.9	8.4	4.1	17.7	9.4	3.5	11.1	6.3	13.9	7.5	4.1	15.8	4.5	3.0	5.1	15.7	10.5	4.7	6.2	2.1	5.5	6.8	16.2	6.9	6.0
Gestational Diabetes																													
Missing Data	%	0.7	21.2	0.3	34.3	15.1	5.7	27.0	14.1	56.3	9.8	22.1	25.1	13.2	43.5	37.6	69.2	12.6	27.3	41.1	13.0	32.1	4.9	3.5	0.6	19.8	52.1	27.5	17.9
Women with Non-Missing Data	**N**	**2,612**	**1,112**	**8,382**	**621**	**1,043**	**1,231**	**513**	**1,081**	**372**	**1,450**	**2,416**	**712**	**684**	**1,009**	**1,601**	**263**	**2,987**	**1,293**	**142**	**934**	**786**	**1,217**	**665**	**896**	**1,149**	**350**	**1,166**	**36,687**
Yes	%	8.8	2.8	2.9	5.0	8.6	10.8	3.5	10.3	4.8	7.4	12.7	6.3	7.9	6.0	5.3	5.7	4.0	5.7	9.9	15.6	6.6	7.3	5.0	8.9	5.3	-	4.3	6.3
Cervical Incompetence																													
Missing Data	%	0.6	20.9	0.3	34.2	15.5	6.2	27.0	13.7	56.2	9.0	22.2	23.3	13.3	43.6	39.3	69.8	12.8	28.2	34.9	10.9	62.8	3.4	100.0	17.0	20.1	53.7	27.5	20.6
Women with Non-Missing Data	**N**	**2,613**	**1,117**	**8,381**	**622**	**1,038**	**1,224**	**513**	**1,086**	**373**	**1,463**	**2,413**	**729**	**683**	**1,008**	**1,557**	**258**	**2,982**	**1,278**	**157**	**957**	**431**	**1,236**	**-**	**748**	**1,145**	**338**	**1,166**	**35,516**
Yes	%	3.3	1.5	-	-	-	1.4	-	-	-	1.4	2.2	-	7.5	-	1.1	-	0.5	1.6	-	4.9	-	2.4	-	-	-	-	-	1.3
Placenta Previa																													
Missing Data	%	0.7	20.5	0.3	34.5	15.2	5.7	27.2	13.7	56.1	9.0	22.5	15.7	13.7	43.7	39.0	70.0	13.0	28.2	34.4	11.1	61.1	5.2	3.5	17.0	20.0	53.6	27.5	18.9
Women with Non-Missing Data	**N**	**2,611**	**1,122**	**8,381**	**619**	**1,042**	**1,230**	**512**	**1,086**	**374**	**1,463**	**2,403**	**801**	**680**	**1,006**	**1,565**	**256**	**2,976**	**1,278**	**158**	**955**	**450**	**1,214**	**665**	**748**	**1,146**	**339**	**1,166**	**36,246**
Yes	%	1.1	-	0.2	-	1.6	3.3	-	-	-	1.0	2.5	-	3.7	5.2	1.0	-	1.1	2.3	-	-	3.1	-	-	-	-	-	-	1.1
Placental Abruption																													
Missing Data	%	0.7	22.3	0.3	34.6	16.3	6.1	27.0	13.7	56.3	9.2	22.9	35.2	13.7	43.7	39.3	69.8	12.9	28.1	34.4	12.1	64.9	7.2	3.5	17.0	20.2	53.8	27.5	19.7
Women with Non-Missing Data	**N**	**2,611**	**1,097**	**8,382**	**618**	**1,029**	**1,225**	**513**	**1,086**	**372**	**1,460**	**2,392**	**616**	**680**	**1,006**	**1,557**	**258**	**2,977**	**1,279**	**158**	**944**	**406**	**1,188**	**665**	**748**	**1,144**	**337**	**1,166**	**35,914**
Yes	%	0.6	-	0.4	-	-	-	-	-	-	-	-	-	-	1.5	-	-	0.5	1.0	-	2.8	-	1.2	-	-	1.0	-	-	0.6
Congenital Abnormalities of the Fetus																													
Missing Data	%	0.8	22.2	0.1	34.7	14.7	6.4	26.6	13.8	56.3	9.2	24.4	20.3	9.8	43.8	37.6	69.2	13.2	27.2	38.6	12.6	57.5	3.7	100.0	17.1	21.6	52.6	27.5	20.5
Women with Non-Missing Data	**N**	**2,608**	**1,099**	**8,399**	**617**	**1,048**	**1,221**	**516**	**1,084**	**372**	**1,460**	**2,346**	**757**	**711**	**1,005**	**1,600**	**263**	**2,969**	**1,296**	**148**	**939**	**492**	**1,233**	**-**	**747**	**1,123**	**346**	**1,166**	**35,565**
Yes	%	0.9	-	1.2	2.3	2.5	2.7	-	-	-	2.9	3.6	3.2	4.9	-	0.7	-	0.5	1.9	-	6.8	-	2.0	-	5.8	2.6	-	-	1.8
UTI(s) During Last 6 months of Pregnancy																													
Missing Data	%	0.5	21.2	0.3	34.4	15.5	10.3	26.9	13.7	56.3	8.7	23.7	25.9	13.6	44.5	35.5	70.4	21.6	28.9	61.4	9.9	36.7	6.6	20.6	17.0	24.5	56.2	27.5	19.9
Women with Non-Missing Data	**N**	**2,616**	**1,112**	**8,382**	**620**	**1,038**	**1,171**	**514**	**1,086**	**372**	**1,468**	**2,366**	**704**	**681**	**991**	**1,655**	**253**	**2,679**	**1,265**	**93**	**968**	**733**	**1,195**	**547**	**748**	**1,082**	**320**	**1,166**	**35,825**
Yes	%	20.3	10.5	5.1	13.9	23.9	6.8	28.4	3.0	4.3	16.5	19.7	26.8	21.0	12.2	25.0	4.7	7.7	10.0	37.6	43.4	8.2	14.4	12.2	3.5	20.7	4.1	9.1	13.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 8: TREATMENTS DURING PREGNANCY

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Vaginal Progesterone																												
Missing Data	%	22.9	54.7	5.7	38.2	21.1	91.0	37.6	25.1	58.9	11.1	39.7	24.7	8.6	52.3	67.4	75.8	48.6	27.3	42.3	6.7	54.4	8.2	48.5	25.0	25.8	68.1	44.4	33.5
Women with Non-Missing Data	**N**	**2,027**	**640**	**7,930**	**584**	**970**	**117**	**439**	**942**	**350**	**1,429**	**1,869**	**715**	**720**	**852**	**837**	**207**	**1,756**	**1,293**	**139**	**1,002**	**528**	**1,175**	**355**	**676**	**1,064**	**233**	**894**	**29,743**
Yes	%	1.7	-	0.2	-	-	-	-	-	-	1.9	0.8	-	6.7	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	0.8
17P (Progesterone Injections, Among Women with a Prior Preterm Birth)																												
Missing Data	%	3.4	12.0	0.7	5.6	7.8	3.6	3.7	1.3	47.0	1.8	3.7	2.9	1.4	5.6	10.8	18.1	6.2	4.6	7.5	1.8	6.6	1.8	11.3	6.3	5.2	7.1	3.0	5.4
Not in Universe	%	84.6	79.4	91.5	87.2	87.8	82.8	93.2	92.1	49.9	83.6	88.5	88.1	73.0	89.5	83.8	79.0	89.2	88.1	78.0	79.0	88.0	75.3	86.4	78.4	78.3	90.1	91.5	85.8
Women with Non-Missing Data	**N**	**317**	**122**	**656**	**68**	**54**	**178**	**22**	**83**	**26**	**235**	**243**	**85**	**202**	**88**	**137**	**24**	**155**	**129**	**35**	**207**	**62**	**293**	**16**	**138**	**236**	**20**	**88**	**3,919**
Yes	%	24.0	21.3	2.0	22.1	-	29.8	-	-	-	20.9	28.8	-	45.0	15.9	-	-	11.6	16.3	-	-	-	24.2	-	-	8.5	-	-	15.0
Antenatal Steroids																												
Missing Data	%	99.9	55.8	0.1	38.3	21.5	35.4	37.7	25.1	59.0	11.9	39.8	25.3	9.3	52.4	67.6	76.0	54.5	26.9	41.5	6.7	54.3	8.5	100.0	25.0	25.8	67.4	43.9	36.7
Women with Non-Missing Data	**N**	**-**	**624**	**8,400**	**583**	**965**	**843**	**438**	**942**	**349**	**1,417**	**1,867**	**710**	**715**	**851**	**831**	**205**	**1,555**	**1,301**	**141**	**1,002**	**529**	**1,171**	**-**	**676**	**1,064**	**238**	**902**	**28,321**
Yes	%	-	4.0	0.3	4.1	-	4.0	-	-	-	5.7	4.2	3.5	8.4	1.5	-	-	1.5	1.7	20.6	-	-	10.9	-	5.2	4.9	-	3.2	2.6
Tocolytics																												
Missing Data	%	99.9	56.0	0.3	38.9	22.1	91.7	37.6	25.1	59.0	12.5	40.2	25.3	9.0	52.4	67.7	75.4	54.8	27.4	41.9	6.6	54.3	8.4	100.0	25.1	25.6	67.8	43.8	38.5
Women with Non-Missing Data	**N**	**3**	**621**	**8,381**	**577**	**958**	**108**	**439**	**942**	**349**	**1,407**	**1,854**	**710**	**717**	**850**	**828**	**210**	**1,545**	**1,291**	**140**	**1,003**	**529**	**1,172**	**-**	**675**	**1,066**	**235**	**905**	**27,515**
Yes	%	-	2.3	0.2	-	-	13.9	-	-	-	1.7	2.0	3.0	5.3	-	-	-	-	-	10.7	-	-	1.8	-	-	2.4	-	2.8	1.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 9: PRENATAL CARE

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Routine Prenatal Care Provider																													
Missing Data	%	0.2	8.6	0.4	33.9	8.1	0.9	20.3	9.1	59.8	7.0	43.6	1.8	1.9	45.8	16.7	63.3	6.8	21.6	73.0	0.5	6.0	0.9	4.6	19.2	2.4	47.9	15.3	14.2
Women with Non-Missing Data	**N**	**2,624**	**1,290**	**8,371**	**625**	**1,130**	**1,293**	**560**	**1,144**	**342**	**1,495**	**1,751**	**933**	**773**	**968**	**2,137**	**313**	**3,188**	**1,394**	**65**	**1,069**	**1,089**	**1,268**	**657**	**728**	**1,399**	**380**	**1,363**	**38,349**
Obstetrician	%	62.7	2.2	4.9	65.8	15.8	88.4	-	2.2	16.4	70.0	60.1	49.9	48.4	96.3	94.4	52.7	35.2	100.0	29.2	99.9	50.4	1.1	74.7	100.0	53.8	30.5	30.9	43.3
Licensed Professional Midwife	%	-	-	19.6	-	1.3	-	-	-	-	-	0.7	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	7.1	20.4	5.4
Nurse Practitioner	%	-	88.4	-	20.6	-	10.0	18.8	16.7	41.5	11.2	7.4	3.0	-	-	1.4	31.9	0.4	-	-	-	23.1	-	-	-	26.7	22.1	28.6	8.9
Certified Nurse Midwife/Certified Midwife	%	25.0	-	73.8	12.2	64.9	1.6	81.3	79.6	40.6	16.9	26.4	46.2	34.4	3.5	1.5	12.8	61.4	-	-	-	1.8	-	25.3	-	19.1	38.7	19.7	35.2
Family Medicine Physician	%	-	-	1.6	-	17.6	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	-	24.3	-	-	-	-	-	-	1.7
Other Provider	%	12.3	9.2	0.1	-	-	-	-	-	-	1.8	5.3	-	16.7	-	2.6	-	-	-	70.8	-	-	98.8	-	-	-	-	-	5.4
Routine Prenatal Care (Individual Visits)																													
Missing Data	%	0.0	5.6	0.1	1.9	7.0	0.0	1.0	0.0	45.8	0.0	0.0	0.0	0.0	1.0	0.7	11.5	1.2	1.8	2.9	0.5	0.1	0.0	0.0	0.0	0.0	2.6	0.2	1.9
Women with Non-Missing Data	**N**	**2,629**	**1,333**	**8,400**	**927**	**1,143**	**1,305**	**696**	**1,258**	**461**	**1,608**	**3,102**	**950**	**788**	**1,770**	**2,549**	**756**	**3,377**	**1,747**	**234**	**1,069**	**1,157**	**1,280**	**689**	**901**	**1,433**	**711**	**1,605**	**43,878**
Received Individual Visits	%	99.6	83.3	99.8	71.8	98.6	99.2	80.9	99.3	65.7	98.4	86.2	99.7	88.7	59.4	89.5	36.1	96.3	90.2	45.7	93.2	98.4	99.1	-	82.0	98.0	-	85.6	88.1
Average number of Individual Prenatal Visits	Mean	8.7	4.4	9.3	4.7	6.1	10.1	4.5	5.9	5.2	8.8	7.4	8.2	10.5	10.7	9.3	6.8	7.2	10.3	7.6	11.2	5.7	11.1	-	3.2	8.2	-	7.7	8.3
Routine Prenatal Care (Group Visits)																													
Missing Data	%	0.0	5.6	0.1	1.9	7.0	0.0	1.0	0.0	45.8	0.0	0.0	0.0	0.0	1.0	0.7	11.5	1.2	1.8	2.9	0.5	0.1	0.0	0.0	0.0	0.0	2.6	0.2	1.9
Women with Non-Missing Data	**N**	**2,629**	**1,333**	**8,400**	**927**	**1,143**	**1,305**	**696**	**1,258**	**461**	**1,608**	**3,102**	**950**	**788**	**1,770**	**2,549**	**756**	**3,377**	**1,747**	**234**	**1,069**	**1,157**	**1,280**	**689**	**901**	**1,433**	**711**	**1,605**	**43,878**
Received Group Visits	%	2.6	95.3	1.6	73.1	97.7	-	81.3	95.9	83.1	-	-	-	7.7	1.4	0.7	16.8	3.1	-	-	5.0	-	-	83.5	83.4	9.6	-	74.2	19.3
Average Number of Group Prenatal Visits	Mean	4.5	3.5	7.0	5.9	5.5	-	5.5	7.0	5.5	-	-	-	4.5	6.0	6.0	4.4	6.6	-	-	11.8	-	-	7.5	7.4	5.3	-	4.8	5.7
Care Coordinator Encounters																													
Missing Data	%	0.2	26.1	0.5	34.6	10.1	0.0	25.2	1.8	53.2	3.0	3.9	0.1	0.0	40.6	8.8	71.0	3.2	10.8	42.3	5.8	0.5	0.2	100.0	17.2	1.7	54.7	35.2	12.4
Women with Non-Missing Data	**N**	**2,625**	**1,043**	**8,367**	**618**	**1,105**	**1,305**	**526**	**1,235**	**398**	**1,559**	**2,982**	**949**	**788**	**1,062**	**2,339**	**248**	**3,311**	**1,587**	**139**	**1,012**	**1,152**	**1,277**	**-**	**746**	**1,409**	**331**	**1,042**	**39,155**
Received Care Coordinator Encounters	%	100.0	50.0	99.5	11.0	70.3	100.0	20.7	86.8	16.6	97.8	99.9	100.0	100.0	95.1	76.0	52.0	96.1	91.9	91.4	96.0	96.2	99.6	-	6.4	75.9	20.8	31.8	86.0
Average Number of Care Coordinator Encounters	Mean	5.2	1.8	3.1	1.3	1.4	7.3	1.6	2.8	1.7	6.0	3.7	6.8	10.3	2.8	2.8	5.9	4.9	3.3	4.0	3.6	4.0	1.7	-	1.1	2.1	3.2	2.0	4.0
Mental Health Encounters																													
Missing Data	%	0.4	37.7	5.1	35.7	16.9	1.5	26.7	1.8	53.2	10.7	16.3	2.1	16.0	44.9	13.1	74.9	5.2	11.8	44.4	98.9	3.0	1.8	100.0	17.2	2.9	55.3	36.7	18.5
Women with Non-Missing Data	**N**	**2,619**	**880**	**7,983**	**608**	**1,021**	**1,286**	**515**	**1,235**	**398**	**1,436**	**2,595**	**930**	**662**	**985**	**2,231**	**214**	**3,240**	**1,569**	**134**	**12**	**1,123**	**1,257**	**-**	**746**	**1,392**	**326**	**1,019**	**36,416**
Received Mental Health Encounters	%	8.3	5.5	0.2	3.3	7.8	-	-	3.7	-	9.1	10.5	-	16.3	9.3	1.3	8.4	3.9	46.3	-	-	4.8	9.5	-	-	-	-	5.4	5.9
Average Number of Mental Health Encounters	Mean	1.8	1.2	-	2.3	1.1	-	-	2.4	-	4.3	3.1	-	3.0	2.3	1.3	1.6	3.2	2.1	-	-	1.7	1.6	-	-	-	-	2.7	2.3
Doula Encounters																													
Missing Data	%	0.8	50.2	92.6	35.3	10.8	1.4	26.7	2.0	53.1	10.6	9.7	2.3	14.6	44.6	14.1	74.0	6.2	11.2	46.1	98.6	3.3	1.8	100.0	17.9	2.7	53.7	37.2	34.9
Women with Non-Missing Data	**N**	**2,610**	**703**	**618**	**611**	**1,096**	**1,287**	**515**	**1,233**	**399**	**1,438**	**2,800**	**928**	**673**	**990**	**2,203**	**222**	**3,206**	**1,579**	**130**	**15**	**1,120**	**1,257**	**-**	**740**	**1,394**	**338**	**1,011**	**29,116**

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Received Doula Encounters	%	0.7	3.6	100.0	-	-	-	-	-	-	-	-	-	-	8.5	4.3	-	2.7	-	-	-	-	-	-	-	-	-	4.1	3.4
Average Number of Doula Encounters	Mean	3.2	1.0	-	-	-	-	-	-	-	-	-	-	-	2.4	1.0	-	2.2	-	-	-	-	-	-	-	-	-	4.2	2.4
Health Education																													
Missing Data	%	0.6	46.3	100.0	52.0	11.6	91.9	96.7	1.7	53.5	9.5	40.5	1.8	72.8	88.2	14.6	76.7	42.8	16.4	53.9	75.0	2.0	35.6	100.0	16.9	2.7	55.2	12.0	47.7
Women with Non-Missing Data	**N**	**2,615**	**758**	**-**	**454**	**1,086**	**106**	**23**	**1,236**	**396**	**1,456**	**1,845**	**933**	**214**	**211**	**2,192**	**199**	**1,956**	**1,487**	**111**	**268**	**1,135**	**824**	**-**	**749**	**1,395**	**327**	**1,416**	**23,392**
Received Health Education, Not Centering	%	23.1	2.0	-	4.2	53.6	-	-	7.0	21.7	1.0	5.9	-	51.9	42.7	62.3	32.7	63.7	39.9	47.7	98.5	4.8	81.8	-	-	-	5.8	2.9	26.1
Average Number of Health Education Sessions	Mean	3.4	1.5	-	1.7	1.3	-	-	1.2	3.1	1.4	2.1	-	1.1	2.4	3.4	4.0	1.8	2.1	3.9	1.7	4.2	1.3	-	-	-	2.5	-	2.4
Home Visits																													
Missing Data	%	0.5	54.2	63.3	53.8	36.0	91.9	96.7	1.7	53.5	8.8	10.1	1.8	73.2	50.8	16.0	75.9	43.2	16.5	53.9	74.7	1.5	36.0	100.0	17.0	2.8	54.8	12.0	38.2
Women with Non-Missing Data	**N**	**2,616**	**647**	**3,082**	**437**	**787**	**106**	**23**	**1,237**	**396**	**1,466**	**2,788**	**933**	**211**	**879**	**2,156**	**206**	**1,942**	**1,486**	**111**	**272**	**1,141**	**819**	**-**	**748**	**1,393**	**330**	**1,416**	**27,628**
Received Home Visits	%	3.7	3.7	58.7	3.2	8.4	-	-	-	-	7.6	-	-	27.5	31.2	12.2	22.3	-	18.7	-	98.5	2.0	-	-	-	-	3.6	1.6	12.3
Average Number of Home Visits	Mean	1.2	1.3	1.4	1.0	1.2	-	-	-	-	1.7	-	-	1.5	1.8	1.2	4.8	-	1.6	-	1.3	1.0	-	-	-	-	1.7	-	1.5
Self-Care, not Centering																													
Missing Data	%	0.5	53.9	100.0	52.9	14.8	91.9	96.9	1.7	53.7	9.1	33.7	1.8	75.6	88.1	19.8	77.5	44.3	16.5	53.1	98.8	1.6	36.1	100.0	16.9	2.7	55.8	100.0	51.8
Women with Non-Missing Data	**N**	**2,616**	**651**	**-**	**445**	**1,047**	**106**	**22**	**1,237**	**394**	**1,461**	**2,056**	**933**	**192**	**213**	**2,057**	**192**	**1,903**	**1,485**	**113**	**13**	**1,139**	**818**	**-**	**749**	**1,395**	**323**	**-**	**21,560**
Received Self-Care, Not Centering	%	-	-	-	-	37.4	-	-	-	13.5	-	-	-	-	39.0	28.6	14.6	9.4	42.3	44.2	-	1.1	-	-	-	-	-	-	9.5
Average Number of Self-Care Sessions	Mean	-	-	-	-	1.1	-	-	-	2.7	-	-	-	-	2.4	9.2	4.9	2.6	2.3	3.9	-	2.2	-	-	-	-	-	-	3.5
Nutrition Counseling																													
Missing Data	%	0.6	45.3	5.1	52.0	10.9	91.8	96.6	2.1	52.8	8.6	28.7	1.8	75.4	50.9	13.7	76.6	42.8	16.6	53.9	98.6	1.8	35.6	100.0	17.2	1.5	55.2	12.0	27.9
Women with Non-Missing Data	**N**	**2,614**	**772**	**7,983**	**454**	**1,095**	**107**	**24**	**1,232**	**402**	**1,469**	**2,213**	**933**	**194**	**877**	**2,215**	**200**	**1,957**	**1,484**	**111**	**15**	**1,137**	**824**	**-**	**746**	**1,412**	**327**	**1,416**	**32,213**
Received Nutrition Counseling	%	-	34.3	-	21.1	84.1	-	-	4.2	27.9	16.1	17.4	-	38.7	13.5	74.0	27.0	71.5	25.1	21.6	-	3.9	53.6	-	10.7	63.2	17.1	24.2	23.7
Average Number of Nutrition Counseling Sessions	Mean	-	1.1	-	1.3	1.6	-	-	1.2	3.2	2.9	2.1	-	1.1	2.1	3.2	3.4	2.0	1.8	1.0	-	1.4	1.3	-	1.1	1.1	2.4	-	2.0
Substance Abuse Services																													
Missing Data	%	1.9	39.5	5.1	52.6	17.8	91.9	96.9	1.8	53.8	9.2	29.1	1.8	75.0	51.7	16.8	77.3	44.0	17.1	55.2	99.1	2.2	35.9	75.5	17.1	2.4	54.9	12.0	28.1
Women with Non-Missing Data	**N**	**2,581**	**854**	**7,983**	**448**	**1,010**	**106**	**22**	**1,235**	**393**	**1,460**	**2,198**	**933**	**197**	**864**	**2,136**	**194**	**1,914**	**1,475**	**108**	**-**	**1,132**	**820**	**169**	**747**	**1,399**	**329**	**1,416**	**32,133**
Received Substance Abuse Services	%	-	5.4	-	-	-	-	-	-	8.1	5.1	2.1	-	6.1	10.1	5.0	-	2.4	7.1	-	-	-	8.2	24.3	-	-	-	3.4	2.3
Average Number of Substance Abuse Services	Mean	-	2.8	-	-	-	-	-	-	2.0	3.4	2.5	-	13.3	2.3	1.4	-	2.6	1.5	-	-	-	2.1	-	-	-	-	-	2.4
Referrals for High Risk Medical Services																													
Missing Data	%	0.6	44.3	5.1	32.9	13.3	8.4	26.5	14.8	53.6	8.8	11.0	2.0	6.2	44.3	16.7	73.8	6.0	15.5	57.7	98.4	8.2	2.2	100.0	17.4	2.5	55.2	49.8	19.6
Women with Non-Missing Data	**N**	**2,613**	**786**	**7,983**	**634**	**1,066**	**1,196**	**517**	**1,072**	**395**	**1,466**	**2,761**	**931**	**739**	**996**	**2,138**	**224**	**3,213**	**1,503**	**102**	**17**	**1,063**	**1,252**	**-**	**744**	**1,397**	**327**	**807**	**35,942**
Received Referrals for High Risk Medical Services	%	47.6	26.3	-	41.5	43.2	8.5	-	21.7	8.4	28.4	47.4	17.7	44.8	23.2	8.2	12.1	11.1	8.6	-	-	11.1	32.0	-	27.0	37.4	4.0	15.0	19.7
Average Number of Referrals for High Risk Medical Services	Mean	2.5	2.5	-	1.9	1.4	1.1	-	1.1	1.6	2.0	1.8	1.2	1.3	1.8	1.5	1.5	1.5	1.1	-	-	1.1	1.4	-	1.5	1.1	2.0	4.9	1.6

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Types of Referrals for High Risk Medical Services (Among Women with Services)																													
Maternal Fetal Specialist	%	5.4	82.4	-	97.6	74.7	36.7	-	23.8	96.9	22.0	55.6	82.5	86.7	63.0	75.4	56.5	59.3	92.1	-	-	80.9	10.6	-	48.9	99.2	-	76.5	52.0
Pulmonologist	%	-	-	-	-	-	-	-	-	-	4.4	-	-	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4
Endocrinologist	%	5.8	-	-	-	-	14.3	-	-	-	-	7.3	-	5.1	14.4	-	-	4.2	-	-	-	-	-	-	23.6	-	-	-	4.8
Cardiologist	%	3.6	5.5	-	-	4.6	14.3	-	-	-	21.7	6.8	-	8.2	10.3	-	-	10.7	-	-	-	-	5.9	-	18.5	2.9	-	5.9	6.8
Other	%	95.4	21.6	-	4.8	43.8	39.8	-	76.7	-	71.2	74.7	17.5	25.4	21.9	22.2	-	40.7	-	-	-	22.6	88.1	-	24.2	3.9	-	30.6	54.6

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE I. 10: DELIVERY INFORMATION

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Induction of Labor (Among Women Who Delivered, Excluding Planned C-sections)																													
Missing Data	%	6.2	27.8	0.9	18.9	18.7	55.6	20.9	7.2	48.1	6.6	7.7	6.4	1.9	48.0	52.1	60.0	36.8	11.4	17.8	1.9	28.9	3.2	78.8	20.4	1.6	26.2	19.4	19.5
Not in Universe	%	33.0	26.5	28.0	26.0	18.8	29.0	19.8	15.7	15.3	16.7	43.6	33.4	18.3	13.0	24.4	15.1	21.0	26.4	26.1	16.5	34.0	15.5	21.2	22.1	32.2	40.0	15.8	25.4
Women with Non-Missing Data	**N**	**1,598**	**645**	**5,977**	**520**	**768**	**201**	**417**	**969**	**312**	**1,234**	**1,509**	**572**	**629**	**697**	**602**	**213**	**1,444**	**1,107**	**135**	**877**	**429**	**1,040**	**0**	**518**	**948**	**247**	**1,042**	**24,650**
Yes	%	24.3	27.9	20.7	34.0	36.6	69.2	48.4	58.2	22.8	34.4	53.9	30.9	37.8	34.0	21.3	35.2	19.7	51.9	30.4	27.5	27.7	41.7	-	41.1	33.8	43.7	24.4	32.1
Induction of Labor with Pitocin (Among Women Who Were Induced)																													
Missing Data	%	2.5	7.7	0.1	2.2	7.7	5.4	2.0	4.1	46.9	0.4	0.8	0.2	7.4	3.1	2.4	14.4	4.5	5.0	3.7	0.7	3.9	0.0	0.0	0.2	0.0	2.9	4.5	3.5
Not in Universe	%	85.2	81.7	85.2	79.4	70.1	89.3	70.3	55.2	45.8	73.6	73.8	81.4	69.8	85.8	94.3	79.7	90.5	65.9	80.1	77.1	89.6	66.1	100.0	76.4	77.7	82.6	84.0	80.4
Women with Non-Missing Data	**N**	**324**	**150**	**1,237**	**174**	**272**	**68**	**195**	**512**	**62**	**418**	**788**	**175**	**180**	**199**	**84**	**50**	**173**	**518**	**39**	**238**	**75**	**434**	**0**	**211**	**320**	**106**	**186**	**7,188**
Yes	%	95.1	44.0	55.4	96.6	91.9	92.6	96.4	93.9	98.4	93.3	90.9	52.0	89.4	91.0	89.3	92.0	93.1	96.7	89.7	92.9	85.3	100.0	-	99.5	86.3	97.2	70.4	84.4
Place of Delivery (Among Women with a Delivery)																													
Missing Data	%	0.6	8.0	4.6	15.9	8.4	1.3	10.5	4.4	46.4	1.4	2.7	1.5	0.4	41.6	8.1	47.3	3.2	7.6	13.3	0.6	2.1	2.3	0.0	1.9	0.5	9.0	14.6	7.7
Not in Universe	%	22.4	18.1	26.3	20.0	11.5	21.8	15.4	9.9	11.0	6.8	34.8	29.7	4.6	5.4	17.4	11.6	16.1	15.4	18.3	8.3	27.9	6.1	21.2	6.0	23.2	36.8	15.8	19.2
Women with Non-Missing Data	**N**	**2,027**	**1,043**	**5,804**	**606**	**985**	**1,004**	**521**	**1,078**	**362**	**1,476**	**1,939**	**654**	**749**	**947**	**1,910**	**351**	**2,759**	**1,369**	**165**	**979**	**811**	**1,173**	**543**	**830**	**1,093**	**395**	**1,119**	**32,692**
Hospital	%	99.9	97.1	49.5	100.0	99.9	99.5	99.8	99.4	99.7	99.5	99.3	100.0	99.6	99.4	99.8	98.6	99.1	99.4	97.6	99.4	99.5	99.5	100.0	99.9	99.8	100.0	99.6	90.6
Birth center	%	-	-	45.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	8.2

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Home birth	%	-	-	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Other	%	-	2.7	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Delivery Method (Among Women with a Delivery)																												
Missing Data	%	0.9	10.3	0.6	16.2	10.2	4.5	11.0	4.5	46.8	2.4	2.9	2.1	0.5	7.7	12.3	49.1	4.6	3.8	14.9	4.5	2.6	2.7	2.5	2.7	0.6	16.2	5.1	6.1
Not in Universe	%	22.4	18.1	26.3	20.0	11.5	21.8	15.4	9.9	11.0	6.8	34.8	29.7	4.6	5.4	17.4	11.6	16.1	15.4	18.3	8.3	27.9	6.1	21.2	6.0	23.2	36.8	15.8	19.2
Women with Non-Missing Data	**N**	**2,019**	**1,010**	**6,147**	**603**	**963**	**962**	**518**	**1,077**	**359**	**1,460**	**1,933**	**648**	**748**	**1,553**	**1,804**	**336**	**2,712**	**1,438**	**161**	**937**	**805**	**1,168**	**526**	**823**	**1,092**	**343**	**1,272**	**33,417**
Vaginal Only	%	69.1	71.3	87.6	70.5	67.0	64.7	73.6	77.4	70.2	66.0	65.1	81.0	63.8	67.3	65.0	69.0	74.7	71.2	68.9	80.5	72.7	72.3	69.4	52.5	67.9	69.7	75.2	73.1
C-Section Only	%	30.9	28.7	12.4	29.5	33.0	35.3	26.4	22.6	29.8	34.0	34.9	19.0	36.2	32.7	35.0	31.0	25.3	28.8	31.1	19.5	27.3	27.7	30.6	47.5	32.1	30.3	24.8	26.9
Delivery Method (Among Low Risk Women with a Delivery) [1]																													
Missing Data	%	0.3	7.2	0.4	7.6	8.7	1.2	5.1	1.9	46.1	0.9	1.6	0.8	0.1	3.0	4.5	24.0	2.1	2.5	7.5	1.3	1.0	0.6	0.9	0.7	0.1	9.5	2.9	3.4
Not in Universe	%	78.4	70.8	74.2	62.8	47.6	73.4	52.5	71.6	33.6	70.4	72.0	74.7	76.9	70.1	72.2	60.7	70.6	71.6	75.9	74.9	79.6	69.6	69.5	70.9	73.6	69.9	66.4	70.5
Women with Non-Missing Data	**N**	**561**	**311**	**2,133**	**280**	**537**	**331**	**298**	**333**	**173**	**462**	**818**	**232**	**181**	**480**	**598**	**131**	**933**	**461**	**40**	**256**	**224**	**381**	**204**	**256**	**377**	**151**	**495**	**11,637**
Vaginal Only	%	71.3	76.5	83.8	71.1	67.6	69.2	74.2	76.0	69.9	68.2	71.3	83.6	70.7	73.1	70.9	75.6	79.2	76.8	72.5	88.3	76.3	81.1	69.6	65.2	77.2	74.8	77.6	75.9
C-Section Only	%	28.7	23.5	16.2	28.9	32.4	30.8	25.8	24.0	30.1	31.8	28.7	16.4	29.3	26.9	29.1	24.4	20.8	23.2	27.5	11.7	23.7	18.9	30.4	34.8	22.8	25.2	22.4	24.1
Scheduled C-Section (Among Women with a C-Section)																													
Missing Data	%	1.1	8.4	4.5	4.6	10.3	10.4	2.8	1.4	47.8	3.2	1.1	0.5	1.6	17.8	13.3	16.3	9.9	3.2	4.1	1.4	8.5	0.5	23.4	8.4	0.6	7.7	19.8	7.4
Not in Universe	%	76.2	73.9	90.8	79.3	67.1	73.9	79.5	80.7	41.6	69.2	78.3	87.1	65.6	70.6	74.7	76.3	78.7	74.9	76.3	82.5	80.9	74.8	76.6	56.6	75.6	83.2	80.2	78.0
Women with Non-Missing Data	**N**	**595**	**251**	**394**	**153**	**277**	**204**	**124**	**225**	**90**	**445**	**639**	**118**	**258**	**207**	**309**	**63**	**387**	**389**	**47**	**173**	**122**	**316**	**-**	**315**	**342**	**67**	**-**	**6,510**
Yes	%	47.2	47.0	35.0	37.3	32.5	46.6	25.0	32.4	40.0	35.7	43.0	29.7	41.9	65.2	58.3	47.6	42.9	50.4	40.4	50.9	58.2	38.3	-	46.0	37.7	34.3	-	43.0
VBAC (Among Women with a Prior C-Section)																													
Missing Data	%	0.0	5.6	0.1	1.9	7.0	0.0	1.0	0.0	45.8	0.0	0.0	0.0	0.0	1.0	0.7	11.5	1.2	1.8	2.9	0.5	0.1	0.0	0.0	0.0	0.0	2.6	0.2	1.9
Not in Universe	%	85.0	80.4	96.2	88.5	83.4	85.6	92.0	88.9	49.1	81.9	87.9	90.7	76.5	89.9	87.4	83.1	88.5	83.5	81.3	82.2	87.4	84.3	88.1	75.7	84.8	92.1	87.4	87.1
Women with Non-Missing Data	**N**	**393**	**198**	**315**	**91**	**118**	**188**	**49**	**140**	**43**	**291**	**376**	**88**	**185**	**163**	**306**	**46**	**352**	**261**	**38**	**186**	**145**	**201**	**82**	**219**	**218**	**39**	**198**	**4,929**
Yes	%	18.3	24.7	27.3	19.8	11.9	9.6	22.4	35.0	-	17.2	19.7	35.2	16.8	11.7	8.8	-	23.6	9.6	-	32.3	16.6	23.4	15.9	17.4	9.6	-	30.3	19.3

Notes: All measures are among women with a delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

[1] Low risk is defined as women with nulliparous, singleton, term births.

TABLE I. 11: BIRTH OUTCOMES

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Outcomes of Strong Start Pregnancy																													
Missing Data	%	16.9	22.5	23.8	21.2	17.6	18.2	15.8	9.3	56.2	1.2	28.1	25.5	3.7	5.4	15.1	20.6	14.3	14.3	20.3	7.0	20.3	5.7	19.9	4.4	15.6	38.4	12.6	17.9
Women with Non-Missing Data	**N**	**2,185**	**1,095**	**6,407**	**745**	**1,013**	**1,068**	**592**	**1,141**	**373**	**1,589**	**2,229**	**708**	**759**	**1,690**	**2,179**	**678**	**2,929**	**1,525**	**192**	**999**	**923**	**1,207**	**552**	**861**	**1,210**	**450**	**1,407**	**36,706**
Live Birth	%	92.2	97.7	96.3	98.4	98.2	94.9	98.1	99.1	98.4	93.8	89.8	93.6	97.2	98.9	95.6	96.5	96.0	96.1	98.4	97.1	90.0	97.1	98.4	95.2	90.1	98.0	95.0	95.5
Stillbirth	%	1.2	-	0.3	-	-	-	-	-	-	-	1.0	-	1.8	-	0.9	-	0.5	-	-	-	-	2.5	-	3.1	-	-	1.0	0.7
Termination	%	1.1	-	0.2	-	-	-	-	-	-	1.3	2.2	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	0.5
Miscarriage	%	5.5	1.3	3.2	-	-	3.5	-	-	-	4.3	7.0	5.5	-	1.0	3.5	3.1	2.8	3.3	-	1.9	8.8	-	-	1.6	8.8	-	3.3	3.3
Estimated Gestational Age (EGA, Among Women with Live Births)																													
Missing Data	%	1.5	14.2	0.6	15.9	13.7	1.4	18.1	1.6	48.3	10.3	9.7	1.5	1.3	5.2	9.9	16.4	5.2	7.0	8.7	2.6	4.0	2.7	3.0	4.8	3.4	21.2	17.0	7.0
Not in Universe	%	23.4	18.6	26.5	20.5	12.0	22.3	16.4	10.1	11.0	7.3	35.5	30.2	6.3	5.5	18.2	11.9	16.6	15.9	18.7	9.2	28.2	8.4	21.2	9.0	23.9	37.0	16.7	19.8
Women with Non-Missing Data	**N**	**1,976**	**949**	**6,127**	**601**	**913**	**996**	**461**	**1,111**	**346**	**1,326**	**1,700**	**649**	**728**	**1,595**	**1,846**	**612**	**2,674**	**1,372**	**175**	**947**	**786**	**1,138**	**522**	**777**	**1,041**	**305**	**1,067**	**32,740**
Very Preterm (20 =< EGA < 34)	%	3.9	5.1	1.0	4.2	2.2	5.2	3.0	2.0	-	4.8	4.7	3.5	7.0	3.7	5.7	4.6	1.6	2.1	8.6	3.2	3.9	8.0	2.3	5.7	5.0	6.9	3.6	3.5
Preterm (34 =< EGA < 37)	%	8.6	9.5	3.4	8.0	4.9	8.6	6.3	6.5	5.5	8.7	11.2	7.6	11.8	6.1	10.6	6.4	5.4	7.0	10.9	7.8	9.8	12.2	6.7	15.7	9.9	15.7	8.1	7.6
Term (37 =< EGA < 42)	%	86.8	83.8	93.5	86.9	91.3	85.0	90.2	90.7	91.9	85.4	82.5	87.2	81.0	89.1	82.3	84.8	91.6	90.7	80.0	86.8	82.3	79.0	89.8	77.3	84.6	75.1	85.3	87.4
Post-Term (42+)	%	0.6	1.7	2.0	-	1.5	1.1	-	-	-	1.1	1.6	1.7	-	1.1	1.4	4.2	1.3	-	-	2.2	3.9	-	-	-	-	-	3.1	1.5
Birth Weight (Among Women with Live Births)																													
Missing Data	%	2.2	13.0	2.0	16.5	14.8	3.3	13.4	4.5	47.5	2.7	5.3	3.9	0.9	19.9	16.4	52.7	5.6	9.1	15.4	3.1	3.7	3.2	4.8	3.0	0.7	24.9	7.1	8.3
Not in Universe	%	23.4	18.6	26.5	20.5	12.0	22.3	16.4	10.1	11.0	7.3	35.5	30.2	6.3	5.5	18.2	11.9	16.6	15.9	18.7	9.2	28.2	8.4	21.2	9.0	23.9	37.0	16.7	19.8
Women with Non-Missing Data	**N**	**1,957**	**965**	**6,006**	**595**	**899**	**971**	**494**	**1,074**	**353**	**1,448**	**1,838**	**626**	**731**	**1,332**	**1,678**	**302**	**2,661**	**1,335**	**159**	**942**	**789**	**1,131**	**510**	**793**	**1,080**	**278**	**1,226**	**32,173**
Very Low Birthweight (<1500g)	%	2.0	1.5	0.5	-	-	2.5	-	-	-	2.1	1.8	-	3.8	1.0	1.8	-	0.9	-	-	1.6	1.5	4.1	-	2.0	2.4	-	1.5	1.5
Low Birthweight (=>1500g < 2500g)	%	8.3	10.6	3.0	9.6	5.6	9.9	7.9	4.7	7.9	10.8	7.1	7.3	14.1	6.2	11.4	4.3	7.2	6.1	10.7	5.8	6.1	14.8	8.6	15.6	9.3	12.9	8.2	7.6
Normal Birthweight (=>2500 < 4000g)	%	83.4	83.6	85.4	84.9	87.9	80.5	87.9	87.6	89.5	81.1	84.4	87.2	77.7	84.8	84.3	88.1	85.9	86.3	83.6	87.5	83.9	75.6	83.5	77.9	82.0	78.4	83.8	84.2
Macrosomic Birthweight (=>4000g)	%	6.3	4.4	11.1	4.0	5.9	7.1	2.6	6.9	-	6.0	6.7	4.6	4.4	8.0	2.5	6.6	5.9	7.0	-	5.1	8.5	5.6	6.9	4.4	6.3	5.8	6.4	6.8

Notes: All measures are among women with a delivery. Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX J: PARTICIPANT-LEVEL PROCESS EVALUATION – THIRD TRIMESTER AND POSTPARTUM FINDINGS, BY MODEL

FINDINGS FROM THE THIRD TRIMESTER AND POSTPARTUM SURVEYS

The information presented in the tables below comes from items collected on the Third Trimester and Postpartum Surveys. We have separated these from the main PLPE findings because of high rates of missing data, limiting the generalizability of these results. High rates of missing data from the Third Trimester and Postpartum Surveys may be attributable to women who are reported to have left Strong Start prior to delivery, women who had sporadic prenatal care attendance, and women who were not able to be reached postpartum. Details on the quality of these data and awardee data collection processes are reported in Volume 2. Despite having weaker data quality than the Intake and Exit forms, the Third Trimester and Postpartum Surveys are the only source of certain measures of interest, including satisfaction with care (prenatal and delivery care), breastfeeding initiation, and postpartum pregnancy prevention. We therefore report these findings below. Table J. 1 through Table J. 3 summarize findings from these two forms among Strong Start enrollees with a single gestation for whom we have data. Rates of missing data, by measure, are presented as well. Cells representing fewer than 11 women are censored using a dash (-). All subsequent tables are limited to women with a single gestation (excluding N=607 women with multiple gestations), results for women with a multiple gestation are presented in Appendix S.

TABLE J. 1: SATISFACTION

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Satisfaction with Prenatal Care					
Missing Data	%	46.4	64.9	48.7	52.0
Women with Non-Missing Data	**N**	**4,712**	**3,648**	**13,095**	**21,455**
Not at All Satisfied	%	-	1.0	0.6	0.6
Slightly Satisfied	%	0.4	1.0	1.3	1.0
Moderately Satisfied	%	3.3	4.4	7.8	6.2
Very Satisfied	%	25.6	35.6	46.1	39.8
Extremely Satisfied	%	70.6	58.1	44.2	52.3
Satisfaction with Delivery Experience					
Missing Data	%	46.5	65.2	48.7	52.1
Women with Non-Missing Data	**N**	**4,698**	**3,615**	**13,114**	**21,427**
Not at All Satisfied	%	2.0	3.1	2.3	2.4
Slightly Satisfied	%	3.0	4.0	2.9	3.1
Moderately Satisfied	%	10.4	11.6	12.8	12.1
Very Satisfied	%	29.1	42.6	46.6	42.1
Extremely Satisfied	%	55.7	38.7	35.4	40.4

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE J. 2: BREASTFEEDING

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Breastfeeding Intention at Third Trimester					
Missing Data	%	38.8	48.4	41.1	42.4
Women with Non-Missing Data	**N**	**5,376**	**5,351**	**15,042**	**25,769**
Breastfeed Only	%	80.4	47.5	40.5	50.3
Formula Feed Only	%	4.0	10.1	15.3	11.9
Both Breast and Formula Feed	%	10.8	31.9	32.5	27.8
I Haven't Decided	%	4.8	10.5	11.8	10.1
Breastfeeding Initiation After Delivery					
Missing Data	%	46.6	57.4	46.1	48.8
Women with Non-Missing Data	**N**	**4,694**	**4,418**	**13,780**	**22,892**
Yes	%	91.5	76.6	72.6	77.3
No	%	7.6	14.9	23.8	18.8
Prefer Not to Answer	%	0.8	8.5	3.6	4.0

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE J. 3: FAMILY PLANNING

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Received Birth Control Counseling after Delivery					
Missing Data	%	47.2	57.8	46.6	49.3
Women with Non-Missing Data	**N**	**4,642**	**4,384**	**13,636**	**22,662**
Yes	%	77.0	77.5	82.2	80.3
No	%	20.0	14.0	14.2	15.3
Unsure	%	3.0	8.4	3.6	4.4
Reported Doing Something to Keep From Getting Pregnant Postpartum					
Missing Data	%	47.1	58.0	46.4	49.2
Women with Non-Missing Data	**N**	**4,645**	**4,356**	**13,701**	**22,702**
Yes	%	84.2	70.8	74.0	75.5
No	%	13.2	17.7	21.5	19.1
Unsure	%	2.6	11.5	4.5	5.4
Reported Using Birth Control Postpartum (Among All Women Who Report Doing Something to Keep from Getting Pregnant)					
Missing Data	%	41.5	42.9	38.6	40.2
Not in Universe	%	14.0	27.4	21.7	21.5
Women with Non-Missing Data	**N**	**3,912**	**3,086**	**10,138**	**17,136**
Female Sterilization	%	3.2	12.6	12.1	10.2
Male Sterilization	%	3.6	0.7	0.7	1.4
LARC - Implant	%	2.8	11.4	10.9	9.2

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
LARC - IUD	%	10.8	11.9	12.3	11.9
Pills	%	8.6	11.9	13.0	11.8
Injection	%	5.9	16.2	20.2	16.2
Condoms	%	26.6	19.8	13.9	17.9
Breastfeeding	%	12.8	2.9	3.1	5.3
Rhythm or Safe Period	%	2.6	0.5	0.2	0.8
Withdrawal or Pulling Out	%	2.6	1.2	1.7	1.8
Spermicide	%	-	-	-	-
Other Method	%	16.7	8.1	9.5	10.9
Method Not Indicated	%	3.8	3.0	2.2	2.7

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX K: PARTICIPANT-LEVEL PROCESS EVALUATION – THIRD TRIMESTER AND POSTPARTUM FINDINGS, BY AWARDEE

TABLE K. 1: SATISFACTION

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Satisfaction with Prenatal Care																													
Missing Data	%	35.4	91.7	47.4	61.4	55.7	48.6	75.7	35.3	55.1	38.6	67.8	68.6	24.1	35.1	54.8	67.0	29.2	57.3	66.8	48.9	58.2	44.5	60.5	55.8	57.8	80.7	77.4	52.0
Women with Non-Missing Data	N	**1,698**	**117**	**4,425**	**365**	**544**	**671**	**171**	**814**	**382**	**987**	**999**	**298**	**598**	**1,160**	**1,160**	**282**	**2,421**	**759**	**80**	**549**	**484**	**711**	**272**	**398**	**605**	**141**	**364**	**21,455**
Not at All Satisfied	%	-	-	-	-	-	-	-	-	-	-	1.2	-	-	-	-	-	0.7	-	-	-	-	-	-	2.8	-	-	3.6	0.6
Slightly Satisfied	%	0.6	-	0.4	-	-	1.5	-	-	-	2.0	3.0	-	-	-	-	-	1.0	-	-	2.4	-	1.5	-	-	-	-	5.2	1.0
Moderately Satisfied	%	5.6	6.0	3.3	2.2	4.2	6.3	4.1	4.4	1.8	5.9	11.6	4.0	6.9	7.8	8.0	3.2	6.4	1.3	12.5	19.3	8.1	7.9	3.3	6.0	4.8	1.4	30.2	6.2
Very Satisfied	%	51.5	45.3	24.7	22.7	50.9	35.6	31.0	37.2	31.2	39.9	49.4	18.5	53.2	35.3	48.4	34.4	59.2	25.2	40.0	49.7	53.5	43.9	47.1	26.6	39.2	28.4	29.1	39.8
Extremely Satisfied	%	41.8	47.9	71.6	75.1	43.2	56.3	63.7	57.6	67.0	51.7	34.7	76.8	38.1	55.5	42.8	61.0	32.7	72.9	42.5	27.3	37.4	45.3	47.1	63.1	53.9	70.2	31.9	52.3
Satisfaction with Delivery Experience																													
Missing Data	%	35.7	91.8	47.5	66.7	55.6	48.5	75.8	35.5	55.3	38.4	67.7	68.3	24.1	35.0	54.8	67.0	29.0	57.5	66.8	48.6	58.3	44.7	61.1	55.5	57.7	80.8	75.5	52.1
Women with Non-Missing Data	N	**1,692**	**116**	**4,411**	**315**	**546**	**672**	**170**	**812**	**380**	**991**	**1,001**	**301**	**598**	**1,162**	**1,161**	**282**	**2,429**	**756**	**80**	**552**	**483**	**708**	**268**	**401**	**606**	**140**	**394**	**21,427**
Not at All Satisfied	%	3.1	-	1.9	-	-	3.0	-	-	-	2.3	3.8	-	-	0.9	1.2	-	2.1	-	-	2.7	-	4.5	-	9.5	3.3	-	9.4	2.4
Slightly Satisfied	%	3.6	-	2.9	-	2.7	5.2	-	2.6	-	4.2	5.7	-	-	1.5	1.4	-	3.1	-	-	3.1	-	3.5	4.9	10.2	3.1	-	6.6	3.1
Moderately Satisfied	%	14.2	15.5	10.3	6.3	16.1	13.5	15.9	9.7	7.6	11.4	13.9	8.6	12.0	11.4	10.9	7.4	12.1	6.1	-	23.4	11.2	13.8	6.3	15.7	9.7	8.6	32.7	12.1
Very Satisfied	%	50.3	44.8	28.2	25.7	55.9	39.4	36.5	46.9	38.7	39.1	48.7	32.2	50.0	37.3	49.1	31.9	61.3	30.8	32.5	47.1	54.5	41.4	57.8	30.7	39.1	57.1	25.4	42.1
Extremely Satisfied	%	28.8	36.2	56.6	65.7	23.6	38.8	41.2	39.9	52.1	43.0	28.0	57.1	34.9	49.0	37.5	56.4	21.4	61.2	41.3	23.7	32.5	36.7	27.6	33.9	44.7	29.3	25.9	40.4

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE K. 2: BREASTFEEDING

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Breastfeeding Intention at Third Trimester																													
Missing Data	%	29.2	74.6	39.6	45.6	43.9	34.5	38.7	26.5	40.2	31.3	60.7	51.4	33.4	35.9	51.6	63.9	17.3	50.9	43.2	40.0	50.8	48.4	45.9	38.2	41.0	56.0	54.6	42.4
Women with Non-Missing Data	N	**1,862**	**359**	**5,078**	**514**	**690**	**855**	**431**	**925**	**509**	**1,105**	**1,219**	**462**	**525**	**1,145**	**1,243**	**308**	**2,826**	**874**	**137**	**644**	**570**	**661**	**373**	**557**	**846**	**321**	**730**	**25,769**
Breastfeed Only	%	35.1	42.9	82.3	36.8	56.2	43.7	47.6	52.5	50.7	23.3	64.5	57.1	55.2	61.3	8.3	70.8	36.8	72.5	39.4	55.6	31.9	30.4	53.9	50.6	20.0	28.3	31.8	50.3
Formula Feed Only	%	12.9	14.8	3.7	21.2	3.0	15.2	5.1	4.3	5.7	25.7	4.8	11.0	9.7	19.2	25.4	4.9	8.8	10.8	17.5	16.5	16.3	22.5	13.9	10.2	29.9	24.6	9.9	11.9
Both Breast and Formula Feed	%	40.6	30.4	9.7	36.8	30.9	29.5	38.3	40.9	22.8	35.3	25.1	25.5	25.5	11.5	40.7	16.6	40.2	13.7	29.2	19.6	47.0	40.4	26.0	31.4	40.5	30.8	26.4	27.8

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
I Haven't Decided	%	11.3	12.0	4.4	5.3	9.9	11.6	9.0	2.3	20.8	15.7	5.7	6.3	9.5	7.9	25.6	7.8	14.1	3.0	13.9	8.4	4.7	6.7	6.2	7.7	9.6	16.2	31.9	10.1
Breastfeeding Initiation After Delivery																													
Missing Data	%	34.0	91.9	47.5	59.4	56.5	47.7	76.0	35.1	57.2	38.7	67.6	68.1	24.7	35.2	54.5	66.7	22.8	57.6	67.2	47.7	57.4	37.7	57.8	56.9	59.7	80.4	9.4	48.8
Women with Non-Missing Data	N	**1,735**	**114**	**4,413**	**384**	**535**	**682**	**169**	**817**	**364**	**985**	**1,004**	**303**	**593**	**1,158**	**1,168**	**284**	**2,641**	**754**	**79**	**562**	**493**	**797**	**291**	**388**	**578**	**143**	**1,458**	**22,892**
Yes	%	76.5	82.5	91.8	70.8	89.2	75.8	88.2	93.1	89.6	59.6	91.1	79.2	74.5	74.1	44.6	88.7	82.1	77.3	77.2	73.7	80.3	70.3	72.5	74.7	63.8	69.9	51.6	77.3
No	%	22.7	16.7	7.4	28.9	9.9	24.0	10.7	6.6	8.0	40.0	8.6	20.8	25.5	25.9	37.3	10.9	14.0	22.4	22.8	26.2	17.8	29.7	-	24.7	35.6	29.4	20.0	18.8
Prefer Not to Answer	%	0.7	-	0.9	-	-	-	-	-	-	-	-	-	-	-	18.1	-	3.9	-	-	-	-	-	27.5	-	-	-	28.4	4.0

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE K. 3: FAMILY PLANNING

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Received Birth Control Counseling after Delivery																													
Missing Data	%	35.9	92.0	48.1	60.0	57.1	49.1	76.2	35.2	57.5	38.9	68.7	68.5	24.0	35.3	54.1	67.0	23.6	57.3	67.2	48.3	58.1	38.4	57.8	57.4	59.7	81.6	9.4	49.3
Women with Non-Missing Data	N	**1,685**	**113**	**4,361**	**378**	**527**	**664**	**167**	**815**	**362**	**982**	**971**	**299**	**599**	**1,157**	**1,177**	**282**	**2,612**	**759**	**79**	**555**	**485**	**789**	**291**	**384**	**577**	**134**	**1,458**	**22,662**
Yes	%	78.7	80.5	76.2	91.5	66.8	84.3	90.4	86.6	77.1	95.4	90.4	81.6	98.2	71.0	79.7	82.6	71.6	93.0	88.6	84.1	77.7	96.2	86.6	57.6	96.0	97.0	69.2	80.3
No	%	18.2	17.7	20.7	7.1	31.1	14.0	7.8	12.5	18.8	4.2	8.7	18.1	-	27.9	12.1	13.5	24.2	6.6	-	15.3	15.1	3.4	-	40.9	3.6	-	2.5	15.3
Unsure	%	3.1	-	3.1	-	2.1	1.7	-	-	4.1	-	-	-	-	1.1	8.2	3.9	4.2	-	-	-	7.2	-	13.4	-	-	-	28.3	4.4
Reported Doing Something to Keep From Getting Pregnant Postpartum																													
Missing Data	%	34.8	92.0	48.1	59.5	58.3	48.4	76.4	35.2	59.3	38.9	68.5	67.9	23.7	34.8	53.7	67.2	23.6	57.8	67.6	47.8	57.5	39.5	57.8	58.3	59.9	80.4	9.4	49.2
Women with Non-Missing Data	N	**1,716**	**113**	**4,365**	**383**	**513**	**674**	**166**	**815**	**346**	**983**	**976**	**305**	**601**	**1,166**	**1,188**	**280**	**2,613**	**751**	**78**	**561**	**492**	**775**	**291**	**376**	**574**	**143**	**1,458**	**22,702**
Yes	%	75.8	79.6	83.7	86.4	59.8	86.1	87.3	70.3	76.6	91.0	86.4	96.4	87.2	51.3	81.1	64.6	56.4	88.0	61.5	90.4	75.8	74.3	76.6	70.2	88.7	93.7	56.2	75.5
No	%	21.0	17.7	13.6	10.4	38.2	11.6	10.8	28.5	18.8	7.4	13.1	-	11.0	48.1	11.2	27.5	37.8	10.7	34.6	7.8	18.3	25.3	-	27.9	10.1	-	6.0	19.1
Unsure	%	3.2	-	2.7	3.1	-	2.4	-	-	4.6	1.5	-	-	1.8	-	7.7	7.9	5.8	-	-	-	5.9	-	23.4	-	-	-	37.7	5.4
Reported Using Birth Control Postpartum (Among All Women Who Report Doing Something to Keep from Getting Pregnant)																													
Missing Data	%	30.4	81.0	42.3	34.0	49.0	26.2	75.4	7.8	52.8	15.9	66.4	67.8	2.7	34.7	46.3	62.4	19.2	55.0	44.4	47.5	55.4	17.3	57.8	55.3	44.2	2.5	8.4	40.2
Not in Universe	%	20.1	12.6	14.2	31.0	26.0	29.3	4.0	46.7	16.1	28.4	6.4	1.3	30.8	31.8	16.2	16.4	37.7	7.8	35.7	5.3	12.3	37.7	9.9	15.4	20.2	79.2	40.6	21.5
Women with Non-Missing Data	N	**1,301**	**90**	**3,655**	**331**	**307**	**580**	**145**	**573**	**265**	**895**	**843**	**294**	**524**	**598**	**964**	**181**	**1,475**	**661**	**48**	**507**	**373**	**576**	**223**	**264**	**509**	**134**	**820**	**17,136**
Female Sterilization	%	16.8	-	3.2	11.5	4.9	11.4	-	18.3	6.8	7.0	10.0	11.9	13.5	22.4	9.1	14.4	5.3	15.3	-	19.9	4.3	14.4	17.0	22.3	10.6	12.7	11.5	10.2

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Male Sterilization	%	-	-	3.9	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	3.5	-	-	-	-	-	-	-	-	-	1.4
LARC - Implant	%	10.8	-	2.8	11.5	4.2	2.9	13.1	19.4	4.5	23.0	17.1	13.3	14.5	9.7	2.2	6.1	9.0	8.9	-	15.6	7.2	9.9	13.0	-	5.9	23.9	12.2	9.2
LARC - IUD	%	15.4	-	11.0	14.2	8.1	8.8	19.3	9.6	6.0	20.7	18.1	18.0	8.2	9.0	2.5	12.2	8.0	16.0	-	15.2	22.8	10.1	17.0	4.2	3.5	9.0	18.2	11.9
Pills	%	7.2	-	8.7	20.2	13.0	17.6	-	10.6	10.6	9.7	13.0	10.2	7.3	14.4	14.2	22.7	9.5	20.3	-	15.6	13.9	11.6	11.2	6.4	20.4	13.4	14.9	11.8
Injection	%	15.0	15.6	4.6	19.6	14.0	22.1	15.9	15.0	21.1	18.5	9.0	29.3	18.5	12.5	39.1	11.6	23.3	5.9	29.2	16.0	8.8	45.3	6.7	-	18.7	20.1	23.9	16.2
Condoms	%	8.1	32.2	27.2	12.4	34.9	12.8	22.8	13.8	28.7	13.7	19.5	7.5	2.5	4.8	19.6	8.8	24.5	16.2	-	6.9	19.8	5.7	18.8	35.2	23.6	10.4	10.1	17.9
Breastfeeding	%	4.4	-	12.5	-	8.1	-	-	-	5.3	-	-	-	-	11.5	-	-	6.8	8.5	-	-	8.0	-	-	-	-	-	-	5.3
Rhythm or Safe Period	%	-	-	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Withdrawal or Pulling Out	%	7.8	-	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
Spermicide	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Method	%	10.7	13.3	17.0	5.1	7.2	19.7	-	10.8	10.2	4.2	7.9	5.8	32.8	11.7	5.6	14.4	9.2	4.2	-	6.7	9.4	2.3	9.0	12.5	11.6	-	3.4	10.9
Method Not Indicated	%	2.8	-	3.7	-	-	1.9	-	-	4.5	1.2	3.2	-	-	-	6.2	-	2.0	-	-	-	3.2	-	-	5.3	2.4	-	3.0	2.7

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX L: PARTICIPANT-LEVEL PROCESS EVALUATION – MULTIPLES

MAIN FINDINGS FOR MULTIPLES

The following tables present all of the main findings from the PLPE dataset for the 607 women with multiple gestations. Rates of missing data reported in these tables include data that are missing because a form was not submitted and data that are missing because the measure was left blank on a submitted form (item nonresponse). In case where the relevant population represents a subgroup of participants (e.g., women with a prior birth are the only group that could have had a prior preterm birth), we restrict the N to only those women in the universe. Women with nonmissing data (and if relevant, in the universe) are the denominator used for calculating all percentages presented in the tables below. Cells representing fewer than 11 women are censored using a dash (-). Results are not reported separate by model due to small sample sizes: Birth Center awardees had 20 participants with multiple gestations, Group Prenatal Care awardees had 123 participants with multiple gestations, and Maternity Care Home awardees had 464 participants with multiple gestations.

TABLE L. 1: DEMOGRAPHIC CHARACTERISTICS AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Mother's Age at Intake		
Missing Data	%	3.3
Women with Non-Missing Data	**N**	**587**
Less than 18 Years of Age	%	2.9
18 and 19 Years of Age	%	5.1
20 Through 34 Years of Age	%	81.1
35 Years and Older	%	10.9
Race and Ethnicity		
Missing Data	%	4.3
Women with Non-Missing Data	**N**	**581**
Hispanic	%	23.8
Non-Hispanic White	%	19.4
Non-Hispanic Black	%	54.4
Other Race/Multiple Races	%	2.4
Ethnicity (Among Hispanic Women)		
Missing Data	%	13.8
Not in Universe	%	63.4
Women with Non-Missing Data	**N**	**138**
Mexican, Mexican American, Chicana	%	42.0
Puerto Rican	%	18.8
Cuban	%	-
Other Hispanic, Latina, or Spanish Origin	%	34.8
Multiple Hispanic, Latina, or Spanish Origins	%	-
Living in Shelter or Homeless at Intake		
Missing Data	%	2.8
Women with Non-Missing Data	**N**	**590**
Yes	%	2.2
Employment and School Status at Intake		
Missing Data	%	5.8
Women with Non-Missing Data	**N**	**572**
Employed, Not in School	%	38.3
In School, Not Employed	%	8.9
Employed and in School	%	3.7
Neither Employed nor in School	%	49.1

Data Elements	N or %	Total
Education Level at Intake		
Missing Data	%	10.2
Women with Non-Missing Data	**N**	**545**
Less than High School	%	21.7
High School Graduate or GED	%	62.8
Associate's Degree	%	5.7
Bachelor's Degree	%	5.0
Other College Degree	%	5.0
Relationship Status at Intake		
Missing Data	%	5.3
Women with Non-Missing Data	**N**	**575**
Married	%	19.8
Living with a Partner	%	29.9
In a Relationship but Not Living Together	%	30.8
Not in a Relationship Right Now	%	19.5

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 2: PSYCHOSOCIAL CHARACTERISTICS AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Insured When Became Pregnant		
Missing Data	%	4.3
Women with Non-Missing Data	**N**	**581**
Yes	%	58.2
No	%	36.5
Unsure	%	5.3
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)		
Missing Data	%	4.3
Not in Universe	%	40.0
Women with Non-Missing Data	**N**	**338**
Medicaid	%	74.9
Other	%	17.2
Both Medicaid and Other Health Insurance	%	8.0
Smokes Cigarettes at Intake		
Missing Data	%	13.2
Women with Non-Missing Data	**N**	**527**
Yes	%	13.5
Food Insecure at Intake		
Missing Data	%	9.1
Women with Non-Missing Data	**N**	**552**
Yes	%	23.4
WIC at Intake		
Missing Data	%	6.3
Women with Non-Missing Data	**N**	**569**
Yes	%	50.6
Exhibiting Depressive Symptoms at Intake[1]		
Missing Data	%	15.0
Women with Non-Missing Data	**N**	**516**
Yes	%	28.3
Exhibiting Anxiety Symptoms at Intake[2]		
Missing Data	%	9.2

Data Elements	N or %	Total
Women with Non-Missing Data	**N**	**551**
None	%	59.9
Mild	%	22.9
Moderate	%	9.6
Severe	%	6.4
Incomplete Score but Showing Symptoms of Anxiety	%	-
History of Intimate Partner Violence[3]		
Missing Data	%	5.6
Women with Non-Missing Data	**N**	**573**
Yes	%	17.3
Experiencing Intimate Partner Violence at Intake (Among Women With a Completed Score or Who Report Being in a Relationship)[4]		
Missing Data	%	8.6
Not in Universe	%	9.9
Women with Non-Missing Data	**N**	**495**
Yes	%	-
Experiencing Prenatal Care Access Barrier		
Missing Data	%	2.8
Women with Non-Missing Data	**N**	**590**
None Reported	%	67.5
Reported One Access Barrier	%	21.0
Reported Two or More Access Barriers	%	11.5
Types of Barriers Reported (Among Women Who Reported Any Barrier)[5]		
No Car	%	59.9
Public Transportation Challenges	%	20.3
Not Enough Money for a Ride	%	26.6
Work Hours Make It Difficult	%	17.7
Childcare Challenges	%	16.1
Partner Objections	%	-
Other	%	15.1

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in Appendix E.

[1] Measured by CES-D 10 scale.
[2] Measured by GAD-7 scale.
[3] Measured by STaT scale.
[4] Measured by WEB scale.
[5] Women could report multiple barriers.

TABLE L. 3: PREGNANCY HISTORY AND INTENTIONS AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Prior Pregnancy		
Missing Data	%	0.2
Women with Non-Missing Data	**N**	**606**
Yes	%	82.2
Pregnancy History Among Women with a Prior Pregnancy		
Not in Universe (No Prior Pregnancy)	%	18.0
Prior Miscarriage (<20 weeks EGA)		
Missing Data	%	12.9
Women with Non-Missing Data	**N**	**420**
Yes	%	31.9
Prior Elective Termination		
Missing Data	%	13.0

Data Elements	N or %	Total
Women with Non-Missing Data	**N**	**419**
Yes	%	19.1
Prior Still Birth (Fetal Death >= 20 Weeks EGA)		
Missing Data	%	25.7
Women with Non-Missing Data	**N**	**342**
Yes	%	3.5
Prior Preeclampsia		
Missing Data	%	46.6
Women with Non-Missing Data	**N**	**215**
Yes	%	22.3
Prior Gestational Diabetes		
Missing Data	%	52.9
Women with Non-Missing Data	**N**	**177**
Yes	%	-
Prior Cervical Incompetence		
Missing Data	%	53.5
Women with Non-Missing Data	**N**	**173**
Yes	%	-
Prior Placenta Abnormalities		
Missing Data	%	54.0
Women with Non-Missing Data	**N**	**170**
Yes	%	-
Prior Congenital Abnormalities of the Fetus		
Missing Data	%	54.0
Women with Non-Missing Data	**N**	**170**
Yes	%	-

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 4: PRIOR BIRTH OUTCOMES AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Prior Birth (Among Women with a Prior Pregnancy)		
Missing Data	%	0.5
Not in Universe	%	18.0
Women with Non-Missing Data	**N**	**495**
Yes	%	90.7
Prior Birth Outcomes Among Women with a Prior Birth		
Inter Pregnancy Interval with Current Pregnancy Since Last Birth		
Missing Data	%	15.8
Not in Universe	%	25.4
Women with Non-Missing Data	**N**	**357**
< 18 months	%	25.5
>= 18 months	%	74.5
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)		
Missing Data	%	1.5
Not in Universe	%	26.0
Women with Non-Missing Data	**N**	**440**
Yes	%	25.0
Prior Low Birthweight Infant (< 2,500 Grams)		
Missing Data	%	15.2
Not in Universe	%	26.0

Data Elements	N or %	Total
Women with Non-Missing Data	**N**	**357**
Yes	%	14.3

Notes: All measures except for prior birth are among women with a prior birth. Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 5: PRE-PREGNANCY MEDICAL CONDITIONS AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Pregnancy Intention		
Missing Data	%	6.6
Women with Non-Missing Data	**N**	**567**
Trying to Become Pregnant	%	27.0
Not Trying to Become Pregnant, Not Using Contraception	%	60.8
Not Trying to Become Pregnant, Sometimes Using Contraception	%	3.9
Not Trying to Become Pregnant, Using Contraception	%	8.3
Diabetes Pre-Pregnancy		
Missing Data	%	15.2
Women with Non-Missing Data	**N**	**515**
Yes	%	2.5
Hypertension Pre-Pregnancy		
Missing Data	%	10.9
Women with Non-Missing Data	**N**	**541**
Yes	%	9.8
Mother's BMI at First Prenatal Visit		
Missing Data	%	17.3
Women with Non-Missing Data	**N**	**502**
Underweight (BMI < 18.5)	%	-
Normal Weight (=>18.5 BMI <25)	%	27.9
Overweight (=>25 BMI <30)	%	25.1
Obese (=>30 BMI < 40)	%	30.7
Very Obese (BMI >= 40)	%	14.9

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 6: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Preeclampsia		
Missing Data	%	13.7
Women with Non-Missing Data	**N**	**524**
Yes	%	12.2
Pregnancy-Related Hypertension		
Missing Data	%	13.5
Women with Non-Missing Data	**N**	**525**
Yes	%	9.1
Gestational Diabetes		
Missing Data	%	13.3
Women with Non-Missing Data	**N**	**526**
Yes	%	7.0

Data Elements	N or %	Total
Cervical Incompetence		
Missing Data	%	17.5
Women with Non-Missing Data	**N**	**501**
Yes	%	3.2
Placenta Previa		
Missing Data	%	16.0
Women with Non-Missing Data	**N**	**510**
Yes	%	-
Placental Abruption		
Missing Data	%	15.8
Women with Non-Missing Data	**N**	**511**
Yes	%	-
Congenital Abnormalities of the Fetus		
Missing Data	%	17.1
Women with Non-Missing Data	**N**	**503**
Yes	%	3.8
UTI(s) During Last 6 months of Pregnancy		
Missing Data	%	15.8
Women with Non-Missing Data	**N**	**511**
Yes	%	13.7

Notes: This table is among all women, but we note that 16 percent of women are reported to have left Strong Start prior to delivery. Sample is limited to women with multiple gestations (N=607). Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 7: TREATMENTS DURING PREGNANCY AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Vaginal Progesterone		
Missing Data	%	28.8
Women with Non-Missing Data	**N**	**432**
Yes	%	3.2
17P (Progesterone Injections, Among Women with a Prior Preterm Birth)		
Missing Data	%	4.6
Not in Universe	%	81.9
Women with Non-Missing Data	**N**	**82**
Yes	%	-
Antenatal Steroids		
Missing Data	%	33.1
Women with Non-Missing Data	**N**	**406**
Yes	%	20.9
Tocolytics		
Missing Data	%	35.9
Women with Non-Missing Data	**N**	**389**
Yes	%	10.5

Notes: This table is among all women, but we note that 16 percent of women are reported to have left Strong Start prior to delivery. Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 8: PRENATAL CARE AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Routine Prenatal Care Provider		
Missing Data	%	8.2
Women with Non-Missing Data	**N**	**557**
Obstetrician	%	68.0
Licensed Professional Midwife	%	-
Nurse Practitioner	%	6.8
Certified Nurse Midwife/Certified Midwife	%	10.6
Family Medicine Physician	%	-
Other Provider	%	13.5
Routine Prenatal Care (Individual Visits)		
Missing Data	%	0.0
Women with Non-Missing Data	**N**	**607**
Received Individual Visits	%	89.6
Average number of Individual Prenatal Visits	Mean	8.2
Routine Prenatal Care (Group Visits)		
Missing Data	%	0.0
Women with Non-Missing Data	**N**	**607**
Received Group Visits	%	20.4
Average Number of Group Prenatal Visits	Mean	5.0
Care Coordinator Encounters		
Missing Data	%	8.9
Women with Non-Missing Data	**N**	**553**
Received Care Coordinator Encounters	%	80.1
Average Number of Care Coordinator Encounters	Mean	4.6
Mental Health Encounters		
Missing Data	%	14.5
Women with Non-Missing Data	**N**	**519**
Received Mental Health Encounters	%	7.5
Average Number of Mental Health Encounters	Mean	1.9
Doula Encounters		
Missing Data	%	17.1
Women with Non-Missing Data	**N**	**503**
Received Doula Encounters	%	-
Average Number of Doula Encounters	Mean	-
Health Education		
Missing Data	%	37.4
Women with Non-Missing Data	**N**	**380**
Received Health Education, Not Centering	%	35.0
Average Number of Health Education Sessions	Mean	2.4
Home Visits		
Missing Data	%	32.8
Women with Non-Missing Data	**N**	**408**
Received Home Visits	%	8.6
Average Number of Home Visits	Mean	1.6
Self-Care, not Centering		
Missing Data	%	41.5
Women with Non-Missing Data	**N**	**355**
Received Self-Care, Not Centering	%	15.2
Average Number of Self-Care Sessions	Mean	4.0
Nutrition Counseling		
Missing Data	%	30.6
Women with Non-Missing Data	**N**	**421**

Data Elements	N or %	Total
Received Nutrition Counseling	%	39.0
Average Number of Nutrition Counseling Sessions	Mean	2.0
Substance Abuse Services		
Missing Data	%	31.6
Women with Non-Missing Data	**N**	**415**
Received Substance Abuse Services	%	4.6
Average Number of Substance Abuse Services	Mean	-
Referrals for High Risk Medical Services		
Missing Data	%	16.6
Women with Non-Missing Data	**N**	**506**
Received Referrals for High Risk Medical Services	%	44.7
Average Number of Referrals for High Risk Medical Services	Mean	1.7
Types of Referrals for High Risk Medical Services (Among Women with Services)		
Maternal Fetal Specialist	%	66.4
Pulmonologist	%	-
Endocrinologist	%	-
Cardiologist	%	7.0
Other	%	47.2

Notes: This table is among all women, but we note that 16 percent of women are reported to have left Strong Start prior to delivery. Sample is limited to women with multiple gestations (N=607). Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. It is unlikely the women enrolled in Maternity Care Home or Group Prenatal Care were cared for by a Licensed Profession Midwife though this was reported for 1% and 2.3%, respectively. Awardees were "self-care" directed to indicate women conducted "self-care" if they weighed themselves, took their own blood pressure, etc., outside of the context of Group Prenatal Care. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 9: DELIVERY INFORMATION AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Induction of Labor (Among Women Who Delivered, Excluding Planned C-sections)		
Missing Data	%	21.1
Not in Universe	%	23.6
Women with Non-Missing Data	**N**	**336**
Yes	%	27.4
Induction of Labor with Pitocin (Among Women Who Were Induced)		
Missing Data	%	1.8
Not in Universe	%	84.8
Women with Non-Missing Data	**N**	**81**
Yes	%	90.1
Place of Delivery (Among Women with a Delivery)		
Missing Data	%	4.6
Not in Universe	%	4.8
Women with Non-Missing Data	**N**	**550**
Hospital	%	99.8
Birth center	%	-
Home birth	%	-
Other	%	-
Delivery Method (Among ALL Women with a Delivery)		
Missing Data	%	3.3
Not in Universe	%	4.8
Women with Non-Missing Data	**N**	**558**
Vaginal Only	%	38.4
C-Section Only	%	61.7

Data Elements	N or %	Total
Scheduled C- Section (Among Women with a C-Section)		
Missing Data	%	13.1
Not in Universe	%	43.3
Women with Non-Missing Data	**N**	**264**
Yes	%	43.2
VBAC (Among Women with a Prior C-Section)		
Missing Data	%	0.0
Not in Universe	%	41.2
Women with Non-Missing Data	**N**	**114**
Yes	%	12.3

Notes: All measures are among women with a delivery. Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. [1] Low risk is defined as women with nulliparous, singleton, term births. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 10: BIRTH OUTCOMES AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Outcomes of Strong Start Pregnancy		
Missing Data	%	4.0
Women with Non-Missing Data	**N**	**583**
Only Live Births	%	80.3
Only Stillbirths	%	3.4
Both Live Births and Stillbirths	%	15.4
Only Terminations	%	-
Only Miscarriages	%	-
Estimated Gestational Age (EGA, Among Women with Live Births)		
Missing Data	%	6.8
Not in Universe	%	8.1
Women with Non-Missing Data	**N**	**517**
Very Preterm (20 =< EGA < 34)	%	25.1
Preterm (34 =< EGA < 37)	%	35.4
Term (37 =< EGA < 42)	%	39.1
Post-Term (42+)	%	-
Birth Weight (Among Women with Live Births)[1]		
Missing Data	%	7.4
Not in Universe	%	6.4
Women with Non-Missing Data	**N**	**523**
Any Very Low Birthweight (<1500g)	%	14.3
Any Low Birthweight (=>1500g < 2500g)	%	57.6
Any Normal Birthweight (=>2500 < 4000g)	%	50.5
Any Macrosomic Birthweight (=>4000g)	%	-

Notes: All measures are among women with a delivery. Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).
[1] Birth Weight sums to more than 100 percent because women can have babies with different birth weights in a single delivery.

FINDINGS FROM THE THIRD TRIMESTER AND POSTPARTUM SURVEYS

The information presented in the tables below comes from items collected on the Third Trimester and Postpartum Surveys. We have separated these from the main PLPE findings because of high rates of missing data, including women who left Strong Start prior to delivery, limiting the generalizability of these results. However, the Third Trimester and Postpartum Surveys are the only source of certain measures of interest, including satisfaction with care (prenatal and delivery care), breastfeeding initiation, and postpartum pregnancy prevention.

TABLE L. 11: SATISFACTION AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Satisfaction with Prenatal Care		
Missing Data	%	45.6
Women with Non-Missing Data	**N**	**330**
Not at All Satisfied	%	-
Slightly Satisfied	%	-
Moderately Satisfied	%	6.7
Very Satisfied	%	45.8
Extremely Satisfied	%	45.2
Satisfaction with Delivery Experience		
Missing Data	%	45.6
Women with Non-Missing Data	**N**	**330**
Not at All Satisfied	%	4.5
Slightly Satisfied	%	-
Moderately Satisfied	%	10.3
Very Satisfied	%	43.0
Extremely Satisfied	%	39.1

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 12: BREASTFEEDING AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Breastfeeding Intention at Third Trimester		
Missing Data	%	45.1
Women with Non-Missing Data	**N**	**333**
Breastfeed Only	%	33.9
Formula Feed Only	%	18.3
Both Breast and Formula Feed	%	35.7
I Haven't Decided	%	12.0
Breastfeeding Initiation After Delivery		
Missing Data	%	43.8
Women with Non-Missing Data	**N**	**341**
Yes	%	66.9
No	%	27.9
Prefer Not to Answer	%	5.3

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE L. 13: FAMILY PLANNING AMONG STRONG START PARTICIPANTS WITH MULTIPLE GESTATIONS

Data Elements	N or %	Total
Received Birth Control Counseling after Delivery		
Missing Data	%	43.7
Women with Non-Missing Data	**N**	**342**
Yes	%	81.3
No	%	14.9
Unsure	%	3.8
Reported "Doing Something to Keep From Getting Pregnant" Postpartum		
Missing Data	%	44.0
Women with Non-Missing Data	**N**	**340**
Yes	%	72.9
No	%	20.3
Unsure	%	6.8
Reported Using Birth Control Postpartum (Among All Women Who Report Doing Something to Keep from Getting Pregnant)		
Missing Data	%	35.3
Not in Universe	%	23.9
Women with Non-Missing Data	**N**	**248**
Female Sterilization	%	26.2
Male Sterilization	%	-
LARC - Implant	%	8.9
LARC - IUD	%	4.8
Pills	%	9.7
Injection	%	19.4
Condoms	%	9.7
Breastfeeding	%	5.2
Rhythm or Safe Period	%	-
Withdrawal or Pulling Out	%	-
Spermicide	%	-
Other Method	%	11.7
Method Not Indicated	%	-

Notes: Sample is limited to women with multiple gestations (N=607). Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX M: REGRESSION-ADJUSTED OUTCOMES – REGRESSION SAMPLE AND DESCRIPTIVE STATISTICS

INTERMEDIATE OUTCOMES ANALYSIS

TABLE M. 1: CONSTRUCTION OF THE ANALYTIC SAMPLE FOR INTERMEDIATE OUTCOMES ANALYSIS

Logic for Dropping Observations	# Excluded	# of Remaining Observations
Starting Sample: Number of Strong Start participants with PLPE data	-	45,316
Dropping participants without an exit form	831	44,485
Dropping participants without an intake form	2,299	42,186
Dropping participants with a miscarriage or elective termination	1,330	40,856
Dropping participants with multiples	585	40,271
Dropping participants missing an intermediate outcome variable (gestational diabetes or preeclampsia)	6,912	33,359
Dropping participants missing any covariates	766	32,593
Final analytic sample	-	32,593

Notes: A dash (-) indicates the reference category for a variable.

TABLE M. 2: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	7,076	7,047	18,470
Outcomes	**Means**		
Gestational Diabetes	0.03***^^^	0.06***	0.08
Preeclampsia	0.02***^^^	0.06	0.06
Demographic Characteristics			
Race/Ethnicity			
White	0.53***^^^	0.13***	0.21
Hispanic	0.25***^^^	0.42***	0.29
Black	0.16***^^^	0.41***	0.45
Other	0.05***^^^	0.04	0.04
Age			
Less than 18 Years Old	0.03***^^^	0.06*	0.06
18 to 19 Years of Age	0.07***^^^	0.12***	0.10
20 to 34 Years of Age	0.82***^^^	0.74**	0.75
35 Years of Age or Older	0.09^	0.08***	0.09
Education			
Less than High School	0.15***^^^	0.25***	0.28
High School Graduate / GED	0.55**^^^	0.51***	0.54
Bachelor's Degree	0.14***^^^	0.04**	0.03
Other Degree	0.12***^^^	0.09	0.09
Education Unknown	0.04***^^^	0.11***	0.06
Relationship Status			
Married	0.42***	0.20	0.20
Living with a Partner	0.33***^^^	0.33***	0.31
In a Relationship, Not Living Together	0.14***^^^	0.24***	0.28
Not in a Relationship	0.10***^^^	0.17	0.18
Relationship Status Unknown	0.01***^^^	0.06***	0.03
Employment/School			
Working, Not in School	0.36***^^^	0.29***	0.34
In School, Not Working	0.09***^	0.12	0.12
Working and in School	0.05 ^^	0.05	0.05
Neither Working nor in School	0.48***^^^	0.50***	0.46
Work/School Status Unknown	0.02***^^^	0.04***	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36^^^	0.47***	0.37
Prior Preterm Birth	0.09***^^^	0.11***	0.15

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
No Prior Preterm Birth	0.55***^^^	0.42***	0.48
Prior Low Birth Weight			
No Prior Birth	0.36^^^	0.47***	0.37
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.09
No Prior Low Birth Weight Birth	0.62***^^^	0.36***	0.47
Prior Low Birth Weight Unknown	0.01***^^^	0.12***	0.07
Prior C-Section			
No Prior Birth	0.36^^^	0.47***	0.37
Prior C-Section	0.04***^^^	0.14***	0.16
No Prior C-Section	0.59***^^^	0.39***	0.46
Interpregnancy Interval			
No Prior Birth	0.36^^^	0.47***	0.37
Short Interpregnancy Interval	0.19***^^^	0.10***	0.13
Normal Interpregnancy Interval	0.36^^^	0.32***	0.36
Interpregnancy Interval Unknown	0.09***^^^	0.12***	0.13
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.69***^^^	0.57***	0.67
Depressed at Intake	0.22***^^^	0.27***	0.24
Depression Unknown	0.09*^^^	0.17***	0.09
Anxiety			
No Anxiety at Intake	0.66***^^^	0.56***	0.62
Anxiety at Intake	0.31***^^^	0.35***	0.33
Anxiety Unknown	0.04***^^^	0.08***	0.06
Food Insecurity			
Not Food Insecure at Intake	0.77***^^^	0.68***	0.74
Food Insecure at Intake	0.18^^^	0.21***	0.18
Food Insecurity Score Unknown	0.05***^^^	0.11***	0.08
Pregnancy Intent			
Intended Pregnancy	0.37***^^^	0.28***	0.26
Unintended Pregnancy	0.61***^^^	0.67***	0.70
Pregnancy Intent Unknown	0.02***^^^	0.05***	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.86***	0.91
Pre-Pregnancy Hypertension	0.01***^^^	0.08***	0.07
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.06***	0.02
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.74***	0.92
Pre-Pregnancy Diabetes	0.00***^^^	0.06***	0.04
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.21***	0.04
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^^^	0.03**	0.03
Normal Weight (18.5-<25 BMI)	0.44***^^^	0.27	0.28
Overweight (25-<30 BMI)	0.25***^^^	0.22**	0.24
Obese (30-<40 BMI)	0.20***^^^	0.22***	0.27
Very Obese (>=40 BMI)	0.04***^^^	0.06***	0.10
BMI Unknown	0.03***^^^	0.19***	0.09
Smoking			
Did not Smoke at Intake	0.81*^^	0.76***	0.82
Smoked at Intake	0.10***^^^	0.08***	0.12
Smoking Status Unknown	0.09***	0.16***	0.06
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78**^^^	0.78**	0.77
History of Intimate Partner Violence	0.20***^^^	0.16***	0.19
History of Intimate Partner Violence Unknown	0.02***^^^	0.06***	0.04
Year			
2013 and 2014	0.20***^^^	0.24***	0.22
2015	0.31***^^^	0.39***	0.35

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
2016 and 2017	0.27***^^^	0.25***	0.31
Region			
Northeast	0.22***^^^	0.12	0.11
Midwest	0.03***^^^	0.25***	0.00
South	0.08***^^^	0.00***	0.26
West	0.68***^^^	0.70***	0.60

Notes: Sample limited to women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 3: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	7,076	6,203	16,623
Outcomes	**Means**		
Gestational Diabetes	0.03***^^^	0.06***	0.08
Preeclampsia	0.02***^^^	0.06***	0.05
Demographic Characteristics			
Race/Ethnicity			
White	0.53***^^^	0.14***	0.21
Hispanic	0.25***^^^	0.35***	0.32
Black	0.16***^^^	0.46***	0.42
Other	0.05**	0.05	0.05
Age			
Less Than 18 Years Old	0.03***^^^	0.06	0.06
18 To 19 Years of Age	0.07***^^^	0.12***	0.10
20 To 34 Years of Age	0.82***^^^	0.75	0.75
35 Years of Age or Older	0.09**^^^	0.07***	0.10
Education			
Less Than High School	0.15***^^^	0.27**	0.28
High School Graduate / GED	0.55***^^^	0.52	0.53
Bachelor's Degree	0.14***^^^	0.04	0.03
Other Degree	0.12***^^^	0.07***	0.09
Education Unknown	0.04***^^^	0.10***	0.07
Relationship Status			
Married	0.42***	0.20	0.21
Living With a Partner	0.33**^^^	0.32	0.31
In a Relationship, Not Living Together	0.14***^^^	0.25***	0.27
Not in a Relationship	0.10***^^^	0.18	0.17
Relationship Status Unknown	0.01***^^^	0.06***	0.03
Employment/School			
Working, Not in School	0.36***^^^	0.30***	0.34
In School, Not Working	0.09***	0.11	0.12
Working and In School	0.05^^	0.05	0.05
Neither Working nor in School	0.48***^^^	0.50***	0.46
Work/School Status Unknown	0.02***^^^	0.04*	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36*^	0.48***	0.38
Prior Preterm Birth	0.09***^^^	0.10***	0.14
No Prior Preterm Birth	0.55***^^^	0.42***	0.48
Prior Low Birth Weight			
No Prior Birth	0.36*^^^	0.48***	0.38
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.08
No Prior Low Birth Weight Birth	0.62***^^^	0.37***	0.48
Prior Low Birth Weight Unknown	0.01***^^^	0.11***	0.07

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Prior C-Section			
No Prior Birth	0.36*^^^	0.48***	0.38
Prior C-Section	0.04***^^^	0.13***	0.16
No Prior C-Section	0.59***^^^	0.40***	0.46
Interpregnancy Interval			
No Prior Birth	0.36*^^^	0.48***	0.38
Short Interpregnancy Interval	0.19***^^^	0.09***	0.13
Normal Interpregnancy Interval	0.36^^^	0.31***	0.36
Interpregnancy Interval Unknown	0.09***^^^	0.12***	0.14
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.69**^^^	0.58***	0.67
Depressed at Intake	0.22^^^	0.26***	0.23
Depression Unknown	0.09***^^^	0.16***	0.10
Anxiety			
No Anxiety at Intake	0.66***^^^	0.57***	0.62
Anxiety at Intake	0.31^^^	0.35***	0.32
Anxiety Unknown	0.04***^^^	0.08***	0.06
Food Insecurity			
Not Food Insecure at Intake	0.77***^^^	0.68***	0.74
Food Insecure at Intake	0.18^^^	0.20***	0.17
Food Insecurity Score Unknown	0.05***^^^	0.11***	0.09
Pregnancy Intent			
Intended Pregnancy	0.37***^^^	0.28	0.27
Unintended Pregnancy	0.61***^^^	0.67***	0.69
Pregnancy Intent Unknown	0.02***^^^	0.05***	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.86***	0.91
Pre-Pregnancy Hypertension	0.01***^^^	0.07***	0.06
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.07***	0.02
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.72***	0.92
Pre-Pregnancy Diabetes	0.00***^^^	0.05***	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.23***	0.04
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^^^	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.44***^^^	0.27	0.28
Overweight (25-<30 BMI)	0.25***^^^	0.23	0.24
Obese (30-<40 BMI)	0.20***^^^	0.22***	0.27
Very Obese (>=40 BMI)	0.04***^^^	0.06***	0.09
BMI Unknown	0.03***^^^	0.19***	0.10
Smoking			
Did Not Smoke at Intake	0.81	0.74***	0.82
Smoked at Intake	0.10***^^^	0.09***	0.11
Smoking Status Unknown	0.09***	0.16***	0.07
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78**^^^	0.78	0.77
History of Intimate Partner Violence	0.20***^^^	0.16***	0.19
History of Intimate Partner Violence Unknown	0.02***^^^	0.06***	0.05
Year			
2013 and 2014	0.20^^^	0.25***	0.21
2015	0.31***^^	0.37***	0.35
2016 and 2017	0.27***^^^	0.25***	0.32

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.22***^^^	0.12	0.12
Midwest	0.03***^^^	0.28***	0.00
South	0.08***^^^	0.00***	0.28
West	0.68***^^^	0.66***	0.55

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 4: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, WHITE WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	3,782	882	3,889
Outcomes	Means		
Gestational Diabetes	0.03***^^^	0.06	0.07
Preeclampsia	0.01***^^	0.03***	0.05
Demographic Characteristics			
Age			
Less than 18 Years Old	0.02***^^^	0.05*	0.04
18 to 19 Years of Age	0.06***^^^	0.13**	0.10
20 to 34 Years of Age	0.82***^^^	0.76**	0.79
35 Years of Age or Older	0.10***^^^	0.06	0.07
Education			
Less than High School	0.10***	0.11***	0.22
High School Graduate / GED	0.56	0.58	0.55
Bachelor's Degree	0.18***^^^	0.07	0.05
Other Degree	0.14***^^^	0.09	0.10
Education Unknown	0.02***^^^	0.15***	0.08
Relationship Status			
Married	0.48***^^^	0.29**	0.25
Living with a Partner	0.33***^^^	0.38	0.37
In a Relationship, Not Living Together	0.10***^^^	0.16***	0.20
Not in a Relationship	0.08***^^^	0.12	0.12
Relationship Status Unknown	0.01***^^^	0.04	0.05
Employment/School			
Working, Not in School	0.39***^^^	0.33	0.34
In School, Not Working	0.07***^^^	0.10*	0.09
Working and in School	0.05**	0.05	0.04
Neither Working nor in School	0.48	0.49	0.48
Work/School Status Unknown	0.02***	0.03***	0.05
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36**^^^	0.54***	0.39
Prior Preterm Birth	0.08***^	0.10***	0.14
No Prior Preterm Birth	0.56***^^^	0.36***	0.47
Prior Low Birth Weight			
No Prior Birth	0.36**^^^	0.54***	0.39
Prior Low Birth Weight Birth	0.01***^^^	0.03***	0.08
No Prior Low Birth Weight Birth	0.63***^^^	0.21***	0.49
Prior Low Birth Weight Unknown	0.00***^^^	0.22***	0.04
Prior C-Section			
No Prior Birth	0.36**^^^	0.54***	0.39
Prior C-Section	0.04***^^^	0.11***	0.16
No Prior C-Section	0.60***^^^	0.35***	0.45

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Interpregnancy Interval			
No Prior Birth	0.36**^^^	0.54***	0.39
Short Interpregnancy Interval	0.21***^^^	0.11***	0.16
Normal Interpregnancy Interval	0.34^^^	0.27***	0.34
Interpregnancy Interval Unknown	0.08***	0.09**	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71***^^^	0.57***	0.66
Depressed at Intake	0.22^^^	0.32***	0.21
Depression Unknown	0.07***^^^	0.11	0.13
Anxiety			
No Anxiety at Intake	0.66***^^^	0.48***	0.59
Anxiety at Intake	0.31^^^	0.45***	0.31
Anxiety Unknown	0.04***^^^	0.07***	0.10
Food Insecurity			
Not Food Insecure at Intake	0.79***^^^	0.67***	0.75
Food Insecure at Intake	0.17***^^^	0.24***	0.14
Food Insecurity Score Unknown	0.04***^^^	0.09***	0.11
Pregnancy Intent			
Intended Pregnancy	0.39***^^^	0.31***	0.23
Unintended Pregnancy	0.59***^^^	0.65**	0.69
Pregnancy Intent Unknown	0.02***^^^	0.04***	0.08
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.92	0.92
Pre-Pregnancy Hypertension	0.01***^^^	0.03***	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.50***	0.93
Pre-Pregnancy Diabetes	0.00***^^^	0.02*	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.48***	0.04
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***	0.04	0.03
Normal Weight (18.5-<25 BMI)	0.48***^^^	0.26***	0.32
Overweight (25-<30 BMI)	0.23^^^	0.17***	0.23
Obese (30-<40 BMI)	0.18***	0.20***	0.24
Very Obese (>=40 BMI)	0.03***	0.04***	0.09
BMI Unknown	0.03***^^^	0.29***	0.10
Smoking			
Did not Smoke at Intake	0.78***^^^	0.58***	0.67
Smoked at Intake	0.14***^^^	0.30	0.28
Smoking Status Unknown	0.08***^^^	0.12***	0.05
Intimate Partner Violence			
No History of Intimate Partner Violence	0.76***^^^	0.66	0.66
History of Intimate Partner Violence	0.22***^^^	0.29***	0.24
History of Intimate Partner Violence Unknown	0.02***^^^	0.05***	0.09
Year			
2013 and 2014	0.19***^^^	0.28	0.29
2015	0.32***^^^	0.39	0.38
2016 and 2017	0.27***^^^	0.20**	0.24
Region			
Northeast	0.22***^^^	0.13***	0.09
Midwest	0.03***^^^	0.20***	0.00
South	0.06***^^^	0.00***	0.49
West	0.67***^^	0.71***	0.46

Notes: Sample limited to white women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 5: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, WHITE WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	3,782	870	3,518
Outcomes		**Means**	
Gestational Diabetes	0.03***^^^	0.06	0.07
Preeclampsia	0.01***^^^	0.03***	0.04
Demographic Characteristics			
Age			
Less than 18 Years Old	0.02***^^^	0.05	0.04
18 to 19 Years of Age	0.06***^^^	0.13**	0.10
20 to 34 Years of Age	0.82***^^^	0.76**	0.79
35 Years of Age or Older	0.10***^^^	0.06	0.06
Education			
Less than High School	0.10***	0.11***	0.22
High School Graduate / GED	0.56	0.58**	0.54
Bachelor's Degree	0.18***^^^	0.07*	0.05
Other Degree	0.14***^^^	0.09	0.10
Education Unknown	0.02***^^^	0.15***	0.09
Relationship Status			
Married	0.48***^^^	0.29**	0.25
Living with a Partner	0.33***^^^	0.39	0.37
In a Relationship, Not Living Together	0.10***^^^	0.16***	0.20
Not in a Relationship	0.08***^^^	0.12	0.13
Relationship Status Unknown	0.01***^^^	0.04**	0.06
Employment/School			
Working, Not in School	0.39***^^^	0.33	0.35
In School, Not Working	0.07***^^^	0.10	0.09
Working and in School	0.05*	0.05	0.04
Neither Working nor in School	0.48	0.49	0.47
Work/School Status Unknown	0.02***	0.03***	0.05
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36**^^^	0.55***	0.39
Prior Preterm Birth	0.08***	0.10***	0.13
No Prior Preterm Birth	0.56***^^^	0.36***	0.48
Prior Low Birth Weight			
No Prior Birth	0.36**^^^	0.55***	0.39
Prior Low Birth Weight Birth	0.01***^^^	0.03***	0.07
No Prior Low Birth Weight Birth	0.63***^^^	0.21***	0.50
Prior Low Birth Weight Unknown	0.00***^^^	0.22***	0.04
Prior C-Section			
No Prior Birth	0.36**^^^	0.55***	0.39
Prior C-Section	0.04***^^^	0.11***	0.16
No Prior C-Section	0.60***^^^	0.35***	0.45
Interpregnancy Interval			
No Prior Birth	0.36**^^^	0.55***	0.39
Short Interpregnancy Interval	0.21***^^^	0.10***	0.16
Normal Interpregnancy Interval	0.34^^^	0.26***	0.33
Interpregnancy Interval Unknown	0.08***	0.09***	0.12
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71***^^^	0.57***	0.66
Depressed at Intake	0.22***^^^	0.32***	0.20
Depression Unknown	0.07***^^^	0.11**	0.14
Anxiety			
No Anxiety at Intake	0.66***^^^	0.48***	0.60
Anxiety at Intake	0.31^^^	0.46***	0.29
Anxiety Unknown	0.04***^^^	0.07***	0.11

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Food Insecurity			
Not Food Insecure at Intake	0.79***^^^	0.67***	0.74
Food Insecure at Intake	0.17***^^^	0.24***	0.13
Food Insecurity Score Unknown	0.04***^^^	0.09***	0.13
Pregnancy Intent			
Intended Pregnancy	0.39***^^^	0.31***	0.24
Unintended Pregnancy	0.59***^^^	0.65	0.68
Pregnancy Intent Unknown	0.02***^^	0.04***	0.09
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.91	0.93
Pre-Pregnancy Hypertension	0.01***^^^	0.03*	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.49***	0.93
Pre-Pregnancy Diabetes	0.00***^^^	0.02	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.49***	0.04
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***	0.04	0.03
Normal Weight (18.5-<25 BMI)	0.48***^^^	0.26***	0.32
Overweight (25-<30 BMI)	0.23^^^	0.18***	0.23
Obese (30-<40 BMI)	0.18***	0.19***	0.23
Very Obese (>=40 BMI)	0.03***	0.04***	0.08
BMI Unknown	0.03***^^^	0.29***	0.11
Smoking			
Did not Smoke at Intake	0.78***^^^	0.58***	0.67
Smoked at Intake	0.14***^^^	0.30**	0.27
Smoking Status Unknown	0.08***^^^	0.12***	0.06
Intimate Partner Violence			
No History of Intimate Partner Violence	0.76***^^^	0.66	0.66
History of Intimate Partner Violence	0.22**^^^	0.29***	0.24
History of Intimate Partner Violence Unknown	0.02***^^^	0.06***	0.10
Year			
2013 and 2014	0.19***^^^	0.28	0.29
2015	0.32***^^^	0.39	0.38
2016 and 2017	0.27***^^^	0.20**	0.24
Region			
Northeast	0.22***^^^	0.13**	0.10
Midwest	0.03***^^^	0.20***	0.00
South	0.06***^^^	0.00***	0.55
West	0.67***^^	0.71***	0.40

Notes: Sample limited to white women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 6: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE O UTCOMES ANALYTIC SAMPLE, BLACK WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,113	2,878	8,363
Outcomes		**Means**	
Gestational Diabetes	0.01***^^^	0.04***	0.06
Preeclampsia	0.02***^^^	0.08***	0.07
Demographic Characteristics			
Age			
Less than 18 Years Old	0.04***^^^	0.07**	0.06

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
18 to 19 Years of Age	0.08**^^^	0.13***	0.10
20 to 34 Years of Age	0.81***^^^	0.75	0.76
35 Years of Age or Older	0.07^^	0.05***	0.07
Education			
Less than High School	0.18***^^^	0.22*	0.24
High School Graduate / GED	0.59	0.61	0.61
Bachelor's Degree	0.11***^^^	0.04**	0.03
Other Degree	0.10*^^^	0.07**	0.09
Education Unknown	0.02***^^^	0.06***	0.04
Relationship Status			
Married	0.25***^^^	0.09**	0.10
Living with a Partner	0.25	0.26	0.24
In a Relationship, Not Living Together	0.27***^^^	0.33***	0.38
Not in a Relationship	0.21***	0.23**	0.25
Relationship Status Unknown	0.02**^^^	0.09***	0.03
Employment/School			
Working, Not in School	0.34	0.33	0.34
In School, Not Working	0.14	0.14	0.14
Working and in School	0.05	0.06	0.06
Neither Working nor in School	0.45	0.43	0.43
Work/School Status Unknown	0.01**^^^	0.04***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Preterm Birth	0.10***	0.11***	0.17
No Prior Preterm Birth	0.50***^^^	0.38***	0.45
Prior Low Birth Weight			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Low Birth Weight Birth	0.02***^^^	0.06***	0.10
No Prior Low Birth Weight Birth	0.52***^^^	0.36***	0.44
Prior Low Birth Weight Unknown	0.06**	0.07	0.08
Prior C-Section			
No Prior Birth	0.40^^^	0.51***	0.38
Prior C-Section	0.06***^^^	0.13***	0.17
No Prior C-Section	0.54***^^^	0.36***	0.45
Interpregnancy Interval			
No Prior Birth	0.40^^^	0.51***	0.38
Short Interpregnancy Interval	0.17***^^^	0.10***	0.13
Normal Interpregnancy Interval	0.34***^^^	0.26***	0.38
Interpregnancy Interval Unknown	0.09*^^^	0.13***	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.61^^^	0.50***	0.62
Depressed at Intake	0.29	0.31*	0.30
Depression Unknown	0.10^^^	0.19***	0.08
Anxiety			
No Anxiety at Intake	0.59^^^	0.48***	0.57
Anxiety at Intake	0.38^^^	0.42***	0.39
Anxiety Unknown	0.03^^^	0.10***	0.04
Food Insecurity			
Not Food Insecure at Intake	0.68***	0.66***	0.74
Food Insecure at Intake	0.26***^^^	0.21	0.20
Food Insecurity Score Unknown	0.06^^^	0.14***	0.06
Pregnancy Intent			
Intended Pregnancy	0.25***^^^	0.18	0.17
Unintended Pregnancy	0.73***^	0.75***	0.80
Pregnancy Intent Unknown	0.03^^^	0.07***	0.03

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.97***^^^	0.78***	0.88
Pre-Pregnancy Hypertension	0.02***^^^	0.13***	0.10
Pre-Pregnancy Hypertension Unknown	0.01**^^^	0.09***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.98***^^^	0.73***	0.92
Pre-Pregnancy Diabetes	0.01***^^^	0.08***	0.03
Pre-Pregnancy Diabetes Unknown	0.02***^^^	0.19***	0.05
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.03	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.40***^^^	0.26	0.27
Overweight (25-<30 BMI)	0.25***^^^	0.19**	0.21
Obese (30-<40 BMI)	0.23***	0.23***	0.28
Very Obese (>=40 BMI)	0.07***	0.08***	0.12
BMI Unknown	0.02***^^^	0.21***	0.10
Smoking			
Did not Smoke at Intake	0.82^^^	0.70***	0.81
Smoked at Intake	0.08**	0.08***	0.11
Smoking Status Unknown	0.10^^^	0.22***	0.08
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78*	0.79	0.80
History of Intimate Partner Violence	0.21***^^^	0.14***	0.17
History of Intimate Partner Violence Unknown	0.02**^^^	0.08***	0.03
Year			
2013 and 2014	0.19***	0.21***	0.25
2015	0.31***^^^	0.37	0.37
2016 and 2017	0.27	0.28	0.28
Region			
Northeast	0.24***^^^	0.14***	0.11
Midwest	0.02***^^^	0.31***	0.00
South	0.11***^^^	0.00***	0.16
West	0.82***^^^	0.65***	0.78

Notes: Sample limited to black women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 7: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, BLACK WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,113	2,875	6,959
Outcomes		**Means**	
Gestational Diabetes	0.01***^^^	0.04***	0.06
Preeclampsia	0.02***^^^	0.08***	0.06
Demographic Characteristics			
Age			
Less than 18 Years Old	0.04***^^^	0.07	0.07
18 to 19 Years of Age	0.08**^^^	0.13***	0.10
20 to 34 Years of Age	0.81***^^^	0.75	0.76
35 Years of Age or Older	0.07^^	0.05***	0.07
Education			
Less than High School	0.18***^^^	0.22	0.23
High School Graduate / GED	0.59	0.61	0.60
Bachelor's Degree	0.11***^^^	0.04*	0.03
Other Degree	0.10^^^	0.07***	0.09

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Education Unknown	0.02***^^^	0.06*	0.05
Relationship Status			
Married	0.25***^^^	0.09**	0.11
Living with a Partner	0.25	0.25	0.25
In a Relationship, Not Living Together	0.27***^^^	0.33***	0.36
Not in a Relationship	0.21***	0.23**	0.25
Relationship Status Unknown	0.02***^^^	0.09***	0.04
Employment/School			
Working, Not in School	0.34	0.33	0.34
In School, Not Working	0.14	0.14	0.15
Working and in School	0.05	0.06	0.06
Neither Working nor in School	0.45	0.43	0.43
Work/School Status Unknown	0.01**^^^	0.04**	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Preterm Birth	0.10***	0.11***	0.16
No Prior Preterm Birth	0.50**^^^	0.38***	0.46
Prior Low Birth Weight			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Low Birth Weight Birth	0.02***^^^	0.06***	0.08
No Prior Low Birth Weight Birth	0.52***^^^	0.36***	0.45
Prior Low Birth Weight Unknown	0.06***	0.07**	0.09
Prior C-Section			
No Prior Birth	0.40^^^	0.51***	0.38
Prior C-Section	0.06***^^^	0.13***	0.16
No Prior C-Section	0.54***^^^	0.36***	0.45
Interpregnancy Interval			
No Prior Birth	0.40^^^	0.51***	0.38
Short Interpregnancy Interval	0.17***^^^	0.10***	0.13
Normal Interpregnancy Interval	0.34**^^^	0.26***	0.37
Interpregnancy Interval Unknown	0.09**^^^	0.13***	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.61^^^	0.50***	0.62
Depressed at Intake	0.29	0.31***	0.29
Depression Unknown	0.10^^^	0.19***	0.09
Anxiety			
No Anxiety at Intake	0.59^^^	0.48***	0.57
Anxiety at Intake	0.38^^^	0.42***	0.39
Anxiety Unknown	0.03^^^	0.10***	0.04
Food Insecurity			
Not Food Insecure at Intake	0.68***	0.66***	0.74
Food Insecure at Intake	0.26***^^^	0.21	0.19
Food Insecurity Score Unknown	0.06^^^	0.14***	0.07
Pregnancy Intent			
Intended Pregnancy	0.25***^^^	0.18	0.18
Unintended Pregnancy	0.73***^	0.75***	0.79
Pregnancy Intent Unknown	0.03^^^	0.07***	0.03
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.97***^^^	0.78***	0.89
Pre-Pregnancy Hypertension	0.02***^^^	0.13***	0.08
Pre-Pregnancy Hypertension Unknown	0.01**^^^	0.09***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.98***^^^	0.73***	0.92
Pre-Pregnancy Diabetes	0.01***^^^	0.08***	0.03
Pre-Pregnancy Diabetes Unknown	0.02***^^^	0.19***	0.06

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.03	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.40***^^^	0.26	0.26
Overweight (25-<30 BMI)	0.25***^^^	0.19**	0.21
Obese (30-<40 BMI)	0.23***	0.23***	0.27
Very Obese (>=40 BMI)	0.07***	0.08***	0.11
BMI Unknown	0.02***^^^	0.21***	0.12
Smoking			
Did not Smoke at Intake	0.82^^^	0.70***	0.80
Smoked at Intake	0.08**	0.08***	0.11
Smoking Status Unknown	0.10^^^	0.22***	0.10
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78	0.79	0.80
History of Intimate Partner Violence	0.21***^^^	0.14***	0.17
History of Intimate Partner Violence Unknown	0.02***^^^	0.08***	0.03
Year			
2013 and 2014	0.19***	0.21	0.23
2015	0.31***^^^	0.37	0.36
2016 and 2017	0.27*	0.28	0.29
Region			
Northeast	0.24***^^^	0.14	0.13
Midwest	0.02***^^^	0.31***	0.00
South	0.11***^^^	0.00***	0.19
West	0.82***^^^	0.65***	0.74

Notes: Sample limited to black women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 8: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, HISPANIC WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,800	2,972	5,422
Outcomes	**Means**		
Gestational Diabetes	0.04***^^^	0.09***	0.11
Preeclampsia	0.02***^^^	0.05	0.05
Demographic Characteristics			
Age			
Less than 18 Years Old	0.03***^^^	0.05*	0.06
18 to 19 Years of Age	0.07*^^^	0.10**	0.08
20 to 34 Years of Age	0.82***^^^	0.73**	0.71
35 Years of Age or Older	0.09***^^^	0.12***	0.14
Education			
Less than High School	0.23***^^^	0.32***	0.40
High School Graduate / GED	0.52***^^^	0.38***	0.43
Bachelor's Degree	0.07***^^^	0.03***	0.02
Other Degree	0.09***^^	0.11***	0.07
Education Unknown	0.08^^^	0.15***	0.09
Relationship Status			
Married	0.38***^^^	0.27	0.28
Living with a Partner	0.37	0.39**	0.37
In a Relationship, Not Living Together	0.15***	0.17***	0.22
Not in a Relationship	0.08***^^^	0.14***	0.11
Relationship Status Unknown	0.01^^^	0.03***	0.01

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Employment/School			
Working, Not in School	0.33*^^^	0.25***	0.35
In School, Not Working	0.08**	0.09	0.10
Working and in School	0.05^^^	0.03**	0.04
Neither Working nor in School	0.52***^^^	0.58***	0.49
Work/School Status Unknown	0.02^^^	0.05***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.33^^^	0.40***	0.34
Prior Preterm Birth	0.10***^^^	0.12	0.13
No Prior Preterm Birth	0.57***^^^	0.48***	0.53
Prior Low Birth Weight			
No Prior Birth	0.33^^^	0.40***	0.34
Prior Low Birth Weight Birth	0.01***^^^	0.04***	0.07
No Prior Low Birth Weight Birth	0.66***^^^	0.42***	0.52
Prior Low Birth Weight Unknown	0.00***^^^	0.15***	0.07
Prior C-Section			
No Prior Birth	0.33^^^	0.40***	0.34
Prior C-Section	0.05***^^^	0.16	0.16
No Prior C-Section	0.62***^^^	0.45***	0.50
Interpregnancy Interval			
No Prior Birth	0.33^^^	0.40***	0.34
Short Interpregnancy Interval	0.17***^^^	0.10	0.11
Normal Interpregnancy Interval	0.40***	0.39**	0.36
Interpregnancy Interval Unknown	0.10***	0.11***	0.19
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70***^^^	0.63***	0.74
Depressed at Intake	0.18^	0.20***	0.17
Depression Unknown	0.12***^^^	0.17***	0.09
Anxiety			
No Anxiety at Intake	0.69	0.67***	0.71
Anxiety at Intake	0.26	0.25	0.24
Anxiety Unknown	0.04^^^	0.08***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.76^^^	0.72***	0.75
Food Insecure at Intake	0.15^^^	0.19***	0.17
Food Insecurity Score Unknown	0.09	0.09**	0.08
Pregnancy Intent			
Intended Pregnancy	0.42***^^^	0.36**	0.39
Unintended Pregnancy	0.56**^^^	0.60	0.59
Pregnancy Intent Unknown	0.02^^^	0.04***	0.02
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.92***	0.94
Pre-Pregnancy Hypertension	0.01***^^^	0.05*	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.03***	0.01
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.82***	0.93
Pre-Pregnancy Diabetes	0.00***^^^	0.04	0.04
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.13***	0.03
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.03***	0.03***	0.02
Normal Weight (18.5-<25 BMI)	0.37***^^^	0.28*	0.27
Overweight (25-<30 BMI)	0.30**^^^	0.27	0.28
Obese (30-<40 BMI)	0.23***	0.23***	0.30
Very Obese (>=40 BMI)	0.04***	0.05***	0.07
BMI Unknown	0.03***^^^	0.14***	0.06
Smoking			
Did not Smoke at Intake	0.87***	0.87***	0.94

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Smoked at Intake	0.02	0.02*	0.03
Smoking Status Unknown	0.10***	0.11***	0.03
Intimate Partner Violence			
No History of Intimate Partner Violence	0.83***	0.82**	0.80
History of Intimate Partner Violence	0.15**	0.14***	0.17
History of Intimate Partner Violence Unknown	0.02***^^^	0.04	0.03
Year			
2013 and 2014	0.21***^^^	0.26***	0.14
2015	0.30*^^^	0.41***	0.32
2016 and 2017	0.28***^^	0.24***	0.40
Region			
Northeast	0.22***^^^	0.09***	0.13
Midwest	0.02***^^^	0.20***	0.00
South	0.10***^^^	0.00***	0.25
West	0.62***^^^	0.76***	0.42

Notes: Sample limited to Hispanic women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 9: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, HISPANIC WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,800	2,413	5,364
Outcomes	**Means**		
Gestational Diabetes	0.04***^^^	0.08***	0.11
Preeclampsia	0.02***^^^	0.05	0.05
Demographic Characteristics			
Age			
Less than 18 Years Old	0.03***^^	0.05***	0.06
18 to 19 Years of Age	0.07*^^^	0.09	0.08
20 to 34 Years of Age	0.82***^^^	0.75***	0.71
35 Years of Age or Older	0.09***^^	0.11***	0.15
Education			
Less than High School	0.23***^^^	0.41	0.40
High School Graduate / GED	0.52***^^^	0.37***	0.42
Bachelor's Degree	0.07***^^^	0.02	0.02
Other Degree	0.09***^^^	0.05*	0.07
Education Unknown	0.08^^^	0.15***	0.09
Relationship Status			
Married	0.38***^^^	0.29	0.28
Living with a Partner	0.37	0.37	0.37
In a Relationship, Not Living Together	0.15***	0.17***	0.22
Not in a Relationship	0.08***^^^	0.14***	0.11
Relationship Status Unknown	0.01^^^	0.03***	0.01
Employment/School			
Working, Not in School	0.33*^^^	0.26***	0.35
In School, Not Working	0.08**	0.07***	0.10
Working and in School	0.05^^^	0.03***	0.05
Neither Working nor in School	0.52***^^^	0.61***	0.49
Work/School Status Unknown	0.02^^^	0.04***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.33^^^	0.40***	0.34
Prior Preterm Birth	0.10***	0.08***	0.13
No Prior Preterm Birth	0.57***^^^	0.52	0.53

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Prior Low Birth Weight			
No Prior Birth	0.33^^^	0.40***	0.34
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.07
No Prior Low Birth Weight Birth	0.66***^^^	0.45***	0.52
Prior Low Birth Weight Unknown	0.00***^^^	0.10***	0.07
Prior C-Section			
No Prior Birth	0.33^^^	0.40***	0.34
Prior C-Section	0.05***^^^	0.13***	0.16
No Prior C-Section	0.62***^^^	0.48*	0.50
Interpregnancy Interval			
No Prior Birth	0.33^^^	0.40***	0.34
Short Interpregnancy Interval	0.17***^^^	0.08***	0.11
Normal Interpregnancy Interval	0.40***	0.40***	0.36
Interpregnancy Interval Unknown	0.10***^	0.12***	0.19
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70***	0.70***	0.74
Depressed at Intake	0.18^	0.16	0.17
Depression Unknown	0.12***^^	0.14***	0.09
Anxiety			
No Anxiety at Intake	0.69^^^	0.74**	0.71
Anxiety at Intake	0.26*^^^	0.19***	0.24
Anxiety Unknown	0.04^^^	0.08***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.76^	0.73*	0.75
Food Insecure at Intake	0.15	0.17	0.17
Food Insecurity Score Unknown	0.09	0.09**	0.08
Pregnancy Intent			
Intended Pregnancy	0.42**	0.40	0.39
Unintended Pregnancy	0.56**	0.56**	0.59
Pregnancy Intent Unknown	0.02^^^	0.04***	0.02
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.95	0.94
Pre-Pregnancy Hypertension	0.01***^	0.02***	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.04***	0.01
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.81***	0.93
Pre-Pregnancy Diabetes	0.00***	0.01***	0.05
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.18***	0.03
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.03***^^^	0.02	0.02
Normal Weight (18.5-<25 BMI)	0.37***^^^	0.29*	0.27
Overweight (25-<30 BMI)	0.30**	0.30**	0.28
Obese (30-<40 BMI)	0.23***	0.24***	0.30
Very Obese (>=40 BMI)	0.04***	0.04***	0.07
BMI Unknown	0.03***^^^	0.11***	0.06
Smoking			
Did not Smoke at Intake	0.87***	0.88***	0.94
Smoked at Intake	0.02	0.02**	0.03
Smoking Status Unknown	0.10***	0.10***	0.03
Intimate Partner Violence			
No History of Intimate Partner Violence	0.83***	0.82*	0.80
History of Intimate Partner Violence	0.15**	0.14***	0.17
History of Intimate Partner Violence Unknown	0.02***^^^	0.04*	0.03
Year			
2013 and 2014	0.21***^^^	0.29***	0.14
2015	0.30*^^^	0.36***	0.32
2016 and 2017	0.28***^^	0.25***	0.41

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.22***^^^	0.10***	0.13
Midwest	0.02***^^^	0.28***	0.00
South	0.10***^^^	0.00***	0.25
West	0.62***^^	0.66***	0.41

Notes: Sample limited to Hispanic women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 10: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, WOMEN WITH OTHER/MULTIPLE RACE/ETHNICITY

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	381	315	796
Outcomes	**Means**		
Gestational Diabetes	0.03***^	0.07**	0.11
Preeclampsia	0.02**	0.04	0.05
Demographic Characteristics			
Age			
Less than 18 Years Old	0.02^^^	0.07***	0.04
18 to 19 Years of Age	0.04*^^^	0.13***	0.07
20 to 34 Years of Age	0.85***^^^	0.73	0.76
35 Years of Age or Older	0.09**	0.08***	0.13
Education			
Less than High School	0.12*^^	0.18	0.16
High School Graduate / GED	0.53	0.50	0.51
Bachelor's Degree	0.15^^^	0.08**	0.13
Other Degree	0.17^	0.12	0.15
Education Unknown	0.03^^^	0.11***	0.05
Relationship Status			
Married	0.39^^^	0.25***	0.40
Living with a Partner	0.37***	0.34**	0.27
In a Relationship, Not Living Together	0.13**^^^	0.22	0.19
Not in a Relationship	0.09^	0.14	0.13
Relationship Status Unknown	0.02^^^	0.05***	0.02
Employment/School			
Working, Not in School	0.34	0.34	0.32
In School, Not Working	0.10^	0.15**	0.11
Working and in School	0.10**^^	0.06	0.06
Neither Working nor in School	0.44*	0.43*	0.49
Work/School Status Unknown	0.02	0.03	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.42^^^	0.55**	0.47
Prior Preterm Birth	0.10	0.07	0.09
No Prior Preterm Birth	0.48^^	0.38*	0.44
Prior Low Birth Weight			
No Prior Birth	0.42^^^	0.55**	0.47
Prior Low Birth Weight Birth	0.00***	0.02***	0.07
No Prior Low Birth Weight Birth	0.57***^^^	0.30***	0.41
Prior Low Birth Weight Unknown	0.01***^^^	0.12***	0.05
Prior C-Section			
No Prior Birth	0.42^^^	0.55**	0.47
Prior C-Section	0.04***^^^	0.10*	0.14

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
No Prior C-Section	0.54***^^^	0.34	0.39
Interpregnancy Interval			
No Prior Birth	0.42^^^	0.55**	0.47
Short Interpregnancy Interval	0.18**^^^	0.12	0.13
Normal Interpregnancy Interval	0.34*^^	0.25	0.29
Interpregnancy Interval Unknown	0.06***	0.08	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70^^^	0.58***	0.68
Depressed at Intake	0.24	0.29*	0.23
Depression Unknown	0.06^^^	0.13**	0.08
Anxiety			
No Anxiety at Intake	0.65^^^	0.50***	0.62
Anxiety at Intake	0.33^^^	0.43***	0.33
Anxiety Unknown	0.02*^^^	0.07	0.05
Food Insecurity			
Not Food Insecure at Intake	0.80***^^^	0.61***	0.72
Food Insecure at Intake	0.18^^^	0.28***	0.19
Food Insecurity Score Unknown	0.03***^^^	0.12**	0.08
Pregnancy Intent			
Intended Pregnancy	0.35**	0.29***	0.41
Unintended Pregnancy	0.62**	0.64***	0.56
Pregnancy Intent Unknown	0.03^^	0.06**	0.03
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	1.00***^^^	0.87***	0.92
Pre-Pregnancy Hypertension	0.00***^^^	0.05	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.08***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.69***	0.91
Pre-Pregnancy Diabetes	0.01*	0.03	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.28***	0.06
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.05	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.46***^^^	0.30	0.34
Overweight (25-<30 BMI)	0.23	0.19**	0.26
Obese (30-<40 BMI)	0.18	0.15*	0.19
Very Obese (>=40 BMI)	0.04**	0.06	0.08
BMI Unknown	0.04***^^^	0.26***	0.09
Smoking			
Did not Smoke at Intake	0.80***^^	0.74***	0.87
Smoked at Intake	0.07^	0.11	0.08
Smoking Status Unknown	0.12***	0.15***	0.04
Intimate Partner Violence			
No History of Intimate Partner Violence	0.70*	0.71	0.75
History of Intimate Partner Violence	0.28***^	0.23	0.20
History of Intimate Partner Violence Unknown	0.01***^^^	0.07	0.05
Year			
2013 and 2014	0.20***^^^	0.28***	0.13
2015	0.33^^	0.41***	0.30
2016 and 2017	0.25***	0.20***	0.41

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.22**^^^	0.11**	0.16
Midwest	0.03**^^^	0.29***	0.00
South	0.08***^^^	0.00***	0.14
West	0.54	0.57	0.52

Notes: Sample limited to women with other/mixed race/ethnicity and nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 11: DESCRIPTIVE STATISTICS FOR THE INTERMEDIATE OUTCOMES ANALYTIC SAMPLE, WOMEN WITH OTHER/MULTIPLE RACE/ETHNICITY EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	381	315	782
Outcomes	**Means**		
Gestational Diabetes	0.03***^	0.07***	0.11
Preeclampsia	0.02**	0.04	0.05
Demographic Characteristics			
Age			
Less than 18 Years Old	0.02^^^	0.07***	0.04
18 to 19 Years of Age	0.04*^^^	0.13***	0.07
20 to 34 Years of Age	0.85***^^^	0.73	0.76
35 Years of Age or Older	0.09**	0.08***	0.13
Education			
Less than High School	0.12*^^	0.18	0.16
High School Graduate / GED	0.53	0.50	0.51
Bachelor's Degree	0.15^^^	0.08**	0.13
Other Degree	0.17^	0.12	0.15
Education Unknown	0.03^^^	0.11***	0.05
Relationship Status			
Married	0.39^^^	0.25***	0.40
Living with a Partner	0.37***	0.34**	0.27
In a Relationship, Not Living Together	0.13**^^^	0.22	0.19
Not in a Relationship	0.09^	0.14	0.12
Relationship Status Unknown	0.02^^^	0.05***	0.02
Employment/School			
Working, Not in School	0.34	0.34	0.31
In School, Not Working	0.10^	0.15**	0.11
Working and in School	0.10**^^	0.06	0.06
Neither Working nor in School	0.44*	0.43*	0.49
Work/School Status Unknown	0.02	0.03	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.42^^^	0.55**	0.47
Prior Preterm Birth	0.10	0.07	0.09
No Prior Preterm Birth	0.48^^	0.38*	0.44
Prior Low Birth Weight			
No Prior Birth	0.42^^^	0.55**	0.47
Prior Low Birth Weight Birth	0.00***	0.02***	0.06
No Prior Low Birth Weight Birth	0.57***^^^	0.30***	0.42
Prior Low Birth Weight Unknown	0.01***^^^	0.12***	0.05
Prior C-Section			
No Prior Birth	0.42^^^	0.55**	0.47
Prior C-Section	0.04***^^^	0.10*	0.14

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
No Prior C-Section	0.54***^^^	0.34	0.39
Interpregnancy Interval			
No Prior Birth	0.42^^^	0.55**	0.47
Short Interpregnancy Interval	0.18**^^^	0.12	0.13
Normal Interpregnancy Interval	0.34*^^	0.25	0.29
Interpregnancy Interval Unknown	0.06***	0.08	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70^^^	0.58***	0.68
Depressed at Intake	0.24	0.29*	0.23
Depression Unknown	0.06^^^	0.13**	0.09
Anxiety			
No Anxiety at Intake	0.65^^^	0.50***	0.62
Anxiety at Intake	0.33^^^	0.43***	0.33
Anxiety Unknown	0.02*^^^	0.07	0.05
Food Insecurity			
Not Food Insecure at Intake	0.80***^^^	0.61***	0.73
Food Insecure at Intake	0.18^^^	0.28***	0.19
Food Insecurity Score Unknown	0.03***^^^	0.12*	0.08
Pregnancy Intent			
Intended Pregnancy	0.35**	0.29***	0.41
Unintended Pregnancy	0.62**	0.64***	0.56
Pregnancy Intent Unknown	0.03^^	0.06**	0.03
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	1.00***^^^	0.87***	0.92
Pre-Pregnancy Hypertension	0.00***^^^	0.05	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.08***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.69***	0.91
Pre-Pregnancy Diabetes	0.01*	0.03	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.28***	0.06
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.05	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.46***^^^	0.30	0.34
Overweight (25-<30 BMI)	0.23	0.19**	0.26
Obese (30-<40 BMI)	0.18	0.15*	0.20
Very Obese (>=40 BMI)	0.04**	0.06	0.07
BMI Unknown	0.04***^^^	0.26***	0.09
Smoking			
Did not Smoke at Intake	0.80***^^	0.74***	0.87
Smoked at Intake	0.07^	0.11	0.08
Smoking Status Unknown	0.12***	0.15***	0.04
Intimate Partner Violence			
No History of Intimate Partner Violence	0.70	0.71	0.75
History of Intimate Partner Violence	0.28***^	0.23	0.20
History of Intimate Partner Violence Unknown	0.01***^^^	0.07	0.05
Year			
2013 and 2014	0.20***^^^	0.28***	0.13
2015	0.33^^	0.41***	0.29
2016 and 2017	0.25***	0.20***	0.41

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.22**^^^	0.11**	0.17
Midwest	0.03**^^^	0.29***	0.00
South	0.08***^^^	0.00***	0.14
West	0.54	0.57*	0.51

Notes: Sample limited to women with other/mixed race/ethnicity and nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

BIRTH OUTCOMES ANALYSIS

TABLE M. 12: CONSTRUCTION OF THE ANALYTIC SAMPLE FOR BIRTH OUTCOMES ANALYSIS

Logic for Dropping Observations	# Excluded	# of Remaining Observations
Starting Sample: Number of Strong Start participants with PLPE data	-	45,316
Dropping participants without an exit form	831	44,485
Dropping participants without an intake form	2,299	42,186
Dropping participants with a miscarriage or elective termination	1,330	40,856
Dropping participants with multiples	585	40,271
Dropping participants missing an outcome variable (preterm, birthweight, or delivery method)	11,327	28,944
Dropping participants missing any covariates	612	28,332
Final analytic sample	-	28,332

Notes: Among the 11,327 dropped due to missing outcome data: 53.9% dropped out of SS; 34.9% did not drop out of SS; and11.2% do not have data on SS drop out.

TABLE M. 13: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	5,424	5,978	16,930
Outcomes	**Means**		
Preterm Birth	0.04***^^^	0.11***	0.13
Low Birth Weight	0.04***^^^	0.10*	0.11
C-Section	0.13***^^^	0.30	0.31
Demographic Characteristics			
Race/Ethnicity			
White	0.54***^^^	0.12***	0.23
Hispanic	0.25***^^^	0.43***	0.28
Black	0.15***^^^	0.41***	0.46
Other	0.05***^^	0.04 **	0.04
Age			
Less than 18 Years Old	0.02***^^^	0.07***	0.06
18 to 19 Years of Age	0.06***^^^	0.11***	0.10
20 to 34 Years of Age	0.83***^^^	0.74***	0.75
35 Years of Age or Older	0.09	0.08 **	0.09
Education			
Less than High School	0.14***^^^	0.26***	0.28
High School Graduate / GED	0.55^^^	0.50***	0.54
Bachelor's Degree	0.15***^^^	0.04***	0.03
Other Degree	0.13***^^^	0.09 **	0.08
Education Unknown	0.03***^^^	0.11***	0.06

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Relationship Status			
Married	0.44***^^^	0.20	0.20
Living with a Partner	0.33***	0.34***	0.30
In a Relationship, Not Living Together	0.13***^^^	0.24***	0.29
Not in a Relationship	0.09***^^^	0.17*	0.18
Relationship Status Unknown	0.01***^^^	0.05***	0.03
Employment/School			
Working, Not in School	0.38***^^^	0.30***	0.34
In School, Not Working	0.08***^^^	0.12	0.12
Working and in School	0.06*^	0.05	0.05
Neither Working nor in School	0.47^^^	0.50***	0.46
Work/School Status Unknown	0.02***^^^	0.04***	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36^^^	0.46***	0.36
Prior Preterm Birth	0.08***^^^	0.11***	0.15
No Prior Preterm Birth	0.56***^^^	0.43***	0.48
Prior Low Birth Weight			
No Prior Birth	0.36^^^	0.46***	0.36
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.09
No Prior Low Birth Weight Birth	0.62***^^^	0.37***	0.46
Prior Low Birth Weight Unknown	0.01***^^^	0.12***	0.09
Prior C-Section			
No Prior Birth	0.36^^^	0.46***	0.36
Prior C-Section	0.05***^^^	0.15***	0.17
No Prior C-Section	0.59***^^^	0.39***	0.46
Interpregnancy Interval			
No Prior Birth	0.36^^^	0.46***	0.36
Short Interpregnancy Interval	0.20***^^^	0.10***	0.14
Normal Interpregnancy Interval	0.36*^^^	0.32***	0.37
Interpregnancy Interval Unknown	0.08***^^^	0.11**	0.13
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71***^^^	0.57***	0.67
Depressed at Intake	0.21***^^^	0.27***	0.23
Depression Unknown	0.08***^^^	0.16***	0.10
Anxiety			
No Anxiety at Intake	0.67***^^^	0.57***	0.62
Anxiety at Intake	0.29***^^^	0.36***	0.32
Anxiety Unknown	0.04***^^^	0.07***	0.06
Food Insecurity			
Not Food Insecure at Intake	0.78***^^^	0.69***	0.75
Food Insecure at Intake	0.17^^^	0.21***	0.17
Food Insecurity Score Unknown	0.05***^^^	0.10***	0.08
Pregnancy Intent			
Intended Pregnancy	0.38***^^^	0.28***	0.26
Unintended Pregnancy	0.59***^^^	0.67***	0.71
Pregnancy Intent Unknown	0.02***^^^	0.04	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.83 **	0.84
Pre-Pregnancy Hypertension	0.01***^^^	0.08***	0.07
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.09	0.09
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.72***	0.86
Pre-Pregnancy Diabetes	0.00***^^^	0.06***	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.22***	0.11
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^^	0.03***	0.02
Normal Weight (18.5-<25 BMI)	0.45***^^^	0.28	0.27

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Overweight (25-<30 BMI)	0.25***^^^	0.23	0.23
Obese (30-<40 BMI)	0.20***^^^	0.22***	0.26
Very Obese (>=40 BMI)	0.04***^^^	0.06***	0.09
BMI Unknown	0.03***^^^	0.18***	0.12
Smoking			
Did not Smoke at Intake	0.83^^^	0.77***	0.82
Smoked at Intake	0.08***	0.08***	0.12
Smoking Status Unknown	0.10***^^^	0.15***	0.06
Intimate Partner Violence			
No History of Intimate Partner Violence	0.79	0.79	0.78
History of Intimate Partner Violence	0.20***^^^	0.17 **	0.18
History of Intimate Partner Violence Unknown	0.02***^^^	0.05	0.04
Year			
2013 and 2014	0.25^^^	0.29***	0.25
2015	0.40 **^^^	0.44***	0.42
2016 and 2017	0.35^^^	0.27***	0.34
Region			
Northeast	0.03***^^^	0.24***	0.00
Midwest	0.09***^^^	0.00***	0.26
South	0.66***^^^	0.71***	0.62
West	0.22***^^^	0.05***	0.12

Notes: Sample limited to women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 14: DESCRIPTIVE STATISTICS FOR THE NULLIPAROUS C-SECTION SAMPLE

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,942	2,758	6,134
Outcomes		**Means**	
C-Section	0.17***^^^	0.28	0.27
Demographic Characteristics			
Race/Ethnicity			
White	0.54***^^^	0.14***	0.23
Hispanic	0.22**^^^	0.36***	0.25
Black	0.18***^^^	0.45**	0.47
Other	0.06***^	0.05	0.05
Age			
Less than 18 Years Old	0.06***^^^	0.13	0.14
18 to 19 Years of Age	0.13***^^^	0.20	0.20
20 to 34 Years of Age	0.76***^^^	0.65	0.63
35 Years of Age or Older	0.05***^^^	0.03	0.03
Education			
Less than High School	0.14***^^^	0.24***	0.27
High School Graduate / GED	0.54^	0.52***	0.55
Bachelor's Degree	0.17***^^^	0.04	0.04
Other Degree	0.12***^^^	0.09	0.08
Education Unknown	0.02***^^^	0.11***	0.06
Relationship Status			
Married	0.28***^^^	0.12	0.11
Living with a Partner	0.39***^^^	0.30*	0.28
In a Relationship, Not Living Together	0.19***^^^	0.30***	0.36
Not in a Relationship	0.13***^^^	0.21	0.21
Relationship Status Unknown	0.01***^^^	0.06***	0.03
Employment/School			
Working, Not in School	0.44***^^^	0.30	0.31

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
In School, Not Working	0.13***^^^	0.19***	0.21
Working and in School	0.09^^	0.07	0.08
Neither Working nor in School	0.33***^^^	0.41***	0.38
Work/School Status Unknown	0.01***^^^	0.04***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior Preterm Birth	0.00***^^^	0.00***	0.00
No Prior Preterm Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior Low Birth Weight Birth	0.00***^^^	0.00***	0.00
No Prior Low Birth Weight Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight Unknown	0.00***^^^	0.00***	0.00
Prior C-Section			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior C-Section	0.00***^^^	0.00***	0.00
No Prior C-Section	0.00***^^^	0.00***	0.00
Interpregnancy Interval			
No Prior Birth	1.00***^^^	1.00***	1.00
Short Interpregnancy Interval	0.00***^^^	0.00***	0.00
Normal Interpregnancy Interval	0.00***^^^	0.00***	0.00
Interpregnancy Interval Unknown	0.00***^^^	0.00***	0.00
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71^^^	0.58***	0.70
Depressed at Intake	0.22^^^	0.27***	0.21
Depression Unknown	0.08^^^	0.16***	0.09
Anxiety			
No Anxiety at Intake	0.64^^^	0.53***	0.63
Anxiety at Intake	0.33^^^	0.39***	0.32
Anxiety Unknown	0.03***^^^	0.08***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.77^^^	0.69***	0.77
Food Insecure at Intake	0.19***^^^	0.22***	0.16
Food Insecurity Score Unknown	0.04***^^^	0.09***	0.07
Pregnancy Intent			
Intended Pregnancy	0.33***^^^	0.25**	0.23
Unintended Pregnancy	0.65***^^^	0.70***	0.74
Pregnancy Intent Unknown	0.02**^^^	0.05***	0.03
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.83***	0.86
Pre-Pregnancy Hypertension	0.00***^^^	0.07***	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.11**	0.09
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.71***	0.86
Pre-Pregnancy Diabetes	0.01***^^^	0.05***	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.23***	0.11
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.06***^	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.51***^^^	0.33	0.34
Overweight (25-<30 BMI)	0.22	0.22	0.22
Obese (30-<40 BMI)	0.16***^^	0.19***	0.21
Very Obese (>=40 BMI)	0.03***^^^	0.05***	0.07
BMI Unknown	0.03***^^^	0.17***	0.13
Smoking			
Did not Smoke at Intake	0.84^^^	0.78***	0.85
Smoked at Intake	0.07***	0.07***	0.09
Smoking Status Unknown	0.09***^^^	0.15***	0.06

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Intimate Partner Violence			
No History of Intimate Partner Violence	0.79***^	0.80	0.82
History of Intimate Partner Violence	0.20***^^^	0.14	0.14
History of Intimate Partner Violence Unknown	0.01***^^^	0.05***	0.04
Year			
2013 and 2014	0.26^^^	0.30***	0.25
2015	0.42^	0.44***	0.41
2016 and 2017	0.32**^^^	0.25***	0.35
Region			
Northeast	0.04***^^^	0.25***	0.00
Midwest	0.08***^^^	0.00***	0.24
South	0.63*^^^	0.68***	0.61
West	0.25***^^^	0.06***	0.15

Notes: Sample limited to nulliparous women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 15: DESCRIPTIVE STATISTICS FOR THE VBAC SAMPLE

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	292	916	2,933
Outcomes	**Means**		
VBAC	0.29***^^^	0.21***	0.17
Demographic Characteristics			
Race/Ethnicity			
White	0.47***^^^	0.09***	0.20
Hispanic	0.28^^^	0.49***	0.28
Black	0.20***^^^	0.39***	0.48
Other	0.05	0.03	0.04
Age			
Less than 18 Years Old	0.00^^^	0.02***	0.01
18 to 19 Years of Age	0.01	0.03	0.03
20 to 34 Years of Age	0.88***^^^	0.81	0.81
35 Years of Age or Older	0.10**	0.14	0.16
Education			
Less than High School	0.15***^^	0.23***	0.28
High School Graduate / GED	0.61***^^^	0.49*	0.52
Bachelor's Degree	0.08***^^	0.05**	0.03
Other Degree	0.10	0.12	0.10
Education Unknown	0.05^^^	0.12***	0.06
Relationship Status			
Married	0.41***^^^	0.26	0.25
Living with a Partner	0.34	0.37***	0.32
In a Relationship, Not Living Together	0.11***^^	0.17***	0.24
Not in a Relationship	0.12**^	0.16	0.16
Relationship Status Unknown	0.01^	0.03	0.03
Employment/School			
Working, Not in School	0.36^^	0.29***	0.38
In School, Not Working	0.07	0.06	0.05
Working and in School	0.04	0.03	0.03
Neither Working nor in School	0.52^	0.58***	0.50
Work/School Status Unknown	0.01*^^	0.04	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior Preterm Birth	0.18***^^^	0.27	0.29

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
No Prior Preterm Birth	0.82***^^^	0.73	0.71
Prior Low Birth Weight			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight Birth	0.02***^^^	0.11***	0.18
No Prior Low Birth Weight Birth	0.95***^^^	0.69	0.71
Prior Low Birth Weight Unknown	0.03***^^^	0.21***	0.12
Prior C-Section			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior C-Section	1.00***^^^	1.00***	1.00
No Prior C-Section	0.00***^^^	0.00***	0.00
Interpregnancy Interval			
No Prior Birth	0.00***^^^	0.00***	0.00
Short Interpregnancy Interval	0.24**^^	0.19	0.19
Normal Interpregnancy Interval	0.59	0.60	0.60
Interpregnancy Interval Unknown	0.17	0.21	0.20
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.66^^^	0.54***	0.65
Depressed at Intake	0.24^	0.30**	0.26
Depression Unknown	0.09^^^	0.16***	0.09
Anxiety			
No Anxiety at Intake	0.61	0.56**	0.60
Anxiety at Intake	0.35	0.38*	0.34
Anxiety Unknown	0.04	0.06	0.06
Food Insecurity			
Not Food Insecure at Intake	0.73^^	0.66***	0.74
Food Insecure at Intake	0.19	0.22***	0.18
Food Insecurity Score Unknown	0.08^^	0.11***	0.08
Pregnancy Intent			
Intended Pregnancy	0.37***^^^	0.26	0.26
Unintended Pregnancy	0.63**^^	0.71	0.70
Pregnancy Intent Unknown	0.00***^^	0.03	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.82	0.84
Pre-Pregnancy Hypertension	0.01***^^^	0.13	0.12
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05	0.04
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.73***	0.87
Pre-Pregnancy Diabetes	0.00***^^^	0.08	0.07
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.19***	0.06
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.02	0.02	0.01
Normal Weight (18.5-<25 BMI)	0.27***^^	0.20	0.18
Overweight (25-<30 BMI)	0.29**	0.26**	0.22
Obese (30-<40 BMI)	0.31	0.28***	0.34
Very Obese (>=40 BMI)	0.09***	0.11***	0.17
BMI Unknown	0.03***^^^	0.14***	0.08
Smoking			
Did not Smoke at Intake	0.77	0.74***	0.80
Smoked at Intake	0.13	0.11***	0.15
Smoking Status Unknown	0.10***^^^	0.15***	0.05
Intimate Partner Violence			
No History of Intimate Partner Violence	0.80*	0.77	0.75
History of Intimate Partner Violence	0.18	0.19	0.21
History of Intimate Partner Violence Unknown	0.02**	0.04	0.04
Year			
2013 and 2014	0.28	0.25	0.25
2015	0.35**^^^	0.48***	0.41

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
2016 and 2017	0.37^^^	0.27***	0.33
Region			
Northeast	0.04***^^^	0.24***	0.00
Midwest	0.09***^^^	0.00***	0.24
South	0.72***	0.72***	0.63
West	0.14^^^	0.04***	0.13

Notes: VBAC = vaginal birth after C-Section. Sample limited to women with a prior C-Section with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 16: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	5,424	5,253	15,115
Outcomes	**Means**		
Preterm Birth	0.04***^^^	0.10***	0.12
Low Birth Weight	0.04***^^^	0.09**	0.10
C-Section	0.13***^^^	0.28***	0.30
Demographic Characteristics			
Race/Ethnicity			
White	0.54***^^^	0.13***	0.23
Hispanic	0.25***^^^	0.36***	0.30
Black	0.15***^^^	0.46***	0.42
Other	0.05***	0.05**	0.04
Age			
Less Than 18 Years Old	0.02***^^^	0.06**	0.06
18 To 19 Years of Age	0.06***^^^	0.12***	0.10
20 To 34 Years of Age	0.83***^^^	0.74	0.75
35 Years of Age or Older	0.09^^^	0.07***	0.10
Education			
Less Than High School	0.14***^^^	0.28	0.28
High School Graduate / Ged	0.55***^^^	0.51**	0.53
Bachelor's Degree	0.15***^^^	0.04	0.03
Other Degree	0.13***^^^	0.07***	0.09
Education Unknown	0.03***^^^	0.10***	0.07
Relationship Status			
Married	0.44***^^^	0.20	0.21
Living With a Partner	0.33**	0.32*	0.31
In a Relationship, Not Living Together	0.13***^^^	0.25***	0.27
Not in a Relationship	0.09***^^^	0.18	0.18
Relationship Status Unknown	0.01***^^^	0.05***	0.03
Employment/School			
Working, Not in School	0.38***^^^	0.31***	0.34
In School, Not Working	0.08***^^^	0.11	0.12
Working and In School	0.06*^	0.05	0.05
Neither Working nor in School	0.47^^^	0.50***	0.46
Work/School Status Unknown	0.02***^^^	0.03	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36^^^	0.47***	0.36
Prior Preterm Birth	0.08***^^^	0.10***	0.14
No Prior Preterm Birth	0.56***^^^	0.43***	0.50
Prior Low Birth Weight			
No Prior Birth	0.36^^^	0.47***	0.36
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.07
No Prior Low Birth Weight Birth	0.62***^^^	0.38***	0.46

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Prior Low Birth Weight Unknown	0.01***^^^	0.10	0.10
Prior C-Section			
No Prior Birth	0.36^^^	0.47***	0.36
Prior C-Section	0.05***^^^	0.14***	0.17
No Prior C-Section	0.59***^^^	0.39***	0.47
Interpregnancy Interval			
No Prior Birth	0.36^^^	0.47***	0.36
Short Interpregnancy Interval	0.20***^^^	0.10***	0.14
Normal Interpregnancy Interval	0.36^^^	0.32***	0.37
Interpregnancy Interval Unknown	0.08***^^^	0.12***	0.13
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71***^^^	0.59***	0.68
Depressed at Intake	0.21*^^^	0.26***	0.22
Depression Unknown	0.08***^^^	0.15***	0.10
Anxiety			
No Anxiety at Intake	0.67***^^^	0.58***	0.63
Anxiety at Intake	0.29**^^^	0.35***	0.31
Anxiety Unknown	0.04***^^^	0.07***	0.06
Food Insecurity			
Not Food Insecure at Intake	0.78***^^^	0.69***	0.75
Food Insecure at Intake	0.17*^^^	0.21***	0.16
Food Insecurity Score Unknown	0.05***^^^	0.10***	0.08
Pregnancy Intent			
Intended Pregnancy	0.38***^^^	0.28**	0.27
Unintended Pregnancy	0.59***^^^	0.67**	0.69
Pregnancy Intent Unknown	0.02***^^^	0.04	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.83**	0.84
Pre-Pregnancy Hypertension	0.01***^^^	0.07***	0.06
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.10	0.10
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.70***	0.85
Pre-Pregnancy Diabetes	0.00***^^^	0.04***	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.25***	0.12
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^^^	0.03*	0.02
Normal Weight (18.5-<25 BMI)	0.45***^^^	0.28	0.27
Overweight (25-<30 BMI)	0.25***	0.24	0.23
Obese (30-<40 BMI)	0.20***^^^	0.22***	0.26
Very Obese (>=40 BMI)	0.04***^^^	0.06***	0.09
BMI Unknown	0.03***^^^	0.18***	0.13
Smoking			
Did Not Smoke at Intake	0.83^^^	0.76***	0.82
Smoked at Intake	0.08***	0.08***	0.11
Smoking Status Unknown	0.10***^^^	0.15***	0.07
Intimate Partner Violence			
No History of Intimate Partner Violence	0.79	0.78	0.78
History of Intimate Partner Violence	0.20***^^^	0.17	0.18
History of Intimate Partner Violence Unknown	0.02***^^^	0.05	0.05
Year			
2013 and 2014	0.25***^^^	0.30***	0.23
2015	0.40*^^^	0.43	0.41
2016 and 2017	0.35^^^	0.28***	0.35

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.03***^^^	0.27***	0.00
Midwest	0.09***^^^	0.00***	0.29
South	0.66***	0.67***	0.57
West	0.22***^^^	0.06***	0.14

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 17: DESCRIPTIVE STATISTICS FOR THE NULLIPIAROUS C-SECTION SAMPLE, EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,942	2,468	5,502
Outcomes		Means	
C-Section	0.17***^^^	0.27	0.27
Demographic Characteristics			
Race/Ethnicity			
White	0.54***^^^	0.15***	0.24
Hispanic	0.22***^^^	0.29	0.27
Black	0.18***^^^	0.50***	0.44
Other	0.06**	0.06	0.05
Age			
Less than 18 Years Old	0.06***^^^	0.12**	0.14
18 to 19 Years of Age	0.13***^^^	0.20	0.20
20 to 34 Years of Age	0.76***^^^	0.65**	0.63
35 Years of Age or Older	0.05***^^^	0.02	0.03
Education			
Less than High School	0.14***^^^	0.26**	0.28
High School Graduate / GED	0.54	0.54	0.54
Bachelor's Degree	0.17***^^^	0.04	0.04
Other Degree	0.12***^^^	0.07**	0.08
Education Unknown	0.02***^^^	0.10***	0.06
Relationship Status			
Married	0.28***^^^	0.12	0.12
Living with a Partner	0.39***^^^	0.30	0.29
In a Relationship, Not Living Together	0.19***^^^	0.31***	0.35
Not in a Relationship	0.13***^^^	0.22	0.21
Relationship Status Unknown	0.01***^^^	0.06***	0.03
Employment/School			
Working, Not in School	0.44***^^^	0.30	0.31
In School, Not Working	0.13***^^^	0.18***	0.21
Working and in School	0.09^	0.07	0.08
Neither Working nor in School	0.33***^^^	0.41***	0.38
Work/School Status Unknown	0.01***^^^	0.03*	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior Preterm Birth	0.00***^^^	0.00***	0.00
No Prior Preterm Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior Low Birth Weight Birth	0.00***^^^	0.00***	0.00
No Prior Low Birth Weight Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight Unknown	0.00***^^^	0.00***	0.00

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Prior C-Section			
No Prior Birth	1.00***^^^	1.00***	1.00
Prior C-Section	0.00***^^^	0.00***	0.00
No Prior C-Section	0.00***^^^	0.00***	0.00
Interpregnancy Interval			
No Prior Birth	1.00***^^^	1.00***	1.00
Short Interpregnancy Interval	0.00***^^^	0.00***	0.00
Normal Interpregnancy Interval	0.00***^^^	0.00***	0.00
Interpregnancy Interval Unknown	0.00***^^^	0.00***	0.00
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.71^^^	0.59***	0.71
Depressed at Intake	0.22^^^	0.27***	0.20
Depression Unknown	0.08**^^^	0.15***	0.09
Anxiety			
No Anxiety at Intake	0.64^^^	0.54***	0.64
Anxiety at Intake	0.33*^^^	0.39***	0.31
Anxiety Unknown	0.03***^^^	0.07***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.77^^^	0.69***	0.77
Food Insecure at Intake	0.19***^^^	0.22***	0.15
Food Insecurity Score Unknown	0.04***^^^	0.10***	0.08
Pregnancy Intent			
Intended Pregnancy	0.33***^^^	0.25	0.24
Unintended Pregnancy	0.65***^^^	0.70**	0.72
Pregnancy Intent Unknown	0.02***^^^	0.05***	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.82***	0.86
Pre-Pregnancy Hypertension	0.00***^^^	0.06***	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.12***	0.10
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.69***	0.86
Pre-Pregnancy Diabetes	0.01***^^^	0.05***	0.02
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.26***	0.12
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.06***^^^	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.51***^^^	0.32	0.34
Overweight (25-<30 BMI)	0.22	0.23	0.22
Obese (30-<40 BMI)	0.16***^^	0.19**	0.21
Very Obese (>=40 BMI)	0.03***^^^	0.05***	0.06
BMI Unknown	0.03***^^^	0.18***	0.14
Smoking			
Did not Smoke at Intake	0.84^^^	0.77***	0.85
Smoked at Intake	0.07**	0.07	0.08
Smoking Status Unknown	0.09***^^^	0.16***	0.07
Intimate Partner Violence			
No History of Intimate Partner Violence	0.79***	0.80*	0.82
History of Intimate Partner Violence	0.20***^^^	0.14	0.14
History of Intimate Partner Violence Unknown	0.01***^^^	0.06***	0.04
Year			
2013 and 2014	0.26***^^^	0.31***	0.23
2015	0.42	0.43	0.41
2016 and 2017	0.32***^^^	0.26***	0.36

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.04***^^^	0.28***	0.00
Midwest	0.08***^^^	0.00***	0.27
South	0.63***	0.65***	0.56
West	0.25***^^^	0.07***	0.17

Notes: Sample limited to nulliparous women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 18: DESCRIPTIVE STATISTICS FOR THE VBAC SAMPLE, EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	292	726	2,568
Outcomes	Means		
VBAC	0.29***^^^	0.22***	0.17
Demographic Characteristics			
Race/Ethnicity			
White	0.47***^^^	0.11***	0.20
Hispanic	0.28^^	0.36**	0.32
Black	0.20***^^^	0.49**	0.44
Other	0.05	0.04	0.04
Age			
Less than 18 Years Old	0.00^^^	0.02***	0.01
18 to 19 Years of Age	0.01	0.03	0.03
20 to 34 Years of Age	0.88***^^	0.82	0.81
35 Years of Age or Older	0.10**	0.13*	0.16
Education			
Less than High School	0.15***^^^	0.26	0.28
High School Graduate / GED	0.61***^^^	0.51	0.51
Bachelor's Degree	0.08***^^^	0.04	0.03
Other Degree	0.10	0.08*	0.11
Education Unknown	0.05^^^	0.10***	0.07
Relationship Status			
Married	0.41***^^^	0.28	0.26
Living with a Partner	0.34	0.33	0.33
In a Relationship, Not Living Together	0.11***^^	0.18***	0.22
Not in a Relationship	0.12*^^	0.17	0.16
Relationship Status Unknown	0.01*^	0.04	0.03
Employment/School			
Working, Not in School	0.36^	0.30***	0.38
In School, Not Working	0.07	0.05	0.06
Working and in School	0.04	0.03	0.03
Neither Working nor in School	0.52^	0.59***	0.49
Work/School Status Unknown	0.01**^	0.03	0.04
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior Preterm Birth	0.18***^	0.24	0.27
No Prior Preterm Birth	0.82***^	0.76	0.73
Prior Low Birth Weight			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior Low Birth Weight Birth	0.02***^^^	0.13*	0.16
No Prior Low Birth Weight Birth	0.95***^^^	0.69*	0.72
Prior Low Birth Weight Unknown	0.03***^^^	0.18***	0.12

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Prior C-Section			
No Prior Birth	0.00***^^^	0.00***	0.00
Prior C-Section	1.00***^^^	1.00***	1.00
No Prior C-Section	0.00***^^^	0.00***	0.00
Interpregnancy Interval			
No Prior Birth	0.00***^^^	0.00***	0.00
Short Interpregnancy Interval	0.24**^^	0.18	0.19
Normal Interpregnancy Interval	0.59	0.58	0.59
Interpregnancy Interval Unknown	0.17*^^	0.24	0.22
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.66^^^	0.56***	0.65
Depressed at Intake	0.24	0.29**	0.25
Depression Unknown	0.09^^^	0.15***	0.10
Anxiety			
No Anxiety at Intake	0.61	0.58	0.60
Anxiety at Intake	0.35	0.35	0.33
Anxiety Unknown	0.04^	0.07	0.07
Food Insecurity			
Not Food Insecure at Intake	0.73^	0.68***	0.74
Food Insecure at Intake	0.19	0.21**	0.17
Food Insecurity Score Unknown	0.08^	0.11*	0.09
Pregnancy Intent			
Intended Pregnancy	0.37***^^^	0.27	0.28
Unintended Pregnancy	0.63*^^	0.70	0.68
Pregnancy Intent Unknown	0.00***^^	0.04	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.83	0.85
Pre-Pregnancy Hypertension	0.01***^^^	0.11	0.11
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.06*	0.04
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.70***	0.87
Pre-Pregnancy Diabetes	0.00***^^^	0.06	0.06
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.24***	0.07
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.02	0.01	0.01
Normal Weight (18.5-<25 BMI)	0.27***^^^	0.19	0.18
Overweight (25-<30 BMI)	0.29**	0.27**	0.23
Obese (30-<40 BMI)	0.31	0.26***	0.34
Very Obese (>=40 BMI)	0.09***	0.11***	0.16
BMI Unknown	0.03***^^^	0.16***	0.08
Smoking			
Did not Smoke at Intake	0.77^	0.72***	0.80
Smoked at Intake	0.13	0.12	0.14
Smoking Status Unknown	0.10**^^^	0.16***	0.06
Intimate Partner Violence			
No History of Intimate Partner Violence	0.80*	0.76	0.75
History of Intimate Partner Violence	0.18	0.20	0.20
History of Intimate Partner Violence Unknown	0.02**^	0.04	0.05
Year			
2013 and 2014	0.28	0.27*	0.24
2015	0.35*^^	0.43	0.41
2016 and 2017	0.37^^	0.30***	0.36

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.04***^^^	0.31***	0.00
Midwest	0.09***^^^	0.00***	0.27
South	0.72***^^	0.64***	0.58
West	0.14^^^	0.05***	0.15

Notes: VBAC = vaginal birth after C-Section. Sample limited to women with a prior C-Section and nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 19: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, WHITE WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	2,921	703	3,829
Outcomes	**Means**		
Preterm Birth	0.04***^^^	0.09**	0.11
Low Birth Weight	0.03***^^^	0.08	0.09
C-Section	0.10***^^^	0.31	0.31
Demographic Characteristics			
Age			
Less than 18 Years Old	0.02***^^^	0.05**	0.04
18 to 19 Years of Age	0.05***^^^	0.14***	0.10
20 to 34 Years of Age	0.83***^^^	0.74***	0.80
35 Years of Age or Older	0.10***^^^	0.06	0.07
Education			
Less than High School	0.09***^^	0.12***	0.21
High School Graduate / GED	0.56	0.57	0.56
Bachelor's Degree	0.20***^^^	0.07**	0.05
Other Degree	0.14***^^^	0.10	0.10
Education Unknown	0.02***^^^	0.14***	0.08
Relationship Status			
Married	0.52***^^^	0.29*	0.25
Living with a Partner	0.32***^^^	0.37	0.36
In a Relationship, Not Living Together	0.09***^^^	0.18*	0.21
Not in a Relationship	0.07***^^^	0.12	0.13
Relationship Status Unknown	0.01***^^^	0.04	0.05
Employment/School			
Working, Not in School	0.40***^^^	0.33	0.34
In School, Not Working	0.07***^^^	0.10	0.09
Working and in School	0.05**	0.06*	0.04
Neither Working nor in School	0.46*	0.49	0.48
Work/School Status Unknown	0.02***	0.03***	0.05
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36^^^	0.55***	0.38
Prior Preterm Birth	0.07***	0.09***	0.14
No Prior Preterm Birth	0.57***^^^	0.36***	0.48
Prior Low Birth Weight			
No Prior Birth	0.36^^^	0.55***	0.38
Prior Low Birth Weight Birth	0.01***^^	0.03***	0.07
No Prior Low Birth Weight Birth	0.64***^^^	0.22***	0.43
Prior Low Birth Weight Unknown	0.00***^^^	0.20***	0.12
Prior C-Section			
No Prior Birth	0.36^^^	0.55***	0.38
Prior C-Section	0.05***^^^	0.12***	0.15

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
No Prior C-Section	0.60***^^^	0.33***	0.47
Interpregnancy Interval			
No Prior Birth	0.36^^^	0.55***	0.38
Short Interpregnancy Interval	0.22***^^^	0.10***	0.17
Normal Interpregnancy Interval	0.34^^^	0.26***	0.35
Interpregnancy Interval Unknown	0.08***	0.09	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.74***^^^	0.56***	0.68
Depressed at Intake	0.20^^^	0.33***	0.20
Depression Unknown	0.06***^^^	0.11*	0.13
Anxiety			
No Anxiety at Intake	0.68***^^^	0.48***	0.62
Anxiety at Intake	0.29^^^	0.46***	0.28
Anxiety Unknown	0.03***^	0.05***	0.10
Food Insecurity			
Not Food Insecure at Intake	0.81***^^^	0.69***	0.76
Food Insecure at Intake	0.16***^^^	0.25***	0.13
Food Insecurity Score Unknown	0.03***^^	0.06***	0.11
Pregnancy Intent			
Intended Pregnancy	0.41***^^^	0.30***	0.24
Unintended Pregnancy	0.57***^^^	0.66	0.69
Pregnancy Intent Unknown	0.02***	0.03***	0.07
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.91***	0.79
Pre-Pregnancy Hypertension	0.01***^^^	0.04*	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05***	0.16
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.53***	0.79
Pre-Pregnancy Diabetes	0.00***^^^	0.02	0.03
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.45***	0.17
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***	0.04**	0.02
Normal Weight (18.5-<25 BMI)	0.50***^^^	0.28	0.28
Overweight (25-<30 BMI)	0.23**^^^	0.18	0.20
Obese (30-<40 BMI)	0.17***^	0.20	0.21
Very Obese (>=40 BMI)	0.03***^^	0.05***	0.07
BMI Unknown	0.03***^^^	0.25***	0.21
Smoking			
Did not Smoke at Intake	0.81***^^^	0.62***	0.68
Smoked at Intake	0.11***^^^	0.28	0.27
Smoking Status Unknown	0.08***	0.10***	0.05
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78***^^^	0.66	0.69
History of Intimate Partner Violence	0.21**^^^	0.30***	0.23
History of Intimate Partner Violence Unknown	0.02***^^	0.04***	0.09
Year			
2013 and 2014	0.25***^^^	0.32*	0.28
2015	0.41***^^	0.45	0.48
2016 and 2017	0.35***^^^	0.23	0.24

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.04***^^^	0.21***	0.00
Midwest	0.06***^^^	0.00***	0.53
South	0.66***	0.68***	0.43
West	0.24***^^^	0.10***	0.04

Notes: Sample limited to white women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 20: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, WHITE WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	2,921	693	3,453
Outcomes	**Means**		
Preterm Birth	0.04***^^^	0.09	0.10
Low Birth Weight	0.03***^^^	0.08	0.08
C-Section	0.10***^^^	0.31	0.30
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.02***^^^	0.05*	0.04
18 To 19 Years of Age	0.05***^^^	0.14***	0.10
20 To 34 Years of Age	0.83***^^^	0.74***	0.80
35 Years of Age or Older	0.10***^^^	0.06	0.06
Education			
Less Than High School	0.09***^^	0.12***	0.21
High School Graduate / Ged	0.56	0.57	0.56
Bachelor's Degree	0.20***^^^	0.07**	0.04
Other Degree	0.14***^^^	0.09	0.10
Education Unknown	0.02***^^^	0.14***	0.08
Relationship Status			
Married	0.52***^^^	0.28**	0.24
Living With a Partner	0.32***^^^	0.37	0.36
In a Relationship, Not Living Together	0.09***^^^	0.18*	0.21
Not in a Relationship	0.07***^^^	0.12	0.13
Relationship Status Unknown	0.01***^^^	0.04*	0.05
Employment/School			
Working, Not in School	0.40***^^^	0.33	0.35
In School, Not Working	0.07***^^^	0.10	0.09
Working and In School	0.05*	0.06*	0.04
Neither Working nor in School	0.46	0.49	0.47
Work/School Status Unknown	0.02***	0.02***	0.05
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.36*^^^	0.55***	0.38
Prior Preterm Birth	0.07***	0.09**	0.12
No Prior Preterm Birth	0.57***^^^	0.36***	0.50
Prior Low Birth Weight			
No Prior Birth	0.36*^^^	0.55***	0.38
Prior Low Birth Weight Birth	0.01***^^^	0.03***	0.06
No Prior Low Birth Weight Birth	0.64***^^^	0.22***	0.43
Prior Low Birth Weight Unknown	0.00***^^^	0.20***	0.13
Prior C-Section			
No Prior Birth	0.36*^^^	0.55***	0.38
Prior C-Section	0.05***^^^	0.12***	0.15
No Prior C-Section	0.60***^^^	0.33***	0.47

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Interpregnancy Interval			
No Prior Birth	0.36*^^^	0.55***	0.38
Short Interpregnancy Interval	0.22***^^^	0.10***	0.17
Normal Interpregnancy Interval	0.34^^^	0.26***	0.35
Interpregnancy Interval Unknown	0.08***	0.09	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.74***^^^	0.56***	0.68
Depressed at Intake	0.20**^^^	0.33***	0.18
Depression Unknown	0.06***^^^	0.11**	0.14
Anxiety			
No Anxiety at Intake	0.68***^^^	0.48***	0.62
Anxiety at Intake	0.29*^^^	0.47***	0.27
Anxiety Unknown	0.03***^	0.05***	0.11
Food Insecurity			
Not Food Insecure at Intake	0.81***^^^	0.69***	0.76
Food Insecure at Intake	0.16***^^^	0.25***	0.12
Food Insecurity Score Unknown	0.03***^^	0.06***	0.12
Pregnancy Intent			
Intended Pregnancy	0.41***^^^	0.30***	0.24
Unintended Pregnancy	0.57***^^^	0.67	0.67
Pregnancy Intent Unknown	0.02***	0.03***	0.08
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.91***	0.78
Pre-Pregnancy Hypertension	0.01***^^^	0.04	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05***	0.18
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.53***	0.78
Pre-Pregnancy Diabetes	0.00***^^^	0.02	0.02
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.45***	0.19
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***	0.04**	0.02
Normal Weight (18.5-<25 BMI)	0.50***^^^	0.28	0.28
Overweight (25-<30 BMI)	0.23**^^^	0.18	0.20
Obese (30-<40 BMI)	0.17***	0.20	0.20
Very Obese (>=40 BMI)	0.03***^^	0.05**	0.07
BMI Unknown	0.03***^^^	0.25*	0.22
Smoking			
Did Not Smoke at Intake	0.81***^^^	0.62***	0.68
Smoked at Intake	0.11***^^^	0.28	0.26
Smoking Status Unknown	0.08***	0.10***	0.06
Intimate Partner Violence			
No History of Intimate Partner Violence	0.78***^^^	0.66	0.68
History of Intimate Partner Violence	0.21^^^	0.30***	0.22
History of Intimate Partner Violence Unknown	0.02***^^	0.04***	0.10
Year			
2013 and 2014	0.25**^^^	0.32**	0.27
2015	0.41***^^	0.45*	0.49
2016 and 2017	0.35***^^^	0.23	0.24

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Region			
Northeast	0.04***^^^	0.22***	0.00
Midwest	0.06***^^^	0.00***	0.59
South	0.66***	0.68***	0.37
West	0.24***^^^	0.10***	0.04

Notes: Sample limited to white women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 21: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, BLACK WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	840	2,424	7,779
Outcomes		**Means**	
Preterm Birth	0.05***^^^	0.12**	0.14
Low Birth Weight	0.06***^^^	0.11***	0.13
C-Section	0.18***^^^	0.30**	0.32
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.04***^^^	0.08**	0.07
18 To 19 Years of Age	0.07***^^^	0.13***	0.10
20 To 34 Years of Age	0.83***^^^	0.75	0.76
35 Years of Age or Older	0.06^	0.05***	0.07
Education			
Less Than High School	0.17***^^^	0.22*	0.24
High School Graduate / Ged	0.58	0.61	0.61
Bachelor's Degree	0.13***^^^	0.04***	0.03
Other Degree	0.10**^^^	0.07	0.08
Education Unknown	0.02***^^^	0.06***	0.04
Relationship Status			
Married	0.26***^^^	0.09*	0.10
Living With a Partner	0.26	0.26**	0.24
In a Relationship, Not Living Together	0.27***^^^	0.34***	0.37
Not in a Relationship	0.20***	0.23**	0.25
Relationship Status Unknown	0.01**^^^	0.08***	0.03
Employment/School			
Working, Not in School	0.36	0.34	0.35
In School, Not Working	0.14	0.14	0.14
Working and In School	0.05	0.06	0.06
Neither Working nor in School	0.43	0.43	0.42
Work/School Status Unknown	0.02*^^^	0.03*	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.40*^^^	0.51***	0.37
Prior Preterm Birth	0.09***	0.11***	0.18
No Prior Preterm Birth	0.51***^^^	0.38***	0.45
Prior Low Birth Weight			
No Prior Birth	0.40*^^^	0.51***	0.37
Prior Low Birth Weight Birth	0.02***^^^	0.06***	0.10
No Prior Low Birth Weight Birth	0.50***^^^	0.36***	0.43
Prior Low Birth Weight Unknown	0.07**	0.08***	0.10
Prior C-Section			
No Prior Birth	0.40*^^^	0.51***	0.37
Prior C-Section	0.07***^^^	0.15***	0.18
No Prior C-Section	0.53***^^^	0.35***	0.45

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Interpregnancy Interval			
No Prior Birth	0.40*^^^	0.51***	0.37
Short Interpregnancy Interval	0.17**^^^	0.10***	0.14
Normal Interpregnancy Interval	0.36*^^^	0.27***	0.39
Interpregnancy Interval Unknown	0.07***^^^	0.12***	0.10
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.61^^^	0.50***	0.62
Depressed at Intake	0.30	0.32***	0.29
Depression Unknown	0.09^^^	0.17***	0.08
Anxiety			
No Anxiety at Intake	0.60^^^	0.48***	0.57
Anxiety at Intake	0.37^^^	0.44***	0.39
Anxiety Unknown	0.04^^^	0.08***	0.04
Food Insecurity			
Not Food Insecure at Intake	0.68***	0.66***	0.75
Food Insecure at Intake	0.27***^^^	0.22**	0.19
Food Insecurity Score Unknown	0.05^^^	0.12***	0.06
Pregnancy Intent			
Intended Pregnancy	0.26***^^^	0.18	0.17
Unintended Pregnancy	0.72***^^	0.76***	0.80
Pregnancy Intent Unknown	0.02^^^	0.05***	0.03
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.98***^^^	0.74***	0.82
Pre-Pregnancy Hypertension	0.01***^^^	0.13***	0.10
Pre-Pregnancy Hypertension Unknown	0.01***^^^	0.13***	0.09
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.98***^^^	0.69***	0.86
Pre-Pregnancy Diabetes	0.01***^^^	0.08***	0.03
Pre-Pregnancy Diabetes Unknown	0.01***^^^	0.23***	0.11
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.03	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.39***^^^	0.26	0.26
Overweight (25-<30 BMI)	0.25***^^^	0.20	0.20
Obese (30-<40 BMI)	0.23**	0.23***	0.27
Very Obese (>=40 BMI)	0.07***	0.08***	0.12
BMI Unknown	0.03***^^^	0.21***	0.12
Smoking			
Did Not Smoke at Intake	0.82^^^	0.72***	0.82
Smoked at Intake	0.08***	0.08***	0.11
Smoking Status Unknown	0.10**^^^	0.20***	0.08
Intimate Partner Violence			
No History of Intimate Partner Violence	0.76***^^	0.80	0.81
History of Intimate Partner Violence	0.22***^^^	0.14***	0.16
History of Intimate Partner Violence Unknown	0.01**^^^	0.06***	0.03
Year			
2013 and 2014	0.25**	0.26***	0.29
2015	0.40	0.43	0.42
2016 and 2017	0.35***^^	0.31	0.30
Region			
Northeast	0.02***^^^	0.30***	0.00
Midwest	0.12***^^^	0.00***	0.16
South	0.80^^^	0.66***	0.80
West	0.05	0.04	0.04

Notes: Sample limited to black women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 22: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, BLACK WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	840	2,421	6,412
Outcomes		Means	
Preterm Birth	0.05***^^^	0.12	0.13
Low Birth Weight	0.06***^^^	0.11*	0.12
C-Section	0.18***^^^	0.30**	0.33
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.04***^^^	0.08	0.07
18 To 19 Years of Age	0.07***^^^	0.13***	0.11
20 To 34 Years of Age	0.83***^^^	0.75	0.75
35 Years of Age or Older	0.06^	0.05***	0.07
Education			
Less Than High School	0.17***^^^	0.22	0.24
High School Graduate / Ged	0.58	0.61	0.60
Bachelor's Degree	0.13***^^^	0.04**	0.03
Other Degree	0.10*^^^	0.07*	0.08
Education Unknown	0.02***^^^	0.05	0.05
Relationship Status			
Married	0.26***^^^	0.09*	0.11
Living With a Partner	0.26	0.26*	0.24
In a Relationship, Not Living Together	0.27***^^^	0.34	0.36
Not in a Relationship	0.20***	0.23***	0.26
Relationship Status Unknown	0.01***^^^	0.08***	0.04
Employment/School			
Working, Not in School	0.36	0.34	0.35
In School, Not Working	0.14	0.14	0.15
Working and In School	0.05	0.06	0.06
Neither Working nor in School	0.43	0.43	0.42
Work/School Status Unknown	0.02**^^^	0.03	0.03
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Preterm Birth	0.09***	0.11***	0.16
No Prior Preterm Birth	0.51**^^^	0.38***	0.46
Prior Low Birth Weight			
No Prior Birth	0.40^^^	0.51***	0.38
Prior Low Birth Weight Birth	0.02***^^^	0.06***	0.08
No Prior Low Birth Weight Birth	0.50***^^^	0.36***	0.43
Prior Low Birth Weight Unknown	0.07***	0.08***	0.11
Prior C-Section			
No Prior Birth	0.40^^^	0.51***	0.38
Prior C-Section	0.07***^^^	0.15***	0.18
No Prior C-Section	0.53***^^^	0.35***	0.45
Interpregnancy Interval			
No Prior Birth	0.40^^^	0.51***	0.38
Short Interpregnancy Interval	0.17**^^^	0.10***	0.13
Normal Interpregnancy Interval	0.36^^^	0.27***	0.38
Interpregnancy Interval Unknown	0.07***^^^	0.12*	0.11
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.61^^^	0.50***	0.62
Depressed at Intake	0.30	0.32***	0.28
Depression Unknown	0.09^^^	0.18***	0.09
Anxiety			
No Anxiety at Intake	0.60^^^	0.48***	0.57
Anxiety at Intake	0.37^^^	0.44***	0.38

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Anxiety Unknown	0.04^^^	0.08***	0.04
Food Insecurity			
Not Food Insecure at Intake	0.68***	0.67***	0.74
Food Insecure at Intake	0.27***^^^	0.22***	0.19
Food Insecurity Score Unknown	0.05*^^^	0.12***	0.07
Pregnancy Intent			
Intended Pregnancy	0.26***^^^	0.18	0.17
Unintended Pregnancy	0.72***^^	0.76***	0.79
Pregnancy Intent Unknown	0.02*^^^	0.05***	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.98***^^^	0.74***	0.81
Pre-Pregnancy Hypertension	0.01***^^^	0.13***	0.08
Pre-Pregnancy Hypertension Unknown	0.01***^^^	0.13***	0.10
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.98***^^^	0.69***	0.84
Pre-Pregnancy Diabetes	0.01**^^^	0.08***	0.02
Pre-Pregnancy Diabetes Unknown	0.01***^^^	0.23***	0.13
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.03	0.03*	0.02
Normal Weight (18.5-<25 BMI)	0.39***^^^	0.26	0.26
Overweight (25-<30 BMI)	0.25***^^^	0.20	0.20
Obese (30-<40 BMI)	0.23**	0.23***	0.27
Very Obese (>=40 BMI)	0.07***	0.08***	0.11
BMI Unknown	0.03***^^^	0.21***	0.13
Smoking			
Did Not Smoke at Intake	0.82^^^	0.72***	0.80
Smoked at Intake	0.08***	0.08***	0.11
Smoking Status Unknown	0.10^^^	0.20***	0.09
Intimate Partner Violence			
No History of Intimate Partner Violence	0.76***^^	0.80	0.81
History of Intimate Partner Violence	0.22***^^^	0.14**	0.16
History of Intimate Partner Violence Unknown	0.01***^^^	0.06***	0.04
Year			
2013 and 2014	0.25	0.26	0.27
2015	0.40	0.43	0.42
2016 and 2017	0.35**^^	0.31	0.31
Region			
Northeast	0.02***^^^	0.30***	0.00
Midwest	0.12***^^^	0.00***	0.19
South	0.80***^^^	0.66***	0.76
West	0.05	0.04*	0.05

Notes: Sample limited to black women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 23: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, HISPANIC WOMEN

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,371	2,583	4,665
Outcomes	**Means**		
Preterm Birth	0.05***^^^	0.11	0.12
Low Birth Weight	0.04***^^^	0.09*	0.08
C-Section	0.13***^^^	0.31***	0.27

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.02***^^^	0.06	0.06
18 To 19 Years of Age	0.06**^^^	0.10	0.09
20 To 34 Years of Age	0.82***^^^	0.72	0.71
35 Years of Age or Older	0.09***^^^	0.12**	0.14
Education			
Less Than High School	0.23***^^^	0.34***	0.41
High School Graduate / Ged	0.53***^^^	0.38***	0.41
Bachelor's Degree	0.08***^^^	0.03***	0.02
Other Degree	0.10***	0.11***	0.07
Education Unknown	0.07**^^^	0.15***	0.09
Relationship Status			
Married	0.39***^^^	0.27*	0.29
Living With a Partner	0.38	0.39**	0.37
In a Relationship, Not Living Together	0.14***^^	0.17***	0.21
Not in a Relationship	0.07***^^^	0.14***	0.11
Relationship Status Unknown	0.01^^^	0.03***	0.01
Employment/School			
Working, Not in School	0.33^^^	0.24***	0.35
In School, Not Working	0.08*^	0.10	0.10
Working and In School	0.05**^^^	0.04	0.04
Neither Working nor in School	0.52^^^	0.58***	0.50
Work/School Status Unknown	0.02^^^	0.05***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.32^^^	0.39***	0.33
Prior Preterm Birth	0.09***^^^	0.13	0.13
No Prior Preterm Birth	0.59***^^^	0.49***	0.54
Prior Low Birth Weight			
No Prior Birth	0.32^^^	0.39***	0.33
Prior Low Birth Weight Birth	0.01***^^^	0.04***	0.07
No Prior Low Birth Weight Birth	0.67***^^^	0.43***	0.53
Prior Low Birth Weight Unknown	0.00***^^^	0.14***	0.07
Prior C-Section			
No Prior Birth	0.32^^^	0.39***	0.33
Prior C-Section	0.06***^^^	0.17	0.18
No Prior C-Section	0.62***^^^	0.44***	0.50
Interpregnancy Interval			
No Prior Birth	0.32^^^	0.39***	0.33
Short Interpregnancy Interval	0.18***^^^	0.10**	0.11
Normal Interpregnancy Interval	0.41*	0.40*	0.38
Interpregnancy Interval Unknown	0.10***^	0.11***	0.18
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.72*^^^	0.64***	0.75
Depressed at Intake	0.17^^^	0.20***	0.16
Depression Unknown	0.11***^^^	0.15***	0.09
Anxiety			
No Anxiety at Intake	0.71^	0.68***	0.72
Anxiety at Intake	0.25	0.25	0.24
Anxiety Unknown	0.04^^^	0.07***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.78^^^	0.72***	0.76
Food Insecure at Intake	0.14*^^^	0.19***	0.16
Food Insecurity Score Unknown	0.08	0.09	0.08
Pregnancy Intent			
Intended Pregnancy	0.42^^^	0.37*	0.39
Unintended Pregnancy	0.57^^	0.60	0.59

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Pregnancy Intent Unknown	0.02^^	0.03***	0.02
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.90***	0.93
Pre-Pregnancy Hypertension	0.01***^^^	0.05	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.05***	0.02
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.81***	0.91
Pre-Pregnancy Diabetes	0.00***^^^	0.05	0.04
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.15***	0.04
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^	0.03**	0.02
Normal Weight (18.5-<25 BMI)	0.38***^^^	0.29**	0.26
Overweight (25-<30 BMI)	0.29	0.28	0.28
Obese (30-<40 BMI)	0.23***	0.24***	0.30
Very Obese (>=40 BMI)	0.03***^^	0.05***	0.07
BMI Unknown	0.02***^^^	0.12***	0.07
Smoking			
Did Not Smoke at Intake	0.87***	0.87***	0.94
Smoked at Intake	0.02**	0.02*	0.03
Smoking Status Unknown	0.11***	0.11***	0.03
Intimate Partner Violence			
No History of Intimate Partner Violence	0.83**	0.82	0.81
History of Intimate Partner Violence	0.15	0.15	0.16
History of Intimate Partner Violence Unknown	0.02***^^	0.03	0.03
Year			
2013 and 2014	0.26***^^	0.30***	0.16
2015	0.38^^^	0.45***	0.37
2016 and 2017	0.35***^^^	0.25***	0.47
Region			
Northeast	0.02***^^^	0.19***	0.00
Midwest	0.12***^^^	0.00***	0.23
South	0.60***^^^	0.77***	0.46
West	0.26***^^^	0.05***	0.30

Notes: Sample limited to Hispanic women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 24: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, HISPANIC WOMEN EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	1,371	1,871	4,607
Outcomes	**Means**		
Preterm Birth	0.05***^	0.07***	0.12
Low Birth Weight	0.04***^	0.05***	0.08
C-Section	0.13***^^^	0.24***	0.27
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.02***^^^	0.05	0.06
18 To 19 Years of Age	0.06**^^^	0.09	0.09
20 To 34 Years of Age	0.82***^^^	0.74**	0.71
35 Years of Age or Older	0.09***^^	0.11***	0.14
Education			
Less Than High School	0.23***^^^	0.43*	0.41
High School Graduate / Ged	0.53***^^^	0.37***	0.41
Bachelor's Degree	0.08***^^^	0.01	0.02

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Other Degree	0.10***^^^	0.05**	0.07
Education Unknown	0.07**^^^	0.13***	0.09
Relationship Status			
Married	0.39***^^^	0.30	0.29
Living With a Partner	0.38	0.38	0.37
In a Relationship, Not Living Together	0.14***^	0.17***	0.21
Not in a Relationship	0.07***^^^	0.14***	0.11
Relationship Status Unknown	0.01^^	0.02*	0.01
Employment/School			
Working, Not in School	0.33^^^	0.25***	0.35
In School, Not Working	0.08*	0.08**	0.10
Working and In School	0.05*^^^	0.03*	0.04
Neither Working nor in School	0.52^^^	0.61***	0.50
Work/School Status Unknown	0.02^^^	0.04***	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.32^^^	0.38***	0.33
Prior Preterm Birth	0.09***	0.09***	0.13
No Prior Preterm Birth	0.59***^^^	0.53	0.54
Prior Low Birth Weight			
No Prior Birth	0.32^^^	0.38***	0.33
Prior Low Birth Weight Birth	0.01***^^^	0.05***	0.07
No Prior Low Birth Weight Birth	0.67***^^^	0.47***	0.53
Prior Low Birth Weight Unknown	0.00***^^^	0.10***	0.07
Prior C-Section			
No Prior Birth	0.32^^^	0.38***	0.33
Prior C-Section	0.06***^^^	0.14***	0.18
No Prior C-Section	0.62***^^^	0.48	0.50
Interpregnancy Interval			
No Prior Birth	0.32^^^	0.38***	0.33
Short Interpregnancy Interval	0.18***^^^	0.08***	0.11
Normal Interpregnancy Interval	0.41*	0.41**	0.38
Interpregnancy Interval Unknown	0.10***^^	0.12***	0.18
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.72**	0.71***	0.75
Depressed at Intake	0.17	0.16	0.16
Depression Unknown	0.11***	0.13***	0.09
Anxiety			
No Anxiety at Intake	0.71^^	0.75**	0.72
Anxiety at Intake	0.25^^^	0.19***	0.24
Anxiety Unknown	0.04^^^	0.07***	0.05
Food Insecurity			
Not Food Insecure at Intake	0.78^^	0.74*	0.76
Food Insecure at Intake	0.14*^^	0.17	0.16
Food Insecurity Score Unknown	0.08	0.09	0.08
Pregnancy Intent			
Intended Pregnancy	0.42	0.41	0.40
Unintended Pregnancy	0.57	0.56	0.58
Pregnancy Intent Unknown	0.02^^	0.03**	0.02
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	0.99***^^^	0.92*	0.93
Pre-Pregnancy Hypertension	0.01***	0.01***	0.04
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.07***	0.03
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	1.00***^^^	0.79***	0.91
Pre-Pregnancy Diabetes	0.00***	0.01***	0.04
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.20***	0.04

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.04***^^^	0.02	0.02
Normal Weight (18.5-<25 BMI)	0.38***^^^	0.28*	0.26
Overweight (25-<30 BMI)	0.29	0.32***	0.28
Obese (30-<40 BMI)	0.23***	0.24***	0.30
Very Obese (>=40 BMI)	0.03***	0.04***	0.07
BMI Unknown	0.02***^^^	0.10***	0.07
Smoking			
Did Not Smoke at Intake	0.87***	0.88***	0.94
Smoked at Intake	0.02*	0.01***	0.02
Smoking Status Unknown	0.11***	0.11***	0.03
Intimate Partner Violence			
No History of Intimate Partner Violence	0.83**	0.82	0.81
History of Intimate Partner Violence	0.15	0.15	0.16
History of Intimate Partner Violence Unknown	0.02***^^^	0.04	0.03
Year			
2013 and 2014	0.26***^^^	0.34***	0.16
2015	0.38	0.41***	0.37
2016 and 2017	0.35***^^^	0.26***	0.47
Region			
Northeast	0.02***^^^	0.26***	0.00
Midwest	0.12***^^^	0.00***	0.24
South	0.60***^^^	0.68***	0.46
West	0.26***^^^	0.06***	0.31

Notes: Sample limited to Hispanic women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 25: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, WOMEN WITH OTHER/MIXED RACE/ETHNICITY

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	292	268	657
Outcomes	**Means**		
Preterm Birth	0.05**^^	0.10	0.09
Low Birth Weight	0.03***^^^	0.13*	0.09
C-Section	0.16***^^^	0.26	0.31
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.03^^	0.07***	0.03
18 To 19 Years of Age	0.04**^^^	0.11**	0.07
20 To 34 Years of Age	0.83**^^^	0.74	0.77
35 Years of Age or Older	0.10	0.08**	0.13
Education			
Less Than High School	0.11*^^^	0.20	0.16
High School Graduate / Ged	0.52	0.48	0.53
Bachelor's Degree	0.15^^	0.10	0.12
Other Degree	0.17^	0.12	0.14
Education Unknown	0.04^^^	0.10***	0.05
Relationship Status			
Married	0.42^^^	0.26***	0.41
Living With a Partner	0.34**	0.35***	0.26
In a Relationship, Not Living Together	0.13**^^	0.19	0.18
Not in a Relationship	0.09*^	0.15	0.13

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Relationship Status Unknown	0.02^	0.05**	0.02
Employment/School			
Working, Not in School	0.34	0.34	0.32
In School, Not Working	0.11	0.14	0.10
Working and In School	0.10***^^	0.05	0.05
Neither Working nor in School	0.43**	0.45	0.51
Work/School Status Unknown	0.02	0.02	0.02
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.43^^^	0.55***	0.44
Prior Preterm Birth	0.09	0.06**	0.10
No Prior Preterm Birth	0.48^^	0.40*	0.46
Prior Low Birth Weight			
No Prior Birth	0.43^^^	0.55***	0.44
Prior Low Birth Weight Birth	0.00***	0.02***	0.07
No Prior Low Birth Weight Birth	0.56***^^^	0.29***	0.42
Prior Low Birth Weight Unknown	0.01***^^^	0.14***	0.07
Prior C-Section			
No Prior Birth	0.43^^^	0.55***	0.44
Prior C-Section	0.05***^^	0.12*	0.16
No Prior C-Section	0.52***^^^	0.33*	0.40
Interpregnancy Interval			
No Prior Birth	0.43^^^	0.55***	0.44
Short Interpregnancy Interval	0.19**^^^	0.11	0.13
Normal Interpregnancy Interval	0.32	0.26	0.32
Interpregnancy Interval Unknown	0.06***	0.08*	0.12
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70^^^	0.59***	0.69
Depressed at Intake	0.24	0.29**	0.22
Depression Unknown	0.06^^^	0.12	0.09
Anxiety			
No Anxiety at Intake	0.66^^^	0.50***	0.64
Anxiety at Intake	0.32^^^	0.43***	0.31
Anxiety Unknown	0.02*^^	0.07	0.05
Food Insecurity			
Not Food Insecure at Intake	0.80**^^^	0.63***	0.74
Food Insecure at Intake	0.17^^^	0.26**	0.19
Food Insecurity Score Unknown	0.03**^^^	0.10**	0.07
Pregnancy Intent			
Intended Pregnancy	0.35*	0.30***	0.42
Unintended Pregnancy	0.62**	0.64**	0.55
Pregnancy Intent Unknown	0.03^	0.06*	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	1.00***^^^	0.85*	0.89
Pre-Pregnancy Hypertension	0.00***^^^	0.06	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.10**	0.06
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.67***	0.87
Pre-Pregnancy Diabetes	0.01	0.03	0.02
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.30***	0.10
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.05	0.05	0.04
Normal Weight (18.5-<25 BMI)	0.44***^^^	0.29	0.31
Overweight (25-<30 BMI)	0.25	0.20**	0.27
Obese (30-<40 BMI)	0.17	0.15	0.19
Very Obese (>=40 BMI)	0.04**	0.07	0.07
BMI Unknown	0.05***^^^	0.24***	0.12

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Smoking			
Did Not Smoke at Intake	0.82**^^^	0.72***	0.87
Smoked at Intake	0.06^^	0.11	0.09
Smoking Status Unknown	0.13***	0.16***	0.04
Intimate Partner Violence			
No History of Intimate Partner Violence	0.71*	0.71*	0.77
History of Intimate Partner Violence	0.27***	0.23	0.18
History of Intimate Partner Violence Unknown	0.02**^^^	0.06	0.05
Year			
2013 and 2014	0.25***^^	0.34***	0.16
2015	0.42*	0.46***	0.36
2016 and 2017	0.33***^^^	0.21***	0.48
Region			
Northeast	0.03**^^^	0.26***	0.00
Midwest	0.07***^^^	0.00***	0.15
South	0.53	0.59	0.56
West	0.37**^^^	0.15***	0.29

Notes: Sample limited to women with other/mixed race/ethnicity with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 26: DESCRIPTIVE STATISTICS FOR THE BIRTH OUTCOMES ANALYTIC SAMPLE, WOMEN WITH OTHER/MIXED RACE/ETHNICITY EXCLUDING MUSC, UAB, AND UPR

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Sample Size	292	268	643
Outcomes	**Means**		
Preterm Birth	0.05**^^	0.10	0.09
Low Birth Weight	0.03***^^^	0.13**	0.09
C-Section	0.16***^^^	0.26	0.31
Demographic Characteristics			
Age			
Less Than 18 Years Old	0.03^^	0.07***	0.03
18 To 19 Years of Age	0.04*^^^	0.11**	0.07
20 To 34 Years of Age	0.83**^^^	0.74	0.76
35 Years of Age or Older	0.10*	0.08**	0.14
Education			
Less Than High School	0.11*^^^	0.20	0.16
High School Graduate / Ged	0.52	0.48	0.53
Bachelor's Degree	0.15^^	0.10	0.13
Other Degree	0.17^	0.12	0.14
Education Unknown	0.04^^^	0.10***	0.05
Relationship Status			
Married	0.42^^^	0.26***	0.41
Living With a Partner	0.34**	0.35***	0.26
In a Relationship, Not Living Together	0.13*^^	0.19	0.18
Not in a Relationship	0.09^	0.15	0.13
Relationship Status Unknown	0.02^	0.05**	0.02
Employment/School			
Working, Not in School	0.34	0.34	0.32
In School, Not Working	0.11	0.14	0.10
Working and In School	0.10***^^	0.05	0.05
Neither Working nor in School	0.43**	0.45	0.51
Work/School Status Unknown	0.02	0.02	0.02

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
Risk Factors from Prior Birth			
Prior Preterm Birth			
No Prior Birth	0.43^^^	0.55***	0.44
Prior Preterm Birth	0.09	0.06**	0.10
No Prior Preterm Birth	0.48^^	0.40*	0.46
Prior Low Birth Weight			
No Prior Birth	0.43^^^	0.55***	0.44
Prior Low Birth Weight Birth	0.00***	0.02***	0.07
No Prior Low Birth Weight Birth	0.56***^^^	0.29***	0.42
Prior Low Birth Weight Unknown	0.01***^^^	0.14***	0.07
Prior C-Section			
No Prior Birth	0.43^^^	0.55***	0.44
Prior C-Section	0.05***^^	0.12*	0.16
No Prior C-Section	0.52***^^^	0.33**	0.40
Interpregnancy Interval			
No Prior Birth	0.43^^^	0.55***	0.44
Short Interpregnancy Interval	0.19**^^^	0.11	0.13
Normal Interpregnancy Interval	0.32	0.26	0.31
Interpregnancy Interval Unknown	0.06***	0.08*	0.12
Risk Factors from Current Pregnancy			
Depression			
Not Depressed at Intake	0.70^^^	0.59***	0.69
Depressed at Intake	0.24	0.29**	0.22
Depression Unknown	0.06*^^^	0.12	0.09
Anxiety			
No Anxiety at Intake	0.66^^^	0.50***	0.64
Anxiety at Intake	0.32^^^	0.43***	0.31
Anxiety Unknown	0.02*^^	0.07	0.05
Food Insecurity			
Not Food Insecure at Intake	0.80*^^^	0.63***	0.74
Food Insecure at Intake	0.17^^^	0.26***	0.19
Food Insecurity Score Unknown	0.03**^^^	0.10*	0.07
Pregnancy Intent			
Intended Pregnancy	0.35*	0.30***	0.42
Unintended Pregnancy	0.62**	0.64***	0.54
Pregnancy Intent Unknown	0.03^	0.06*	0.04
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	1.00***^^^	0.85**	0.89
Pre-Pregnancy Hypertension	0.00***^^^	0.06	0.05
Pre-Pregnancy Hypertension Unknown	0.00***^^^	0.10**	0.06
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	0.99***^^^	0.67***	0.87
Pre-Pregnancy Diabetes	0.01	0.03	0.02
Pre-Pregnancy Diabetes Unknown	0.00***^^^	0.30***	0.10
BMI At First Prenatal Visit			
Underweight (<18.5 BMI)	0.05	0.05	0.04
Normal Weight (18.5-<25 BMI)	0.44***^^^	0.29	0.31
Overweight (25-<30 BMI)	0.25	0.20**	0.27
Obese (30-<40 BMI)	0.17	0.15	0.19
Very Obese (>=40 BMI)	0.04*	0.07	0.07
BMI Unknown	0.05***^^^	0.24***	0.12
Smoking			
Did Not Smoke at Intake	0.82**^^^	0.72***	0.87
Smoked at Intake	0.06 ^^	0.11	0.09
Smoking Status Unknown	0.13***	0.16***	0.04
Intimate Partner Violence			
No History of Intimate Partner Violence	0.71	0.71*	0.76
History of Intimate Partner Violence	0.27***	0.23	0.19

Measure	Model		
	Birth Centers	Group Prenatal Care	Maternity Care Homes
History of Intimate Partner Violence Unknown	0.02**^^^	0.06	0.05
Year			
2013 and 2014	0.25***^^	0.34***	0.16
2015	0.42*	0.46***	0.36
2016 and 2017	0.33***^^^	0.21***	0.49
Region			
Northeast	0.03**^^^	0.26***	0.00
Midwest	0.07***^^^	0.00***	0.16
South	0.53	0.59	0.55
West	0.37**^^^	0.15***	0.30

Notes: Sample limited to women with other/mixed race/ethnicity with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 27: SHARE OF STRONG START PARTICIPANTS WITH PLPE DATA INCLUDED IN THE BIRTH OUTCOMES ANALYTIC SAMPLE, BY AWARDEE

Awardee	Total Number of Enrollees	Count in Regression Sample	Share in Regression Sample
Access Community Health Network	2,676	1,897	70.9%
Albert Einstein Healthcare Network	1,429	675	47.2%
American Association of Birth Centers (AABC)	8,426	5,139	61.0%
Amerigroup Corporation	976	467	47.8%
Central Jersey Family Health Consortium	1,238	759	61.3%
Florida Association of Health Start Coalitions	1,343	915	68.1%
Grady Memorial Hospital Corporation	709	410	57.8%
Harris County Hospital District	1,264	1,010	79.9%
HealthInsight of Nevada	857	325	37.9%
Johns Hopkins University	1,629	1,276	78.3%
Los Angeles County Department of Health Services	3,142	1,576	50.2%
Maricopa Special Health Care District	959	483	50.4%
Medical University of South Carolina	820	718	87.6%
Meridian Health Plan	1,812	1,252	69.1%
Mississippi Primary Health Care Association	2,628	1,378	52.4%
Oklahoma Health Care Authority	869	265	30.5%
Providence Health Foundation of Providence Hospital	3,458	2,499	72.3%
Signature Medical Group	1,802	1,188	65.9%
St. John Community Health Investment Corp.	247	120	48.6%
Texas Tech University Health Sciences Center	1,094	829	75.8%
United Neighborhood Health Services	1,174	747	63.6%
University of Alabama at Birmingham	1,322	1,097	83.0%
University of Kentucky Research Foundation	696	483	69.4%
University of Puerto Rico Medical Sciences Campus	928	725	78.1%
University of South Alabama	1,457	1,020	70.0%
University of Tennessee Medical Group	732	205	28.0%
Virginia Commonwealth University	1,629	874	53.7%
All Awardees	**45,316**	**28,332**	**62.5%**

Notes: Regression sample is the sample included in regression models for preterm birth, low birth weight, and C-section.

DEPRESSION ANALYSIS

TABLE M. 28: CONSTRUCTION OF THE ANALYTIC SAMPLE FOR DEPRESSION ANALYSIS

Logic for Dropping Observations	# Excluded	# of Remaining Observations
Starting Sample: Number of Strong Start participants with PLPE data	-	45,316
Dropping participants without an exit form	831	44,485
Dropping participants without an intake form	2,299	42,186
Dropping participants with a miscarriage or elective termination	1,330	40,856
Dropping participants with multiples	585	40,271
Dropping participants missing depression variable	4,946	35,325
Dropping participants missing an outcome variable (preterm, birthweight, or delivery method)	9,577	25,748
Dropping participants missing any covariates	1,768	23,980
Final analytic sample	-	23,980

TABLE M. 29: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	6,237	17,743
Outcomes	Means	
Preterm Birth	0.13***	0.10
Low Birth Weight	0.11***	0.08
C-Section	0.29***	0.26
Demographic Characteristics		
Race/Ethnicity		
White	0.23***	0.28
Hispanic	0.23***	0.33
Black	0.49***	0.35
Other	0.04	0.04
Age		
Less than 18 Years Old	0.06***	0.05
18 to 19 Years of Age	0.09	0.09
20 to 34 Years of Age	0.76	0.77
35 Years of Age or Older	0.08*	0.09
Education		
Less than High School	0.26*	0.25
High School Graduate / Ged	0.57***	0.54
Bachelor's Degree	0.04***	0.07
Other Degree	0.09	0.10
Education Unknown	0.04	0.04
Relationship Status		
Married	0.17***	0.28
Living with a Partner	0.30***	0.33
In a Relationship, Not Living Together	0.28***	0.25
Not in a Relationship	0.25***	0.14
Employment/School		
Working, Not in School	0.33***	0.36
In School, Not Working	0.12	0.11
Working and in School	0.05	0.05
Neither Working nor in School	0.51***	0.48
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.37**	0.39
Prior Preterm Birth	0.16***	0.12
No Prior Preterm Birth	0.47***	0.49
Prior Low Birth Weight		
No Prior Birth	0.37**	0.39
Prior Low Birth Weight Birth	0.08***	0.06

Measure	Depression Status	
	Depressed	Not Depressed
No Prior Low Birth Weight Birth	0.46	0.47
Prior Low Birth Weight Unknown	0.09	0.08
Prior C-Section		
No Prior Birth	0.37**	0.39
Prior C-Section	0.16***	0.14
No Prior C-Section	0.47	0.47
Interpregnancy Interval		
No Prior Birth	0.37**	0.39
Short Interpregnancy Interval	0.15	0.14
Normal Interpregnancy Interval	0.37	0.36
Interpregnancy Interval Unknown	0.11	0.10
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.61***	0.83
Food Insecure at Intake	0.35***	0.13
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.22***	0.32
Unintended Pregnancy	0.78***	0.68
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.87*	0.87
Pre-Pregnancy Hypertension	0.07***	0.05
Pre-Pregnancy Hypertension Unknown	0.06**	0.07
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.85***	0.87
Pre-Pregnancy Diabetes	0.04**	0.03
Pre-Pregnancy Diabetes Unknown	0.11***	0.10
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.31	0.31
Overweight (25-<30 BMI)	0.22***	0.24
Obese (30-<40 BMI)	0.25	0.24
Very Obese (>=40 BMI)	0.09***	0.07
BMI Unknown	0.10	0.11
Smoking		
Did not Smoke at Intake	0.76***	0.86
Smoked at Intake	0.16***	0.08
Smoking Status Unknown	0.08***	0.06
Intimate Partner Violence		
No History of Intimate Partner Violence	0.66***	0.86
History of Intimate Partner Violence	0.34***	0.14
Year		
2013 and 2014	0.27***	0.25
2015	0.42	0.42
2016 and 2017	0.31***	0.33
Model		
Maternity Care Home	0.59**	0.61
Birth Center	0.17***	0.21
Group Prenatal Care	0.24***	0.18
Region		
Northeast	0.06***	0.05
Midwest	0.70***	0.62
South	0.13***	0.19
West	0.10***	0.15

Notes: Sample limited to women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 30: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, BIRTH CENTER MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,072	3,696
Outcomes	**Means**	
Preterm Birth	0.05	0.04
Low Birth Weight	0.04	0.03
C-Section	0.13	0.12
Demographic Characteristics		
Race/Ethnicity		
White	0.51***	0.56
Hispanic	0.20***	0.26
Black	0.22***	0.13
Other	0.06	0.05
Age		
Less than 18 Years Old	0.03	0.02
18 to 19 Years of Age	0.07**	0.05
20 to 34 Years of Age	0.81*	0.84
35 Years of Age or Older	0.08	0.09
Education		
Less than High School	0.18***	0.12
High School Graduate / Ged	0.58	0.55
Bachelor's Degree	0.11***	0.17
Other Degree	0.11	0.13
Education Unknown	0.03	0.02
Relationship Status		
Married	0.32***	0.49
Living with a Partner	0.32	0.33
In a Relationship, Not Living Together	0.18***	0.12
Not in a Relationship	0.17***	0.07
Employment/School		
Working, Not in School	0.36*	0.39
In School, Not Working	0.09	0.08
Working and in School	0.06	0.05
Neither Working nor in School	0.48	0.48
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.37	0.36
Prior Preterm Birth	0.11***	0.07
No Prior Preterm Birth	0.52***	0.57
Prior Low Birth Weight		
No Prior Birth	0.37	0.36
Prior Low Birth Weight Birth	0.01*	0.01
No Prior Low Birth Weight Birth	0.59**	0.63
Prior Low Birth Weight Unknown	0.02***	0.01
Prior C-Section		
No Prior Birth	0.37	0.36
Prior C-Section	0.06	0.05
No Prior C-Section	0.57	0.59
Interpregnancy Interval		
No Prior Birth	0.37	0.36
Short Interpregnancy Interval	0.19*	0.21
Normal Interpregnancy Interval	0.37	0.36
Interpregnancy Interval Unknown	0.07	0.07
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.61***	0.84
Food Insecure at Intake	0.36***	0.12
Food Insecurity Score Unknown	0.03	0.03
Pregnancy Intent		
Intended Pregnancy	0.28***	0.43

Measure	Depression Status	
	Depressed	Not Depressed
Unintended Pregnancy	0.72***	0.57
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.99	0.99
Pre-Pregnancy Hypertension	0.01	0.01
Pre-Pregnancy Hypertension Unknown	0.00	0.00
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.99	0.99
Pre-Pregnancy Diabetes	0.01	0.00
Pre-Pregnancy Diabetes Unknown	0.00	0.00
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.45	0.45
Overweight (25-<30 BMI)	0.23	0.25
Obese (30-<40 BMI)	0.20	0.19
Very Obese (>=40 BMI)	0.05**	0.03
BMI Unknown	0.03	0.03
Smoking		
Did not Smoke at Intake	0.78***	0.85
Smoked at Intake	0.13***	0.06
Smoking Status Unknown	0.09	0.08
Intimate Partner Violence		
No History of Intimate Partner Violence	0.65***	0.84
History of Intimate Partner Violence	0.35***	0.16
Year		
2013 and 2014	0.25	0.25
2015	0.41	0.40
2016 and 2017	0.34	0.35
Region		
Northeast	0.04	0.03
Midwest	0.68**	0.65
South	0.08	0.09
West	0.19**	0.23

Notes: Sample limited to women with nonmissing data participating in the Birth Center model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 31: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, GROUP PRENATAL CARE MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,467	3,212
Outcomes	**Means**	
Preterm Birth	0.12***	0.10
Low Birth Weight	0.11**	0.09
C-Section	0.31	0.30
Demographic Characteristics		
Race/Ethnicity		
White	0.15***	0.12
Hispanic	0.32***	0.48
Black	0.48***	0.35
Other	0.05	0.05
Age		
Less than 18 Years Old	0.07**	0.06
18 to 19 Years of Age	0.12	0.11
20 to 34 Years of Age	0.74	0.75
35 Years of Age or Older	0.07**	0.09

Measure	Depression Status	
	Depressed	Not Depressed
Education		
Less than High School	0.22***	0.30
High School Graduate / Ged	0.56***	0.50
Bachelor's Degree	0.04	0.04
Other Degree	0.10	0.09
Education Unknown	0.07	0.07
Relationship Status		
Married	0.13***	0.24
Living with a Partner	0.33*	0.36
In a Relationship, Not Living Together	0.29***	0.24
Not in a Relationship	0.25***	0.15
Employment/School		
Working, Not in School	0.31	0.32
In School, Not Working	0.13*	0.11
Working and in School	0.05	0.05
Neither Working nor in School	0.52	0.52
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.46	0.46
Prior Preterm Birth	0.14***	0.10
No Prior Preterm Birth	0.40***	0.44
Prior Low Birth Weight		
No Prior Birth	0.46	0.46
Prior Low Birth Weight Birth	0.05	0.05
No Prior Low Birth Weight Birth	0.33***	0.40
Prior Low Birth Weight Unknown	0.16***	0.10
Prior C-Section		
No Prior Birth	0.46	0.46
Prior C-Section	0.17**	0.14
No Prior C-Section	0.37*	0.40
Interpregnancy Interval		
No Prior Birth	0.46	0.46
Short Interpregnancy Interval	0.11	0.10
Normal Interpregnancy Interval	0.32	0.34
Interpregnancy Interval Unknown	0.10	0.10
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.57***	0.80
Food Insecure at Intake	0.37***	0.15
Food Insecurity Score Unknown	0.05	0.05
Pregnancy Intent		
Intended Pregnancy	0.22***	0.33
Unintended Pregnancy	0.78***	0.67
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.81***	0.86
Pre-Pregnancy Hypertension	0.10***	0.07
Pre-Pregnancy Hypertension Unknown	0.09	0.08
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.68***	0.75
Pre-Pregnancy Diabetes	0.06	0.06
Pre-Pregnancy Diabetes Unknown	0.26***	0.20
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.28	0.29
Overweight (25-<30 BMI)	0.20***	0.25
Obese (30-<40 BMI)	0.23	0.24
Very Obese (>=40 BMI)	0.07	0.06
BMI Unknown	0.19***	0.14

Measure	Depression Status	
	Depressed	Not Depressed
Smoking		
Did not Smoke at Intake	0.73***	0.82
Smoked at Intake	0.14***	0.06
Smoking Status Unknown	0.13	0.12
Intimate Partner Violence		
No History of Intimate Partner Violence	0.70***	0.87
History of Intimate Partner Violence	0.30***	0.13
Year		
2013 and 2014	0.30	0.29
2015	0.44	0.45
2016 and 2017	0.26	0.26
Region		
Northeast	0.25**	0.22
Midwest	0.69***	0.73
South	0.00***	0.00
West	0.06	0.05

Notes: Sample limited to women with nonmissing data participating in the Group Prenatal Care model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 32: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, MATERNITY CARE HOME MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	3,698	10,835
Outcomes	**Means**	
Preterm Birth	0.15***	0.12
Low Birth Weight	0.13***	0.10
C-Section	0.32***	0.30
Demographic Characteristics		
Race/Ethnicity		
White	0.19***	0.23
Hispanic	0.20***	0.31
Black	0.58***	0.42
Other	0.04	0.04
Age		
Less than 18 Years Old	0.06*	0.05
18 to 19 Years of Age	0.09*	0.10
20 to 34 Years of Age	0.76	0.75
35 Years of Age or Older	0.09	0.09
Education		
Less than High School	0.30**	0.28
High School Graduate / Ged	0.57	0.55
Bachelor's Degree	0.02***	0.04
Other Degree	0.08	0.09
Education Unknown	0.03***	0.04
Relationship Status		
Married	0.14***	0.22
Living with a Partner	0.28***	0.33
In a Relationship, Not Living Together	0.31**	0.29
Not in a Relationship	0.27***	0.16
Employment/School		
Working, Not in School	0.32***	0.36
In School, Not Working	0.12	0.12
Working and in School	0.04**	0.05
Neither Working nor in School	0.51***	0.47

Measure	Depression Status	
	Depressed	Not Depressed
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.33***	0.38
Prior Preterm Birth	0.19***	0.14
No Prior Preterm Birth	0.48	0.48
Prior Low Birth Weight		
No Prior Birth	0.33***	0.38
Prior Low Birth Weight Birth	0.11***	0.08
No Prior Low Birth Weight Birth	0.48***	0.44
Prior Low Birth Weight Unknown	0.08***	0.10
Prior C-Section		
No Prior Birth	0.33***	0.38
Prior C-Section	0.19***	0.17
No Prior C-Section	0.47**	0.45
Interpregnancy Interval		
No Prior Birth	0.33***	0.38
Short Interpregnancy Interval	0.15**	0.13
Normal Interpregnancy Interval	0.40***	0.37
Interpregnancy Interval Unknown	0.12	0.11
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.62***	0.84
Food Insecure at Intake	0.34***	0.12
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.21***	0.29
Unintended Pregnancy	0.79***	0.71
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.85	0.84
Pre-Pregnancy Hypertension	0.08**	0.07
Pre-Pregnancy Hypertension Unknown	0.07***	0.09
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.87	0.87
Pre-Pregnancy Diabetes	0.04	0.03
Pre-Pregnancy Diabetes Unknown	0.09**	0.10
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.02
Normal Weight (18.5-<25 BMI)	0.28	0.27
Overweight (25-<30 BMI)	0.23	0.23
Obese (30-<40 BMI)	0.27	0.26
Very Obese (>=40 BMI)	0.11***	0.09
BMI Unknown	0.09***	0.13
Smoking		
Did not Smoke at Intake	0.77***	0.86
Smoked at Intake	0.18***	0.10
Smoking Status Unknown	0.05***	0.03
Intimate Partner Violence		
No History of Intimate Partner Violence	0.65***	0.86
History of Intimate Partner Violence	0.35***	0.14
Year		
2013 and 2014	0.27***	0.23
2015	0.42	0.43
2016 and 2017	0.31***	0.34

Measure	Depression Status	
	Depressed	Not Depressed
Region		
Northeast	0.00***	0.00
Midwest	0.71***	0.57
South	0.20***	0.28
West	0.09***	0.15

Notes: Sample limited to women with nonmissing data participating in the Maternity Care Home model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 33: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, WHITE WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,463	4,928
Outcomes	**Means**	
Preterm Birth	0.10***	0.07
Low Birth Weight	0.08***	0.06
C-Section	0.25**	0.22
Demographic Characteristics		
Age		
Less than 18 Years Old	0.04***	0.03
18 to 19 Years of Age	0.09	0.08
20 to 34 Years of Age	0.79**	0.81
35 Years of Age or Older	0.08	0.08
Education		
Less than High School	0.19***	0.15
High School Graduate / Ged	0.59	0.58
Bachelor's Degree	0.08***	0.12
Other Degree	0.11	0.12
Education Unknown	0.03	0.02
Relationship Status		
Married	0.28***	0.40
Living with a Partner	0.36	0.36
In a Relationship, Not Living Together	0.19***	0.16
Not in a Relationship	0.17***	0.09
Employment/School		
Working, Not in School	0.32***	0.39
In School, Not Working	0.08	0.08
Working and in School	0.04	0.05
Neither Working nor in School	0.56***	0.48
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.39	0.39
Prior Preterm Birth	0.15***	0.10
No Prior Preterm Birth	0.46***	0.51
Prior Low Birth Weight		
No Prior Birth	0.39	0.39
Prior Low Birth Weight Birth	0.06***	0.03
No Prior Low Birth Weight Birth	0.49	0.48
Prior Low Birth Weight Unknown	0.07***	0.09
Prior C-Section		
No Prior Birth	0.39	0.39
Prior C-Section	0.13***	0.10
No Prior C-Section	0.48**	0.51
Interpregnancy Interval		
No Prior Birth	0.39	0.39
Short Interpregnancy Interval	0.18	0.19

Measure	Depression Status	
	Depressed	Not Depressed
Normal Interpregnancy Interval	0.34	0.35
Interpregnancy Interval Unknown	0.09***	0.07
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.63***	0.87
Food Insecure at Intake	0.34***	0.10
Food Insecurity Score Unknown	0.03	0.03
Pregnancy Intent		
Intended Pregnancy	0.25***	0.35
Unintended Pregnancy	0.75***	0.65
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.92***	0.87
Pre-Pregnancy Hypertension	0.03	0.03
Pre-Pregnancy Hypertension Unknown	0.05***	0.10
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.86	0.85
Pre-Pregnancy Diabetes	0.03***	0.02
Pre-Pregnancy Diabetes Unknown	0.11**	0.14
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.38	0.37
Overweight (25-<30 BMI)	0.23**	0.20
Obese (30-<40 BMI)	0.19	0.19
Very Obese (>=40 BMI)	0.07**	0.05
BMI Unknown	0.10***	0.16
Smoking		
Did not Smoke at Intake	0.64***	0.77
Smoked at Intake	0.31***	0.18
Smoking Status Unknown	0.05	0.05
Intimate Partner Violence		
No History of Intimate Partner Violence	0.57***	0.82
History of Intimate Partner Violence	0.43***	0.18
Year		
2013 and 2014	0.28	0.27
2015	0.42***	0.46
2016 and 2017	0.30***	0.26
Model		
Maternity Care Home	0.48**	0.51
Birth Center	0.37***	0.42
Group Prenatal Care	0.15***	0.08
Region		
Northeast	0.05***	0.03
Midwest	0.66***	0.51
South	0.18***	0.33
West	0.12*	0.13

Notes: Sample limited to white women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 34: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, BLACK WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	3,084	6,207
Outcomes	**Means**	
Preterm Birth	0.14***	0.12
Low Birth Weight	0.13*	0.12
C-Section	0.32	0.30

Measure	Depression Status	
	Depressed	Not Depressed
Demographic Characteristics		
Age		
Less than 18 Years Old	0.07	0.06
18 to 19 Years of Age	0.11	0.11
20 to 34 Years of Age	0.77	0.76
35 Years of Age or Older	0.06	0.07
Education		
Less than High School	0.26***	0.21
High School Graduate / Ged	0.62	0.62
Bachelor's Degree	0.03***	0.05
Other Degree	0.07***	0.09
Education Unknown	0.02*	0.03
Relationship Status		
Married	0.08***	0.13
Living with a Partner	0.24**	0.26
In a Relationship, Not Living Together	0.36***	0.39
Not in a Relationship	0.32***	0.22
Employment/School		
Working, Not in School	0.33***	0.37
In School, Not Working	0.14	0.15
Working and in School	0.05***	0.07
Neither Working nor in School	0.48***	0.42
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.39***	0.41
Prior Preterm Birth	0.18***	0.15
No Prior Preterm Birth	0.44	0.44
Prior Low Birth Weight		
No Prior Birth	0.39***	0.41
Prior Low Birth Weight Birth	0.09*	0.08
No Prior Low Birth Weight Birth	0.43	0.42
Prior Low Birth Weight Unknown	0.09	0.09
Prior C-Section		
No Prior Birth	0.39***	0.41
Prior C-Section	0.18	0.16
No Prior C-Section	0.44	0.42
Interpregnancy Interval		
No Prior Birth	0.39***	0.41
Short Interpregnancy Interval	0.14	0.14
Normal Interpregnancy Interval	0.38**	0.36
Interpregnancy Interval Unknown	0.10	0.09
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.61***	0.82
Food Insecure at Intake	0.35***	0.14
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.17*	0.19
Unintended Pregnancy	0.83*	0.81
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.81	0.82
Pre-Pregnancy Hypertension	0.10	0.09
Pre-Pregnancy Hypertension Unknown	0.09	0.09
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.82***	0.85
Pre-Pregnancy Diabetes	0.04	0.04
Pre-Pregnancy Diabetes Unknown	0.14***	0.11
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.02	0.03

Measure	Depression Status	
	Depressed	Not Depressed
Normal Weight (18.5-<25 BMI)	0.28	0.28
Overweight (25-<30 BMI)	0.20	0.21
Obese (30-<40 BMI)	0.27	0.26
Very Obese (>=40 BMI)	0.11	0.10
BMI Unknown	0.12	0.12
Smoking		
Did not Smoke at Intake	0.77***	0.85
Smoked at Intake	0.15***	0.08
Smoking Status Unknown	0.09*	0.08
Intimate Partner Violence		
No History of Intimate Partner Violence	0.70***	0.89
History of Intimate Partner Violence	0.30***	0.11
Year		
2013 and 2014	0.28	0.27
2015	0.43	0.43
2016 and 2017	0.29	0.30
Model		
Maternity Care Home	0.69***	0.74
Birth Center	0.08	0.08
Group Prenatal Care	0.23***	0.18
Region		
Northeast	0.07	0.06
Midwest	0.78*	0.77
South	0.11***	0.13
West	0.04	0.05

Notes: Sample limited to black women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 35: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, HISPANIC WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,420	5,839
Outcomes	**Means**	
Preterm Birth	0.12	0.11
Low Birth Weight	0.08*	0.07
C-Section	0.28*	0.26
Demographic Characteristics		
Age		
Less than 18 Years Old	0.06*	0.05
18 to 19 Years of Age	0.09	0.08
20 to 34 Years of Age	0.72*	0.74
35 Years of Age or Older	0.14	0.13
Education		
Less than High School	0.34***	0.39
High School Graduate / GED	0.44	0.43
Bachelor's Degree	0.03	0.03
Other Degree	0.11***	0.08
Education Unknown	0.08	0.08
Relationship Status		
Married	0.22***	0.32
Living with a Partner	0.35***	0.39
In a Relationship, Not Living Together	0.23***	0.19
Not in a Relationship	0.19***	0.10
Employment/School		
Working, Not in School	0.33	0.32
In School, Not Working	0.10	0.09

Measure	Depression Status	
	Depressed	Not Depressed
Working and in School	0.05	0.04
Neither Working nor in School	0.51**	0.54
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.31**	0.35
Prior Preterm Birth	0.15***	0.11
No Prior Preterm Birth	0.53	0.54
Prior Low Birth Weight		
No Prior Birth	0.31**	0.35
Prior Low Birth Weight Birth	0.06*	0.05
No Prior Low Birth Weight Birth	0.52	0.53
Prior Low Birth Weight Unknown	0.10***	0.07
Prior C-Section		
No Prior Birth	0.31**	0.35
Prior C-Section	0.18***	0.15
No Prior C-Section	0.51	0.50
Interpregnancy Interval		
No Prior Birth	0.31**	0.35
Short Interpregnancy Interval	0.13	0.12
Normal Interpregnancy Interval	0.41	0.39
Interpregnancy Interval Unknown	0.15	0.14
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.59***	0.82
Food Insecure at Intake	0.35***	0.13
Food Insecurity Score Unknown	0.05	0.05
Pregnancy Intent		
Intended Pregnancy	0.28***	0.43
Unintended Pregnancy	0.72***	0.57
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.93	0.94
Pre-Pregnancy Hypertension	0.05*	0.03
Pre-Pregnancy Hypertension Unknown	0.03	0.03
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.90	0.91
Pre-Pregnancy Diabetes	0.04	0.04
Pre-Pregnancy Diabetes Unknown	0.06	0.05
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03**	0.02
Normal Weight (18.5-<25 BMI)	0.30	0.29
Overweight (25-<30 BMI)	0.26***	0.30
Obese (30-<40 BMI)	0.27	0.27
Very Obese (>=40 BMI)	0.06	0.06
BMI Unknown	0.08**	0.06
Smoking		
Did not Smoke at Intake	0.87***	0.93
Smoked at Intake	0.05***	0.02
Smoking Status Unknown	0.08***	0.05
Intimate Partner Violence		
No History of Intimate Partner Violence	0.69***	0.87
History of Intimate Partner Violence	0.31***	0.13
Year		
2013 and 2014	0.25***	0.21
2015	0.41	0.39
2016 and 2017	0.33***	0.40
Model		
Maternity Care Home	0.51***	0.57
Birth Center	0.15	0.16
Group Prenatal Care	0.33***	0.27

Measure	Depression Status	
	Depressed	Not Depressed
Region		
Northeast	0.08***	0.04
Midwest	0.59**	0.56
South	0.13**	0.16
West	0.20***	0.24

Notes: Sample limited to Hispanic women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 36: DESCRIPTIVE STATISTICS FOR THE DEPRESSION ANALYTIC SAMPLE, WOMEN WITH OTHER/MIXED RACE/ETHNICITY

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	270	769
Outcomes	**Means**	
Preterm Birth	0.11**	0.08
Low Birth Weight	0.12*	0.08
C-Section	0.23	0.28
Demographic Characteristics		
Age		
Less than 18 Years Old	0.05	0.03
18 to 19 Years of Age	0.06	0.08
20 to 34 Years of Age	0.81	0.77
35 Years of Age or Older	0.08*	0.11
Education		
Less than High School	0.20*	0.15
High School Graduate / GED	0.55	0.52
Bachelor's Degree	0.08***	0.15
Other Degree	0.14	0.16
Education Unknown	0.03	0.02
Relationship Status		
Married	0.27***	0.41
Living with a Partner	0.35*	0.30
In a Relationship, Not Living Together	0.21*	0.17
Not in a Relationship	0.17**	0.12
Employment/School		
Working, Not in School	0.31	0.35
In School, Not Working	0.14	0.10
Working and in School	0.05	0.07
Neither Working nor in School	0.50	0.48
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.40**	0.48
Prior Preterm Birth	0.16***	0.06
No Prior Preterm Birth	0.44	0.46
Prior Low Birth Weight		
No Prior Birth	0.40**	0.48
Prior Low Birth Weight Birth	0.08***	0.03
No Prior Low Birth Weight Birth	0.44	0.42
Prior Low Birth Weight Unknown	0.07	0.07
Prior C-Section		
No Prior Birth	0.40**	0.48
Prior C-Section	0.14	0.12
No Prior C-Section	0.46*	0.40
Interpregnancy Interval		
No Prior Birth	0.40**	0.48
Short Interpregnancy Interval	0.19**	0.13

Measure	Depression Status	
	Depressed	Not Depressed
Normal Interpregnancy Interval	0.31	0.31
Interpregnancy Interval Unknown	0.10	0.08
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.60***	0.81
Food Insecure at Intake	0.36***	0.15
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.32***	0.41
Unintended Pregnancy	0.68***	0.59
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.90	0.91
Pre-Pregnancy Hypertension	0.04	0.05
Pre-Pregnancy Hypertension Unknown	0.07	0.05
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.86	0.89
Pre-Pregnancy Diabetes	0.01	0.02
Pre-Pregnancy Diabetes Unknown	0.13**	0.09
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.04	0.05
Normal Weight (18.5-<25 BMI)	0.32	0.36
Overweight (25-<30 BMI)	0.24	0.25
Obese (30-<40 BMI)	0.23**	0.17
Very Obese (>=40 BMI)	0.06	0.07
BMI Unknown	0.11	0.10
Smoking		
Did not Smoke at Intake	0.73***	0.86
Smoked at Intake	0.18***	0.06
Smoking Status Unknown	0.09	0.08
Intimate Partner Violence		
No History of Intimate Partner Violence	0.58***	0.84
History of Intimate Partner Violence	0.42***	0.16
Year		
2013 and 2014	0.26	0.22
2015	0.38	0.40
2016 and 2017	0.36	0.38
Model		
Maternity Care Home	0.50*	0.56
Birth Center	0.25	0.25
Group Prenatal Care	0.25**	0.19
Region		
Northeast	0.07	0.06
Midwest	0.63***	0.50
South	0.10	0.11
West	0.19***	0.33

Notes: Sample limited to women with other/mixed race/ethnicity and nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 37: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	7,096	12,332
Outcomes	**Means**	
Breastfeeding Initiation	0.78***	0.82

Measure	Depression Status	
	Depressed	Not Depressed
Demographic Characteristics		
Race/Ethnicity		
White	0.24***	0.29
Hispanic	0.23***	0.33
Black	0.48***	0.35
Other	0.05	0.04
Age		
Less than 18 Years Old	0.06***	0.04
18 to 19 Years of Age	0.09	0.09
20 to 34 Years of Age	0.76	0.77
35 Years of Age or Older	0.09	0.09
Education		
Less than High School	0.26	0.24
High School Graduate / GED	0.57***	0.54
Bachelor's Degree	0.05***	0.08
Other Degree	0.10	0.10
Education Unknown	0.03	0.04
Relationship Status		
Married	0.18***	0.30
Living with a Partner	0.30***	0.33
In a Relationship, Not Living Together	0.28***	0.24
Not in a Relationship	0.24***	0.13
Employment/School		
Working, Not in School	0.34***	0.36
In School, Not Working	0.12*	0.11
Working and in School	0.05	0.05
Neither Working nor in School	0.49**	0.47
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.37**	0.39
Prior Preterm Birth	0.15***	0.11
No Prior Preterm Birth	0.48**	0.50
Prior Low Birth Weight		
No Prior Birth	0.37**	0.39
Prior Low Birth Weight Birth	0.08***	0.06
No Prior Low Birth Weight Birth	0.48	0.48
Prior Low Birth Weight Unknown	0.07	0.07
Prior C-Section		
No Prior Birth	0.37**	0.39
Prior C-Section	0.16***	0.14
No Prior C-Section	0.46	0.47
Interpregnancy Interval		
No Prior Birth	0.37**	0.39
Short Interpregnancy Interval	0.14	0.14
Normal Interpregnancy Interval	0.39*	0.37
Interpregnancy Interval Unknown	0.10	0.10
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.62***	0.83
Food Insecure at Intake	0.35***	0.13
Food Insecurity Score Unknown	0.03*	0.04
Pregnancy Intent		
Intended Pregnancy	0.23***	0.34
Unintended Pregnancy	0.77***	0.66
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.89	0.88
Pre-Pregnancy Hypertension	0.06**	0.05
Pre-Pregnancy Hypertension Unknown	0.05***	0.06

Measure	Depression Status	
	Depressed	Not Depressed
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.87**	0.88
Pre-Pregnancy Diabetes	0.03	0.03
Pre-Pregnancy Diabetes Unknown	0.10**	0.09
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.31	0.31
Overweight (25-<30 BMI)	0.22***	0.24
Obese (30-<40 BMI)	0.25	0.24
Very Obese (>=40 BMI)	0.09***	0.07
BMI Unknown	0.10*	0.11
Smoking		
Did not Smoke at Intake	0.77***	0.86
Smoked at Intake	0.16***	0.08
Smoking Status Unknown	0.07***	0.06
Intimate Partner Violence		
No History of Intimate Partner Violence	0.66***	0.86
History of Intimate Partner Violence	0.34***	0.14
Year		
2013 and 2014	0.25	0.24
2015	0.43	0.42
2016 and 2017	0.32**	0.34
Model		
Maternity Care Home	0.61	0.62
Birth Center	0.21***	0.23
Group Prenatal Care	0.18***	0.15
Region		
Northeast	0.04***	0.03
Midwest	0.71***	0.62
South	0.15***	0.21
West	0.10***	0.14

Notes: Sample limited to women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 38: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, BIRTH CENTER MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	841	2,849
Outcomes	**Means**	
Breastfeeding Initiation	0.91**	0.93
Demographic Characteristics		
Race/Ethnicity		
White	0.51***	0.56
Hispanic	0.20***	0.25
Black	0.22***	0.13
Other	0.07	0.06
Age		
Less than 18 Years Old	0.03	0.02
18 to 19 Years of Age	0.07**	0.05
20 to 34 Years of Age	0.81**	0.84
35 Years of Age or Older	0.09	0.09
Education		
Less than High School	0.17***	0.12
High School Graduate / Ged	0.57	0.54
Bachelor's Degree	0.12***	0.18
Other Degree	0.12	0.14

Measure	Depression Status	
	Depressed	Not Depressed
Education Unknown	0.03	0.02
Relationship Status		
Married	0.32***	0.50
Living with a Partner	0.34	0.32
In a Relationship, Not Living Together	0.17***	0.12
Not in a Relationship	0.17***	0.06
Employment/School		
Working, Not in School	0.36**	0.40
In School, Not Working	0.10	0.08
Working and in School	0.07	0.06
Neither Working nor in School	0.47	0.46
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.38	0.36
Prior Preterm Birth	0.10***	0.07
No Prior Preterm Birth	0.53**	0.57
Prior Low Birth Weight		
No Prior Birth	0.38	0.36
Prior Low Birth Weight Birth	0.01**	0.01
No Prior Low Birth Weight Birth	0.58*	0.62
Prior Low Birth Weight Unknown	0.03***	0.01
Prior C-Section		
No Prior Birth	0.38	0.36
Prior C-Section	0.06	0.05
No Prior C-Section	0.56	0.59
Interpregnancy Interval		
No Prior Birth	0.38	0.36
Short Interpregnancy Interval	0.17**	0.21
Normal Interpregnancy Interval	0.38	0.36
Interpregnancy Interval Unknown	0.07	0.06
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.62***	0.84
Food Insecure at Intake	0.35***	0.13
Food Insecurity Score Unknown	0.02	0.03
Pregnancy Intent		
Intended Pregnancy	0.29***	0.44
Unintended Pregnancy	0.71***	0.56
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.99	0.99
Pre-Pregnancy Hypertension	0.01	0.01
Pre-Pregnancy Hypertension Unknown	0.00	0.00
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	1.00	1.00
Pre-Pregnancy Diabetes	0.00	0.00
Pre-Pregnancy Diabetes Unknown	0.00	0.00
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.04
Normal Weight (18.5-<25 BMI)	0.46	0.46
Overweight (25-<30 BMI)	0.23	0.25
Obese (30-<40 BMI)	0.20	0.19
Very Obese (>=40 BMI)	0.04	0.03
BMI Unknown	0.03	0.03
Smoking		
Did not Smoke at Intake	0.79***	0.86
Smoked at Intake	0.12***	0.06
Smoking Status Unknown	0.09	0.09
Intimate Partner Violence		
No History of Intimate Partner Violence	0.65***	0.84

Measure	Depression Status	
	Depressed	Not Depressed
History of Intimate Partner Violence	0.35***	0.16
Year		
2013 and 2014	0.24	0.26
2015	0.41	0.39
2016 and 2017	0.34	0.36
Region		
Northeast	0.03	0.03
Midwest	0.67**	0.62
South	0.09	0.10
West	0.21***	0.25

Notes: Sample limited to women with nonmissing data participating in the Birth Center model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 39: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, GROUP PRENATAL CARE MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	756	1,847
Outcomes	**Means**	
Breastfeeding Initiation	0.84	0.85
Demographic Characteristics		
Race/Ethnicity		
White	0.17***	0.12
Hispanic	0.31***	0.53
Black	0.47***	0.31
Other	0.06	0.04
Age		
Less than 18 Years Old	0.08***	0.06
18 to 19 Years of Age	0.11	0.10
20 to 34 Years of Age	0.73	0.74
35 Years of Age or Older	0.07**	0.10
Education		
Less than High School	0.23***	0.32
High School Graduate / GED	0.56***	0.49
Bachelor's Degree	0.05	0.05
Other Degree	0.10	0.09
Education Unknown	0.05	0.05
Relationship Status		
Married	0.14***	0.26
Living with a Partner	0.33**	0.37
In a Relationship, Not Living Together	0.29***	0.23
Not in a Relationship	0.24***	0.15
Employment/School		
Working, Not in School	0.31	0.32
In School, Not Working	0.14***	0.10
Working and in School	0.04	0.05
Neither Working nor in School	0.50	0.52
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.49	0.46
Prior Preterm Birth	0.12**	0.10
No Prior Preterm Birth	0.39**	0.44
Prior Low Birth Weight		
No Prior Birth	0.49	0.46
Prior Low Birth Weight Birth	0.05	0.05

Measure	Depression Status	
	Depressed	Not Depressed
No Prior Low Birth Weight Birth	0.31***	0.41
Prior Low Birth Weight Unknown	0.15***	0.08
Prior C-Section		
No Prior Birth	0.49	0.46
Prior C-Section	0.17**	0.14
No Prior C-Section	0.35***	0.40
Interpregnancy Interval		
No Prior Birth	0.49	0.46
Short Interpregnancy Interval	0.11*	0.09
Normal Interpregnancy Interval	0.30**	0.35
Interpregnancy Interval Unknown	0.10	0.10
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.59***	0.81
Food Insecure at Intake	0.37***	0.15
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.22***	0.35
Unintended Pregnancy	0.78***	0.65
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.81**	0.84
Pre-Pregnancy Hypertension	0.07**	0.05
Pre-Pregnancy Hypertension Unknown	0.12	0.11
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.63***	0.73
Pre-Pregnancy Diabetes	0.04	0.04
Pre-Pregnancy Diabetes Unknown	0.32***	0.22
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.04	0.04
Normal Weight (18.5-<25 BMI)	0.28	0.29
Overweight (25-<30 BMI)	0.19***	0.25
Obese (30-<40 BMI)	0.22	0.23
Very Obese (>=40 BMI)	0.06	0.05
BMI Unknown	0.21***	0.14
Smoking		
Did not Smoke at Intake	0.73***	0.84
Smoked at Intake	0.13***	0.04
Smoking Status Unknown	0.14	0.12
Intimate Partner Violence		
No History of Intimate Partner Violence	0.70***	0.87
History of Intimate Partner Violence	0.30***	0.13
Year		
2013 and 2014	0.30	0.28
2015	0.47	0.47
2016 and 2017	0.23	0.25
Region		
Northeast	0.16	0.14
Midwest	0.75**	0.79
South	0.00***	0.00
West	0.10**	0.07

Notes: Sample limited to women with nonmissing data participating in the Group Prenatal Care model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 40: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, MATERNITY CARE HOME MODEL

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	2,499	7.636
Outcomes	**Means**	
Breastfeeding Initiation	0.73***	0.77
Demographic Characteristics		
Race/Ethnicity		
White	0.18***	0.22
Hispanic	0.21***	0.31
Black	0.57***	0.43
Other	0.04	0.04
Age		
Less than 18 Years Old	0.06	0.05
18 to 19 Years of Age	0.09	0.10
20 to 34 Years of Age	0.76	0.76
35 Years of Age or Older	0.09	0.10
Education		
Less than High School	0.29*	0.27
High School Graduate / GED	0.57	0.56
Bachelor's Degree	0.02***	0.04
Other Degree	0.09	0.09
Education Unknown	0.03***	0.04
Relationship Status		
Married	0.14***	0.23
Living with a Partner	0.28***	0.33
In a Relationship, Not Living Together	0.31	0.29
Not in a Relationship	0.27***	0.15
Employment/School		
Working, Not in School	0.34**	0.36
In School, Not Working	0.12	0.12
Working and in School	0.05*	0.05
Neither Working nor in School	0.50***	0.46
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.34***	0.38
Prior Preterm Birth	0.18***	0.14
No Prior Preterm Birth	0.49	0.48
Prior Low Birth Weight		
No Prior Birth	0.34***	0.38
Prior Low Birth Weight Birth	0.11***	0.08
No Prior Low Birth Weight Birth	0.50***	0.44
Prior Low Birth Weight Unknown	0.06***	0.10
Prior C-Section		
No Prior Birth	0.34***	0.38
Prior C-Section	0.20***	0.17
No Prior C-Section	0.47	0.45
Interpregnancy Interval		
No Prior Birth	0.34***	0.38
Short Interpregnancy Interval	0.14	0.13
Normal Interpregnancy Interval	0.41***	0.38
Interpregnancy Interval Unknown	0.11	0.11
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.62***	0.83
Food Insecure at Intake	0.34***	0.13
Food Insecurity Score Unknown	0.03*	0.04
Pregnancy Intent		
Intended Pregnancy	0.22***	0.30

Measure	Depression Status	
	Depressed	Not Depressed
Unintended Pregnancy	0.78***	0.70
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.88***	0.85
Pre-Pregnancy Hypertension	0.07	0.07
Pre-Pregnancy Hypertension Unknown	0.05***	0.08
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.90***	0.88
Pre-Pregnancy Diabetes	0.03	0.03
Pre-Pregnancy Diabetes Unknown	0.07***	0.09
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.02	0.02
Normal Weight (18.5-<25 BMI)	0.28	0.27
Overweight (25-<30 BMI)	0.23	0.23
Obese (30-<40 BMI)	0.28*	0.26
Very Obese (>=40 BMI)	0.11***	0.09
BMI Unknown	0.08***	0.13
Smoking		
Did not Smoke at Intake	0.78***	0.87
Smoked at Intake	0.18***	0.10
Smoking Status Unknown	0.04***	0.03
Intimate Partner Violence		
No History of Intimate Partner Violence	0.66***	0.87
History of Intimate Partner Violence	0.34***	0.13
Year		
2013 and 2014	0.23	0.22
2015	0.42	0.43
2016 and 2017	0.34	0.36
Region		
Northeast	0.00***	0.00
Midwest	0.71***	0.59
South	0.22***	0.31
West	0.06***	0.11

Notes: Sample limited to women with nonmissing data participating in the Maternity Care Home model. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 41: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, WHITE WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,003	3,515
Outcomes	**Means**	
Breastfeeding Initiation	0.82***	0.85
Demographic Characteristics		
Age		
Less than 18 Years Old	0.04***	0.02
18 to 19 Years of Age	0.09	0.08
20 to 34 Years of Age	0.79*	0.82
35 Years of Age or Older	0.08	0.08
Education		
Less than High School	0.18***	0.14
High School Graduate / GED	0.58	0.58
Bachelor's Degree	0.09***	0.14
Other Degree	0.12	0.12
Education Unknown	0.02	0.02
Relationship Status		
Married	0.29***	0.42

Measure	Depression Status	
	Depressed	Not Depressed
Living with a Partner	0.37	0.36
In a Relationship, Not Living Together	0.18***	0.15
Not in a Relationship	0.16***	0.08
Employment/School		
Working, Not in School	0.33***	0.40
In School, Not Working	0.08	0.08
Working and in School	0.05	0.05
Neither Working nor in School	0.54***	0.47
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.39	0.39
Prior Preterm Birth	0.14***	0.10
No Prior Preterm Birth	0.48**	0.51
Prior Low Birth Weight		
No Prior Birth	0.39	0.39
Prior Low Birth Weight Birth	0.05***	0.03
No Prior Low Birth Weight Birth	0.51	0.49
Prior Low Birth Weight Unknown	0.05***	0.08
Prior C-Section		
No Prior Birth	0.39	0.39
Prior C-Section	0.13***	0.09
No Prior C-Section	0.49*	0.52
Interpregnancy Interval		
No Prior Birth	0.39	0.39
Short Interpregnancy Interval	0.17	0.19
Normal Interpregnancy Interval	0.35	0.35
Interpregnancy Interval Unknown	0.09**	0.07
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.65***	0.87
Food Insecure at Intake	0.32***	0.10
Food Insecurity Score Unknown	0.03	0.03
Pregnancy Intent		
Intended Pregnancy	0.26***	0.37
Unintended Pregnancy	0.74***	0.63
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.93***	0.87
Pre-Pregnancy Hypertension	0.03	0.03
Pre-Pregnancy Hypertension Unknown	0.04***	0.10
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.88*	0.86
Pre-Pregnancy Diabetes	0.03*	0.02
Pre-Pregnancy Diabetes Unknown	0.09***	0.12
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.39	0.37
Overweight (25-<30 BMI)	0.22	0.20
Obese (30-<40 BMI)	0.20	0.19
Very Obese (>=40 BMI)	0.06	0.05
BMI Unknown	0.10***	0.15
Smoking		
Did not Smoke at Intake	0.67***	0.79
Smoked at Intake	0.28***	0.17
Smoking Status Unknown	0.06	0.05
Intimate Partner Violence		
No History of Intimate Partner Violence	0.57***	0.82
History of Intimate Partner Violence	0.43***	0.18
Year		
2013 and 2014	0.27	0.28

Measure	Depression Status	
	Depressed	Not Depressed
2015	0.42*	0.45
2016 and 2017	0.31**	0.28
Model		
Maternity Care Home	0.45*	0.48
Birth Center	0.42*	0.46
Group Prenatal Care	0.13***	0.06
Region		
Northeast	0.03*	0.02
Midwest	0.65***	0.50
South	0.18***	0.33
West	0.13	0.14

Notes: Sample limited to white women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 42: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, BLACK WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	1,970	4,255
Outcomes	**Means**	
Breastfeeding Initiation	0.71	0.71
Demographic Characteristics		
Age		
Less than 18 Years Old	0.07	0.06
18 to 19 Years of Age	0.10	0.10
20 to 34 Years of Age	0.77	0.76
35 Years of Age or Older	0.07	0.07
Education		
Less than High School	0.26***	0.20
High School Graduate / GED	0.62	0.62
Bachelor's Degree	0.03***	0.05
Other Degree	0.08**	0.10
Education Unknown	0.02	0.03
Relationship Status		
Married	0.09***	0.14
Living with a Partner	0.24	0.26
In a Relationship, Not Living Together	0.35***	0.39
Not in a Relationship	0.32***	0.21
Employment/School		
Working, Not in School	0.33***	0.37
In School, Not Working	0.14	0.15
Working and in School	0.05***	0.07
Neither Working nor in School	0.48***	0.41
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.38***	0.42
Prior Preterm Birth	0.17***	0.14
No Prior Preterm Birth	0.44	0.44
Prior Low Birth Weight		
No Prior Birth	0.38***	0.42
Prior Low Birth Weight Birth	0.10	0.09
No Prior Low Birth Weight Birth	0.44**	0.41
Prior Low Birth Weight Unknown	0.08	0.08
Prior C-Section		
No Prior Birth	0.38***	0.42
Prior C-Section	0.18**	0.16
No Prior C-Section	0.43	0.42

Measure	Depression Status	
	Depressed	Not Depressed
Interpregnancy Interval		
No Prior Birth	0.38***	0.42
Short Interpregnancy Interval	0.13	0.13
Normal Interpregnancy Interval	0.40**	0.37
Interpregnancy Interval Unknown	0.09	0.08
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.60***	0.82
Food Insecure at Intake	0.36***	0.15
Food Insecurity Score Unknown	0.03	0.04
Pregnancy Intent		
Intended Pregnancy	0.18	0.20
Unintended Pregnancy	0.82	0.80
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.85	0.84
Pre-Pregnancy Hypertension	0.09	0.09
Pre-Pregnancy Hypertension Unknown	0.06*	0.07
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.85*	0.86
Pre-Pregnancy Diabetes	0.03	0.03
Pre-Pregnancy Diabetes Unknown	0.12**	0.10
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.28	0.28
Overweight (25-<30 BMI)	0.21	0.21
Obese (30-<40 BMI)	0.26	0.26
Very Obese (>=40 BMI)	0.12	0.10
BMI Unknown	0.11	0.12
Smoking		
Did not Smoke at Intake	0.78***	0.86
Smoked at Intake	0.15***	0.07
Smoking Status Unknown	0.07	0.06
Intimate Partner Violence		
No History of Intimate Partner Violence	0.70***	0.89
History of Intimate Partner Violence	0.30***	0.11
Year		
2013 and 2014	0.24	0.24
2015	0.44	0.43
2016 and 2017	0.32	0.33
Model		
Maternity Care Home	0.72***	0.78
Birth Center	0.10	0.09
Group Prenatal Care	0.18***	0.13
Region		
Northeast	0.03	0.02
Midwest	0.81	0.80
South	0.13	0.14
West	0.04	0.04

Notes: Sample limited to black women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 43: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, HISPANIC WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	929	4,044
Outcomes	**Means**	
Breastfeeding Initiation	0.88*	0.90
Demographic Characteristics		
Age		
Less than 18 Years Old	0.06	0.05
18 to 19 Years of Age	0.08	0.08
20 to 34 Years of Age	0.73	0.74
35 Years of Age or Older	0.13	0.13
Education		
Less than High School	0.34***	0.39
High School Graduate / GED	0.46*	0.43
Bachelor's Degree	0.03	0.04
Other Degree	0.10**	0.08
Education Unknown	0.08	0.07
Relationship Status		
Married	0.24***	0.34
Living with a Partner	0.36*	0.39
In a Relationship, Not Living Together	0.22***	0.18
Not in a Relationship	0.18***	0.09
Employment/School		
Working, Not in School	0.36**	0.33
In School, Not Working	0.10	0.09
Working and in School	0.06**	0.04
Neither Working nor in School	0.48***	0.54
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.32	0.35
Prior Preterm Birth	0.12	0.10
No Prior Preterm Birth	0.56	0.55
Prior Low Birth Weight		
No Prior Birth	0.32	0.35
Prior Low Birth Weight Birth	0.06	0.05
No Prior Low Birth Weight Birth	0.54	0.54
Prior Low Birth Weight Unknown	0.08***	0.06
Prior C-Section		
No Prior Birth	0.32	0.35
Prior C-Section	0.17	0.15
No Prior C-Section	0.51	0.51
Interpregnancy Interval		
No Prior Birth	0.32	0.35
Short Interpregnancy Interval	0.12	0.11
Normal Interpregnancy Interval	0.40	0.39
Interpregnancy Interval Unknown	0.15	0.15
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.61***	0.81
Food Insecure at Intake	0.35***	0.13
Food Insecurity Score Unknown	0.05	0.05
Pregnancy Intent		
Intended Pregnancy	0.30***	0.44
Unintended Pregnancy	0.70***	0.56
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.93*	0.94
Pre-Pregnancy Hypertension	0.04	0.03
Pre-Pregnancy Hypertension Unknown	0.03	0.03
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.90**	0.93

Measure	Depression Status	
	Depressed	Not Depressed
Pre-Pregnancy Diabetes	0.04	0.03
Pre-Pregnancy Diabetes Unknown	0.06**	0.04
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.02
Normal Weight (18.5-<25 BMI)	0.31	0.29
Overweight (25-<30 BMI)	0.25***	0.30
Obese (30-<40 BMI)	0.29	0.27
Very Obese (>=40 BMI)	0.06	0.06
BMI Unknown	0.06	0.06
Smoking		
Did not Smoke at Intake	0.88***	0.93
Smoked at Intake	0.04***	0.01
Smoking Status Unknown	0.08***	0.05
Intimate Partner Violence		
No History of Intimate Partner Violence	0.70***	0.87
History of Intimate Partner Violence	0.30***	0.13
Year		
2013 and 2014	0.25***	0.20
2015	0.43*	0.40
2016 and 2017	0.32***	0.40
Model		
Maternity Care Home	0.57	0.58
Birth Center	0.18	0.18
Group Prenatal Care	0.25	0.24
Region		
Northeast	0.05**	0.03
Midwest	0.59*	0.56
South	0.18	0.20
West	0.18*	0.21

Notes: Sample limited to Hispanic women with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 44: DESCRIPTIVE STATISTICS FOR THE DEPRESSION BREASTFEEDING ANALYTIC SAMPLE, MIXED/OTHER WOMEN

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	194	518
Outcomes	**Means**	
Breastfeeding Initiation	0.86	0.90
Demographic Characteristics		
Age		
Less than 18 Years Old	0.05	0.03
18 to 19 Years of Age	0.07	0.08
20 to 34 Years of Age	0.80	0.81
35 Years of Age or Older	0.09	0.09
Education		
Less than High School	0.18*	0.13
High School Graduate / GED	0.57	0.54
Bachelor's Degree	0.07***	0.15
Other Degree	0.15	0.15
Education Unknown	0.03	0.02
Relationship Status		
Married	0.27***	0.42
Living with a Partner	0.34	0.29
In a Relationship, Not Living Together	0.23**	0.16
Not in a Relationship	0.15	0.13

Measure	Depression Status	
	Depressed	Not Depressed
Employment/School		
Working, Not in School	0.32	0.36
In School, Not Working	0.16**	0.10
Working and in School	0.05*	0.08
Neither Working nor in School	0.47	0.45
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.43	0.47
Prior Preterm Birth	0.13***	0.07
No Prior Preterm Birth	0.43	0.46
Prior Low Birth Weight		
No Prior Birth	0.43	0.47
Prior Low Birth Weight Birth	0.07**	0.03
No Prior Low Birth Weight Birth	0.43	0.44
Prior Low Birth Weight Unknown	0.07	0.06
Prior C-Section		
No Prior Birth	0.43	0.47
Prior C-Section	0.12	0.12
No Prior C-Section	0.45	0.41
Interpregnancy Interval		
No Prior Birth	0.43	0.47
Short Interpregnancy Interval	0.18**	0.11
Normal Interpregnancy Interval	0.29	0.34
Interpregnancy Interval Unknown	0.10	0.07
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.63***	0.80
Food Insecure at Intake	0.35***	0.17
Food Insecurity Score Unknown	0.02	0.03
Pregnancy Intent		
Intended Pregnancy	0.34**	0.42
Unintended Pregnancy	0.66**	0.58
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.91	0.92
Pre-Pregnancy Hypertension	0.03	0.03
Pre-Pregnancy Hypertension Unknown	0.06	0.05
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.86	0.89
Pre-Pregnancy Diabetes	0.01	0.02
Pre-Pregnancy Diabetes Unknown	0.13	0.09
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.05	0.05
Normal Weight (18.5-<25 BMI)	0.31	0.36
Overweight (25-<30 BMI)	0.24	0.24
Obese (30-<40 BMI)	0.23*	0.17
Very Obese (>=40 BMI)	0.06	0.07
BMI Unknown	0.11	0.11
Smoking		
Did not Smoke at Intake	0.75***	0.86
Smoked at Intake	0.16***	0.06
Smoking Status Unknown	0.09	0.08
Intimate Partner Violence		
No History of Intimate Partner Violence	0.59***	0.83
History of Intimate Partner Violence	0.41***	0.17
Year		
2013 and 2014	0.22	0.22
2015	0.39	0.41
2016 and 2017	0.39	0.38

Measure	Depression Status	
	Depressed	Not Depressed
Model		
Maternity Care Home	0.48	0.54
Birth Center	0.30	0.31
Group Prenatal Care	0.22**	0.15
Region		
Northeast	0.05	0.03
Midwest	0.66***	0.54
South	0.12	0.12
West	0.16***	0.30

Notes: Sample limited to women with other/mixed race/ethnicity with nonmissing data. Significance calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicates significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level for the difference in means from Maternity Care Homes. One caret (^) indicates significance at the 0.1 level; two carets (^^) indicates significance at the 0.05 level; and three carets (^^^) indicates significance at the 0.01 level for the difference in means from Group Prenatal Care.

TABLE M. 45: CONSTRUCTION OF THE ANALYTIC SAMPLE FOR DEPRESSION CORRELATES ANALYSIS

Logic for Dropping Observations	# Excluded	# of Remaining Observations
Starting Sample: Number of Strong Start participants with PLPE data	-	45,316
Dropping participants without an exit form	831	44,485
Dropping participants without an intake form	2,299	42,186
Dropping participants with a miscarriage or elective termination	1,330	40,856
Dropping participants with multiples	585	40,271
Dropping participants missing depression variable	4,946	35,325
Dropping participants missing any covariates	2,916	32,409
Final analytic sample	-	32,409

TABLE M. 46: DESCRIPTIVE STATISTICS FOR THE DEPRESSION CORRELATES SAMPLE

Measure	Depression Status	
	Depressed	Not Depressed
Sample Size	8,747	23,662
Demographic Characteristics		
Race/Ethnicity		
White	0.24***	0.27
Hispanic	0.22***	0.32
Black	0.49***	0.35
Other	0.05	0.05
Age		
Less than 18 Years Old	0.06***	0.05
18 to 19 Years of Age	0.10***	0.09
20 to 34 Years of Age	0.75***	0.77
35 Years of Age or Older	0.08	0.09
Education		
Less than High School	0.26***	0.25
High School Graduate / GED	0.57***	0.55
Bachelor's Degree	0.04***	0.06
Other Degree	0.09**	0.10
Education Unknown	0.04	0.04
Relationship Status		
Married	0.17***	0.27
Living with a Partner	0.29***	0.33
In a Relationship, Not Living Together	0.29***	0.25
Not in a Relationship	0.25***	0.14
Employment/School		
Working, Not in School	0.31***	0.35
In School, Not Working	0.12**	0.11
Working and in School	0.05	0.06

Measure	Depression Status	
	Depressed	Not Depressed
Neither Working nor in School	0.51***	0.48
Risk Factors from Prior Birth		
Prior Preterm Birth		
No Prior Birth	0.39**	0.40
Prior Preterm Birth	0.16***	0.12
No Prior Preterm Birth	0.45***	0.48
Prior Low Birth Weight		
No Prior Birth	0.39**	0.40
Prior Low Birth Weight Birth	0.07***	0.05
No Prior Low Birth Weight Birth	0.43**	0.44
Prior Low Birth Weight Unknown	0.11***	0.10
Prior C-Section		
No Prior Birth	0.39**	0.40
Prior C-Section	0.13***	0.11
No Prior C-Section	0.48	0.48
Interpregnancy Interval		
No Prior Birth	0.39**	0.40
Short Interpregnancy Interval	0.14	0.14
Normal Interpregnancy Interval	0.36*	0.35
Interpregnancy Interval Unknown	0.11	0.11
Risk Factors from Current Pregnancy		
Food Insecurity		
Not Food Insecure at Intake	0.60***	0.82
Food Insecure at Intake	0.36***	0.13
Food Insecurity Score Unknown	0.04	0.04
Pregnancy Intent		
Intended Pregnancy	0.22***	0.32
Unintended Pregnancy	0.78***	0.68
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	0.83***	0.85
Pre-Pregnancy Hypertension	0.06***	0.05
Pre-Pregnancy Hypertension Unknown	0.10	0.10
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	0.81***	0.84
Pre-Pregnancy Diabetes	0.03*	0.03
Pre-Pregnancy Diabetes Unknown	0.16***	0.13
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.03	0.03
Normal Weight (18.5-<25 BMI)	0.29	0.30
Overweight (25-<30 BMI)	0.21***	0.23
Obese (30-<40 BMI)	0.24	0.23
Very Obese (>=40 BMI)	0.08***	0.07
BMI Unknown	0.15	0.15
Smoking		
Did not Smoke at Intake	0.75***	0.85
Smoked at Intake	0.17***	0.09
Smoking Status Unknown	0.08***	0.06
Intimate Partner Violence		
No History of Intimate Partner Violence	0.66***	0.85
History of Intimate Partner Violence	0.34***	0.15
Anxiety		
No Anxiety at Intake	0.24***	0.18
Anxiety at Intake	0.21***	0.80
Unknown Anxiety at Intake	0.79***	0.20
Year		
2013 and 2014	0.22**	0.21
2015	0.33**	0.34
2016 and 2017	0.24***	0.27

Measure	Depression Status	
	Depressed	Not Depressed
Model		
Maternity Care Home	0.21***	0.18
Birth Center	0.59***	0.62
Group Prenatal Care	0.17***	0.20
Region		
Northeast	0.07***	0.04
Midwest	0.69***	0.60
South	0.12***	0.19
West	0.12***	0.17

Notes: Sample limited to women with nonmissing data. Significance of the difference in means from women who are not depressed calculated using pairwise comparison of means test. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level.

APPENDIX N: REGRESSION-ADJUSTED OUTCOMES – FULL REGRESSION RESULTS

INTERMEDIATE OUTCOMES ANALYSIS

TABLE N. 1: FULL INTERMEDIATE OUTCOMES REGRESSION RESULTS

Measure	Gestational Diabetes	Preeclampsia
Model		
Maternity Care Home	-	-
Birth Center	-0.04***	-0.02***
Group Prenatal Care	-0.02**	0.00
Race		
Non-Hispanic White	-	-
Hispanic	0.01***	0.00
Non-Hispanic Black	-0.02***	0.01
Non-Hispanic Other / Multiple	0.02*	0.00
Age		
<18 Years of Age	-	-
18-19 Years of Age	0.01*	0.00
20-34 Years of Age	0.03***	0.00
35 or More Years of Age	0.10***	0.02*
Education		
Less than High School	-	-
High School Degree or GED	-0.01***	0.00
Bachelor's Degree	-0.01	-0.01
Other Degree	0.00	0.00
Unknown Education	0.00	0.00
Relationship Status		
Married	-	-
Living with Partner	-0.02***	0.00
In a Relationship Not Living Together	-0.01***	0.00
Not in a Relationship	-0.02***	0.01**
Unknown Relationship Status	-0.02**	0.00
Employment and School Status		
Working, Not in School	-	-
In School, Not Working	-0.01	-0.01
Working and in School	-0.01*	-0.01
Neither Working nor in School	0.00	0.00
Unknown Employment / School Status	0.00	0.00
Prior Preterm Birth		
No Prior Birth	-	-
Prior Preterm Birth	0.00	-0.01
No Prior Preterm Birth	0.00	-0.03***
Prior Low Birth Weight Birth		
No Prior Birth	-	-
Prior Low Birth Weight Birth	0.00	0.02**
No Prior Low Birth Weight Birth	0.01	0.00
Unknown Prior Low Birth Weight Birth	N/A	N/A
Prior C-Section		
No Prior Birth	-	-
Prior C-Section Birth	0.01**	0.01***
No Prior C-Section Birth	N/A	N/A
Interpregnancy Interval		
No Prior Birth	-	-
< 18 Months	-0.02***	-0.01***
>= 18 Months	0.00	0.00
Unknown Interpregnancy Interval	N/A	N/A
Depression		
Not Depressed	-	-
Depressed	-0.01	0.00
Unknown Depression	0.00	0.00
Anxiety		
No Anxiety	-	-

Measure	Gestational Diabetes	Preeclampsia
Anxiety	0.00	0.00
Unknown Anxiety	-0.01	0.00
Food Insecurity		
No Food Insecurity	-	-
Food Insecurity	0.01	-0.01**
Unknown Food Insecurity	0.00	0.01
Pregnancy Intention		
Intended Pregnancy	-	-
Unintended Pregnancy	0.00	0.00
Unknown Pregnancy Intent	-0.02**	0.00
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	-	-
Pre-Pregnancy Hypertension	0.01	0.18***
Unknown Pre-Pregnancy Hypertension	0.00	0.03***
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	-	-
Pre-Pregnancy Diabetes	0.17**	0.05**
Unknown Pre-Pregnancy Diabetes	0.02	0.00
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.00	0.00
Normal (18.5-<25 BMI)	-	-
Overweight (25-<30 BMI)	0.02***	0.01***
Obese (30-<40 BMI)	0.06***	0.02***
Very Obese (>=40 BMI)	0.08***	0.04***
BMI Missing	0.01**	0.00
Smoking		
Did not Report Smoking at Intake	-	-
Reported Smoking at Intake	0.00	-0.01***
Unknown Smoking Status	0.00	-0.01**
Intimate Partner Violence		
No History of Intimate Partner Violence	-	-
History of Intimate Partner Violence	0.00	0.00
Unknown History of Intimate Partner Violence	0.02	0.00
Year		
2013-2014	-	-
2015	0.00	0.00
2016-2017	0.01	0.00
Unknown Year	-0.01	-0.02***
Region		
South	-	-
Northeast	0.01	-0.01
Midwest	0.00	-0.01*
West	0.02*	0.01*
Constant	0.03***	0.05***
Sample Size	**32,593**	**32,593**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 2: FULL INTERMEDIATE OUTCOMES REGRESSION RESULTS EXCLUDING MUSC, UAB, AND UPR

Measure	Gestational Diabetes	Preeclampsia
Model		
Maternity Care Home	-	-
Birth Center	-0.04***	-0.01***
Group Prenatal Care	-0.03**	0.01
Race		
Non-Hispanic White	-	-
Hispanic	0.01**	0.00
Non-Hispanic Black	-0.02***	0.01

Measure	Gestational Diabetes	Preeclampsia
Non-Hispanic Other / Multiple	0.02*	0.00
Age		
<18 Years of Age	-	-
18-19 Years of Age	0.01	0.00
20-34 Years of Age	0.03***	0.00
35 or More Years of Age	0.10***	0.01
Education		
Less than High School	-	-
High School Degree or GED	-0.01***	0.00
Bachelor's Degree	-0.01	0.00
Other Degree	0.00	0.00
Unknown Education	0.00	0.00
Relationship Status		
Married	-	-
Living with Partner	-0.01***	0.01*
In a Relationship Not Living Together	-0.01**	0.00
Not in a Relationship	-0.02***	0.01**
Unknown Relationship Status	-0.02*	0.00
Employment and School Status		
Working, Not in School	-	-
In School, Not Working	-0.01	-0.01*
Working and in School	-0.01**	-0.01
Neither Working nor in School	0.01*	0.00
Unknown Employment / School Status	0.00	0.00
Prior Preterm Birth		
No Prior Birth	-	-
Prior Preterm Birth	0.00	-0.01
No Prior Preterm Birth	0.00	-0.04***
Prior Low Birth Weight Birth		
No Prior Birth	-	-
Prior Low Birth Weight Birth	0.00	0.03**
No Prior Low Birth Weight Birth	0.01	0.00
Unknown Prior Low Birth Weight Birth	N/A	N/A
Prior C-Section		
No Prior Birth	-	-
Prior C-Section Birth	0.01**	0.01***
No Prior C-Section Birth	N/A	N/A
Interpregnancy Interval		
No Prior Birth	-	-
< 18 Months	-0.02***	-0.01**
>= 18 Months	0.00	0.00
Unknown Interpregnancy Interval	N/A	N/A
Depression		
Not Depressed	-	-
Depressed	-0.01	0.00
Unknown Depression	0.00	0.00
Anxiety		
No Anxiety	-	-
Anxiety	0.00	0.00
Unknown Anxiety	-0.01	0.00
Food Insecurity		
No Food Insecurity	-	-
Food Insecurity	0.00	-0.01*
Unknown Food Insecurity	0.00	0.01
Pregnancy Intention		
Intended Pregnancy	-	-
Unintended Pregnancy	0.00	0.00
Unknown Pregnancy Intent	-0.02*	0.00
Pre-Pregnancy Hypertension		
No Pre-Pregnancy Hypertension	-	-

Measure	Gestational Diabetes	Preeclampsia
Pre-Pregnancy Hypertension	0.01	0.18***
Unknown Pre-Pregnancy Hypertension	-0.01	0.03***
Pre-Pregnancy Diabetes		
No Pre-Pregnancy Diabetes	-	-
Pre-Pregnancy Diabetes	0.24***	0.04*
Unknown Pre-Pregnancy Diabetes	0.02*	-0.01
BMI at First Prenatal Visit		
Underweight (<18.5 BMI)	0.01	0.00
Normal (18.5-<25 BMI)	-	-
Overweight (25-<30 BMI)	0.02***	0.01***
Obese (30-<40 BMI)	0.06***	0.02***
Very Obese (>=40 BMI)	0.08***	0.04***
BMI Missing	0.01*	0.00
Smoking		
Did not Report Smoking at Intake	-	-
Reported Smoking at Intake	0.00	-0.01***
Unknown Smoking Status	0.00	-0.01*
Intimate Partner Violence		
No History of Intimate Partner Violence	-	-
History of Intimate Partner Violence	0.00	0.00
Unknown History of Intimate Partner Violence	0.02	0.00
Year		
2013-2014	-	-
2015	0.00	0.00
2016-2017	0.00	0.00
Unknown Year	-0.01	-0.02***
Region		
South	-	-
Northeast	0.02	-0.01
Midwest	0.00	-0.01
West	0.02*	0.01*
Constant	0.03***	0.04***
Sample Size	**29,902**	**29,902**

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 3: FULL INTERMEDIATE OUTCOMES REGRESSION RESULTS, BY RACE

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Model								
Maternity Care Home	-	-	-	-	-	-	-	-
Birth Center	-0.03***	-0.04***	-0.04***	-0.06***	-0.02***	-0.02***	-0.01**	0.00
Group Prenatal Care	-0.01	-0.03***	0.00	-0.01	-0.02	0.01	0.00	-0.02
Age								
<18 Years of Age	-	-	-	-	-	-	-	-
18-19 Years of Age	0.01	0.00	0.02**	-0.03	-0.01	0.01	0.00	0.04
20-34 Years of Age	0.01	0.01*	0.04***	0.02	-0.02	0.01	0.01	0.01
35 or More Years of Age	0.07***	0.05***	0.13***	0.07*	-0.02	0.02	0.03**	0.04
Education								
Less than High School	-	-	-	-	-	-	-	-
High School Degree or GED	0.00	-0.01	-0.02***	0.05**	0.01	-0.01*	0.00	0.02
Bachelor's Degree	0.01	-0.01	0.00	0.02	0.01	-0.01	-0.01	0.01
Other Degree	0.02	0.02*	-0.03***	0.04	0.01	-0.01	0.00	0.01
Unknown Education	-0.01	0.00	-0.01	0.05	0.00	-0.01	0.00	-0.01

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Relationship Status								
Married	-	-	-	-	-	-	-	-
Living with Partner	-0.01	-0.02**	-0.02**	-0.02	0.00	0.00	0.00	0.02
In a Relationship Not Living Together	0.00	-0.02**	-0.02	-0.03	0.00	-0.01	-0.01	0.01
Not in a Relationship	-0.02**	-0.02**	-0.03***	-0.02	0.02	0.00	0.01	0.03
Unknown Relationship Status	-0.01	-0.02	-0.03	0.03	-0.01	0.00	0.00	0.02
Employment and School Status								
Working, Not in School	-	-	-	-	-	-	-	-
In School, Not Working	-0.01*	-0.01*	-0.01	0.02	-0.02**	-0.01	0.00	-0.01
Working and in School	0.00	-0.02***	0.00	0.01	-0.02**	-0.01	-0.01	0.00
Neither Working nor in School	0.00	0.00	0.01	0.03**	0.00	0.00	0.00	-0.02
Unknown Employment / School Status	0.00	0.00	0.02	-0.06*	0.00	0.00	-0.01	-0.05**
Prior Preterm Birth								
No Prior Birth	-	-	-	-	-	-	-	-
Prior Preterm Birth	-0.04***	0.01	0.02	-0.06	0.00	-0.01	0.00	-0.05*
No Prior Preterm Birth	-0.04**	-0.01	0.01	-0.06*	-0.02*	-0.04***	-0.03**	-0.05**
Prior Low Birth Weight Birth								
No Prior Birth	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	0.04**	-0.02*	0.01	0.10**	0.00	0.02	0.03*	0.08
No Prior Low Birth Weight Birth	0.03*	0.00	0.01	0.05	-0.01	0.00	0.00	0.02
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prior C-Section								
No Prior Birth	-	-	-	-	-	-	-	-
Prior C-Section Birth	0.01	0.01*	0.02	0.02	0.02**	0.02**	0.01	0.02
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval								
No Prior Birth	-	-	-	-	-	-	-	-
< 18 Months	0.01*	-0.01	-0.04***	-0.05*	0.00	-0.02***	-0.01*	0.00
>= 18 Months	0.02***	0.00	-0.02**	-0.01	0.00	0.00	0.00	-0.01
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Depression								
Not Depressed	-	-	-	-	-	-	-	-
Depressed	0.00	0.00	-0.01*	-0.01	0.00	-0.01	0.00	0.03**
Unknown Depression	0.00	0.00	0.00	-0.05**	0.00	0.01	-0.02***	-0.02
Anxiety								
No Anxiety	-	-	-	-	-	-	-	-
Anxiety	0.00	0.00	0.01	-0.02	0.01	0.00	-0.01	-0.01
Unknown Anxiety	0.01	-0.01	-0.02*	-0.06	0.00	0.00	0.01	-0.01
Food Insecurity								
No Food Insecurity	-	-	-	-	-	-	-	-
Food Insecurity	0.00	0.01	0.00	0.02	0.00	-0.01	0.00	-0.02
Unknown Food Insecurity	0.01	0.00	0.00	0.00	0.03*	0.01	0.00	-0.05***
Pregnancy Intention								
Intended Pregnancy	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	-0.02***	0.01	-0.03	-0.01	0.00	0.00	0.00
Unknown Pregnancy Intent	0.00	-0.02	-0.04***	-0.05	0.00	0.01	-0.01	0.00
Pre-Pregnancy Hypertension								
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.03	0.02***	0.00	0.03	0.20***	0.15***	0.22***	0.27***
Unknown Pre-Pregnancy Hypertension	0.00	0.00	0.02	-0.07*	0.02	0.01	0.06**	0.05
Pre-Pregnancy Diabetes								
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	0.17	0.10**	0.25**	0.26**	0.02	0.06*	0.04**	0.05

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Unknown Pre-Pregnancy Diabetes	0.02	0.01	0.02	0.04	-0.01	0.02	-0.01	0.01
BMI at First Prenatal Visit								
Underweight (<18.5 BMI)	-0.01	0.02	0.00	0.03	0.01	0.00	-0.01	0.00
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	0.02***	0.01***	0.03***	0.04***	0.01**	0.00	0.01***	0.01
Obese (30-<40 BMI)	0.05***	0.04***	0.08***	0.07***	0.02***	0.02***	0.02***	0.04***
Very Obese (>=40 BMI)	0.08***	0.06***	0.11***	0.05*	0.04***	0.04***	0.03**	0.02
BMI Missing	0.00	0.02***	0.02	0.00	0.01	-0.02**	0.00	0.03
Smoking								
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.01	-0.01*	0.00	0.00	-0.01**	-0.02**	-0.03***	0.00
Unknown Smoking Status	0.00	0.00	-0.01	0.01	-0.01	-0.01*	-0.01	0.00
Intimate Partner Violence								
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.01	0.01	-0.01	0.00	0.00	0.01	-0.02
Unknown History of Intimate Partner Violence	0.00	0.01	0.04**	0.08	-0.02**	0.00	0.01	0.08
Year								
2013-2014	-	-	-	-	-	-	-	-
2015	0.01*	-0.01	0.00	0.00	0.01**	0.00	-0.01	0.01
2016-2017	0.01	0.00	0.01	-0.01	0.01	-0.01	-0.01	0.02
Unknown Year	0.01	0.00	-0.03***	-0.03	-0.01	-0.03***	-0.03***	0.01
Region								
South	-	-	-	-	-	-	-	-
Northeast	0.04*	0.02	0.01	-0.02	0.00	0.00	-0.01	0.00
Midwest	0.00	0.00	0.01	0.00	-0.01	-0.01	-0.02**	-0.03**
West	0.01	0.03**	0.02	0.04**	0.00	0.03	0.02**	-0.01
Constant	0.01	0.06***	0.01	0.04	0.05***	0.06***	0.04***	0.01
Sample Size	**8,553**	**12,354**	**10,194**	**1,492**	**8,553**	**12,354**	**10,194**	**1,492**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 4: FULL INTERMEDIATE OUTCOMES REGRESSION RESULTS, BY RACE EXCLUDING MUSC, UAB, AND UPR

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Model								
Maternity Care Home	-	-	-	-	-	-	-	-
Birth Center	-0.03***	-0.04***	-0.03***	-0.06***	-0.02**	-0.02**	-0.01**	0.00
Group Prenatal Care	-0.01	-0.03***	0.00	-0.02	-0.01	0.02	0.03*	-0.02
Age								
<18 Years of Age	-	-	-	-	-	-	-	-
18-19 Years of Age	0.00	0.00	0.01	-0.03	-0.02	0.01	-0.01	0.04
20-34 Years of Age	0.01	0.02*	0.04***	0.02	-0.03*	0.01	0.00	0.01
35 or More Years of Age	0.06***	0.05***	0.13***	0.07*	-0.03*	0.01	0.03**	0.04
Education								
Less than High School	-	-	-	-	-	-	-	-
High School Degree or GED	0.00	-0.01	-0.02***	0.05**	0.01	-0.01*	0.01	0.02
Bachelor's Degree	0.01	0.00	-0.01	0.02	0.01*	0.00	0.00	0.01
Other Degree	0.02*	0.01	-0.03***	0.05	0.01	-0.01	0.01	0.01
Unknown Education	0.00	0.00	0.00	0.05	0.00	0.00	0.01	-0.01
Relationship Status								
Married	-	-	-	-	-	-	-	-
Living with Partner	-0.01	-0.02**	-0.01*	-0.02	0.00	0.00	0.01*	0.02

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
In a Relationship Not Living Together	0.00	-0.01*	-0.02	-0.03	0.00	-0.01	-0.01	0.01
Not in a Relationship	-0.02***	-0.02**	-0.02***	-0.02	0.01	0.00	0.01	0.03
Unknown Relationship Status	-0.02	-0.02	-0.01	0.03	-0.01	-0.01	-0.01	0.02
Employment and School Status								
Working, Not in School	-	-	-	-	-	-	-	-
In School, Not Working	-0.01	0.00	-0.01	0.02	-0.02**	-0.01	-0.01	-0.01
Working and in School	0.00	-0.03***	0.00	0.01	-0.01**	-0.01	-0.01	0.01
Neither Working nor in School	0.00	0.00	0.01	0.03*	0.00	0.00	0.00	-0.01
Unknown Employment / School Status	0.00	0.00	0.00	-0.06*	0.00	0.01	-0.01	-0.05**
Prior Preterm Birth								
No Prior Birth	-	-	-	-	-	-	-	-
Prior Preterm Birth	-0.05***	0.02	0.01	-0.06	-0.01	-0.01	0.00	-0.06**
No Prior Preterm Birth	-0.04**	0.00	0.00	-0.06	-0.02**	-0.04***	-0.04***	-0.07***
Prior Low Birth Weight Birth								
No Prior Birth	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	0.05**	-0.03**	0.01	0.10**	0.02	0.02	0.02	0.08*
No Prior Low Birth Weight Birth	0.03	-0.01	0.01	0.05	0.00	0.00	0.00	0.02
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prior C-Section								
No Prior Birth	-	-	-	-	-	-	-	-
Prior C-Section Birth	0.01	0.01	0.02	0.02	0.01*	0.02**	0.02**	0.02
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval								
No Prior Birth	-	-	-	-	-	-	-	-
< 18 Months	0.02*	-0.01	-0.04***	-0.05*	0.00	-0.02**	-0.01	0.00
>= 18 Months	0.02***	0.00	-0.02*	-0.01	0.00	0.00	0.00	-0.01
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Depression								
Not Depressed	-	-	-	-	-	-	-	-
Depressed	0.00	0.00	-0.01*	-0.01	0.00	-0.01**	0.00	0.03**
Unknown Depression	0.00	0.00	0.00	-0.05**	0.00	0.01	-0.01*	-0.02
Anxiety								
No Anxiety	-	-	-	-	-	-	-	-
Anxiety	0.01	-0.01	0.01	-0.02	0.01	0.00	-0.01	-0.02
Unknown Anxiety	0.02	-0.01	-0.02	-0.06	0.00	0.00	0.01	-0.01
Food Insecurity								
No Food Insecurity	-	-	-	-	-	-	-	-
Food Insecurity	0.00	0.00	0.00	0.02	0.00	-0.01	0.00	-0.02
Unknown Food Insecurity	0.01	0.00	0.00	0.00	0.03*	0.01	0.00	-0.05***
Pregnancy Intention								
Intended Pregnancy	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	-0.01**	0.00	-0.03	0.00	0.01	0.00	0.00
Unknown Pregnancy Intent	0.01	-0.01	-0.04**	-0.05	0.01	0.01	-0.01	0.00
Pre-Pregnancy Hypertension								
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.04	0.02**	0.01	0.04	0.19***	0.13***	0.29***	0.25***
Unknown Pre-Pregnancy Hypertension	-0.01	-0.01	0.01	-0.07*	0.02	0.01	0.07**	0.06
Pre-Pregnancy Diabetes								
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	0.26**	0.14***	0.36***	0.27**	-0.01	0.05	0.05**	0.03
Unknown Pre-Pregnancy Diabetes	0.03	0.02	0.02	0.04	-0.01	0.02	-0.03	0.01

Measure	Gestational Diabetes				Preeclampsia			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other
BMI at First Prenatal Visit								
Underweight (<18.5 BMI)	-0.01	0.02*	-0.01	0.03	0.01	0.00	0.00	0.00
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	0.01***	0.01	0.03***	0.04***	0.01**	0.00	0.01***	0.01
Obese (30-<40 BMI)	0.05***	0.04***	0.08***	0.07***	0.02***	0.02***	0.02***	0.05***
Very Obese (>=40 BMI)	0.08***	0.07***	0.11***	0.06*	0.05***	0.04***	0.04**	0.02
BMI Missing	-0.01	0.02***	0.01	0.00	0.01	-0.02**	0.00	0.04
Smoking								
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.01*	-0.01	-0.01	0.00	-0.01**	-0.02**	-0.03***	0.01
Unknown Smoking Status	0.00	0.00	-0.01	0.01	-0.01	-0.01	-0.01	0.00
Intimate Partner Violence								
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.01	0.01	-0.01	0.00	-0.01	0.01	-0.01
Unknown History of Intimate Partner Violence	0.00	0.01	0.05***	0.08	-0.02**	0.00	0.01	0.08
Year								
2013-2014	-	-	-	-	-	-	-	-
2015	0.01	-0.01	0.00	0.00	0.01**	0.00	-0.01	0.02*
2016-2017	0.01	0.00	0.01	-0.02	0.01	-0.01	-0.01	0.03**
Unknown Year	0.01	-0.01	-0.03***	-0.03	-0.01	-0.03***	-0.03***	0.02
Region								
South	-	-	-	-	-	-	-	-
Northeast	0.04*	0.02	0.01	-0.02	0.00	0.00	-0.04**	0.00
Midwest	0.00	0.00	0.01	0.00	-0.01	0.00	-0.02**	-0.03**
West	0.01	0.04**	0.02	0.04**	0.00	0.03	0.02**	-0.01
Constant	0.01	0.05***	0.01	0.04	0.05***	0.06***	0.04***	0.00
Sample Size	**8,170**	**10,947**	**9,307**	**1,478**	**8,170**	**10,947**	**9,307**	**1,478**

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

BIRTH OUTCOMES ANALYSIS

TABLE N. 5: FULL BIRTH OUTCOMES REGRESSION RESULTS

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
Model					
Maternity Care Home	-	-	-	-	-
Birth Center	-0.05***	-0.04***	-0.07***	-0.09***	0.10**
Group Prenatal Care	-0.02	-0.01	0.00	0.01	0.02
Race					
Non-Hispanic White	-	-	-	-	-
Hispanic	0.02*	0.01	-0.01	0.00	0.02
Non-Hispanic Black	0.01	0.03***	0.01	0.02	0.01
Non-Hispanic Other / Multiple	0.00	0.02**	0.00	0.01	-0.04
Age					
<18 Years of Age	-	-	-	-	-
18-19 Years of Age	-0.02	0.00	0.02	0.02	-0.27***
20-34 Years of Age	0.00	0.02**	0.08***	0.09***	-0.25**

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
35 or More Years of Age	0.03**	0.04***	0.14***	0.23***	-0.27***
Education					
Less than High School	-	-	-	-	-
High School Degree or GED	0.00	0.00	0.00	-0.02*	-0.01
Bachelor's Degree	-0.01	-0.01	0.00	-0.01	0.02
Other Degree	-0.01	-0.01	0.01	-0.01	0.00
Unknown Education	-0.01	-0.01	-0.01	-0.04*	-0.01
Relationship Status					
Married	-	-	-	-	-
Living with Partner	0.01	0.01	0.01	0.01	-0.02
In a Relationship Not Living Together	0.00	0.01	0.01	0.01	0.00
Not in a Relationship	0.01*	0.02***	0.01	0.01	0.00
Unknown Relationship Status	0.02	0.02	0.03*	0.01	-0.06
Employment and School Status					
Working, Not in School	-	-	-	-	-
In School, Not Working	0.00	0.00	-0.02**	-0.03**	0.03
Working and in School	-0.02***	-0.01	-0.02*	-0.04**	0.05
Neither Working nor in School	0.01**	0.01*	0.00	0.00	0.00
Unknown Employment / School Status	0.02	0.03**	0.01	0.00	0.01
Prior Preterm Birth					
No Prior Birth	-	-	-	-	-
Prior Preterm Birth	0.12***	0.06***	-0.12***	N/A	0.03*
No Prior Preterm Birth	0.01	-0.01	-0.13***	N/A	N/A
Prior Low Birth Weight Birth					
No Prior Birth	-	-	-	-	-
Prior Low Birth Weight Birth	0.03*	0.07***	-0.02	N/A	-0.05*
No Prior Low Birth Weight Birth	-0.02**	-0.03***	-0.04**	N/A	-0.04*
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A
Prior C-Section					
No Prior Birth	-	-	-	-	-
Prior C-Section Birth	0.00	0.00	0.66***	N/A	N/A
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval					
No Prior Birth	-	-	-	-	-
< 18 Months	-0.01	-0.01	-0.03***	N/A	0.03
>= 18 Months	-0.02***	-0.01	-0.02*	N/A	-0.01
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A
Depression					
Not Depressed	-	-	-	-	-
Depressed	0.01	0.00	-0.01	0.00	0.01
Unknown Depression	0.00	0.00	0.00	0.00	-0.04*
Anxiety					
No Anxiety	-	-	-	-	-
Anxiety	0.01**	0.01***	0.02***	0.03***	-0.02
Unknown Anxiety	0.01	0.01	0.01	0.02	-0.06
Food Insecurity					
No Food Insecurity	-	-	-	-	-
Food Insecurity	0.00	0.00	0.00	0.01	0.01
Unknown Food Insecurity	0.00	-0.01*	-0.01	0.01	0.04*
Pregnancy Intention					
Intended Pregnancy	-	-	-	-	-
Unintended Pregnancy	0.00	-0.01	-0.02***	-0.02*	0.00
Unknown Pregnancy Intent	0.00	-0.01	-0.02	-0.03	-0.03
Pre - Pregnancy Hypertension					
No Pre-Pregnancy Hypertension	-	-	-	-	-
Pre-Pregnancy Hypertension	0.12***	0.11***	0.06***	0.10***	-0.05***
Unknown Pre-Pregnancy Hypertension	0.03**	0.02	0.06***	0.02	-0.05

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
Pre-Pregnancy Diabetes					
No Pre-Pregnancy Diabetes	-	-	-	-	-
Pre-Pregnancy Diabetes	0.09***	0.00	0.08***	0.06	-0.05**
Unknown Pre-Pregnancy Diabetes	-0.01	-0.01	-0.04	-0.02	0.01
BMI at First Prenatal Visit					
Underweight (<18.5 BMI)	0.03***	0.06***	-0.04***	-0.04**	0.05
Normal (18.5-<25 BMI)	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01*	-0.02***	0.04***	0.06***	-0.07***
Obese (30-<40 BMI)	0.00	-0.02***	0.08***	0.12***	-0.10***
Very Obese (>=40 BMI)	0.00	-0.03***	0.15***	0.23***	-0.15***
BMI Missing	0.01	0.00	0.08***	0.07***	-0.08**
Smoking					
Did not Report Smoking at Intake	-	-	-	-	-
Reported Smoking at Intake	0.01*	0.04***	0.02***	0.01	-0.03**
Unknown Smoking Status	-0.01	-0.01	0.00	0.03*	0.01
Intimate Partner Violence					
No History of Intimate Partner Violence	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.00	0.00	0.00	-0.01
Unknown History of Intimate Partner Violence	0.01	0.00	-0.01	-0.04	0.07
Year					
2013-2014	-	-	-	-	-
2015	-0.01**	-0.01	-0.01**	-0.03***	-0.01
2016-2017	-0.03***	-0.03***	-0.03***	-0.04***	0.02
Region					
South	-	-	-	-	-
Northeast	-0.01	-0.01	0.01	0.00	0.00
Midwest	-0.01	-0.01	0.02	0.02	-0.02
West	0.01	-0.01	-0.01	-0.01	0.05
Constant	0.10***	0.08***	0.18***	0.18***	0.55***
Sample Size	**28,332**	**28,332**	**28,332**	**10,834**	**4,141**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 6: FULL BIRTH OUTCOMES REGRESSION RESULTS EXCLUDING MUSC, UAB, AND UPR

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
Model					
Maternity Care Home	-	-	-	-	-
Birth Center	-0.04***	-0.03***	-0.07***	-0.09***	0.10**
Group Prenatal Care	-0.02**	-0.02***	-0.02	-0.02	0.05
Race					
Non-Hispanic White	-	-	-	-	-
Hispanic	0.01**	0.01	-0.02**	-0.01	0.02
Non-Hispanic Black	0.02**	0.04***	0.01	0.03*	0.00
Non-Hispanic Other / Multiple	0.00	0.03**	0.01	0.02	-0.05
Age					
<18 Years of Age	-	-	-	-	-
18-19 Years of Age	-0.02*	0.00	0.02	0.02	-0.21**
20-34 Years of Age	-0.01	0.02*	0.08***	0.09***	-0.21**
35 or More Years of Age	0.02	0.04***	0.14***	0.23***	-0.23**
Education					
Less than High School	-	-	-	-	-
High School Degree or GED	-0.01**	-0.01*	-0.01	-0.03**	-0.02
Bachelor's Degree	-0.02***	-0.02***	-0.01	-0.02	0.04

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
Other Degree	-0.02***	-0.02***	-0.01	-0.02	-0.01
Unknown Education	-0.01	-0.01	-0.01	-0.05**	-0.02
Relationship Status					
Married	-	-	-	-	-
Living with Partner	0.00	0.00	0.00	0.00	-0.02
In a Relationship Not Living Together	0.00	0.00	0.01	0.00	0.00
Not in a Relationship	0.01**	0.02**	0.01	0.00	-0.01
Unknown Relationship Status	0.02	0.01	0.02	-0.01	-0.05
Employment and School Status					
Working, Not in School	-	-	-	-	-
In School, Not Working	-0.01	0.00	-0.02***	-0.03**	0.04
Working and in School	-0.02**	-0.01	-0.02	-0.05***	0.02
Neither Working nor in School	0.01*	0.00	0.00	0.00	0.01
Unknown Employment / School Status	0.01	0.03*	0.01	0.01	0.02
Prior Preterm Birth					
No Prior Birth	-	-	-	-	-
Prior Preterm Birth	0.11***	0.06***	-0.13***	N/A	0.03*
No Prior Preterm Birth	0.01	-0.01	-0.13***	N/A	N/A
Prior Low Birth Weight Birth					
No Prior Birth	-	-	-	-	-
Prior Low Birth Weight Birth	0.03*	0.07***	0.00	N/A	-0.06*
No Prior Low Birth Weight Birth	-0.01	-0.02***	-0.02	N/A	-0.04
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A
Prior C-Section					
No Prior Birth	-	-	-	-	-
Prior C-Section Birth	0.00	0.00	0.67***	N/A	N/A
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval					
No Prior Birth	-	-	-	-	-
< 18 Months	-0.01	-0.01*	-0.03***	N/A	0.04**
>= 18 Months	-0.02***	-0.01	-0.02**	N/A	0.00
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A
Depression					
Not Depressed	-	-	-	-	-
Depressed	0.00	0.00	-0.01	0.00	0.01
Unknown Depression	0.00	0.00	0.00	0.00	-0.05**
Anxiety					
No Anxiety	-	-	-	-	-
Anxiety	0.01*	0.01***	0.02***	0.02**	-0.03**
Unknown Anxiety	0.00	0.01	0.01	0.02	-0.04
Food Insecurity					
No Food Insecurity	-	-	-	-	-
Food Insecurity	0.00	-0.01	0.00	0.01	0.02
Unknown Food Insecurity	0.00	-0.01*	-0.01	0.01	0.04*
Pregnancy Intention					
Intended Pregnancy	-	-	-	-	-
Unintended Pregnancy	0.00	-0.01	-0.02***	-0.02	-0.01
Unknown Pregnancy Intent	-0.01	-0.02	-0.02	-0.03	-0.02
Pre Pregnancy Hypertension					
No Pre-Pregnancy Hypertension	-	-	-	-	-
Pre-Pregnancy Hypertension	0.10***	0.09***	0.05***	0.10***	-0.04**
Unknown Pre-Pregnancy Hypertension	0.03*	0.01	0.05**	0.01	-0.04
Pre Pregnancy Diabetes					
No Pre-Pregnancy Diabetes	-	-	-	-	-
Pre-Pregnancy Diabetes	0.05*	-0.01	0.07**	0.03	-0.05**
Unknown Pre-Pregnancy Diabetes	0.00	0.01	-0.01	-0.01	0.00
BMI at First Prenatal Visit					
Underweight (<18.5 BMI)	0.03***	0.06***	-0.04***	-0.04**	0.05

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	VBAC
Normal (18.5-<25 BMI)	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01**	-0.02***	0.03***	0.05***	-0.06***
Obese (30-<40 BMI)	0.00	-0.02***	0.08***	0.12***	-0.09***
Very Obese (>=40 BMI)	0.00	-0.02***	0.15***	0.22***	-0.15***
BMI Missing	0.01	-0.01	0.06***	0.06***	-0.07**
Smoking					
Did not Report Smoking at Intake	-	-	-	-	-
Reported Smoking at Intake	0.01**	0.04***	0.02**	0.00	-0.03*
Unknown Smoking Status	0.00	0.00	0.00	0.03	0.02
Intimate Partner Violence					
No History of Intimate Partner Violence	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.00	0.00	0.00	-0.01
Unknown History of Intimate Partner Violence	0.01	0.00	-0.01	-0.03	0.06
Year					
2013-2014	-	-	-	-	-
2015	-0.01**	-0.01*	-0.01**	-0.03**	-0.02
2016-2017	-0.02***	-0.02***	-0.03***	-0.05***	0.01
Region					
South	-	-	-	-	-
Northeast	0.00	0.01	0.03	0.02	-0.01
Midwest	-0.01	0.00	0.02	0.02	-0.02
West	0.01	0.00	0.00	-0.01	0.04
Constant	0.10***	0.08***	0.19***	0.19***	0.51***
Sample Size	**25,792**	**25,792**	**25,792**	**9,912**	**3,586**

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 7: FULL BIRTH OUTCOMES REGRESSION RESULTS, BY RACE

Measure	Preterm Birth				Low Birth Weight				C-Section Birth			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Model												
Maternity Care Home	-	-	-	-	-	-	-	-	-	-	-	-
Birth Center	-0.06***	-0.05***	-0.05***	-0.02	-0.04***	-0.05***	-0.02***	-0.03	-0.08***	-0.05***	-0.04**	-0.04*
Group Prenatal Care	-0.05***	-0.02	0.00	0.02	-0.02*	-0.03**	0.02	0.04	0.03	-0.03	0.04	-0.02
Age												
<18 Years of Age	-	-	-	-	-	-	-	-	-	-	-	-
18-19 Years of Age	0.00	-0.01	-0.03	-0.01	0.02	0.01	-0.02	0.05	-0.01	0.00	0.04*	0.10
20-34 Years of Age	0.02	0.00	-0.01	0.00	0.04**	0.03**	0.00	0.04	0.07**	0.07***	0.10***	0.15**
35 or More Years of Age	0.02	0.05**	0.02	0.06	0.05**	0.08***	0.02	0.06	0.11***	0.13***	0.18***	0.19**
Education												
Less than High School	-	-	-	-	-	-	-	-	-	-	-	-
High School Degree or GED	-0.02	-0.01	0.01	-0.02	-0.01	-0.01	0.01	0.01	-0.01	-0.01	0.00	-0.01
Bachelor's Degree	-0.02*	-0.02	0.00	-0.02	-0.02	-0.03*	-0.02	0.01	-0.01	0.01	0.04	-0.07
Other Degree	-0.01	-0.04***	0.00	0.07**	-0.01	-0.05***	0.01	0.00	-0.01	0.01	0.03	-0.02
Unknown Education	0.01	-0.04***	0.01	-0.05	0.00	-0.04**	0.02*	-0.06	0.02	-0.04*	0.00	-0.01
Relationship Status												
Married	-	-	-	-	-	-	-	-	-	-	-	-
Living with Partner	0.01	0.02**	0.00	0.01	0.01	0.02*	0.00	0.01	0.02**	0.00	0.01	-0.01
In a Relationship Not Living Together	0.01	0.02**	-0.02**	0.01	0.01	0.02**	-0.01	0.00	0.05**	0.00	0.00	-0.03
Not in a Relationship	0.02	0.02**	-0.01	0.10***	0.01	0.04***	-0.01	0.04	0.03	0.01	0.01	0.01
Unknown Relationship Status	0.00	0.04*	0.01	-0.03	0.00	0.05**	0.02	-0.11***	0.02	0.04	-0.01	-0.03
Employment and School Status												
Working, Not in School	-	-	-	-	-	-	-	-	-	-	-	-
In School, Not Working	-0.01	-0.01	0.01	-0.01	0.00	-0.01	0.01	0.03	-0.04**	-0.02	0.00	-0.01
Working and in School	-0.02**	-0.03**	-0.01	0.00	0.00	-0.02**	0.00	0.01	-0.02	-0.01	-0.04	-0.05
Neither Working nor in School	0.02*	0.01	0.01	0.00	0.01	0.01	0.00	0.02	-0.01*	0.00	-0.01	0.02
Unknown Employment / School Status	0.01	0.02	0.02	0.08	0.01	0.03	0.02	0.21**	0.00	0.04*	-0.01	-0.01
Prior Preterm Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Preterm Birth	0.13***	0.13***	0.11***	0.13**	0.08***	0.06***	0.05***	0.00	-0.12***	-0.15***	-0.11***	-0.16*
No Prior Preterm Birth	0.01	0.02	-0.01	-0.01	0.02	-0.02	-0.02	-0.07	-0.08**	-0.16***	-0.12***	-0.17**
Prior Low Birth Weight Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	-0.01	0.05**	0.02	0.03	0.06**	0.08***	0.05**	0.19**	-0.02	0.01	-0.02	-0.09
No Prior Low Birth Weight Birth	-0.04**	-0.02	-0.01	0.00	-0.05**	-0.03***	-0.01	-0.02	-0.03	-0.01	-0.05***	-0.07
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prior C-Section												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior C-Section Birth	0.00	-0.01	0.01	0.03	-0.01	0.00	0.00	0.05*	0.67***	0.67***	0.64***	0.70***
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
< 18 Months	0.00	-0.02	0.00	0.00	0.00	-0.02	-0.01	0.03	-0.03*	-0.04***	-0.03**	0.04
>= 18 Months	-0.01	-0.03**	-0.01	-0.03	0.00	-0.02	-0.01	0.02	-0.01	-0.02*	-0.02	0.07**
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Depression												
Not Depressed	-	-	-	-	-	-	-	-	-	-	-	-
Depressed	0.02	0.01	-0.01	0.02	0.01	0.00	0.00	0.01	0.00	-0.01	-0.01	-0.05
Unknown Depression	0.00	0.01	-0.03***	-0.01	-0.01	0.02	-0.02***	0.06	0.03*	-0.02	-0.01	-0.01
Anxiety												
No Anxiety	-	-	-	-	-	-	-	-	-	-	-	-
Anxiety	0.00	0.01	0.03***	0.02	0.01	0.01	0.02**	0.03	0.02*	0.01	0.03**	0.05*

Measure	Preterm Birth				Low Birth Weight				C-Section Birth			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Unknown Anxiety	0.00	-0.01	0.03*	0.05	0.03*	0.00	0.00	-0.02	-0.02	0.00	0.03	0.11**
Food Insecurity												
No Food Insecurity	-	-	-	-	-	-	-	-	-	-	-	-
Food Insecurity	0.00	-0.01	0.00	0.03	0.00	-0.01	0.00	0.00	-0.01	0.01	0.00	-0.03
Unknown Food Insecurity	0.00	0.00	-0.01	0.03	-0.01	-0.01	-0.01	-0.02	-0.02	0.02	-0.03*	-0.01
Pregnancy Intention												
Intended Pregnancy	-	-	-	-	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.01	0.00	-0.04***	-0.02***	-0.04
Unknown Pregnancy Intent	-0.02	0.02	-0.01	0.05	-0.03	0.00	0.00	-0.01	-0.03	-0.05	-0.02	-0.04
Pre-Pregnancy Hypertension												
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.07***	0.13***	0.14***	0.12**	0.08***	0.11***	0.15***	0.08	0.09***	0.06***	0.06***	0.00
Unknown Pre-Pregnancy Hypertension	-0.04	0.05**	0.06**	0.04	-0.03	0.04**	0.06**	-0.05	0.10***	0.03	0.05	0.01
Pre-Pregnancy Diabetes												
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	0.16***	0.07	0.08**	-0.04	0.02	0.00	-0.01	-0.10***	0.11***	0.04	0.14***	-0.04
Unknown Pre-Pregnancy Diabetes	0.00	-0.01	-0.04*	-0.01	0.01	-0.02	-0.04	0.11**	-0.05	0.01	-0.10***	-0.05
BMI at First Prenatal Visit												
Underweight (<18.5 BMI)	0.03*	0.04*	0.01	0.04	0.05**	0.06**	0.08***	0.04	-0.03	-0.03	-0.08***	-0.04
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01	-0.01	0.00	-0.01	-0.02***	-0.03***	-0.01	-0.01	0.04***	0.03***	0.03**	0.06**
Obese (30-<40 BMI)	-0.01	0.00	-0.01	0.02	-0.02***	-0.03***	-0.01	0.00	0.07***	0.09***	0.06***	0.08**
Very Obese (>=40 BMI)	0.00	-0.01	-0.01	0.04	-0.04**	-0.04***	-0.01	0.00	0.14***	0.17***	0.10***	0.17***
BMI Missing	0.02*	0.00	0.03**	-0.01	0.00	-0.01	0.01	-0.03	0.07**	0.05***	0.12***	0.12**
Smoking												
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.01	0.01	0.02	-0.01	0.04***	0.04***	0.06*	-0.02	0.01	0.01	0.02	-0.03
Unknown Smoking Status	0.01	-0.02	0.00	-0.06***	0.01	-0.02	-0.02**	-0.05**	-0.01	0.01	0.00	-0.03
Intimate Partner Violence												
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	-0.01	0.01	0.01	-0.05**	0.00	0.01	0.00	-0.03	0.00	0.02	-0.02*	-0.02
Unknown History of Intimate Partner Violence	-0.01	0.03	0.00	-0.03	-0.01	-0.02	0.04	-0.05**	-0.01	0.02	-0.04	-0.08
Year												
2013-2014	-	-	-	-	-	-	-	-	-	-	-	-
2015	0.01	-0.03***	0.00	0.00	0.00	-0.02**	0.00	0.00	-0.01	-0.01	-0.01	-0.04
2016-2017	-0.02**	-0.05***	-0.01	0.00	-0.02***	-0.04***	-0.01**	0.00	-0.03**	-0.04***	-0.01	-0.04
Region												
South	-	-	-	-	-	-	-	-	-	-	-	-
Northeast	0.01	0.01	-0.04*	0.00	-0.01	0.02	-0.04	0.01	0.02	0.01	0.01	0.01
Midwest	-0.03**	0.01	-0.01	-0.04*	-0.02*	0.00	0.01	0.01	0.00	0.01	0.02	0.10***
West	-0.01	-0.01	0.02	-0.01	-0.01	-0.02	0.00	-0.01	-0.01	0.03	-0.01	-0.01
Constant	0.11***	0.12***	0.10***	0.04	0.07***	0.14***	0.08***	0.03	0.17***	0.23***	0.14***	0.17***
Sample Size	**7,453**	**11,043**	**8,619**	**1,217**	**7,453**	**11,043**	**8,619**	**1,217**	**7,453**	**11,043**	**8,619**	**1,217**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 8: FULL BIRTH OUTCOMES REGRESSION RESULTS, BY RACE EXCLUDING MUSC, UAB, AND UPR

Measure	Preterm Birth				Low Birth Weight				C-Section Birth			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Model												
Maternity Care Home	-	-	-	-	-	-	-	-	-	-	-	-
Birth Center	-0.05***	-0.04***	-0.05***	-0.02	-0.03***	-0.04***	-0.02***	-0.02	-0.08***	-0.06***	-0.05**	-0.05*
Group Prenatal Care	-0.04***	-0.01	-0.04***	0.02	-0.01	-0.02**	-0.02**	0.04	0.03	-0.03**	-0.01	-0.02
Age												
<18 Years of Age	-	-	-	-	-	-	-	-	-	-	-	-
18-19 Years of Age	-0.01	-0.02	-0.02	-0.01	0.01	0.01	0.00	0.05	0.00	0.01	0.03	0.10
20-34 Years of Age	0.00	-0.01	0.00	0.01	0.03*	0.02	0.01	0.04	0.07**	0.07***	0.10***	0.15**
35 or More Years of Age	0.00	0.04*	0.02	0.06	0.04**	0.07***	0.02	0.06	0.10**	0.12***	0.18***	0.19**
Education												
Less than High School	-	-	-	-	-	-	-	-	-	-	-	-
High School Degree or GED	-0.02*	-0.02**	0.00	-0.02	-0.01	-0.02*	0.00	0.00	-0.01	-0.01	-0.01	-0.01
Bachelor's Degree	-0.02*	-0.02	-0.04**	-0.02	-0.02	-0.03	-0.04***	0.01	0.00	0.00	0.02	-0.06
Other Degree	-0.02	-0.04***	-0.02**	0.07**	-0.01	-0.05***	-0.01	0.00	0.00	0.01	-0.02	-0.01
Unknown Education	0.01	-0.05***	0.01	-0.05	-0.01	-0.04**	0.01	-0.07	0.02	-0.05**	-0.01	-0.01
Relationship Status												
Married	-	-	-	-	-	-	-	-	-	-	-	-
Living with Partner	0.00	0.02*	0.00	0.01	0.00	0.01	0.00	0.01	0.02*	-0.01	0.00	-0.01
In a Relationship Not Living Together	0.00	0.02**	-0.02*	0.01	0.01	0.02*	-0.02**	0.00	0.05**	0.00	0.00	-0.03
Not in a Relationship	0.01	0.03**	0.00	0.09**	0.01	0.04***	0.00	0.04	0.03	0.00	0.01	0.02
Unknown Relationship Status	-0.01	0.03	0.02	-0.03	0.00	0.04**	0.00	-0.11***	0.02	0.04	-0.03	-0.03
Employment and School Status												
Working, Not in School	-	-	-	-	-	-	-	-	-	-	-	-
In School, Not Working	-0.02	-0.01	0.01	-0.01	0.00	-0.02**	0.02	0.03	-0.04**	-0.03***	0.00	-0.01
Working and in School	-0.02*	-0.03*	0.00	0.00	0.00	-0.03**	0.00	0.02	-0.01	-0.01	-0.03	-0.05
Neither Working nor in School	0.01*	0.00	0.01*	0.01	0.01	0.00	0.00	0.02	-0.01*	0.00	-0.01	0.02
Unknown Employment / School Status	0.01	0.02	0.00	0.09	0.01	0.03	0.02	0.21**	0.00	0.05*	-0.02	-0.01
Prior Preterm Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Preterm Birth	0.12***	0.13***	0.09***	0.11**	0.08***	0.06***	0.04**	-0.01	-0.13***	-0.15***	-0.13***	-0.15
No Prior Preterm Birth	0.02	0.02	-0.02	-0.02	0.01	-0.01	-0.02	-0.07	-0.09**	-0.16***	-0.14***	-0.15**
Prior Low Birth Weight Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	-0.02	0.04	0.04	0.03	0.05	0.06***	0.06**	0.18**	-0.02	0.01	0.01	-0.10
No Prior Low Birth Weight Birth	-0.04**	-0.01	0.00	0.01	-0.04**	-0.03**	-0.01	-0.02	-0.02	-0.01	-0.02	-0.08
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Prior C-Section												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior C-Section Birth	0.00	-0.01	0.01	0.03	0.00	0.00	-0.01	0.05*	0.67***	0.68***	0.65***	0.70***
No Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Interpregnancy Interval												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
< 18 Months	0.00	-0.02	0.00	0.00	0.00	-0.02**	-0.01	0.03	-0.03*	-0.05***	-0.03*	0.03
>= 18 Months	-0.02	-0.02**	-0.01	-0.02	0.00	-0.01	-0.01	0.02	-0.02	-0.03**	-0.02	0.06*
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Depression												
Not Depressed	-	-	-	-	-	-	-	-	-	-	-	-
Depressed	0.01	0.01	-0.01	0.02	0.01	0.00	0.00	0.01	0.00	0.00	-0.01	-0.05
Unknown Depression	0.00	0.02	-0.03**	-0.02	-0.01	0.01	-0.02***	0.06	0.03**	0.00	-0.01	-0.01
Anxiety												
No Anxiety	-	-	-	-	-	-	-	-	-	-	-	-
Anxiety	0.00	0.01	0.02**	0.02	0.01	0.01	0.01	0.03	0.02**	0.01	0.02	0.05**

Measure	Preterm Birth				Low Birth Weight				C-Section Birth			
	White	Black	Hispanic	Other	White	Black	Hispanic	Other	White	Black	Hispanic	Other
Unknown Anxiety	0.00	-0.01	0.02	0.05	0.03*	0.00	0.00	-0.02	-0.01	-0.01	0.02	0.11**
Food Insecurity												
No Food Insecurity	-	-	-	-	-	-	-	-	-	-	-	-
Food Insecurity	0.00	-0.01	0.00	0.03	0.00	-0.01*	0.00	0.00	-0.01	0.01	0.00	-0.03
Unknown Food Insecurity	0.01	0.01	-0.01	0.03	-0.01	-0.01	-0.02*	-0.02	-0.02	0.02	-0.03*	-0.01
Pregnancy Intention												
Intended Pregnancy	-	-	-	-	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	-0.01	0.00	0.00	-0.01*	-0.01	0.00	0.01	0.00	-0.04***	-0.02***	-0.03
Unknown Pregnancy Intent	-0.02	0.01	-0.04	0.05	-0.03	0.00	-0.03	0.00	-0.03	-0.05	-0.01	-0.04
Pre-Pregnancy Hypertension												
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.06*	0.09***	0.17***	0.10*	0.06**	0.08***	0.15***	0.07	0.09***	0.06***	0.03	0.03
Unknown Pre-Pregnancy Hypertension	-0.04	0.05**	0.05*	0.04	-0.03	0.04**	0.04*	-0.05	0.10***	0.04	0.03	0.01
Pre-Pregnancy Diabetes												
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	0.10**	0.04	0.04	-0.06	0.03	0.00	-0.03	-0.09***	0.08**	0.05	0.10***	0.00
Unknown Pre-Pregnancy Diabetes	0.00	-0.01	0.00	-0.01	0.01	-0.02	0.01	0.12**	-0.05	0.00	-0.03	-0.05
BMI at First Prenatal Visit												
Underweight (<18.5 BMI)	0.04**	0.04	0.03	0.04	0.05**	0.07**	0.08***	0.04	-0.02	-0.03	-0.08***	-0.04
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01	-0.02***	0.00	0.00	-0.02**	-0.03***	-0.01	-0.01	0.04***	0.03**	0.02**	0.06**
Obese (30-<40 BMI)	-0.01	0.00	0.00	0.02	-0.02***	-0.03***	0.00	0.00	0.07***	0.09***	0.06***	0.08**
Very Obese (>=40 BMI)	0.01	-0.01	0.00	0.05	-0.02	-0.04***	0.00	0.01	0.15***	0.16***	0.09***	0.17***
BMI Missing	0.02**	0.00	0.01	0.00	0.00	0.00	-0.01	-0.04	0.07**	0.04**	0.06***	0.12**
Smoking												
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.02**	0.00	0.02	0.00	0.05***	0.04***	0.02	-0.02	0.02	0.01	0.01	-0.04
Unknown Smoking Status	0.02	-0.01	0.00	-0.06***	0.02	-0.01	-0.01	-0.05*	-0.01	0.01	0.01	-0.04
Intimate Partner Violence												
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.00	0.02**	-0.04**	0.00	0.00	0.00	-0.02	0.00	0.01	-0.02*	-0.02
Unknown History of Intimate Partner Violence	-0.01	0.03	0.01	-0.03	0.00	-0.02	0.06**	-0.05**	-0.02	0.02	-0.02	-0.08
Year												
2013-2014	-	-	-	-	-	-	-	-	-	-	-	-
2015	0.01	-0.03***	-0.02	0.01	0.01	-0.02*	-0.01	0.00	-0.01	-0.01	-0.01	-0.04
2016-2017	-0.01	-0.04***	-0.01*	0.01	-0.02**	-0.03***	-0.02***	0.01	-0.03**	-0.04***	-0.01	-0.04
Region												
South	-	-	-	-	-	-	-	-	-	-	-	-
Northeast	0.01	0.00	0.00	0.00	-0.01	0.02	0.01	0.02	0.02	0.01	0.06**	0.01
Midwest	-0.02	0.02	-0.01	-0.05**	-0.01	0.00	0.01	0.01	0.00	0.00	0.02	0.09**
West	0.00	0.00	0.03	-0.01	0.00	-0.01	0.01	0.00	-0.01	0.02	0.00	-0.01
Constant	0.10***	0.13***	0.10***	0.04	0.06***	0.14***	0.08***	0.02	0.16***	0.25***	0.16***	0.17**
Sample Size	**7,067**	**9,673**	**7,849**	**1,203**	**7,067**	**9,673**	**7,849**	**1,203**	**7,067**	**9,673**	**7,849**	**1,203**

Notes: Sample limited to women with nonmissing data and excludes participants at the Medical College of South Carolina, the University of Alabama, Birmingham, and the University of Puerto Rico because these awardees disproportionately enrolled high-risk women. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

DEPRESSION ANALYSIS

TABLE N. 9: FULL DEPRESSION REGRESSION RESULTS

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	Breast Feeding
Depression					
Not Depressed	-	-	-	-	-
Depressed	0.01**	0.01	0.00	0.02	0.00
Race					
Non-Hispanic White	-	-	-	-	-
Hispanic	0.02**	0.01	-0.01	0.01	0.07***
Non-Hispanic Black	0.01	0.03***	0.01	0.03*	-0.07***
Non-Hispanic Other / Multiple	0.00	0.02*	0.01	0.02	0.02
Age					
<18 Years of Age	-	-	-	-	-
18-19 Years of Age	-0.01	0.01	0.02	0.02	0.05**
20-34 Years of Age	0.00	0.02**	0.08***	0.09***	0.06***
35 or More Years of Age	0.03*	0.05***	0.15***	0.25***	0.06***
Education					
Less than High School	-	-	-	-	-
High School Degree or GED	0.00	-0.01	0.00	-0.02	0.05***
Bachelor's Degree	-0.02	-0.02**	0.00	-0.01	0.11***
Other Degree	-0.01	-0.01	0.02	-0.01	0.09***
Unknown Education	-0.01	-0.01	-0.02	-0.05**	0.05***
Relationship Status					
Married	-	-	-	-	-
Living with Partner	0.01	0.01*	0.01	0.01	-0.06***
In a Relationship Not Living Together	0.01	0.01	0.01	0.01	-0.06***
Not in a Relationship	0.02**	0.02***	0.02*	0.02	-0.12***
Employment and School Status					
Working, Not in School	-	-	-	-	-
In School, Not Working	-0.01	0.00	-0.02**	-0.02*	0.01
Working and in School	-0.01*	0.00	-0.02	-0.04**	0.05***
Neither Working nor in School	0.01***	0.01**	0.00	-0.01	-0.02**
Prior Preterm Birth					
No Prior Birth	-	-	-	-	-
Prior Preterm Birth	N/A	N/A	N/A	N/A	N/A
No Prior Preterm Birth	-0.11***	-0.07***	0.00	N/A	0.02
Prior Low Birth Weight Birth					
No Prior Birth	-	-	-	-	-
Prior Low Birth Weight Birth	0.15***	0.14***	0.51***	N/A	0.02
No Prior Low Birth Weight Birth	0.10***	0.04***	0.49***	N/A	0.02
Unknown Prior Low Birth Weight Birth	0.13***	0.07***	0.53***	N/A	N/A
Prior C-Section					
No Prior Birth	-	-	-	-	-
Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A
No Prior C-Section Birth	0.00	0.00	-0.66***	N/A	0.02*
Interpregnancy Interval					
No Prior Birth	-	-	-	-	-
< 18 Months	0.00	-0.01	-0.02**	N/A	-0.10***
>= 18 Months	-0.02***	-0.01**	-0.01	N/A	-0.08***
Unknown Interpregnancy Interval	N/A	N/A	N/A	N/A	-0.08***
Food Insecurity					
No Food Insecurity	-	-	-	-	-
Food Insecurity	0.00	0.00	0.01	0.01	0.03**
Unknown Food Insecurity	0.00	-0.02**	-0.02	0.00	-0.03*
Pregnancy Intention					
Intended Pregnancy	-	-	-	-	-

Measure	Preterm Birth	Low Birth Weight	C-Section	C-Section Nulliparous Women	Breast Feeding
Unintended Pregnancy	0.00	0.00	-0.02***	-0.02*	-0.02**
Pre-Pregnancy Hypertension					
No Pre-Pregnancy Hypertension	-	-	-	-	-
Pre-Pregnancy Hypertension	0.13***	0.11***	0.06***	0.11***	-0.06**
Unknown Pre-Pregnancy Hypertension	0.04	0.02	0.07***	0.02	-0.02
Pre-Pregnancy Diabetes					
No Pre-Pregnancy Diabetes	-	-	-	-	-
Pre-Pregnancy Diabetes	0.09***	0.00	0.08***	0.07	-0.04*
Unknown Pre-Pregnancy Diabetes	-0.01	-0.01	-0.04	-0.02	-0.01
BMI at First Prenatal Visit					
Underweight (<18.5 BMI)	0.03**	0.06***	-0.04***	-0.03	0.00
Normal (18.5-<25 BMI)	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01*	-0.02***	0.04***	0.06***	0.02**
Obese (30-<40 BMI)	-0.01	-0.02***	0.08***	0.12***	-0.01
Very Obese (>=40 BMI)	-0.01	-0.03***	0.15***	0.23***	-0.02
BMI Missing	0.01	-0.01	0.07***	0.06***	0.01
Smoking					
Did not Report Smoking at Intake	-	-	-	-	-
Reported Smoking at Intake	0.01	0.04***	0.01*	0.00	-0.11***
Unknown Smoking Status	-0.01	-0.01	-0.01	0.03	-0.04***
Intimate Partner Violence					
No History of Intimate Partner Violence	-	-	-	-	-
History of Intimate Partner Violence	0.00	0.00	0.00	0.00	0.01
Year					
2013-2014	-	-	-	-	-
2015	-0.01**	-0.01*	-0.01**	-0.03***	0.01
2016-2017	-0.03***	-0.03***	-0.03***	-0.05***	0.03**
Model					
Maternity Care Home	-	-	-	-	-
Birth Center	-0.05***	-0.04***	-0.07***	-0.09***	0.08***
Group Prenatal Care	-0.03*	-0.01	0.00	0.01	0.06**
Region					
South	-	-	-	-	-
Northeast	0.00	0.00	0.01	0.00	0.03
Midwest	-0.02	-0.01	0.01	0.03	0.00
West	0.01	-0.01	-0.01	0.00	0.03
Constant	0.10***	0.08***	0.18***	0.17***	0.77***
Sample Size	**23,980**	**23,980**	**23,980**	**9,204**	**16,428**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 10: FULL DEPRESSION REGRESSION RESULTS, BY MODEL

Measure	Preterm Birth			Low Birth Weight			C-Section			Breast Feeding		
	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home
Depression												
Not Depressed	-	-	-	-	-	-	-	-	-	-	-	-
Depressed	0.00	0.01	0.01	0.00	0.00	0.01*	0.00	-0.01	0.01	0.00	0.02	0.00
Race												
Non-Hispanic White	-	-	-	-	-	-	-	-	-	-	-	-
Hispanic	0.01**	0.04*	0.01	0.01	0.02	0.01	0.02	-0.02	-0.03***	0.01	-0.01	0.11***
Non-Hispanic Black	0.01	0.02	0.01	0.01**	0.03	0.04***	0.04***	-0.01	0.00	-0.01	-0.10***	-0.06**
Non-Hispanic Other / Multiple	0.01	0.03	-0.02	0.00	0.07*	0.02	0.04	-0.05	0.01	0.01	-0.02	0.03
Age												
<18 Years of Age	-	-	-	-	-	-	-	-	-	-	-	-
18-19 Years of Age	-0.01	-0.05*	0.00	-0.02	-0.03*	0.04***	0.03	0.01	0.02	0.03	0.13**	0.03
20-34 Years of Age	-0.01	-0.05*	0.02*	0.00	-0.02	0.05***	0.09**	0.06*	0.09***	0.04	0.14**	0.04**
35 or More Years of Age	-0.02	-0.01	0.06***	0.00	0.03	0.07***	0.13***	0.16***	0.16***	0.01	0.12*	0.05**
Education												
Less than High School	-	-	-	-	-	-	-	-	-	-	-	-
High School Degree or GED	-0.02	0.03	-0.01	-0.02**	0.03*	-0.01**	-0.01	0.01	-0.01	0.08***	-0.01	0.06***
Bachelor's Degree	-0.01	0.04*	-0.05***	-0.02**	0.03	-0.04***	-0.01	0.05	0.01	0.10***	0.06*	0.18***
Other Degree	-0.01	0.04	-0.02**	-0.01	0.00	-0.02**	0.01	0.09**	-0.01	0.11***	-0.04	0.12***
Unknown Education	0.00	-0.02	0.00	-0.03**	0.02	-0.01	-0.04	-0.02	0.00	-0.01	0.00	0.07***
Relationship Status												
Married	-	-	-	-	-	-	-	-	-	-	-	-
Living with Partner	0.00	0.02	0.01	0.00	0.01	0.01	0.02*	0.03	-0.01	-0.04***	-0.07*	-0.06***
In a Relationship Not Living Together	0.02**	0.01	0.00	0.03***	0.01	0.01	0.07***	0.00	0.00	-0.03**	-0.08***	-0.07***
Not in a Relationship	0.03**	0.03	0.01	0.03*	0.04**	0.01	0.04**	0.03	0.00	-0.05***	-0.13***	-0.13***
Employment and School Status												
Working, Not in School	-	-	-	-	-	-	-	-	-	-	-	-
In School, Not Working	-0.04***	0.01	-0.01	-0.02**	0.00	0.00	-0.02	-0.02	-0.02**	-0.01	0.01	0.02
Working and in School	-0.02*	-0.02	-0.01	0.00	0.00	0.00	-0.02	-0.03	-0.01	0.01	0.01	0.07***
Neither Working nor in School	-0.01	0.01	0.02***	-0.01	0.00	0.01**	-0.01	-0.01	-0.01	-0.02*	-0.02	-0.02*
Prior Preterm Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Preterm Birth	N/A	0.09**	0.13***	N/A	0.11***	0.07***	N/A	0.42***	0.51***	N/A	-0.14**	-0.08***
No Prior Preterm Birth	-0.09***	-0.02	0.02	-0.07***	0.05	0.00	0.00	0.42***	0.51***	0.01	-0.11	-0.07***
Prior Low Birth Weight Birth												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	N/A	N/A	0.03	N/A	N/A	0.08***	N/A	N/A	0.00	N/A	N/A	0.05**
No Prior Low Birth Weight Birth	-0.01	-0.01	-0.02*	-0.07	-0.09***	-0.03***	0.04***	-0.01	-0.02	0.01	0.01	0.04***
Unknown Prior Low Birth Weight Birth	-0.05	0.02	N/A	-0.05	-0.06	0.00	0.07***	0.06	0.00	0.07	0.03	0.00
Prior C-Section												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
Prior C-Section Birth	0.10**	N/A	N/A	0.16**	N/A	N/A	0.50***	N/A	N/A	-0.11**	N/A	N/A
No Prior C-Section Birth	0.09*	0.04***	-0.01	0.13**	0.02*	0.00	-0.13***	-0.63***	-0.67***	-0.08**	0.07**	0.01
Interpregnancy Interval												
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-
< 18 Months	0.00	N/A	0.00	-0.01	N/A	-0.02**	-0.05***	N/A	-0.01	0.06***	N/A	-0.04*
>= 18 Months	0.01	-0.04**	-0.03***	0.00	-0.02	-0.02**	-0.05***	0.03**	-0.01	0.07***	0.00	-0.01
Unknown Interpregnancy Interval	N/A	0.00	N/A	N/A	-0.02	N/A	N/A	0.05**	N/A	N/A	0.03	N/A
Food Insecurity												
No Food Insecurity	-	-	-	-	-	-	-	-	-	-	-	-
Food Insecurity	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	0.01	0.01	0.00	0.03**
Unknown Food Insecurity	-0.02	0.04**	-0.01	-0.02**	0.03	-0.03***	0.02	-0.01	-0.03*	-0.02	-0.04	-0.03

Measure	Preterm Birth			Low Birth Weight			C-Section			Breast Feeding		
	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home	Birth Center	Group Prenatal Care	Maternity Care Home
Pregnancy Intention												
Intended Pregnancy	-	-	-	-	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	0.02	0.00	-0.01	0.01	-0.01	-0.01	0.00	-0.03***	0.01	-0.01	-0.03***
Pre-Pregnancy Hypertension												
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.02	0.05**	0.16***	0.11*	0.06***	0.13***	0.03	0.03*	0.07***	-0.04	-0.02	-0.07**
Unknown Pre-Pregnancy Hypertension	-0.06***	0.03	0.05*	-0.06***	0.00	0.05**	0.07***	0.01	0.07**	-0.16***	-0.05**	0.04
Pre-Pregnancy Diabetes												
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	-0.01	0.03	0.13***	-0.01	-0.01	0.00	0.01	0.06	0.09***	0.07**	-0.05	-0.04**
Unknown Pre-Pregnancy Diabetes	N/A	-0.03	-0.01	N/A	-0.03*	-0.02	N/A	-0.06	-0.01	N/A	0.07**	-0.10**
BMI at First Prenatal Visit												
Underweight (<18.5 BMI)	0.03	-0.01	0.05***	0.04	0.05	0.07***	0.00	-0.08***	-0.05**	0.04**	-0.08**	0.00
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	0.00	-0.02	-0.01	0.00	-0.01	-0.03***	0.03*	0.05**	0.04***	0.01	0.03	0.01
Obese (30-<40 BMI)	0.00	-0.01	-0.01	0.00	-0.03*	-0.02***	0.07***	0.08***	0.08***	-0.02	0.00	-0.01
Very Obese (>=40 BMI)	-0.03***	-0.01	-0.01	-0.01	-0.03	-0.04***	0.06***	0.18***	0.15***	0.02	-0.03	-0.03
BMI Missing	-0.01	0.04**	-0.01	-0.01	0.02	-0.02**	0.04**	0.07	0.08***	-0.02	-0.15***	0.07
Smoking												
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.01	0.02	0.01	0.02	0.07***	0.04***	0.04***	0.00	0.01	-0.16***	-0.02	-0.11***
Unknown Smoking Status	0.00	-0.01	-0.01	0.00	-0.01	-0.01	0.01	-0.01	-0.01	-0.01	-0.01	-0.07***
Intimate Partner Violence												
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	-0.01**	0.01	0.01	-0.01*	0.00	0.01	-0.02	0.01	0.01	0.01	0.02	0.01
Year												
2013-2014	-	-	-	-	-	-	-	-	-	-	-	-
2015	-0.02**	0.00	-0.02**	-0.01	0.01	-0.02*	-0.01	-0.02	-0.02**	0.00	-0.01	0.02*
2016-2017	-0.01	-0.02*	-0.04***	-0.01*	-0.02**	-0.03***	0.00	0.00	-0.05***	-0.02	0.01	0.04*
Region												
South	-	-	-	-	-	-	-	-	-	-	-	-
Northeast	-0.03***	-0.01	N/A	-0.01	-0.01	0.00	-0.02	0.01	N/A	0.06**	0.02	N/A
Midwest	-0.01*	N/A	-0.01	0.01	N/A	-0.01	0.01	N/A	0.01	0.00	N/A	0.00
West	-0.02**	-0.04**	0.03*	-0.01	-0.01	-0.01	-0.03**	0.00	0.01	0.01	0.08***	0.03
Constant	0.07***	0.07*	0.09***	0.07**	0.06**	0.07***	0.06	0.20***	0.21***	0.86***	0.88***	0.76***
Sample Size	**4,768**	**4,679**	**14,533**	**4,768**	**4,679**	**14,533**	**4,768**	**4,679**	**14,533**	**3,690**	**2,603**	**10,135**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 11: FULL DEPRESSION REGRESSION RESULTS, BY RACE

Measure	Preterm Birth				Low Birth Weight				C-Section				Breast Feeding Initiation			
	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed
Depression																
Not Depressed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Depressed	0.01	0.01*	0.00	0.03	0.01	0.00	0.01	0.02	0.00	0.00	0.00	-0.03	0.00	0.02	-0.01	-0.03
Age																
<18 Years of Age	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-19 Years of Age	-0.01	0.00	-0.02	0.00	0.02	0.02	0.00	0.07	-0.03	0.02	0.05*	0.10	-0.02	0.08**	0.00	0.01
20-34 Years of Age	0.01	0.01	-0.01	0.00	0.04**	0.03*	0.01	0.04	0.05*	0.08***	0.10***	0.15**	-0.02	0.10***	0.01	0.08
35 or More Years of Age	0.02	0.05*	0.02	0.05	0.06***	0.08***	0.03	0.07	0.09***	0.15***	0.18***	0.19**	-0.03	0.08**	0.01	0.08
Education																
Less than High School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High School Degree or GED	-0.01	-0.01	0.01	-0.02	-0.01	-0.02**	0.01	0.00	-0.01	-0.01	0.01	-0.01	0.08***	0.09***	0.02	0.03
Bachelor's Degree	-0.01	-0.02	-0.01	0.00	-0.01	-0.04***	-0.02	0.01	-0.01	0.01	0.04	-0.07	0.14***	0.21***	0.02	0.10**
Other Degree	-0.01	-0.03**	0.01	0.08**	0.00	-0.05***	0.01	0.00	0.00	0.01	0.04	-0.02	0.14***	0.16***	0.01	0.08*
Unknown Education	0.02	-0.03*	0.00	-0.08	0.02	-0.05**	0.01	-0.07	0.00	-0.04*	0.00	-0.06	0.06	0.09**	0.02	0.01
Relationship Status																
Married	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Living with Partner	0.00	0.03**	0.00	0.01	0.01	0.02**	0.01	0.01	0.02*	-0.01	0.01	-0.02	-0.06***	-0.10***	-0.03	-0.02
In a Relationship Not Living Together	0.01	0.03***	-0.02*	0.01	0.01	0.03***	-0.01	0.01	0.04**	0.00	0.00	-0.06*	-0.06***	-0.11***	-0.03**	0.08**
Not in a Relationship	0.02	0.03**	0.00	0.11***	0.00	0.04***	0.00	0.07*	0.02	0.01	0.02	-0.01	-0.14***	-0.15***	-0.09***	-0.04
Employment and School Status																
Working, Not in School	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
In School, Not Working	-0.02*	-0.01	0.01	0.00	0.00	-0.02*	0.02	0.04	-0.05***	-0.01	0.00	0.00	-0.01	0.04***	-0.02	0.07
Working and in School	-0.02*	-0.02	0.00	0.01	0.00	-0.03**	0.02	0.03	-0.01	-0.01	-0.03	-0.06	0.05***	0.06***	0.02	0.06*
Neither Working nor in School	0.01*	0.01	0.01*	0.01	0.01*	0.01	0.00	0.03	-0.02**	0.00	-0.01	0.02	-0.03***	-0.01	-0.02**	0.03
Prior Preterm Birth																
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prior Preterm Birth	0.12***	0.12***	0.12***	0.15**	0.15***	0.07***	0.07***	0.20***	0.53***	0.50***	0.01	0.48***	N/A	N/A	-0.02	-0.06
No Prior Preterm Birth	0.01	0.02	N/A	0.01	0.09***	-0.01	N/A	0.15**	0.56***	0.49***	N/A	0.44***	-0.03*	0.03	N/A	-0.07
Prior Low Birth Weight Birth																
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prior Low Birth Weight Birth	N/A	0.05*	N/A	N/A	N/A	0.08***	N/A	N/A	N/A	0.01	N/A	N/A	N/A	0.05	-0.03	N/A
No Prior Low Birth Weight Birth	-0.04	-0.02	-0.02	0.01	-0.13***	-0.03**	-0.06**	-0.18**	-0.01	-0.02	-0.02	0.00	0.01	0.03	-0.05*	0.15**
Unknown Prior Low Birth Weight Birth	0.00	N/A	0.00	0.01	-0.08**	N/A	-0.04	-0.17**	0.02	N/A	0.04	0.09	-0.04	N/A	-0.05*	0.08
Prior C-Section																
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prior C-Section Birth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-0.03	N/A	N/A	N/A
No Prior C-Section Birth	0.00	0.01	-0.01	-0.03	0.00	0.00	0.00	-0.06*	-0.66***	-0.66***	-0.64***	-0.68***	-0.01	0.02	0.02	-0.05*
Interpregnancy Interval																
No Prior Birth	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
< 18 Months	0.00	-0.01	0.02	0.00	-0.01	-0.02	0.02	0.03	-0.02	-0.03*	0.47***	0.01	0.02	-0.18***	N/A	0.04
>= 18 Months	-0.02	-0.03**	0.01	-0.02	-0.01	-0.03*	0.02	0.03	-0.01	-0.02	0.48***	0.06	0.00	-0.13***	0.03	-0.03
Unknown Interpregnancy Interval	N/A	N/A	0.02	N/A	N/A	N/A	0.03	N/A	N/A	N/A	0.50***	N/A	N/A	-0.14***	0.03	N/A
Food Insecurity																
No Food Insecurity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food Insecurity	0.00	-0.01	0.00	0.03	0.00	-0.01	0.00	0.01	0.00	0.01	0.01	-0.03	0.00	0.05**	0.00	0.06**
Unknown Food Insecurity	0.01	-0.01	0.00	0.03	-0.01	-0.03**	-0.01	-0.06**	-0.02	0.00	-0.02	-0.04	-0.03	-0.04	-0.03	0.01
Pregnancy Intention																
Intended Pregnancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unintended Pregnancy	0.00	0.00	0.01	0.00	-0.01	-0.01	0.00	0.00	0.00	-0.04***	-0.02**	-0.04	-0.01	-0.01	-0.01	-0.06**
Pre-Pregnancy Hypertension																
No Pre-Pregnancy Hypertension	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Hypertension	0.08***	0.14***	0.15***	0.15**	0.08***	0.11***	0.15***	0.10	0.09***	0.06***	0.05**	0.02	-0.10***	-0.02	-0.12***	-0.17*

Measure	Preterm Birth				Low Birth Weight				C-Section				Breast Feeding Initiation			
	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed	Black	White	Hispanic	Other/ Mixed
Unknown Pre-Pregnancy Hypertension	-0.02	0.04	0.07**	0.06	-0.01	0.04**	0.06**	-0.04	0.10***	0.03	0.08**	0.04	-0.02	0.00	0.02	-0.09
Pre-Pregnancy Diabetes																
No Pre-Pregnancy Diabetes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-Pregnancy Diabetes	0.18***	0.07	0.09***	-0.02	0.02	-0.01	-0.01	-0.10***	0.14***	0.03	0.15***	-0.09	-0.05	-0.01	-0.06**	-0.02
Unknown Pre-Pregnancy Diabetes	-0.01	0.01	-0.04*	-0.01	0.00	-0.02	-0.03	0.10	-0.04	0.02	-0.12***	-0.08	0.07*	-0.07	-0.03	0.07
BMI at First Prenatal Visit																
Underweight (<18.5 BMI)	0.03	0.04	0.02	0.03	0.05**	0.06**	0.07***	0.02	-0.03	-0.03	-0.07***	-0.03	-0.01	-0.01	0.01	0.00
Normal (18.5-<25 BMI)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Overweight (25-<30 BMI)	-0.01	-0.02*	0.00	-0.01	-0.02***	-0.02**	-0.01	-0.01	0.04***	0.04***	0.03**	0.06**	0.02	0.01	0.02	0.00
Obese (30-<40 BMI)	-0.02*	0.00	0.00	0.01	-0.02***	-0.03***	0.00	-0.01	0.07***	0.09***	0.07***	0.10***	-0.03	-0.02	0.00	0.00
Very Obese (>=40 BMI)	0.00	-0.01	-0.01	0.04	-0.04**	-0.03***	-0.01	-0.02	0.13***	0.17***	0.10***	0.17***	-0.03	-0.02	-0.05*	-0.06
BMI Missing	0.02	0.00	0.03**	-0.01	-0.01	0.00	0.00	-0.02	0.06*	0.04***	0.12***	0.15**	-0.01	0.01	0.00	-0.06
Smoking																
Did not Report Smoking at Intake	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reported Smoking at Intake	0.01	0.01	0.01	0.00	0.05***	0.04**	0.06*	-0.01	0.01	0.01	0.01	-0.03	-0.09***	-0.10***	-0.10**	-0.17***
Unknown Smoking Status	0.02	-0.02	0.00	-0.06***	0.00	-0.01	-0.02	-0.04	0.00	0.00	-0.02	-0.02	-0.05*	-0.03	-0.03	-0.05
Intimate Partner Violence																
No History of Intimate Partner Violence	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
History of Intimate Partner Violence	-0.01	0.01	0.02**	-0.04*	0.00	0.01	0.00	-0.02	0.00	0.02*	-0.01	-0.01	0.00	0.02	0.02	-0.02
Year																
2013-2014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2015	0.01	-0.03***	-0.01	0.01	0.00	-0.02**	0.00	0.00	-0.01	-0.01	-0.01	-0.04	0.00	0.03	0.01	0.02
2016-2017	-0.02*	-0.05***	-0.01	0.00	-0.02***	-0.04***	-0.01**	0.01	-0.02*	-0.05***	-0.01	-0.04	-0.02	0.05	0.03**	0.06
Model																
Maternity Care Home	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Birth Center	-0.06***	-0.04***	-0.05***	-0.02	-0.04***	-0.05***	-0.03***	-0.03	-0.09***	-0.05**	-0.04**	-0.07***	0.12***	0.16***	0.02	0.07**
Group Prenatal Care	-0.06***	-0.03	-0.01	0.03	-0.02	-0.03**	0.01	0.05	0.02	-0.02	0.03	-0.02	0.14***	0.06	0.02	0.07*
Region																
South	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northeast	0.01	0.02	-0.04*	-0.03	0.00	0.02	-0.03	0.02	0.03	0.02	0.00	-0.02	0.01	0.06	0.03	-0.03
Midwest	-0.03**	0.00	-0.02	-0.05*	-0.02*	0.00	0.00	0.02	0.00	0.01	0.02	0.09**	0.01	-0.03	0.00	0.01
West	-0.01	0.00	0.02	-0.02	-0.01	-0.02*	0.00	-0.01	-0.01	0.02	0.00	-0.01	0.02	0.10***	0.02	0.02
Constant	0.11***	0.11***	0.10***	0.05	0.06***	0.14***	0.07***	0.02	0.19***	0.23***	0.14***	0.20***	0.82***	0.65***	0.91***	0.72***
Sample Size	**6,391**	**9,291**	**7,259**	**1,039**	**6,391**	**9,291**	**7,259**	**1,039**	**6,391**	**9,291**	**7,259**	**1,039**	**4,518**	**6,225**	**4,973**	**712**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE N. 12: FULL CORRELATES OF DEPRESSION

Measure	Depressed	Depressed Including Model	Depressed Including Anxiety
Race			
Non-Hispanic White	-	-	-
Hispanic	-0.02	-0.02	0.00
Non-Hispanic Black	0.06***	0.06***	0.03***
Non-Hispanic Other / Multiple	0.02	0.02	0.00
Age			
<18 Years of Age	-	-	-
18-19 Years of Age	-0.02	-0.02	-0.01
20-34 Years of Age	-0.04***	-0.04***	-0.02
35 or More Years of Age	-0.04**	-0.04**	-0.01
Education			
Less than High School	-	-	-
High School Degree or GED	0.00	0.00	0.00
Bachelor's Degree	-0.02	-0.03*	-0.01
Other Degree	0.00	0.00	0.00
Unknown Education	0.00	0.00	0.01
Relationship Status			
Married	-	-	-
Living with Partner	0.02***	0.02***	0.00
In a Relationship Not Living Together	0.05***	0.05***	0.03***
Not in a Relationship	0.12***	0.12***	0.08***
Employment and School Status			
Working, Not in School	-	-	-
In School, Not Working	0.01	0.01	0.00
Working and in School	0.00	0.00	0.00
Neither Working nor in School	0.02***	0.02***	0.02***
Prior Preterm Birth			
No Prior Birth	-	-	-
Prior Preterm Birth	0.07***	0.07***	0.04***
No Prior Preterm Birth	0.03*	0.03*	0.03**
Prior Low Birth Weight Birth			
No Prior Birth	-	-	-
Prior Low Birth Weight Birth	-0.01	0.00	0.01
No Prior Low Birth Weight Birth	0.00	0.00	0.01
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A
Prior C-Section			
No Prior Birth	-	-	-
Prior C-Section Birth	N/A	N/A	N/A
No Prior C-Section Birth	-0.01	-0.01	0.00
Interpregnancy Interval			
No Prior Birth	-	-	-
< 18 Months	0.00	0.00	0.00
>= 18 Months	0.00	0.00	-0.01
Unknown Interpregnancy Interval	N/A	N/A	N/A
Food Insecurity			
No Food Insecurity	-	-	-
Food Insecurity	0.23***	0.23***	0.12***
Unknown Food Insecurity	0.05***	0.05***	0.03***
Pregnancy Intention			
Intended Pregnancy	-	-	-
Unintended Pregnancy	0.03***	0.03***	0.02***
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	-	-	-
Pre-Pregnancy Hypertension	0.00	0.00	-0.01
Unknown Pre-Pregnancy Hypertension	-0.06***	-0.05**	-0.04**

Measure	Depressed	Depressed Including Model	Depressed Including Anxiety
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	-	-	-
Pre-Pregnancy Diabetes	0.01	0.00	0.00
Unknown Pre-Pregnancy Diabetes	0.06**	0.05	0.04**
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	-0.01	-0.01	-0.01
Normal (18.5-<25 BMI)	-	-	-
Overweight (25-<30 BMI)	-0.01*	-0.01*	-0.01
Obese (30-<40 BMI)	-0.01	0.00	-0.01
Very Obese (>=40 BMI)	0.00	0.01	-0.01
BMI Missing	-0.02	-0.01	-0.01
Smoking			
Did not Report Smoking at Intake	-	-	-
Reported Smoking at Intake	0.09***	0.09***	0.04***
Unknown Smoking Status	0.04**	0.03**	0.02**
Intimate Partner Violence			
No History of Intimate Partner Violence	-	-	-
History of Intimate Partner Violence	0.18***	0.18***	0.09***
Year			
2013-2014	-	-	-
2015	-0.01	-0.01	-0.01**
2016-2017	-0.01	-0.01	-0.01
Unknown Year	0.01	0.01	0.00
Region			
South	-	-	-
Northeast	0.06**	0.04	0.03*
Midwest	-0.07***	-0.06***	-0.04***
West	-0.04**	-0.03**	-0.02**
Model			
Maternity Care Home	-	-	-
Birth Center	-	0.02	-
Group Prenatal Care	-	0.03	-
Anxiety			
No Anxiety	-	-	-
Anxiety	-	-	0.45***
Constant	0.13***	0.12***	0.03
Sample Size	**32,409**	**32,409**	**32,409**

Notes: Sample limited to women with nonmissing data. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

APPENDIX O: TECHNICAL ASSISTANCE AND DATA ACQUISITION – MEDICAID AND BIRTH CERTIFICATE DATA REQUEST APPLICATIONS: FREQUENTLY ASKED QUESTIONS

GENERAL PROJECT INFORMATION

- What is the title of the project?
- What is the period of performance?
- Who is the sponsoring agency (or funder)?
- Who is the Principal Investigator and what is his/her contact information?
- Who are the Co-Investigators (if any) and what is their contact information?
- How is education a major component of your organization's mission, and how will the proposed research be used in an educational endeavor?

PROJECT DESCRIPTION

- Provide a brief overview of your project including how and why the data are needed.
- Describe the study population.
- Describe the research questions, hypotheses, and study aims.
- What is the significance of the planned research (i.e., how does the research add to the existing literature)?
- What are the benefits of the study to the subjects?
- What are the benefits of the study to participating states (if applicable)?
- How will the results of this research be disseminated/published?

DATA REQUEST AND ANALYSES

- What type of data is your organization requesting? (Please include a list of specific variables.)
- Will your organization request any data to allow for the potential identification of patients?
- What is the data linkage process (if any)?
- What is the time-period of requested data (i.e., 2016 - 2018)?
- What is the preferred date to receive the data?
- How often does your organization need the data (i.e., one-time, yearly, quarterly, other)?
- What is the preferred file format (i.e., SAS, Stata, CSV) to receive the data?
- What is the method of statistical analysis your organization will use to analyze the data?

DATA SECURITY AND TRANSFER PROCESS

- What, if any, IRB approval has your organization received? What were the dates of approval? What type of approval was received? (Please provide a copy of the approval letter.)
- Please list the personnel (name, title, organization, and contact information) who will have access to or contact with the data (including collecting, viewing, analyzing, managing and securing data).
- How will your organization protect confidential data including personally identifiable information (PII) and protected health information (PHI)? Where will the data be stored, how will it be stored, how will it be kept secure, and how will the data be transferred?
- How and when will your organization destroy the data at the end of the project?
- Does your organization have signed HIPAA compliant authorizations from the individuals that you are requesting information about?

APPENDIX P: IMPACT ANALYSIS – DETAILED DESCRIPTION OF ANALYTIC APPROACH

There were three main steps to conducting the impact analysis:

1. Create propensity-score-based weights for the comparison group.
2. Confirm there were no remaining meaningful differences in control variables between Strong-Start participants and comparison observations after the weights were applied.
3. Estimate impacts as the difference in outcomes between Strong-Start participants and propensity-score-weighted comparison group observations.

Propensity score reweighting yields statistically efficient estimates (Hirano, Imbens, and Ridder, 2003), and Monte Carlo simulation has shown evidence that it performs very well among alternative propensity-score-based methods in terms of minimizing bias, while also having a lower variance than pairwise matching across a range of scenarios (Busso, DiNardo, and McCrary, 2014). Because our intent was to estimate treatment effects at the awardee- and site-levels, and many sites involve a modest number of treated cases, we determined that a statistically efficient method that makes full use of available data would have the best chance of detecting true treatment effects. Given the statistical efficiency of propensity score reweighting and evidence of its good performance relative to alternatives, we decided to use the propensity score reweighting approach as our estimation method for the analysis. Appendix R provides a detailed discussion about the choice between propensity score reweighting and matching. Awardee data and, in some cases, site-specific data were pooled to produce model-level estimates of impact. Each awardee and site with sufficient observations to support site-specific impact estimates have their own analyses with results reported in Volume 2.

COMPUTING PROPENSITY SCORES AND PROPENSITY SCORE-ADJUSTED WEIGHTS

We created propensity scores by estimating logistic regressions in which the dependent variable indicates whether the woman is a Strong Start participant or in the comparison group. The regressions controlled for a variety of factors (described in detail in Table 40 of the main report), including demographic characteristics, behavioral risk factors, medical risk factors, Medicaid eligibility type, hospital characteristics, and, when available, diagnoses reported on the claims data. We used the predicted probabilities from these models to construct weights for the comparison group observations, with those more similar to Strong Start participants receiving larger weights.

We developed propensity-score-adjusted weights as follows: Pregnant women enrolled in Strong Start receive a weight (W) of 1, and pregnant women not enrolled in Strong Start receive a weight that is calculated as W = PS/(1- PS), where PS is the propensity score for each individual. With weights computed in this way, differences in (weighted) means between the treatment and comparison group are estimates of average treatment effects for the treated. Propensity score weights were constructed separately for each Strong Start awardee and site (where applicable). Specifically, with the treatment and comparison group observations of each awardee (or site) we estimated separate logistic regression models of Strong Start participation. In each case, we used the same control variables in the logistic model specification and created propensity scores and weights for the given estimation sample.

The range of the values of the weights differed across estimation samples. Because we have substantially more comparison group cases than treated cases, the average weights of the comparison group cases within each estimation sample is always less than 1. Overall, the weights computed for comparison group women vary from nearly zero to 2.66. Weights close to zero are expected and appropriate for comparison group cases that are dissimilar to treated cases, but there is concern that extremely large weights could over-inflate the variance of the treatment effects of interest. Weights for comparison group cases that are greater than 1 are rare, and our maximum weight of 2.66 is not extreme in an absolute sense relative to the treated cases that all have weights of 1. We considered whether the larger weights were having a substantial effect on our estimates, and found that trimming the weights at the 99th percentile led to a very small reduction in variance, but at the expense of a sizeable increase in bias. In general, we note that because the comparison group sample is much larger than the treatment group sample, the weighted comparison group means are more precisely estimated than the treatment group means, so further increases in the precision for the comparison group would translate to modest improvements in the precision of the treatment effect.

After reweighting, comparison group observations looked very similar to participants in terms of the control variables in Table 40 of the main report. This holds within each awardee (or site), because the weights were constructed separately for each awardee or site. Success of the balance was confirmed, and all remaining standardized differences were less than 10 percent, a commonly suggested threshold. In practice, the remaining standardized differences were negligible and typically much less than 10 percent. In Table P. 1 through Table P. 3, we report standardized differences in key control variables between treatment and comparison group cases overall for each Strong Start model before and after reweighting. Note that before reweighting many of the standardized differences are well in excess of 10 percent, but after reweighting all standardized differences are less than 10 percent.

ESTIMATING IMPACTS

For the impact analysis, we developed estimates at the awardee, site, and model levels, each of which is described in the following subsections.

Awardee and Site-Specific Impacts

After the propensity score reweighting, we estimated impacts by comparing mean outcomes for Strong Start participants and reweighted comparison group women. The results tables in the main report identify differences for each outcome and the statistical significance of the differences. We estimated

impacts for each awardee and site that has a sufficient number of women participating in Strong Start.[76] To test for differences in mean outcomes, we estimated the following weighted linear regression:

$$(1)\ Outcome_{(i)} = \beta_0 + \beta_1 StrongStart + \varepsilon,$$

where Strong Start is an indicator taking the value of 1 for participants and 0 for comparison group observations.[77] For each outcome (indexed by i), we estimated this regression for each applicable awardee and site, applying the propensity score weights. The regression coefficient β_1 represents the impact of enrolling in Strong Start and receiving care in a specific Birth Center, Group Prenatal Care practice, or Maternity Care Home relative to women of similar risk profiles served by standard Medicaid providers.

Impacts by Strong Start Delivery Model

To estimate impacts for each Strong Start model (i.e., Birth Center, Group Prenatal Care, and Maternity Care Home), we combined observations from awardees associated with each model in turn. Because comparison group cases are already weighed to be similar to Strong Start participants within each awardee's data, they are also balanced when the data for awardees are pooled.

We estimated three separate regressions for each outcome—one for each model—of the same form as in equation (1). In this case, β_1 represents the overall impact of enrolling in each of the respective Strong Start intervention models.[78] With this approach, the main analytic question is answered: Do the enhanced services provided through Strong Start in combination with care delivered in a Birth Center, Group Prenatal Care practice, or a Maternity Care Home result in improved outcomes when compared to standard Medicaid maternity care practices?

We estimated alternative propensity score model specifications with estimation samples and control variables as described in the Analytic Approach and Data Sources section of this report. In some cases, we did not include all applicable control variables in all propensity score models. Indicator variables with very low frequency may be perfect predictors of treatment status and could not be included in the logistic regression models. The HEN variable was sometimes strongly aligned with Strong Start participation and was dropped in cases in which its inclusion created a lack of overlap in the distribution of propensity scores for treated and comparison groups. In cases such as these, variables had to be dropped to make it possible to report an overall adjusted difference in outcomes for the

[76] In the original design plan report, we presented a power analysis, with an array of assumptions, to estimate the minimum sample size likely required to reasonably detect effects of given sizes. Results from this analysis showed that it would take at least 400 enrollees to have an 80 percent probability of detecting effect sizes with two-sided tests as large as 4 to 6 percentage points. However, given the actual distribution of the data received, site-level analyses were conducted in cases where there are at least 220 Strong Start participants. While this sample size threshold is lower than the numbers in the power analysis, prior studies found that propensity score reweighting can yield correct estimations of treatment effect even with small study samples in this range. See Pirracchio, R., Resche-Rigon, M., and Chevret, S. (2002). "Evaluation of the Propensity score methods for estimating marginal odds ratios in case of small sample size." *BMC Medical Research Methodology* 12(70), DOI: 10.1186/1471-2288-12-70

[77] In this setting, with treated and comparison group cases already balanced on covariates, it is unnecessary to add control variables directly. When control variables are added as a test, virtually identical results are obtained. Estimated treatment effects (i.e., marginal effects) from nonlinear models such as a logit for discrete outcomes and generalized linear models with a log link, absent control variables, reduce to the same difference-in-mean treatment effects that are obtained with the linear models. Accordingly, the analysis focused on linear model results for all outcome variables.

[78] We also estimated alternative specification models that include indicator variables for each awardee. Because covariates are balanced, these indicators are uncorrelated with treatment status by design; but, their inclusion could reduce overall regression variance. We obtained virtually identical results to those reported when awardee-level indicator variables were included.

sample. Finally, in some cases with relatively small sample sizes, control variables with low frequency were dropped or merged with other categories when balance could not be achieved with less than a 10 percent standardized difference.

INSTRUMENTAL VARIABLES MODELS BASED ON DISTANCE TO SITE

Propensity score reweighting does not control for selection into Strong Start due to unobservable characteristics, such as social risk factors and health conditions not captured by included diagnoses. We considered instrumental variable (IV) analysis as an alternative analytic strategy to address the issue of potential selection on such unobservables. A good instrumental variable is correlated with treatment status but uncorrelated with the confounding unobserved factors. Prior health services research studies have used distance to healthcare providers as an instrumental variable. For example, Benatar et al. (2012) used the cube-root of distance from the census track or ZIP Code in which each woman lived to the Birth Center as an instrumental variable for Birth Center use. We estimated preliminary IV models for a set of awardees for which distance measures could be produced and that had relatively large sample sizes. The treatment effects estimated with these models were highly unstable and implausible in magnitude in some cases. Based on these results, we did not further pursue the IV approach for this report.

TABLE P. 1: STANDARDIZED DIFFERENCES IN CONTROL VARIABLES FORSTRONG START AND COMPARISON GROUP WOMEN PRE- AND POST-WEIGHTING, BIRTH CENTER MODEL LEVEL ANALYSIS (N=329,079)

Variable	Pre-Weighting Difference	Post-Weighting Difference
Age		
Less than 15 years old	0.03	0.00
15 to 17 years old	0.02	0.00
18 to 19 years old	-0.01	0.00
20 to 24 years old	-0.05	0.00
25 to 29 years old	0.04	0.00
30 to 34 years old	0.01	0.00
35 years or older	-0.01	0.00
Missing	0.05	-0.02
Education		
Less than High School	-0.06	0.01
High School or GED	-0.09	0.00
Some College	0.05	0.00
Associate's Degree	0.03	0.00
Bachelor's Degree or Higher	**0.12**	0.00
Missing	-0.03	-0.03
Marital Status		
No	**-0.19**	0.00
Yes	**0.19**	0.00
Missing	0.02	0.01
Race/Ethnicity		
Non-Hispanic White	**0.32**	0.00
Non-Hispanic Black/African American	**-0.24**	0.00
Hispanic	-0.09	-0.01
Non-Hispanic Other Race	-0.09	0.00

Variable	Pre-Weighting Difference	Post-Weighting Difference
Race/Ethnicity Unknown	-0.05	-0.01
Missing	0.01	0.00
Prenatal Care Initiation		
No Prenatal Care	-0.07	0.00
First Trimester	-0.05	0.00
Second Trimester	0.01	0.00
Third Trimester	-0.02	0.00
Missing	0.08	0.00
Pre-Pregnancy Smoking		
No	0.01	-0.01
Yes	**-0.10**	0.00
Missing	0.02	0.00
Body Mass Index		
Underweight	0.03	0.00
Healthy	0.08	0.00
Overweight	-0.03	0.00
Class 1 Obese	-0.07	0.00
Class 2 Obese	-0.04	0.00
Super Obese	-0.09	0.00
Missing	-0.04	-0.01
Parity		
No Previous Births	0.00	0.00
One Previous Birth	-0.03	0.00
Two to Four Previous Births	0.01	0.00
Five or More Previous Births	0.05	0.00
Missing	0.00	0.00
Plurality		
Singleton	0.05	0.00
Twins	-0.05	0.00
Pre-Pregnancy Diabetes		
No	-0.02	0.00
Yes	0.02	0.00
Missing	0.01	0.01
Pre-Pregnancy Hypertension		
No	0.01	0.00
Yes	-0.01	0.00
Missing	0.01	0.01
Previous Other Poor Birth Outcomes		
No	**0.11**	0.00
Yes	**-0.18**	0.00
No Previous Birth	0.00	0.00
Missing	**-0.13**	0.00
Previous Preterm Birth		
No	0.00	0.00
Yes	-0.02	-0.01
No Previous Birth	0.00	0.00
Missing	0.00	0.00

Variable	Pre-Weighting Difference	Post-Weighting Difference
Delivery at HEN Hospital		
No	**0.16**	0.00
Yes	**-0.19**	0.00
Missing	**0.11**	0.00
Mother Eligibility Category		
Disabled	-0.07	0.01
Foster Care	0.06	0.00
Low-Income Families	-0.07	0.01
Poverty-Related Children	0.05	0.00
Children's Health Insurance Program (CHIP)	0.01	-0.01
Non-Parent Adults	0.09	-0.01
Affordable Care Act Medicaid Expansion	0.05	0.00
Poverty-Related Pregnant Women	**0.10**	0.00
Medically Needy	0.03	0.00
Emergency Medicaid/CHIP for unborn children	-0.06	0.00
Family Planning, Other, or Not Enrolled	**-0.10**	0.00
ACA 1[1]	-0.01	-0.01
ACA 2[1]	0.03	0.00
Mother not present on Eligibility File	-0.05	0.00
Number of Months Eligible in Year Before Delivery		
0 months	**-0.10**	0.00
1 months	-0.06	0.00
2 months	-0.06	0.00
3 months	**-0.10**	0.00
4 months	-0.03	-0.01
5 months	-0.02	0.00
6 months	-0.01	0.00
7 months	-0.01	0.00
8 months	**0.13**	0.00
9 months	0.00	0.00
10 months	-0.04	0.00
11 months	-0.01	0.00
12 months	**0.10**	0.00
Infant Present on Eligibility File		
Yes	-0.03	-0.01

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.
Notes: Standardized differences to assess balance in observed covariates are calculated according to Austin & Stuart, 2015.
[1] ACA 1 and ACA 2 are eligibility categories specific to the DC Medicaid expansion.

TABLE P. 2: STANDARDIZED DIFFERENCES IN CONTROL VARIABLES FOR STRONG START AND COMPARISON GROUP WOMEN PRE- AND POST-WEIGHTING, GROUP PRENATAL CARE MODEL LEVEL ANALYSIS (N=179.258)

Variable	Pre-Weighting Difference	Post-Weighting Difference
Age		
Less than 15 years old	0.01	0.00
15 to 17 years old	0.09	0.01
18 to 19 years old	**0.19**	0.00
20 to 24 years old	**0.13**	0.00
25 to 29 years old	**-0.10**	0.00
30 to 34 years old	**-0.20**	0.00

Variable	Pre-Weighting Difference	Post-Weighting Difference
35 years or older	**-0.16**	-0.01
Missing	**0.19**	0.00
Education		
Less than High School	0.03	0.00
High School or GED	**0.16**	0.00
Some College	**-0.12**	0.00
Associate's Degree	**-0.10**	-0.01
Bachelor's Degree or Higher	**-0.22**	0.00
Missing	-0.03	0.00
Marital Status		
No	**0.26**	0.00
Yes	**-0.27**	0.00
Missing	0.03	0.00
Race/Ethnicity		
Non-Hispanic White	**-0.21**	0.00
Non-Hispanic Black/African American	**0.21**	-0.01
Hispanic	0.02	0.01
Non-Hispanic Other Race	**-0.12**	0.00
Race/Ethnicity Unknown	-0.04	0.00
Prenatal Care Initiation		
No Prenatal Care	-0.08	0.00
First Trimester	**0.12**	0.00
Second Trimester	0.01	0.00
Third Trimester	**-0.14**	0.00
Missing	-0.06	0.01
Pre-Pregnancy Smoking		
No	-0.08	0.01
Yes	0.04	-0.01
Missing	-0.07	-0.01
Body Mass Index		
Underweight	-0.03	0.02
Healthy	-0.02	0.00
Overweight	-0.06	0.00
Class 1 Obese	0.01	0.00
Class 2 Obese	0.00	0.00
Super Obese	-0.02	0.00
Missing	0.01	0.00
Parity		
No Previous Births	**0.29**	0.00
One Previous Birth	**-0.13**	0.00
Two to Four Previous Births	**-0.16**	0.00
Five or More Previous Births	-0.08	0.00
Missing	0.00	0.01
Plurality		
Singleton	0.04	0.00
Twins	-0.04	0.00
Pre-Pregnancy Diabetes		
Yes	0.00	-0.01

Variable	Pre-Weighting Difference	Post-Weighting Difference
Pre-Pregnancy Hypertension		
Yes	**0.11**	0.00
Previous Other Poor Birth Outcomes		
No	**-0.25**	0.00
Yes	-0.07	-0.01
No Previous Birth	**0.29**	0.00
Missing	-0.02	0.00
Previous Preterm Birth		
No	**-0.33**	0.00
Yes	0.09	-0.01
No Previous Birth	**0.29**	0.00
Delivery at HEN Hospital		
No	**0.43**	**0.57**
Yes	**-0.47**	**-0.53**
Missing	-0.08	0.02
Mother Eligibility Category		
Disabled	0.02	0.01
Foster Care	0.07	0.00
Low-Income Families	**0.10**	0.00
Poverty-Related Children	0.05	0.00
Children's Health Insurance Program (CHIP)	0.05	0.01
Non-Parent Adults	-0.05	0.00
Affordable Care Act Medicaid Expansion	0.03	0.00
Poverty-Related Pregnant Women	0.09	0.00
Medically Needy	0.00	0.00
Emergency Medicaid/CHIP for unborn children	**-0.17**	0.00
Family Planning, Other, or Not Enrolled	**-0.30**	0.00
ACA 1[1]	-0.04	0.00
ACA 2[1]	0.01	0.00
Mother not present on Eligibility File	**-0.18**	-0.01
Number of Months Eligible in Year Before Delivery		
0 months	**-0.36**	-0.01
1 months	**-0.13**	0.00
2 months	**-0.09**	0.00
3 months	-0.04	0.00
4 months	-0.03	0.00
5 months	-0.05	0.00
6 months	-0.01	0.00
7 months	0.07	0.00
8 months	0.09	0.01
9 months	0.00	0.00
10 months	0.01	0.00
11 months	0.04	0.00
12 months	**0.18**	0.00
Infant Present on Eligibility File		
Yes	-0.03	0.00

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.
Notes: Standardized differences to assess balance in observed covariates are calculated according to Austin & Stuart, 2015.
[1] ACA 1 and ACA 2 are eligibility categories specific to the DC Medicaid expansion.

TABLE P. 3: STANDARDIZED DIFFERENCES IN CONTROL VARIABLES FOR STRONG START AND COMPARISON GROUP WOMEN PRE- AND POST-WEIGHTING, FOR MATERNITY CARE HOME MODEL LEVEL ANALYSIS (N=328,157)

Variable	Pre-Weighting Difference	Post-Weighting Difference
Age		
Less than 15 years old	0.03	0.00
15 to 17 years old	**0.11**	0.00
18 to 19 years old	**0.10**	0.00
20 to 24 years old	0.07	0.00
25 to 29 years old	-0.07	0.00
30 to 34 years old	-0.09	0.00
35 years or older	-0.06	0.00
Education		
Less than High School	**0.18**	0.00
High School or GED	0.05	0.00
Some College	**-0.10**	0.00
Associate's Degree	-0.08	0.00
Bachelor's Degree or Higher	**-0.19**	0.00
Missing	0.03	-0.01
Marital Status		
No	**0.25**	0.00
Yes	**-0.25**	0.00
Missing	0.01	0.00
Race/Ethnicity		
Non-Hispanic White	**-0.23**	0.00
Non-Hispanic Black/African American	**0.40**	0.00
Hispanic	**-0.19**	0.00
Non-Hispanic Other Race	**-0.10**	0.00
Race/Ethnicity Unknown	-0.02	0.01
Missing	0.03	0.00
Prenatal Care Initiation		
No Prenatal Care	**-0.12**	0.00
First Trimester	0.00	0.00
Second Trimester	0.03	0.00
Third Trimester	-0.09	0.00
Missing	0.06	0.00
Pre-Pregnancy Smoking		
No	-0.01	0.00
Yes	0.05	0.00
Missing	0.02	0.00
Body Mass Index		
Underweight	0.00	0.00
Healthy	-0.04	0.00
Overweight	-0.03	0.00
Class 1 Obese	0.08	0.00
Class 2 Obese	0.01	0.00
Super Obese	0.06	0.00
Missing	-0.04	0.00

Variable	Pre-Weighting Difference	Post-Weighting Difference
Parity		
No Previous Births	0.06	0.00
One Previous Birth	-0.06	0.00
Two to Four Previous Births	0.00	0.00
Five or More Previous Births	0.00	0.00
Missing	0.02	0.00
Plurality		
Singleton	0.04	0.00
Twins	-0.04	0.00
Triplets	0.01	0.00
Pre-Pregnancy Diabetes		
No	-0.03	0.01
Yes	0.03	-0.01
Missing	0.01	0.00
Pre-Pregnancy Hypertension		
No	-0.07	0.00
Yes	0.07	0.00
Missing	0.01	0.00
Previous Other Poor Birth Outcomes		
No	-0.02	0.00
Yes	-0.09	0.00
No Previous Birth	0.06	0.00
Missing	0.04	0.00
Previous Preterm Birth		
No	-0.07	0.00
Yes	0.04	0.00
No Previous Birth	0.06	0.00
Missing	0.00	0.00
Delivery at HEN Hospital		
No	**-0.17**	**-0.15**
Yes	**0.17**	**0.15**
Missing	-0.01	-0.01
Mother Eligibility Category		
Disabled	**0.10**	0.00
Foster Care	0.05	0.00
Low-Income Families	0.03	0.00
Poverty-Related Children	**0.10**	0.00
Children's Health Insurance Program (CHIP)	**0.12**	0.00
Non-Parent Adults	0.02	0.00
Affordable Care Act Medicaid Expansion	**0.17**	0.00
Poverty-Related Pregnant Women	**-0.09**	0.00
Medically Needy	0.06	0.00
Emergency Medicaid/CHIP for unborn children	0.04	-0.01
Family Planning, Other, or Not Enrolled	**-0.12**	0.00
ACA 1[1]	0.08	0.00
ACA 2[1]	**0.10**	0.00
Mother not present on Eligibility File	**-0.17**	0.00

Variable	Pre-Weighting Difference	Post-Weighting Difference
Number of Months Eligible in Year Before Delivery		
0 months	**-0.18**	0.00
1 months	**-0.13**	0.00
2 months	**-0.13**	0.00
3 months	**-0.13**	0.00
4 months	-0.05	0.00
5 months	-0.03	0.00
6 months	0.01	0.00
7 months	0.08	0.00
8 months	0.04	0.00
9 months	0.06	0.00
10 months	0.03	0.00
11 months	0.01	0.00
12 months	**0.16**	0.00
Infant Present on Eligibility File		
Yes	**0.27**	0.00

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.
Notes: Standardized differences to assess balance in observed covariates are calculated according to Austin & Stuart, 2015.
[1] ACA 1 and ACA 2 are eligibility categories specific to the DC Medicaid expansion.

APPENDIX Q: IMPACT ANALYSIS – SUMMARY OF COMPARISON GROUP DECISIONS

Identifying women who could serve as a comparison group for women enrolled in Strong Start was among the most challenging aspects of the evaluation. To estimate the impact of Strong Start *in combination* with one of the three delivery models of care (i.e., Birth Centers, Group Prenatal Care, or Maternity Care Homes), we had to identify women who received care in typical Medicaid maternity care practices, but were otherwise similar to Strong Start enrollees. The vast majority of typical Medicaid prenatal care is practiced in such settings as private solo and/or group practices, Federally Qualified Health Centers, hospital outpatient department clinics, and (to a smaller extent) public health department clinics. Criticisms of typical care often cited in the literature include that it is: medical in focus, interventionist, less focused on education and discontinuous care.

Ideally, a comparison group of women would be drawn from the same counties or parishes[79] where Strong Start participants reside so that treatment and comparison group cases had been exposed to the same contextual factors. However, there were two scenarios that necessitated drawing the comparison group from a different county than that where Strong Start sites or participants are located:

1. Scenario 1 – The demonstration, through a single site or multiple demonstration sites, "saturated" the area.
2. Scenario 2 – There were some typical Medicaid maternity practices in the local area, but the Strong Start site was the only source of care for high-risk pregnant women enrolled in Medicaid.

To determine which Strong Start awardees and sites fell under each of these categories, the impact analysis team reviewed case study memos and followed up with site visit teams to gather information prior to conducting any analyses. Table Q. 1 summarizes findings regarding whether valid comparison groups could be obtained from the local area surrounding each Strong Start site or whether matched comparison counties needed to be identified.

Overall, for 12 awardees we pulled the comparison group from the same counties where Strong Start participants reside. For five awardees we needed to find matched counties to select the comparison group for at least one of the sites associated with the awardee. For three of these awardees, this was due to scenario 1. For two of these awardees, matched counties needed to be found due to scenario 2.

For each case for which there was a need to go outside the local area to find a comparison group, we used a statistical matching technique, nearest neighbor matching using the Mahalanobis distance measure, to find the most similar county within the same state based on observable characteristics of the county.[80] Using this matching technique, we paired treatment counties where Strong Start participants resided with the closest matched county in the state without Strong Start participants. The following variables were used for matching: urban-rural continuum, personal income per capita, percent in poverty, percent black, percent Hispanic, percent of children covered by Medicaid, number of doctors per capita, number of certified nurse midwives and certified midwives per capita, number of hospital beds per capita, percent of births with low birth weight. With the comparison group drawn from

[79] Because Louisiana is the only state that uses the term "parishes," we will herein refer to all counties and parishes as counties unless referring specifically to Louisiana.
[80] See Rubin, D.B. (1979). "Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies." *Journal of the American Statistical Association* 74, 318–328

Medicaid-covered births in the counties identified through this process, we used the same methods as those we applied to within-county comparison groups.

TABLE Q. 1: SUMMARY OF COMPARISON GROUP COUNTY DECISIONS

Awardee	Decision on Comparison Group Location			Reason for Using Matched Counties	
	Use Same Counties for All Sites	Use Matched Counties for All Sites	Use a Combination of Same and Matched Counties	Only Medicaid Maternity Provider in the Area	High-Risk Sites
Albert Einstein Healthcare Network	No	No	**Yes**	**Yes**	No
American Association of Birth Centers	No	No	**Yes**	**Yes**	No
Amerigroup Corporation	**Yes**	No	No	N/A	N/A
Central Jersey Family Health Consortium	**Yes**	No	No	N/A	N/A
Florida Association of Healthy Start Coalitions	No	No	**Yes**	**Yes**	No
Health Insight of Nevada	**Yes**	No	No	N/A	N/A
Johns Hopkins University School of Medicine	**Yes**	No	No	N/A	N/A
Maricopa Special Health Care District	**Yes**	No	No	N/A	N/A
Medical University of South Carolina	No	**Yes**	No	No	**Yes**
Meridian Health Plan	**Yes**	No	No	N/A	N/A
Mississippi Primary Health Care Association	**Yes**	No	No	N/A	N/A
Providence Health Foundation	**Yes**	No	No	N/A	N/A
Signature Medical Group	**Yes**	No	No	N/A	N/A
United Neighborhood Health Services	**Yes**	No	No	N/A	N/A
University of Alabama, Birmingham	No	**Yes**	No	No	**Yes**
University of South Alabama	**Yes**	No	No	N/A	N/A
University of Tennessee Health Science Center	**Yes**	No	No	N/A	N/A

APPENDIX R: IMPACT ANALYSIS – RATIONALE FOR PROPENSITY SCORE REWEIGHTING

PROPENSITY SCORE REWEIGHTING VS. MATCHING FOR ESTIMATING STRONG START TREATMENT EFFECTS

Propensity score reweighting (i.e., inverse probability of treatment weighting on the propensity score) is one of a class of available propensity-score-based methods (also including ***matching*** on the propensity score, ***stratification*** on the propensity score, and ***covariate adjustment*** using the propensity score) employed to reduce the effects of confounding in observational studies (Austin, 2011; Imbens, 2004; Rosenbaum and Rubin, 1983). Like propensity score matching (and other methods that directly match on covariates like nearest neighbor matching), propensity score reweighting allows for the construction of a comparison group of untreated individuals that are observationally similar to treated individuals (Hirano and Imbens, 2001; Imbens, 2004). Both methods allow for close inspection of the degree to which covariates are balanced in the treatment and comparison groups, and performing such inspection is an element of best-practice implementation (Austin, 2008; Austin and Stuart, 2015; Hill, 2008). The propensity score reweighting approach to construct a comparison group has been applied previously to evaluate the impact of birth center care on birth outcomes (Benatar et al., 2013). This approach is also currently being used in CMMI evaluations of the Multi-Payer Advanced Primary Care Practice Demonstration (Centers for Medicare & Medicaid Services, 2017) and the FQHC Advanced Primary Care Practice Demonstration (Kahn et al., 2017).

Propensity score matching and weighting share the step of estimating a propensity score model of treatment status. Given the estimated propensity score, matching involves attempting to match each treated case to one or more untreated cases with a similar propensity score to create a comparison group. The matching process involves a number of decisions including choice of matching method, number of cases to match, whether to use a caliper in the match, and matching with or without replacement (Caliendo and Kopeinig, 2005). In widely used pair-wise (1:1) matching, only a subset (quite possibly a small subset) of untreated cases are matched and used for the comparison group. In contrast, with propensity score reweighting, a statistical weight is calculated as a function of the propensity score (Rosenbaum, 1987). Potentially all available untreated cases are then used for the comparison group. Untreated cases that are more similar to treatment group members receive larger statistical weights, and dissimilar comparison group members receive lower weights. The weighted untreated cases are used as the comparison group, which will have means and distributions of observable characteristics that are very similar to the treated group. If meaningful differences in covariates are detected in early stages, the propensity score model is refined until remaining differences are negligible.

Both propensity score weighting and the many variants of matching produce treatment effects estimates that have similar large sample properties. Under the common assumption that treatment status is independent of the potential outcomes given the covariates, both weighting and matching yield treatment effect estimates that are statistically consistent, i.e., estimates converge to their true values as the sample size increases (Imbens, 2004; Lunceford and Davidian, 2004). Whereas propensity score weighting allows treatment effect estimates that are statistically efficient (Hirano, Imbens, and Ridder, 2003), propensity score matching estimators are generally not efficient. More efficient estimates will generally have lower standard errors, and therefore be more likely to statistically detect treatment effects. In selecting the number of comparison group cases (M) in 1:M propensity score matching, a higher value of M tends to increase precision (reduce variance) at the expense of higher bias (Austin, 2010). Because propensity score weighting uses all untreated cases, the method does not present this tradeoff. Propensity score weighting estimates may be more sensitive than matching if the propensity

score equation is misspecified (Rubin, 2004). Careful modeling of the propensity score equation can help avoid this potential problem. Further, when propensity score weighting is combined with regression adjustment for covariates, estimates have been shown to be "doubly robust" to misspecification in either the propensity score equation or the outcome equation (Bang and Robins, 2005).

The various matching and weighting methods differ in their finite (small) sample performance. Recent Monte Carlo simulation evidence finds that, in realistic microeconomic datasets where there is adequate overlap in the propensity score distributions of treated and untreated observations, propensity score reweighting is more effective than pairwise matching and is competitive with the most effective matching estimators (Busso, DiNardo, and McCrary, 2014). Both methods rank well in terms of minimizing bias, but propensity score weighing using normalized weights has lower variance than pairwise matching across a wide range of alternative data generating process scenarios.

Because the Strong Start impacts analyses will estimate treatment effects at the site level (many of which involve a modest number of treated cases), a statistically efficient method that makes full use of available data will have the best chance of detecting true treatment effects. Given the statistical efficiency of propensity score reweighting and its documented strong performance relative to alternatives, we will use the propensity score reweighting approach as our primary estimation method for the impact analysis.

APPENDIX S: IMPACT ANALYSIS – DATA PREPARATION

In conjunction with the technical assistance team, the impact team spent considerable time obtaining and linking birth certificate and Medicaid eligibility and claims/encounter data for women enrolled in Strong Start and a comparison group of women who had a birth covered by Medicaid but were not enrolled in Strong Start. We derived the key analytic and control variables for the impact analysis from birth certificates (birth and process outcomes and demographic and medical risk factors), Medicaid eligibility files (eligibility route and dates), and Medicaid claims (expenditure and utilization outcomes and diagnoses).

To obtain these outcomes for women enrolled in Strong Start, and to identify a comparison group of women with a Medicaid-covered birth and their outcomes, we linked birth certificates to both Strong Start participant lists and Medicaid eligibility files. Once birth certificates were linked to Medicaid eligibility files for mothers and infants, we identified a comparison group of women enrolled in Medicaid in the same or similar geographic areas where Strong Start participants resided. By attaching the Medicaid ID to each Strong Start participant and comparison group woman and infant, we linked Medicaid claims data to create cost and utilization outcomes for each mother and infant. This section describes these processes along with the steps needed to make comparable analysis files across states.

LINKING BIRTH CERTIFICATES TO MEDICAID ELIGIBILITY DATA AT THE URBAN INSTITUTE

The linkage between birth certificates, Strong Start participant lists, and Medicaid data was performed either by state staff, state contractors, or Urban Institute staff. State staff conducted the linkage for Louisiana, Michigan, Mississippi, Missouri, New Jersey, Pennsylvania, and Tennessee, and state contractors linked the data in Arizona and Maryland. Urban Institute staff linked data for Alabama, the District of Columbia, Georgia, Florida, and Nevada.

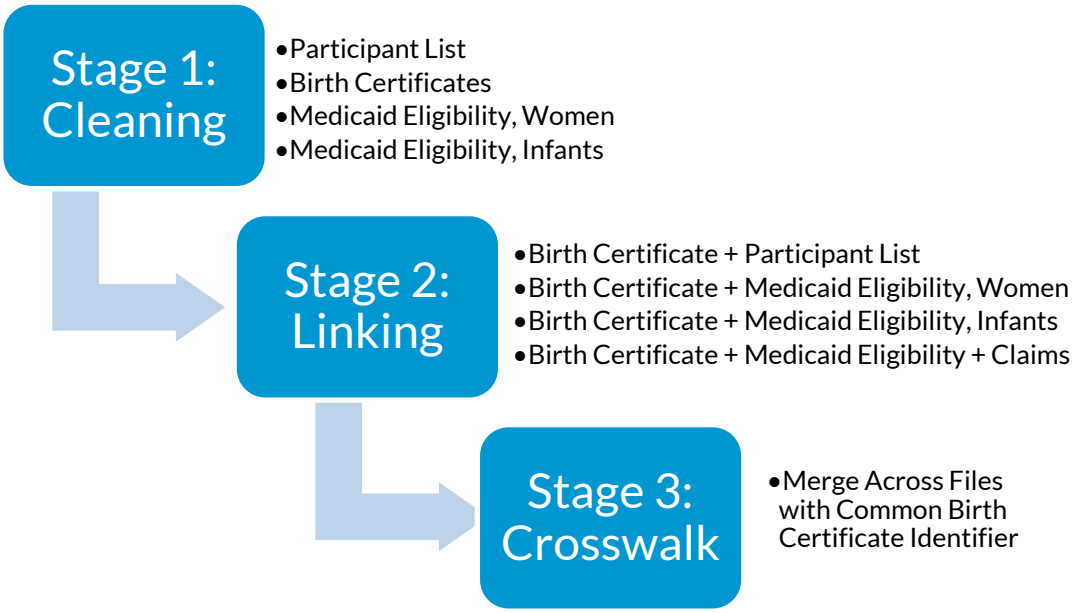
This process of standardizing variables, de-duplicating files, and linking files together is similar to a process recommended by CMS. [81]While the Urban Institute was not responsible for the linkage in some states, the steps followed by states are likely similar to this process. The rest of this section describes these processes in detail and concludes with a discussion of unique challenges from each state.

Figure S. 1 shows the process flow for states where the Urban Institute conducted the linkage. This process entailed the following key steps:

- Cleaning, standardizing, and de-duplicating birth certificate and Medicaid eligibility files so that matching variables have a common set of codes, structures, and well-understood crosswalks
- Linking standardized Strong Start participant lists to birth certificate files
- Linking mothers' standardized eligibility files to birth certificate files
- Linking infants' standardized eligibility files to birth certificate files
- Creating a crosswalk from birth certificates to Strong Start participants, and to mother and infant pairs

[81] https://www.medicaid.gov/medicaid/quality-of-care/downloads/using-vital-records.pdf.

FIGURE S. 1: PROCESS FOR LINKING BIRTH CERTIFICATE AND MEDICAID ELIGIBILITY DATA



Cleaning and Standardizing Files

In general, we followed very similar cleaning processes for each state, with slight variations where data elements differed. For the participant lists, birth certificates, and Medicaid eligibility records, this involved:

- saving name fields as separate variables for first, middle, and last names;
- transforming names to all caps and removing special characters (hyphens, spaces, etc.); and
- saving birth dates for mothers and infants with leading zeros on day and month.

Participant lists in Florida and Washington, DC contained data on fetal deaths, miscarriages and terminations, and mothers who moved or were lost to care. In the cleaning process for these states, we developed special codes to remove these individuals from the participant list, as these observations were not expected to be present in the birth certificates. This type of data anomaly was found when looking at records left unlinked after one iteration of linking.

Cleaning Medicaid eligibility files also entailed de-duplicating files (e.g., differentiating multiple eligibility spells for a single person) by Medicaid ID or another unique identifier in order to retain only one record per ever-eligible woman or infant. The de-duplicated record combined eligibility information from multiple records into one record per person.

For birth certificate or Medicaid files that did not contain a unique identifier, one was created for reference. For example, if a birth certificate file did not contain a birth certificate ID variable, we generated a unique ID based on each observation so that each record could be easily referenced.

LINKING

As every baby born in the U.S. must, by law, have a birth certificate, the birth certificate files served as the base file to which participant lists and Medicaid eligibility files were linked. The birth certificate files also contained the key analytic outcome variables for the impact analysis. Once cleaned, we separately linked the following three files to each state's birth certificate file:

- Strong Start participant lists
- Medicaid eligibility files for the mother
- Medicaid eligibility files for the infant

The birth certificate file identifier thus became the common key that allowed us to create a crosswalk across all the files.

In general, the linking methodology used two types of variables: those that are used for ***blocking*** and those that are used for ***matching***. We used blocking variables to create bins within which matching was performed. Blocks were calculated by combining a set of variables together into a single variable. As two different datasets were being linked, it was integral that the blocking variables on each dataset had identical coding schemes to ensure that like values were compared. Then, once separated into a subset of observations based on blocking, the program used the ***name*** to find the best match.

For example, suppose two hypothetical datasets, A and B, are prepared for linking. If delivery date and mother's year and month of birth were used as the blocking variables, then the block might have the value "20140101199906," where the delivery date is "20140101" and the mother's year and month of birth is "199906." After the linking program reads all the observations in dataset B, the records are sorted by block. Then, the coding program reads each observation in dataset A one by one. As observations are read, the blocking variable for the observation in dataset A is created and compared to all observations in dataset B having the same blocking variable. The best link between datasets A and B is kept, and if the Jaro-Winkler score meets or exceeds a given threshold, then the observations are considered a match.[82] This process repeats over several different block variables to maximize the number of links found.

Two issues are worth noting about our linkage process: First, we could not link mothers and infants to each other in the Medicaid eligibility and claims files in advance of linking the eligibility files to birth certificates. The only way to "crosswalk" the mother and infant eligibility files is through the birth certificate file because states do not often have a family-level Medicaid ID that can be used to link mother and infant pairs. Therefore, we use the separate mother and infant links to the birth certificate to identify mother and infant pairs in the Medicaid eligibility and claims records. Second, the Urban Institute's Institutional Review Board does not allow us to receive Social Security numbers (SSNs) from states. SSNs were often used by states that conducted the links themselves, which likely results in higher quality matches in those states. See Appendix T for additional discussion of this issue.

[82] Jaro–Winkler distance is a metric for measuring the edit distance (similarity) between two string sequences. See Jaro, M. A. (1989). "Advances in record linkage methodology as applied to the 1985 census of Tampa Florida". *Journal of the American Statistical Association*. 84 (406): 414–20. doi:10.1080/01621459.1989.10478785.

Linking Strong Start Participant Lists to Birth Certificate Files

At the start of the process, the linking program read in all the birth certificate records and calculated the blocking variable for the first pass. Ideally, this first blocking variable included the mother's year and month of birth and the infant's year and month of birth. The variables that were actually available are described in the state-specific information later in this chapter.

Next, the linking program read the Strong Start participant list one record at a time. As each record was read, the same blocking variable was calculated the single participant record was compared with every birth certificate having the same blocking variable, and a name similarity score was calculated between the two records.[83] Once this process was completed for each participant record within the block, we kept the participant record with the highest similarity score, identifying it as the best potential match to the birth certificate record. If the similarity score met or exceeded our minimum threshold, these two records were considered a match.

When calculating name similarity, we looked at several variations of name: mother's name as given on the participant list and birth certificate, mother's maiden name, and surname of the infant. Preference was given to records that matched on the name fields as given.

We allowed each Strong Start participant to link to only one birth certificate. Strong Start participants who had more than one birth over the course of the evaluation had separate participant IDs that could each link to a separate birth certificate record. In the case of twins or other multiple births, we took a second pass over the data and allowed the Strong Start participant to link to additional birth certificates. Twins and other multiple births, however, were excluded from the claims analysis after linking, as described in the next section of this appendix.

In cases in which the birth date of the infant was not captured on the participant list, we took at least one additional pass over the data using only the mother's date of birth information as our blocking variable.

Linking Birth Certificates and Medicaid Eligibility Files

To start the linking process, we calculated the blocking variables (usually mother's year and month of birth) on the birth certificate file during the first pass. We compared each observation in the cleaned and de-duplicated Medicaid eligibility file to all of the birth certificate observations with the same blocking variable. We then calculated similarity scores between the names on the two files. The birth certificate with the highest name similarity score was kept as the best potential match for the eligibility record. Then, if the record with the highest name similarity met or exceeded our minimum threshold, the two records were considered a match and the birth certificate record was not allowed to link again to another eligibility record in this file.

We conducted Medicaid eligibility links to birth certificates separately for births by year. This ensured that a woman with births in each year, but who only appeared in the cleaned eligibility file once,

[83] For a detailed example of how name similarities are calculated, see Appendix A of https://www.ncjrs.gov/pdffiles1/bjs/grants/239536.pdf.

was linked to two birth certificate records. For infants, we linked births across all years to eligibility records.

In all states, we considered the name of the woman in the name fields as given, but also considered several variations to allow for cases where surnames were slightly different and/or inconsistent or where middle names were included in the last name field. Overall, when linking mother eligibility to birth certificates, we compared links for the following options:

- names as given on the birth certificate and eligibility records
- name from the eligibility record and any maiden name that was present on the birth certificate
- mother's first name and the surname of the infant on the birth certificate (in some states)

When linking infant eligibility to birth certificates, we compared the following:

- names as given on the birth certificate and eligibility records
- name from the eligibility record and the mother's surname from the birth certificate

Preference was given to records that matched on name fields as given. We also considered additional variations when the middle name was present to help account for hyphenated or complex last names (e.g., including or excluding the middle name). In the state-specific information that follows, we discuss the specific variables that were available in each state.

State-Specific Challenges

Alabama: Alabama provided a crosswalk between mothers and infants in the 2014 and 2015 Medicaid files. However, we still performed our links between Medicaid-eligible infants and birth certificates for all years. We relied on the crosswalk provided by the state when inconsistencies between the two methods existed. Medicaid eligibility data for Alabama does not contain the middle name. Because we generally use this variable for matching, we included an additional block for women that used the first three letters of the last name. When we did this, we used a very high threshold for the similarity score in order to minimize false matches.

We used the following variables as blocks to link Strong Start participants to the birth certificate file: the mother's year and month of birth and the infant's year and month of birth. We used the mother's year of birth and first three letters of her last name as the block to link the mother's eligibility file to the birth certificate. We used the infant's year and month of birth as the block to link the infant's Medicaid eligibility file to the birth certificate.

Washington, DC: In DC, our linkage efforts resulted in fewer infant links than mother links. We used several extra combinations of alternate last names, as well as a pass without middle names, to try to improve the linkage rate. None of these techniques were successful in finding more than a handful of additional links. However, an early version of birth certificate data provided a payment flag for births covered by Medicaid. We could not use the flag directly for linking; but, the frequencies from the flag were close to the number of birth certificates that linked to Medicaid eligibility files for both mothers and infants, which made us more confident about our matching algorithm.

We used the following variables as blocks to link Strong Start participants to the birth certificate file: the mother's year and month of birth and the infant's year and month of birth, as well as the estimated infant's year of birth (from participant file). We used the mother's year and month of birth on the birth certificate as a block to link to the mother's Medicaid eligibility file, and the infant's year and month of birth as a block to link to the infant's Medicaid eligibility file.

Florida: Medicaid eligibility data for Florida did not include middle names. The lack of middle names, combined with a high proportion of hyphenated or complex last names, presented challenges for linking in this state. For example, the name on the birth certificate record might have been "Mary Jane Smith-Jones," while the name on the eligibility record was simply "Mary Smith." At the same time, the Florida files contained more maiden names than other states. We used a higher score threshold to balance the additional information in surnames with the lack of middle names. In addition, because middle names were missing, we calculated an additional block for mothers with the first three letters of their last names using a very high similarity score.

We used the following variables as blocks to link Strong Start participants to the birth certificate file: the mother's year and month of birth and the infant's year and month of birth. We used the mother's year and month of birth and the infant's year and month of birth as blocks to link to the mother's Medicaid eligibility file, and infant's year and month of birth as blocks to link to the infant's Medicaid eligibility file.

Nevada: As in the case of Florida, Nevada files included many complex last names. To account for last name differences between the birth certificates and the eligibility files, we developed code that switched the different segments of last names and made comparisons to capture cases where last names were stored differently or in different orders across datasets. Additionally, we added the date of birth variable to capture more records so a lower score could be used to account for more name variation.

We used the following variables as blocks to link Strong Start participants to the birth certificate file: the mother's year, month, and day of birth and the infant's year, month, and day of birth. To link the mother's Medicaid eligibility file to the birth certificate, we used the mother's year, month, and day of birth. For the infant eligibility file, we used infant's year, month, and day of birth.

MEDICAID CLAIMS AND ENCOUNTER DATA

The evaluation team used Medicaid claims and encounter claims data to estimate the impact of Strong Start on costs and utilization and to create supplemental variables to enhance the propensity score reweighting process.[84] We developed a common set of variables, codes, and structures to make consistent claims files across states. This process involved extensive communication with states to ensure that each state provided all data required to construct analytic variables, as well as documentation on definitions and codes. As described in detail in the Technical Assistance and Data Acquisition section in the main report, this effort was extremely time-consuming.

[84] For ease of exposition, we may refer to claims and encounter data collectively as claims data.

We requested Medicaid claims and encounter data from all 20 states for which we planned to conduct the impact analysis; 11 ultimately submitted claims. Our analysis includes the District of Columbia and the following eight states with reliable data: Alabama, Arizona, Florida, Louisiana, Missouri, New Jersey, South Carolina, and Tennessee.[85] These states provided claims-level data that could be used to construct analytic variables on risk factors, health utilization, and costs for the mother and infant.

Table S. 1 shows the analytic variables constructed from claims data, and Table S. 2 identifies whether variables were available or not for each state for birth certificates and claims. We constructed claims variables for mother and infant pairs where both the mother and infant were eligible for Medicaid during some or all of the study period, which is one year before birth, the birth month, and 11 months following the birth month.

TABLE S. 1: RISK FACTOR, EXPENDITURE, AND UTILIZATION VARIABLES CONSTRUCTED FROM CLAIMS AND ENCOUNTER DATA

Variables Constructed from Claims and Encounter Data
Risk Factors for Women
Any diagnosis of pre-pregnancy hypertension on a claim in the 8 months before the delivery month
Any diagnosis of pre-pregnancy diabetes on a claim in the 8 months before the delivery month
Number of different categories of clinical diagnoses based on Clinical Classification Software (CCS) diagnosis categories in the 8 months before the delivery month
Expenditures
Total Medicaid expenditures for the pregnant woman in 8 months before delivery period
Total Medicaid expenditures for the mother and infant during the delivery period
Total delivery and post-delivery Medicaid expenditures[1]
Utilization
Number of emergency department visits in the 8 months before the delivery month
Number of hospitalizations in the 8 months before the delivery month
Number of days in NICU
Number of ED visits for mother 11 months after delivery month
Number of hospitalizations for mother 11 months after delivery month
Number of emergency department visits for infant in the first year of life
Number of hospitalizations for infant in the first year of life

Notes: [1] Includes expenditures during the delivery period, infant expenditures during the 11 months after the delivery month, and mother expenditures during the 11 months after the delivery month.

[85] As described in the Technical Assistance and Data Acquisition section, Michigan and Georgia also provided claims data. However, these data were not usable because there were significant numbers of missing individuals in the samples provided. In Michigan, approximately 20 percent of Strong Start participants who matched to the birth certificate file were missing from the Medicaid eligibility and claims files. Those missing from the Medicaid files also have significantly worse birth outcomes compared to those who are matched (data not shown). In Georgia, the majority of Strong Start participants did not merge to the Medicaid data. The state was unable to provide an updated file that corrected the issue in time for us to process and analyze the claims data.

TABLE S. 2: ANALYTIC VARIABLES CONSTRUCTED FROM BIRTH CERTIFICATE AND CLAIMS DATA, BY STATE

Outcomes	Alabama	Arizona	District of Columbia	Florida	Louisiana	Missouri	New Jersey	South Carolina	Tennessee	Maryland	Mississippi	Nevada	Pennsylvania
Key Birth Outcomes													
Clinical gestational age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birth weight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Apgar score	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Birth process outcomes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
C-section	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VBAC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weekend delivery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Cost Outcomes													
Prenatal period expenditures	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Total expenditures during delivery period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Total delivery and post-delivery expenditures	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Utilization Outcomes													
Number of ED visits in prenatal period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Number of hospitalizations in prenatal period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
NICU days	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	No	No	No
Number of ED visits for mother post-delivery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Number of hospitalizations for mother post-delivery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Number of ED visits for infant post-delivery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Number of hospitalizations for infant post-delivery	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Demographic Risk Factors													
Age	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Race	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Quarter of birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marital status	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Basis of Medicaid eligibility	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Outcomes	Alabama	Arizona	District of Columbia	Florida	Louisiana	Missouri	New Jersey	South Carolina	Tennessee	Maryland	Mississippi	Nevada	Pennsylvania
Behavioral Risk Factors													
Smoking	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Prenatal care initiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Medical Risk Factors													
Plurality	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous preterm birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Previous other poor pregnancy outcome	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interpregnancy interval	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-pregnancy diabetes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-pregnancy hypertension	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mother's BMI pre-pregnancy	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
HEN hospital	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Diagnosis of diabetes pre-pregnancy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Diagnosis of hypertension pre-pregnancy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Number of unique diagnoses	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Indicators for unique non-pregnancy-related diagnoses in prenatal period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No

Notes: "No" indicates that the data was not received to construct this variable.

Constructing the Prenatal, Delivery, and Postnatal Period

Using the date of birth from the birth certificate, we scanned the maternal and infant claims for any hospital inpatient or Birth Center claim that included the infant's date of birth.[86] When there were multiple claims with adjacent or overlapping dates (e.g., inpatient claims for both mother and infant), we linked these claims to create the delivery period. The first date in the delivery period is the admission date for the first claim in the episode, and the final date is the discharge date for the last claim. Using this delivery period, we constructed the pre-pregnancy period as the 8 months prior to the first day of the delivery period. Similarly, we constructed postnatal period variables representing the 11 months following the month of delivery for the mother and the first year of birth for the infant.

Exclusions

We excluded the following mother/infant pairs and their claims from the claims analysis files:

- multiple births (twins/triplets) as Strong Start is not expected to impact the rate of multiple births
- mother/baby pairs without an identifiable delivery claim for either a hospital or birth center birth
- all long-term care and home health claims as identified by various codes, such as claim type, provider type, and category of service, as these data are not provided in some states and these claim types are rare among pregnant women and infants
- all managed care premiums[87]

Adjustments

We requested fully adjusted claims with denied claims removed or with adjustment indicators provided and documented. All but two states (Florida and Tennessee) provided fully adjusted claims. For Florida and Tennessee, we applied the adjustment indicators provided by the states to produce final claims.

Recoding

To develop consistent codes across states, we relied on documentation provided by the states. Documentation came in a variety of formats and generally required further clarification from states. After we resolved codes, we mapped state-specific variables into the common analytic variables described in Table S. 1.

[86] For South Carolina, the hospital or birth center claim with specific diagnoses associated with delivery is used, with admission dates within two days of the delivery.
[87] We were unable to exclude dental premiums in Louisiana since individual dental claims with dates are not available in that state.

Managed Care

At the onset of this effort, we had concerns that Medicaid expenditures would be missing on encounter records for women enrolled in risk-based managed care plans. However, all but one state (Missouri) included the Medicaid paid amount for all women enrolled in managed care. In the case of Missouri, about half of encounter records were for women enrolled in managed care, and all the encounter records were missing expenditures. In Missouri, we imputed claim-level expenditures by matching the Healthcare Common Procedure Coding System (HCPCS) procedure code for the claim to the average payment for the equivalent fee-for-service claim. Because Missouri pays hospitals a per diem amount for inpatient claims, we computed average per diem payments from hospital fee-for-service inpatient claims per county of mother's residence (hospital county was not available). We applied that per diem amount to each managed care hospital claim according to the number of days of stay. We also compared total and average monthly expenditures for all states and found the estimates looked reasonable compared to each other and to data from the Hospital Cost and Utilization Project for delivery hospitalization. No external source has established a universal benchmark for most of the expenditure variables created; but, this comparison allowed us to conclude that managed care plans are submitting relatively complete Medicaid expenditure information on their claims/encounter data provided to their states. The benchmark means for all analytic variables and all states are included in Table S. 3.

TABLE S. 3: BENCHMARK MEANS FOR ANALYTIC VARIABLES CONSTRUCTED BY CLAIMS DATA, BY STATE

Measures	Alabama	Arizona	District of Columbia	Florida	Louisiana	Missouri	New Jersey	South Carolina	Tennessee
Number of births	22,395	22,236	7,166	96,123	32,629	29,283	32,237	36,651	44,715
Eligibility[88]									
Mean number of months, prenatal period	6.08	6.37	6.90	6.36	6.70	6.35	5.91	6.45	6.95
Mean number of months, postnatal for mother	4.43	9.07	9.84	6.79	6.86	5.99	7.25	7.22	10.86
Mean number of months, postnatal for infant	10.66	10.07	10.47	10.31	10.80	10.77	10.47	10.76	10.84
Utilization									
Mean number of hospitalizations, prenatal period	0.08	0.06	0.08	0.07	0.05	0.06	0.04	0.11	0.05
Mean number of ED visits, prenatal period	0.71	0.65	0.96	1.53	0.96	0.96	0.90	1.09	1.35
Mean number of days for delivery period	5.00	3.47	3.44	3.04	3.65	4.29	4.39	NA	3.36
Median number of days for delivery period	3.00	2.00	3.00	2.00	2.00	2.00	3.00	NA	2.00
Percent of deliveries with a C-section	31.77	25.09	30.76	32.20	32.59	27.87	35.45	31.59	31.68
Percent of deliveries with a NICU stay	15.09	5.73	16.52	11.90	12.32	14.31	12.99	5.71	19.60
Mean number of hospital stays, postnatal for mother	0.04	0.05	0.06	0.06	0.04	0.04	0.04	0.07	0.07
Mean number of ED visits, postnatal for mother	0.30	0.58	0.84	0.69	0.68	0.67	0.66	0.73	1.24
Mean number of hospital stays, postnatal for infant	0.12	0.09	0.09	0.08	0.10	0.08	0.09	0.11	0.08
Mean number of ED visits, postnatal for infant	1.01	0.92	1.40	0.86	1.20	1.29	1.09	0.99	1.31
Medicaid Expenditures									
Mean prenatal care expenditures	1,143	2,177	1,360	2,918	1,842	2,865	3,435	2,365	2,210
Mean expenditures per month of eligibility, prenatal period	196	337	389	479	301	452	550	390	340
Mean total expenditures during delivery period	9,912	6,956	10,211	9,347	6,801	8,091	16,287	10,365	11,488
Median total expenditures during delivery period	5,775	5,571	5,625	4,895	4,071	5,823	16,246	7,025	5,387
Mean total expenditures, postnatal for mother	632	2,068	1,636	1,450	1,007	1,504	1,973	1,506	2,237
Mean expenditures per month of eligibility, postnatal for mother	162	254	175	280	173	292	259	267	230
Mean total expenditures, postnatal for infant	2,372	2,704	1,795	2,377	3,302	2,112	2,672	2,335	3,271
Mean expenditures per month of eligibility, postnatal for infant	231	312	187	255	329	202	278	238	334

[88] For the prenatal period, the maximum is 8 months. For the postnatal period, the maximum is 11 months following the delivery month for the mother, and 11 months following the delivery period for the infant.

Anomalies

Despite our attempts, we cannot always ensure that all analytic variables have comparable definitions across states. States have considerable leeway in how they define, code, and process their Medicaid data. Also, while the same data are requested from all states, not all states were able to provide the exact data requested for both administrative and (in one case) confidentiality reasons. The following are those anomalies, by state:

- *Alabama*: Revenue codes were not available to compute NICU days by level of care. We computed total NICU days from the length of stay of separate infant claims. The state informed us that only infants in the NICU have separate claims from those of the mother.
- *District of Columbia*: NICU days are not available.
- *Louisiana*: NICU days were not available. Dental claims did not contain service dates. We excluded encounter-level dental claims, but included the dental managed care premiums in Medicaid expenditures calculations.
- *Missouri*: About half the claims were encounter records that had no Medicaid paid amount. As previously described, we imputed the amount paid from fee-for-service claims with the same HCPCS code or hospital ZIP Code.
- *South Carolina*: According to the state's confidentiality restrictions, only the year was provided on the birth certificates, and only the month and year were provided on the claims. We defined the delivery period to be the month/year of delivery. We aggregated all claims within each of the following three groups: 12 months prior to delivery month, the delivery month, and 11 months following delivery. Accordingly, South Carolina's delivery expenditures could be higher on average than the actual delivery hospitalization expenditures. Similarly, we computed the length of the delivery hospitalization as the total number of hospital days during the delivery month.
- *Tennessee:* NICU days were not available.

APPENDIX T: IMPACT ANALYSIS – QUALITY OF LINKING PROCESS

LINKING DATASETS FOR THE STRONG START EVALUATION

To conduct the Strong Start Impact Evaluation, we linked four data sets together:

- Strong Start participant lists
- birth certificates
- Medicaid eligibility files
- in states where available, Medicaid claims/encounter data

In this appendix, we assess and compare the quality of data linkages across states. In general, there is no generally accepted method for determining the quality of such linkage efforts. Sometimes, a comprehensive list of individuals who needed to be matched was available and used as a benchmark. Unfortunately, there was no such "gold standard" list of Medicaid-covered pregnant women or births against which the linkage conducted for the Strong Start evaluation could be benchmarked. As a result, this assessment is, by nature, qualitative and comparative.

We received or linked data for the District of Columbia (DC) and the following 12 states: Alabama, Arizona, Florida, Louisiana, Maryland, Missouri, Mississippi, Nevada, New Jersey, Pennsylvania, South Carolina, and Tennessee. Seven states conducted the linkage across files themselves; two states designated a contractor to conduct the linkage; and the Urban Institute conducted the linkage in three states and DC. Appendix S provides detailed information on the linking methodology used by Urban to link the four data sets in these states. The linking methodology varied across states along key dimensions that may affect the quality of the linkage and the comparability of the data across states, including:

- whether Urban, the state, or a state-designated contractor conducted the linkage;
- whether the Medicaid eligibility files used in the linkage included all women, all women in an age range (e.g., 15 - 44), or only women with a delivery claim;
- whether Social Security numbers were used to link birth certificates to Medicaid eligibility records;
- the types of birth certificate links to Medicaid eligibility records that were developed and/or provided to Urban, including birth certificates where both the mother **and** infant linked to Medicaid eligibility (Mother **and** Infant), the mother **or** the infant linked to Medicaid eligibility (Mother **or** Infant), and **only** the mother's links to Medicaid eligibility were developed (**Only** Mother Eligibility Links Developed); and
- whether claims/encounter data were obtained from the state.

Table T. 1 presents data on these dimensions for the states from which data were obtained. Information is based on conversations with state officials and analysis of data obtained from the states. What follows is a technical analysis of the quality of the linkage process.

TABLE T. 1:STATE LINKAGE METHODOLOGY

State	Linked By	Eligibility File	Social Security Number Used to Link	Types of Links Provided and/or Developed	Claims Data Obtained
Alabama	Urban Institute	Deliveries	No	Mother **or** Infant	**Yes**
Arizona	State Contractor	Deliveries	**Yes**	Mother **or** Infant	**Yes**
District of Columbia	Urban Institute	Women 15 - 44	No	Mother **or** Infant (2014 - 2015); **Only** Mother Eligibility Links Developed (2016)	**Yes**
Florida	Urban Institute	Women 15 - 44	No	Mother **or** Infant (2014 - 2015); **Only** Mother Eligibility Links Developed (2016)	**Yes**
Louisiana	State	Women 10 - 54	**Yes**	Mother **and** Infant	**Yes**
Maryland	State Contractor	Deliveries	No	Mother **and** Infant	No
Missouri	State	All Women	**Yes**	Mother **and** Infant	No
Mississippi	State	All Women	**Yes**	**Only** Mother Eligibility Links Developed	No
Nevada	Urban Institute	Women 15 - 44	No	**Only** Mother Eligibility Links Developed	No
New Jersey	State	Unknown	Unknown	Mother **or** Infant (2014); Mother **and** Infant (2015 - 2016)	**Yes**
Pennsylvania	State	All Women	**Yes**	Mother **or** Infant	No
South Carolina	State	All Women	**Yes**	Mother **and** Infant	**Yes**
Tennessee	State	All Women	**Yes**	Mother **or** Infant	**Yes**

Sources: Urban Institute.

ASSESSING QUALITY OF LINKAGES

There was no comprehensive list of Medicaid-covered pregnant women and births in the counties and states in which the Strong Start evaluation's impact analysis was conducted that could be used as a benchmark for linking success. However, Strong Start participants should, in theory, link to both birth certificates and Medicaid eligibility records and have a delivery claim or encounter in Medicaid claims/encounter files. While there is no similar benchmark for the comparison group, the rate at which Strong Start participants can be linked to these files may give an indication of the quality of the linking process for both groups of women.

In theory, every Strong Start participant should link to a birth certificate. However, there are several reasons why a 100 percent match rate would not be expected. Some women who initially enrolled in Strong Start may have terminated their pregnancy, miscarried, or moved out of state (in which case they would not link to a birth certificate in the state of their initial Strong Start participation). Consequently, it is unlikely that the rate at which Strong Start women were linked to birth certificates would be 100 percent. However, higher rates of linkage between Strong Start participants and birth certificates are probable indicators of higher quality.

All women enrolled in Strong Start and linked to a birth certificate should match to Medicaid eligibility records. Again, however, a 100 percent match would not be expected. For example, some awardees and sites enrolled women who were presumptively eligible for Medicaid, but whom may not have ultimately been determined to be eligible. Other awardees and sites noted that they enrolled women in Strong Start who they thought were Medicaid-eligible, but for whom the state took so long to determine eligibility that thy did not obtain Medicaid coverage in time for their deliveries. In Tennessee, Strong Start awardees served women covered by CHIP who were not included in Medicaid eligibility records.

In addition, poor quality of state data may contribute to a match rate below 100 percent. For example, our analysis of the eligibility and claims files identified errors in Medicaid eligibility records where women with paid Medicaid claims for prenatal care and delivery were not in the eligibility files. Again, a higher linkage rate for Strong Start participants between birth certificates and Medicaid eligibility is likely an indicator of the quality of the link; but, other factors may also influence this metric.

Strong Start participants who linked to birth certificates and Medicaid eligibility files should have had a very high rate of having a Medicaid claim or encounter for a delivery. However, some states that were implementing managed care at the time of the Strong Start evaluation and/or states with alternative payment strategies under managed care may not have reported all encounters accurately. In addition, some claims may initially have been paid for women who appeared to be Medicaid-eligible but ultimately were not enrolled in Medicaid.

Moreover, challenges with matching across files by name, errors in Medicaid eligibility and claims files, and data transcription and entry errors may lead to a less-than-perfect match across each of the separate linkages. Appendix S provides a more detailed discussion of these challenges and how they were addressed.

While the linkage rates for Strong Start participants may serve as a reasonable proxy for the quality of the process for all women, we conducted a broader examination that included linkage rates for women enrolled in Strong Start and women in the comparison groups. This analysis examined the following measures:

- share of Strong Start enrollees that are linked to birth certificates, Medicaid eligibility files, and Medicaid claims/encounter data
- share of birth certificate records that are linked to Medicaid eligibility records in states where Urban conducted the linkage
- share of linked birth certificate and Medicaid eligibility data that link to a delivery claim in the Medicaid claims files

LINKING STRONG START PARTICIPANTS TO BIRTH CERTIFICATES, MEDICAID ELIGIBILITY, AND MEDICAID CLAIMS

We first examine the rate at which Strong Start participants were linked to birth certificates and Medicaid eligibility files across states. Strong Start participant lists are the closest to a gold standard benchmark, as nearly all Strong Start participants with live births should link to birth certificates, Medicaid eligibility, and claims/encounter files. We assessed the quality of the linkage for all Strong Start participants at the state level, regardless of whether the awardee or site was excluded from our final analysis due to selection issues (e.g., UAB, MUSC, and select Group Prenatal Care sites and awardees).

The rate at which we linked Strong Start participants to birth certificate records varied considerably across states (see Table T. 2, "Linked to Birth Certificate" column), with lower some states under 75 percent as for Arizona (69%), DC (65%), Maryland (66%), New Jersey (72%), and Pennsylvania (68%), and others around 90 percent, as for Florida (86%), Michigan (89%), Mississippi (86%), and Nevada (91%).[89] What accounts for the variation across states is not entirely clear. States where Social Security numbers were used in the linkage process appear to have the highest rates of linkage. However, Pennsylvania had a low rate of linkage despite having had access to Social Security numbers and Medicaid IDs. Two of the linkages conducted by Urban – Florida and DC – had low rates of matching Strong Start women to birth certificates, which may have been due to Social Security numbers and Medicaid IDs being unavailable for linking. At the same time, we achieved higher matching rates for two other Urban-linked states, Alabama and Nevada.

TABLE T. 2: STRONG START PARTICIPANTS LINKAGE TO BIRTH CERTIFICATES AND MEDICAID ELIGBILITY FILES

State	Linkage	Participant List	Linked to Birth Certificate		Linked to Birth Certificates and Medicaid Eligibility		Dropped Due to Missing or Invalid Birth Weight or Gestational Age	
	Entity	N	N	%	N	%	N	%
Alabama	UI	2,745	2,274	83%	2,085	92%	2,077	76%
Arizona	State	1,056	730	69%	721	99%	721	68%
District of Columbia	UI	3,094	2,019	65%	1,871	93%	1,868	60%
Florida	UI	3,313	2,847	86%	2,679	94%	2,673	81%
Louisiana	State	886	717	81%	680	95%	677	76%
Maryland	State	1,954	1,221	62%	1,221	100%	1,219	62%
Michigan	State	1,980	1,769	89%	1,422	80%	1,422	72%
Mississippi	State	2,246	1,937	86%	1,936	100%	1,931	86%
Missouri	State	1,795	1,405	78%	1,405	100%	1,378	77%
Nevada	UI	663	602	91%	563	94%	562	85%
New Jersey	State	1,168	836	72%	786	94%	785	67%
Pennsylvania	State	1,501	1,022	68%	1,020	100%	1,014	68%
South Carolina	State	872	759	87%	759	100%	758	87%
Tennessee	State	3,096	2,263	73%	2,206	97%	2,185	71%
Total	**N/A**	**26,369**	**20,401**	**77%**	**19,354**	**95%**	**19,270**	**73%**
Total (without Michigan)	**N/A**	**24,389**	**18,632**	**76%**	**17,932**	**96%**	**17,848**	**73%**

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

[89] As described in the next section, we ultimately determined that the quality of the linkage conducted in Michigan was not high enough to use. Consequently, we present summary data with and without Michigan.

While there was variation across states in the rates of linkage by characteristics of the participants, in most states, the rate at which participants were matched to birth certificates varied systematically by characteristics of the women, as can be seen in Table T. 3. In Alabama, DC, Florida, Louisiana, Maryland, Mississippi, and Tennessee, Strong Start participants who were Hispanic were less likely to match than participants who were non-Hispanic blacks and, with the exception of DC, non-Hispanic whites. In Alabama, DC, Louisiana, Mississippi, and New Jersey, participants who were married were less likely to match than those who were not married or were living with a partner, while in Arizona, Louisiana, and Mississippi, they were more likely to match. There were differences in match rates by age and educational status; but, there were no consistent patterns within or across states. Missouri and Nevada had few significant differences in match rates across participants' characteristics, and South Carolina had none.

A priori, we expected to match nearly all birth certificates records to Medicaid eligibility for Strong Start participants since they should have a birth covered by Medicaid. The data confirm this expectation in most states: among the Strong Start participants who linked to birth certificates, a very high share also linked to a mother's or infant's Medicaid eligibility record with eligibility in the period appropriate to the birth (Table T. 2, "Linked to Birth Certificates" and "Linked Birth Certificates and Medicaid Eligibility" columns). Importantly, in five states—Maryland, Mississippi, Missouri, Pennsylvania, and South Carolina—we only obtained data in cases where the birth certificates and Medicaid eligibility records were already linked. We do not observe cases where participants with birth record matches may not have linked to eligibility records; we show the match rate for these cases as 100 percent. However, even in states where Urban conducted the match (i.e., Alabama, DC, Florida, and Nevada), the match rate was over 90 percent. There were few systematic differences in the match rates based on characteristics of Strong Start participants (data not shown).

In Michigan, the match rate between birth certificates and Medicaid eligibility for Strong Start participants was much lower than in other states. Only 80 percent of women participating in Strong Start and/or their children could be matched to Medicaid eligibility records. The birth certificate records indicate that the women who did not match were much more likely to have a premature infant or an infant with low birthweight. Based on the low match rate for women participating in Strong Start, we believed there was a systematic problem with the match in Michigan. Consequently, data for Michigan were not included in the impact analysis or in subsequent tables.

For all other states (Michigan excluded) from which we obtained birth certificate and Medicaid eligibility data, we linked 77 percent of Strong Start participants to birth certificates. Among participants linked to birth certificates, 96 percent were also linked to Medicaid eligibility for either the mother or infant, thus making them eligible for inclusion in the impact analysis. A small number of observations (90) were excluded from the impact analyses because they had invalid or missing gestational age or birthweight information on the birth certificate. Ultimately, 73 percent of Strong Start participants in these states were eligible for the birth outcome analysis.

We conducted the claims analysis on a subset of Strong Start women included in the birth outcome analysis. This subset of women included those who gave birth in 2014 or 2015 and where both the mother AND the infant were linked to Medicaid eligibility files in the appropriate periods surrounding the birth. This analysis is limited to DC and eight states with available claims/encounter data: Alabama, Arizona, Florida, Louisiana, New Jersey, South Carolina, and Tennessee. Table T. 4 presents data on the

linkage rates to Medicaid claims/encounter data and the construction of the claims analysis file. The first row indicates how many Strong Start participants were included in the base birth certificate file, which includes birth certificates linked to Medicaid eligibility records where both the mother AND infant have a Medicaid eligibility spell over the course of the study period.[90] Between 1 and 7 percent of observations in each state was excluded from the analysis because of multiple births and data anomalies such as observations without a Medicaid ID for a mother or an infant, observations for which infants were linked to multiple mothers, and observations for which no claims were available.

Among observations eligible for the claims analysis, virtually all had a delivery claim. The one exception was in Missouri, where only 88 percent of observations eligible for the claims analysis had a delivery claim or encounter. Among those with a delivery claim/encounter, most observations linked to the birth outcomes analytic file, which limited observations to those with eligibility for mother and infant consistent with the date of delivery. The last row of Table T. 4 shows the share of observations in the birth outcomes analytic file for 2014 and 2015 with available claims data, which ranges from 78 percent in Tennessee to 97 percent in New Jersey. As mentioned previously, Strong Start sites in Tennessee served CHIP-enrolled pregnant women who could not be included in the Medicaid claims analysis accounts, in large part, for the lower share of matches to the birth outcomes file. Additional variation in these match rates results from the types of eligibility matches obtained and used across states, as discussed in the next section. Overall, 86 percent of Strong Start enrollees included in the birth outcome analysis in 2014 and 2015 were included in the claims analysis.

LINKING BIRTH CERTIFICATES TO MEDICAID ELIGIBILITY FOR STRONG START PARTICIPANTS AND THE COMPARISON GROUP

Assessing the quality of the linkage of birth certificates to Medicaid eligibility at the state level for Strong Start participants and the comparison group together was challenging.[91] We had no "list" of Medicaid-covered pregnant women to serve as a benchmark for matching birth certificate records. States that conducted the linkage themselves used a variety of methods to identify Medicaid-eligible pregnant women. Some states first identified women with a delivery in their Medicaid claims, then identified these women in Medicaid eligibility files, and finally used this list link to birth certificates. While deliveries identified in the claims/encounter data may serve as a useful benchmark list, there are challenges to this approach. In working with states over the course of this evaluation, Urban researchers found that algorithms to identify births were complicated, that an iterative process that included hand-matching was necessary, and that some deliveries were missing from claims/encounter data. Other states identified all women or women of childbearing years and/or infants and linked these eligibility files to birth certificates. Finally, whether the share of births linked to Medicaid-covered women was similar to the "best" benchmark cannot be assessed in states that only provided data on births that were matched to Medicaid-covered women. An assessment of the quality of these matches can be found in Table T. 5 through Table T. 7.

[90] This broader definition of matched eligibility, using data from the whole study period (2013 - 2016), is used to maximize the ability to identify claims/encounters and deliveries by obtaining Medicaid IDs for as many mother and infant pairs as possible.
[91] The state level refers to the counties from which we are drawing comparison women and not the whole state.

TABLE T. 3: STRONG START PARTICIPANT LINKAGE RATES TO BIRTH CERTIFICATES BY DEMOGRAPHIC CHARACTERISTICS

Birth Certificate Match Rate – All States	Alabama	Arizona	District of Columbia	Florida	Louisiana	Maryland	Michigan	Mississippi	Missouri	Nevada	New Jersey	South Carolina	Tennessee
Race/Ethnicity	***	N.S.	***	***	***	***	**	***	N.S.	N.S.	***	N.S.	***
Hispanic	69%	72%	46%	73%	66%	47%	95%	62%	85%	92%	75%	86%	61%
Non-Hispanic White	79%	64%	34%	87%	85%	61%	90%	83%	78%	91%	72%	85%	82%
Non-Hispanic Black	86%	66%	73%	91%	82%	66%	89%	87%	79%	90%	71%	88%	74%
Non-Hispanic other/multiple	71%	72%	68%	87%	70%	63%	84%	94%	77%	88%	69%	79%	83%
Missing, no intake	82%	66%	0%	91%	50%	73%	77%	93%	76%	86%	53%	80%	85%
Missing, item non-responsed	56%	57%	57%	77%	67%	50%	100%	92%	76%	89%	73%	100%	79%
Marital Status	***	*	***	N.S.	**	N.S.	***	N.S.	N.S.	*	***	N.S.	**
Not married or living with partner	86%	65%	69%	85%	85%	64%	91%	88%	77%	89%	74%	89%	72%
Married or living with partner	80%	72%	60%	86%	78%	61%	88%	82%	79%	93%	72%	86%	73%
Missing, no intake	82%	66%	0%	91%	50%	73%	77%	93%	76%	86%	53%	80%	85%
Missing, item non-responsed	74%	73%	73%	86%	81%	56%	100%	86%	77%	76%	66%	67%	73%
Age	*	N.S.	**	***	**	N.S.	***	N.S.	N.S.	N.S.	***	N.S.	***
Less than 18	83%	74%	67%	80%	83%	63%	98%	88%	76%	92%	65%	93%	73%
Between 18 and 20	78%	68%	68%	84%	91%	60%	88%	89%	73%	97%	69%	88%	74%
Between 20 and 35	84%	69%	66%	86%	81%	63%	90%	86%	79%	89%	74%	87%	74%
Greater than 35	79%	68%	57%	81%	72%	59%	86%	82%	82%	89%	71%	89%	61%
Missing, no intake	82%	66%	0%	91%	50%	73%	77%	93%	76%	86%	53%	80%	85%
Missing, item non-responsed	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Education	**	N.S.	***	N.S.	**	**	N.S.	*	**	N.S.	***	N.S.	***
Less than high school	83%	70%	65%	86%	85%	63%	90%	88%	74%	91%	71%	87%	69%
High school or Graduate	83%	68%	68%	85%	83%	64%	90%	87%	79%	91%	73%	89%	75%
College: Associates	84%	73%	64%	90%	72%	60%	89%	85%	87%	96%	65%	87%	88%
College: Bachelors	96%	74%	61%	84%	67%	58%	90%	74%	85%	89%	76%	83%	81%
Other Degree	82%	71%	66%	86%	75%	52%	94%	77%	79%	84%	62%	78%	72%
Missing, no intake	82%	66%	0%	91%	50%	73%	77%	93%	76%	86%	53%	80%	85%
Missing, item non-responsed	75%	57%	49%	84%	77%	44%	86%	84%	73%	86%	77%	88%	66%
Total	**83%**	**69%**	**65%**	**86%**	**81%**	**62%**	**89%**	**86%**	**78%**	**91%**	**72%**	**87%**	**73%**

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.
Notes: Cells that contain one asterisk (*) indicate significance at the 0.10 level; cells that contain two asterisks (**) indicate significance at the 0.05 level; and cells that contain three asterisks (***) indicate significance at the 0.01 level. Cells that contain "N.S." indicate that there is no statistical significance.

TABLE T. 4: STRONG START PARTICIPANT LINKAGE RATE FOR TO MEDICAID CLAIMS/ENCOUNTER DATA, 2014 - 2015

Measures	Alabama	Arizona	District of Columbia	Florida	Louisiana	Missouri	New Jersey	South Carolina	Tennessee	Total
Number of Medicaid-Eligible Mother and Infant Pairs Linked to Birth Certificates	**1,313**	**510**	**992**	**1,816**	**434**	**962**	**591**	**970**	**1,188**	**8,776**
Number of twins excluded	42	10	6	25	8	26	9	70	36	232
Number excluded due to data anomalies	0	0	0	1	6	0	11	0	8	26
Share of linked observations eligible for claims analysis	96.8%	98.0%	99.4%	98.6%	96.8%	97.3%	96.6%	92.8%	96.3%	97.1%
Number of Observations Eligible for Claims Analysis	**1,271**	**500**	**986**	**1,790**	**420**	**936**	**571**	**900**	**1,144**	**8,518**
Delivery not found	21	17	18	81	8	116	13	60	24	358
Share of eligible observations with delivery claim	98.3%	96.6%	98.2%	95.5%	98.1%	87.6%	97.7%	93.3%	97.9%	95.8%
Identified Delivery	**1,250**	**483**	**968**	**1,709**	**412**	**820**	**558**	**840**	**1,120**	**8,160**
No eligibility in appropriate time period	3	3	1	6	52	12	37	1	11	126
Share of claims with Medicaid eligibility for mother or infant in appropriate time period	99.8%	99.4%	99.9%	99.6%	87.4%	98.5%	93.4%	99.9%	99.0%	98.5%
Total Observations on Analytic File with Claims	**1,247**	**480**	**967**	**1,703**	**360**	**808**	**521**	**839**	**1,109**	**8,034**
Share of observations on birth outcome analytic file with claims	88%	95%	82%	87%	96%	85%	97%	87%	78%	86%

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

Table T. 5 presents data on the share of birth certificates that linked to either a mother's or infant's Medicaid eligibility record in select counties for the four states for which Urban conducted the linkage.[92] In addition, this table presents data from two sources on the share of all births covered by Medicaid in the state. While helpful, the rates in these reports are not entirely comparable to the Urban match rates because, with the exception of DC, the Urban link was conducted in select counties that may have had different match rates than the state as a whole. Moreover, the two sources of data used different methods to calculate births and provide a range of rates. Markus et al. (2013) used consistent metrics across states to estimate the share of 2010 births covered by Medicaid. The Kaiser Family Foundation information (Smith et al. 2016) is more recent, but collected data from states whose methodology and time frame varied.

As shown in Table T. 5, 53 percent of births certificates were linked to Medicaid eligibility records in Alabama; 52 percent in DC; 58 percent in Florida; and 41 percent in Nevada. The share of births that link to Medicaid are in the range of these two benchmarks in Alabama and DC, but not in Florida or Nevada. Variation from these benchmarks may be attributable to the different counties included in the analyses, the different methodology used to determine this share across states, or other factors.

TABLE T. 5: STATE-LEVEL LINKAGE RATE BETWEEN MEDICAID ELIGIBILITY FILES AND BIRTH CERTIFICATES, 2014 - 2016

State	Number of Birth Certificates	Number of Birth Certificates Linked to Mother OR Infant Medicaid Eligibility Records	Percentage of Birth Certificates Linked to Medicaid Eligibility Records	Markus et al.	Kaiser Family Foundation
Alabama	83,961	44,349	52.8%	52.5%	58.0%
District of Columbia	26,200	13,685	52.2%	67.8%	46.0%
Florida	312,322	182,114	58.3%	48.4%	50.0%
Nevada	98,316	40,187	40.9%	44.0%	64.0%

Sources: Urban Institute analysis of merged birth certificate and Medicaid data;
Markus, Anne Rossier, Ellie Andres, Kristina D. West, Nicole Garro, and Cynthia Pellegrini. "Medicaid covered births, 2008 through 2010, in the context of the implementation of health reform." Women's Health Issues 23, no. 5 (2013): e273-e280;
Vernon K. Smith, Kathleen Gifford, Eileen Ellis, and Barbara Edwards, Health Management Associates; and Robin Rudowitz, Elizabeth Hinton, Larisa Antonisse and Allison Valentine, Kaiser Commission on Medicaid and the Uninsured. Implementing Coverage and Payment Initiatives: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2016 and 2017, The Henry J. Kaiser Family Foundation, October 2016.

Notes: Data from Markus et al. refers to 2010 estimates of Medicaid financing of births. Data from the Kaiser Family Foundation varies by year: the Alabama estimate is from 2010, District of Columbia and Florida estimates are from 2014, and the Nevada estimate is from 2016.

[92] We consider birth certificates linked to Medicaid eligibility records if either the mother or the infant links to Medicaid eligibility records during the period of a year before (mother) or after the birth (mother and infant). This linked file forms the basis for our analysis of birth outcomes.

States varied in the types of links they provided Urban, and these links ultimately served as the base for the birth outcomes and claims analytic files (see Table T. 6). New Jersey, Maryland, Missouri, and South Carolina only provided links to birth certificates for cases in which both the mother AND the infant linked to Medicaid eligibility records.[93,94] Mississippi only linked mothers' Medicaid eligibility to birth certificates and did not link infants' eligibility. Arizona and Tennessee provided all birth certificates for which the mother OR the infant linked to Medicaid eligibility. In the states for which Urban conducted the linkage, births for which either the mother or infant matched to Medicaid eligibility records were linked and analyzed, with two exceptions:

- In DC and Florida, 2016 Medicaid eligibility records for infants were not obtained in order to facilitate timely data acquisition; thus, only links to the mother were developed for 2016 in these states.
- In Nevada, only links based on mothers' eligibility were developed.

It is not clear whether the states that provided only observations for which mothers and infants both linked to Medicaid eligibility files produced a better match or whether they excluded some observations that should have been included in the analytic file. Similarly, the inclusion of observations for which either the mother or infant was eligible (as opposed to observations for which BOTH the mother and infant were eligible) may overstate actual eligibility. Table T. 6 presents these data for Strong Start participants and all matches separately.

TABLE T. 6: COMPOSITION OF BIRTH OUTCOME ANALYSIS FILE BY TYPE OF ELIGIBILITY MATCH

State	Strong Start and Comparison Group				Strong Start			
Alabama	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	21.9%	18.3%	19.2%	19.8%	15.4%	7.3%	12.1%	10.6%
Only infant eligible	5.3%	7.7%	14.7%	9.2%	6.5%	10.4%	13.1%	10.4%
Mother and infant eligible	72.8%	74.0%	66.1%	71.0%	78.1%	82.3%	74.7%	78.9%
Arizona	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	7.1%	5.4%	5.2%	6.0%	6.7%	5.2%	5.7%	5.7%
Only infant eligible	3.5%	2.5%	5.2%	3.7%	3.3%	1.8%	5.3%	3.3%
Mother and infant eligible	89.4%	92.2%	89.7%	90.3%	90.0%	92.9%	89.0%	91.0%
District of Columbia	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	12.4%	14.0%	100.0%	37.1%	9.8%	10.3%	100.0%	43.6%
Only infant eligible	16.4%	14.3%	0.0%	11.1%	12.0%	9.4%	0.0%	6.3%
Mother and infant eligible	71.1%	71.8%	0.0%	51.8%	78.3%	80.2%	0.0%	50.1%
Florida	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	8.5%	10.2%	100.0%	32.2%	6.4%	7.1%	100.0%	31.7%
Only infant eligible	23.2%	21.7%	0.0%	16.8%	10.1%	7.6%	0.0%	6.3%
Mother and infant eligible	68.4%	68.0%	0.0%	51.0%	83.5%	85.3%	0.0%	62.0%
Louisiana	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	1.8%	2.0%	2.2%	2.0%	0.6%	0.9%	0.6%	0.7%
Mother and infant eligible	98.2%	98.0%	97.8%	98.0%	99.4%	99.1%	99.4%	99.3%
Maryland	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	0.2%	0.1%	0.1%	0.1%	0.2%	0.2%	0.7%	0.3%
Mother and infant eligible	99.8%	99.9%	99.9%	99.9%	99.8%	99.8%	99.3%	99.7%
Mississippi	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Missouri	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	0.0%	0.1%	0.1%	0.1%	0.0%	0.5%	0.0%	0.3%

[93] In 2014, New Jersey provided data that included observations where only the mother linked to Medicaid eligibility files.
[94] Some only-mother-eligible or only-infant-eligible linked birth certificates are found in these states; but, they are minimal.

State	Strong Start and Comparison Group				Strong Start			
Only infant eligible	1.1%	1.4%	2.7%	1.7%	1.3%	1.5%	1.5%	1.5%
Mother and infant eligible	98.9%	98.5%	97.2%	98.2%	98.7%	98.0%	98.5%	98.3%
Nevada	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
New Jersey	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	20.8%	1.3%	0.3%	8.3%	22.5%	2.2%	0.8%	6.2%
Only infant eligible	1.4%	1.6%	2.8%	1.9%	0.6%	0.5%	0.4%	0.5%
Mother and infant eligible	77.8%	97.2%	96.9%	89.9%	76.9%	97.3%	98.8%	93.3%
Pennsylvania	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	4.7%	4.4%	4.0%	4.4%	0.0%	0.0%	0.0%	0.0%
Only infant eligible	0.5%	0.2%	0.2%	0.3%	1.0%	1.1%	1.2%	1.1%
Mother and infant eligible	94.9%	95.4%	95.8%	95.3%	99.0%	98.9%	98.7%	98.9%
South Carolina	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	0.3%	0.3%	0.0%	0.2%	0.3%	0.2%	0.0%	0.2%
Mother and infant eligible	99.7%	99.7%	100.0%	99.8%	99.7%	99.8%	100.0%	99.8%
Tennessee	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**
Only mother eligible	6.5%	7.6%	7.6%	7.2%	2.2%	4.2%	6.3%	4.4%
Only infant eligible	14.9%	16.0%	16.1%	15.7%	28.3%	24.1%	17.2%	22.7%
Mother and infant eligible	78.6%	76.3%	76.3%	77.1%	69.5%	71.7%	76.5%	72.9%

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.
Notes: In Mississippi and Nevada, only Medicaid eligibility for the mother was used in the link.

The birth outcomes analysis file included all observations for which either the mother or the infant matched to Medicaid eligibility during the time period appropriate to the birth certificate, that is the year before and after birth for the mother and in the year after birth for the infant. Two other options considered were analyzing only observations with a mother and infant that both link to eligibility or analyzing only observations where there was at least a link to mother's eligibility. As shown in Table T. 6, these strategies would have resulted in considerable loss of the Strong Start sample in a number of states, particularly those states for which Urban conducted the linkage. Therefore, all observations for which either the mother or infant matched to Medicaid eligibility were kept, and indicators that identified matched mother-infant observations; mother-only matched observations; and infant-only matched observations were included in the propensity score reweighting strategy. Sensitivity analyses that excluded observations where only the infant matched to eligibility were consistent with model-level estimates reported in the main body of the report.

LINKING BIRTH CERTIFICATES AND MEDICAID ELIGIBILITY TO MEDICAID CLAIMS/ENCOUNTERS

It should be expected that the majority of observations in the birth outcome analytic file, which links birth certificates with Medicaid eligibility files, would match to Medicaid claims/encounter data. Birth certificates, Medicaid eligibility files, and Medicaid claims files are linked only for 2014 and 2015 because claims files for 2016 were not available in time to be analyzed. We linked claims data in eight states: Alabama, Arizona, DC, Florida, Louisiana, New Jersey, South Carolina, and Tennessee. The analytic file contained all birth certificates that linked to either a mother or an infant who was eligible in the year before or after the birth when we analyzed birth outcomes. The analytic file contained the subset of these births where both the mother AND the infant could be linked to Medicaid eligibility files over the time period of the study when we analyzed claims.

Table T. 7 presents data on the linkage rate between the birth certificate and Medicaid eligibility-linked file and the claims data. The base file for the analysis was birth certificates in each state that had linked to both a mother and infant Medicaid eligibility record at any point over the course of the study period. Twins and other multiple births were excluded from the analysis because individual infant costs could not be determined. Other exclusions occurred due to data anomalies, but were usually small in number. In Louisiana, 3,900 observations had no infant IDs, and 429 infants were linked to multiple mothers; less than 4 percent of records were excluded from the analytic file for all other states.

Once exclusions were made, each observation was scanned to identify a delivery claim. Observations without a delivery claim were removed from the file. We found a delivery claim for the vast majority of observations that had a mother and infant match to Medicaid eligibility, ranging from 89.6 percent in Louisiana to 96.8 percent in DC. Among these files, the vast majority of observations had eligibility for the mother and infant in the time periods appropriate to the delivery. The last row of Table T. 7 presents data on the share of observations in the 2014 and 2015 birth outcomes analytic file that were matched to claims data. The share that matches varies considerably, from 69 percent in Florida to 93 percent in Arizona. Variation is mostly, though not exclusively, as result of variation of the share of observations in the birth outcomes file where there the mother and infant both match to Medicaid eligibility files.

DISCUSSION

Assessing the quality of the data linkage performed for the Strong Start evaluation was especially challenging because no list of Medicaid-covered pregnant women existed that could be used as a benchmark for success. The Strong Start participant list was the closest to such a list; however, these women may not have appeared in eligibility files if their Medicaid enrollment was still being processed at the time of their delivery. Similarly, women may not have appeared in the birth certificate file if their pregnancy did not result in a live birth. There was considerable variation in the share of Strong Start participants who could be linked to birth certificates across states. In general, states in which Social Security numbers were available to use (by state officials) in the linkage process identified a higher share of participants on the birth certificates. Once Strong Start participants were linked to birth certificates, a very high share also linked to Medicaid eligibility records. Overall, 73 percent of Strong Start participants were identified on the birth certificates, linked to Medicaid eligibility records, and had the data needed to be included in the analysis file. Moreover, a delivery claim was identified for 96 percent of Strong Start women eligible for the claims analysis, which represents 86 percent of women enrolled in Strong Start in 2014 and 2015 who were included in the birth outcome analysis. As we have no reason to expect match rates to differ between women who participate in Strong Start and women in the comparison groups, these estimates also likely reflect the overall quality of the matching.

TABLE T. 7: STATE LEVEL LINKAGE RATE TO MEDICAID CLAIMS/ENCOUNTER DATA 2014-2015

Measure	Alabama	Arizona	District of Columbia	Florida	Louisiana	Missouri	New Jersey	South Carolina	Tennessee	Total
Number of Medicaid-Eligible Mother and Infant Pairs Linked to Birth Certificates	**24,557**	**23,928**	**7,562**	**103,053**	**42,034**	**32,970**	**34,639**	**39,929**	**50,805**	**359,477**
Number of twins excluded	991	600	160	1,687	1,295	1,131	547	1,275	3,009	10,695
Number excluded due to data anomalies	0	0	0	589	4,329	0	11	0	163	5,092
Share of linked observations eligible for claims analysis	95.9%	97.5%	97.9%	97.8%	86.6%	96.6%	98.4%	96.8%	93.8%	95.6%
Number of Observations Eligible for Claims Analysis	**23,556**	**23,328**	**7,402**	**100,777**	**36,410**	**31,838**	**34,081**	**38,654**	**47,633**	**343,679**
Delivery not found	1,161	1,092	236	6,164	3,781	2,557	1,844	2,003	2,918	21,756
Share of eligible observations with delivery claim	95.1%	95.3%	96.8%	93.9%	89.6%	92.0%	94.6%	94.8%	93.9%	93.7%
Identified Delivery	**22,395**	**22,236**	**7,166**	**94,613**	**32,629**	**29,281**	**32,237**	**36,651**	**44,715**	**321,923**
No eligibility in appropriate time period	63	274	15	348	3,035	174	159	45	399	4,512
Share of claims with Medicaid eligibility for mother or infant in appropriate time period	99.7%	98.8%	99.8%	99.6%	90.7%	99.4%	99.5%	99.9%	99.1%	98.6%
Total Observations on Analytic File with Claims	**22,332**	**21,962**	**7,151**	**94,265**	**29,594**	**29,107**	**32,078**	**36,606**	**44,316**	**317,411**
Share of observations on birth outcomes analytic file with claims	75%	93%	72%	69%	86%	88%	93%	90%	80%	80%

Sources: Urban Institute analysis of merged birth certificate and Medicaid data.

APPENDIX U: IMPACT ANALYSIS – COUNTS OF AWARDEES, SITES, AND PARTICIPANTS INCLUDED

The impact analysis was conducted for a subset of awardees and sites. Inclusion in the model-level impact analysis depended upon whether the awardee or site was located in a state where birth certificate and Medicaid eligibility and claims/encounter data were obtained and whether or not the awardee or site was identified as having potential selection bias issues (as with some Group Prenatal Care awardees and with sites and awardees that served as the high-risk provider for the state.) Table U. 1 presents data on the number of awardees, sites, and participants that are involved in Strong Start *and*:

- included in our master crosswalk list of participants;
- located in states that provided birth certificate and Medicaid eligibility and claims/encounter data for the evaluations;
- included in participant lists sent to states; and
- included in the model level analyses.

Table U. 1 also presents data on the share of total awardees, sites, and participants in the states where we obtained birth certificate and Medicaid data, in the participant lists sent to states to link birth certificate and Medicaid data, and that were included in the model-level analysis.

TABLE U. 1: COUNT OF AWARDEES, SITES, AND PARTICIPANTS IN CROSSWALK DATA FROM AWARDEES AND FINAL ANALYSES

Measures	Awardees	Sites	Total Participants
Total			
Crosswalk Data (Q4 2016)	27	213	45270
Crosswalk data in states with birth certificate and Medicaid data	20	120	26590
Excluded for missing date information	0	3	1207
Excluded due to small number of participants in the county	1	2	631
Excluded in South Carolina – not case-managed	0	0	284
Excluded for miscellaneous reasons	0	6	58
Number in participant list sent to states	19	109	24410
Number in model-level analysis	14	84	14910
Number in claims analysis	10	61	5728
Percent of total in states with birth certificate	74.1%	56.3%	58.7%
Percent of total in participant list	70.4%	51.2%	53.9%
Percent of total in model-level analysis	51.9%	39.4%	32.9%
Birth Centers			
Crosswalk Data (Q4 2016)	2	46	8612
Crosswalk data in states with birth certificate and Medicaid data	2	22	4967
Excluded for missing date information	0	0	356
Excluded due to small number of participants in the county	0	1	204
Excluded in South Carolina – not case-managed	0	0	0
Excluded for miscellaneous reasons	0	0	2
Number in participant list sent to states	2	21	4405
Number in model-level analysis	2	21	3414

Measures	Awardees	Sites	Total Participants
Number in claims analysis	2	17	1854
Percent of total in states with birth certificate	100.0%	47.8%	57.7%
Percent of total in participant list	100.0%	45.7%	51.1%
Percent of total in model-level analysis	100.0%	45.7%	39.6%
Group Prenatal Care			
Crosswalk Data (Q4 2016)	13	55	10349
Crosswalk data in states with birth certificate and Medicaid data	8	28	5437
Excluded for missing date information	0	3	232
Excluded due to small number of participants in the county	1	1	104
Excluded in South Carolina – not case-managed	0	0	0
Excluded for miscellaneous reasons	0	-1	41
Number in participant list sent to states	7	25	5060
Number in model-level analysis	6	10	2393
Number in claims analysis	4	5	526
Percent of total in states with birth certificate	61.5%	50.9%	52.5%
Percent of total in participant list	53.8%	45.5%	48.9%
Percent of total in model-level analysis	46.2%	18.2%	23.1%
Maternity Care Home			
Crosswalk Data (Q4 2016)	17	112	26309
Crosswalk data in states with birth certificate and Medicaid data	13	70	16186
Excluded for missing date information	0	0	619
Excluded due to small number of participants in the county	0	0	323
Excluded in South Carolina – not case-managed	0	0	284
Excluded for miscellaneous reasons	3	7	15
Number in participant list sent to states	10	63	14945
Number in model-level analysis	8	53	9103
Number in claims analysis	6	39	3348
Percent of total in states with birth certificate	76.5%	62.5%	61.5%
Percent of total in participant list	58.8%	56.3%	56.8%
Percent of total in model-level analysis	47.1%	47.3%	34.6%

APPENDIX V: IMPACT ANALYSIS – FINAL COMPARISON GROUP FEASIBILITY STUDY

STRONG START FOR MOTHERS AND NEWBORNS EVALUATION: COMPARISON GROUP FEASIBILITY STUDY

I. Overview

The Strong Start for Mothers and Newborns initiative (or Strong Start II[95]), funded under the Affordable Care Act, aims to improve maternal and infant outcomes for women enrolled in Medicaid through the funding of three innovative, evidence-based, enhanced prenatal care models: birth centers, maternity care homes, and group prenatal care sites. The initiative, which is currently providing funding to 27 awardees and 186 provider sites across 30 states, the District of Columbia, and Puerto Rico, will serve up to 80,000 women over the next three years.

The Center for Medicare and Medicaid Innovation (CMMI) of the Center for Medicare and Medicaid Services (CMS) has contracted with the Urban Institute and its subcontractors—the American Institutes for Research (AIR), Health Management Associates (HMA), and Briljent—to conduct an independent evaluation of the Strong Start. This five-year evaluation will monitor and assess the implementation of Strong Start interventions and evaluate the impact of Strong Start on health care delivery, health outcomes, and cost of care. The evaluation is built around three principle data collection efforts, as well as technical assistance to states, including:

- Qualitative case studies in the first four years of the evaluation, including site visits and focus groups in 25 states in Years One and Three;
- The collection and analysis of Participant Level Process Evaluation data on women's risk factors, service utilization, and maternal and child outcomes (among other measures) across all of the 27 Strong Start awardees' service sites; and
- An impact analysis to assess whether Strong Start improves birth outcomes and reduces costs relative to care in "standard Medicaid practices."

In addition to these three evaluation tasks, the project is also providing technical assistance to states to build their capacity to produce data files that link vital records to Medicaid eligibility and claims/encounter data for the impacts analysis. Finally, the project is supporting CMMI's program monitoring function by collecting on a quarterly basis a series of measures of program performance, including enrollment, risk identification, service provision, and birth outcomes (among other measures).

This report, developed as part of the project's Evaluation Design task, focuses on the impact analysis and addresses the feasibility of using alternative comparison groups to evaluate the impact of Strong Start. [96] The impact analysis aims to answer the following three broad evaluation questions:

- What are the impacts of the care models and enhanced services supported by Strong Start relative to traditional Medicaid care on gestational age, birth weight, and cost?

[95] Strong Start II, which is the subject of this report, is one of two initiatives to improve birth outcomes that are being funded by CMS. The other initiative, Strong Start I, is designed to reduce early elective deliveries. For the remainder of this document, we refer to Strong Start but this should be interpreted as referring to Strong Start II.

[96] Generally, the term" control group" is used for random assignment (experimental) designs and "comparison group" is used for quasi-experimental designs. Random assignment has been ruled out as infeasible, so we use the term comparison group rather than control group throughout.

- Does the impact differ across awardees and across the three Strong Start models? If so, how?
- How does the implementation analysis explain the impact findings? For example, which features of the models (such as services offered and intensity of services) lead to the greatest impact of the program?

To answer these questions, the experience of women who enroll in Strong Start will be compared to that of a comparison group of women served in traditional settings. Since women are not being randomly assigned to Strong Start practices, a comparison group of women must be identified that is similar enough to the women enrolled in Strong Start so that their experience can serve as a counterfactual for what would have occurred if Strong Start were not in place. Three approaches to selecting a comparison group are considered in this report:

- Selecting a comparison group from individuals in a local area using birth certificate data alone or linked to Medicaid eligibility data;
- Selecting a comparison group from local area practices and using medical abstraction from both the Strong Start site and comparison sites to obtain data; and
- Selecting a within site comparison group from a pre-Strong Start period at Strong Start sites that became a Maternity Care Home or Centering Pregnancy site with implementation of Strong Start.

Each of these approaches is examined based on the extent to which it answers the primary research question, accounts for selection into Strong Start, and its potential risks and limitations. In addition, the usefulness of baseline data and a difference-in-difference approach for each alternative comparison group is discussed.

II. Selecting a Comparison Group

One of the most challenging issues for the evaluation design is to select a comparison group that will serve as the counterfactual to answer the question: "What would have occurred had Strong Start not been in place?" Further consideration of this broad question leads to two potential alternative questions:

- Does the additional funding from Strong Start, in combination with one of its three alternative models of care, result in improved outcomes when compared to standard Medicaid maternity care practice?
- What would have occurred if women received care in the same sites, or very similar sites, but without the services funded by Strong Start?

Answering the first potential question requires that we select a comparison group of women who do not receive services in sites that fit the model for Strong Start sites, a setting we here call "standard Medicaid maternity practice." These practices include private providers, community health centers, public health department clinics, and hospital outpatient departments that do not use maternity care approaches similar to those in Strong Start sites.

Answering the second potential question requires that we select a comparison group from the same or similar type of sites which follow one of the three Strong Start models (maternity care homes, group prenatal care, and birth centers) but only includes women who do not receive Strong Start enhanced services. This approach would explore the marginal effects of enhanced Strong Start services relative to the care received in maternity care homes, group prenatal care/centering pregnancy practices, or birth centers that do not participate in Strong Start.

We assert that this evaluation should primarily focus on the first question as the more relevant one for public policy. Note that in pursuing the first question, the evaluation will not be able to separate the role of the additional Strong Start funding from the role of the alternative model of care already in place. Nonetheless, we think it is the best question to ask from a policy perspective and the more feasible question to address with the data that will be produced.

Ideally, we would have a consistent evaluation method across all Strong Start sites in order to compare the impact of Strong Start across awardees and across the three models. Regardless of the method chosen, a comparison group will be developed for each Strong Start site from Medicaid covered women in the local area. The comparison group women should be as similar to those enrolled in Strong Start as possible.

We have considered three alternative comparison group approaches. The first, and our preferred approach, was developed in our initial proposal. Under this approach, a comparison group of women from each Strong Start site's service area would be identified based on birth certificate data, preferably linked with Medicaid enrollment, claims and encounter data. In the second approach, a comparison group of women would be selected from specific local practices in each Strong Start service area and would rely on medical abstraction for obtaining data on medical risks and outcomes. In the third approach, a comparison group of women would be constructed using baseline data in Strong Start sites that became either a maternity care home or a group prenatal site with implementation of Strong Start. This approach would also rely on medical abstraction for obtaining data on medical risks and outcomes.

Each approach has been considered according to its strengths and potential risks, as follows:

- **Evaluation Question.** We considered the degree to which the approach helps to answer the primary research question outlined above, that is: "Does the additional funding from Strong Start, in combination with other resources devoted to one of these three alternative models of care already in place, result in improved outcomes when compared to standard Medicaid maternity care practice?"
- **Selection.** We considered the degree to which the approach controls for selection into Strong Start. Selection bias could occur if Strong Start participants select providers (or services) for reasons that are unobserved but also correlated with outcomes (self-selection). For example, women who want to avoid a medically unnecessary cesarean section may choose to receive their care from midwives in a birth center, or a woman who is extremely cautious about her pregnancy could choose a maternity care home that is affiliated with a tertiary hospital. It could also occur as a result of sites selecting/screening their enrollees on the basis of risk factors or other characteristics.
- **Risk.** We considered the feasibility and cost of implementing each comparison group approach, and consequently the risk to the evaluation of choosing a particular strategy that might fail due to lack of data.

Our preferred approach, outlined first below, controls well for selection on observables and answers the primary evaluation question well. In addition, because it would be feasible across the broadest group of sites, the approach would allow for the comparison of findings across awardees and model type, which is a major goal of the evaluation. However, it does have risks that will be discussed in more detail below. The other two approaches can also control for selection if implemented well, and answer the appropriate evaluation question in some circumstances. However, they cannot be implemented uniformly across all sites in a similar manner; using multiple methods that vary across awardee or site would not allow for comparability of impact findings in cross-awardee and cross-site analyses. There are also substantial differences in the resources needed to implement each strategy, with our preferred approach being the least costly.

III. Comparison Group Alternatives

A. Preferred Approach: Comparison Individuals in Local Area

Our preferred approach is to select a comparison group for each Strong Start site from observably similar women in the local area who are enrolled in Medicaid but do not participate in Strong Start. Propensity score reweighting, described below, will be used to assure that the comparison group is similar to those enrolled in Strong Start across observable social and medical risk factors. Data to identify comparison group women and measure their outcomes will come from birth certificate and Medicaid eligibility data. There are 27 awardees and 186 sites across 32 jurisdictions. Because of the difficulty of obtaining both birth certificates and Medicaid data from such a large number of jurisdictions, eight states with very small sample sizes of Strong Start participants will be excluded from the impact analysis. These eight jurisdictions all have a single AABC site, except for Puerto Rico and Nevada.[97]

Within states, local areas will be defined for each site and will include the city, county, adjacent county or similar nearby city depending on site specific circumstances. For example, a comparison group could be drawn from the city in which a site is located if the site serves only a small share of the Medicaid covered pregnant women in the city. One concern that we will continue to investigate as we learn more about the awardees and their sites is that propensity score reweighting will work well only when demonstration participants form a relatively small proportion of Medicaid pregnant women (for example, less than 25 percent) in a geographic area, and where there is an overall low penetration of the three maternity care models being studied (regardless of whether the sites receive Strong Start funding). If the demonstration (through a single site or multiple demonstration sites) or non-demonstration sites using similar models "saturate" the area, it will be difficult to choose a good comparison group from the same local area. Therefore, if the majority of women in a Strong Start site's service area is being served by a Strong Start or Strong Start-type site, a comparison group will be drawn from a similar nearby geographic area.

[97] The excluded jurisdictions are Kansas, Nebraska, Nevada, New York, North Carolina, Puerto Rico, West Virginia, and Wisconsin.

To control for risk selection, the propensity score reweighting approach would be used to develop the matched comparison group. Propensity score reweighting is very similar to more traditional propensity score matching, except that it uses information from all eligible comparison group members rather than an arbitrary number of best matches for each member of the treatment group. In propensity score reweighting, comparison group members who are more similar to treatment group members receive larger statistical weights, and dissimilar comparison group members receive lower (or even zero) weights. After successful reweighting, there are no remaining statistically significant differences in the (mean) observed characteristics of the two groups.

Pregnant women participating in Strong Start will be matched to Medicaid non-participants in the same geographic area using propensity scores that rely on information available from birth and fetal death certificates (birth certificates) and, if available, Medicaid data. For this approach, we will construct a comparison group for each site such that observable characteristics are nearly identical to those of the women participating in Strong Start.

Table V. 1 shows the variables that will be used in the matching process and their sources. The birth certificate variables for matching include: the mother's age, race, marital status, zip code, educational attainment, the presence of information about the father, the number of cigarettes smoked by the mother prior to pregnancy, parity, health risk factors exogenous to the mother's pregnancy (chronic hypertension, non-gestational diabetes, pre-pregnancy BMI etc.), pregnancy risk factors (previous birth of an exceptionally small baby, previous stillborn, previous pre-term birth), the trimester in which the mother initiated prenatal care, and zip code or census tract. As we discuss later in this memo, not all of the variables on the birth certificate are reported reliably. In particular, the concordance of the birth record with other data sources is low for pre-pregnancy medical risk factors. At the same time, the specificity for these variables is high, that is, when they are reported on the birth certificate they have a very high likelihood of being present. Therefore, even though some risk factors will be under-reported, we will still match on these variables and obtain matches for women who are identified as having a given risk factor. Medicaid eligibility files contain information on the basis of eligibility (BOE) for women enrolled in Medicaid. The BOE will be used as a factor in our propensity score modeling in order to identify women who are eligible due to their disability or cash-assistance status, eligible due to Section 1931, eligible through the ACA expansion, or eligible due only to pregnancy.

Ideally, we want to draw the comparison group from the universe of pregnant women receiving prenatal care services in "standard Medicaid maternity practices," but this will only be possible if Medicaid data are available, since the birth certificate does not identify the site where prenatal care is received. Consequently, it would not be possible to exclude pregnant women in sites where similar care models or even enhanced services are provided. This issue will be examined in the case studies, to better understand the extent of this problem. The effect of including such women in the impact analysis would be to reduce the size of the impact of Strong Start services.

TABLE V. 1: CONTROL VARIABLES FOR IMPACT ANALYSIS

Variable	Specification	Source
Demographic Risk Factors		
Mother's Age	Actual age (1-year increments)	Birth Certificate
Mother's Race	White non-Hispanic, Black non-Hispanic, Puerto Rican, other Hispanic, American Indian or Alaskan Native, Native Hawaiian or other Pacific Islander, Asian, mixed race, other	Birth Certificate
Mother's Education	Eighth grade or less, no high school degree (age related), no high school degree, GED (if available), high school degree, some college no degree, associate's degree, bachelor's degree, master's, doctorate or professional degree	Birth Certificate
Marital Status	Married, not married and paternity acknowledgement signed, not married and paternity acknowledgement not signed	Birth Certificate
Basis of Medicaid Eligibility	Disabled, receiving cash assistance, Section 1931 eligibility, ACA expansion	Medicaid Eligibility Files (if match to Medicaid eligibility files feasible)
Insurance Status	Private, Medicaid, self-pay, other	Medicaid Eligibility Files or Birth Certificate (if no match to Medicaid eligibility files)
Census Tract/ZIP Code	Census tract or zip code from geo-coded match with mother's address	Birth Certificate matched with census tract geocoding data
Behavioral Risk Factors		
Smoking	Number of cigarettes smoked in three months prior to pregnancy	Birth Certificate
First Trimester Prenatal Care	Date of prenatal care initiation within first three months of pregnancy	Birth Certificate
Medical Risk Factors		
Plurality	Single, twin, triplet, four or more	Birth Certificate
Previous Live Births	First birth, second birth, third birth, etc.	Birth Certificate
Previous Preterm birth	Mother has had a previous pre-term birth	Birth Certificate
Previous Other Poor Pregnancy Outcome	Mother has had previous perinatal death, or small for gestational age birth)	Birth Certificate
Inter-pregnancy interval (live birth)	Time since last live birth less than 6 months, 6 to 17 months, 18 to 23 months, 24 months or more	Birth Certificate
Inter-pregnancy interval (other pregnancy outcome)	Time since last other birth outcome less than 6 months, 6 to 17 months, 18 to 23 months, 24 months or more	Birth Certificate
Pre-pregnancy Diabetes	Mother had diabetes prior to pregnancy	Birth Certificate
Pre-pregnancy Hypertension	Mother had hypertension prior to pregnancy	Birth Certificate
Mother's BMI pre-pregnancy	Underweight, normal weight, overweight, obese	Birth Certificate
Hospital is participating in Hospital Engagement Network (HEN)	Delivery hospital is in HEN network	Birth Certificate linked with data on HEN hospitals

The propensity score reweighting approach to identify a comparison group from administrative records has been used previously by Urban Institute researchers to evaluate the impact of birth center care on birth outcomes (Benatar et al. 2013). This approach is also currently being used in several large CMMI evaluations, including its Multi-Payer Advanced Primary Care Practice (MAPCP) Demonstration (Smith 2013), the FQHC Advanced Primary Care Practice Demonstration (Timbie 2013), and the Comprehensive Primary Care Initiative (Brown et al. 2013).

Under this approach, impact assessments would be made based on propensity score weighted comparisons between the experiences of Strong Start women and comparison group women in the post-implementation period. While baseline data could be obtained for both women served by Strong Start sites and comparison group women, we would not conduct a difference-in-difference analysis using baseline data because it would not answer the primary analytic question.

There are a number of risks to this approach related to the evaluation's ability to obtain linked birth certificate and Medicaid enrollment records and with the ability of these data to accurately provide all of the information we would need for a successful impact analysis.

The first risk concerns the potential reluctance or inability of states to provide us with birth certificates and Medicaid data. Each state has unique rules and regulations regarding the provision of personally identifying information (PII) and protected health information (PHI). Moreover, there are regulations regarding sharing data across State agencies and with outside organizations. To address this risk, a large portion of the evaluation resources will be devoted to providing technical assistance to states to extract needed data and perform the linkage. [98]

Technical assistance is designed to help state staff assess and address statutory or regulatory restrictions on the provision of the data. The TA will begin with state specific needs assessments that include identifying key site contacts and brief telephone assessments of States' willingness and ability to link and provide data. This will be followed up with site visits to identify State's matching history, Medicaid managed care data quality, and obstacles to success. Additional assistance will be provided to help agencies through both global and customized TA.

Based on past experience we believe that birth certificate data will generally be more readily available than Medicaid data. It will be possible to conduct the study with only birth certificate data. If we are not able to obtain Medicaid data we would use the insurance variables on the birth certificate in our propensity score algorithm to identify other Medicaid covered women. A recent study in Iowa suggests that the Medicaid coverage indicator on the birth certificate is highly reliable in that state and two other studies covering 14 states found this indicator to be quite reliable, although this varied by state (Kane et al. 2003, Martin et al. 2013, Ahluwalia 2013). In states where the insurance variable is not available, other variables that are highly correlated with Medicaid eligibility, such as educational attainment, can be used as a proxy (Dubay et al, 2001) found that using combinations of marital status and education can very closely identify Medicaid eligible pregnant women.

An additional risk is that states may be willing to provide the data, but are not prepared to link birth certificates to Medicaid records. Such a linkage is not essential to our method, but is highly desirable. Of the 24 states where we plan to obtain birth certificates, and if possible Medicaid data, we initially have estimated that 15 states would be able to link birth certificates and Medicaid data, and 9 states would provide linkable birth certificates and Medicaid data to the evaluation team for linkage. As we conduct the initial TA site visits in 2014, we will have more insight into which states are willing and able to provide either or both types of files, and whether they prefer to do the linkage (with technical assistance if needed) or have us do the linkage.

The third major risk concerns the quality of birth certificate data, since these data are used to create propensity scores for matching. There is a concern that the variables that identify the risk of poor birth outcomes may be incomplete or inaccurate. A number of studies have assessed the sensitivity and specificity of various data elements on birth certificates relative to medical records in a few states. In general, the studies come to similar conclusions, although there is variation across and within states. Some studies measure the degree of exact match ("concordance") between a medical record or hospital

[98]TA advisors from Health Management Associates will work with states on the data structure and linkage, and TA advisors from the American Institutes for Research will work with state staff to address regulatory and legal issues related to data sharing. The plan for this technical assistance is contained in another evaluation document.

discharge abstract and the birth certificate. Others measure "sensitivity," the degree to which the birth certificate correctly identifies a characteristic recorded in the medical record.

The studies find that there is a high level of agreement for birth weight, a key outcome for our impact analysis. The rate of agreement for gestational age is lower overall but is high in some states (Dietz et al. 2013). In terms of risk factors, socio-demographic risk factors such as race, marital status, and education have very high agreement rates, as does nulliparity and number of previous births. To the extent that Strong Start sites place an emphasis on social risk factors, we will be able to identify a comparison group well.

However, maternal medical risk factors have low rates of agreement, reflecting underreporting on the birth certificate for pre-pregnancy hypertension and diabetes, previous preterm birth, or previous low-birth weight birth. On the other hand, the "specificity," is quite high for all of the outcomes and risk factors, indicating that there are few cases where women are identified as having a condition or outcome falsely (data not shown). One medical risk factor has been shown to be reliable the birth certificate, maternal height and weight (used to measure obesity). A recent study showed that pre-pregnancy height, weight and BMI also had high agreement rates when compared to WIC prenatal enrollment records (Park et al. 2011).

Based on these studies, the greatest risk from poor data quality for the evaluation is that birth certificates may understate the prevalence of pre-pregnancy hypertension and diabetes and previous preterm or low birth weight births. To the extent that Strong Start women are being screened for risk based on such medical risk factors, our propensity score matching methodology will result in Strong Start women having an unmeasured higher risk profile than the comparison group. This unmeasured higher risk profile of Strong Start will likely bias downwards the impact of Strong Start relative to traditional Medicaid.

We propose to develop two special studies that would help us understand the extent of this bias. First, in states where Medicaid claims data are of research quality and the delivery system is primarily fee-for-service, for example, Alabama, Alaska, or Oklahoma, we would examine the claims history of women who were enrolled in Medicaid in the three months before they became pregnant. We would use their claims history to examine whether treatment and comparison group women matched on pre-pregnancy diagnoses of interest, despite the lack of specificity of the birth certificate. This would allow us to assess the extent to which the lack of specificity on the birth certificate records was biasing the composition of the comparison groups or whether the conditions of interest were sufficiently correlated with other well reported items that they produce an appropriate comparison group.

TABLE V. 2: EXACT MATCH OR SENSITIVITY OF BIRTH CERTIFICATE ITEMS

Author		Martin et al. (2013)		Roohan et al. (2003)	Zollinger et al. (2005)	DiGuiseppe et al. (2002)	Reichman and Hade (2001)
State and Year	Exact Concordance	State A 2010-2011	State B 2009	New York 1999	Indiana 1996	Nebraska & Ohio 1993-1995	New Jersey 1989-1992
Outcomes							
Gestational age	E	N/A	N/A	N/A	N/A	High	N/A
OB estimate of gestation (exact)	E	High	Moderate	N/A	N/A	N/A	N/A
Date of last menses (month)	E	High	High	N/A	N/A	N/A	N/A
Date of last menses (day)	E	Substantial	Moderate	Substantial	N/A	N/A	N/A
Date of last menses (within two weeks)	E	High	Substantial	High	N/A	N/A	N/A
Birth weight	E	High	High	High	N/A	High	High

Author		Martin et al. (2013)		Roohan et al. (2003)	Zollinger et al. (2005)	DiGuiseppe et al. (2002)	Reichman and Hade (2001)
Cesarean section	E	High	High	N/A	N/A	High	High
Breastfeeding at discharge	E	High	High	N/A	N/A	N/A	N/A
Apgar Score	E	N/A	N/A	N/A	N/A	High	N/A
Risk Factors							
Race	E	N/A	N/A	N/A	High (S)	High	High
Marital status	S	N/A	N/A	N/A	High	N/A	Substantial
Education	S	N/A	N/A	N/A	High	N/A	N/A
Medicaid coverage	S	Substantial	Moderate	N/A	N/A	N/A	N/A
Smoking	S	N/A	N/A	Substantial	Moderate	Moderate	Low
Late initiation of care	S	N/A	N/A	N/A	N/A	Substantial	N/A
Month prenatal care began	E	Substantial	Substantial	N/A	N/A	N/A	N/A
Day prenatal care began	E	Moderate	Moderate	Moderate	N/A	N/A	N/A
Chronic hypertension	S	Extremely low	N/A	Extremely low	N/A	Extremely low	Extremely low
Diabetes	E	N/A	N/A	Moderate	N/A	N/A	Low
Previous caesarian section	S	Substantial	Moderate	N/A	N/A	Substantial	N/A
Previous large baby or small baby	S	N/A	N/A	N/A	Extremely low	Extremely low	Extremely low
Previous pre-term birth	S	Extremely low	Extremely low	Extremely low	Extremely low	N/A	N/A
Total number of pregnancy outcomes	E	Substantial	Substantial	N/A	N/A	N/A	N/A
Nulliparity	S	N/A	N/A	N/A	N/A	High	N/A
Number of live births now living	E	High	High	N/A	N/A	N/A	N/A
Date of last live birth	E	High	Substantial	N/A	N/A	N/A	N/A

Notes: "E" means "Exact Concordance"; "S" means "Sensitivity." E and S are High (90 - 100), Substantial (75 - 89), Moderate (60 - 74), Low (40 - 59), and Extremely Low (Less than 40).

Second, we would use the rich data on medical risk factors that are being collected as part of the evaluation's participant-level process evaluation to assess the accuracy of the birth certificate records for Strong Start enrollees. Specifically, data collected from the Strong Start intake and exit forms regarding medical risk factors, such as pre-pregnancy diabetes, hypertension, and BMI and previous pre-term or low-birth weight births, would be compared to data on these measures on the birth certificate. We would also assess the extent to which these medical risk factors are correlated with will reported items on the birth certificate. This analysis will help us assess the extent of bias the might result from the under-reporting of medical risk factors on the birth certificates.

A final major source of risk for this approach is the content and quality of Medicaid data. If available, Medicaid eligibility files will be used to identify non-Strong Start women who could serve in the comparison group. In addition, these files contain information on the basis of eligibility (BOE) for women enrolled in Medicaid. The BOE will be used as a factor in our propensity score modeling allowing us to identify women who are eligible due to their disability or cash-assistance status, eligibility due to Section 1931, ACA related eligibility, or eligibility due only to their pregnancy. Based on our experience working with Medicaid data, we believe that these data are of high quality (although there is no experience yet with how eligibility for Medicaid due to the ACA expansion will be captured).

For the purposes of measuring services during the pregnancy and post-partum periods, Medicaid claims data have substantial limitations. Global billing for pregnancy is used by most states. As a result, prenatal care encounters are not usually present on the claims data and can be difficult to distinguish vaginal from cesarean births. Fortunately, vaginal and cesarean births are quite accurately reported on the birth certificate. First trimester care, month prenatal care began, and number of prenatal visits each has substantial to moderate agreement with medical record data.

The movement to managed care under the Medicaid program and the lack of research quality of Medicaid claims data further limits the usefulness of Medicaid claims/encounter data. As of October 2010, among the 24 states in which we will be conducting the impact analysis all except for Alabama, Alaska, Louisiana, and Oklahoma report operating comprehensive risk-based Medicaid Managed care programs. Since this time, Louisiana has implemented broad based risk-based capitated manage care. Some states such as Alabama have managed care programs that rely heavily on primary care case management models; in these cases, claims/encounter data are likely to be more complete.

Exhibit 3 also presents data from an analysis of whether Medicaid data are of research quality for the states in which we plan to conduct the impact analysis. Of the 21 of our states that were reviewed, 13 have research quality encounter data for physician, outpatient, and clinic claims, and 11 have research quality data for inpatient claims for both adults and children. To summarize, only 10 of the 19 states with comprehensive managed care have research quality data for both outpatient and inpatient claims. As mentioned previously, as part of our TA process we will develop a screening method for updating this analysis. In addition to the critical role of Medicaid data in identifying Medicaid enrollees for the comparison group, in states with high quality data the claims data could potentially be useful for identifying pre-pregnancy conditions such as diabetes and hypertension or other relevant diagnoses that may be under-reported on the birth certificate for women who were enrolled in Medicaid pre-pregnancy. In addition, they could be used to identify the provider site for prenatal care.

TABLE V. 3: QUALITY OF ENCOUNTER DATA IN IMPACT ANALYSIS BY STATE

State	Share in Risk-Based Managed Care, 2011	Good Research Quality of Outpatient Encounter Data, 2012	Good Research Quality of Inpatient Encounter Data, 2012
Alabama	0%	N/A	N/A
Alaska	0%	N/A	N/A
Arizona	89%	Yes	Yes
California	55%	Yes	Yes
District of Columbia	74%	No	No
Florida	45%	No	No
Georgia	68%	Yes	No
Illinois[1]	7%	N/A	N/A
Kentucky	21%	Yes	Yes
Louisiana[2]	N/A	N/A	N/A
Maryland	74%	No	Yes
Michigan	68%	Yes	No
Minnesota	66%	Yes	Yes
Mississippi	9%	N/A	N/A
Missouri	47%	Yes	Yes
Nevada	62%	No	No
New Jersey	95%	Yes	Yes
New Mexico	68%	Yes	Yes
Oklahoma	0%	N/A	N/A
Oregon	83%	Yes	Yes
Pennsylvania	58%	No	No
South Carolina	48%	No	No
Tennessee	100%	Yes	Yes
Texas	49%	Yes	No
Virginia	62%	Yes	Yes
Summary	**N/A**	**13 Yes**	**11 Yes**

Sources: Managed Care Enrollment: Gifford et al., 2011.
Quality of Encounter Data: Data on research quality of MAX data from Byrd et al. (2012).

Notes: [1] Illinois is required to have 50 percent of their Medicaid enrollees in managed care by January 2015.
[2] Enrollment in risk-based managed care statewide began in 2011 in Louisiana; data on enrollment levels and encounter data quality are not available.

Another major purpose for using the claims and encounter data is to examine mother and infant costs during the first postpartum year, but the cost analysis will be limited by some of the same factors indicated above. In states where most women are enrolled in risk-based managed care plans, we will be unable to directly analyze the costs for specific services. Consequently, in states with risk-based managed care, we will focus on the major cost drivers such as presence of a C-Section at delivery (which can be obtained from the birth certificate), the length of hospitalization for mother and infant (if claims/encounter data are available), and the use of neo-natal intensive care.

In summary, while there are substantial risks concerning data availability, we have shown that there are ways to mitigate that risk in various ways. In addition, we propose to develop several special studies that will help us understand the extent of the bias introduced by our methods for this approach.

B. Contingency Plan One: Comparison Group from Prenatal Care Sites in Local Area

If there are any states where we cannot obtain birth certificate data or if birth certificate data are of particularly poor quality, we would consider another approach. Under this contingency approach, we would identify specific "standard Medicaid practices" in the same local areas as each Strong Start site that would be willing to serve as comparison sites and draw our comparison group of women from these practices. As with the first approach, comparison group women would be matched to Strong Start participants using site-specific data on demographic, social, and medical risks. Ideally, women from the comparison group would be screened using the same method being used by the local Strong Start site to identify them as high risk, or data would be available from the sites electronic health records to measure risk. We would account for observed differences between the treatment and comparison group using propensity score re-weighting.

The main difference between this approach and our main approach would be that data for this analysis would not come from birth certificate data linked with Medicaid eligibility and claims files. Rather, data would be derived from a combination of medical abstraction of information on women in both the Strong Start and comparison sites and/or medical risk factors and birth outcomes contained in the participant level process evaluation's Exit Form collected by staff at both Strong Start and comparison sites.

Impact assessments under this approach would also be made based on propensity score weighted comparisons between the experiences of Strong Start women and women served by local area comparison sites. We would not use baseline data to conduct a difference-in-difference approach because doing so would not answer the primary analytic question.

There are numerous risks associated with this approach as well, and they are primarily related to the high level of resources (currently not in the evaluation budget) for implementing such an approach. The first has to do with the limited readily-available data to identify appropriate comparison sites. The sites should be those that provide "standard Medicaid prenatal care" to women who are similar to Strong Start participants, and that have a high enough volume to create a comparison group of sufficient size to detect differences attributable to Strong Start. [99] Information on individual practices, including their location and other characteristics, may not be available in existing data sources, especially in states that have extensive risk-based managed care penetration (since plans maintain provider information). Even in states that do not rely heavily on managed care, Medicaid and other state agencies are unlikely to have detailed information on the characteristics of the practices sufficient to determine which ones would be appropriate comparison sites. Consequently, a telephone survey of Medicaid practices would likely be necessary to collect such information. Within the current evaluation resources, it would be extremely difficult to identify potential comparison practices in a systematic way across numerous sites.

The second major risk concerns comparison site participation. For this approach to succeed, comparison sites (those without Strong Start funding) must participate in the evaluation, yet this participation would require their willingness to provide data on the comparison group, including likely the need to obtain informed consent from patients, to screen them using the risk screener being used by the local Strong Start site (or some other very similar risk information), and complete (at a minimum) the patient–level process evaluation's Exit Form (or provide similar data from medical records). Potential comparison practices are not likely to be willing to participate without substantial incentive funding. Thus, primary data collection would likely be necessary for the Strong Start evaluation.

The third major risk concerns data on cost of care. In the absence of Medicaid claims data, which this approach does not rely on, evaluation costs could not be analyzed, nor could utilization differences as proposed in our preferred approach. This is because it would be infeasible to obtain or track hospital cost data or data from pediatricians and internists seen by the mother or infant.

We have not developed specific estimates of the additional costs involved for this alternative approach, because doing so would require us to undertake such tasks as soliciting competitive bids from organizations that conduct medical record abstraction, and surveying representative samples of Medicaid practices at the local level. However, the primary data collection required for this strategy would likely cost more than the first option that relies on administrative records for data on the comparison group.

[99] The design report has a full discussion of power and the sample size needed to detect meaningful changes in outcomes.

C. Contingency Plan Two: Comparison Group from Women Served in Strong Start Sites before Strong Start Implementation

The second contingency plan involves using baseline data. To answer our primary evaluation question, this approach could only be used in Strong Start sites that became a maternity care home or group prenatal care site after Strong Start was implemented. Since these practices were standard Medicaid practices prior to Strong Start, the impact of the "switch" from a standard Medicaid practice to a maternity care home or a group prenatal care site would be derived from the difference in outcomes between the baseline and the post-implementation phase. This approach is not appropriate for birth centers since they were not standard Medicaid practices prior to Strong Start and the only change they are implementing are Strong Start enhanced services. For this approach, we would rely on the abstraction of data on medical risk factors and outcomes during the baseline period. The data extracted would be similar to that collected through the participant level process evaluation on the Exit Form and Exit Form data for the Strong Start period. Obtaining these data may be easier to accomplish than for the Comparison Site design, since these sites are receiving Strong Start funding and have been told that they may be required to do such data gathering for a baseline period.

The first risk is inherent in any pre/post evaluation design: while the pre-post design controls for selection into the site of care (a challenge in the first two approaches described above), it creates another analytic problem, which is the presence of a secular trend in factors that may impact outcomes. For example, this approach would not control for unobservable changes within sites that alter practice quality and patient outcomes (e.g., staffing changes, IT upgrades, and changes in practice leadership or culture), or the effect of ACA implementation on the practices. An ideal design for sites such as these (which changed from standard Medicaid practice with the intervention), would be a Difference-in-Differences design using comparison sites. However, such as design would introduce the resource problems identified above for the comparison site design. If comparison sites could not be incorporated, we would conduct a pre-post design and attempt to control through propensity score matching for differences in the populations served over the course of the demonstration. This estimate would reflect the impact of switching and any other practice changes that occurred over time.

A second risk is sample size. Each practice is likely to have relatively few Strong Start enrollees during the program period, and similarly relatively few women in the year before implementation. Drawing from earlier years creates even greater problems controlling for secular trends. One way to mitigate this risk is to pool across sites with the pre-post design and report only overall impacts, unless the data support site-specific estimates.

Finally, while Strong Start awardees were required by the CMMI application to have a minimum of two years of baseline data, including measures of gestational age and birthweight. According to federal officials, most applicants have access to more variables and more years of data, but there has been no systematic cataloging of these baseline data. It is very uncertain whether and how many sites could provide all of variables necessary to conduct an impact analysis. If one or more sites are able to provide comprehensive data and the sites are large enough that sample size concerns are mitigated, it might be worth conducting this analysis as a special study and not solely as a contingency plan.

IV. Conclusion

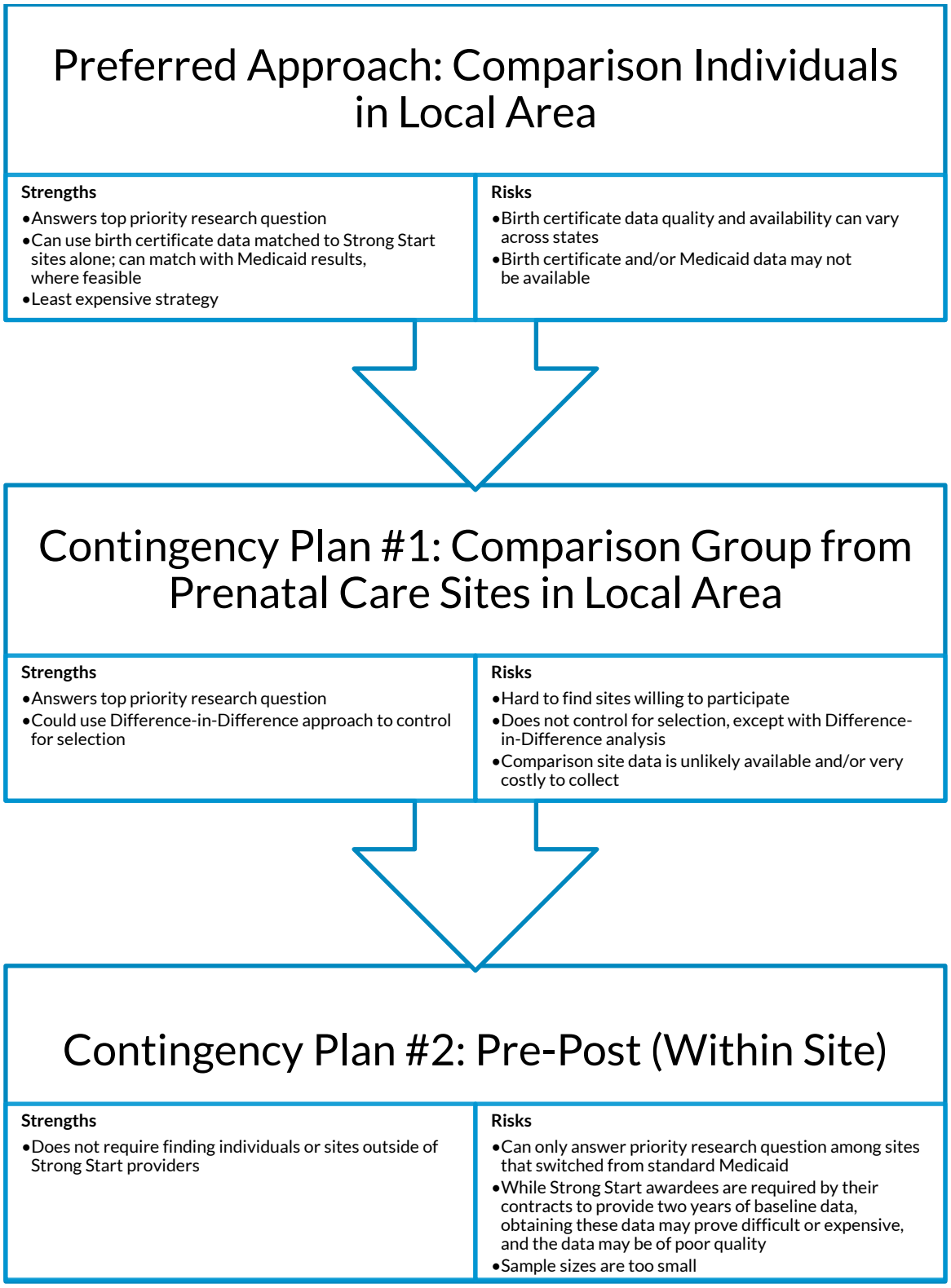
In this report, we have explored the strengths and weakness of three alternative approaches to developing comparison groups to evaluate the impact of Strong Start on birth outcomes and cost. Exhibit 4 presents a summary of the strengths and risks of the three approaches. Our preferred approach is to draw a comparison group from women in the local area of each Strong Start site using birth certificate data, and where possible, linked with Medicaid eligibility data. The main advantage of this approach, compared to the other approaches, is that we would be able to use a consistent evaluation strategy across all awardees and sites for which we could obtain birth certificate and/or Medicaid data. In addition, this approach relies on administrative data rather than primary data collection and therefore we believe that it will be the least costly. There are also risks to this strategy that include not being able to obtain data from all states and the quality of the birth certificate data.

The second approach we examined is similar to the first approach except that comparison sites from the local area of each Strong Start site would be identified and a comparison group of women would be developed from these practices. This approach would rely on primary data collection to obtain information on medical risk factors and birth outcomes, which might be more reliable than the data reported on the birth certificates. While this design has the same analytic advantages as our preferred approach, there are considerable implementation challenges. These include the ability to systematically identify appropriate comparison sites and to gain their participation and the costs of primary data collection. Moreover, sample sizes may not be adequate in comparison sites to detect important differences in outcomes.

The third approach examined would be used only in sites that became maternity care homes or group prenatal care practices with the implementation of Strong Start. In these circumstances, women who received care in a Strong Start site prior to the implementation of Strong Start would serve as a comparison group. This approach would also require primary data collection either by the sites or through medical abstraction. It may be appropriate to utilize this approach among those sites that "switch" for a special study, this strategy is not appropriate for the overall evaluation.

When all of these factors are weighed, we feel confident that our preferred approach is the most likely to succeed. The approach may be modified in places where administrative records are not available or not of sufficient quality.

FIGURE V. 1: SUMMARY OF PREFERRED APPROACH AND CONTINGENCY APPROACHES FOR SELECTING COMPARISON GROUP



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APPENDIX W: IMPACT ANALYSIS – GROUP PRENATAL CARE ENROLLMENT STRATEGIES

Table W. 1 presents data regarding whether Group Prenatal Care sites in states included in the impact analysis used an opt-in or opt-out strategy for enrolling Strong Start women into Group Prenatal Care as the table also presents the share of women offered Group Prenatal Care who enrolled in the sites that had opt-in strategies. Sites that had opt-in strategies and enrolled less than 75 percent of women offered Group Prenatal Care were excluded from the model-level impact analysis because of concerns regarding selection bias.

TABLE W. 1: SUMMARY OF GROUP PRENATAL CARE ENROLLMENT STRATEGIES

Awardee	State	Number of Sites	Enrollment Approach		Selection Issue[1]
			Opt-Out	Opt-In	
Albert Einstein Healthcare Network	**PA**	**3**	**Yes**	**No**	**No**
Amerigroup Corporation	**LA**	**7**	**Yes**	**Yes**	**Yes***
Ochsner St. Charles Clinic Uptown	LA	N/A	No	**Yes**	**Yes**
Woman's Hospital at Gonzales	LA	N/A	**Yes**	No	No
LSU New Orleans - Perdido Clinic	LA	N/A	No	**Yes**	**Yes**
LSU New Orleans - Carrolton	LA	N/A	No	**Yes**	**Yes**
LSU Shreveport	LA	N/A	No	**Yes**	**Yes**
Daughters of Charity - Gentilly	LA	N/A	No	**Yes**	**Yes**
Woman's Health Center for OB/GYN at Woman's Hospital	LA	N/A	No	**Yes**	**Yes**
Central Jersey Family Health Consortium	**NJ**	**8**	**Yes**	**Yes**	**Yes***
Capital Health System	NJ	N/A	No	**Yes**	**Yes**
Newark Community Health Center	NJ	N/A	**Yes**	No	No
Jewish Renaissance Medical Center	NJ	N/A	No	**Yes**	**Yes**
JFK Medical Center	NJ	N/A	**Yes**	No	No
Jersey Shore University Hospital	NJ	N/A	No	**Yes**	**Yes**
Rutgers/NJ Medical School	NJ	N/A	No	**Yes**	**Yes**
Saint Peter's University Hospital	NJ	N/A	No	**Yes**	**Yes**
Southern Jersey Family Medical Center	NJ	N/A	No	**Yes**	**Yes**
Health Insight of Nevada	**NV**	**3**	**No**	**Yes**	**No**
Providence Hospital	**DC**	**1**	**No**	**Yes**	**No**
University of South Alabama	**AL**	**2**	**No**	**Yes**	**Yes**
University of Tennessee Health Science Center	**TN**	**2**	**Yes**	**Yes**	**Yes***
Regional One Outpatient Center	TN	N/A	No	**Yes**	**Yes**
Hollywood Primary Care Center	TN	N/A	**Yes**	No	No

Notes: Cells that contain one asterisk (*) indicate that there is only a selection issue at opt-in sites for these awardees.
[1] Sites with greater than 25 percent of women declining to participate are considered to have a selection issue with implications for the impact analysis.

APPENDIX X: SPECIAL STUDY – ENHANCED PRENATAL EDUCATION

TABLE X. 1: INTENDED DELIVERY METHOD AND DELIVERY METHOD BY MODEL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Intended Method of Delivery, Third Trimester					
Missing Data	%	38.4	48.4	40.9	42.1
Women with Non-Missing Data	**N**	**5,408**	**5,359**	**15,105**	**25,872**
Vaginal	%	96.4	83.7	81.3	84.9
C-Section	%	2.4	8.6	12.3	9.5
Unsure	%	1.3	7.7	6.4	5.6
Method of Delivery Among Participants Who Intended a Vaginal Delivery					
Missing Data	%	18.1	39.4	27.8	28.6
Not in Universe	%	27.6	22.9	28.2	26.8
Women with Non-Missing Data	**N**	**4,775**	**3,914**	**11,246**	**19,935**
Vaginal	%	90.1	77.8	81.3	82.7
C-Section	%	9.9	22.2	18.7	17.3
Method of Delivery Among Participants Who Intended a C-Section Delivery					
Missing Data	%	18.1	39.4	27.8	28.6
Not in Universe	%	80.8	56.6	65.5	66.4
Women with Non-Missing Data	**N**	**104**	**410**	**1,725**	**2,239**
Vaginal	%	-	9.0	7.1	7.5
C-Section	%	91.3	91.0	92.9	92.5
Method of Delivery Among Participants Unsure of Their Intended Delivery Method					
Missing Data	%	18.1	39.4	27.8	28.6
Not in Universe	%	81.4	57.4	69.0	68.7
Women with Non-Missing Data	**N**	**49**	**326**	**821**	**1,196**
Vaginal	%	40.8	56.7	52.6	53.3
C-Section	%	59.2	43.3	47.4	46.7
Method of Delivery Among Participants Missing Intended Delivery Method					
Missing Data	%	56.8	56.8	59.6	58.4
Not in Universe	%	25.8	15.8	18.2	19.2
Women with Non-Missing Data	**N**	**1,526**	**2,847**	**5,674**	**10,047**
Vaginal	%	84.9	69.8	67.7	70.9
C-Section	%	15.1	30.2	32.3	29.1

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse; or a response. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 2: BREASTFEEDING INTENT AND BREASTFEEDING BY MODEL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Breastfeeding Initiation Among Participants Who Intended to Only Breastfeed					
Missing Data	%	52.8	69.6	57.4	59.3
Not in Universe	%	8.5	14.8	25.2	19.5
Women with Non-Missing Data	**N**	**3,394**	**1,623**	**4,454**	**9,471**
Ever Breastfed	%	97.2	94.2	91.5	94.0
Never Breastfed	%	2.8	5.8	8.5	6.0
Breastfeeding Initiation Among Participants Who Intended to Only Formula Feed					
Missing Data	%	52.8	69.6	57.4	59.3
Not in Universe	%	45.4	27.8	36.3	36.1
Women with Non-Missing Data	**N**	**153**	**274**	**1,620**	**2,047**
Ever Breastfed	%	28.8	31.8	26.0	27.0
Never Breastfed	%	71.2	68.2	74.0	73.0

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Breastfeeding Initiation Among Participants Who Intended to Both Breastfeed and Formula Feed					
Missing Data	%	52.8	69.6	57.4	59.3
Not in Universe	%	42.3	21.1	28.2	29.3
Women with Non-Missing Data	**N**	**430**	**964**	**3,681**	**5,075**
Ever Breastfed	%	86.0	88.1	83.5	84.6
Never Breastfed	%	14.0	11.9	16.5	15.4
Breastfeeding Initiation Among Participants Who Hadn't Decided Whether to Breast or Formula Feed					
Missing Data	%	52.8	69.6	57.4	59.3
Not in Universe	%	45.3	27.6	38.2	37.1
Women with Non-Missing Data	**N**	**166**	**296**	**1,129**	**1,591**
Ever Breastfed	%	74.7	72.6	62.0	65.3
Never Breastfed	%	25.3	27.4	38.0	34.7
Breastfeeding Initiation Among Participants With Missing Breastfeeding Intent					
Missing Data	%	94.2	91.5	90.6	91.5
Women with Non-Missing Data	**N**	**513**	**885**	**2,403**	**3,801**
Ever Breastfed	%	89.9	79.7	72.3	76.4
Never Breastfed	%	10.1	20.3	27.7	23.6

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse.

TABLE X. 3: DELIVERY METHOD AND DELIVERY SATISFACTION BY MODEL

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Satisfaction with Delivery Experience Among Participants with a Vaginal Delivery					
Missing Data	%	46.5	65.2	48.7	52.1
Not in Universe	%	7.5	12.8	17.2	14.3
Women with Non-Missing Data	**N**	**4,040**	**2,284**	**8,710**	**15,034**
Not at All Satisfied	%	1.0	2.6	1.8	1.7
Slightly Satisfied	%	2.0	2.9	2.5	2.4
Moderately Satisfied	%	8.0	9.2	11.4	10.2
Very Satisfied	%	28.2	43.7	47.4	41.7
Extremely Satisfied	%	60.8	41.5	36.9	44.0
Satisfaction with Delivery Experience Among Participants with a C-Section Delivery					
Missing Data	%	46.5	65.2	48.7	52.1
Not in Universe	%	47.3	24.8	36.2	35.7
Women with Non-Missing Data	**N**	**544**	**1,042**	**3,863**	**5,449**
Not at All Satisfied	%	9.2	4.6	3.5	4.3
Slightly Satisfied	%	9.6	6.0	4.0	4.9
Moderately Satisfied	%	25.0	16.2	15.2	16.4
Very Satisfied	%	35.1	40.9	44.5	42.9
Extremely Satisfied	%	21.1	32.2	32.8	31.5
Satisfaction with Delivery Experience Among Participants Missing Delivery Method					
Missing Data	%	46.5	65.2	48.7	52.1
Not in Universe	%	53.3	33.5	49.9	46.8
Women with Non-Missing Data	**N**	**14**	**136**	**375**	**525**
Not at All Satisfied	%	-	-	-	2.1
Slightly Satisfied	%	-	-	-	2.9
Moderately Satisfied	%	-	11.0	19.5	17.3
Very Satisfied	%	-	48.5	45.1	46.1
Extremely Satisfied	%	-	33.8	30.9	31.6

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 4: INTENDED DELIVERY METHOD AND DELIVERY METHOD BY AWARDEE

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Intended Method of Delivery, Third Trimester																													
Missing Data	%	28.9	74.7	39.3	44.8	43.1	34.0	38.4	26.2	40.9	30.7	60.2	51.1	33.2	36.0	51.9	64.1	16.6	50.2	41.9	40.2	50.9	48.0	46.2	38.0	41.2	56.7	54.9	42.1
Women with Non-Missing Data	**N**	**1,871**	**357**	**5,104**	**522**	**699**	**861**	**433**	**928**	**503**	**1,114**	**1,235**	**465**	**526**	**1,144**	**1,235**	**307**	**2,852**	**886**	**140**	**642**	**568**	**665**	**371**	**559**	**843**	**316**	**726**	**25,872**
Vaginal	%	83.7	86.0	96.5	85.2	88.3	79.4	89.4	90.0	77.1	81.3	79.5	91.2	76.6	83.3	67.4	86.0	84.5	83.3	82.1	84.9	87.1	86.9	84.4	71.6	77.7	88.0	73.0	84.9
C-Section	%	10.6	9.8	2.3	9.4	6.6	17.0	4.8	5.9	10.3	14.8	11.8	5.8	18.1	13.9	18.1	9.8	8.2	14.9	12.9	10.4	9.0	9.3	10.5	17.5	14.6	7.3	5.2	9.5
Unsure	%	5.7	4.2	1.2	5.4	5.2	3.6	5.8	4.1	12.5	3.9	8.7	3.0	5.3	2.8	14.4	4.2	7.3	1.8	-	4.7	3.9	3.8	5.1	10.9	7.7	4.7	21.8	5.6
Method of Delivery Among Participants Who Intended a Vaginal Delivery																													
Missing Data	%	11.2	60.2	18.3	28.0	38.9	18.3	31.9	23.0	49.9	25.7	30.6	28.7	29.3	36.0	41.2	65.5	8.5	37.3	38.6	35.2	26.8	44.1	28.0	34.6	18.6	32.6	45.7	55.4
Not in Universe	%	33.0	21.1	28.0	27.6	17.4	33.7	21.2	16.8	16.8	19.5	42.2	33.5	20.2	15.6	30.0	14.9	27.2	23.4	26.6	16.7	34.1	12.5	29.2	23.0	36.3	40.7	25.8	26.8
Women with Non-Missing Data	**N**	**1,467**	**264**	**4,512**	**419**	**537**	**626**	**330**	**758**	**283**	**882**	**846**	**359**	**398**	**865**	**739**	**168**	**2,197**	**699**	**84**	**517**	**453**	**555**	**295**	**382**	**646**	**195**	**459**	**19,935**
Vaginal	%	79.5	81.8	90.6	79.2	73.6	78.1	78.8	83.0	78.1	77.8	77.2	87.7	80.7	80.5	79.7	81.0	82.8	83.1	73.8	90.3	80.4	83.1	75.9	65.7	83.7	69.2	84.3	82.7
C-Section	%	20.5	18.2	9.4	20.8	26.4	21.9	21.2	17.0	21.9	22.2	22.8	12.3	19.3	19.5	20.3	19.0	17.2	16.9	26.2	9.7	19.6	16.9	24.1	34.3	16.3	30.8	15.7	17.3
Method of Delivery Among Participants Who Intended a C-Section Delivery																													
Missing Data	%	11.2	60.2	18.3	28.0	38.9	18.3	31.9	23.0	49.9	25.7	30.6	28.7	29.3	36.0	41.2	65.5	8.5	37.3	38.6	35.2	26.8	44.1	28.0	34.6	18.6	32.6	45.7	95.0
Not in Universe	%	81.9	37.7	80.5	67.0	57.5	71.9	65.7	73.0	46.8	64.3	65.1	68.7	58.6	55.6	50.9	32.3	85.3	55.6	55.2	59.0	68.9	51.4	66.8	54.7	72.9	64.9	52.1	66.4
Women with Non-Missing Data	**N**	**182**	**30**	**97**	**47**	**44**	**128**	**17**	**51**	**28**	**161**	**135**	**24**	**95**	**150**	**203**	**19**	**210**	**126**	**15**	**62**	**50**	**57**	**36**	**96**	**122**	**18**	**36**	**2,239**
Vaginal	%	6.6	-	-	-	-	-	-	-	-	-	8.9	-	-	-	6.9	-	8.1	-	-	-	-	-	-	-	-	-	-	7.5
C-Section	%	93.4	93.3	90.7	89.4	100.0	93.8	94.1	82.4	85.7	94.4	91.1	91.7	92.6	96.0	93.1	100.0	91.9	93.7	100.0	88.7	86.0	84.2	97.2	90.6	95.1	83.3	94.4	92.5
Method of Delivery Among Participants Unsure of Their Intended Delivery Method																													
Missing Data	%	11.2	60.2	18.3	28.0	38.9	18.3	31.9	23.0	49.9	25.7	30.6	28.7	29.3	36.0	41.2	65.5	8.5	37.3	38.6	35.2	26.8	44.1	28.0	34.6	18.6	32.6	45.7	97.3
Not in Universe	%	85.1	39.0	81.1	69.3	58.7	79.5	64.7	74.2	47.6	71.6	66.4	70.0	67.1	62.2	54.1	33.5	86.5	61.8	59.3	62.2	71.3	53.9	69.2	59.0	76.8	66.0	46.6	68.7
Women with Non-Missing Data	**N**	**98**	**12**	**44**	**25**	**29**	**28**	**24**	**35**	**21**	**43**	**95**	**12**	**28**	**31**	**121**	**-**	**170**	**16**	**-**	**28**	**22**	**25**	**19**	**57**	**65**	**-**	**124**	**1,196**
Vaginal	%	46.9	-	40.9	-	48.3	60.7	54.2	65.7	52.4	39.5	41.1	-	-	45.2	62.8	-	58.2	-	-	53.6	59.1	48.0	68.4	28.1	50.8	-	74.2	53.3
C-Section	%	53.1	-	59.1	60.0	51.7	39.3	45.8	34.3	-	60.5	58.9	-	67.9	54.8	37.2	-	41.8	-	-	46.4	-	52.0	-	71.9	49.2	-	25.8	46.7
Method of Delivery Among Participants Missing Intended Delivery Method																													
Missing Data	%	67.3	32.0	55.9	68.1	59.8	64.4	63.7	71.5	85.8	70.0	37.6	43.7	66.6	66.2	53.7	72.0	79.9	51.0	58.1	61.0	47.9	52.4	53.3	62.0	58.7	46.7	43.6	77.5
Not in Universe	%	22.4	18.1	26.3	20.0	11.5	21.8	15.4	9.9	11.0	6.8	34.8	29.7	4.6	5.4	17.4	11.6	16.1	15.4	18.3	8.3	27.9	6.1	21.2	6.0	23.2	36.8	15.8	19.2
Women with Non-Missing Data	**N**	**272**	**704**	**1,494**	**112**	**353**	**180**	**147**	**233**	**27**	**374**	**857**	**253**	**227**	**507**	**741**	**140**	**135**	**597**	**57**	**330**	**280**	**531**	**176**	**288**	**259**	**120**	**653**	**10,047**
Vaginal	%	62.9	70.3	85.0	69.6	66.9	60.0	72.8	74.2	59.3	67.4	64.8	79.1	61.7	64.9	66.5	65.0	67.4	71.5	80.7	80.3	71.8	68.4	72.2	54.2	62.5	79.2	72.9	70.9
C-Section	%	37.1	29.7	15.0	30.4	33.1	40.0	27.2	25.8	40.7	32.6	35.2	20.9	38.3	35.1	33.5	35.0	32.6	28.5	19.3	19.7	28.2	31.6	27.8	45.8	37.5	20.8	27.1	29.1

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse; or a response. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 5: BREASTFEEDING INTENT AND BREASTFEEDING BY AWARDEE

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Breastfeeding Initiation Among Participants Who Intended to Only to Breastfeed																													
Missing Data	%	41.7	93.7	53.8	63.3	62.7	54.1	78.8	48.2	60.6	44.5	79.6	74.0	37.6	53.7	69.8	77.5	28.1	65.7	71.0	59.9	68.0	63.4	75.3	64.6	64.6	83.7	65.7	78.8
Not in Universe	%	37.5	3.3	7.4	22.6	15.5	25.4	10.4	24.6	16.1	42.5	7.5	10.5	27.5	17.0	27.4	6.2	44.3	9.1	16.6	16.9	21.2	25.6	7.8	17.3	27.8	10.1	22.3	19.5
Women with Non-Missing Data	**N**	**546**	**43**	**3,265**	**133**	**269**	**268**	**76**	**343**	**198**	**210**	**398**	**147**	**275**	**525**	**72**	**139**	**944**	**449**	**30**	**250**	**125**	**141**	**116**	**163**	**108**	**45**	**193**	**9,471**
Ever Breastfed	%	92.1	97.7	97.2	91.0	93.7	91.8	97.4	95.3	95.5	85.2	96.0	84.4	90.2	90.7	77.8	95.7	95.8	87.3	96.7	91.6	89.6	89.4	100.0	89.6	95.4	88.9	94.3	94.0
Never Breastfed	%	7.9	-	2.8	9.0	6.3	8.2	-	4.7	-	14.8	4.0	15.6	9.8	9.3	22.2	-	4.2	12.7	-	8.4	10.4	10.6	-	10.4	-	-	5.7	6.0
Breastfeeding Initiation Among Participants Who Intended to Only Formula Feed																													
Missing Data	%	41.7	93.7	53.8	63.3	62.7	54.1	78.8	48.2	60.6	44.5	79.6	74.0	37.6	53.7	69.8	77.5	28.1	65.7	71.0	59.9	68.0	63.4	75.3	64.6	64.6	83.7	65.7	95.4
Not in Universe	%	50.8	5.3	44.7	29.4	36.1	39.2	19.6	49.5	37.5	41.5	19.3	23.3	56.3	37.9	21.0	21.3	65.8	30.8	24.9	34.0	27.7	29.3	24.2	30.5	26.0	14.1	30.6	36.1
Women with Non-Missing Data	**N**	**195**	**14**	**130**	**69**	**15**	**88**	**11**	**29**	**16**	**226**	**33**	**26**	**48**	**151**	**237**	**-**	**208**	**63**	**-**	**66**	**50**	**94**	**-**	**44**	**135**	**16**	**60**	**2,047**
Ever Breastfed	%	28.2	-	25.4	21.7	-	23.9	-	58.6	-	16.4	54.5	42.3	-	21.9	20.7	-	39.4	25.4	-	36.4	66.0	25.5	-	-	14.8	-	18.3	27.0
Never Breastfed	%	71.8	-	74.6	78.3	-	76.1	-	41.4	-	83.6	45.5	57.7	91.7	78.1	79.3	-	60.6	74.6	-	63.6	34.0	74.5	-	95.5	85.2	-	81.7	73.0
Breastfeeding Initiation Among Participants Who Intended to Both Breastfeed and Formula Feed																													
Missing Data	%	41.7	93.7	53.8	63.3	62.7	54.1	78.8	48.2	60.6	44.5	79.6	74.0	37.6	53.7	69.8	77.5	28.1	65.7	71.0	59.9	68.0	63.4	75.3	64.6	64.6	83.7	65.7	88.6
Not in Universe	%	34.0	4.6	42.0	23.2	26.8	32.6	14.4	30.8	30.9	35.1	15.0	19.5	46.6	41.4	17.0	19.0	42.4	30.0	20.7	32.1	16.7	21.1	18.7	25.3	20.4	11.0	25.0	29.3
Women with Non-Missing Data	**N**	**638**	**24**	**352**	**128**	**130**	**174**	**48**	**264**	**72**	**329**	**166**	**62**	**125**	**88**	**340**	**30**	**1,010**	**78**	**20**	**86**	**178**	**199**	**41**	**91**	**214**	**39**	**149**	**5,075**
Ever Breastfed	%	84.8	79.2	85.8	78.9	90.0	84.5	91.7	96.2	93.1	77.2	92.2	82.3	80.0	81.8	75.3	90.0	89.1	70.5	70.0	72.1	92.1	82.4	100.0	80.2	80.8	74.4	75.2	84.6
Never Breastfed	%	15.2	-	14.2	21.1	10.0	15.5	-	-	-	22.8	7.8	17.7	20.0	18.2	24.7	-	10.9	29.5	-	27.9	7.9	17.6	-	19.8	19.2	-	24.8	15.4
Breastfeeding Initiation Among Participants Who Hadn't Decided Whether to Breast or Formula Feed																													
Missing Data	%	41.7	93.7	53.8	63.3	62.7	54.1	78.8	48.2	60.6	44.5	79.6	74.0	37.6	53.7	69.8	77.5	28.1	65.7	71.0	59.9	68.0	63.4	75.3	64.6	64.6	83.7	65.7	96.4
Not in Universe	%	52.4	5.7	44.6	34.9	33.7	40.6	19.2	50.6	33.6	47.6	19.2	24.7	56.9	42.8	25.3	21.0	63.2	33.2	24.9	37.4	30.5	33.9	23.2	33.1	31.9	13.7	25.0	37.1
Women with Non-Missing Data	**N**	**153**	**-**	**138**	**17**	**45**	**69**	**14**	**16**	**49**	**128**	**35**	**12**	**44**	**64**	**126**	**13**	**297**	**21**	**-**	**29**	**18**	**35**	**-**	**21**	**50**	**19**	**150**	**1,591**
Ever Breastfed	%	60.1	-	72.5	-	86.7	66.7	-	87.5	81.6	50.0	80.0	-	59.1	51.6	52.4	-	75.4	76.2	-	48.3	-	57.1	-	66.7	64.0	-	68.0	65.3
Never Breastfed	%	39.9	-	27.5	-	-	33.3	-	-	-	50.0	-	-	40.9	48.4	47.6	-	24.6	-	-	51.7	66.7	42.9	-	-	36.0	-	32.0	34.7
Breastfeeding Initiation Among Participants With Missing Breastfeeding Intent																													
Missing Data	%	92.8	98.3	94.2	96.2	94.2	93.7	97.4	87.0	97.6	94.5	88.1	94.1	87.2	81.5	92.9	89.3	97.7	92.1	96.3	87.9	90.2	74.4	94.0	92.6	95.3	96.8	69.4	91.5
Women with Non-Missing Data	**N**	**190**	**24**	**490**	**36**	**71**	**82**	**18**	**163**	**20**	**88**	**369**	**56**	**101**	**330**	**182**	**91**	**78**	**141**	**-**	**130**	**113**	**328**	**41**	**67**	**68**	**23**	**492**	**3,801**
Ever Breastfed	%	72.1	91.7	90.0	72.2	85.9	69.5	88.9	91.4	100.0	60.2	90.5	83.9	63.4	73.9	51.6	87.9	73.1	73.8	-	65.4	71.7	68.9	100.0	82.1	60.3	60.9	70.3	76.4
Never Breastfed	%	27.9	-	10.0	-	-	30.5	-	8.6	-	39.8	9.5	-	36.6	26.1	48.4	12.1	26.9	26.2	-	34.6	28.3	31.1	-	17.9	39.7	-	29.7	23.6

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 6: DELIVERY METHOD AND DELIVERY SATISFACTION BY AWARDEE

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Satisfaction with Delivery Experience Among Participants with a Vaginal Delivery																													
Missing Data	%	35.7	91.8	47.5	66.7	55.6	48.5	75.8	35.5	55.3	38.4	67.7	68.3	24.1	35.0	54.8	67.0	29.0	57.5	66.8	48.6	58.3	44.7	61.1	55.5	57.7	80.8	75.5	66.4
Not in Universe	%	20.3	3.0	7.0	10.6	17.5	19.4	9.4	17.6	19.7	21.8	13.9	6.6	27.5	24.0	20.0	12.6	19.4	13.8	19.5	11.8	11.5	15.9	13.4	22.2	14.2	10.0	6.5	14.3
Women with Non-Missing Data	**N**	**1,158**	**73**	**3,822**	**215**	**331**	**419**	**104**	**590**	**212**	**641**	**569**	**238**	**381**	**733**	**649**	**174**	**1,767**	**510**	**33**	**425**	**350**	**505**	**176**	**201**	**402**	**67**	**289**	**15,034**
Not at All Satisfied	%	2.6	-	0.9	-	-	3.3	-	-	-	-	2.3	-	-	-	-	-	1.9	-	-	-	-	3.8	-	7.0	3.0	-	9.7	1.7
Slightly Satisfied	%	3.6	-	1.9	-	-	4.5	-	2.2	-	4.2	3.3	-	-	1.8	-	-	2.8	-	-	2.6	-	3.2	-	7.0	-	-	4.5	2.4
Moderately Satisfied	%	11.4	-	7.9	5.1	9.7	12.2	11.5	9.0	-	10.6	14.4	8.0	8.9	11.1	10.5	-	9.8	4.7	-	23.3	9.7	11.1	-	12.9	7.2	-	32.5	10.2
Very Satisfied	%	50.9	45.2	27.5	25.6	57.7	37.2	39.4	47.1	42.0	38.5	50.6	31.1	51.7	36.8	47.1	31.0	64.0	27.6	-	49.6	56.3	42.6	58.0	31.3	42.3	55.2	25.6	41.7
Extremely Satisfied	%	31.5	38.4	61.8	67.9	28.1	42.7	42.3	41.0	53.3	45.6	29.3	59.7	36.7	49.8	40.7	60.9	21.5	66.7	51.5	22.1	32.9	39.4	30.7	41.8	45.5	31.3	27.7	44.0
Satisfaction with Delivery Experience Among Participants with a C-Section Delivery																													
Missing Data	%	35.7	91.8	47.5	66.7	55.6	48.5	75.8	35.5	55.3	38.4	67.7	68.3	24.1	35.0	54.8	67.0	29.0	57.5	66.8	48.6	58.3	44.7	61.1	55.5	57.7	80.8	75.5	87.8
Not in Universe	%	44.3	6.4	46.7	23.6	30.1	33.6	18.9	50.9	32.7	40.7	21.1	26.1	48.5	45.7	30.6	23.8	54.6	30.1	23.2	40.9	30.7	40.7	26.9	23.0	28.3	11.2	19.4	35.7
Women with Non-Missing Data	**N**	**527**	**26**	**484**	**92**	**176**	**234**	**37**	**172**	**102**	**336**	**345**	**53**	**216**	**346**	**375**	**79**	**561**	**220**	**24**	**113**	**127**	**187**	**83**	**194**	**200**	**58**	**82**	**5,449**
Not at All Satisfied	%	4.4	-	10.1	-	-	-	-	-	-	4.8	6.4	-	-	-	-	-	3.4	-	-	-	-	-	-	11.9	-	-	-	4.3
Slightly Satisfied	%	3.4	-	9.9	-	-	6.8	-	-	-	4.5	9.9	-	-	-	-	-	3.9	-	-	-	-	-	-	13.4	5.5	-	-	4.9
Moderately Satisfied	%	20.5	-	25.6	-	26.7	16.2	-	12.2	-	13.1	14.2	-	17.6	11.6	8.0	-	16.6	10.0	-	21.2	15.7	20.3	-	19.1	14.0	-	36.6	16.4
Very Satisfied	%	48.8	-	34.3	21.7	55.7	43.6	-	44.8	32.4	39.6	44.3	35.8	47.2	38.4	49.1	35.4	54.0	40.0	-	41.6	50.4	38.5	59.0	29.4	32.5	63.8	26.8	42.9
Extremely Satisfied	%	23.0	-	20.0	64.1	13.1	30.8	43.2	37.2	53.9	38.1	25.2	47.2	31.5	47.4	38.9	45.6	22.1	46.4	-	28.3	29.9	31.6	18.1	26.3	44.0	22.4	19.5	31.5
Satisfaction with Delivery Experience Among Participants Missing Delivery Method																													
Missing Data	%	35.7	91.8	47.5	66.7	55.6	48.5	75.8	35.5	55.3	38.4	67.7	68.3	24.1	35.0	54.8	67.0	29.0	57.5	66.8	48.6	58.3	44.7	61.1	55.5	57.7	80.8	75.5	98.8
Not in Universe	%	64.1	8.2	52.4	32.7	43.0	50.2	21.1	60.7	44.2	60.8	31.4	30.6	75.8	61.2	41.2	30.7	69.4	41.7	27.4	50.1	41.3	54.1	38.8	44.0	42.0	17.8	23.6	46.8
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**-**	**17**	**17**	**22**	**49**	**-**	**13**	**28**	**-**	**-**	**69**	**104**	**20**	**56**	**14**	**14**	**14**	**-**	**15**	**-**	**-**	**-**	**-**	**-**	**525**
Not at All Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1
Slightly Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9
Moderately Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.1	-	33.9	-	-	-	-	-	-	-	-	-	-	17.3
Very Satisfied	%	-	-	-	-	76.5	-	-	53.1	-	-	46.4	-	-	34.8	57.7	-	51.8	-	-	-	-	-	-	-	-	-	-	46.1
Extremely Satisfied	%	-	-	-	-	-	-	-	34.7	-	-	42.9	-	-	47.8	16.3	60.0	-	-	-	-	-	-	-	-	-	-	-	31.6

Notes: Women with multiple gestations (N=607) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 7: RATES OF C-SECTION, LOW-RISK C-SECTION, AND VBAC BY AWARDEE, REGRESSION SAMPLE

Measure	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University
C-Section																												
Women With Non-Missing Data	**N**	**1897**	**675**	**5139**	**467**	**759**	**915**	**413**	**1010**	**325**	**1276**	**1576**	**483**	**718**	**1252**	**1378**	**265**	**2499**	**1188**	**120**	**829**	**747**	**1097**	**483**	**725**	**1020**	**205**	**874**
C-Section	%	31.1	29.2	12.0	28.5	32.7	35.8	26.3	22.8	29.2	33.9	35.4	18.6	36.6	31.8	35.1	32.8	24.5	29.0	33.3	20.0	27.7	28.4	31.3	47.7	32.0	35.6	25.1
Low-Risk C-Section																												
Women With Non-Missing Data	**N**	**528**	**217**	**1765**	**213**	**422**	**315**	**229**	**311**	**159**	**407**	**626**	**181**	**175**	**383**	**488**	**104**	**862**	**392**	**32**	**223**	**210**	**355**	**191**	**229**	**351**	**87**	**332**
Low-Risk C-Section	%	29.0	24.9	15.4	27.7	31.0	31.7	25.3	24.8	29.6	32.2	29.9	14.9	29.7	27.7	29.1	26.0	20.8	24.2	-	12.1	23.3	19.4	30.9	33.2	23.4	29.9	21.4
VBAC																												
Women With Non-Missing Data	**N**	**365**	**126**	**270**	**69**	**97**	**181**	**42**	**125**	**38**	**247**	**316**	**64**	**177**	**107**	**225**	**36**	**309**	**205**	**28**	**166**	**134**	**188**	**78**	**190**	**199**	**26**	**133**
VBAC	%	17.8	23.8	27.8	21.7	12.4	9.4	26.2	32.8	-	15.8	19.9	35.9	16.4	14.0	7.6	-	23.6	8.8	-	30.1	16.4	21.8	16.7	17.9	9.5	-	24.1

Notes: Sample limited to women included in regression analysis. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE X. 8: UNADJUSTED DIFFERENCES IN BIRTH OUTCOMES BY AWARDEE, REGRESSION SAMPLE

Measure	C-Section	Low Risk C-Section	VBAC
Awardee			
Access Community Health Network	0.19***	0.14***	-0.10**
Albert Einstein Health Network	0.17***	0.09***	-0.04
American Association of Birth Centers	-	-	-
Amerigroup Corporation	0.16***	0.12***	-0.06
Central Jersey Family Health Consortium	0.21***	0.16***	-0.15***
Florida Association of Healthy Start Coalitions	0.24***	0.16***	-0.18***
Grady Memorial Hospital Association	0.14***	0.10***	-0.02
Harris County Hospital District	0.11***	0.09***	0.05
HealthInsight of Nevada	0.17***	0.14***	-0.04
Johns Hopkins University	0.22***	0.17***	-0.12***
Los Angeles County Department of Health Services	0.23***	0.14***	-0.08**
Maricopa Special Health Care District	0.07***	0	0.08*
Medical University of South Carolina	0.25***	0.14**	-0.11***
Meridian Health Plan	0.20***	0.12***	-0.14***
Mississippi Primary Health Care Association	0.23***	0.14***	-0.20***
Oklahoma Health Care Authority	0.21***	0.11***	-0.14**
Providence Health Foundation of Providence Hospital	0.12***	0.05	-0.04
Signature Medical Group	0.17***	0.09***	-0.19***
St. John Community Health Investment Corp.	0.21***	0.13***	-0.10***
Texas Tech University Health Sciences Center	0.08***	-0.03**	0.02
United Neighborhood Health Services	0.16***	0.08**	-0.11**
University of Alabama at Birmingham	0.16***	0.04	-0.06
University of Kentucky Research Foundation	0.19***	0.15***	-0.11**
University of Puerto Rico Medical Sciences Campus	0.36***	0.18***	-0.10***
University of South Alabama	0.20***	0.08***	-0.18***
University of Tennessee Medical Group	0.24***	0.14***	-0.12***
Virginia Commonwealth University	0.13***	0.06*	-0.04
Constant	0.12***	0.15***	0.28***
Sample Size	**28,332**	**9,787**	**4,141**

Notes: Sample limited to women with nonmissing data. A dash (-) indicates the reference awardee. American Association of Birth Centers is the reference awardee. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

TABLE X. 9: ADJUSTED DIFFERENCES IN BIRTH OUTCOMES BY AWARDEE, REGRESSION SAMPLE

Measure	C-Section	Low Risk C-Section	VBAC
Awardee			
Access Community Health Network	0.06**	0.07	-0.06
Albert Einstein Health Network	0.07***	0.02	-0.35***
American Association of Birth Centers	-	-	-
Amerigroup Corporation	0.03*	0.07**	0.02
Central Jersey Family Health Consortium	0.12***	0.09*	-0.46***
Florida Association of Healthy Start Coalitions	0.11***	0.14***	-0.11**
Grady Memorial Hospital Association	-0.03	-0.01	0.12**
Harris County Hospital District	0.04***	0.09**	0.11**
HealthInsight of Nevada	0.12***	0.18***	-0.16*
Johns Hopkins University	0.08***	0.13***	-0.02
Los Angeles County Department of Health Services	0.11***	0.16***	-0.19***
Maricopa Special Health Care District	0.04***	0.07*	-0.06
Medical University of South Carolina	0.05**	0.06	-0.01
Meridian Health Plan	0.11***	0.05	-0.11
Mississippi Primary Health Care Association	0.08***	0.08**	-0.11**
Oklahoma Health Care Authority	0.11***	0.09**	-0.06
Providence Health Foundation of Providence Hospital	0.04*	0.03	0.04
Signature Medical Group	0.05**	0.04	-0.18**
St. John Community Health Investment Corp.	0.01	-0.01	-0.09
Texas Tech University Health Sciences Center	-0.05***	-0.04**	0.12***
United Neighborhood Health Services	0.06***	0.08***	-0.04
University of Alabama at Birmingham	0.03	-0.01	0.05
University of Kentucky Research Foundation	0.06**	0.17***	-0.1
University of Puerto Rico Medical Sciences Campus	0.18***	0.16***	-0.04
University of South Alabama	0.06***	0.05*	-0.08**
University of Tennessee Medical Group	0.08***	0.05*	0.03
Virginia Commonwealth University	-0.04	0.03	0.06
Race			
Non-Hispanic White	-	-	-
Hispanic	-0.01	-0.01	-0.01
Non-Hispanic Black	0.01	0.03**	-0.02
Non-Hispanic Other / Multiple	0	0.02	-0.05
Age			
<18 Years of Age	-	-	-
18-19 Years of Age	0.02	0.01	-0.24**
20-34 Years of Age	0.08***	0.07***	-0.22**
35 or More Years of Age	0.14***	0.22***	-0.25**

Measure	C-Section	Low Risk C-Section	VBAC
Education			
Less than High School	-	-	-
High School Degree or GED	-0.01	-0.03**	0
Bachelor's Degree	0	-0.02	0.03
Other Degree	0	-0.02	0.01
Unknown Education	-0.02*	-0.06***	0.03
Relationship Status			
Married	-	-	-
Living with Partner	0.01	0.01	-0.02
In a Relationship Not Living Together	0.01	0.01	-0.01
Not in a Relationship	0.01	0.01	0
Unknown Relationship Status	0.03	0.03	-0.06
Employment and School Status			
Working, Not in School	-	-	-
In School, Not Working	-0.02***	-0.04***	0.03
Working and in School	-0.02*	-0.04**	0.05
Neither Working nor in School	0	-0.01	0.01
Unknown Employment / School Status	0.01	-0.02	0.02
Prior Preterm Birth			
No Prior Birth	-	-	-
Prior Preterm Birth	-0.14***		0.03**
No Prior Preterm Birth	-0.14***		
Prior Low Birth Weight Birth			
No Prior Birth	-	-	-
Prior Low Birth Weight Birth	0.01		-0.08***
No Prior Low Birth Weight Birth	-0.01		-0.06**
Unknown Prior Low Birth Weight Birth	N/A	N/A	N/A
Prior C-Section			
No Prior Birth	-	-	-
Prior C-Section Birth	0.66***		
No Prior C-Section Birth	N/A	N/A	N/A
Interpregnancy Interval			
No Prior Birth	-	-	-
< 18 Months	-0.03***		0.03
>= 18 Months	-0.02**		-0.01
Unknown Interpregnancy Interval	N/A	N/A	N/A
Depression			
Not Depressed	-	-	-
Depressed	-0.01	-0.01	0.01
Unknown Depression	0	0.01	-0.04

Measure	C-Section	Low Risk C-Section	VBAC
Anxiety			
No Anxiety	-	-	-
Anxiety	0.02***	0.03***	-0.02
Unknown Anxiety	0.02	0.03	-0.06
Food Insecurity			
No Food Insecurity	-	-	-
Food Insecurity	0	0.01	0.01
Unknown Food Insecurity	0	0.02	0.04*
Pregnancy Intention			
Intended Pregnancy	-	-	-
Unintended Pregnancy	-0.02***	-0.01	0
Unknown Pregnancy Intent	-0.03	-0.04	0
Pre-Pregnancy Hypertension			
No Pre-Pregnancy Hypertension	-	-	-
Pre-Pregnancy Hypertension	0.06***	0.11***	-0.05***
Unknown Pre-Pregnancy Hypertension	0.01	0.02	-0.04
Pre-Pregnancy Diabetes			
No Pre-Pregnancy Diabetes	-	-	-
Pre-Pregnancy Diabetes	0.10***	0.09**	-0.08***
Unknown Pre-Pregnancy Diabetes	0.02	-0.03	0.01
BMI at First Prenatal Visit			
Underweight (<18.5 BMI)	-0.05***	-0.04**	0.06
Normal (18.5-<25 BMI)	-	-	-
Overweight (25-<30 BMI)	0.04***	0.05***	-0.06***
Obese (30-<40 BMI)	0.08***	0.12***	-0.10***
Very Obese (>=40 BMI)	0.15***	0.23***	-0.15***
BMI Missing	0.08***	0.07***	-0.09***
Smoking			
Did not Report Smoking at Intake	-	-	-
Reported Smoking at Intake	0.01**	0.02	-0.03**
Unknown Smoking Status	0	0.04**	0
Intimate Partner Violence			
No History of Intimate Partner Violence	-	-	-
History of Intimate Partner Violence	0	-0.01	0
Unknown History of Intimate Partner Violence	0	-0.02	0.05
Year			
2013-2014	-	-	-
2015	-0.01	-0.02*	-0.01
2016-2017	-0.02**	-0.02*	0.01

Measure	C-Section	Low Risk C-Section	VBAC
Region			
South	-	-	-
Northeast	-0.03	0.03	0.39***
Midwest	0.01	0.05	0.06
West	-0.04***	-0.05***	0.20***
Constant	0.12***	0.10***	0.58***
Sample Size	**28,332**	**9,787**	**4,141**

Notes: Sample limited to women with nonmissing data. American Association of Birth Centers is the reference awardee. One asterisk (*) indicates significance at the 0.1 level; two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicate significance at the 0.01 level. A dash (-) indicates the reference category for a variable. N/A indicates variable was omitted from model due to collinearity. Models estimated using linear probability models with standard errors clustered at the Strong Start site level.

APPENDIX Y: SPECIAL STUDY – CHARACTERISTICS OF BIRTH CENTER PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

TABLE Y. 1: DEMOGRAPHICS AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Mother's Age at Intake					
Missing Data	%	0.8	19.0	10.7	13.9
Women with Non-Missing Data	**N**	**119**	**115**	**234**	**1,415**
Less than 18 Years of Age	%	-	-	-	3.3
18 and 19 Years of Age	%	-	-	-	7.3
20 Through 34 Years of Age	%	74.8	91.3	82.9	82.0
35 Years and Older	%	23.5	-	14.1	7.3
Race and Ethnicity					
Missing Data	%	1.7	19.0	11.1	13.9
Women with Non-Missing Data	**N**	**118**	**115**	**233**	**1,415**
Hispanic	%	13.6	13.0	13.3	18.9
Non-Hispanic White	%	78.0	66.1	72.1	58.6
Non-Hispanic Black	%	-	15.7	9.9	17.0
Other Race/Multiple Races	%	-	-	4.7	5.5
Ethnicity (Among Hispanic Women)					
Missing Data	%	5.8	21.1	14.1	17.6
Not in Universe	%	80.8	68.3	74.0	66.2
Women with Non-Missing Data	**N**	**16**	**15**	**31**	**267**
Mexican, Mexican American, Chicana	%	-	-	-	24.0
Puerto Rican	%	-	-	-	42.3
Cuban	%	-	-	-	-
Other Hispanic, Latina, or Spanish Origin	%	-	-	41.9	26.6
Multiple Hispanic, Latina, or Spanish Origins	%	-	-	-	4.5
Living in Shelter or Homeless at Intake					
Missing Data	%	0.8	19.0	10.7	13.6
Women with Non-Missing Data	**N**	**119**	**115**	**234**	**1,421**
Yes	%	-	-	-	0.8
Employment and School Status at Intake					
Missing Data	%	0.8	19.7	11.1	14.4
Women with Non-Missing Data	**N**	**119**	**114**	**233**	**1,408**
Employed, Not in School	%	38.7	35.1	36.9	34.7
In School, Not Employed	%	-	-	-	7.5
Employed and in School	%	-	-	-	4.8
Neither Employed nor in School	%	52.1	57.0	54.5	52.9
Education Level at Intake					
Missing Data	%	1.7	19.7	11.5	15.1
Women with Non-Missing Data	**N**	**118**	**114**	**232**	**1,395**
Less than High School	%	-	-	5.2	16.7
High School Graduate or GED	%	64.4	71.9	68.1	60.9
Associate's Degree	%	11.9	-	10.3	9.2
Bachelor's Degree	%	15.3	-	11.6	9.5
Other College Degree	%	-	-	4.7	3.7
Relationship Status at Intake					
Missing Data	%	0.8	20.4	11.5	14.8
Women with Non-Missing Data	**N**	**119**	**113**	**232**	**1,401**
Married	%	65.5	60.2	62.9	41.0
Living with a Partner	%	26.1	23.9	25.0	28.3
In a Relationship but Not Living Together	%	-	-	5.2	19.1
Not in a Relationship Right Now	%	-	10.6	6.9	11.6

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 2: PSYCHOSOCIAL AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Insured When Became Pregnant					
Missing Data	%	0.8	19.7	11.1	14.5
Women with Non-Missing Data	**N**	**119**	**114**	**233**	**1,406**
Yes	%	41.2	52.6	46.8	42.4
No	%	57.1	44.7	51.1	54.6
Unsure	%	-	-	-	3.1
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)					
Missing Data	%	0.8	19.7	11.1	14.5
Not in Universe	%	58.3	38.0	47.3	49.3
Women with Non-Missing Data	**N**	**49**	**60**	**109**	**596**
Medicaid	%	65.3	51.7	57.8	65.8
Other	%	26.5	45.0	36.7	26.2
Both Medicaid and Other Health Insurance	%	-	-	-	8.1
Smokes Cigarettes at Intake					
Missing Data	%	13.3	22.5	18.3	21.9
Women with Non-Missing Data	**N**	**104**	**110**	**214**	**1,284**
Yes	%	-	-	-	11.2
Food Insecure at Intake					
Missing Data	%	2.5	23.2	13.7	17.2
Women with Non-Missing Data	**N**	**117**	**109**	**226**	**1,361**
Yes	%	17.1	12.8	15.0	18.4
WIC at Intake					
Missing Data	%	0.8	20.4	11.5	15.1
Women with Non-Missing Data	**N**	**119**	**113**	**232**	**1,395**
Yes	%	47.1	44.2	45.7	51.5
Exhibiting Depressive Symptoms at Intake[1]					
Missing Data	%	3.3	21.1	13.0	20.3
Women with Non-Missing Data	**N**	**116**	**112**	**228**	**1,311**
Yes	%	16.4	25.9	21.1	21.5
Exhibiting Anxiety Symptoms at Intake[2]					
Missing Data	%	2.5	19.0	11.5	15.9
Women with Non-Missing Data	**N**	**117**	**115**	**232**	**1,382**
None (<5)	%	85.5	71.3	78.4	71.6
Mild (5)	%	11.1	19.1	15.1	19.5
Moderate (10)	%	-	-	4.7	6.4
Severe (>=15)	%	-	-	-	2.0
Incomplete but Showing Symptoms of Anxiety	%	-	-	-	-
Experienced Intimate Partner Violence[3]					
Missing Data	%	1.7	19.7	11.5	15.0
Women with Non-Missing Data	**N**	**118**	**114**	**232**	**1,398**
Yes	%	18.6	16.7	17.7	18.2
Experiencing Intimate Partner Violence at Intake[4] (Among Women With a Completed Score or Who Report Being in a Relationship)					
Missing Data	%	0.8	19.0	10.7	15.1
Not in Universe	%	2.5	2.1	2.3	3.2
Women with Non-Missing Data	**N**	**116**	**112**	**228**	**1,343**
Yes	%	-	-	-	2.2
Experiencing Prenatal Care Access Barrier					
Missing Data	%	0.8	19.0	10.7	13.6
Women with Non-Missing Data	**N**	**119**	**115**	**234**	**1,421**
None Reported	%	81.5	76.5	79.1	69.7
Reported One Access Barrier	%	16.0	14.8	15.4	20.3
Reported Two or More Access Barriers	%	-	-	5.6	10.0

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Types of Barriers Reported[5] (Among Women Who Reported Any Barrier)					
No Car	%	-	63.0	49.0	59.5
Public Transportation Challenges	%	-	-	-	23.0
Not Enough Money for a Ride	%	-	-	-	24.4
Work Hours Make It Difficult	%	-	-	-	18.6
Childcare Challenges	%	45.5	-	34.7	26.3
Partner Objections	%	-	-	-	-
Other	%	-	-	-	10.7

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in Appendix E.

[1] Measured by CES-D 10 scale.
[2] Measured by GAD-7 scale.
[3] Measured by STaT scale.
[4] Measured by WEB scale.
[5] Women could report multiple barriers.

TABLE Y. 3: PREGNANCY HISTORY AND INTENTIONS AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Prior Pregnancy					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Yes	%	89.2	80.3	84.4	73.1
Not in Universe (No Prior Pregnancy)	%	10.8	19.7	15.6	15.6
Prior Miscarriage (<20 weeks EGA)					
Missing Data	%	0.0	2.8	1.5	1.5
Women with Non-Missing Data	**N**	**107**	**110**	**217**	**217**
Yes	%	44.9	29.1	36.9	36.9
Prior Elective Termination					
Missing Data	%	0.0	2.8	1.5	1.5
Women with Non-Missing Data	**N**	**107**	**110**	**217**	**217**
Yes	%	17.8	12.7	15.2	15.2
Prior Still Birth (Fetal Death >= 20 Weeks EGA)					
Missing Data	%	15.8	12.7	14.1	14.1
Women with Non-Missing Data	**N**	**88**	**96**	**184**	**184**
Yes	%	-	-	-	-
Prior Preeclampsia					
Missing Data	%	19.2	35.2	27.9	27.9
Women with Non-Missing Data	**N**	**84**	**64**	**148**	**148**
Yes	%	-	-	-	4.1
Prior Gestational Diabetes					
Missing Data	%	20.0	33.8	27.5	27.5
Women with Non-Missing Data	**N**	**83**	**66**	**149**	**149**
Yes	%	-	-	-	4.7
Prior Cervical Incompetence					
Missing Data	%	21.7	37.3	30.2	30.2
Women with Non-Missing Data	**N**	**81**	**61**	**142**	**142**
Yes	%	-	-	-	-
Prior Placenta Abnormalities					
Missing Data	%	20.8	36.6	29.4	29.4
Women with Non-Missing Data	**N**	**82**	**62**	**144**	**144**
Yes	%	-	-	-	-

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Prior Congenital Abnormalities of the Fetus					
Missing Data	%	21.7	35.9	29.4	29.4
Women with Non-Missing Data	**N**	**81**	**63**	**144**	**144**
Yes	%	-	-	-	1.4

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 4: PRIOR BIRTH OUTCOMES AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Prior Birth					
Missing Data	%	0.0	0.0	0.0	1.2
Not in Universe	%	10.8	19.7	15.6	26.9
Women with Non-Missing Data	**N**	**107**	**114**	**221**	**1,181**
Yes	%	97.2	94.7	95.9	90.3
Inter-Pregnancy Interval with Current Pregnancy Since Last Birth					
Missing Data	%	8.3	26.1	17.9	21.2
Not in Universe	%	13.3	20.4	17.2	30.3
Women with Non-Missing Data	**N**	**94**	**76**	**170**	**798**
< 18 months	%	39.4	40.8	40.0	39.2
>= 18 months	%	60.6	59.2	60.0	60.8
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)					
Missing Data	%	0.0	0.0	0.0	0.0
Not in Universe	%	13.3	23.9	19.1	35.2
Women with Non-Missing Data	**N**	**104**	**108**	**212**	**1,066**
Yes	%	12.5	11.1	11.8	13.3
Prior Low Birthweight Infant (< 2,500 Grams)					
Missing Data	%	0.0	0.0	0.0	0.2
Not in Universe	%	13.3	23.9	19.1	35.2
Women with Non-Missing Data	**N**	**104**	**108**	**212**	**1,063**
Yes	%	-	-	-	-

Notes: All measures except for prior birth are among women with a prior birth. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 5: PRE-PREGNANCY MEDICAL CONDITIONS AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Pregnancy Intention					
Missing Data	%	2.5	21.1	12.6	15.7
Women with Non-Missing Data	**N**	**117**	**112**	**229**	**1,386**
Trying to Become Pregnant	%	59.8	34.8	47.6	35.2
Not Trying to Become Pregnant, Not Using Contraception	%	28.2	50.0	38.9	51.5

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Not Trying to Become Pregnant, Sometimes Using Contraception	%	-	10.7	8.7	9.3
Not Trying to Become Pregnant, Using Contraception	%	-	-	4.8	4.0
Diabetes Pre-Pregnancy					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Yes	%	-	-	-	1.2
Hypertension Pre-Pregnancy					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Yes	%	-	-	-	0.8
Mother's BMI at First Prenatal Visit					
Missing Data	%	1.7	3.5	2.7	3.9
Women with Non-Missing Data	**N**	**118**	**137**	**255**	**1,580**
Underweight (BMI < 18.5)	%	-	-	5.9	4.6
Normal weight (=>18.5 BMI <25)	%	47.5	56.2	52.2	44.9
Overweight (=>25 BMI <30)	%	24.6	19.0	21.6	25.8
Obese (=>30 BMI < 40)	%	18.6	16.1	17.3	20.8
Very obese (BMI >= 40)	%	-	-	-	3.9

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 6: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Preeclampsia					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	1.4
Pregnancy-Related Hypertension					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	-
Gestational Diabetes					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	1.0
Cervical Incompetence					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	-
Placenta Previa					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	-
Placental Abruption					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	-

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Congenital Abnormalities of the Fetus					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	1.1
UTI(s) During Last 6 months of Pregnancy					
Missing Data	%	0.0	1.4	0.8	0.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,644**
Yes	%	-	-	-	1.9

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 7: TREATMENTS DURING PREGNANCY AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Vaginal Progesterone					
Missing Data	%	0.0	1.4	0.8	6.0
Women with Non-Missing Data	**N**	**120**	**140**	**260**	**1,545**
Yes	%	-	-	-	-
17P (Progesterone Injections) (Among Women with a Prior Preterm Birth)					
Missing Data	%	0.0	0.0	0.0	0.8
Not in Universe	%	89.2	91.5	90.5	91.4
Women with Non-Missing Data	**N**	**13**	**12**	**25**	**129**
Yes	%	-	-	-	-
Antenatal Steroids					
Missing Data	%	0.0	0.7	0.4	0.0
Women with Non-Missing Data	**N**	**120**	**141**	**261**	**1,644**
Yes	%	-	-	-	0.7
Tocolytics					
Missing Data	%	0.0	0.7	0.4	0.0
Women with Non-Missing Data	**N**	**120**	**141**	**261**	**1,644**
Yes	%	-	-	-	-

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 8: PRENATAL CARE AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N, %, or Mean	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Routine Prenatal Care Provider					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Obstetrician	%	-	-	-	-
Licensed Professional Midwife	%	77.5	45.1	59.9	100.0
Nurse Practitioner	%	-	-	-	-
Certified Nurse Midwife/Certified Midwife	%	22.5	53.5	39.3	-
Family Medicine Physician	%	-	-	-	-
Other Provider	%	-	-	-	-

Data Elements	N, %, or Mean	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Routine Prenatal Care (Individual Visits)					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Received Individual Visits	%	100.0	100.0	100.0	99.8
Average number of individual prenatal visits	Mean	10.8	10.1	10.4	9.1
Routine Prenatal Care (Group Visits)					
Missing Data	%	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,644**
Received Group Visits	%	-	-	-	1.6
Average Number of Group Prenatal Visits	Mean	-	-	-	7.0
Care Coordinator Encounters					
Missing Data	%	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,642**
Received Care Coordinator Encounters	%	100.0	99.3	99.6	100.0
Average Number of Care Coordinator Encounters	Mean	5.5	4.7	5.1	3.8
Mental Health Encounters					
Missing Data	%	0.0	0.7	0.4	5.8
Women with Non-Missing Data	**N**	**120**	**141**	**261**	**1,548**
Received Mental Health Encounters	%	-	-	-	-
Average Number of Mental Health Encounters	Mean	-	-	-	-
Doula Encounters					
Missing Data	%	92.5	95.1	93.9	96.1
Women with Non-Missing Data	**N**	**-**	**-**	**16**	**64**
Received Doula Encounters	%	-	-	-	100.0
Average Number of Doula Encounters	Mean	-	-	-	-
Health Education					
Missing Data	%	100.0	99.3	99.6	100.0
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**-**
Received Health Education, Not Centering	%	-	-	-	-
Average Number of Health Education Sessions	Mean	-	-	-	-
Home Visits					
Missing Data	%	39.2	48.6	44.3	67.7
Women with Non-Missing Data	**N**	**76**	**76**	**146**	**531**
Received Home Visits	%	95.9	78.1	87.0	73.1
Average Number of Home Visits	Mean	1.8	1.5	1.7	1.8
Self-Care, not Centering					
Missing Data	%	100.0	99.3	99.6	100.0
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**-**
Received Self-Care, Not Centering	%	-	-	-	-
Average Number of Self-Care Sessions	Mean	-	-	-	-
Nutrition Counseling					
Missing Data	%	0.0	2.1	1.1	5.8
Women with Non-Missing Data	**N**	**120**	**139**	**259**	**1,548**
Received Nutrition Counseling	%	-	-	-	-
Average Number of Nutrition Counseling Sessions	Mean	-	-	-	-
Substance Abuse Services					
Missing Data	%	0.0	2.1	1.1	5.8
Women with Non-Missing Data	**N**	**120**	**139**	**259**	**1,548**
Received Substance Abuse Services	%	-	-	-	-
Average Number of Substance Abuse Services	Mean	-	-	-	-

Data Elements	N, %, or Mean	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Referrals for High Risk Medical Services					
Missing Data	%	0.0	0.7	0.4	5.8
Women with Non-Missing Data	**N**	**120**	**141**	**261**	**1,548**
Received Referrals for High Risk Medical Services	%	-	-	-	-
Average Number of Referrals for High Risk Medical Services	Mean	-	-	-	-
Types of Referrals for High Risk Medical Services (Among Women with Services)					
Maternal Fetal Specialist	%	-	-	-	-
Pulmonologist	%	-	-	-	-
Endocrinologist	%	-	-	-	-
Cardiologist	%	-	-	-	-
Other	%	-	-	-	-

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. It is unlikely the women enrolled in Maternity Care Home or Group Prenatal Care were cared for by a Licensed Profession Midwife though this was reported for 1% and 2.3%, respectively. Awardees were "self-care" directed to indicate women conducted "self-care" if they weighed themselves, took their own blood pressure, etc., outside of the context of Group Prenatal Care. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 9: DELIVERY INFORMATION AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Induction of Labor, Excluding Planned Cesarean Sections (Among Women Who Delivered, Excluding Planned C sections)					
Missing Data	%	0.8	11.3	6.5	0.7
Not in Universe	%	0.0	0.0	0.0	29.5
Women with Non-Missing Data	**N**	**119**	**126**	**245**	**1,148**
Yes	%	-	-	-	11.1
Induction of Labor with Pitocin (Among Women Who Were Induced)					
Missing Data	%	0.0	0.0	0.0	0.0
Not in Universe	%	98.3	97.2	97.7	92.3
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**127**
Yes	%	-	-	-	35.4
Place of Delivery					
Missing Data	%	0.0	0.0	0.0	5.8
Not in Universe	%	0.0	0.0	0.0	27.5
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,096**
Hospital	%	-	-	-	42.8
Birth center	%	-	-	-	42.4
Home birth	%	100.0	100.0	100.0	14.3
Other	%	-	-	-	-
Delivery Method (Among Women with a Delivery)					
Missing Data	%	0.0	0.0	0.0	0.2
Not in Universe	%	0.0	0.0	0.0	27.5
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,188**
Vaginal Only	%	100.0	97.9	98.9	84.9
C-Section Only	%	-	-	-	15.1
Delivery Method (Among Low Risk Women with a Delivery) (Nulliparous, Singleton, Term)					
Missing Data	%	0.0	0.0	0.0	0.2
Not in Universe	%	86.7	76.1	80.9	75.7
Women with Non-Missing Data	**N**	**16**	**34**	**50**	**397**
Vaginal Only	%	100.0	91.2	94.0	82.1
C-Section Only	%	-	-	-	17.9

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Scheduled C-Section (Among Women with a C-Section)					
Missing Data	%	0.0	2.1	1.1	5.5
Not in Universe	%	100.0	97.9	98.9	89.1
Women with Non-Missing Data	**N**	-	-	-	**89**
Yes	%	-	-	-	37.1
VBAC (Among Women with a Prior C-Section)					
Missing Data	%	0.0	0.0	0.0	0.0
Not in Universe	%	96.7	97.2	96.9	95.4
Women with Non-Missing Data	**N**	-	-	-	**76**
Yes	%	-	-	-	22.4

Notes: All measures are among women with a delivery. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).[1] Low risk is defined as women with nulliparous, singleton, term births.

TABLE Y. 10: BIRTH OUTCOMES AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Outcomes of Strong Start Pregnancy					
Missing Data	%	0.0	0.0	0.0	25.7
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,222**
Live Birth	%	100.0	100.0	100.0	97.3
Stillbirth	%	-	-	-	-
Termination	%	-	-	-	-
Miscarriage	%	-	-	-	2.3
Estimated Gestational Age (EGA) (Among Women with Live Births)					
Missing Data	%	0.0	0.0	0.0	0.3
Not in Universe	%	0.0	0.0	0.0	27.7
Women with Non-Missing Data	**N**	**120**	**142**	**262**	**1,184**
Very Preterm (20 =< EGA < 34)	%	-	-	-	1.5
Preterm (34 =< EGA < 37)	%	-	-	-	3.3
Term (37 =< EGA < 42)	%	93.3	97.9	95.8	92.7
Post-Term (42+)	%	-	-	-	2.5
Birth Weight (Among Women with Live Births)					
Missing Data	%	0.0	3.5	1.9	1.3
Not in Universe	%	0.0	0.0	0.0	27.7
Women with Non-Missing Data	**N**	**120**	**137**	**257**	**1,167**
Very Low Birthweight (<1500g)	%	-	-	-	-
Low Birthweight (=>1500g < 2500g)	%	-	-	-	3.1
Normal Birthweight (=>2500 < 4000g)	%	76.7	88.3	82.9	82.6
Macrosomic Birthweight (=>4000g)	%	23.3	11.0	16.7	13.6

Notes: All measures are among women with a delivery. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

[1] For the measure Outcomes of Strong Start Pregnancy, 11 percent of the missing data is attributable to a missing exit form. Among the remaining 89 percent of data missing due to item nonresponse, 67 percent of participants were reported to have left Strong Start prior to delivery and 17 percent are missing information on whether they left Strong Start. Remaining sources of missing data include women missing responses for all of the following variables: number of live births delivered, estimated gestational age, baby date of birth, and infant birth weight.

TABLE Y. 11: SATISFACTION AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Satisfaction with Prenatal Care (Based on Postpartum Form Data)					
Missing Data	%	13.3	40.8	28.2	48.4
Women with Non-Missing Data	**N**	**104**	**84**	**188**	**849**
Not at All Satisfied	%	-	-	-	-
Slightly Satisfied	%	-	-	-	-
Moderately Satisfied	%	-	-	-	2.6
Very Satisfied	%	-	16.7	11.2	17.8
Extremely Satisfied	%	93.3	83.3	88.8	79.5
Satisfaction with Delivery Experience					
Missing Data	%	13.3	42.3	29.0	48.7
Women with Non-Missing Data	**N**	**104**	**82**	**186**	**844**
Not at All Satisfied	%	-	-	-	2.1
Slightly Satisfied	%	-	-	-	3.6
Moderately Satisfied	%	-	-	-	11.1
Very Satisfied	%	-	19.5	11.3	25.1
Extremely Satisfied	%	94.2	67.1	82.3	58.1

Notes: Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 12: BREASTFEEDING AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Breastfeeding Intention at Third Trimester					
Missing Data	%	0.8	37.3	20.6	34.3
Women with Non-Missing Data	**N**	**119**	**89**	**208**	**1,080**
Breastfeed Only	%	99.2	86.5	93.8	84.9
Formula Feed Only	%	-	-	-	3.0
Both Breast and Formula Feed	%	-	-	-	7.8
I Haven't Decided	%	-	-	-	4.4
Breastfeeding after Delivery (Based on Postpartum Form Data)					
Missing Data	%	14.2	40.8	28.6	48.4
Women with Non-Missing Data	**N**	**103**	**84**	**187**	**849**
Yes	%	99.0	95.2	97.3	96.1
No	%	-	-	-	3.4
Prefer Not to Answer	%	-	-	-	-

Notes: Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 13: FAMILY PLANNING AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Had Birth Control Counseling after Delivery (Based on Postpartum Form Data)					
Missing Data	%	15.8	41.5	29.8	49.6
Women with Non-Missing Data	**N**	**101**	**83**	**184**	**829**
Yes	%	73.3	75.9	74.5	78.8
No	%	25.7	22.9	24.5	19.7
Unsure	%	-	-	-	1.6

Data Elements	N or %	Women with an Intended Home Birth	Women with an Unintended Home Birth	All Women with a Home Birth	Women with a Licensed Professional Midwife as Their Routine Prenatal Care Service Provider
Reported Doing Something to Keep from Getting Pregnant Postpartum					
Missing Data	%	14.2	41.5	29.0	49.1
Women with Non-Missing Data	**N**	**103**	**83**	**186**	**836**
Yes	%	86.4	86.7	86.6	85.2
No	%	12.6	13.3	12.9	13.5
Unsure	%	-	-	-	1.3
Birth Control Reported Used Postpartum (Among All Women Who Reported Either Doing Something to Keep from Getting Pregnant or Select a Method That They re Using)					
Missing Data	%	9.2	33.8	22.5	45.1
Not in Universe	%	16.7	15.5	16.0	11.6
Women with Non-Missing Data	**N**	**89**	**72**	**161**	**712**
Female Sterilization	%	-	-	-	2.7
Male Sterilization	%	-	-	7.5	4.2
LARC - Implant	%	-	-	-	-
LARC - IUD	%	-	16.7	9.3	5.8
Pills	%	-	-	7.5	9.7
Injection	%	-	-	-	4.6
Condoms	%	18.0	30.6	23.6	29.2
Breastfeeding	%	-	-	10.6	12.2
Rhythm or Safe Period	%	13.5	-	8.1	3.1
Withdrawal or Pulling Out	%	-	-	-	2.1
Spermicide	%	-	-	-	-
Other Method	%	31.5	18.1	25.5	22.5
Method Not Indicated	%	-	-	-	2.8

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 14: INTENDED PLACE OF DELIVERY AND PLACE OF DELIVERY CONCORDANCE, BY MODEL AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Birth Center	Group Prenatal Care	Maternity Care Home	Total
Intended Place of Delivery					
Missing Data	%	39.0	48.2	40.7	42.1
Women with Non-Missing Data	**N**	**5,360**	**5,377**	**15,139**	**25,876**
Hospital	%	32.0	96.6	95.9	82.8
Birth Center	%	61.2	1.1	3.5	15.0
Home	%	3.6	-	-	0.8
Other	%	3.2	2.2	0.6	1.4
Place of Delivery Concordance					
Missing Data	%	21.1	39.0	28.9	48.9
Not in Universe	%	25.9	15.8	18.2	19.2
Women with Non-Missing Data	**N**	**4,658**	**4,697**	**13,501**	**22,856**
Intended Hospital/Delivered Hospital	%	29.9	97.2	95.4	82.4
Intended Hospital/Delivered Birth Center	%	0.3	-	-	0.1
Intended Hospital/Delivered Home	%	0.4	-	0.1	0.2
Intended Hospital/Delivered Other	%	-	-	0.1	0.1
Intended Birth Center/Delivered Hospital	%	17.5	1.0	3.8	6.0
Intended Birth Center/Delivered Birth Center	%	43.8	-	-	8.9
Intended Birth Center/Delivered Home	%	1.3	-	-	0.3
Intended Birth Center/Delivered Other	%	0.4	-	-	0.1
Intended Home/Delivered Hospital	%	1.0	-	-	0.2
Intended Home/Delivered Birth Center	%	-	-	-	-
Intended Home/Delivered Home	%	2.6	-	-	0.5
Intended Home/Delivered Other	%	-	-	-	-
Intended Other/Delivered Hospital	%	2.1	1.4	0.5	1.0
Intended Other/Delivered Birth Center	%	0.4	-	-	0.1
Intended Other/Delivered Home	%	-	-	-	-

TABLE Y. 15: INTENDED PLACE OF DELIVERY AND PLACE OF DELIVERY CONCORDANCE, BY AWARDEE AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Access Community Health Network	Albert Einstein Health Network	American Association of Birth Centers	Amerigroup Corporation	Central Jersey Family Health Consortium	Florida Association of Healthy Start Coalitions	Grady Memorial Hospital Association DBA Grady Health System	Harris County Hospital District	HealthInsight of Nevada	Johns Hopkins University	Los Angeles County Department of Health Services	Maricopa Special Health Care District	Medical University of South Carolina	Meridian Health Plan	Mississippi Primary Health Care Association	Oklahoma Health Care Authority	Providence Health Foundation of Providence Hospital	Signature Medical Group	St. John Community Health Investment Corp.	Texas Tech University Health Sciences Center	United Neighborhood Health Services	University of Alabama at Birmingham	University of Kentucky Research Foundation	University of Puerto Rico Medical Sciences Campus	University of South Alabama	University of Tennessee Medical Group	Virginia Commonwealth University	Total
Intended Place of Delivery																													
Missing Data	%	28.6	74.2	39.7	44.2	43.1	34.2	38.0	26.4	39.8	30.7	60.0	51.3	33.2	36.0	51.3	64.1	16.8	50.3	41.9	40.9	50.4	48.1	46.0	38.6	40.9	56.4	54.4	42.1
Women with Non-Missing Data	**N**	**1,877**	**364**	**5,067**	**527**	**699**	**859**	**436**	**926**	**512**	**1,115**	**1,241**	**463**	**526**	**1,144**	**1,249**	**307**	**2,843**	**885**	**140**	**635**	**574**	**664**	**372**	**553**	**847**	**318**	**733**	**25,876**
Hospital	%	99.6	99.7	28.9	99.2	99.1	99.7	97.9	99.7	94.9	99.6	98.7	99.1	99.2	99.7	99.4	98.0	97.9	99.4	95.0	20.8	99.3	99.8	98.1	98.0	99.9	93.4	83.1	82.8
Birth Center	%	-	-	64.2	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	-	-	78.9	-	-	-	-	-	6.3	-	15.0
Home	%	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Other	%	-	-	3.1	-	-	-	-	-	5.1	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.0	1.5
Place of Delivery Concordance																													
Missing Data	%	10.7	59.5	21.4	27.6	37.6	16.5	31.0	23.1	48.9	24.9	30.3	28.6	29.3	59.8	38.5	65.2	7.7	39.2	37.3	33.6	26.2	44.0	27.4	34.9	18.4	29.6	48.9	48.9
Not in Universe	%	22.4	18.1	26.3	20.0	11.5	21.8	15.4	9.9	11.1	6.8	34.8	29.7	4.6	5.4	17.4	11.6	16.1	15.4	18.3	8.3	27.9	6.1	21.2	6.0	23.2	36.9	15.9	19.2
Women with Non-Missing Data	**N**	**1,760**	**316**	**4,392**	**495**	**626**	**806**	**377**	**843**	**341**	**1,099**	**1,084**	**396**	**521**	**622**	**1,130**	**198**	**2,606**	**807**	**107**	**624**	**532**	**639**	**354**	**533**	**836**	**245**	**567**	**22,856**
Intended Hospital/Delivered Hospital	%	99.4	98.1	26.6	99.2	98.9	99.5	98.4	99.1	99.1	99.1	98.3	99.2	99.4	99.4	99.5	96.0	97.4	99.0	93.5	21.2	99.2	99.8	98.3	97.9	99.9	94.7	84.5	82.4
Intended Hospital/Delivered Birth Center	%	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Intended Hospital/Delivered Home	%	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Intended Hospital/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Intended Birth Center/Delivered Hospital	%	-	-	18.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1
Intended Birth Center/Delivered Birth Center	%	-	-	46.3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	-	-	78.5	-	-	-	-	-	5.3	-	8.9
Intended Birth Center/Delivered Home	%	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Intended Birth Center/Delivered Other	%	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Intended Home/Delivered Hospital	%	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Intended Home/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Home/Delivered Home	%	-	-	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
Intended Home/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Other/Delivered Hospital	%	-	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	14.1	1.0
Intended Other/Delivered Birth Center	%	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Intended Other/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse; or a response. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 16: INTENDED PLACE OF DELIVERY AND PLACE OF DELIVERY CONCORDANCE, BY BIRTH CENTER SITE AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Intended Place of Delivery																									
Missing Data	%	33.3	33.3	35.2	21.1	76.0	3.8	51.8	18.8	40.1	50.0	53.2	28.4	6.7	5.8	42.1	8.8	100.0	36.2	59.1	30.3	37.1	100.0	39.1	39.0
Women with Non-Missing Data	**N**	**279.0**	**-**	**92.0**	**325.0**	**83.0**	**25.0**	**40.0**	**13.0**	**145.0**	**20.0**	**59.0**	**136.0**	**14.0**	**113.0**	**187.0**	**31.0**	**-**	**132.0**	**105.0**	**357.0**	**44.0**	**-**	**14.0**	**5360.0**
Hospital	%	44	-	66	-	84	-	-	-	-	-	-	46	-	-	21	-	-	-	-	76	-	-	-	32
Birth Center	%	32.6	-	33.7	97.8	15.7	72.0	82.5	-	99.3	85.0	88.1	19.9	-	99.1	73.8	71.0	-	94.7	96.2	23.0	93.2	-	78.6	61.2
Home	%	13.6	-	-	-	-	-	-	-	-	-	-	30.9	-	-	-	-	-	-	-	-	-	-	-	3.6
Other	%	9.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2
Place of Delivery Concordance																									
Missing Data	%	4.8	33.3	31.7	9.7	32.9	3.8	27.7	12.5	24.0	42.5	44.4	36.8	6.7	3.3	48.9	14.7	100.0	12.6	34.2	12.7	15.7	58.7	21.7	21.1
Not in Universe	%	41.6	11.1	42.3	19.9	45.7	0.0	27.7	12.5	17.8	17.5	11.9	13.2	6.7	3.3	16.1	5.9	0.0	30.4	30.0	20.7	38.6	41.3	43.5	17.2
Women with Non-Missing Data	**N**	**224.0**	**-**	**37.0**	**290.0**	**74.0**	**25.0**	**37.0**	**12.0**	**141.0**	**16.0**	**55.0**	**95.0**	**13.0**	**112.0**	**172.0**	**27.0**	**-**	**118.0**	**92.0**	**341.0**	**32.0**	**-**	**-**	**4658.0**
Intended Hospital/Delivered Hospital	%	42	-	43	-	82	-	-	-	-	-	-	43	-	-	19	-	-	-	-	75	-	-	-	30
Intended Hospital/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Intended Hospital/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Intended Hospital/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Birth Center/Delivered Hospital	%	14.7	-	-	23.8	-	-	-	-	27.0	-	-	11.6	-	26.8	38.4	-	-	16.9	12.0	10.9	37.5	-	-	17.5
Intended Birth Center/Delivered Birth Center	%	19.2	-	35.1	72.1	-	44.0	56.8	-	71.6	-	72.7	-	-	69.6	36.6	63.0	-	78.0	82.6	11.4	56.3	-	-	43.8
Intended Birth Center/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Intended Birth Center/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Intended Home/Delivered Hospital	%	5.4	-	-	-	-	-	-	-	-	-	-	20.0	-	-	-	-	-	-	-	-	-	-	-	1.0
Intended Home/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Home/Delivered Home	%	8.5	-	-	-	-	-	-	-	-	-	-	14.7	-	-	-	-	-	-	-	-	-	-	-	2.6
Intended Home/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Other/Delivered Hospital	%	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1
Intended Other/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Intended Other/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Other/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse; or a response. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 17: INTENDED PLACE OF DELIVERY AND PLACE OF DELIVERY CONCORDANCE, BY BIRTH CENTER SITE AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Providence - Community of Hope	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Intended Place of Delivery																										
Missing Data	%	48.9	25.2	33.3	19.6	35.6	38.5	98.0	35.5	13.4	22.5	23.8	30.4	14.5	62.0	47.2	47.4	100.0	5.4	48.5	100.0	62.2	20.1	54.3	39.6	39.0
Women with Non-Missing Data	**N**	**411.0**	**95.0**	**32.0**	**37.0**	**67.0**	**291.0**	**-**	**236.0**	**161.0**	**293.0**	**48.0**	**172.0**	**136.0**	**63.0**	**216.0**	**70.0**	**-**	**35.0**	**85.0**	**-**	**94.0**	**259.0**	**176.0**	**162.0**	**5360.0**
Hospital	%	38	-	-	-	-	4	-	57	41	85	71	-	-	27	74	17	-	-	-	-	81	-	24	44	32
Birth Center	%	57.7	92.6	93.8	100.0	100.0	92.8	-	31.8	52.2	9.2	27.1	97.1	60.3	68.3	25.9	80.0	-	42.9	64.7	-	16.0	96.5	73.9	50.0	61.2
Home	%	-	-	-	-	-	-	-	-	-	-	-	-	36.0	-	-	-	-	-	29.4	-	-	-	-	-	3.6
Other	%	3.9	-	-	-	-	-	-	11.4	6.8	5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2
Place of Delivery Concordance																										
Missing Data	%	22.3	16.5	25.0	10.9	20.2	10.6	32.0	27.6	3.8	14.6	20.6	20.2	11.3	43.4	21.5	35.3	100.0	0.0	33.9	100.0	26.9	10.5	34.0	30.2	21.1
Not in Universe	%	30.1	18.1	35.4	28.3	20.2	41.4	68.0	12.8	12.9	15.1	3.2	14.2	9.4	21.1	33.0	12.8	0.0	16.2	29.7	0.0	38.2	13.0	27.3	45.2	17.2
Women with Non-Missing Data	**N**	**383.0**	**83.0**	**19.0**	**28.0**	**62.0**	**227.0**	**-**	**218.0**	**155.0**	**266.0**	**48.0**	**162.0**	**126.0**	**59.0**	**186.0**	**69.0**	**-**	**31.0**	**60.0**	**-**	**87.0**	**248.0**	**149.0**	**66.0**	**4658.0**
Intended Hospital/Delivered Hospital	%	36	-	-	-	-	-	-	57	41	84	71	-	-	27	65	17	-	-	-	-	82	-	22	20	30
Intended Hospital/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Intended Hospital/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	-	-	-	-	-	-	-	-	-	0.4
Intended Hospital/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Birth Center/Delivered Hospital	%	25.3	13.3	-	-	21.0	-	-	17.0	27.7	6.8	-	9.9	12.7	22.0	-	29.0	-	-	-	-	14.9	30.2	24.2	-	17.5
Intended Birth Center/Delivered Birth Center	%	33.4	78.3	100.0	89.3	79.0	92.5	-	15.6	23.2	-	-	85.8	40.5	42.4	23.1	52.2	-	-	40.0	-	-	65.3	49.7	60.6	43.8
Intended Birth Center/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Intended Birth Center/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Intended Home/Delivered Hospital	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
Intended Home/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Home/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	32.5	-	-	-	-	-	31.7	-	-	-	-	-	2.6
Intended Home/Delivered Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Other/Delivered Hospital	%	2.9	-	-	-	-	-	-	10.1	-	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1
Intended Other/Delivered Birth Center	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Intended Other/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intended Other/Delivered Home	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse; or a response. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 18: PLACE OF DELIVERY AMONG BIRTH CENTER PARTICIPANTS BY INTENDED PLACE OF DELIVERY AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Birth Center Participants Who Intended a Hospital Birth	Birth Center Participants Who Intended a Birth Center Birth	Birth Center Participants Who Intended a Home Birth	Birth Center Participants Who Intended to Give Birth Another Place
Women with Non-Missing Data	**N**	**1,428**	**2,937**	**172**	**121**
Hospital	%	97.5	27.8	26.2	79.3
Birth Center	%	1.1	69.4	-	15.7
Home Birth	%	1.3	2.1	69.8	-
Other Place	%	-	0.7	-	-

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Y. 19: INTENDED PLACE OF DELIVERY AMONG BIRTH CENTER PARTICIPANTS BY PLACE OF DELIVERY AMONG PARTICIPANTS WITH A HOME BIRTH OR LICENSED PROFESSIONAL MIDWIFE AS THEIR ROUTINE PRENATAL CARE PROVIDER

Data Elements	N or %	Birth Center Participants with a Hospital Birth	Birth Center Participants with a Birth Center Birth	Birth Center Participants with a Home Birth	Birth Center Participants Who Gave Birth Another Place
Women with Non-Missing Data	**N**	**2,349**	**2,079**	**206**	**24**
Hospital	%	59.3	0.7	8.7	-
Birth Center	%	34.7	98.1	30.1	83.3
Home Birth	%	1.9	0.3	58.3	-
Other Place	%	4.1	0.9	2.9	-

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX Z: SPECIAL STUDY – PARTICIPANT-LEVEL PROCESS EVALUATION – MAIN FINDINGS, BY AABC SITE

TABLE Z. 1: PLPE FORM SUBMISSION (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Strong Start Participants with PLPE Data	N	418	-	142	412	348	26	83	16	242	40	126	190	15	120	254	35	-	207	257	522	70	46	23	8426
Intake Forms Received	**N**	**405**	**-**	**123**	**388**	**154**	**26**	**70**	**15**	**188**	**26**	**111**	**168**	**15**	**107**	**236**	**33**	**-**	**174**	**181**	**505**	**65**	**-**	**23**	**7012**
Intake Form Submission Rate	%	96.9	-	86.6	94.2	44.3	100.0	84.3	93.8	77.7	65.0	88.1	88.4	100.0	89.2	92.9	94.3	-	84.1	70.4	96.7	92.9	-	100.0	83.2
Third-Trimester Surveys Received	**N**	**289**	**-**	**94**	**328**	**85**	**25**	**41**	**13**	**146**	**20**	**59**	**139**	**15**	**113**	**189**	**31**	**-**	**136**	**110**	**366**	**45**	**-**	**14**	**5178**
Third Trimester Survey Submission Rate	%	69.1	-	66.2	79.6	24.4	96.2	49.4	81.3	60.3	50.0	46.8	73.2	100.0	94.2	74.4	88.6	-	65.7	42.8	70.1	64.3	-	60.9	61.5
Postpartum Surveys Received	**N**	**218**	**-**	**109**	**313**	**73**	**25**	**33**	**14**	**171**	**18**	**63**	**104**	**15**	**117**	**173**	**31**	**-**	**99**	**106**	**393**	**37**	**-**	**-**	**4863**
Postpartum Survey Submission Rate	%	52.2	-	76.8	76.0	21.0	96.2	39.8	87.5	70.7	45.0	50.0	54.7	100.0	97.5	68.1	88.6	-	47.8	41.2	75.3	52.9	-	-	57.7
Exit Forms Received	**N**	**418**	**-**	**141**	**412**	**348**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**35**	**-**	**206**	**257**	**522**	**70**	**46**	**23**	**8418**
Exit Form Submission Rate	%	100.0	-	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	99.5	100.0	100.0	100.0	100.0	100.0	99.9

TABLE Z. 2: PLPE FORM SUBMISSION (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women s Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Strong Start Participants with PLPE Data	N	805	128	48	46	104	473	50	366	186	64	247	160	166	409	133	-	37	165	-	249	324	385	269	8426
Intake Forms Received	**N**	**597**	**108**	**36**	**44**	**92**	**380**	**-**	**335**	**184**	**57**	**178**	**143**	**143**	**372**	**115**	**-**	**37**	**103**	**-**	**160**	**300**	**340**	**262**	**7012**
Intake Form Submission Rate	%	74.2	84.4	75.0	95.7	88.5	80.3	-	91.5	98.9	89.1	72.1	89.4	86.1	91.0	86.5	-	100.0	62.4	-	64.3	92.6	88.3	97.4	83.2
Third-Trimester Surveys Received	**N**	**414**	**95**	**32**	**37**	**70**	**298**	**-**	**250**	**166**	**49**	**175**	**137**	**64**	**220**	**73**	**-**	**35**	**90**	**-**	**94**	**260**	**190**	**164**	**5178**
Third Trimester Survey Submission Rate	%	51.4	74.2	66.7	80.4	67.3	63.0	-	68.3	89.2	76.6	70.9	85.6	38.6	53.8	54.9	-	94.6	54.5	-	37.8	80.2	49.4	61.0	61.5
Postpartum Surveys Received	**N**	**331**	**101**	**29**	**33**	**83**	**249**	**-**	**262**	**156**	**53**	**162**	**137**	**101**	**181**	**96**	**-**	**30**	**58**	**-**	**82**	**252**	**214**	**129**	**4863**

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women s Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Postpartum Survey Submission Rate	%	41.1	78.9	60.4	71.7	79.8	52.6	-	71.6	83.9	82.8	65.6	85.6	60.8	44.3	72.2	-	81.1	35.2	-	32.9	77.8	55.6	48.0	57.7
Exit Forms Received	**N**	**805**	**128**	**48**	**46**	**104**	**473**	**50**	**365**	**185**	**64**	**247**	**160**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**269**	**8418**
Exit Form Submission Rate	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.5	100.0	100.0	100.0	100.0	99.5	100.0	-	100.0	100.0	-	100.0	100.0	99.5	100.0	99.9

TABLE Z. 3: DEMOGRAPHICS (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Mother's Age at Intake																									
Missing Data	%	3.1	-	13.4	5.8	56.1	0.0	15.7	6.3	22.3	35.0	11.9	11.6	0.0	10.8	7.1	2.9	-	16.4	29.6	3.3	7.1	100.0	0.0	16.9
Women with Non-Missing Data	**N**	**405**	**-**	**123**	**388**	**152**	**26**	**70**	**15**	**188**	**26**	**111**	**168**	**15**	**107**	**236**	**33**	**-**	**173**	**181**	**495**	**65**	**-**	**23**	**6986**
Less than 18 Years of Age	%	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.0	-	-	-	2.6
18 and 19 Years of Age	%	10.4	-	-	-	13.2	-	-	-	-	-	-	11.3	-	-	-	-	-	8.1	6.1	13.5	-	-	-	6.3
20 Through 34 Years of Age	%	81.0	-	79.7	83.2	78.9	88.5	85.7	73.3	92.6	76.9	82.0	79.2	-	84.1	85.6	90.9	-	82.7	81.8	76.6	86.2	-	95.7	81.9
35 Years and Older	%	3.5	-	12.2	14.4	7.2	-	-	-	5.9	-	16.2	7.1	-	14.0	8.5	-	-	7.5	9.4	5.9	-	-	-	9.2
Race and Ethnicity																									
Missing Data	%	4.1	-	14.8	7.0	56.1	0.0	15.7	6.3	24.0	35.0	12.7	11.6	0.0	11.7	8.3	2.9	-	15.9	30.7	4.5	8.6	100.0	0.0	17.5
Women with Non-Missing Data	**N**	**401**	**-**	**121**	**383**	**152**	**26**	**70**	**15**	**184**	**26**	**110**	**168**	**15**	**106**	**233**	**33**	**-**	**174**	**178**	**489**	**64**	**-**	**23**	**6938**
Hispanic	%	11.0	-	55.4	35.5	-	-	15.7	-	10.9	-	10.9	17.3	-	34.9	38.6	-	-	27.0	80.3	10.6	37.5	-	-	26.4
Non-Hispanic White	%	51.9	-	36.4	45.4	82.2	80.8	70.0	93.3	77.2	50.0	63.6	67.3	-	60.4	49.4	90.9	-	56.3	19.1	82.6	43.8	-	73.9	56.0
Non-Hispanic Black	%	29.9	-	-	6.5	13.8	-	-	-	-	-	21.8	10.1	-	-	5.6	-	-	13.8	-	2.2	-	-	-	12.2
Other Race/Multiple Races	%	7.2	-	-	12.5	-	-	-	-	6.5	-	-	-	-	-	6.4	-	-	-	-	4.5	-	-	-	5.4
Ethnicity (Among Hispanic Women)																									
Missing Data	%	9.3	-	13.4	13.8	58.7	0.0	16.9	6.3	24.8	35.0	17.5	11.6	6.7	10.8	14.6	5.9	-	20.8	31.5	6.1	11.4	100.0	0.0	20.2
Not in Universe	%	80.1	-	39.4	53.2	40.5	100.0	69.9	87.5	66.9	52.5	73.0	73.2	60.0	58.3	50.0	88.2	-	56.5	12.8	83.8	54.3	0.0	87.0	58.1
Women with Non-Missing Data	**N**	**44**	**-**	**67**	**136**	**-**	**-**	**11**	**-**	**20**	**-**	**12**	**29**	**-**	**37**	**90**	**-**	**-**	**47**	**143**	**52**	**24**	**-**	**-**	**1831**
Mexican, Mexican American, Chicana	%	25.0	-	85.1	64.7	-	-	-	-	-	-	-	-	-	35.1	62.2	-	-	-	76.9	50.0	66.7	-	-	53.1
Puerto Rican	%	-	-	-	-	-	-	-	-	55.0	-	-	55.2	-	-	-	-	-	57.4	-	-	-	-	-	12.3
Cuban	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	HolyFamily Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Other Hispanic, Latina, or Spanish Origin	%	36.4	-	-	27.2	-	-	-	-	-	-	-	-	-	59.5	32.2	-	-	29.8	20.3	38.5	-	-	-	30.4
Multiple Hispanic, Latina, or Spanish Origins	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9
Living in Shelter or Homeless at Intake																									
Missing Data	%	3.1	-	13.4	5.8	56.1	0.0	15.7	6.3	22.3	35.0	11.9	11.6	0.0	10.8	7.1	2.9	-	15.9	29.6	3.3	7.1	100.0	0.0	16.8
Women with Non-Missing Data	**N**	**405**	**-**	**123**	**388**	**152**	**26**	**70**	**15**	**188**	**26**	**111**	**168**	**15**	**107**	**236**	**33**	**-**	**174**	**181**	**495**	**65**	**-**	**23**	**6996**
Yes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Employment and School Status at Intake																									
Missing Data	%	4.3	-	16.9	6.1	58.4	0.0	15.7	6.3	23.1	37.5	15.1	12.6	0.0	12.5	10.6	2.9	-	17.4	32.3	5.1	7.1	100.0	0.0	18.2
Women with Non-Missing Data	**N**	**400**	**-**	**118**	**387**	**144**	**26**	**70**	**15**	**186**	**25**	**107**	**166**	**15**	**105**	**227**	**33**	**-**	**171**	**174**	**486**	**65**	**-**	**23**	**6876**
Employed, Not in School	%	35.0	-	29.7	46.8	38.9	50.0	41.4	-	43.5	48.0	49.5	26.5	-	47.6	43.2	33.3	-	43.9	23.6	34.8	32.3	-	-	36.9
In School, Not Employed	%	13.3	-	12.7	9.6	-	-	-	-	5.9	-	-	-	-	-	8.8	-	-	-	8.0	8.8	-	-	-	8.2
Employed and in School	%	8.5	-	-	7.8	-	-	-	-	12.9	-	-	-	-	-	8.4	-	-	7.0	6.3	4.3	-	-	-	5.7
Neither Employed nor in School	%	43.3	-	52.5	35.9	52.1	-	47.1	-	37.6	-	37.4	67.5	-	37.1	39.6	57.6	-	43.9	62.1	52.1	49.2	-	56.5	49.2
Education Level at Intake																									
Missing Data	%	7.2	-	18.3	8.3	58.7	0.0	15.7	6.3	23.1	35.0	13.5	13.7	0.0	10.8	10.2	2.9	-	16.4	37.0	10.4	7.1	100.0	0.0	19.9
Women with Non-Missing Data	**N**	**388**	**-**	**116**	**378**	**143**	**26**	**70**	**15**	**186**	**26**	**109**	**164**	**15**	**107**	**228**	**33**	**-**	**173**	**162**	**459**	**65**	**-**	**23**	**6734**
Less than High School	%	26.0	-	37.9	5.8	18.9	-	-	-	-	-	-	13.4	-	-	7.9	-	-	8.7	17.3	16.3	-	-	-	15.0
High School Graduate or GED	%	56.4	-	50.9	47.4	68.5	50.0	60.0	73.3	53.2	-	47.7	65.9	-	44.9	57.9	51.5	-	56.6	57.4	72.1	58.5	-	47.8	57.5
Associate's Degree	%	7.7	-	-	11.6	7.7	-	-	-	11.3	-	14.7	15.2	-	12.1	11.0	-	-	13.3	8.0	2.8	-	-	-	8.4
Bachelor's Degree	%	6.2	-	-	28.0	-	-	20.0	-	26.9	-	27.5	-	-	38.3	14.9	-	-	16.8	14.8	4.6	21.5	-	-	14.8
Other College Degree	%	3.6	-	-	7.1	-	-	-	-	5.9	-	-	-	-	-	8.3	-	-	-	-	4.1	-	-	-	4.3
Relationship Status at Intake																									
Missing Data	%	5.7	-	16.9	6.3	56.6	0.0	15.7	6.3	23.6	37.5	12.7	13.2	0.0	10.8	8.3	2.9	-	16.9	30.0	4.1	7.1	100.0	4.3	17.8
Women with Non-Missing Data	**N**	**394**	**-**	**118**	**386**	**150**	**26**	**70**	**15**	**185**	**25**	**110**	**165**	**15**	**107**	**233**	**33**	**-**	**172**	**180**	**491**	**65**	**-**	**22**	**6910**
Married	%	24.1	-	50.8	45.6	31.3	57.7	51.4	-	55.7	48.0	57.3	48.5	-	65.4	36.9	93.9	-	48.8	58.3	40.9	44.6	-	50.0	43.7
Living with a Partner	%	40.4	-	28.8	37.8	43.3	-	37.1	-	31.9	-	30.0	18.2	-	29.0	45.5	-	-	30.2	27.8	-	40.0	-	-	33.6
In a Relationship but Not Living Together	%	19.3	-	16.1	9.8	16.0	-	-	-	9.2	-	10.9	13.9	-	-	8.6	-	-	15.1	12.2	-	-	-	-	13.6
Not in a Relationship Right Now	%	16.2	-	-	6.7	9.3	-	-	-	-	-	-	19.4	-	-	9.0	-	-	-	-	-	-	-	-	9.1

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 4: DEMOGRAPHICS (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Mother's Age at Intake																									
Missing Data	%	25.7	15.7	25.0	4.3	11.5	19.7	100.0	8.7	1.6	12.7	27.9	10.7	13.9	9.0	13.5	-	0.0	37.6	-	35.7	7.4	11.7	2.6	16.9
Women with Non-Missing Data	**N**	**597**	**107**	**36**	**44**	**92**	**380**	**-**	**334**	**183**	**55**	**178**	**142**	**143**	**372**	**115**	**-**	**37**	**103**	**-**	**160**	**300**	**340**	**261**	**6986**
Less than 18 Years of Age	%	4.4	-	-	-	-	3.9	-	-	3.8	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	2.6
18 and 19 Years of Age	%	4.9	-	-	-	-	6.8	-	9.0	6.0	-	-	-	-	6.7	-	-	-	-	-	13.1	-	4.7	10.3	6.3
20 Through 34 Years of Age	%	81.4	88.8	88.9	77.3	89.1	84.2	-	79.9	80.9	81.8	89.3	79.6	84.6	82.8	81.7	-	86.5	83.5	-	73.1	84.7	78.8	73.9	81.9
35 Years and Older	%	9.4	-	-	-	-	5.0	-	8.4	9.3	-	6.7	12.7	11.2	6.7	13.9	-	-	11.7	-	7.5	12.3	15.3	12.3	9.2
Race and Ethnicity																									
Missing Data	%	26.0	17.3	25.0	4.3	12.5	19.9	88.0	10.1	2.2	14.3	28.3	10.7	15.1	9.3	13.5	-	0.0	37.6	-	36.1	8.0	12.2	3.4	17.5
Women with Non-Missing Data	**N**	**595**	**105**	**36**	**44**	**91**	**379**	**-**	**329**	**182**	**54**	**177**	**142**	**141**	**371**	**115**	**-**	**37**	**103**	**-**	**159**	**298**	**338**	**259**	**6938**
Hispanic	%	38.8	-	-	4.5	-	50.7	-	51.4	12.6	46.3	32.8	12.0	9.9	31.3	-	-	-	14.6	-	-	6.4	27.8	37.5	26.4
Non-Hispanic White	%	51.6	93.3	72.2	88.6	71.4	19.8	-	10.6	79.1	40.7	43.5	82.4	53.9	33.7	79.1	-	83.8	70.9	-	85.5	70.5	61.2	59.1	56.0
Non-Hispanic Black	%	6.2	-	-	-	-	25.9	-	34.3	-	-	14.7	-	30.5	31.3	12.2	-	-	12.6	-	13.2	15.8	-	-	12.2
Other Race/Multiple Races	%	3.4	-	-	-	-	3.7	-	3.6	7.1	-	9.0	-	-	3.8	-	-	-	-	-	-	7.4	9.8	-	5.4
Ethnicity (Among Hispanic Women)																									
Missing Data	%	27.2	15.7	25.0	4.3	13.5	20.7	88.0	9.8	4.3	38.1	29.6	18.9	16.9	18.6	16.5	-	2.7	37.6	-	36.1	9.0	15.6	7.5	20.2
Not in Universe	%	44.0	81.9	70.8	91.3	76.9	38.7	4.0	44.0	83.3	22.2	47.0	70.4	74.7	53.1	79.7	-	91.9	53.3	-	63.1	85.2	60.0	56.3	58.1
Women with Non-Missing Data	**N**	**231**	**-**	**-**	**-**	**-**	**192**	**-**	**169**	**23**	**25**	**58**	**17**	**14**	**116**	**-**	**-**	**-**	**15**	**-**	**-**	**19**	**94**	**97**	**1831**
Mexican, Mexican American, Chicana	%	40.3	-	-	-	-	63.5	-	74.6	56.5	-	56.9	-	-	26.7	-	-	-	-	-	-	-	76.6	59.8	53.1
Puerto Rican	%	-	-	-	-	-	-	-	11.8	-	80.0	-	-	-	55.2	-	-	-	-	-	-	-	-	-	12.3
Cuban	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Other Hispanic, Latina, or Spanish Origin	%	54.1	-	-	-	-	32.8	-	10.7	-	-	37.9	-	-	16.4	-	-	-	-	-	-	-	19.1	40.2	30.4
Multiple Hispanic, Latina, or Spanish Origins	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9
Living in Shelter or Homeless at Intake																									
Missing Data	%	25.7	15.7	25.0	4.3	11.5	19.7	88.0	8.5	1.1	11.1	27.9	10.7	13.9	9.0	13.5	-	0.0	37.6	-	35.7	7.4	11.7	2.6	16.8
Women with Non-Missing Data	**N**	**597**	**107**	**36**	**44**	**92**	**380**	**-**	**335**	**184**	**56**	**178**	**142**	**143**	**372**	**115**	**-**	**37**	**103**	**-**	**160**	**300**	**340**	**261**	**6996**
Yes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Employment and School Status at Intake																									
Missing Data	%	26.6	15.7	25.0	4.3	11.5	21.4	88.0	9.8	2.2	11.1	29.6	10.7	13.9	10.8	14.3	-	0.0	38.2	-	37.3	10.2	12.7	6.3	18.2
Women with Non-Missing Data	**N**	**590**	**107**	**36**	**44**	**92**	**372**	**-**	**330**	**182**	**56**	**174**	**142**	**143**	**365**	**114**	**-**	**37**	**102**	**-**	**156**	**291**	**336**	**251**	**6876**
Employed, Not in School	%	32.9	38.3	66.7	54.5	42.4	33.1	-	41.5	42.3	50.0	27.0	39.4	44.8	17.8	44.7	-	-	45.1	-	32.7	38.8	43.5	28.3	36.9
In School, Not Employed	%	9.0	-	-	-	-	9.7	-	7.9	8.8	-	-	-	9.8	5.8	-	-	-	-	-	9.0	9.6	11.0	6.0	8.2
Employed and in School	%	4.4	-	-	-	-	3.0	-	5.2	9.9	-	10.3	-	-	-	-	-	-	-	-	-	7.6	6.5	-	5.7
Neither Employed nor in School	%	53.7	56.1	-	36.4	44.6	54.3	-	45.5	39.0	32.1	58.0	52.1	38.5	76.2	41.2	-	67.6	48.0	-	55.1	44.0	39.0	61.8	49.2

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women s Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Education Level at Intake																									
Missing Data	%	32.3	17.3	25.0	4.3	11.5	23.3	88.0	12.0	3.8	14.3	28.7	10.7	16.3	9.5	13.5	-	0.0	37.6	-	37.8	8.3	12.5	16.0	19.9
Women with Non-Missing Data	**N**	**544**	**105**	**36**	**44**	**92**	**363**	**-**	**322**	**179**	**54**	**176**	**142**	**139**	**370**	**115**	**-**	**37**	**103**	**-**	**155**	**297**	**337**	**225**	**6734**
Less than High School	%	27.0	10.5	-	-	-	15.7	-	21.1	13.4	22.2	7.4	7.7	-	23.2	-	-	-	-	-	31.0	3.7	10.7	39.1	15.0
High School Graduate or GED	%	51.7	60.0	41.7	40.9	53.3	65.6	-	58.7	53.1	57.4	62.5	57.7	48.9	74.1	49.6	-	91.9	79.6	-	55.5	44.8	56.1	47.1	57.5
Associate's Degree	%	5.1	13.3	-	-	-	6.1	-	6.8	9.5	-	12.5	14.1	15.8	-	-	-	-	-	-	-	10.1	11.6	5.8	8.4
Bachelor's Degree	%	11.6	12.4	30.6	36.4	26.1	9.4	-	9.9	21.2	-	13.6	14.1	29.5	-	37.4	-	-	-	-	-	35.0	16.9	5.3	14.8
Other College Degree	%	4.6	-	-	-	-	3.3	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	6.4	4.7	-	4.3
Relationship Status at Intake																									
Missing Data	%	27.2	15.7	25.0	4.3	11.5	21.8	88.0	9.6	1.6	11.1	29.6	11.3	13.9	10.0	13.5	-	0.0	38.2	-	36.1	8.3	12.2	4.1	17.8
Women with Non-Missing Data	**N**	**585**	**107**	**36**	**44**	**92**	**370**	**-**	**331**	**183**	**56**	**174**	**141**	**143**	**368**	**115**	**-**	**37**	**102**	**-**	**159**	**297**	**338**	**257**	**6910**
Married	%	43.1	71.0	55.6	54.5	66.3	40.5	-	29.9	39.9	21.4	53.4	48.9	51.0	28.3	44.3	-	59.5	54.9	-	28.9	66.3	32.5	42.8	43.7
Living with a Partner	%	40.5	22.4	-	31.8	26.1	28.6	-	34.4	44.3	41.1	25.9	31.9	29.4	14.9	32.2	-	-	31.4	-	39.6	23.6	47.6	34.6	33.6
In a Relationship but Not Living Together	%	9.7	-	-	-	-	18.6	-	21.5	10.4	21.4	9.2	12.8	14.0	40.8	15.7	-	-	-	-	15.1	7.7	13.6	14.0	13.6
Not in a Relationship Right Now	%	6.7	-	-	-	-	12.2	-	14.2	-	-	11.5	-	-	16.0	-	-	-	-	-	16.4	-	6.2	8.6	9.1

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (mother's age). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 5: PSYCHOSOCIAL (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Insured When Became Pregnant																									
Missing Data	%	3.8	-	13.4	6.6	56.4	0.0	15.7	6.3	22.3	35.0	12.7	11.6	0.0	11.7	11.0	2.9	-	16.9	30.4	5.1	8.6	100.0	4.3	17.7
Women with Non-Missing Data	**N**	**402**	**-**	**123**	**385**	**151**	**26**	**70**	**15**	**188**	**26**	**110**	**168**	**15**	**106**	**226**	**33**	**-**	**172**	**179**	**486**	**64**	**-**	**22**	**6916**
Yes	%	52.5	-	56.9	53.5	86.1	-	30.0	-	54.8	57.7	56.4	14.9	73.3	70.8	59.7	57.6	-	46.5	34.1	74.3	34.4	-	54.5	50.2
No	%	43.3	-	40.7	40.0	13.9	61.5	65.7	-	42.6	42.3	42.7	84.5	-	28.3	37.6	42.4	-	47.7	62.0	23.9	65.6	-	-	46.2
Unsure	%	4.2	-	-	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)																									
Missing Data	%	3.8	-	13.4	6.6	56.4	0.0	15.7	6.3	22.3	35.0	12.7	11.6	0.0	11.7	11.0	2.9	-	16.9	30.4	5.1	8.6	100.0	4.3	17.7
Not in Universe	%	45.7	-	37.3	43.4	6.1	61.5	59.0	43.8	35.1	27.5	38.1	75.3	26.7	25.8	35.8	41.2	-	44.4	45.9	24.4	60.0	-	43.5	41.0
Women with Non-Missing Data	**N**	**211**	**-**	**70**	**206**	**130**	**-**	**21**	**-**	**103**	**15**	**62**	**25**	**11**	**75**	**135**	**19**	**-**	**80**	**61**	**361**	**22**	**-**	**12**	**3471**
Medicaid	%	69.2	-	68.6	51.9	80.8	-	71.4	-	32.0	-	50.0	64.0	-	48.0	68.1	-	-	68.8	41.0	68.1	54.5	-	-	59.5
Other	%	19.0	-	24.3	39.8	13.8	-	-	-	60.2	-	50.0	-	-	49.3	24.4	-	-	27.5	57.4	18.0	-	-	-	31.9
Both Medicaid and Other Health Insurance	%	11.8	-	-	8.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.9	-	-	-	8.6
Smokes Cigarettes at Intake																									
Missing Data	%	17.7	-	23.2	15.3	58.4	7.7	22.9	6.3	26.4	45.0	34.9	28.9	6.7	22.5	19.3	14.7	-	28.0	40.1	8.8	12.9	100.0	8.7	24.4
Women with Non-Missing Data	**N**	**344**	**-**	**109**	**349**	**144**	**24**	**64**	**15**	**178**	**22**	**82**	**135**	**14**	**93**	**205**	**29**	**-**	**149**	**154**	**467**	**61**	**-**	**21**	**6353**
Yes	%	26.2	-	13.8	3.4	37.5	-	-	-	-	-	-	-	-	-	6.8	-	-	9.4	-	30.8	-	-	-	10.6
Food Insecure at Intake																									
Missing Data	%	12.4	-	23.9	7.8	62.4	0.0	19.3	6.3	24.4	35.0	18.3	13.2	0.0	12.5	14.2	5.9	-	17.4	37.4	7.4	11.4	100.0	4.3	21.1
Women with Non-Missing Data	**N**	**366**	**-**	**108**	**380**	**130**	**26**	**67**	**15**	**183**	**26**	**103**	**165**	**15**	**105**	**218**	**32**	**-**	**171**	**161**	**474**	**62**	**-**	**22**	**6635**
Yes	%	24.0	-	15.7	15.8	-	-	19.4	-	11.5	-	25.2	-	-	10.5	23.4	-	-	23.4	19.9	13.5	-	-	-	17.9
WIC at Intake																									
Missing Data	%	4.8	-	16.9	7.3	61.6	0.0	16.9	6.3	23.6	35.0	13.5	11.6	0.0	10.8	13.0	2.9	-	17.9	30.4	5.7	8.6	100.0	0.0	19.0
Women with Non-Missing Data	**N**	**398**	**-**	**118**	**382**	**133**	**26**	**69**	**15**	**185**	**26**	**109**	**168**	**15**	**107**	**221**	**33**	**-**	**170**	**179**	**483**	**64**	**-**	**23**	**6808**
Yes	%	54.3	-	65.3	39.5	50.4	-	37.7	-	29.2	-	39.4	56.5	-	29.0	31.7	-	-	38.2	55.3	65.8	53.1	-	56.5	42.8
Exhibiting Depressive Symptoms at Intake[1]																									
Missing Data	%	15.6	-	27.5	13.1	73.1	0.0	22.9	12.5	26.4	40.0	21.4	13.2	6.7	15.8	18.5	5.9	-	24.2	41.2	10.4	12.9	100.0	0.0	24.1
Women with Non-Missing Data	**N**	**353**	**-**	**103**	**358**	**93**	**26**	**64**	**14**	**178**	**24**	**99**	**165**	**14**	**101**	**207**	**32**	**-**	**157**	**151**	**459**	**61**	**-**	**23**	**6381**
Yes	%	31.4	-	23.3	17.9	17.2	-	-	-	14.6	-	23.2	-	-	12.9	28.0	-	-	20.4	17.2	24.0	-	-	-	23.8
Exhibiting Anxiety Symptoms at Intake[2]																									
Missing Data	%	7.9	-	19.0	7.8	72.8	0.0	19.3	6.3	24.4	40.0	16.7	12.6	0.0	11.7	13.8	8.8	-	19.8	33.9	6.8	8.6	100.0	0.0	20.0
Women with Non-Missing Data	**N**	**385**	**-**	**115**	**380**	**94**	**26**	**67**	**15**	**183**	**24**	**105**	**166**	**15**	**106**	**219**	**31**	**-**	**166**	**170**	**477**	**64**	**-**	**23**	**6724**
None (<5)	%	56.4	-	73.9	75.3	80.9	76.9	71.6	66.7	75.4	54.2	68.6	97.6	-	80.2	63.0	87.1	-	71.7	72.9	49.7	78.1	-	78.3	68.8
Mild (5)	%	25.7	-	13.0	16.6	13.8	-	22.4	-	19.1	-	21.0	-	-	14.2	21.9	-	-	16.3	20.0	31.9	18.8	-	-	20.9
Moderate (10)	%	12.2	-	12.2	3.9	-	-	-	-	-	-	-	-	-	-	9.1	-	-	8.4	-	10.7	-	-	-	6.6
Severe (>=15)	%	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	-	2.8
Incomplete but Showing Symptoms of Anxiety	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Experienced Intimate Partner Violence[3]																									
Missing Data	%	5.5	-	16.2	6.6	57.5	0.0	19.3	12.5	22.7	35.0	16.7	14.2	0.0	10.8	11.4	2.9	-	17.4	31.5	4.3	8.6	100.0	0.0	18.2
Women with Non-Missing Data	**N**	**395**	**-**	**119**	**385**	**147**	**26**	**67**	**14**	**187**	**26**	**105**	**163**	**15**	**107**	**225**	**33**	**-**	**171**	**176**	**490**	**64**	**-**	**23**	**6876**
Yes	%	26.6	-	17.6	21.0	17.0	-	19.4	-	26.7	-	25.7	-	-	14.0	25.3	-	-	21.1	13.1	20.2	20.3	-	-	20.4

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Experiencing Intimate Partner Violence at Intake[4] (Among Women With a Completed Score or Who Report Being in a Relationship)																									
Missing Data	%	6.2	-	17.6	6.6	58.4	3.8	16.9	6.3	23.1	35.0	15.9	12.6	0.0	11.7	11.0	2.9	-	16.4	33.9	5.5	8.6	100.0	0.0	19.0
Not in Universe	%	5.5	-	1.4	3.4	1.4	7.7	1.2	12.5	1.7	5.0	1.6	2.1	0.0	1.7	5.1	0.0	-	1.9	0.4	2.0	7.1	-	8.7	3.5
Women with Non-Missing Data	**N**	**369**	**-**	**115**	**371**	**139**	**23**	**68**	**13**	**182**	**24**	**104**	**162**	**15**	**104**	**213**	**33**	**-**	**169**	**169**	**474**	**59**	**-**	**21**	**6515**
Yes	%	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2
Experiencing Prenatal Care Access Barrier																									
Missing Data	%	3.1	-	13.4	5.8	56.1	0.0	15.7	6.3	22.3	35.0	11.9	11.6	0.0	10.8	7.1	2.9	-	15.9	29.6	3.3	7.1	100.0	0.0	16.8
Women with Non-Missing Data	**N**	**405**	**-**	**123**	**388**	**152**	**26**	**70**	**15**	**188**	**26**	**111**	**168**	**15**	**107**	**236**	**33**	**-**	**174**	**181**	**495**	**65**	**-**	**23**	**6996**
None Reported	%	62.5	-	61.8	73.2	92.1	80.8	78.6	73.3	80.3	42.3	80.2	95.2	-	87.9	67.4	69.7	-	70.1	66.9	79.4	61.5	-	69.6	73.5
Reported One Access Barrier	%	24.4	-	28.5	23.2	-	-	17.1	-	16.5	42.3	18.0	-	-	11.2	26.3	-	-	22.4	27.6	19.2	35.4	-	-	20.8
Reported Two or More Access Barriers	%	13.1	-	9.8	3.6	-	-	-	-	-	-	-	-	-	-	6.4	-	-	7.5	-	-	-	-	-	5.7
Types of Barriers Reported[5] (Among Women Who Reported Any Barrier)																									
No Car	%	66.4	-	46.8	34.6	-	-	-	-	37.8	-	-	-	-	-	45.5	-	-	44.2	46.7	46.1	-	-	-	46.1
Public Transportation Challenges	%	21.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.1
Not Enough Money for a Ride	%	19.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.4
Work Hours Make It Difficult	%	21.1	-	-	29.8	-	-	-	-	51.4	-	-	-	-	-	27.3	-	-	23.1	25.0	28.4	-	-	-	25.3
Childcare Challenges	%	13.2	-	-	24.0	-	-	-	-	-	-	-	-	-	-	20.8	-	-	21.2	18.3	10.8	-	-	-	21.0
Partner Objections	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
Other	%	8.6	-	27.7	16.3	-	-	-	-	-	-	-	-	-	-	22.1	-	-	21.2	18.3	15.7	-	-	-	16.5

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in **Appendix E**.

[1] Measured by CES-D 10 scale.
[2] Measured by GAD-7 scale.
[3] Measured by STaT scale.
[4] Measured by WEB scale.
[5] Women could report multiple barriers.

TABLE Z. 6: PSYCHOSOCIAL (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Insured When Became Pregnant																									
Missing Data	%	27.0	16.5	25.0	4.3	12.5	19.9	88.0	9.0	2.2	11.1	28.3	10.7	14.5	11.0	14.3	-	5.4	37.6	-	36.1	7.7	13.5	5.2	17.7
Women with Non-Missing Data	**N**	**587**	**106**	**36**	**44**	**91**	**379**	**-**	**333**	**182**	**56**	**177**	**142**	**142**	**364**	**114**	**-**	**35**	**103**	**-**	**159**	**299**	**333**	**254**	**6916**
Yes	%	37.3	43.4	63.9	81.8	47.3	35.1	-	63.1	71.4	57.1	31.6	47.2	73.2	30.2	56.1	-	-	40.8	-	52.2	57.5	47.7	37.0	50.2
No	%	58.9	54.7	33.3	-	52.7	62.0	-	33.3	20.3	39.3	66.7	48.6	24.6	67.9	42.1	-	94.3	59.2	-	23.3	39.8	46.8	60.2	46.2
Unsure	%	3.7	-	-	-	-	2.9	-	3.6	8.2	-	-	-	-	-	-	-	-	-	-	24.5	-	5.4	-	3.6
Type of Insurance (Among Women Who Were Insured When They Became Pregnant)																									
Missing Data	%	27.0	16.5	25.0	4.3	12.5	19.9	88.0	9.0	2.2	11.1	28.3	10.7	14.5	11.0	14.3	-	5.4	37.6	-	36.1	7.7	13.5	5.2	17.7
Not in Universe	%	45.8	47.2	27.1	17.4	46.2	52.0	6.0	33.6	28.0	38.1	49.0	47.2	22.9	62.1	37.6	-	89.2	37.0	-	30.5	39.2	45.2	59.7	41.0
Women with Non-Missing Data	**N**	**219**	**46**	**23**	**36**	**43**	**133**	**-**	**210**	**130**	**32**	**56**	**67**	**104**	**110**	**64**	**-**	**-**	**42**	**-**	**83**	**172**	**159**	**94**	**3471**
Medicaid	%	54.3	60.9	-	33.3	44.2	55.6	-	77.1	46.9	78.1	41.1	59.7	54.8	78.2	59.4	-	-	92.9	-	81.9	41.3	52.8	51.1	59.5
Other	%	39.7	34.8	73.9	50.0	41.9	39.1	-	9.5	40.0	-	55.4	31.3	36.5	17.3	31.3	-	-	-	-	-	51.7	37.1	37.2	31.9
Both Medicaid and Other Health Insurance	%	5.9	-	-	-	-	-	-	13.3	13.1	-	-	-	-	-	-	-	-	-	-	-	7.0	10.1	11.7	8.6
Smokes Cigarettes at Intake																									
Missing Data	%	30.1	16.5	33.3	10.9	25.0	27.1	88.0	16.1	14.5	14.3	37.2	14.5	19.9	9.5	25.6	-	0.0	37.6	-	36.5	13.6	24.4	11.6	24.4
Women with Non-Missing Data	**N**	**562**	**106**	**32**	**41**	**78**	**345**	**-**	**307**	**159**	**54**	**155**	**136**	**133**	**370**	**99**	**-**	**37**	**103**	**-**	**158**	**280**	**291**	**237**	**6353**
Yes	%	9.3	-	-	-	-	5.5	-	-	8.2	-	-	-	-	9.7	-	-	-	-	-	47.5	-	4.5	19.0	10.6
Food Insecure at Intake																									
Missing Data	%	29.4	17.3	25.0	8.7	14.4	24.3	88.0	17.8	3.8	12.7	32.0	12.6	19.9	11.2	15.8	-	2.7	38.2	-	36.1	8.0	16.6	14.6	21.1
Women with Non-Missing Data	**N**	**568**	**105**	**36**	**42**	**89**	**358**	**-**	**301**	**179**	**55**	**168**	**139**	**133**	**363**	**112**	**-**	**36**	**102**	**-**	**159**	**298**	**321**	**229**	**6635**
Yes	%	15.7	14.3	-	-	25.8	18.7	-	20.3	15.6	-	14.3	19.4	18.0	14.0	29.5	-	-	24.5	-	30.8	15.4	15.6	32.8	17.9
WIC at Intake																									
Missing Data	%	28.5	17.3	27.1	4.3	11.5	20.9	88.0	12.6	2.2	12.7	29.6	10.7	16.3	12.7	15.0	-	5.4	37.6	-	37.3	8.3	14.0	9.7	19.0
Women with Non-Missing Data	**N**	**575**	**105**	**35**	**44**	**92**	**374**	**-**	**320**	**182**	**55**	**174**	**142**	**139**	**357**	**113**	**-**	**35**	**103**	**-**	**156**	**297**	**331**	**242**	**6808**
Yes	%	42.3	37.1	54.3	47.7	41.3	33.2	-	47.2	42.3	61.8	24.7	37.3	37.4	64.7	22.1	-	-	44.7	-	28.2	26.3	23.6	45.9	42.8
Exhibiting Depressive Symptoms at Intake[1]																									
Missing Data	%	29.7	18.9	29.2	8.7	15.4	30.0	90.0	18.9	8.1	12.7	33.6	12.6	18.7	13.2	17.3	-	5.4	38.2	-	36.5	14.2	20.0	18.3	24.1
Women with Non-Missing Data	**N**	**565**	**103**	**34**	**42**	**88**	**331**	**-**	**297**	**171**	**55**	**164**	**139**	**135**	**355**	**110**	**-**	**35**	**102**	**-**	**158**	**278**	**308**	**219**	**6381**
Yes	%	26.9	15.5	-	-	20.5	28.7	-	25.3	28.7	30.9	22.0	19.4	28.9	27.0	25.5	-	-	23.5	-	31.0	18.3	23.1	44.7	23.8
Exhibiting Anxiety Symptoms at Intake[2]																									
Missing Data	%	27.9	16.5	25.0	6.5	12.5	22.6	88.0	12.8	4.8	11.1	30.4	11.3	14.5	9.3	14.3	-	0.0	38.2	-	36.1	9.3	14.3	8.6	20.0
Women with Non-Missing Data	**N**	**580**	**106**	**36**	**43**	**91**	**366**	**-**	**319**	**177**	**56**	**172**	**141**	**142**	**371**	**114**	**-**	**37**	**102**	**-**	**159**	**294**	**330**	**245**	**6724**
None (<5)	%	67.9	74.5	80.6	76.7	73.6	64.8	-	68.3	59.3	66.1	73.8	74.5	73.9	71.4	70.2	-	89.2	81.4	-	54.1	78.9	74.5	49.0	68.8
Mild (5)	%	22.2	19.8	-	-	17.6	19.9	-	19.7	28.8	-	15.1	16.3	16.2	24.5	24.6	-	-	16.7	-	35.8	15.6	17.6	26.5	20.9
Moderate (10)	%	5.7	-	-	-	-	12.6	-	8.2	6.8	-	7.0	-	-	3.0	-	-	-	-	-	7.5	3.7	4.5	12.7	6.6

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women s Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women s Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Severe (>=15)	%	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.6	2.8
Incomplete but Showing Symptoms of Anxiety	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9
Experienced Intimate Partner Violence[3]																									
Missing Data	%	26.6	16.5	25.0	6.5	11.5	20.7	88.0	11.7	3.2	11.1	30.8	10.7	15.1	9.5	14.3	-	0.0	38.2	-	36.9	8.0	13.0	3.7	18.2
Women with Non-Missing Data	**N**	**590**	**106**	**36**	**43**	**92**	**375**	**-**	**323**	**180**	**56**	**171**	**142**	**141**	**370**	**114**	**-**	**37**	**102**	**-**	**157**	**298**	**335**	**258**	**6876**
Yes	%	22.7	17.9	-	-	21.7	19.5	-	24.1	24.4	32.1	21.1	33.1	16.3	8.6	30.7	-	-	-	-	22.3	20.1	20.0	22.9	20.4
Experiencing Intimate Partner Violence at Intake[4] (Among Women With a Completed Score or Who Report Being in a Relationship)																									
Missing Data	%	28.2	18.1	25.0	6.5	13.5	22.2	88.0	13.7	1.6	14.3	29.6	11.3	15.1	10.3	13.5	-	0.0	37.6	-	37.3	7.7	14.0	12.7	19.0
Not in Universe	**%**	**3.1**	**2.4**	**10.4**	**8.7**	**1.9**	**5.1**	**0.0**	**6.6**	**4.3**	**6.3**	**6.5**	**3.1**	**2.4**	**1.7**	**3.0**	**-**	**2.7**	**5.5**	**-**	**8.8**	**0.9**	**3.1**	**4.5**	**3.5**
Women with Non-Missing Data	N	552	101	31	39	88	344	-	292	175	50	158	136	137	360	111	-	36	94	-	134	296	319	222	6515
Yes	%	-	-	-	-	-	4.1	-	4.5	-	-	-	-	-	-	-	-	-	-	-	8.2	-	-	-	2.2
Experiencing Prenatal Care Access Barrier																									
Missing Data	%	25.7	15.7	25.0	4.3	11.5	19.7	88.0	8.5	1.1	11.1	27.9	10.7	13.9	9.0	13.5	-	0.0	37.6	-	35.7	7.4	11.7	2.6	16.8
Women with Non-Missing Data	**N**	**597**	**107**	**36**	**44**	**92**	**380**	**-**	**335**	**184**	**56**	**178**	**142**	**143**	**372**	**115**	**-**	**37**	**103**	**-**	**160**	**300**	**340**	**261**	**6996**
None Reported	%	78.4	86.9	63.9	88.6	75.0	67.1	-	70.4	73.4	96.4	82.6	78.9	82.5	59.7	67.0	-	35.1	73.8	-	66.9	84.3	75.6	58.6	73.5
Reported One Access Barrier	%	19.3	11.2	30.6	-	21.7	27.6	-	20.3	20.7	-	14.6	18.3	12.6	17.5	24.3	-	62.2	24.3	-	25.0	13.3	19.7	35.6	20.8
Reported Two or More Access Barriers	%	2.3	-	-	-	-	5.3	-	9.3	6.0	-	-	-	-	22.8	8.7	-	-	-	-	8.1	-	4.7	5.7	5.7
Types of Barriers Reported[5] (Among Women Who Reported Any Barrier)																									
No Car	%	45.7	-	-	-	-	43.2	-	50.5	38.8	-	41.9	40.0	44.0	88.0	34.2	-	-	-	-	22.6	-	43.4	54.6	46.1
Public Transportation Challenges	%	-	-	-	-	-	9.6	-	-	-	-	-	-	-	52.7	-	-	-	-	-	-	-	-	-	11.1
Not Enough Money for a Ride	%	-	-	-	-	-	-	-	26.3	-	-	-	-	-	56.0	-	-	-	-	-	-	-	-	-	13.4
Work Hours Make It Difficult	%	21.7	-	-	-	-	25.6	-	30.3	26.5	-	-	-	-	8.7	34.2	-	-	-	-	35.8	29.8	30.1	23.1	25.3
Childcare Challenges	%	20.2	-	-	-	-	22.4	-	13.1	-	-	-	-	-	34.0	-	-	87.5	44.4	-	22.6	-	13.3	17.6	21.0
Partner Objections	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
Other	%	14.7	-	-	-	-	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	30.2	51.1	20.5	15.7	16.5

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11). All scales are defined in Appendix E.

[1] Measured by CES-D 10 scale.

[2] Measured by GAD-7 scale.

[3] Measured by STaT scale.

[4] Measured by WEB scale.

[5] Women could report multiple barriers.

TABLE Z. 7: PREGNANCY HISTORY AND INTENTIONS (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Prior Pregnancy																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**207**	**257**	**512**	**70**	**46**	**23**	**8407**
Yes	%	70.6	-	78.0	73.3	71.7	84.6	75.9	-	73.1	52.5	77.0	71.1	-	67.5	72.0	82.4	-	74.4	73.5	76.2	70.0	73.9	82.6	73.7
Not in Universe (No Prior Pregnancy)	%	29.4	-	21.8	26.7	28.3	15.4	24.1	37.5	26.9	47.5	23.0	28.9	33.3	32.5	28.0	17.6	-	25.6	26.5	23.8	30.0	26.1	17.4	26.3
Prior Miscarriage (<20 weeks EGA)																									
Missing Data	%	3.1	-	4.2	1.5	0.3	0.0	1.2	0.0	0.0	2.5	3.2	0.5	13.3	0.0	2.0	2.9	-	1.4	0.8	3.7	0.0	0.0	4.3	1.5
Women with Non-Missing Data	**N**	**282**	**-**	**105**	**296**	**247**	**22**	**62**	**-**	**177**	**20**	**93**	**134**	**-**	**81**	**178**	**27**	**-**	**151**	**187**	**371**	**49**	**34**	**18**	**6075**
Yes	%	35.8	-	41.0	28.0	43.7	-	33.9	-	34.5	-	41.9	38.1	-	35.8	35.4	-	-	28.5	29.4	32.1	36.7	32.4	-	32.9
Prior Elective Termination																									
Missing Data	%	3.1	-	4.2	1.5	0.3	0.0	1.2	0.0	0.0	2.5	3.2	0.5	13.3	0.0	2.0	2.9	-	1.4	0.8	3.7	0.0	0.0	4.3	1.5
Women with Non-Missing Data	**N**	**282**	**-**	**105**	**296**	**247**	**22**	**62**	**10**	**177**	**20**	**93**	**134**	**8**	**81**	**178**	**27**	**-**	**151**	**187**	**371**	**49**	**34**	**18**	**6075**
Yes	%	14.5	-	12.4	33.1	9.3	-	21.0	-	21.5	55.0	-	10.4	-	16.0	16.3	-	-	12.6	-	-	24.5	-	-	15.1
Prior Still Birth (Fetal Death >= 20 Weeks EGA)																									
Missing Data	%	12.9	-	13.4	25.2	6.9	7.7	16.9	12.5	15.7	30.0	9.5	7.9	26.7	10.0	13.4	8.8	-	10.6	2.7	5.7	17.1	17.4	8.7	12.3
Women with Non-Missing Data	**N**	**241**	**-**	**92**	**198**	**224**	**20**	**49**	**8**	**139**	**9**	**85**	**120**	**6**	**69**	**149**	**25**	**-**	**132**	**182**	**361**	**37**	**26**	**17**	**5162**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Prior Preeclampsia																									
Missing Data	%	32.3	-	35.2	28.6	36.1	38.5	18.1	25.0	34.3	35.0	50.0	20.5	26.7	27.5	33.9	55.9	-	23.7	31.1	31.3	31.4	30.4	47.8	31.5
Women with Non-Missing Data	**N**	**160**	**-**	**61**	**184**	**123**	**12**	**48**	**6**	**94**	**7**	**34**	**96**	**6**	**48**	**97**	**9**	**-**	**105**	**109**	**230**	**27**	**20**	**8**	**3549**
Yes	%	-	-	-	-	17.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2
Prior Gestational Diabetes																									
Missing Data	%	33.7	-	35.9	29.1	39.9	42.3	20.5	25.0	34.7	37.5	50.8	20.5	26.7	31.7	33.9	55.9	-	26.1	28.4	32.8	31.4	28.3	52.2	32.4
Women with Non-Missing Data	**N**	**154**	**-**	**60**	**182**	**110**	**11**	**46**	**6**	**93**	**6**	**33**	**96**	**6**	**43**	**97**	**9**	**-**	**100**	**116**	**222**	**27**	**21**	**7**	**3473**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.3	-	-	-	-	4.1
Prior Cervical Incompetence																									
Missing Data	%	34.0	-	39.4	29.4	42.5	42.3	20.5	25.0	35.1	37.5	53.2	21.1	26.7	32.5	36.2	55.9	-	26.1	33.1	32.6	31.4	28.3	52.2	34.0
Women with Non-Missing Data	**N**	**153**	**-**	**55**	**181**	**101**	**11**	**46**	**6**	**92**	**6**	**30**	**95**	**6**	**42**	**91**	**9**	**-**	**100**	**104**	**223**	**27**	**21**	**7**	**3339**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prior Placenta Abnormalities																									
Missing Data	%	33.0	-	39.4	29.6	41.6	38.5	20.5	25.0	34.7	37.5	53.2	21.1	26.7	32.5	35.8	55.9	-	26.1	33.1	32.6	31.4	30.4	47.8	33.6
Women with Non-Missing Data	**N**	**157**	**-**	**55**	**180**	**104**	**12**	**46**	**6**	**93**	**6**	**30**	**95**	**6**	**42**	**92**	**9**	**-**	**100**	**104**	**223**	**27**	**20**	**8**	**3372**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Prior Congenital Abnormalities of the Fetus																									
Missing Data	%	33.5	-	37.3	29.4	40.5	42.3	19.3	25.0	35.1	37.5	51.6	21.1	26.7	31.7	35.4	47.1	-	26.1	31.9	32.8	30.0	30.4	47.8	33.2
Women with Non-Missing Data	**N**	**155**	**-**	**58**	**181**	**108**	**11**	**47**	**6**	**92**	**6**	**32**	**95**	**6**	**43**	**93**	**12**	**-**	**100**	**107**	**222**	**28**	**20**	**8**	**3402**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 8: PREGNANCY HISTORY AND INTENTIONS (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women s Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Prior Pregnancy																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**366**	**186**	**63**	**247**	**159**	**166**	**409**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**385**	**268**	**8407**
Yes	%	76.0	80.3	64.6	69.6	80.8	70.0	54.0	75.7	73.7	68.3	80.2	75.5	75.9	71.4	80.5	-	83.8	78.2	-	65.5	77.2	70.9	75.0	73.7
Not in Universe (No Prior Pregnancy)	%	24.0	19.7	35.4	30.4	19.2	30.0	46.0	24.0	25.8	31.7	19.8	24.5	24.1	28.6	19.5	-	16.2	21.8	-	34.5	22.8	28.6	25.0	26.3
Prior Miscarriage (<20 weeks EGA)																									
Missing Data	%	0.7	1.6	0.0	0.0	0.0	1.5	0.0	1.1	1.1	0.0	2.8	0.0	0.0	2.0	0.0	-	0.0	0.0	-	0.4	1.2	2.1	2.2	1.5
Women with Non-Missing Data	**N**	**605**	**100**	**31**	**32**	**84**	**324**	**27**	**274**	**136**	**43**	**191**	**120**	**126**	**284**	**107**	**-**	**31**	**129**	**-**	**162**	**246**	**267**	**195**	**6075**
Yes	%	26.3	37.0	45.2	40.6	36.9	26.9	-	28.5	25.0	34.9	26.2	45.0	38.9	35.9	37.4	-	-	41.9	-	30.2	38.2	31.8	29.2	32.9
Prior Elective Termination																									
Missing Data	%	0.7	1.6	0.0	0.0	0.0	1.5	0.0	1.1	1.1	0.0	2.8	0.0	0.0	2.0	0.0	-	0.0	0.0	-	0.4	1.2	2.1	2.2	1.5
Women with Non-Missing Data	**N**	**605**	**100**	**31**	**32**	**84**	**324**	**27**	**274**	**136**	**43**	**191**	**120**	**126**	**284**	**107**	**-**	**31**	**129**	**-**	**162**	**246**	**267**	**195**	**6075**
Yes	%	11.7	-	-	-	-	13.0	-	19.3	16.2	-	11.0	20.0	36.5	14.1	21.5	-	-	13.2	-	9.9	14.2	38.2	-	15.1
Prior Still Birth (Fetal Death >= 20 Weeks EGA)																									
Missing Data	%	9.6	8.7	8.3	4.3	2.9	10.4	14.0	15.6	12.9	7.9	11.3	15.1	26.5	11.7	16.5	-	8.1	10.3	-	6.8	12.0	28.3	5.2	12.3
Women with Non-Missing Data	**N**	**534**	**91**	**27**	**30**	**81**	**282**	**20**	**221**	**114**	**38**	**170**	**96**	**82**	**244**	**85**	**-**	**28**	**112**	**-**	**146**	**211**	**166**	**187**	**5162**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Prior Preeclampsia																									
Missing Data	%	32.8	34.6	31.3	37.0	34.6	20.5	22.0	24.9	33.9	33.3	23.9	33.3	41.0	32.8	44.4	-	10.8	30.3	-	33.7	28.7	40.5	33.2	31.5
Women with Non-Missing Data	**N**	**347**	**58**	**16**	**15**	**48**	**234**	**16**	**187**	**75**	**22**	**139**	**67**	**58**	**158**	**48**	**-**	**27**	**79**	**-**	**79**	**157**	**119**	**112**	**3549**
Yes	%	8.6	-	-	-	-	-	-	7.5	-	-	-	-	-	10.1	-	-	-	-	-	13.9	7.6	-	-	6.2
Prior Gestational Diabetes																									
Missing Data	%	31.8	37.0	33.3	34.8	31.7	19.5	24.0	26.8	34.9	36.5	25.9	35.2	42.2	35.5	49.6	-	10.8	28.5	-	36.1	32.1	40.5	31.7	32.4
Women with Non-Missing Data	**N**	**355**	**55**	**15**	**16**	**51**	**239**	**15**	**180**	**73**	**20**	**134**	**64**	**56**	**147**	**41**	**-**	**27**	**82**	**-**	**73**	**146**	**119**	**116**	**3473**
Yes	%	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1
Prior Cervical Incompetence																									
Missing Data	%	36.4	37.0	33.3	39.1	37.5	20.9	24.0	28.1	35.5	36.5	26.3	35.8	43.4	36.4	50.4	-	10.8	31.5	-	38.2	32.4	42.6	35.1	34.0
Women with Non-Missing Data	**N**	**318**	**55**	**15**	**14**	**45**	**232**	**15**	**175**	**72**	**20**	**133**	**63**	**54**	**143**	**40**	**-**	**27**	**77**	**-**	**68**	**145**	**111**	**107**	**3339**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prior Placenta Abnormalities																									
Missing Data	%	35.7	37.0	33.3	39.1	37.5	20.7	24.0	27.6	34.4	36.5	25.1	35.2	43.4	35.9	50.4	-	10.8	30.3	-	36.5	32.4	42.6	35.1	33.6
Women with Non-Missing Data	**N**	**324**	**55**	**15**	**14**	**45**	**233**	**15**	**177**	**74**	**20**	**136**	**64**	**54**	**145**	**40**	**-**	**27**	**79**	**-**	**72**	**145**	**111**	**107**	**3372**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2
Prior Congenital Abnormalities of the Fetus																									
Missing Data	%	35.8	36.2	33.3	37.0	35.6	20.3	24.0	28.1	35.5	34.9	25.9	34.6	41.6	36.4	50.4	-	8.1	30.3	-	36.5	31.2	41.6	33.2	33.2
Women with Non-Missing Data	**N**	**323**	**56**	**15**	**15**	**47**	**235**	**15**	**175**	**72**	**21**	**134**	**65**	**57**	**143**	**40**	**-**	**28**	**79**	**-**	**72**	**149**	**115**	**112**	**3402**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1

Notes: All measures except for prior pregnancy are among women with a prior pregnancy. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who did not have a prior pregnancy. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 9: PRIOR BIRTH OUTCOMES (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Prior Birth																									
Missing Data	%	1.0	-	0.7	1.2	3.5	0.0	0.0	0.0	2.1	10.0	1.6	1.1	0.0	2.5	2.0	0.0	-	1.0	2.7	0.4	1.4	10.9	0.0	1.7
Not in Universe	%	29.4	-	21.8	26.7	28.3	15.4	24.1	37.5	26.9	47.5	23.0	28.9	33.3	32.5	28.0	17.6	-	25.6	26.5	23.8	30.0	26.1	17.4	26.3
Women with Non-Missing Data	**N**	**291**	**-**	**110**	**297**	**236**	**22**	**63**	**-**	**172**	**17**	**95**	**133**	**-**	**78**	**178**	**28**	**-**	**152**	**182**	**388**	**48**	**29**	**19**	**6048**

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Yes	%	88.7	-	88.2	78.8	94.1	86.4	88.9	-	86.0	64.7	84.2	91.0	-	88.5	84.8	85.7	-	90.1	96.7	88.4	81.3	100.0	84.2	88.5
Inter-Pregnancy Interval with Current Pregnancy Since Last Birth																									
Missing Data	%	12.4	-	21.1	11.4	77.7	11.5	21.7	6.3	26.4	37.5	20.6	25.8	0.0	15.0	18.1	5.9	-	24.2	40.5	8.8	15.7	100.0	8.7	24.0
Not in Universe	%	36.4	-	26.1	40.5	17.9	26.9	28.9	31.3	30.2	52.5	32.5	32.1	46.7	36.7	38.2	29.4	-	29.0	20.6	31.8	42.9	0.0	30.4	30.1
Women with Non-Missing Data	**N**	**214**	**-**	**75**	**198**	**15**	**16**	**41**	**-**	**105**	**-**	**59**	**80**	**-**	**58**	**111**	**22**	**-**	**97**	**100**	**304**	**29**	**-**	**14**	**3855**
< 18 months	%	35.5	-	33.3	33.8	-	-	34.1	-	41.0	-	47.5	48.8	-	37.9	27.9	50.0	-	41.2	40.0	34.2	37.9	-	-	35.2
>= 18 months	%	64.5	-	66.7	66.2	80.0	-	65.9	-	59.0	-	52.5	51.3	-	62.1	72.1	50.0	-	58.8	60.0	65.8	62.1	-	85.7	64.8
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Not in Universe	%	38.3	-	31.0	43.2	35.8	26.9	32.5	37.5	38.8	72.5	36.5	36.3	46.7	42.5	40.6	29.4	-	33.8	31.5	33.0	44.3	37.0	30.4	36.3
Women with Non-Missing Data	**N**	**258**	**-**	**97**	**234**	**222**	**19**	**56**	**-**	**147**	**-**	**80**	**121**	**-**	**69**	**151**	**24**	**-**	**137**	**176**	**343**	**39**	**29**	**16**	**5351**
Yes	%	17.8	-	14.4	8.5	13.1	-	-	-	-	-	-	-	-	-	13.2	-	-	12.4	13.6	25.9	-	-	-	13.2
Prior Low Birthweight Infant (< 2,500 Grams)																									
Missing Data	%	0.5	-	0.7	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.8	0.0	0.0	0.0	0.4	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.2
Not in Universe	%	38.3	-	31.0	43.2	35.8	26.9	32.5	37.5	38.8	72.5	36.5	36.3	46.7	42.5	40.6	29.4	-	33.8	31.5	33.0	44.3	37.0	30.4	36.3
Women with Non-Missing Data	**N**	**256**	**-**	**97**	**234**	**222**	**19**	**56**	**-**	**147**	**-**	**79**	**121**	**-**	**69**	**150**	**24**	**-**	**136**	**176**	**343**	**39**	**29**	**16**	**5340**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1

Notes: All measures except for prior birth are among women with a prior birth. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 10: PRIOR BIRTH OUTCOMES (L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Prior Birth																									
Missing Data	%	1.9	3.1	4.2	0.0	0.0	1.7	6.0	1.9	0.0	3.2	2.0	0.6	1.8	0.7	1.5	-	0.0	3.0	-	2.8	0.9	3.6	0.0	1.7
Not in Universe	%	24.0	19.7	35.4	30.4	19.2	30.0	46.0	24.3	26.3	31.7	19.8	24.5	24.1	28.6	19.5	-	16.2	21.8	-	34.5	22.8	29.1	25.0	26.3
Women with Non-Missing Data	**N**	**596**	**98**	**29**	**32**	**84**	**323**	**24**	**270**	**137**	**41**	**193**	**119**	**123**	**289**	**105**	**-**	**31**	**124**	**-**	**156**	**247**	**259**	**201**	**6048**
Yes	%	93.0	91.8	86.2	84.4	91.7	92.6	100.0	87.4	89.1	95.1	89.6	87.4	83.7	90.0	81.9	-	93.5	91.9	-	94.2	84.2	76.1	91.5	88.5

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Inter-Pregnancy Interval with Current Pregnancy Since Last Birth																									
Missing Data	%	32.6	17.3	33.3	8.7	14.4	25.2	88.0	12.3	7.0	14.3	33.6	15.1	18.1	15.9	18.0	-	8.1	45.5	-	43.0	9.3	17.9	18.7	24.0
Not in Universe	%	22.4	24.4	37.5	37.0	21.2	29.6	10.0	33.1	34.4	34.9	20.6	30.2	33.7	33.7	30.8	-	21.6	18.8	-	24.9	32.4	42.9	30.2	30.1
Women with Non-Missing Data	**N**	**362**	**74**	**14**	**25**	**67**	**214**	**-**	**200**	**109**	**32**	**113**	**87**	**80**	**206**	**68**	**-**	**26**	**59**	**-**	**80**	**189**	**151**	**137**	**3855**
< 18 months	%	29.6	44.6	-	-	49.3	34.1	-	30.0	25.7	37.5	37.2	35.6	32.5	40.8	45.6	-	-	35.6	-	21.3	43.9	29.8	27.0	35.2
>= 18 months	%	70.4	55.4	-	64.0	50.7	65.9	-	70.0	74.3	62.5	62.8	64.4	67.5	59.2	54.4	-	65.4	64.4	-	78.8	56.1	70.2	73.0	64.8
Prior Preterm Birth (=>20 Weeks - < 37 Weeks)																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Not in Universe	%	31.1	29.1	47.9	41.3	26.0	36.8	52.0	35.5	34.4	38.1	30.0	34.6	38.0	36.4	35.3	-	21.6	30.9	-	41.0	35.8	48.8	31.3	36.3
Women with Non-Missing Data	**N**	**554**	**90**	**25**	**27**	**76**	**299**	**23**	**236**	**122**	**39**	**173**	**104**	**103**	**260**	**86**	**-**	**29**	**114**	**-**	**147**	**208**	**197**	**184**	**5351**
Yes	%	12.5	-	-	-	-	11.4	-	14.0	9.0	28.2	9.8	12.5	15.5	17.3	-	-	-	11.4	-	13.6	7.7	11.7	20.7	13.2
Prior Low Birthweight Infant (< 2,500 Grams)																									
Missing Data	%	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.3	0.5	0.0	0.0	0.0	0.6	0.5	0.0	-	0.0	0.0	-	0.4	0.0	0.8	0.0	0.2
Not in Universe	%	31.1	29.1	47.9	41.3	26.0	36.8	52.0	35.2	33.9	38.1	30.0	34.6	38.0	36.4	35.3	-	21.6	30.9	-	41.0	35.8	48.3	31.3	36.3
Women with Non-Missing Data	**N**	**553**	**90**	**25**	**27**	**77**	**297**	**24**	**236**	**122**	**39**	**173**	**104**	**102**	**258**	**86**	**-**	**29**	**114**	**-**	**146**	**208**	**196**	**184**	**5340**
Yes	%	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1

Notes: All measures except for prior birth are among women with a prior birth. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (interpregnancy interval). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 11: PRE-PREGNANCY MEDICAL CONDITIONS (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Pregnancy Intention																									
Missing Data	%	5.3	-	16.9	8.3	59.8	0.0	16.9	12.5	23.6	35.0	17.5	12.6	0.0	13.3	12.2	5.9	-	20.3	31.5	4.7	7.1	100.0	0.0	19.1
Women with Non-Missing Data	**N**	**396**	**-**	**118**	**378**	**139**	**26**	**69**	**14**	**185**	**26**	**104**	**166**	**15**	**104**	**223**	**32**	**-**	**165**	**176**	**488**	**65**	**0**	**23**	**6799**
Trying to Become Pregnant	%	30.3	-	51.7	40.7	33.1	-	37.7	-	47.0	57.7	43.3	24.7	-	52.9	39.5	65.6	-	36.4	49.4	37.5	43.1	-	60.9	39.3
Not Trying to Become Pregnant, Not Using Contraception	%	61.1	-	33.1	49.2	59.7	61.5	52.2	-	42.2	-	48.1	74.1	-	31.7	46.2	-	-	55.8	43.2	50.4	47.7	-	-	47.2
Not Trying to Become Pregnant, Sometimes Using Contraception	%	3.0	-	-	2.9	-	-	-	-	-	-	-	-	-	-	4.9	-	-	-	-	2.7	-	-	-	6.8

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Not Trying to Become Pregnant, Using Contraception	%	5.6	-	-	7.1	-	-	-	-	-	-	-	-	-	12.5	9.4	-	-	-	-	9.4	-	-	-	6.8
Diabetes Pre-Pregnancy																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8399**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6
Hypertension Pre-Pregnancy																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8400**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Mother's BMI at First Prenatal Visit																									
Missing Data	%	0.0	-	3.5	2.4	2.3	0.0	2.4	0.0	0.0	0.0	0.0	0.0	53.3	0.8	0.0	0.0	-	15.0	0.4	9.6	0.0	10.9	0.0	3.5
Women with Non-Missing Data	**N**	**418**	**-**	**137**	**402**	**338**	**26**	**81**	**16**	**242**	**40**	**126**	**190**	**-**	**119**	**254**	**34**	**-**	**176**	**256**	**463**	**70**	**41**	**23**	**8115**
Underweight (BMI < 18.5)	%	5.5	-	-	6.7	6.5	-	-	-	5.0	-	-	-	-	-	5.1	-	-	-	-	4.8	-	-	-	4.3
Normal weight (=>18.5 BMI <25)	%	41.4	-	36.5	60.7	39.1	46.2	50.6	68.8	66.9	57.5	47.6	38.9	-	63.9	44.1	52.9	-	47.2	40.6	38.4	58.6	41.5	-	45.5
Overweight (=>25 BMI <30)	%	27.8	-	27.7	20.1	24.9	-	19.8	-	22.7	-	20.6	28.9	-	21.0	23.6	-	-	23.9	24.2	25.5	17.1	-	-	25.6
Obese (=>30 BMI < 40)	%	18.9	-	29.9	11.7	25.1	-	21.0	-	5.4	-	23.0	26.3	-	9.2	22.8	-	-	22.7	27.0	25.1	18.6	-	-	20.6
Very obese (BMI >= 40)	%	6.5	-	-	-	4.4	-	-	-	-	-	-	-	-	-	4.3	-	-	-	4.7	6.3	-	-	-	4.0

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 12: PRE-PREGNANCY MEDICAL CONDITIONS (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Pregnancy Intention																									
Missing Data	%	28.7	15.7	25.0	8.7	13.5	20.9	88.0	10.4	3.8	11.1	30.0	13.2	15.1	11.0	18.8	-	2.7	38.2	-	37.3	8.3	15.1	7.8	19.1
Women with Non-Missing Data	**N**	**573**	**107**	**36**	**42**	**90**	**374**	**-**	**328**	**179**	**56**	**173**	**138**	**141**	**364**	**108**	**-**	**36**	**102**	**-**	**156**	**297**	**327**	**247**	**6799**
Trying to Become Pregnant	%	44.7	41.1	36.1	57.1	40.0	34.8	-	31.4	48.0	28.6	32.9	41.3	36.2	28.3	51.9	-	63.9	43.1	-	16.7	48.1	43.7	41.7	39.3
Not Trying to Become Pregnant, Not Using Contraception	%	42.8	54.2	55.6	38.1	52.2	56.7	-	55.5	38.0	55.4	58.4	50.0	51.1	39.0	35.2	-	-	13.7	-	25.0	38.7	41.3	47.0	47.2

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Not Trying to Become Pregnant, Sometimes Using Contraception	%	2.8	-	-	-	-	2.9	-	-	6.1	-	-	-	-	31.6	-	-	-	43.1	-	48.7	8.4	5.8	-	6.8
Not Trying to Become Pregnant, Using Contraception	%	9.8	-	-	-	-	5.6	-	11.0	7.8	-	-	-	9.9	-	-	-	-	-	-	9.6	4.7	9.2	7.3	6.8
Diabetes Pre-Pregnancy																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**184**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8399**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	-	-	-	-	-	-	-	-	-	0.6
Hypertension Pre-Pregnancy																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**185**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8400**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Mother's BMI at First Prenatal Visit																									
Missing Data	%	1.0	4.7	41.7	4.3	1.9	0.8	6.0	0.3	0.5	68.3	17.4	0.0	12.7	0.7	0.0	-	0.0	0.6	-	3.2	0.0	1.6	0.4	3.5
Women with Non-Missing Data	**N**	**796**	**121**	**28**	**44**	**102**	**469**	**47**	**365**	**185**	**20**	**204**	**159**	**145**	**406**	**133**	**-**	**37**	**164**	**-**	**241**	**324**	**379**	**267**	**8115**
Underweight (BMI < 18.5)	%	3.1	-	-	-	-	3.8	-	3.6	-	-	-	-	-	3.7	-	-	-	-	-	-	5.9	3.2	-	4.3
Normal weight (=>18.5 BMI <25)	%	42.2	51.2	57.1	59.1	56.9	44.1	51.1	34.8	51.9	-	41.7	49.7	45.5	37.7	52.6	-	51.4	51.8	-	39.8	53.1	49.3	33.3	45.5
Overweight (=>25 BMI <30)	%	29.5	24.0	-	-	18.6	26.2	27.7	28.2	22.2	-	29.4	24.5	24.8	24.6	27.1	-	-	25.0	-	24.5	28.4	26.6	31.5	25.6
Obese (=>30 BMI < 40)	%	22.5	20.7	-	-	10.8	19.4	-	26.0	16.8	-	21.1	17.6	22.1	28.1	16.5	-	-	17.1	-	24.1	11.4	18.2	27.7	20.6
Very obese (BMI >= 40)	%	2.6	-	-	-	-	6.4	-	7.4	-	-	-	-	-	5.9	-	-	-	-	-	7.5	-	-	5.6	4.0

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; a response of don't know, unsure, not known, prefer not to answer; or an outlier value (BMI of mother at first prenatal visit). Not in universe includes women for whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 13: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Preeclampsia																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8382**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	-	-	-	1.5
Pregnancy-Related Hypertension																									

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8382**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Gestational Diabetes																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8382**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	2.9
Cervical Incompetence																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Placenta Previa																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Placental Abruption																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8382**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Congenital Abnormalities of the Fetus																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8399**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2
UTI(s) During Last 6 months of Pregnancy																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8382**
Yes	%	-	-	-	-	-	-	-	-	9.2	-	-	-	-	-	4.3	-	-	-	8.3	-	-	-	-	5.1

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 14: PREGNANCY CONDITIONS DEVELOPED DURING STRONG START (L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Preeclampsia																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8382**
Yes	%	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5
Pregnancy-Related Hypertension																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8382**
Yes	%	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3
Gestational Diabetes																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8382**
Yes	%	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	5.2	-	2.9
Cervical Incompetence																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	1.1	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**184**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Placenta Previa																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	1.1	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**184**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Placental Abruption																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8382**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Congenital Abnormalities of the Fetus																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**184**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8399**
Yes	%	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2
UTI(s) During Last 6 months of Pregnancy																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8382**
Yes	%	17.0	-	-	-	-	20.1	-	3.3	-	-	-	-	-	3.4	12.8	-	-	-	-	-	-	-	-	5.1

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 15: TREATMENTS DURING PREGNANCY (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Vaginal Progesterone																									
Missing Data	%	10.5	-	1.4	3.6	6.1	0.0	0.0	6.3	5.4	0.0	7.1	0.0	6.7	1.7	4.3	0.0	-	1.4	2.3	7.2	0.0	2.2	0.0	5.7
Women with Non-Missing Data	**N**	**374**	**-**	**140**	**397**	**325**	**26**	**83**	**15**	**229**	**40**	**117**	**190**	**14**	**118**	**243**	**34**	**-**	**204**	**251**	**475**	**70**	**45**	**23**	**7930**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
17P (Progesterone Injections, Among Women with a Prior Preterm Birth)																									
Missing Data	%	1.9	-	0.7	0.7	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	-	0.5	0.0	1.4	0.0	0.0	0.0	0.7
Not in Universe	%	89.0	-	89.4	95.1	91.6	96.2	92.8	87.5	97.1	97.5	92.9	95.3	100.0	94.2	92.1	85.3	-	91.3	90.7	82.6	100.0	95.7	91.3	91.5
Women with Non-Missing Data	**N**	**38**	**-**	**14**	**17**	**27**	**1**	**6**	**2**	**6**	**1**	**9**	**9**	**0**	**7**	**19**	**5**	**-**	**17**	**24**	**82**	**0**	**2**	**2**	**656**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0
Antenatal Steroids																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8400**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Tocolytics																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	0.0	0.0	0.0	0.3
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**70**	**46**	**23**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 16: TREATMENTS DURING PREGNANCY (L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Vaginal Progesterone																									
Missing Data	%	11.4	1.6	0.0	2.2	1.9	5.3	0.0	4.6	4.8	1.6	4.5	1.3	12.7	11.5	3.0	-	5.4	3.6	-	8.0	2.8	7.5	4.5	5.7
Women with Non-Missing Data	**N**	**712**	**125**	**48**	**45**	**102**	**448**	**50**	**349**	**177**	**62**	**236**	**157**	**145**	**362**	**129**	**-**	**35**	**159**	**-**	**229**	**315**	**356**	**256**	**7930**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
17P (Progesterone Injections, Among Women with a Prior Preterm Birth)																									
Missing Data	%	0.9	0.0	0.0	0.0	0.0	0.2	0.0	0.5	1.1	1.6	0.0	0.0	1.2	2.0	0.0	-	0.0	0.0	-	1.2	0.0	1.3	0.7	0.7
Not in Universe	%	91.4	95.3	93.8	91.3	90.4	92.8	96.0	90.7	93.5	82.5	93.1	91.8	90.4	88.5	92.5	-	97.3	92.1	-	92.0	95.1	93.5	85.8	91.5
Women with Non-Missing Data	**N**	**62**	**6**	**3**	**4**	**10**	**33**	**2**	**32**	**10**	**10**	**17**	**13**	**14**	**39**	**10**	**-**	**1**	**13**	**-**	**17**	**16**	**20**	**36**	**656**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0
Antenatal Steroids																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**185**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8400**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Tocolytics																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	1.1	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.3
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**50**	**365**	**184**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8381**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 17: PRENATAL CARE (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Routine Prenatal Care Provider																									
Missing Data	%	0.2	-	2.1	0.0	0.0	0.0	0.0	0.0	1.2	2.5	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	1.2	0.0	2.9	0.0	0.0	0.4
Women with Non-Missing Data	**N**	**417**	**-**	**139**	**412**	**346**	**26**	**83**	**16**	**239**	**39**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**254**	**512**	**68**	**46**	**23**	**8371**
Obstetrician	%	-	-	11.5	6.1	-	-	-	-	-	-	-	20.5	-	-	-	-	-	-	7.1	12.9	-	-	-	4.9

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Licensed Professional Midwife	%	97.6	-	21.6	-	-	-	95.2	-	-	-	-	78.9	-	-	-	-	-	98.1	-	-	-	71.7	-	19.6
Nurse Practitioner	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Certified Nurse Midwife/Certified Midwife	%	-	-	66.9	93.7	98.6	100.0	-	100.0	100.0	97.4	98.4	-	100.0	100.0	99.6	97.1	-	-	92.5	65.6	98.5	-	95.7	73.8
Family Medicine Physician	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.3	-	-	-	1.6
Other Provider	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Routine Prenatal Care (Individual Visits)																									
Missing Data	%	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8400**
Received Individual Visits	%	99.8	-	99.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	99.5	99.6	100.0	100.0	100.0	100.0	99.8
Average number of individual prenatal visits	Mean	8.5	-	7.0	8.2	7.8	12.1	8.5	8.1	11.0	10.1	12.3	10.6	13.3	10.8	9.6	6.8	-	6.3	10.0	11.1	9.7	10.4	9.2	9.3
Routine Prenatal Care (Group Visits)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**242**	**40**	**126**	**190**	**15**	**120**	**254**	**34**	**-**	**206**	**257**	**512**	**70**	**46**	**23**	**8400**
Received Group Visits	%	-	-	-	-	-	-	19.3	-	-	-	-	-	-	-	10.2	-	-	-	-	-	-	-	-	1.6
Average Number of Group Prenatal Visits	Mean	-	-	-	-	-	-	7.0	-	-	-	-	-	-	-	7.0	-	-	-	-	-	-	-	-	7.0
Care Coordinator Encounters																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	-	1.0	1.2	0.0	2.9	0.0	0.0	0.5
Women with Non-Missing Data	**N**	**418**	**-**	**141**	**412**	**346**	**26**	**83**	**16**	**239**	**40**	**126**	**190**	**15**	**120**	**253**	**34**	**-**	**205**	**254**	**512**	**68**	**46**	**23**	**8367**
Received Care Coordinator Encounters	%	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	100.0	100.0	100.0	92.9	100.0	-	100.0	99.2	100.0	100.0	100.0	100.0	99.5
Average Number of Care Coordinator Encounters	Mean	2.7	-	2.1	3.0	2.4	3.0	4.9	2.6	2.6	3.0	3.8	5.6	2.3	2.9	3.3	3.0	-	3.5	3.6	2.2	4.8	9.1	4.4	3.1
Mental Health Encounters																									
Missing Data	%	10.5	-	1.4	3.6	6.1	0.0	0.0	6.3	4.5	0.0	2.4	0.0	6.7	0.8	3.1	0.0	-	1.4	2.3	7.2	0.0	0.0	0.0	5.1
Women with Non-Missing Data	**N**	**374**	**-**	**140**	**397**	**325**	**26**	**83**	**15**	**231**	**40**	**123**	**190**	**14**	**119**	**246**	**34**	**-**	**204**	**251**	**475**	**70**	**46**	**23**	**7983**
Received Mental Health Encounters	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Average Number of Mental Health Encounters	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doula Encounters																									
Missing Data	%	99.3	-	93.7	82.3	100.0	92.3	97.6	81.3	88.4	87.5	92.9	90.5	100.0	90.8	92.5	94.1	-	98.1	96.9	98.6	94.3	97.8	95.7	92.6
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**73**	**-**	**-**	**-**	**-**	**28**	**-**	**-**	**18**	**-**	**11**	**19**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**618**
Received Doula Encounters	%	-	-	-	100.0	-	-	-	-	100.0	-	-	100.0	-	100.0	100.0	-	-	-	-	-	-	-	-	100.0
Average Number of Doula Encounters	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Health Education																									
Missing Data	%	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Received Health Education, Not Centering	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Health Education Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Home Visits																									
Missing Data	%	93.1	-	78.9	91.3	99.7	30.8	60.2	12.5	50.4	65.0	23.8	14.2	80.0	23.3	27.6	35.3	-	87.9	35.4	85.7	44.3	58.7	100.0	63.3
Women with Non-Missing Data	**N**	**29**	**-**	**30**	**36**	**-**	**18**	**33**	**14**	**120**	**14**	**96**	**163**	**-**	**92**	**184**	**22**	**-**	**25**	**166**	**73**	**39**	**19**	**-**	**3082**
Received Home Visits	%	41.4	-	83.3	72.2	-	61.1	-	100.0	-	78.6	66.7	77.3	-	81.5	35.9	95.5	-	-	92.8	41.1	-	100.0	-	58.7
Average Number of Home Visits	Mean	1.6	-	2.2	1.1	-	1.1	-	1.0	-	1.2	1.0	1.9	-	1.0	1.3	1.2	-	-	1.9	1.1	-	2.7	-	1.4
Self-Care, not Centering																									
Missing Data	%	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Women with Non-Missing Data	**N**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Received Self-Care, Not Centering	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Self-Care Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nutrition Counseling																									
Missing Data	%	10.5	-	1.4	3.6	6.1	0.0	0.0	6.3	4.5	0.0	2.4	0.0	6.7	0.8	3.1	0.0	-	1.4	2.3	7.2	0.0	0.0	0.0	5.1
Women with Non-Missing Data	**N**	**374**	**-**	**140**	**397**	**325**	**26**	**83**	**15**	**231**	**40**	**123**	**190**	**14**	**119**	**246**	**34**	**-**	**204**	**251**	**475**	**70**	**46**	**23**	**7983**
Received Nutrition Counseling	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Nutrition Counseling Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Substance Abuse Services																									
Missing Data	%	10.5	-	1.4	3.6	6.1	0.0	0.0	6.3	4.5	0.0	2.4	0.0	6.7	0.8	3.1	0.0	-	1.4	2.3	7.2	0.0	0.0	0.0	5.1
Women with Non-Missing Data	**N**	**374**	**-**	**140**	**397**	**325**	**26**	**83**	**15**	**231**	**40**	**123**	**190**	**14**	**119**	**246**	**34**	**-**	**204**	**251**	**475**	**70**	**46**	**23**	**7983**
Received Substance Abuse Services	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Substance Abuse Services	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Referrals for High Risk Medical Services																									
Missing Data	%	10.5	-	1.4	3.6	6.1	0.0	0.0	6.3	4.5	0.0	2.4	0.0	6.7	0.8	3.1	0.0	-	1.4	2.3	7.2	0.0	0.0	0.0	5.1
Women with Non-Missing Data	**N**	**374**	**-**	**140**	**397**	**325**	**26**	**83**	**15**	**231**	**40**	**123**	**190**	**14**	**119**	**246**	**34**	**-**	**204**	**251**	**475**	**70**	**46**	**23**	**7983**
Received Referrals for High Risk Medical Services	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Referrals for High Risk Medical Services	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Types of Referrals for High Risk Medical Services (Among Women with Services)																									
Maternal Fetal Specialist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulmonologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endocrinologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cardiologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 18: PRENATAL CARE (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Routine Prenatal Care Provider																									
Missing Data	%	0.0	0.0	0.0	0.0	1.0	0.0	10.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.4
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**103**	**473**	**45**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8371**
Obstetrician	%	7.8	-	-	-	-	3.6	-	-	-	-	-	-	-	12.8	-	-	-	-	-	-	-	8.1	5.2	4.9
Licensed Professional Midwife	%	-	87.4	81.3	76.1	-	-	95.6	-	-	-	-	94.3	-	67.6	-	-	67.6	25.5	-	-	-	-	-	19.6
Nurse Practitioner	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Certified Nurse Midwife/Certified Midwife	%	92.0	9.4	-	-	99.0	96.2	-	95.1	98.9	100.0	98.8	-	99.4	19.7	99.2	-	32.4	70.9	-	97.2	99.1	90.1	94.0	73.8
Family Medicine Physician	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
Other Provider	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
Routine Prenatal Care (Individual Visits)																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**185**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8400**
Received Individual Visits	%	99.8	100.0	100.0	100.0	99.0	99.8	98.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	100.0	-	100.0	99.4	-	100.0	99.7	99.7	99.3	99.8
Average number of individual prenatal visits	Mean	7.9	12.2	5.8	9.0	10.3	9.3	8.4	10.6	12.3	4.4	10.4	11.8	10.2	7.8	11.2	-	10.1	7.9	-	7.4	10.5	9.6	9.2	9.3
Routine Prenatal Care (Group Visits)																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Women with Non-Missing Data	**N**	**804**	**127**	**48**	**46**	**104**	**473**	**50**	**365**	**185**	**63**	**247**	**159**	**166**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**383**	**268**	**8400**
Received Group Visits	%	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
Average Number of Group Prenatal Visits	Mean	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.0
Care Coordinator Encounters																									
Missing Data	%	0.1	0.0	0.0	0.0	1.0	0.6	10.0	0.3	0.5	0.0	0.4	0.0	6.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.8	0.0	0.5
Women with Non-Missing Data	**N**	**803**	**127**	**48**	**46**	**103**	**470**	**45**	**365**	**185**	**63**	**246**	**159**	**156**	**407**	**133**	**-**	**37**	**165**	**-**	**249**	**324**	**382**	**268**	**8367**
Received Care Coordinator Encounters	%	99.8	100.0	100.0	100.0	100.0	99.6	100.0	98.6	100.0	98.4	99.6	100.0	99.4	100.0	100.0	-	100.0	100.0	-	100.0	98.1	100.0	100.0	99.5
Average Number of Care Coordinator Encounters	Mean	2.8	2.6	2.3	2.9	3.0	2.4	2.9	2.9	2.5	2.3	4.9	4.2	1.6	3.1	2.3	-	9.4	6.4	-	3.4	2.6	2.5	3.1	3.1
Mental Health Encounters																									
Missing Data	%	9.7	0.8	0.0	2.2	1.9	4.2	0.0	3.6	4.8	1.6	2.8	0.6	11.4	11.5	0.0	-	5.4	3.6	-	7.6	2.5	7.0	4.1	5.1
Women with Non-Missing Data	**N**	**726**	**126**	**48**	**45**	**102**	**453**	**50**	**353**	**177**	**62**	**240**	**158**	**147**	**362**	**133**	**-**	**35**	**159**	**-**	**230**	**316**	**358**	**257**	**7983**
Received Mental Health Encounters	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Average Number of Mental Health Encounters	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Doula Encounters																									
Missing Data	%	97.1	97.6	100.0	60.9	86.5	61.7	98.0	96.7	100.0	100.0	99.2	90.6	92.2	99.8	74.4	-	100.0	99.4	-	99.2	89.2	91.9	92.2	92.6
Women with Non-Missing Data	**N**	**23**	**-**	**-**	**18**	**14**	**181**	**-**	**12**	**-**	**-**	**-**	**15**	**13**	**-**	**34**	**-**	**-**	**-**	**-**	**-**	**35**	**31**	**21**	**618**
Received Doula Encounters	%	100.0	-	-	100.0	100.0	100.0	-	100.0	-	-	-	100.0	100.0	-	100.0	-	-	-	-	-	100.0	100.0	100.0	100.0
Average Number of Doula Encounters	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Health Education																									
Missing Data	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0
Women with Non-Missing Data	**N**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Received Health Education, Not Centering	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Health Education Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Home Visits																									
Missing Data	%	65.3	25.2	81.3	32.6	37.5	79.9	76.0	26.8	81.7	100.0	87.0	15.1	34.3	100.0	18.8	-	100.0	75.8	-	98.0	21.0	50.6	50.4	63.3
Women with Non-Missing Data	**N**	**279**	**95**	**-**	**31**	**65**	**95**	**12**	**268**	**34**	**-**	**32**	**135**	**109**	**-**	**108**	**-**	**-**	**40**	**-**	**-**	**256**	**190**	**133**	**3082**
Received Home Visits	%	54.1	80.0	-	87.1	92.3	-	-	22.4	73.5	-	-	92.6	50.5	-	43.5	-	-	45.0	-	-	98.4	86.8	35.3	58.7
Average Number of Home Visits	Mean	1.4	1.1	-	1.1	1.2	-	-	1.5	1.0	-	-	2.0	1.0	-	1.2	-	-	1.5	-	-	1.0	1.6	1.6	1.4
Self-Care, not Centering																									
Missing Data	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	100.0	100.0	-	100.0	100.0	100.0	100.0	100.0
Women with Non-Missing Data	**N**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Received Self-Care, Not Centering	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Self-Care Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nutrition Counseling																									
Missing Data	%	9.7	0.8	0.0	2.2	1.9	4.2	0.0	3.6	4.8	1.6	2.8	0.6	11.4	11.5	0.0	-	5.4	3.6	-	7.6	2.5	7.0	4.1	5.1
Women with Non-Missing Data	**N**	**726**	**126**	**48**	**45**	**102**	**453**	**50**	**353**	**177**	**62**	**240**	**158**	**147**	**362**	**133**	**-**	**35**	**159**	**-**	**230**	**316**	**358**	**257**	**7983**
Received Nutrition Counseling	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Nutrition Counseling Sessions	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Substance Abuse Services																									
Missing Data	%	9.7	0.8	0.0	2.2	1.9	4.2	0.0	3.6	4.8	1.6	2.8	0.6	11.4	11.5	0.0	-	5.4	3.6	-	7.6	2.5	7.0	4.1	5.1
Women with Non-Missing Data	**N**	**726**	**126**	**48**	**45**	**102**	**453**	**50**	**353**	**177**	**62**	**240**	**158**	**147**	**362**	**133**	**-**	**35**	**159**	**-**	**230**	**316**	**358**	**257**	**7983**
Received Substance Abuse Services	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Substance Abuse Services	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Referrals for High Risk Medical Services																									
Missing Data	%	9.7	0.8	0.0	2.2	1.9	4.2	0.0	3.6	4.8	1.6	2.8	0.6	11.4	11.5	0.0	-	5.4	3.6	-	7.6	2.5	7.0	4.1	5.1
Women with Non-Missing Data	**N**	**726**	**126**	**48**	**45**	**102**	**453**	**50**	**353**	**177**	**62**	**240**	**158**	**147**	**362**	**133**	**-**	**35**	**159**	**-**	**230**	**316**	**358**	**257**	**7983**
Received Referrals for High Risk Medical Services	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Average Number of Referrals for High Risk Medical Services	Mean	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Types of Referrals for High Risk Medical Services (Among Women with Services)																									
Maternal Fetal Specialist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulmonologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endocrinologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Cardiologist	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes: This table is among all women, but we note that 23 percent of women are reported to have left Strong Start prior to delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. All reported means are among women with a visit or encounter. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 19: DELIVERY INFORMATION (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Induction of Labor, Excluding Planned Cesarean Sections (Among Women Who Delivered, Excluding Planned C sections)																									
Missing Data	%	0.2	-	2.1	0.5	0.0	0.0	2.4	0.0	0.8	0.0	0.8	0.5	0.0	1.7	0.4	0.0	-	0.5	1.2	0.2	0.0	0.0	0.0	0.9
Not in Universe	%	44.7	-	43.0	19.9	48.8	3.8	27.7	12.5	18.2	17.5	12.7	14.7	20.0	5.0	16.9	5.9	-	30.9	30.7	26.2	38.6	41.3	43.5	28.0
Women with Non-Missing Data	**N**	**230**	**-**	**78**	**328**	**177**	**25**	**58**	**14**	**196**	**33**	**109**	**161**	**12**	**112**	**210**	**32**	**-**	**142**	**175**	**377**	**43**	**27**	**13**	**5977**
Yes	%	13.0	-	26.9	10.1	17.5	-	-	-	13.3	-	23.9	24.8	-	19.6	34.8	-	-	-	16.6	47.2	-	-	-	20.7
Induction of Labor with Pitocin (Among Women Who Were Induced)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Not in Universe	%	92.8	-	84.5	92.0	91.0	76.9	94.0	93.8	89.3	82.5	79.4	78.9	93.3	81.7	71.3	88.2	-	94.7	88.7	65.2	87.1	97.8	95.7	85.2
Women with Non-Missing Data	**N**	**30**	**-**	**21**	**33**	**31**	**-**	**-**	**-**	**26**	**-**	**26**	**40**	**-**	**22**	**73**	**-**	**-**	**-**	**29**	**178**	**-**	**-**	**-**	**1237**
Yes	%	-	-	-	54.5	-	-	-	-	69.2	-	-	72.5	-	-	89.0	-	-	-	34.5	35.4	-	-	-	55.4
Place of Delivery																									
Missing Data	%	0.5	-	31.0	2.9	3.5	0.0	0.0	0.0	3.7	2.5	1.6	27.9	0.0	0.0	0.8	11.8	-	2.4	8.9	0.6	5.7	0.0	8.7	4.6
Not in Universe	%	41.6	-	42.3	19.9	45.7	0.0	27.7	12.5	17.8	17.5	11.9	13.2	6.7	3.3	16.1	5.9	-	30.4	30.0	20.7	38.6	41.3	43.5	26.3
Women with Non-Missing Data	**N**	**242**	**-**	**38**	**318**	**176**	**26**	**60**	**14**	**190**	**32**	**109**	**112**	**14**	**116**	**211**	**28**	**-**	**139**	**157**	**403**	**39**	**27**	**11**	**5804**
Hospital	%	67.8	-	57.9	27.4	93.8	57.7	26.7	-	22.1	62.5	28.4	75.0	-	27.6	63.0	-	-	20.1	19.1	87.6	46.2	-	-	49.5
Birth center	%	21.9	-	34.2	69.8	-	42.3	58.3	78.6	76.8	34.4	70.6	-	-	69.0	34.6	60.7	-	77.7	77.7	11.7	53.8	81.5	-	45.5
Home birth	%	10.3	-	-	-	-	-	-	-	-	-	-	20.5	-	-	-	-	-	-	-	-	-	-	-	4.5
Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Delivery Method (Among Women with a Delivery)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.6
Not in Universe	%	41.6	-	42.3	19.9	45.7	0.0	27.7	12.5	17.8	17.5	11.9	13.2	6.7	3.3	16.1	5.9	-	30.4	30.0	20.7	38.6	41.3	43.5	26.3
Women with Non-Missing Data	**N**	**244**	**-**	**81**	**330**	**188**	**26**	**60**	**14**	**199**	**33**	**111**	**165**	**14**	**116**	**213**	**32**	**-**	**143**	**180**	**406**	**43**	**27**	**13**	**6147**
Vaginal	%	77.5	-	84.0	93.9	82.4	76.9	90.0	100.0	91.0	69.7	90.1	82.4	-	94.0	91.1	90.6	-	86.0	88.3	83.0	81.4	88.9	100.0	87.6
C-Section	%	22.5	-	16.0	-	17.6	-	-	-	9.0	-	9.9	17.6	-	-	8.9	-	-	14.0	11.7	17.0	18.6	-	-	12.4
Delivery Method (Among Low Risk Women with a Delivery)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.4
Not in Universe	%	78.7	-	82.4	65.8	80.1	73.1	75.9	68.8	69.4	42.5	69.0	70.0	60.0	60.8	66.5	76.5	-	77.3	81.3	75.2	75.7	78.3	87.0	74.2
Women with Non-Missing Data	**N**	**89**	**-**	**24**	**141**	**69**	**-**	**20**	**-**	**74**	**23**	**39**	**57**	**-**	**47**	**85**	**-**	**-**	**46**	**48**	**127**	**17**	**-**	**-**	**2133**
Vaginal	%	84.3	-	75.0	91.5	81.2	-	80.0	-	83.8	60.9	82.1	86.0	-	91.5	92.9	-	-	73.9	77.1	87.4	64.7	-	-	83.8
C-Section	%	15.7	-	-	8.5	18.8	-	-	-	16.2	-	17.9	-	-	-	-	-	-	26.1	22.9	12.6	-	-	-	16.2
Scheduled C-Section (Among Women with a C-Section)																									
Missing Data	%	7.4	-	7.7	3.2	4.3	0.0	3.6	0.0	3.7	25.0	4.8	13.7	0.0	1.7	3.9	5.9	-	6.3	4.7	3.5	11.4	6.5	0.0	4.5
Not in Universe	%	86.8	-	90.1	95.1	90.5	76.9	92.8	100.0	92.6	75.0	91.3	84.7	66.7	94.2	92.5	91.2	-	89.9	91.8	86.5	88.6	93.5	100.0	90.8
Women with Non-Missing Data	**N**	**24**	**-**	**-**	**-**	**18**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**51**	**-**	**-**	**-**	**394**
Yes	%	54.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.9	-	-	-	35.0
VBAC (Among Women with a Prior C-Section)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Not in Universe	%	92.6	-	95.1	99.8	95.1	88.5	98.8	93.8	100.0	100.0	96.8	91.1	86.7	96.7	94.9	97.1	-	99.0	98.8	90.4	97.1	100.0	100.0	96.2
Women with Non-Missing Data	**N**	**31**	**-**	**-**	**-**	**17**	**-**	**-**	**-**	**-**	**-**	**-**	**17**	**-**	**-**	**13**	**-**	**-**	**-**	**-**	**49**	**-**	**-**	**-**	**315**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.3

Notes: All measures are among women with a delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

[1] Low risk is defined as women with nulliparous, singleton, term births.

TABLE Z. 20: DELIVERY INFORMATION (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Induction of Labor, Excluding Planned Cesarean Sections (Among Women Who Delivered, Excluding Planned C sections)																									
Missing Data	%	0.1	0.8	0.0	0.0	1.0	1.3	0.0	0.5	0.5	0.0	0.0	2.5	0.6	0.5	0.0	-	0.0	0.0	-	0.0	0.3	10.1	0.0	0.9
Not in Universe	%	31.0	18.1	35.4	28.3	21.2	41.4	68.0	16.9	17.7	3.2	14.2	9.4	22.3	38.1	13.5	-	18.9	30.3	-	39.0	13.0	28.1	47.8	28.0
Women with Non-Missing Data	**N**	**554**	**103**	**31**	**33**	**81**	**271**	**16**	**302**	**152**	**61**	**212**	**140**	**128**	**251**	**115**	**-**	**30**	**115**	**-**	**152**	**281**	**238**	**140**	**5977**
Yes	%	31.0	17.5	-	-	-	-	-	21.9	29.6	34.4	5.2	11.4	35.9	-	40.9	-	-	-	-	27.0	21.4	23.5	30.0	20.7
Induction of Labor with Pitocin (Among Women Who Were Induced)																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Not in Universe	%	78.6	85.8	95.8	97.8	90.4	98.3	96.0	81.7	75.3	66.7	95.5	89.9	72.3	97.3	64.7	-	97.3	96.4	-	83.5	81.5	84.9	84.3	85.2
Women with Non-Missing Data	**N**	**172**	**18**	**-**	**-**	**10**	**-**	**-**	**66**	**45**	**-**	**11**	**16**	**46**	**-**	**47**	**-**	**-**	**-**	**-**	**41**	**60**	**56**	**42**	**1237**
Yes	%	76.2	-	-	-	-	-	-	72.7	77.8	-	-	-	76.1	-	76.6	-	-	-	-	46.3	70.0	78.6	71.4	55.4
Place of Delivery																									
Missing Data	%	0.5	4.7	14.6	8.7	1.9	2.3	2.0	3.8	0.5	0.0	0.4	5.0	0.6	0.7	0.8	-	0.0	4.2	-	2.0	1.2	15.3	26.5	4.6
Not in Universe	%	30.1	18.1	35.4	28.3	20.2	41.4	68.0	12.8	12.9	3.2	14.2	9.4	21.1	33.0	12.8	-	16.2	29.7	-	38.2	13.0	27.3	45.1	26.3
Women with Non-Missing Data	**N**	**558**	**98**	**24**	**29**	**81**	**266**	**15**	**305**	**161**	**61**	**211**	**136**	**130**	**271**	**115**	**-**	**31**	**109**	**-**	**149**	**278**	**221**	**76**	**5804**
Hospital	%	68.3	16.3	-	-	22.2	-	-	85.2	75.8	90.2	10.4	18.4	47.7	71.2	54.8	-	-	14.7	-	94.6	33.1	47.5	30.3	49.5
Birth center	%	30.6	76.5	95.8	86.2	76.5	95.5	-	14.1	23.6	-	88.2	40.4	48.5	21.4	45.2	-	-	45.9	-	-	64.7	51.1	68.4	45.5
Home birth	%	-	-	-	-	-	-	-	-	-	-	-	40.4	-	6.6	-	-	51.6	39.4	-	-	-	-	-	4.5
Other	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
Delivery Method (Among Women with a Delivery)																									
Missing Data	%	0.0	0.8	2.1	0.0	1.0	0.4	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	9.4	0.0	0.6
Not in Universe	%	30.1	18.1	35.4	28.3	20.2	41.4	68.0	12.8	12.9	3.2	14.2	9.4	21.1	33.0	12.8	-	16.2	29.7	-	38.2	13.0	27.3	45.1	26.3
Women with Non-Missing Data	**N**	**562**	**103**	**30**	**33**	**82**	**275**	**16**	**318**	**161**	**61**	**212**	**144**	**131**	**272**	**116**	**-**	**31**	**116**	**-**	**154**	**282**	**244**	**147**	**6147**
Vaginal	%	85.9	92.2	83.3	93.9	96.3	99.3	81.3	84.0	88.8	90.2	94.8	91.7	85.5	81.6	88.8	-	87.1	92.2	-	73.4	93.3	91.0	81.0	87.6
C-Section	%	14.1	-	-	-	-	-	-	16.0	11.2	9.8	5.2	8.3	14.5	18.4	11.2	-	-	-	-	26.6	6.7	9.0	19.0	12.4
Delivery Method (Among Low Risk Women with a Delivery)																									
Missing Data	%	0.0	0.8	2.1	0.0	1.0	0.4	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	5.7	0.0	0.4
Not in Universe	%	80.5	78.7	66.7	69.6	80.8	82.7	84.0	71.0	69.9	65.1	74.9	69.8	68.1	76.3	69.2	-	89.2	76.4	-	74.7	67.9	61.8	84.3	74.2
Women with Non-Missing Data	**N**	**157**	**26**	**15**	**14**	**19**	**80**	**-**	**105**	**55**	**22**	**62**	**48**	**53**	**95**	**41**	**-**	**-**	**39**	**-**	**63**	**104**	**125**	**42**	**2133**
Vaginal	%	80.3	80.8	73.3	85.7	100.0	97.5	-	75.2	89.1	86.4	88.7	77.1	79.2	83.2	80.5	-	-	87.2	-	65.1	88.5	88.0	76.2	83.8
C-Section	%	19.7	-	-	-	-	-	-	24.8	-	-	-	22.9	20.8	16.8	-	-	-	-	-	34.9	11.5	12.0	-	16.2
Scheduled C-Section (Among Women with a C-Section)																									
Missing Data	%	6.0	3.1	10.4	4.3	1.0	0.2	6.0	3.0	1.1	9.5	1.2	5.0	6.0	0.5	5.3	-	0.0	4.8	-	12.4	1.2	2.9	6.0	4.5
Not in Universe	%	90.2	93.7	89.6	95.7	97.1	99.6	94.0	85.8	89.8	90.5	95.5	92.5	88.6	87.3	90.2	-	89.2	94.5	-	83.5	94.1	93.8	89.6	90.8
Women with Non-Missing Data	**N**	**31**	**-**	**-**	**-**	**-**	**-**	**-**	**41**	**17**	**-**	**-**	**-**	**-**	**50**	**-**	**-**	**-**	**-**	**-**	**-**	**15**	**13**	**12**	**394**
Yes	%	-	-	-	-	-	-	-	36.6	-	-	-	-	-	42.0	-	-	-	-	-	-	-	-	-	35.0

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
VBAC (Among Women with a Prior C-Section)																									
Missing Data	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.5	0.0	-	0.0	0.0	-	0.0	0.0	0.5	0.0	0.1
Not in Universe	%	96.4	99.2	97.9	100.0	97.1	100.0	100.0	94.3	92.5	90.5	99.6	98.1	95.8	93.4	94.0	-	91.9	98.2	-	94.0	99.1	98.7	94.8	96.2
Women with Non-Missing Data	**N**	**29**	-	-	-	-	-	-	**20**	**13**	-	-	-	-	**25**	-	-	-	-	-	**15**	-	-	**14**	**315**
Yes	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.3

Notes: All measures are among women with a delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or a response of don't know, unsure, not known, prefer not to answer. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).
[1] Low risk is defined as women with nulliparous, singleton, term births.

TABLE Z. 21: BIRTH OUTCOMES (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Outcomes of Strong Start Pregnancy																									
Missing Data	%	40.2	-	41.5	18.2	43.6	0.0	20.5	6.3	15.7	17.5	10.3	11.6	6.7	3.3	15.0	2.9	-	30.0	28.0	15.2	32.9	39.1	43.5	23.8
Women with Non-Missing Data	**N**	**250**	-	**83**	**337**	**195**	**26**	**66**	**15**	**204**	**33**	**113**	**168**	**14**	**116**	**216**	**33**	-	**145**	**185**	**434**	**47**	**28**	**13**	**6407**
Live Birth	%	96.8	-	97.6	97.3	95.9	100.0	90.9	93.3	97.5	100.0	98.2	98.2	100.0	100.0	98.1	97.0	-	98.6	96.8	93.3	91.5	96.4	100.0	96.3
Stillbirth	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Termination	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Miscarriage	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2	-	-	-	3.2
Estimated Gestational Age (EGA) (Among Women with Live Births)																									
Missing Data	%	0.0	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.4	0.0	-	0.5	0.0	0.0	0.0	0.0	0.0	0.6
Not in Universe	%	42.1	-	42.3	20.4	46.0	0.0	27.7	12.5	17.8	17.5	11.9	13.2	6.7	3.3	16.5	5.9	-	30.4	30.4	20.9	38.6	41.3	43.5	26.5
Women with Non-Missing Data	**N**	**242**	-	**81**	**328**	**187**	**26**	**60**	**14**	**199**	**33**	**110**	**165**	**14**	**116**	**211**	**32**	-	**143**	**179**	**405**	**43**	**27**	**13**	**6127**
Very Preterm (20 =< EGA < 34)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
Preterm (34 =< EGA < 37)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1	6.7	-	-	-	3.4
Term (37 =< EGA < 42)	%	90.9	-	91.4	93.0	94.7	96.2	91.7	100.0	94.0	87.9	97.3	93.9	100.0	96.6	97.2	96.9	-	90.9	89.9	91.4	93.0	100.0	100.0	93.5
Post-Term (42+)	%	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Birth Weight (Among Women with Live Births)																									
Missing Data	%	0.2	-	3.5	0.5	9.2	0.0	0.0	0.0	0.0	40.0	0.0	0.0	53.3	0.0	1.2	0.0	-	2.9	3.1	0.0	1.4	0.0	0.0	2.0
Not in Universe	%	42.1	-	42.3	20.4	46.0	0.0	27.7	12.5	17.8	17.5	11.9	13.2	6.7	3.3	16.5	5.9	-	30.4	30.4	20.9	38.6	41.3	43.5	26.5
Women with Non-Missing Data	**N**	**241**	**-**	**77**	**326**	**155**	**26**	**60**	**14**	**199**	**17**	**111**	**165**	**-**	**116**	**209**	**32**	**-**	**138**	**171**	**405**	**42**	**27**	**13**	**6006**
Very Low Birthweight (<1500g)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
Low Birthweight (=>1500g < 2500g)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	3.0
Normal Birthweight (=>2500 < 4000g)	%	84.2	-	83.1	86.2	92.3	76.9	68.3	100.0	88.9	88.2	86.5	87.9	-	87.9	91.9	78.1	-	85.5	87.1	86.7	88.1	74.1	92.3	85.4
Macrosomic Birthweight (=>4000g)	%	11.6	-	-	10.4	-	-	26.7	-	9.5	-	10.8	8.5	-	-	8.1	-	-	8.0	9.9	6.9	-	-	-	11.1

Notes: All measures are among women with a delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 22: BIRTH OUTCOMES (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Outcomes of Strong Start Pregnancy																									
Missing Data	%	27.0	18.1	31.3	28.3	19.2	39.1	66.0	10.4	13.4	3.2	12.1	9.4	19.9	29.8	11.3	-	16.2	27.9	-	32.5	9.6	21.8	40.3	23.8
Women with Non-Missing Data	**N**	**587**	**104**	**33**	**33**	**84**	**288**	**17**	**328**	**161**	**61**	**217**	**144**	**133**	**287**	**118**	**-**	**31**	**119**	**-**	**168**	**293**	**301**	**160**	**6407**
Live Birth	%	95.4	100.0	93.9	100.0	98.8	95.1	88.2	97.0	99.4	100.0	97.7	100.0	98.5	94.4	98.3	-	100.0	97.5	-	91.7	95.9	92.4	91.3	96.3
Stillbirth	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3
Termination	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2
Miscarriage	%	3.7	-	-	-	-	3.8	-	-	-	-	-	-	-	5.2	-	-	-	-	-	7.7	3.8	6.3	7.5	3.2
Estimated Gestational Age (EGA) (Among Women with Live Births)																									
Missing Data	%	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.3	1.1	0.0	0.0	0.0	0.0	1.0	0.0	-	0.0	0.0	-	0.4	0.0	9.1	0.0	0.6
Not in Universe	%	30.3	18.1	35.4	28.3	20.2	42.1	70.0	12.8	13.4	3.2	14.2	9.4	21.1	33.3	12.8	-	16.2	29.7	-	38.2	13.3	27.3	45.5	26.5
Women with Non-Missing Data	**N**	**559**	**104**	**31**	**33**	**83**	**273**	**15**	**318**	**159**	**61**	**212**	**144**	**131**	**269**	**116**	**-**	**31**	**116**	**-**	**153**	**281**	**245**	**146**	**6127**
Very Preterm (20 =< EGA < 34)	%	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0
Preterm (34 =< EGA < 37)	%	5.9	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	-	-	-	-	-	-	3.4
Term (37 =< EGA < 42)	%	90.7	95.2	87.1	100.0	97.6	96.0	100.0	93.1	96.2	88.5	97.2	93.8	97.7	91.8	93.1	-	93.5	89.7	-	94.8	93.6	95.5	93.2	93.5
Post-Term (42+)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Birth Weight (Among Women with Live Births)																									
Missing Data	%	0.5	1.6	12.5	4.3	1.9	1.3	8.0	0.5	3.2	1.6	2.8	0.0	0.0	0.5	0.0	-	2.7	1.2	-	0.8	0.6	9.4	0.4	2.0
Not in Universe	%	30.3	18.1	35.4	28.3	20.2	42.1	70.0	12.8	13.4	3.2	14.2	9.4	21.1	33.3	12.8	-	16.2	29.7	-	38.2	13.3	27.3	45.5	26.5
Women with Non-Missing Data	**N**	**556**	**102**	**25**	**31**	**81**	**268**	**11**	**317**	**155**	**60**	**205**	**144**	**131**	**271**	**116**	**-**	**30**	**114**	**-**	**152**	**279**	**244**	**145**	**6006**
Very Low Birthweight (<1500g)	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
Low Birthweight (=>1500g < 2500g)	%	3.4	-	-	-	-	-	-	4.4	-	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	3.0
Normal Birthweight (=>2500 < 4000g)	%	86.0	77.5	64.0	83.9	80.2	86.9	100.0	87.7	78.7	90.0	84.4	72.9	86.3	87.5	89.7	-	93.3	78.9	-	80.9	86.0	85.2	84.1	85.4
Macrosomic Birthweight (=>4000g)	%	9.7	22.5	-	-	17.3	11.9	-	7.3	18.7	-	12.2	22.2	12.2	6.6	-	-	-	18.4	-	14.5	11.8	13.9	9.7	11.1

Notes: All measures are among women with a delivery. Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn; item nonresponse; or an outlier value (estimated gestational age and birth weight). Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 23: SATISFACTION (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Satisfaction with Prenatal Care																									
Missing Data	%	50.0	-	44.4	25.2	79.8	15.4	63.9	18.8	37.6	57.5	51.6	45.3	33.3	6.7	40.2	8.8	-	54.6	60.3	27.3	47.1	100.0	69.6	47.4
Women with Non-Missing Data	**N**	**209**	**-**	**79**	**308**	**70**	**22**	**30**	**13**	**151**	**17**	**61**	**104**	**-**	**112**	**152**	**31**	**-**	**94**	**102**	**372**	**37**	**-**	**-**	**4425**
Not at All Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slightly Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Moderately Satisfied	%	5.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.8	-	-	-	3.3
Very Satisfied	%	17.7	-	35.4	10.4	20.0	-	-	-	11.9	-	-	52.9	-	-	30.9	-	-	13.8	13.7	26.1	-	-	-	24.7
Extremely Satisfied	%	76.6	-	63.3	86.4	74.3	81.8	93.3	84.6	85.4	-	88.5	43.3	-	91.1	60.5	96.8	-	86.2	84.3	68.5	81.1	-	-	71.6
Satisfaction with Delivery Experience																									
Missing Data	%	50.0	-	45.1	26.5	79.8	15.4	63.9	18.8	38.0	57.5	51.6	45.8	33.3	7.5	39.8	8.8	-	55.1	59.9	27.3	47.1	100.0	65.2	47.5
Women with Non-Missing Data	**N**	**209**	**-**	**78**	**303**	**70**	**22**	**30**	**13**	**150**	**17**	**61**	**103**	**-**	**111**	**153**	**31**	**-**	**93**	**103**	**372**	**37**	**-**	**-**	**4411**
Not at All Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9
Slightly Satisfied	%	6.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.6	-	-	-	2.9
Moderately Satisfied	%	14.8	-	-	8.3	-	-	-	-	9.3	-	-	13.6	-	-	11.1	-	-	-	-	6.5	-	-	-	10.3
Very Satisfied	%	23.0	-	46.2	13.9	28.6	-	-	-	18.0	-	-	52.4	-	27.0	32.7	-	-	16.1	25.2	33.1	-	-	-	28.2
Extremely Satisfied	%	52.2	-	39.7	73.6	60.0	50.0	60.0	92.3	68.0	-	72.1	29.1	-	67.6	51.6	71.0	-	72.0	67.0	54.6	62.2	-	-	56.6

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 24: SATISFACTION (L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Satisfaction with Prenatal Care																									
Missing Data	%	60.9	33.1	47.9	43.5	30.8	48.2	100.0	30.3	33.9	20.6	43.7	15.1	59.6	60.6	56.4	-	35.1	66.1	-	73.5	25.0	55.8	53.0	47.4
Women with Non-Missing Data	**N**	**314**	**85**	**25**	**26**	**72**	**245**	**-**	**255**	**123**	**50**	**139**	**135**	**67**	**161**	**58**	**-**	**24**	**56**	**-**	**66**	**243**	**170**	**126**	**4425**
Not at All Satisfied	%	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slightly Satisfied	%	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4
Moderately Satisfied	%	3.5	-	-	-	-	4.9	-	9.0	-	-	-	-	-	-	-	-	-	-	-	16.7	-	-	-	3.3
Very Satisfied	%	51.0	18.8	-	-	-	31.4	-	43.9	22.0	78.0	7.9	-	28.4	18.6	27.6	-	-	-	-	57.6	13.2	26.5	31.7	24.7
Extremely Satisfied	%	45.5	78.8	64.0	57.7	83.3	63.3	-	45.1	76.4	22.0	89.2	96.3	70.1	81.4	67.2	-	100.0	87.5	-	25.8	86.0	72.9	65.9	71.6
Satisfaction with Delivery Experience																									
Missing Data	%	60.9	35.4	47.9	43.5	30.8	48.2	100.0	29.8	33.9	22.2	44.1	15.7	60.2	60.4	56.4	-	35.1	66.1	-	73.5	25.0	56.6	53.0	47.5
Women with Non-Missing Data	**N**	**314**	**82**	**25**	**26**	**72**	**245**	**-**	**257**	**123**	**49**	**138**	**134**	**66**	**162**	**58**	**-**	**24**	**56**	**-**	**66**	**243**	**167**	**126**	**4411**
Not at All Satisfied	%	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9
Slightly Satisfied	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.6	-	2.9
Moderately Satisfied	%	14.0	-	-	-	-	6.5	-	17.9	-	-	-	-	-	21.0	-	-	-	-	-	27.3	10.3	13.8	13.5	10.3
Very Satisfied	%	42.4	40.2	-	42.3	-	31.4	-	40.1	22.0	81.6	9.4	9.7	30.3	26.5	25.9	-	-	-	-	51.5	23.9	29.3	35.7	28.2
Extremely Satisfied	%	36.9	53.7	68.0	50.0	76.4	58.8	-	36.2	70.7	-	83.3	76.1	54.5	49.4	60.3	-	79.2	80.4	-	19.7	64.2	49.1	47.6	56.6

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 25: BREASTFEEDING (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Breastfeeding Intention at Third Trimester																									
Missing Data	%	32.8	-	33.8	21.1	76.0	3.8	50.6	25.0	40.1	50.0	53.2	28.9	0.0	5.8	27.2	8.8	-	36.7	58.4	29.9	35.7	100.0	39.1	39.6
Women with Non-Missing Data	**N**	**281**	**-**	**94**	**325**	**83**	**25**	**41**	**12**	**145**	**20**	**59**	**135**	**15**	**113**	**185**	**31**	**-**	**131**	**107**	**359**	**45**	**-**	**14**	**5078**
Breastfeed Only	%	65.8	-	85.1	97.2	67.5	96.0	100.0	100.0	96.6	100.0	93.2	86.7	66.7	99.1	90.3	100.0	-	92.4	89.7	52.4	97.8	-	100.0	82.3

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Formula Feed Only	%	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.5	-	-	-	3.7
Both Breast and Formula Feed	%	19.6	-	-	-	15.7	-	-	-	-	-	-	-	-	-	6.5	-	-	-	10.3	17.3	-	-	-	9.7
I Haven't Decided	%	6.4	-	-	-	-	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	15.9	-	-	-	4.4
Breastfeeding Initiation After Delivery																									
Missing Data	%	50.2	-	43.7	24.3	80.9	15.4	60.2	18.8	38.8	60.0	51.6	46.8	46.7	5.8	39.8	8.8	-	55.1	61.1	27.5	48.6	100.0	65.2	47.5
Women with Non-Missing Data	**N**	**208**	**-**	**80**	**312**	**66**	**22**	**33**	**13**	**148**	**16**	**61**	**101**	**-**	**113**	**153**	**31**	**-**	**93**	**100**	**371**	**36**	**-**	**-**	**4413**
Yes	%	88.9	-	93.8	97.4	89.4	100.0	100.0	84.6	98.6	87.5	98.4	97.0	-	100.0	95.4	100.0	-	97.8	95.0	70.4	97.2	-	-	91.8
No	%	9.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27.5	-	-	-	7.4
Prefer Not to Answer	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 26: BREASTFEEDING (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Breastfeeding Intention at Third Trimester																									
Missing Data	%	48.9	26.8	33.3	19.6	35.6	37.6	98.0	34.2	11.3	25.4	30.8	15.7	62.0	46.7	47.4	-	5.4	47.3	-	62.2	22.2	53.2	40.7	39.6
Women with Non-Missing Data	**N**	**411**	**93**	**32**	**37**	**67**	**295**	**-**	**241**	**165**	**47**	**171**	**134**	**63**	**218**	**70**	**-**	**35**	**87**	**-**	**94**	**252**	**180**	**159**	**5078**
Breastfeed Only	%	71.8	98.9	96.9	100.0	97.0	81.4	-	62.7	97.0	83.0	92.4	99.3	79.4	70.2	95.7	-	100.0	97.7	-	51.1	94.8	96.7	56.6	82.3
Formula Feed Only	%	7.8	-	-	-	-	-	-	5.4	-	-	-	-	-	7.3	-	-	-	-	-	-	-	-	-	3.7
Both Breast and Formula Feed	%	19.2	-	-	-	-	15.6	-	26.1	-	-	-	-	-	11.9	-	-	-	-	-	-	-	-	30.2	9.7
I Haven't Decided	%	-	-	-	-	-	-	-	5.8	-	-	-	-	-	10.6	-	-	-	-	-	40.4	-	-	6.9	4.4
Breastfeeding Initiation After Delivery																									
Missing Data	%	60.6	31.5	47.9	41.3	30.8	48.4	100.0	29.5	32.8	20.6	45.7	15.7	60.2	60.4	57.9	-	35.1	65.5	-	73.5	26.9	56.1	53.0	47.5
Women with Non-Missing Data	**N**	**317**	**87**	**25**	**27**	**72**	**244**	**-**	**258**	**125**	**50**	**134**	**134**	**66**	**162**	**56**	**-**	**24**	**57**	**-**	**66**	**237**	**169**	**126**	**4413**
Yes	%	85.8	100.0	100.0	100.0	97.2	94.7	-	90.7	98.4	94.0	96.3	100.0	93.9	92.6	100.0	-	100.0	98.2	-	60.6	99.6	81.7	86.5	91.8
No	%	14.2	-	-	-	-	-	-	9.3	-	-	-	-	-	7.4	-	-	-	-	-	16.7	-	18.3	11.1	7.4
Prefer Not to Answer	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.7	-	-	2.4	0.9

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 27: FAMILY PLANNING (AABC SITES A-K)

Data Elements	N or %	Agape Midwifery Services	Alaska Family Health & Birth Center	Baby Buddies Birth Center at Harmony Health	Best Start Birth Center	Birth & Beyond	Birth & Wellness Center	Birthways Family Birth Center	Boise Women's Health & Birth Center	Breath of Life Women's Health & Birth Center	Brooklyn Birthing Center	Charleston Birth Place	Childbirth Options Birth and Wellness Center	Connecticut Childbirth & Women's Health Institute	Dar a Luz Birth & Health Center	El Rio Birth & Women's Health Center	Footprints in Time Midwifery and Birth Center	Geneva Woods Birth Center	Heart 2 Heart Birth Center	Holy Family Services Birth Center	Infinity Birthing & Wellness Center	Inland Midwife Services	Juneau Family Health & Birth Center	Klamath Women's Clinic & Birth Center	Birth Center Total
Received Birth Control Counseling after Delivery																									
Missing Data	%	51.2	-	45.1	26.0	80.6	15.4	60.2	18.8	38.8	57.5	51.6	47.4	46.7	5.8	40.2	11.8	-	56.0	61.5	27.7	48.6	100.0	65.2	48.1
Women with Non-Missing Data	**N**	**204**	**-**	**78**	**305**	**67**	**22**	**33**	**13**	**148**	**17**	**61**	**100**	**-**	**113**	**152**	**30**	**-**	**91**	**99**	**370**	**36**	**-**	**-**	**4361**
Yes	%	75.5	-	82.1	55.1	83.6	72.7	87.9	84.6	40.5	64.7	65.6	92.0	-	100.0	69.1	90.0	-	87.9	35.4	71.1	88.9	-	-	76.2
No	%	23.5	-	15.4	43.3	-	-	-	-	56.8	-	29.5	-	-	-	19.1	-	-	-	60.6	22.2	-	-	-	20.7
Unsure	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.8	-	-	-	-	6.8	-	-	-	3.1
Reported "Doing Something to Keep from Getting Pregnant" Postpartum																									
Missing Data	%	51.2	-	44.4	25.7	81.8	15.4	60.2	25.0	38.8	57.5	52.4	47.4	46.7	5.8	40.6	11.8	-	56.0	61.9	27.3	48.6	100.0	65.2	48.1
Women with Non-Missing Data	**N**	**204**	**-**	**79**	**306**	**63**	**22**	**33**	**12**	**148**	**17**	**60**	**100**	**-**	**113**	**151**	**30**	**-**	**91**	**98**	**372**	**36**	**-**	**-**	**4365**
Yes	%	77.9	-	84.8	96.4	82.5	77.3	78.8	91.7	78.4	76.5	86.7	97.0	-	94.7	88.1	40.0	-	83.5	70.4	68.0	97.2	-	-	83.7
No	%	19.6	-	15.2	-	-	-	-	-	20.3	-	-	-	-	-	7.3	60.0	-	15.4	23.5	28.8	-	-	-	13.6
Unsure	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.2	-	-	-	2.7
Reported Using Birth Control Postpartum (Among All Women Who Reported Either Doing Something to Keep from Getting Pregnant)																									
Missing Data	%	47.8	-	23.2	24.0	79.2	3.8	60.2	12.5	29.3	55.0	50.0	45.3	0.0	2.5	31.9	8.8	-	52.2	58.8	25.0	47.1	100.0	65.2	42.3
Not in Universe	%	14.1	-	29.6	4.4	5.8	30.8	8.4	18.8	22.7	12.5	8.7	3.7	60.0	8.3	15.7	55.9	-	11.1	14.4	25.6	2.9	0.0	13.0	14.2
Women with Non-Missing Data	**N**	**159**	**-**	**67**	**295**	**52**	**17**	**26**	**11**	**116**	**13**	**52**	**97**	**-**	**107**	**133**	**12**	**-**	**76**	**69**	**253**	**35**	**-**	**-**	**3655**
Female Sterilization	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.7	-	-	-	3.2
Male Sterilization	%	-	-	-	5.1	-	-	-	-	-	-	-	11.3	-	15.0	-	-	-	-	-	-	-	-	-	3.9
LARC - Implant	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8
LARC - IUD	%	-	-	-	29.2	-	-	-	-	-	-	-	-	-	22.4	-	-	-	-	-	-	-	-	-	11.0
Pills	%	15.1	-	-	9.8	-	-	-	-	-	-	-	-	-	12.1	-	-	-	-	-	10.3	-	-	-	8.7
Injection	%	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.5	-	-	-	4.6
Condoms	%	27.7	-	16.4	20.3	-	-	-	-	35.3	-	28.8	62.9	-	24.3	26.3	-	-	42.1	24.6	20.9	45.7	-	-	27.2
Breastfeeding	%	10.7	-	29.9	14.9	-	-	-	-	32.8	-	25.0	-	-	-	9.0	-	-	-	26.1	17.4	-	-	-	12.5
Rhythm or Safe Period	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7
Withdrawal or Pulling Out	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7
Spermicide	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Method	%	19.5	-	-	8.5	-	-	-	-	13.8	-	-	19.6	-	15.0	18.8	-	-	18.4	20.3	16.6	-	-	-	17.0
Method Not Indicated	%	-	-	-	7.5	-	-	-	-	-	-	-	-	-	-	13.5	-	-	-	-	-	-	-	-	3.7

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE Z. 28: FAMILY PLANNING (AABC SITES L-Z)

Data Elements	N or %	Lisa Ross Birth & Women's Center	Mat-Su Midwifery & Family Health	Morning Star Women's Health & Birth Center	Morning Star Women's Health & Birth Center (Duluth)	New Birth Company	North Houston Birth Center	Northern New Mexico Birth Center	PCC Community Wellness Center	PeaceHealth Nurse Midwifery Birth Center	Reading Birth & Women's Center	Rite of Passage Women's Health & Birth Center	Rosemary Birthing Home	Special Beginnings Birth and Women's Center	The Birth Place	The Midwife Center for Birth & Women's Health	The Midwife's Place	Tree of Life & Gynecology Orlando	Tree of Life Birth & Gynecology Center	Trillium Waterbirth Center	Women Care Women's Health & Birth Center	Women's Birth & Wellness Center	Women's Health & Birth Center	Women's Wellness & Maternity Center	Birth Center Total
Received Birth Control Counseling after Delivery																									
Missing Data	%	61.1	33.1	50.0	39.1	32.7	48.6	100.0	29.2	33.9	23.8	45.7	20.8	60.8	61.4	57.1	-	35.1	65.5	-	73.5	27.8	57.4	53.7	48.1
Women with Non-Missing Data	**N**	**313**	**85**	**24**	**28**	**70**	**243**	**-**	**259**	**123**	**48**	**134**	**126**	**65**	**158**	**57**	**-**	**24**	**57**	**-**	**66**	**234**	**164**	**124**	**4361**
Yes	%	90.4	61.2	54.2	75.0	71.4	63.8	-	78.4	85.4	97.9	88.8	62.7	81.5	94.9	94.7	-	100.0	100.0	-	75.8	92.7	66.5	91.1	76.2
No	%	9.3	34.1	-	-	21.4	32.9	-	19.7	13.0	-	9.0	36.5	-	-	-	-	-	-	-	-	5.6	29.3	-	20.7
Unsure	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.7	-	-	-	3.1
Reported "Doing Something to Keep from Getting Pregnant" Postpartum																									
Missing Data	%	60.4	32.3	52.1	43.5	32.7	49.7	100.0	29.5	34.4	22.2	44.9	15.7	60.8	60.9	57.1	-	35.1	65.5	-	73.5	28.1	56.9	54.5	48.1
Women with Non-Missing Data	**N**	**318**	**86**	**23**	**26**	**70**	**238**	**-**	**258**	**122**	**49**	**136**	**134**	**65**	**160**	**57**	**-**	**24**	**57**	**-**	**66**	**233**	**166**	**122**	**4365**
Yes	%	93.7	87.2	78.3	65.4	91.4	65.5	-	82.2	91.0	98.0	77.2	100.0	73.8	78.8	80.7	-	87.5	93.0	-	69.7	97.4	87.3	82.0	83.7
No	%	5.7	-	-	-	-	26.1	-	15.9	-	-	16.9	-	23.1	19.4	-	-	-	-	-	-	-	12.0	13.9	13.6
Unsure	%	-	-	-	-	-	8.4	-	1.9	-	-	-	-	-	-	-	-	-	-	-	24.2	-	-	-	2.7
Reported Using Birth Control Postpartum (Among All Women Who Reported Either Doing Something to Keep from Getting Pregnant)																									
Missing Data	%	59.0	21.3	39.6	28.3	20.2	47.4	100.0	28.4	16.1	17.5	34.4	14.5	39.2	55.7	27.8	-	18.9	64.8	-	67.1	22.2	44.4	52.2	42.3
Not in Universe	%	4.0	19.7	22.9	34.8	18.3	19.7	0.0	13.7	24.2	6.3	23.1	1.3	31.9	13.4	37.6	-	24.3	3.0	-	14.5	7.7	17.9	10.4	14.2
Women with Non-Missing Data	**N**	**298**	**75**	**18**	**17**	**64**	**156**	**-**	**212**	**111**	**48**	**105**	**134**	**48**	**126**	**46**	**-**	**21**	**53**	**-**	**46**	**227**	**145**	**100**	**3655**
Female Sterilization	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.0	3.2
Male Sterilization	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.3	-	-	3.9
LARC - Implant	%	7.0	-	-	-	-	-	-	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8
LARC - IUD	%	4.7	-	-	-	-	-	-	21.2	9.9	-	20.0	9.7	-	11.1	-	-	-	-	-	-	23.3	9.0	-	11.0
Pills	%	9.7	-	-	-	-	-	-	5.2	9.9	-	-	-	-	25.4	-	-	-	-	-	-	6.2	7.6	15.0	8.7
Injection	%	11.4	-	-	-	-	-	-	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.0	4.6
Condoms	%	14.1	-	-	-	46.9	38.5	-	18.4	42.3	-	38.1	8.2	25.0	38.9	30.4	-	-	30.2	-	-	36.1	33.1	19.0	27.2
Breastfeeding	%	-	66.7	-	-	-	16.7	-	6.6	-	-	10.5	-	-	-	-	-	-	-	-	-	11.0	16.6	-	12.5
Rhythm or Safe Period	%	-	-	-	-	-	-	-	-	-	-	-	9.7	-	-	-	-	-	-	-	-	-	-	-	2.7
Withdrawal or Pulling Out	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7
Spermicide	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Method	%	36.2	-	-	-	18.8	14.1	-	20.3	-	-	-	56.7	-	-	-	-	-	-	-	-	7.0	13.1	15.0	17.0
Method Not Indicated	%	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7

Notes: Women with multiple gestations (N=18) have been excluded from these results. Rates of missing data and not in universe are reported based on the share of Strong Start participants with PLPE data. Data may be missing due to a missing form from which a measure is drawn or item nonresponse. Not in universe includes women who whom a measure does not apply, and is defined separately for each measure. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX AA: SPECIAL STUDY – GESTATIONAL DIABETES MELLITUS AND NUTRITION COUNSELING SERVICES

TABLE AA. 1: STRONG START AWARDEE CHARACTERISTICS AND RATE OF GDM

Strong Start Model and Awardee	# Sites	Total # Participants	Analytic Sample	Unadjusted GDM Rate	Adjusted GDM Rate[1]
		N	N	Percent	Percent
Strong Start Program Total	217	44,820	32,259	5.6%	4.3%
Birth Centers (46 Sites)					
American Association of Birth Centers	46	8,408	6,952	2.7%	3.7%
Group Prenatal Care (40 Sites)					
Albert Einstein Healthcare Network	2	1,412	847	2.2%	4.0%
Amerigroup Corporation	7	945	565	4.2%	3.6%
Central Jersey Family Health Consortium	7	1,229	952	8.7%	4.2%
Grady Memorial Hospital Corporation	4	703	270	-	-
Harris County Hospital District	7	1,258	1,011	9.5%	6.0%
Health Insight of Nevada	3	851	356	4.8%	3.8%
University of Kentucky Research Foundation	7	689	655	4.9%	3.8%
University of Puerto Rico Medical Sciences Campus	1	901	753	9.3%	5.3%
University of Tennessee Medical Group	2	730	280	-	-
Maternity Care Homes (94 Sites)					
Access Community Health Network	31	2,630	2,480	8.3%	4.1%
Florida Association of Healthy Start Coalitions	8	1,305	1,188	10.6%	4.9%
Johns Hopkins University	5	1,608	1,389	6.0%	4.2%
Los Angeles County Department of Health Services	6	3,102	2,266	11.3%	5.8%
Maricopa Special Health Care District	5	950	547	5.7%	5.4%
Medical University of South Carolina	5	788	630	8.3%	5.6%
Meridian Health Plan	1	1,787	982	5.8%	4.2%
Mississippi Primary Health Care Association	8	2,566	1,385	3.0%	3.5%
Signature Medical Group	9	1,779	1,196	4.8%	3.5%
St. John Community Health Investment Corp.	4	241	101	-	-
United Neighborhood Health Services	8	1,158	738	5.0%	4.3%
University of Alabama at Birmingham	4	1,280	1,110	7.5%	4.3%
Mixed Models (Maternity Care Home plus Group Prenatal Care, 37 Sites)					
Oklahoma Health Care Authority	8	854	242	4.5%	6.3%
Providence Health Foundation of Providence Hospital[2]	6	3,419	2,870	3.3%	4.1%
Texas Tech University Health Sciences Center	3	1,074	762	2.9%	4.0%
University of South Alabama	9	1,544	1,082	5.5%	4.4%
Virginia Commonwealth University	11	1,609	650	3.8%	4.1%

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).
[1] Adjusted for age, race/ethnicity, body mass index, preexisting and current hypertension, and previous birth complications (GDM, preeclampsia, and miscarriage).
[2] Providence Health Foundation of Providence Hospital also had one birth center site.

TABLE AA. 2: GDM RATE BY STRONG START AWARDEE, ADJUSTED OLS[1]

Strong Start Model and Awardee	GDM Model	
	Coefficient	SE
Total		
Regression Constant	0.009	-0.01
Birth Centers		
American Association of Birth Centers	-0.014	-0.01
Group Prenatal Care		
Albert Einstein Healthcare Network	-0.021	-0.01
Amerigroup Corporation	0.023	-0.01
Central Jersey Family Health Consortium	0.029*	-0.01
Grady Memorial Hospital Corporation DBA Grady Health	-0.027	-0.02
Harris County Hospital District	0.030*	-0.01
HealthInsight of Nevada	0.003	-0.02
University of Kentucky Research Foundation	0.020	-0.02
University of Puerto Rico Medical Sciences Campus	0.030	-0.02
University of Tennessee Medical Group	-0.021	-0.07
Maternity Care Homes		
Access Community Health Network	0.004	-0.01
Florida Association of Healthy Start Coalitions	0.029**	-0.01
Johns Hopkins University	-	-
Los Angeles County Department of Health Services	0.043***	-0.01
Maricopa Special Health Care District	0.016	-0.01
Medical University of South Carolina	0.048**	-0.02
Meridian Health Plan	0.007	-0.01
Mississippi Primary Health Care Association	-0.022	-0.01
Signature Medical Group	-0.028	-0.02
St. John Community Health Investment Corp.	0.092*	-0.04
United Neighborhood Health Services	0.025	-0.02
University of Alabama at Birmingham	0.043***	-0.01
Mixed Models (Maternity Care Home plus Group Prenatal Care)		
Oklahoma Health Care Authority	0.040	-0.02
Providence Health Foundation of Providence Hospital	-0.017	-0.01
Texas Tech University Health Sciences Center	-0.031*	-0.02
University of South Alabama	0.006	-0.01
Virginia Commonwealth University	-0.040	-0.05

Notes: One asterisk (*) indicates significance at the 0.01 level; two asterisks (**) indicate significance at the 0.001 level; and three asterisks (***) indicate significance at the 0.0001 level. A dash (-) indicates the reference category for a variable.
[1] Adjusted for age, race/ethnicity, body mass index, preexisting and current hypertension, and previous birth complications (GDM, preeclampsia, and miscarriage), depressive symptoms, smoking status, and food insecurity.

TABLE AA. 3: GDM RATE BY STRONG START AWARDEE, ADJUSTED OLS[1]

Strong Start Model and Awardee	GDM Model	
	Coefficient	SE
Regression Constant	0.004	-0.01
Nutrition Encounter	0.085***	0.00
Birth Centers		
American Association of Birth Centers	-0.007	-0.01
Group Prenatal Care		
Albert Einstein Healthcare Network	-0.017	-0.01
Amerigroup Corporation	0.013	-0.01
Central Jersey Family Health Consortium	-0.020	-0.01
Grady Memorial Hospital Corporation DBA Grady Health	-0.014	-0.02
Harris County Hospital District	0.034**	-0.01
HealthInsight of Nevada	-0.011	-0.01
University of Kentucky Research Foundation	0.031	-0.02
University of Puerto Rico Medical Sciences Campus	0.023	-0.01
University of Tennessee Medical Group	-0.052	-0.03
Maternity Care Homes		
Access Community Health Network	0.006	-0.01
Florida Association of Healthy Start Coalitions	0.038***	-0.01
Johns Hopkins University	-	-
Los Angeles County Department of Health Services	0.041***	-0.01
Maricopa Special Health Care District	0.019	-0.01
Medical University of South Carolina	0.051***	-0.02
Meridian Health Plan	0.005	-0.01
Mississippi Primary Health Care Association	-0.056***	-0.01
Signature Medical Group	-0.032*	-0.01
St. John Community Health Investment Corp.	0.100*	-0.04
United Neighborhood Health Services	0.020	-0.01
University of Alabama at Birmingham	0.026*	-0.01
Mixed Model (Maternity Care Home plus Group Prenatal Care)		
Oklahoma Health Care Authority	0.018	-0.02
Providence Health Foundation of Providence Hospital	-0.044***	-0.01
Texas Tech University Health Sciences Center	-0.026*	-0.01
University of South Alabama	-0.049***	-0.01
Virginia Commonwealth University	-0.037	-0.05

Notes: One asterisk (*) indicates significance at the 0.01 level; two asterisks (**) indicate significance at the 0.001 level; and three asterisks (***) indicate significance at the 0.0001 level. A dash (-) indicates the reference category for a variable.
[1] Adjusted for age, race/ethnicity, body mass index, preexisting and current hypertension, and previous birth complications (GDM, preeclampsia, and miscarriage).

APPENDIX BB: SPECIAL STUDY – INTEGRATING MENTAL HEALTH SERVICES INTO PRENATAL CARE IN STRONG START MATERNITY CARE HOMES

TABLE BB. 1. CONSTRUCTING THE ANALYTIC SAMPLE FOR BIRTHWEIGHT OUTCOME ONLY

Strong Start MCH Awardee	Observations	Missing Site Visits	Missing Forms		No Birth Outcome	Missing Covariates	Missing Key Independent Variable	Missing Key Outcome	Final Analytic Sample	% Analytic Sample Observations in Full Sample
		Exclude All Participants if a Site Had No Information on the Type of Mental Health Services Provided	Missing Exit Form	Missing Intake Form	Exclude if Miscarriage or Aborted Pregnancy	Exclude if Missing Any Covariates	Exclude if Depression and Anxiety Screening Scores Were Both Missing/Outliers or One Was Missing/Outlier and the Other Was Below the Screening Threshold	Exclude if No Live Birth or Birth Weight Was Missing/ Outlier		
Access Community Health Network	2,629	0	0	6	144	38	172	478	1,791	68.1
Johns Hopkins University	1,608	162	0	2	74	8	32	57	1,273	79.2
Los Angeles County Department of Health Services	3,102	39	0	3	205	28	43	1,005	1,779	57.4
Maricopa Special Health Care District	950	129	0	135	30	5	40	196	415	43.7
Medical University of South Carolina	788	34	0	0	-	4	14	41	688	87.3
Meridian Health Plan	1,787	0	17	8	17	16	89	390	1,250	69.9
Mississippi Primary Health Care Association	2,566	1,724	1	20	41	69	271	155	285	11.1
Oklahoma Health Care Authority	687	36	81	4	20	13	75	315	143	20.8
Providence Health Foundation of Providence Hospital	2,921	0	23	1	86	67	303	459	1,982	67.9
Signature Medical Group	1,779	8	32	54	52	54	402	234	943	53.0
St. John Community Health Investment Corp.	241	10	6	49	-	0	4	52	120	49.8
Texas Tech University Health Sciences Center	1,031	0	4	31	19	63	195	74	645	62.6
United Neighborhood Health Services	1,158	0	1	3	89	21	82	243	719	62.1
University of Alabama at Birmingham	1,280	64	0	0	-	2	73	129	1,008	78.8
University of South Alabama	1,249	11	66	1	93	9	103	151	815	65.3
Virginia Commonwealth University	528	197	0	0	-	34	46	53	193	36.6
Florida Association of Healthy Start Coalitions	1,305	321	0	0	35	5	21	208	715	54.8
Total	**25,609**	**2735**	**231**	**317**	**921**	**436**	**1,965**	**4,240**	**14,764**	**57.7**

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 2. CONSTRUCTING THE ANALYTIC SAMPLE FOR BOTH BIRTHWEIGHT AND PRETERM BIRTH OUTCOMES

Strong Start MCH Awardee	Observations	Missing Site Visits	Missing Forms		No Birth Outcome	Missing Covariates	Missing Key Independent Variable	Missing Key Outcomes	Final Analytic Sample	% Analytic Sample Observations in Full Sample
		Exclude All Participants if a Site Had No Information on the Type of Mental Health Services Provided	Missing Exit Form	Missing Intake Form	Exclude if Miscarriage or Aborted Pregnancy	Exclude if Missing Any Covariates	Exclude if Depression and Anxiety Screening Scores Were Both Missing/Outliers or One Was Missing/Outlier and the Other Was Below the Screening Threshold	Exclude if No Live Birth or Birth Weight Was Missing/ Outlier		
Access Community Health Network	2,629	0	0	6	144	38	172	439	1,830	69.6
Johns Hopkins University	1,608	162	0	2	74	8	32	30	1,300	80.8
Los Angeles County Department of Health Services	3,102	39	0	3	205	28	43	898	1,886	60.8
Maricopa Special Health Care District	950	129	0	135	30	5	40	167	444	46.7
Medical University of South Carolina	788	34	0	0	-	4	14	37	692	87.8
Meridian Health Plan	1,787	0	17	8	17	16	89	93	1,547	86.6
Mississippi Primary Health Care Association	2,566	1,724	1	20	41	69	271	75	365	14.2
Oklahoma Health Care Authority	687	36	81	4	20	13	75	67	391	56.9
Providence Health Foundation of Providence Hospital	2,921	0	23	1	86	67	303	387	2,054	70.3
Signature Medical Group	1,779	8	32	54	52	54	402	164	1,013	56.9
St. John Community Health Investment Corp.	241	10	6	49	-	0	4	27	145	60.2
Texas Tech University Health Sciences Center	1,031	0	4	31	19	63	195	59	660	64.0
United Neighborhood Health Services	1,158	0	1	3	89	21	82	221	741	64.0
University of Alabama at Birmingham	1,280	64	0	0	-	2	73	99	1,038	81.1
University of South Alabama	1,249	11	66	1	93	9	103	144	822	65.8
Virginia Commonwealth University	528	197	0	0	-	34	46	44	202	38.3
Florida Association of Healthy Start Coalitions	1,305	321	0	0	35	5	21	169	754	57.8
Total	**25,609**	**2735**	**231**	**317**	**921**	**436**	**1,965**	**3,120**	**15,884**	**62.0**

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 3: PARTICIPANT CHARACTERISTICS BY TYPE OF MENTAL HEALTH SERVICES PROVIDED BY AWARDEE AND MENTAL HEALTH STATUS, BASED ON THE ANALYTIC SAMPLE FOR BIRTHWEIGHT OUTCOME ONLY

Data Element	Whole Sample (N=14,764)		Receiving Care from Awardees Offering In-House Mental Health Services				Exhibiting Depressive or Anxiety Symptoms			
			Yes (N=6,063)		No (N=8,701)		Yes (N=4,161)		No (N=10,603)	
N or %	N	%	N	%	N	%	N	%	N	%
Ethnicity/Race			Chi-Square = 1,300.0***				Chi-Square = 327.8***			
Hispanic	4,433	30.0	2,724	44.9	1,709	19.6	903	21.7	3,530	33.3
Non-Hispanic White	3,311	22.4	1,123	18.5	2,188	25.2	816	19.6	2,495	23.5
Non-Hispanic African American	6,400	43.4	1,867	30.8	4,533	52.1	2,277	54.7	4,123	38.9
Other	620	4.2	349	5.8	271	3.1	165	4.0	455	4.3
Age			Chi-Square = 246.2***				Chi-Square = 7.0			
< 18 years	768	5.2	253	4.2	515	5.9	233	5.6	535	5.1
18–20 years	2,312	15.7	781	12.9	1,531	17.6	641	15.4	1,671	15.8
21–25 years	4,789	32.4	1,800	29.7	2,989	34.4	1,400	33.7	3,389	32.0
26–34 years	5,454	36.9	2,430	40.1	3,024	34.8	1,498	36.0	3,956	37.3
≥ 35 years	1,441	9.8	799	13.2	642	7.4	389	9.4	1,052	9.9
Education			Chi-Square = 94.6***				Chi-Square = 42.7***			
Less Than High School	4,256	28.8	1,765	29.1	2,491	28.6	1,227	29.5	3,029	28.6
High School or GED	8,095	54.8	3,113	51.3	4,982	57.3	2,349	56.5	5,746	54.2
Bachelor's Degree	511	3.5	277	4.6	234	2.7	87	2.1	424	4.0
Other Degree	1,311	8.9	623	10.3	688	7.9	361	8.7	950	9.0
Unknown Education	591	4.0	285	4.7	306	3.5	137	3.3	454	4.3
Relationship Status			Chi-Square = 297.3***				Chi-Square = 342.8***			
Married	3,114	21.1	1,583	26.1	1,531	17.6	610	14.7	2,504	23.6
Living With Partner	4,654	31.5	2,062	34.0	2,592	29.8	1,164	28.0	3,490	32.9
In a Relationship, Not Living Together	4,160	28.2	1,550	25.6	2,610	30.0	1,250	30.0	2,910	27.5
Not in a Relationship	2,663	18.0	822	13.6	1,841	21.2	1,070	25.7	1,593	15.0
Unknown Relationship Status	173	1.2	46	0.8	127	1.5	67	1.6	106	1.0
Employment/School			Chi-Square = 24.0***				Chi-Square = 27.8***			
Working, Not in School	5,125	34.7	2,184	36.0	2,941	33.8	1,330	32.0	3,795	35.8
In School, Not Work	1,665	11.3	599	9.9	1,066	12.3	471	11.3	1,194	11.3
Working and in School	765	5.2	307	5.1	458	5.3	198	4.8	567	5.4
Neither Working nor in School	6,996	47.4	2,891	47.7	4,105	47.2	2,090	50.2	4,906	46.3
Unknown Employment/School Status	213	1.4	82	1.4	131	1.5	72	1.7	141	1.3
Prior Preterm Birth			Chi-Square = 9.5**				Chi-Square = 47.8***			
No	7,172	48.6	2,946	48.6	4,226	48.6	1,986	47.7	5,186	48.9
Yes	2,266	15.4	870	14.4	1,396	16.0	771	18.5	1,495	14.1
No Prior Birth	5,326	36.1	2,247	37.1	3,079	35.4	1,404	33.7	3,922	37.0
Prior Low Birth Weight			Chi-Square = 28.6				Chi-Square = 74.8***			
No	6,866	46.5	2,835	46.8	4,031	46.3	2,041	49.1	4,825	45.5
Yes	1,251	8.5	528	8.7	723	8.3	435	10.5	816	7.7
No Prior Birth	5,326	36.1	2,247	37.1	3,079	35.4	1,404	33.7	3,922	37.0
Prior Low Birth Weight Unknown	1,321	9.0	453	7.5	868	10.0	281	6.8	1,040	9.8
Prior C-Section			Chi-Square = 31.1***				Chi-Square = 20.7***			
Prior Non-C-Section Birth	6,835	46.3	2,653	43.8	4,182	48.1	1,945	46.7	4,890	46.1
Prior C-Section Birth	2,603	17.6	1,163	19.2	1,440	16.6	812	19.5	1,791	16.9
No Prior Birth	5,326	36.1	2,247	37.1	3,079	35.4	1,404	33.7	3,922	37.0

Data Element	Whole Sample (N=14,764)		Receiving Care from Awardees Offering In-House Mental Health Services				Exhibiting Depressive or Anxiety Symptoms			
			Yes (N=6,063)		No (N=8,701)		Yes (N=4,161)		No (N=10,603)	
Interpregnancy Interval			**Chi-Square = 260.3*** **				**Chi-Square = 14.9** **			
< 18 Months	2,016	13.7	683	11.3	1,333	15.3	582	14.0	1,434	13.5
≥ 18 Months	5,593	37.9	2,096	34.6	3,497	40.2	1,622	39.0	3,971	37.5
No Prior Birth	5,326	36.1	2,247	37.1	3,079	35.4	1,404	33.7	3,922	37.0
IPI Unknown	1,829	12.4	1,037	17.1	792	9.1	553	13.3	1,276	12.0
Experiencing Food Insecurity			**Chi-Square = 8.9***				**Chi-Square = 954.0*** **			
No	11,429	77.4	4,669	77.0	6,760	77.7	2,587	62.2	8,842	83.4
Yes	2,624	17.8	1,064	17.6	1,560	17.9	1,383	33.2	1,241	11.7
Unknown Food Insecurity	711	4.8	330	5.4	381	4.4	191	4.6	520	4.9
Pregnancy Intent			**Chi-Square = 173.2*** **				**Chi-Square = 104.6*** **			
Unintended Pregnancy	10,481	71.0	3,982	65.7	6,499	74.7	3,177	76.4	7,304	68.9
Intended Pregnancy	4,057	27.5	2,012	33.2	2,045	23.5	900	21.6	3,157	29.8
Unknown Pregnancy Intent	226	1.5	69	1.1	157	1.8	84	2.0	142	1.3
Pre-Pregnancy Hypertension			**Chi-Square = 187.0*** **				**Chi-Square = 75.0*** **			
No	12,739	86.3	5,461	90.1	7,278	83.7	3,662	88.0	9,077	85.6
Yes	1,028	7.0	393	6.5	635	7.3	332	8.0	696	6.6
Missing	997	6.8	209	3.5	788	9.1	167	4.0	830	7.8
Pre-Pregnancy Diabetes			**Chi-Square = 274.1*** **				**Chi-Square = 32.3*** **			
No	13,038	88.3	5,606	92.5	7,432	85.4	3,752	90.2	9,286	87.6
Yes	528	3.6	235	3.9	293	3.4	156	3.8	372	3.5
Missing	1,198	8.1	222	3.7	976	11.2	253	6.1	945	8.9
BMI at First Prenatal Visit			**Chi-Square = 245.3*** **				**Chi-Square = 39.8*** **			
Underweight (< 18.5 BMI)	346	2.3	143	2.4	203	2.3	107	2.6	239	2.3
Normal Weight (≥ 18.5 and < 25 BMI)	4,049	27.4	1,647	27.2	2,402	27.6	1,171	28.1	2,878	27.1
Overweight (≥ 25 and < 30 BMI)	3,463	23.5	1,584	26.1	1,879	21.6	965	23.2	2,498	23.6
Obese (≥ 30 and < 40 BMI)	3,932	26.6	1,741	28.7	2,191	25.2	1,122	27.0	2,810	26.5
Very Obese (≥40 BMI)	1,392	9.4	573	9.5	819	9.4	444	10.7	948	8.9
Missing	1,582	10.7	375	6.2	1,207	13.9	352	8.5	1,230	11.6
Smoked Cigarettes			**Chi-Square = 161.6*** **				**Chi-Square = 248.1*** **			
No	12,437	84.2	5,384	88.8	7,053	81.1	3,193	76.7	9,244	87.2
Yes	1,757	11.9	507	8.4	1,250	14.4	736	17.7	1,021	9.6
Unknown Smoking Status	570	3.9	172	2.8	398	4.6	232	5.6	338	3.2
Ever Experienced Intimate Partner Violence (IPV)			**Chi-Square = 0.5**				**Chi-Square = 842.8*** **			
No	11,802	79.9	4,856	80.1	6,946	79.8	2,703	65.0	9,099	85.8
Yes	2,768	18.8	1,124	18.5	1,644	18.9	1,397	33.6	1,371	12.9
Unknown IPV	194	1.3	83	1.4	111	1.3	61	1.5	133	1.3
Birth Year			**Chi-Square = 184.2*** **				**Chi-Square = 13.7** **			
2013 or 2014	3,332	22.6	1,106	18.2	2,226	25.6	1,017	24.4	2,315	21.8
2015	6,020	40.8	2,437	40.2	3,583	41.2	1,688	40.6	4,332	40.9
2016 or 2017	4,992	33.8	2,271	37.5	2,721	31.3	1,347	32.4	3,645	34.4
Unknown Birth Year	420	2.8	249	4.1	171	2.0	109	2.6	311	2.9

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level.

TABLE BB. 4: PARTICIPANT CHARACTERISTICS BY TYPE OF MENTAL HEALTH SERVICES PROVIDED BY AWARDEE AND MENTAL HEALTH STATUS, BASED ON THE ANALYTIC SAMPLE FOR BOTH BIRTHWEIGHT AND PRETERM BIRTH OUTCOMES

Data Element	Whole Sample (N = 15,884)		Receiving Care from Awardees Offering In-House Mental Health Services				Exhibiting Depressive or Anxiety Symptoms			
			Yes (N = 6,553)		No (N = 9,331)		Yes (N = 4,462)		No (N = 11,422)	
N or %	N	%	N	%	N	%	N	%	N	%
Ethnicity/Race			Chi-Square = 1,400.0***				Chi-Square = 362.1***			
Hispanic	4,716	29.7	2,938	44.8	1,778	19.1	962	21.6	3,754	32.9
Non-Hispanic White	3,744	23.6	1,252	19.1	2,492	26.7	903	20.2	2,841	24.9
Non-Hispanic African American	6,743	42.5	1,974	30.1	4,769	51.1	2,409	54.0	4,334	37.9
Other	681	4.3	389	5.9	292	3.1	188	4.2	493	4.3
Age			Chi-Square = 234.2***				Chi-Square = 6.1			
< 18 years	822	5.2	277	4.2	545	5.8	245	5.5	577	5.1
18–20 years	2,487	15.7	867	13.2	1,620	17.4	691	15.5	1,796	15.7
21–25 years	5,200	32.7	1,972	30.1	3,228	34.6	1,512	33.9	3,688	32.3
26–34 years	5,849	36.8	2,591	39.5	3,258	34.9	1,600	35.9	4,249	37.2
≥ 35 years	1,526	9.6	846	12.9	680	7.3	414	9.3	1,112	9.7
Education			Chi-Square = 101.6***				Chi-Square = 47.5***			
Less Than High School	4,589	28.9	1,926	29.4	2,663	28.5	1,332	29.9	3,257	28.5
High School or GED	8,690	54.7	3,350	51.1	5,340	57.2	2,506	56.2	6,184	54.1
Bachelor's Degree	553	3.5	299	4.6	254	2.7	95	2.1	458	4.0
Other Degree	1,415	8.9	659	10.1	756	8.1	386	8.7	1,029	9.0
Unknown Education	637	4.0	319	4.9	318	3.4	143	3.2	494	4.3
Relationship Status			Chi-Square = 296.3***				Chi-Square = 366.0***			
Married	3,381	21.3	1,710	26.1	1,671	17.9	661	14.8	2,720	23.8
Living With Partner	5,018	31.6	2,229	34.0	2,789	29.9	1,251	28.0	3,767	33.0
In a Relationship, Not Living Together	4,433	27.9	1,663	25.4	2,770	29.7	1,333	29.9	3,100	27.1
Not in a Relationship	2,862	18.0	896	13.7	1,966	21.1	1,146	25.7	1,716	15.0
Unknown Relationship Status	190	1.2	55	0.8	135	1.5	71	1.6	119	1.0
Employment/School			Chi-Square = 24.8***				Chi-Square = 33.9***			
Working, Not in School	5,498	34.6	2,351	35.9	3,147	33.7	1,408	31.6	4,090	35.8
In School, Not Work	1,779	11.2	643	9.8	1,136	12.2	511	11.5	1,268	11.1
Working and in School	831	5.2	346	5.3	485	5.2	214	4.8	617	5.4
Neither Working nor in School	7,544	47.5	3,122	47.6	4,422	47.4	2,252	50.5	5,292	46.3
Unknown Employment/School Status	232	1.5	91	1.4	141	1.5	77	1.7	155	1.4
Prior Preterm Birth			Chi-Square = 15.3***				Chi-Square = 51.2***			
No	7,709	48.5	3,160	48.2	4,549	48.8	2,114	47.4	5,595	49.0
Yes	2,422	15.3	927	14.2	1,495	16.0	824	18.5	1,598	14.0
No Prior Birth	5,753	36.2	2,466	37.6	3,287	35.2	1,524	34.2	4,229	37.0
Prior Low Birth Weight			Chi-Square = 11.6**				Chi-Square = 71.5***			
No	7,227	45.5	2,928	44.7	4,299	46.1	2,135	47.9	5,092	44.6
Yes	1,318	8.3	543	8.3	775	8.3	455	10.2	863	7.6
No Prior Birth	5,753	36.2	2,466	37.6	3,287	35.2	1,524	34.2	4,229	37.0
Prior Low Birth Weight Unknown	1,586	10.0	616	9.4	970	10.4	348	7.8	1,238	10.8
Prior C-Section			Chi-Square = 32.1***				Chi-Square = 18.3***			
Prior Non-C-Section Birth	7,443	46.9	2,899	44.2	4,544	48.7	2,106	47.2	5,337	46.7
Prior C-Section Birth	2,688	16.9	1,188	18.1	1,500	16.1	832	18.7	1,856	16.3
No Prior Birth	5,753	36.2	2,466	37.6	3,287	35.2	1,524	34.2	4,229	37.0

Data Element	Whole Sample (N = 15,884)		Receiving Care from Awardees Offering In-House Mental Health Services				Exhibiting Depressive or Anxiety Symptoms			
			Yes (N = 6,553)		No (N = 9,331)		Yes (N = 4,462)		No (N = 11,422)	
Interpregnancy Interval			Chi-Square = 270.8***				Chi-Square = 12.5**			
< 18 Months	2,204	13.9	747	11.4	1,457	15.6	632	14.2	1,572	13.8
≥ 18 Months	5,992	37.7	2,250	34.3	3,742	40.1	1,727	38.7	4,265	37.3
No Prior Birth	5,753	36.2	2,466	37.6	3,287	35.2	1,524	34.2	4,229	37.0
IPI Unknown	1,935	12.2	1,090	16.6	845	9.1	579	13.0	1,356	11.9
Experiencing Food Insecurity			Chi-Square = 13.0**				Chi-Square = 1100.0***			
No	12,301	77.4	5,025	76.7	7,276	78.0	2,769	62.1	9,532	83.5
Yes	2,818	17.7	1,165	17.8	1,653	17.7	1,491	33.4	1,327	11.6
Unknown Food Insecurity	765	4.8	363	5.5	402	4.3	202	4.5	563	4.9
Pregnancy Intent			Chi-Square = 190.0***				Chi-Square = 106.5***			
Unintended Pregnancy	11,306	71.2	4,310	65.8	6,996	75.0	3,410	76.4	7,896	69.1
Intended Pregnancy	4,341	27.3	2,168	33.1	2,173	23.3	965	21.6	3,376	29.6
Unknown Pregnancy Intent	237	1.5	75	1.1	162	1.7	87	2.0	150	1.3
Pre-Pregnancy Hypertension			Chi-Square = 42.1***				Chi-Square = 63.2***			
No	13,436	84.6	5,683	86.7	7,753	83.1	3,845	86.2	9,591	84.0
Yes	1,083	6.8	406	6.2	677	7.3	352	7.9	731	6.4
Missing	1,365	8.6	464	7.1	901	9.7	265	5.9	1,100	9.6
Pre-Pregnancy Diabetes			Chi-Square = 86.5***				Chi-Square = 28.9***			
No	13,754	86.6	5,833	89.0	7,921	84.9	3,946	88.4	9,808	85.9
Yes	554	3.5	242	3.7	312	3.3	164	3.7	390	3.4
Missing	1,576	9.9	478	7.3	1,098	11.8	352	7.9	1,224	10.7
BMI at First Prenatal Visit			Chi-Square = 124.0***				Chi-Square = 46.9***			
Underweight (< 18.5 BMI)	359	2.3	149	2.3	210	2.3	108	2.4	251	2.2
Normal Weight (≥ 18.5 and < 25 BMI)	4,244	26.7	1,715	26.2	2,529	27.1	1,227	27.5	3,017	26.4
Overweight (≥ 25 and < 30 BMI)	3,613	22.8	1,639	25.0	1,974	21.2	1,005	22.5	2,608	22.8
Obese (≥ 30 and < 40 BMI)	4,147	26.1	1,817	27.7	2,330	25.0	1,191	26.7	2,956	25.9
Very Obese (≥40 BMI)	1,463	9.2	591	9.0	872	9.4	469	10.5	994	8.7
Missing	2,058	13.0	642	9.8	1,416	15.2	462	10.4	1,596	14.0
Smoked Cigarettes			Chi-Square = 185.4***				Chi-Square = 262.4***			
No	13,355	84.1	5,818	88.8	7,537	80.8	3,416	76.6	9,939	87.0
Yes	1,930	12.2	551	8.4	1,379	14.8	803	18.0	1,127	9.9
Unknown Smoking Status	599	3.8	184	2.8	415	4.5	243	5.5	356	3.1
Ever Experienced Intimate Partner Violence (IPV)			Chi-Square = 0.3				Chi-Square = 915.6***			
No	12,637	79.6	5,213	79.6	7,424	79.6	2,871	64.3	9,766	85.5
Yes	3,042	19.2	1,252	19.1	1,790	19.2	1,526	34.2	1,516	13.3
Unknown IPV	205	1.3	88	1.3	117	1.3	65	1.5	140	1.2
Birth Year			Chi-Square = 315.1***				Chi-Square = 12.4**			
2013 or 2014	3,653	23.0	1,146	17.5	2,507	26.9	1,101	24.7	2,552	22.3
2015	6,416	40.4	2,559	39.1	3,857	41.3	1,801	40.4	4,615	40.4
2016 or 2017	5,395	34.0	2,599	39.7	2,796	30.0	1,451	32.5	3,944	34.5
Unknown Birth Year	420	2.6	249	3.8	171	1.8	109	2.4	311	2.7

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level.

TABLE BB. 5: PERCENT OF STUDY PARTICIPANTS EXHIBITING DEPRESSIVE OR ANXIETY SYMPTOMS AND RECEIVING ENHANCED MENTAL HEALTH SERVICES, BY MCH AWARDEE, BASED ON THE ANALYTIC SAMPLE FOR BIRTHWEIGHT OUTCOME ONLY

MCH Awardee	Service Type	Sites	Participants	Women Exhibiting Depressive or Anxiety Symptoms		Women Receiving Enhanced Mental Health Services[1]	
				N	%	N	%
Signature Medical Group	In-House	8	943	271	28.7	176	64.9
Medical University of South Carolina	In-House	3	688	91	13.2	42	46.2
Los Angeles County Department of Health Services	In-House	5	1,779	413	23.2	92	22.3
Access Community Health Network	In-House	31	1,791	470	26.2	90	19.2
United Neighborhood Health Services	In-House	8	719	99	13.8	15	15.2
Oklahoma Health Care Authority	In-House	3	143	21	14.7	-	-
University of Alabama at Birmingham	Referral	3	1,008	549	54.5	82	14.9
Virginia Commonwealth University	Referral	3	193	90	46.6	12	13.3
Johns Hopkins University	Referral	3	1,273	451	35.4	47	10.4
Providence Health Foundation of Providence Hospital	Referral	3	1,982	599	30.2	33	5.5
Meridian Health Plan	Referral	1	1,250	118	9.4	-	-
Mississippi Primary Health Care Association	Referral	2	285	138	48.4	-	-
Texas Tech University Health Sciences Center	Referral	2	645	190	29.5	-	-
Maricopa Special Health Care District	Referral	3	415	57	13.7	-	-
St. John Community Health Investment Corp.	Referral	2	120	52	43.3	-	-
University of South Alabama	Referral	4	815	291	35.7	-	-
Florida Association of Healthy Start Coalitions	Referral	5	715	261	36.5	-	-
Overall	**N/A**	**89**	**14,764**	**4,161**	**28.2**	**599**	**14.4**

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).
[1] These were results among participants exhibiting depressive or anxiety symptoms.

TABLE BB. 6: PERCENT OF STUDY PARTICIPANTS EXHIBITING DEPRESSIVE OR ANXIETY SYMPTOMS AND RECEIVING ENHANCED MENTAL HEALTH SERVICES, BY MCH AWARDEE, BASED ON THE ANALYTIC SAMPLE FOR BOTH BIRTHWEIGHT AND PRETERM BIRTH OUTCOMES

MCH Awardee	Service Type	Sites	Participants	Women Exhibiting Depressive or Anxiety Symptoms		Women Receiving Enhanced Mental Health Services[1]	
				N	%	N	%
Signature Medical Group	In-House	8	1,013	288	28.4	188	65.3
Medical University of South Carolina	In-House	3	692	91	13.2	42	46.2
Los Angeles County Department of Health Services	In-House	5	1,886	437	23.2	97	22.2
Access Community Health Network	In-House	31	1,830	486	26.6	94	19.3
United Neighborhood Health Services	In-House	8	741	105	14.2	16	15.2
Oklahoma Health Care Authority	In-House	3	391	84	21.5	-	-
University of Alabama at Birmingham	Referral	3	1,038	571	55.0	84	14.7
Virginia Commonwealth University	Referral	3	202	91	45.1	12	13.2
Johns Hopkins University	Referral	3	1,300	461	35.5	47	10.2

MCH Awardee	Service Type	Sites	Participants	Women Exhibiting Depressive or Anxiety Symptoms		Women Receiving Enhanced Mental Health Services[1]	
				N	%	N	%
Meridian Health Plan	Referral	1	1,547	156	10.1	12	7.7
Providence Health Foundation of Providence Hospital	Referral	3	2,054	626	30.5	34	5.4
Mississippi Primary Health Care Association	Referral	2	365	180	49.3	-	-
Texas Tech University Health Sciences Center	Referral	2	660	194	29.4	-	-
Maricopa Special Health Care District	Referral	3	444	59	13.3	-	-
St. John Community Health Investment Corp.	Referral	2	145	63	43.5	-	-
University of South Alabama	Referral	4	822	294	35.8	-	-
Florida Association of Healthy Start Coalitions	Referral	5	754	276	36.6	-	-
Overall	**N/A**	**89**	**15,884**	**4,462**	**28.1**	**631**	**14.1**

Notes: A dash (-) indicates a censored cell due to small sample size (N<11).
[1] These were results among participants exhibiting depressive or anxiety symptoms.

TABLE BB. 7: IMPACT OF DEPRESSION OR ANXIETY AND MENTAL HEALTH SERVICE TYPE ON LOW BIRTH WEIGHT, ODDS RATIOS FROM LOGISTIC REGRESSION MODELS

Independent Variables	Unadjusted			Adjusted		
	Odds Ratio	95% Confidence Interval	% Low Birth Weight	Odds Ratio	95% Confidence Interval	% Low Birth Weight
Model 1: Impact of Depression or Anxiety on Low Birth Weight						
Women Exhibiting Depressive or Anxiety Symptoms						
No	1.00	-	9.6	1.00	-	8.5
Yes	1.37***	1.19, 1.57	12.7	1.19**	1.04, 1.35	9.9
Model 2: Impact of Mental Health Service Type on Low Birth Weight						
Service Type for Women Not Exhibiting Depressive or Anxiety Symptoms						
In-house service available	1.00	-	9.7	1.00	-	9.0
Exclusively by referral	0.98	0.71, 1.35	9.5	0.89	0.71, 1.11	8.1
Service Type for Women Exhibiting Depressive or Anxiety Symptoms						
In-house service available	1.00	-	9.8	1.00	-	8.1
Exclusively by referral	1.51*	1.09, 2.10	14.1	1.36*	1.04, 1.76	10.7

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 8: IMPACT OF DEPRESSION OR ANXIETY AND MENTAL HEALTH SERVICE TYPE ON PRETERM BIRTH, ODDS RATIOS FROM LOGISTIC REGRESSION MODELS

Independent Variables	Unadjusted			Adjusted		
	Odds Ratio	95% Confidence Interval	% Preterm Birth	Odds Ratio	95% Confidence Interval	% Preterm Birth
Model 1: Impact of Depression or Anxiety on Preterm Birth						
Women Exhibiting Depressive or Anxiety Symptoms						
No	1.00	-	12.2	1.00	-	11.0
Yes	1.29***	1.10, 1.51	15.2	1.19*	1.04, 1.38	12.9
Model 2: Impact of Mental Health Service Type on Preterm Birth						
Service Type for Women Not Exhibiting Depressive or Anxiety Symptoms						
In-house service available	1.00	-	13.6	1.00	-	12.5
Exclusively by referral	0.79	0.61, 1.03	11.1	0.77**	0.64, 0.93	9.9
Service Type for Women Exhibiting Depressive or Anxiety Symptoms						
In-house service available	1.00	-	14.3	1.00	-	12.7
Exclusively by referral	1.10	0.76, 1.60	15.6	1.02	0.76, 1.36	12.9

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 9: THE EFFECT OF DEPRESSION OR ANXIETY ON BIRTH OUTCOMES, UNADJUSTED LOGISTIC REGRESSION

Independent Variables	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Exhibiting Depressive or Anxiety Symptoms				
No	1.00	-	1.00	-
Yes	1.37***	1.19, 1.57	1.29***	1.10, 1.51

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 10: ADJUSTED LOGISTIC REGRESSION OF DEPRESSION OR ANXIETY ON BIRTH OUTCOMES

Independent Variables	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Exhibiting Depressive or Anxiety Symptoms				
No	1.00	-	1.00	-
Yes	1.19**	1.04, 1.35	1.19*	1.04, 1.38
Race/Ethnicity				
Non-Hispanic White	1.00	-	1.00	-
Hispanic	1.13	0.87, 1.46	1.21	0.92, 1.59
Non-Hispanic Black	1.65***	1.32, 2.06	1.1	0.86, 1.40
Other	1.32	0.86, 2.00	0.9	0.64, 1.27
Age				
< 18 years	1.00	-	1.00	-
18-20 years	1.42*	1.05, 1.93	1.02	0.75, 1.38
21-25 years	1.71**	1.21, 2.42	1.32	0.96, 1.82
26-34 years	1.71**	1.21, 2.41	1.39*	1.02, 1.89
≥ 35 years	2.05***	1.44, 2.94	1.76**	1.21, 2.56
Education				
Less Than High School	1.00	-	1.00	-
High School or GED	0.87*	0.77, 0.98	0.94	0.85, 1.05
Bachelor's Degree	0.66**	0.50, 0.87	0.62*	0.43, 0.90
Other Degree	0.79	0.62, 1.00	0.81*	0.68, 0.98
Unknown Education	0.94	0.67, 1.31	1.11	0.88, 1.41
Relationship Status				
Married	1.00	-	1.00	-
Living with Partner	1.17	0.99, 1.4	1.12	0.98, 1.29
In a Relationship Not Living Together	1.11	0.92, 1.32	1.07	0.92, 1.24
Not in a Relationship	1.19*	1.00, 1.41	1.1	0.94, 1.30
Unknown Relationship Status	1.19	0.7, 2.01	1.05	0.68, 1.63
Employment / School				
Working, Not in School	1.00	-	1.00	-
In School, Not Work	1.09	0.87, 1.37	0.94	0.78, 1.14
Working and in School	1	0.8, 1.25	0.83	0.65, 1.07
Neither Working nor in School	1.15*	1.01, 1.32	1.16*	1.03, 1.3
Unknown Employment / School Status	1.22	0.82, 1.82	1.02	0.71, 1.47
Prior Preterm Birth				
No Prior Birth	1.00	-	1.00	-
Yes	1.84***	1.47, 2.30	2.37***	1.88, 2.99
No	0.98	0.74, 1.29	0.97	0.75, 1.26
Prior Low Birth Weight				
No Prior Birth	1.00	-	1.00	-
Yes	1.6***	1.23, 2.09	1.04	0.81, 1.34
No	0.67***	0.57, 0.80	0.77**	0.64, 0.92
Prior C-Section				
No Prior Birth	1.00	-	1.00	-
Prior C-Section Birth	1.04	0.90, 1.20	1.12	0.92, 1.35
Interpregnancy Interval				
No Prior Birth	1.00	-	1.00	-
< 18 Months	0.83	0.66, 1.05	1.06	0.89, 1.25

Independent Variables	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
≥ 18 Months	0.76**	0.62, 0.93	0.81**	0.71, 0.93
Experiencing Food Insecurity				
No	1.00	-	1.00	-
Yes	0.94	0.81, 1.10	1.01	0.87, 1.17
Unknown Food Insecurity	0.66**	0.48, 0.90	0.88	0.71, 1.09
Pregnancy Intent				
Intended Pregnancy	1.00	-	1.00	-
Unintended Pregnancy	0.96	0.85, 1.10	1.05	0.95, 1.17
Unknown Pregnancy Intent	0.7	0.40, 1.23	0.96	0.62, 1.47
Pre-Pregnancy Hypertension				
No	1.00	-	1.00	-
Yes	2.95***	2.41, 3.62	2.85***	2.40, 3.39
Missing	1.62*	1.08, 2.45	1.28	0.77, 2.12
Pre-Pregnancy Diabetes				
No	1.00	-	1.00	-
Yes	0.99	0.82, 1.21	2.09***	1.54, 2.84
Missing	0.99	0.65, 1.49	0.91	0.54, 1.53
BMI at First Prenatal Visit				
Normal Weight (≥ 18.5 and <25 BMI)	1.00	-	1.00	-
Underweight (< 18.5 BMI)	1.76**	1.27, 2.43	1.41**	1.13, 1.76
Overweight (≥ 25 and <30 BMI)	0.76***	0.68, 0.85	0.95	0.84, 1.08
Obese (≥30 and <40 BMI)	0.75***	0.65, 0.87	0.92	0.82, 1.03
Very Obese (≥40 BMI)	0.64***	0.53, 0.77	0.9	0.72, 1.11
Missing	0.7**	0.55, 0.89	1.05	0.87, 1.27
Smoked Cigarettes				
No	1.00	-	1.00	-
Yes	1.45***	1.22, 1.73	0.98	0.82, 1.17
Unknown Smoking Status	0.85	0.61, 1.19	0.74	0.55, 1.01
Ever Experienced Intimate Partner Violence				
No	1.00	-	1.00	-
Yes	1.03	0.92, 1.15	1.11	0.99, 1.23
Unknown IPV	0.99	0.56, 1.73	1.28	0.66, 2.47
Birth Year				
2013 or 2014	1.00	-	1.00	-
2015	0.86	0.73, 1.01	0.86	0.73, 1.01
2016 or 2017	0.68***	0.57, 0.81	0.71**	0.58, 0.87
Unknown Birth Year	0.91	0.70, 1.17	-	-

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 11: THE EFFECT OF DEPRESSION OR ANXIETY AND MENTAL HEALTH SERVICE TYPE ON BIRTH OUTCOMES, UNADJUSTED LOGISTIC REGRESSION

Independent Variables	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Exhibiting Depressive or Anxiety Symptoms				
No	1.00	-	1.00	-
Yes	1.01	0.84, 1.22	1.07	0.88, 1.29
Type of Mental Health Services Provided By Clinical Site				
In-house services available	1.00	-	1.00	-
Exclusively by referral	0.98	0.71, 1.35	0.79	0.61, 1.03
Interaction Between Exhibiting Depressive/Anxiety Symptoms and Type of Mental Health Services Provided				
Not exhibiting depressive/anxiety symptoms and in-house services available	1.00	-	1.00	-
Exhibiting depressive/anxiety symptoms and exclusively by referral	1.55***	1.23, 1.94	1.39*	1.08, 1.80

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE BB. 12: THE EFFECT OF DEPRESSION OR ANXIETY AND MENTAL HEALTH SERVICE TYPE ON BIRTH OUTCOMES, ADJUSTED LOGISTIC REGRESSION

Measures	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Exhibiting Depressive or Anxiety Symptoms				
No	1.00	-	1.00	-
Yes	0.90	0.74, 1.09	1.02	0.83, 1.26
Type of Mental Health Services Provided By Clinical Site				
In-house services available	1.00	-	1.00	-
Exclusively by referral	0.89	0.71, 1.11	0.77**	0.64, 0.93
Interaction Between Exhibiting Depressive/Anxiety Symptoms and Type of Mental Health Services Provided				
Not exhibiting depressive/anxiety symptoms and in-house services available	1.00	-	1.00	-
Exhibiting depressive/anxiety symptoms and exclusively by referral	1.52***	1.22, 1.90	1.32*	1.03, 1.68
Race/Ethnicity				
Non-Hispanic White	1.00	-	1.00	-
Hispanic	1.12	0.88, 1.43	1.17	0.91, 1.49
Non-Hispanic Black	1.65***	1.32, 2.06	1.11	0.89, 1.37
Other	1.3	0.86, 1.95	0.87	0.63, 1.20
Age				
< 18 years	1.00	-	1.00	-
18-20 years	1.43*	1.06, 1.93	1.02	0.75, 1.38
21-25 years	1.71**	1.22, 2.41	1.31	0.95, 1.80
26-34 years	1.71**	1.22, 2.41	1.37*	1.01, 1.86
≥ 35 years	2.07***	1.45, 2.94	1.73**	1.18, 2.52
Education				
Less Than High School	1.00	-	1.00	-
High School or GED	0.87*	0.77, 0.98	0.94	0.85, 1.05
Bachelor's Degree	0.67**	0.5, 0.88	0.61*	0.42, 0.90
Other Degree	0.79*	0.62, 1.00	0.8*	0.66, 0.97
Unknown Education	0.93	0.66, 1.31	1.11	0.89, 1.38
Relationship Status				
Married	1.00	-	1.00	-
Living with Partner	1.16	0.98, 1.39	1.12	0.98, 1.28
In a Relationship Not Living Together	1.1	0.92, 1.32	1.07	0.93, 1.24
Not in a Relationship	1.19	1.00, 1.41	1.12	0.95, 1.31
Unknown Relationship Status	1.2	0.70, 2.03	1.07	0.69, 1.64
Employment / School				
Working, Not in School	1.00	-	1.00	-
In School, Not Work	1.09	0.87, 1.38	0.94	0.78, 1.14
Working and in School	1	0.80, 1.25	0.83	0.65, 1.07
Neither Working nor in School	1.15*	1.01, 1.32	1.15*	1.03, 1.29
Unknown Employment / School Status	1.21	0.81, 1.82	1.01	0.70, 1.45
Prior Preterm Birth				
No Prior Birth	1.00	-	1.00	-
Yes	1.83***	1.46, 2.30	2.35***	1.86, 2.96
No	0.98	0.74, 1.29	0.97	0.75, 1.25
Prior Low Birth Weight				
No Prior Birth	1.00	-	1.00	-
Yes	1.6**	1.22, 2.09	1.03	0.79, 1.35
No	0.67***	0.56, 0.80	0.77**	0.64, 0.93
Prior C-Section				
No Prior Birth	1.00	-	1.00	-
Prior C-Section Birth	1.04	0.91, 1.19	1.1	0.92, 1.32
Interpregnancy Interval				
No Prior Birth	1.00	-	1.00	-
< 18 Months	0.83	0.66, 1.04	1.07	0.90, 1.27
≥ 18 Months	0.75**	0.61, 0.93	0.83**	0.73, 0.94

Measures	Low Birthweight		Preterm Birth	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Experiencing Food Insecurity				
No	1.00	-	1.00	-
Yes	0.94	0.81, 1.10	1.01	0.87, 1.17
Unknown Food Insecurity	0.66**	0.48, 0.90	0.87	0.70, 1.07
Pregnancy Intent				
Intended Pregnancy	1.00	-	1.00	-
Unintended Pregnancy	0.97	0.85, 1.10	1.05	0.95, 1.17
Unknown Pregnancy Intent	0.69	0.40, 1.20	0.96	0.63, 1.45
Pre-Pregnancy Hypertension				
No	1.00	-	1.00	-
Yes	2.94***	2.39, 3.62	2.84***	2.39, 3.37
Missing	1.71*	1.09, 2.69	1.39	0.79, 2.42
Pre-Pregnancy Diabetes				
No	1.00	-	1.00	-
Yes	0.98	0.81, 1.20	2.09***	1.52, 2.89
Missing	0.96	0.62, 1.48	0.86	0.49, 1.52
BMI at First Prenatal Visit				
Normal Weight (≥ 18.5 and <25 BMI)	1.00	-	1.00	-
Underweight (< 18.5 BMI)	1.76**	1.28, 2.44	1.4**	1.12, 1.75
Overweight (≥ 25 and <30 BMI)	0.76***	0.68, 0.86	0.95	0.84, 1.08
Obese (≥30 and <40 BMI)	0.75***	0.64, 0.87	0.92	0.82, 1.03
Very Obese (≥40 BMI)	0.64***	0.53, 0.77	0.89	0.72, 1.11
Missing	0.7**	0.55, 0.89	1.07	0.87, 1.32
Smoked Cigarettes				
No	1.00	-	1.00	-
Yes	1.45***	1.22, 1.73	0.98	0.81, 1.18
Unknown Smoking Status	0.85	0.61, 1.19	0.75	0.55, 1.04
Ever Experienced Intimate Partner Violence				
No	1.00	-	1.00	-
Yes	1.03	0.92, 1.15	1.1	0.99, 1.21
Unknown IPV	0.98	0.56, 1.70	1.25	0.66, 2.37
Birth Year				
2013 or 2014	1.00	-	1.00	-
2015	0.85	0.72, 1.00	0.83*	0.72, 0.97
2016 or 2017	0.67***	0.57, 0.79	0.68***	0.57, 0.81
Unknown Birth Year	0.9	0.70, 1.16		
Strong Start Intervention Intensity				
Low	1.00	-	1.00	-
Medium	0.93	0.72, 1.18	0.80	0.62, 1.02
High	0.96	0.76, 1.20	0.85	0.69, 1.05

Notes: One asterisk (*) indicates significance at the 0.05 level; two asterisks (**) indicate significance at the 0.01 level; and three asterisks (***) indicate significance at the 0.001 level. A dash (-) indicates a censored cell due to small sample size (N<11).

APPENDIX CC: SPECIAL STUDY – MATERNAL AND INFANT BIRTH, UTILIZATION, AND EXPENDITURE OUTCOMES AMONG TWIN PREGNANCIES IN FOUR STATE MEDICAL PROGRAMS

TABLE CC. 1: BIRTH OUTCOMES FOR TWINS, THREE STATES, 2014 - 2015

Measure	N or %	Three States
Number of births	N	1,910
Number of infants	N	3,775
Average maternal age (years)	N	27.46
Average gestational age (weeks)	N	34.82
Percent preterm	%	66.80
Percent very preterm	%	23.60
Average birth weight (grams)	N	2,242.36
Percent low birth weight	%	65.00
Percent very low birth weight	%	11.00

TABLE CC. 2: DELIVERY HOSPITALIZATION FOR TWINS, THREE STATES, 2014 - 2015

Measure	N, %, or $	Three States
Average length of delivery stay (days)	N	12.34
Percent of deliveries with NICU	%	45.20
Average length of NICU stays (days)	N	12.08
Average total delivery costs	$	32,641.02

TABLE CC. 3: UTILIZATION AND MEDICAID COSTS FOR TWINS, THREE STATES, 2014 - 2015

Measure	N, #, or $	Three States
Average ED visits (mom prenatal)	N	1.44
Average hospital stays (mom prenatal)	N	0.27
Average ED visits (mom postnatal)	N	0.8
Average hospital stays (mom postnatal)	N	0.06
Average ED visits (infant postnatal)	N	1
Average hospital stays (infant postnatal)	N	0.15
Average monthly Medicaid costs (mom prenatal)	$	740.07
Average monthly Medicaid costs (mom postnatal)	$	263.88
Average monthly Medicaid costs (infant postnatal)	$	458.49
Average total cost for mom and infant (all months)	$	43,441.09

APPENDIX DD: SPECIAL STUDY – SUBSTANCE USE DISORDERS AMONG WOMEN WHO DELIVERED INFANTS IN 2014 - 2015 IN THREE STATE MEDICAID PROGRAMS

The sample is defined as women who delivered a live singleton infant in 2014-2015 in three state Medicaid programs. The study period is defined as the 24 months surrounding the delivery (i.e., 12 months before the delivery month, the delivery month, and the 11 months after the delivery month for each sample person). Estimates were derived from data from birth certificates and Medicaid claims and eligibility files for 2013-2016. Analysis included only mother-infant dyads with at least one Medicaid claim for the delivery and valid data on gestational age and birth weight.

Diagnosed substance use disorder (SUD) was defined based on the Healthcare Effectiveness Data and Information Set (HEDIS) measure expanded to include people in remission; mothers of infants diagnosed with fetal alcohol syndrome; people diagnosed with drug dependence complicating their pregnancy; and people with no observed diagnosis of SUD but who sought or received treatment for a SUD during the study period. Our algorithm for identifying diagnosed SUD relies on the Explicit-Mention Substance Abuse Need for Treatment in Women (EMSANT-W) algorithm (Derrington et al. 2015).

Our algorithm for identifying SUD-related treatments relied on procedure and diagnostic codes and was developed from published reports (Bouchery et al. 2012) and Virginia Department of Medical Assistance Services' Addiction and Recovery Treatment Services (ARTS) (Virginia Department of Medical Assistance Services 2017). Probable SUD was defined as having a flag for a SUD-related diagnosis indicating a need for screening for SUD and based on the EMSANT-W algorithm (Derrington et al. 2015). Treatment was defined as any of the following mutually exclusive categories: inpatient, outpatient therapy, residential, partial hospitalization/intensive outpatient, methadone, buprenorphine, and other unidentified SUD medication treatment (e.g., medication administration). Inpatient treatment was defined as any non-delivery hospital claim with a primary diagnosis of SUD (not including probable SUD). We also identified some SUD-related treatment supports, such as any peer supports.

There are limitations inherent in the use of administrative health care data including lack of detail, lack of data from outside Medicaid (e.g., Veteran's Administration care), and problems with identifiers that lead to missing records and failure to match mothers and their infants. In addition, we had no prescription drug data and needed to rely on procedure codes to identify treatment with medication. There are a number of reasons why we do not expect this limitation to lead us to underestimate treatment in a very meaningful way. One reason is that methadone is not in the prescription drug data. Another reason is that we do have the claims and diagnosis codes for drug screen/testing used to monitor buprenorphine patients. We also have the claims and diagnosis codes for medication administration and office visits that the Medicaid manuals in 2 of the 3 study states indicate providers need to submit to get paid for treating SUD-diagnosed patients with medication. However, codes like medication administration and office visits do not allow us to identify the specific medication and instead the treatment is classified as "intensive outpatient", "residential", "inpatient", "partial hospitalization", or "unknown medication" depending on the procedure code. Having the prescription drug data would help to identify some specific medication treatment (e.g., buprenorphine), and would also help us to identify some treated people whose provider didn't use one of the stipulated/standard procedure codes.

Analysis involved many different specifications for aggregating substance use disorder-related diagnoses including looking at specific diagnoses (e.g., opioid use disorder), non-specific diagnoses (e.g., drug dependence complicating pregnancy), and different time periods (e.g., diagnoses after the delivery month). Analysis also involved evaluating results from multiple approaches to estimation: taking the mean from the three states (as reported in the tables), and alternatively, computing estimates from the pooled three-state sample. We used regression to estimate state means and standard errors, and t-tests to test for differences.

TABLE DD. 1: SOCIODEMOGRAPHIC AND HEALTH CHARACTERISTICS OF WOMEN WHO DELIVERED AN INFANT IN 2014 OR 2015 BY STATUS WITH A DIAGNOSED OR PROBABLE SUBSTANCE USE DISORDER (SUD) IN MEDICAID DATA, THREE STATE MEDICAID PROGRAMS, 2013-2016

Measures	All Sample Women by Status with a Diagnosed or Probable SUD	
Characteristics	**No SUD**	**Any Diagnosed or Probable SUD**
Sociodemographic Characteristics		
Age Group		
<=25	47.3%	41.6%***
26-34	41.4%	46.7%***
>=35	11.2%	11.6%
Race/Hispanic Ethnicity		
Non-Hispanic white	29.7%	42.9%***
Non-Hispanic black	29.2%	28.1%
Non-Hispanic other	6.5%	5.2%***
Hispanic	34.4%	23.6%***
Not reported	0.2%	-
Education (From 2 of 3 States)		
Less than high school	27.5%	31.4%***
High school	38.1%	35.7%***
Some college/Associates	28.9%	30.0%
College graduate	5.2%	2.7%***
Not reported	0.3%	0.3%
Married		
Yes	32.4%	21.5%***
No	67.1%	77.6%***
Not reported	0.4%	1.0%***
Strong Start participant	3.0%	4.7%***
Rural/Urban		
Large central metro	47.6%	48.8%
Large fringe metro	21.0%	21.9%
Medium metro	18.9%	18.9%
Small metro/nonmetropolitan	12.5%	10.5%***
Health Characteristics		
Number of unique diagnoses (excluding prenatal), prior to delivery month	3.0	4.7***
Pre-gestational diabetes	0.9%	1.3%***
Pre-gestational hypertension	1.7%	2.7%***
Any psychiatric diagnosis	9.6%	40.3%***
First time delivery	36.2%	32.6%***
Number of previous births, among women who previously delivered	1.9	2.1***
Total	**63,786**	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE DD. 2: TIMING OF FIRST OBSERVED ENROLLMENT AND FIRST OBSERVED SUBSTANCE USE DISORDER (SUD) – RELATED DIAGNOSIS IN MEDICAID DATA AMONG WOMEN WHO DELIVERED AN INFANT IN 2014 OR 2015 AND HAVE A DIAGNOSED OR PROBABLE SUD, THREE STATE MEDICAID PROGRAMS, 2013-2016

Measures	All Sample Women by Status with a Diagnosed or Probable SUD	
Timing of First Observation	**No SUD**	**Any Diagnosed or Probable SUD**
First Observed Full-Benefit Medicaid Enrollment		
10-12 Months before delivery month	40.8%	53.1%***
7-9 Months before delivery month	26.4%	20.0%***
4-6 Months before delivery month	17.8%	14.6%***
1-3 Months before delivery month	8.9%	6.8%***
Delivery month	3.4%	2.6%***
<=3 Months after delivery month	1.0%	1.1%
>3 Months after delivery month	1.7%	1.9%
First Observed SUD-Related Diagnosis		
10-12 Months before delivery month	N/A	12.6%
7-9 Months before delivery month	N/A	9.7%
4-6 Months before delivery month	N/A	17.5%
1-3 Months before delivery month	N/A	17.2%
Delivery month	N/A	17.5%
<=3 Months after delivery month	N/A	10.0%
>3 Months after delivery month	N/A	15.5%
First Observed SUD-Related Treatment		
10-12 Months before delivery month	N/A	14.4%
7-9 Months before delivery month	N/A	8.7%
4-6 Months before delivery month	N/A	16.9%
1-3 Months before delivery month	N/A	18.2%
Delivery month	N/A	6.2%
<=3 Months after delivery month	N/A	14.2%
>3 Months after delivery month	N/A	21.4%
None in the study period	100.0%	55.4%
Total	**63,786**	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE DD. 3: MEDICAID HEALTH CARE UTILIZATION RATES AMONG WOMEN WHO DELIVERED AN INFANT IN 2014 OR 2015 BY STATUS WITH A DIAGNOSED OR PROBABLE SUBSTANCE USE DISORDER (SUD), THREE STATE MEDICAID PROGRAMS, 2013-2016

Measures	All Sample Women by Status with a Diagnosed or Probable SUD	
Medicaid Utilization Measures	**No SUD**	**Any Diagnosed or Probable SUD**
Utilization 1-12 Months Before Delivery Month		
Trimester in Which Prenatal Care Began		
First trimester	58.0%	50.7%***
Second trimester	31.7%	32.3%
Third trimester	7.4%	10.4%***
No prenatal care	1.0%	3.2%***
Not reported	1.9%	3.5%***
Monthly Rate of Maternal Health Care Utilization While Enrolled During the 12 Months Before Delivery Month		
# Hospital stays	0.01	0.03***
# Emergency department visits	0.11	0.20***
Other Services Ever Received 1-12 Months Before Delivery Month		
Alcohol and/or drug assessment or screening	0.4%	0.6%**
Screening for mental health	0.1%	0.3%***
Tobacco cessation counseling or services	0.6%	1.5%***

Measures	All Sample Women by Status with a Diagnosed or Probable SUD	
Utilization 1-11 Months Following Delivery Month		
Monthly Rate of Maternal Health Care Utilization While Enrolled During the 11 Months After Delivery Month		
# Hospital stays	0.01	0.02***
# Emergency department visits	0.06	0.13***
Other Services Ever Received 1-11 Months Following Delivery Month		
Counseling for contraceptives	12.5%	13.0%
Received contraception	29.8%	30.9%
Alcohol and/or drug assessment or screening	0.1%	0.1%
Screening for mental health	1.1%	1.4%**
Tobacco cessation counseling or services	0.2%	0.7%***
Total	**63,786**	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE DD. 4: RATES OF MEDICAID TREATMENT/TREATMENT SUPPORTS AMONG WOMEN WHO DELIVERED AN INFANT IN 2014 OE 2015 AND HAVE A DIAGNOSED OR PROBABLE SUD BY PERIOD OF ENROLLMENT AND TYPE OF SUD TREATMENT, THREE STATE MEDICAID GROUPS, 2013-2016

Measures	Sample Women with Diagnosed or Probable SUD
Type and Timing of Treatment	
Any SUD-related treatment during 24-month study period	44.6%
Monthly Rate of SUD-Related Treatment While Enrolled, Average of 24 Months	
Any type of SUD-related treatment	9.1%
Any inpatient	0.4%
Any outpatient therapy	6.0%
Any residential	0.2%
Any partial hospitalization or intensive outpatient	3.3%
Any SUD-related medication	1.8%
Any methadone	1.7%
Any buprenorphine	0.3%
Average # Consecutive Months With Any SUD-Related Treatment, Among Those With Treatment	
In the 12 months before delivery month	2.3
In the 11 months after delivery month	2.8
Monthly Rate of SUD-Related Treatment While Enrolled Among Those Treated With Methadone, Average of 24 Months	
Any inpatient	0.8%
Any outpatient therapy	31.7%
Any residential	2.5%
Any partial hospitalization or intensive outpatient	36.0%
Average # Consecutive Months With Methadone Treatment Among Those Treated With Methadone	
In the 12 months before delivery month	2.8
In the 11 months after delivery month	5.0
Total	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE DD. 5: INFANT MEDICAID HEALTH CARE UTILIZATION AND OUTCOMES FOR INFANTS OF WOMEN WHO DELIVERED IN 2014 OR 2015 BY MATERNAL STATUS WITH A DIAGNOSED OR PROBABLE SUBSTANCE USE DISORDER (SUD), THREE STATE MEDICAID PROGRAMS, 2013-2016

Measures	Infants of Sample Women by Maternal Status with a Diagnosed or Probable SUD	
All Sample Infants	**No SUD**	**Any Diagnosed or Probable SUD**
NICU during birth hospitalization (including infants readmitted within a day after discharge)	10.2%	23.1%***
# NICU days, if any NICU	11.9	15.5***
# Hospital days during birth hospitalization	3.4	6.4***
Preterm (<37 weeks)	8.0%	14.0%***
Very preterm (<34 weeks)	2.0%	4.0%***
Low birth weight (less than 2,500 grams)	6.9%	13.0%***
Very low birth weight (less than 1,500 grams)	1.0%	2.0%***
Apgar score at 5 minutes (from 2 of 3 states)	8.7	8.6***
Any infant drug/alcohol related diagnosis	N/A	28.0%
Neonatal Abstinence Syndrome (NAS), excluding iatrogenic NAS	N/A	11.8%
NAS not excluding low birth weight neonates if their mother has a diagnosed or probable SUD	N/A	12.1%
Fetal Alcohol Syndrome (FAS)	N/A	0.3%
Suspicion of exposure to drugs/alcohol via placenta or breast milk	N/A	18.6%
Total	**63,786**	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

TABLE DD. 6: MATERNAL AND INFANT MEDICAID EXPENDITURES AMONG WOMEN WHO DELIVERED INFANTS IN 2014 OR 2015 BY MATERNAL STATUS WITH A DIAGNOSED OR PROBABLE SUBSTANCE USE DISORDER (SUD), THREE STATE MEDICAID PROGRAMS, 2013-2016

Measures	All Sample Women by Status with a Diagnosed or Probable SUD	
Medicaid Expenditure Measures	**No SUD**	**Any Diagnosed or Probable SUD**
Average Monthly Expenditures for Enrollees by Time Period		
1-12 months before the delivery month	$325	$611***
1-11 months following the delivery month, mother	$190	$425***
1-11 months following the delivery month, infant	$255	$365***
Total Expenditures by Time Period		
1-12 months before the delivery month	$2,510	$4,978***
Delivery hospitalization/delivery month (mother and infant)	$11,196	$17,243***
1-11 months following the delivery month, mother	$1,321	$3,543***
1-11 months following the delivery month, infant	$2,488	$3,743***
Total	**63,786**	**8,300**

Notes: Two asterisks (**) indicate significance at the 0.05 level; and three asterisks (***) indicates significance at the 0.01 level for the comparison of group means within the maternal characteristic. A dash (-) indicates a censored cell due to small sample size (N<11).

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