

Evaluation of the Independence at Home Demonstration

An Examination of the First Six Years

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Overall key takeaways

Effects of the demonstration payment incentive through Year 6

- The estimated effect of the IAH on total expenditures was a reduction of \$41 per beneficiary per month in Year 6 (1 percent). The chance that IAH actually reduced expenditures by this amount was 45 percent.
- The IAH payment incentive did not affect hospital use or quality of care in Year 6.
- Results for expenditures, hospital use, and quality of care were less favorable in Year 6 than Year 5 in large part because of a single influential site that left the demonstration after Year 5.
- We found no evidence that the IAH payment incentive improved key outcomes in Year 6 relative to Year 5 for practices that participated in both Year 5 and Year 6.
- We did not find evidence that the IAH payment incentive affected the mortality rate or probability of entry into institutional long-term care.
- Many IAH practices did not meet standards for all six quality measures tied to payment, even though doing so would have increased the amount of their incentive payments.

Effects of home-based primary care for dually eligible beneficiaries

- Receiving home-based primary care had no effect on total Medicare and Medicaid expenditures for dually eligible beneficiaries, nor on Medicare or Medicaid expenditures when measured separately.
- Receiving home-based primary care had no effect on hospital use or quality of care.
- Home-based primary care recipients received more Medicare and Medicaid services in the home and fewer services in nursing facilities.

Association of home-based primary care with Medicare expenditures at the end of life

- Receiving home-based primary care was associated with lower Medicare expenditures during the last three months of life, and high-intensity users incurred the lowest Medicare expenditures.
- However, in the last 6 and 12 months of life, receiving home-based primary care was associated with higher Medicare expenditures.
- In the last three months of life, total Medicare expenditures were lower for home-based primary care recipients mainly because of lower inpatient expenditures.

I. Introduction

Section 3024 of the Patient Protection and Affordable Care Act (Public Law 111-148) enacted the Independence at Home (IAH) demonstration in 2010. The purpose of the IAH demonstration is to test a payment incentive and service delivery model for providing home-based primary care to chronically ill and functionally limited Medicare beneficiaries.¹ In June 2012, the Centers for Medicare & Medicaid Services (CMS) launched the IAH demonstration. Under the demonstration, physicians and nurse practitioners direct home-based primary care teams with the goal of reducing health care expenditures and improving health outcomes.

The legislation authorizing IAH requires an independent evaluation to determine the impact of the demonstration on beneficiaries' Medicare expenditures and other health-related outcomes. This report describes the evaluation's findings on the effects of the demonstration payment incentive through the sixth year of the IAH demonstration. It updates our previous evaluation reports, which covered the first five years of the demonstration.²

A. Background on the IAH demonstration

Under current policy, the Medicare fee schedule provides a higher payment for primary care visits that take place in a patient's home than for those in a clinician's office, regardless of the patient's health status, to compensate clinicians for travel time. The IAH demonstration provides incentives to home-based primary care practices that meet certain requirements to encourage lower cost, higher quality care. As part of the IAH demonstration, practices can earn incentive payments if their patients' Medicare expenditures are below the practice's target expenditures and the practice meets required standards for a set of quality measures. They were expected to lower expenditures by providing timely, coordinated care to patients as they need it, especially after an emergency department (ED) visit or hospital discharge. In turn, the patients would be healthier by preventing exacerbations of chronic conditions and treating acute conditions promptly, decreasing the need for costly ED visits and hospital admissions. For the demonstration to produce savings for the Medicare program, there must be a sufficient reduction in Medicare spending for patients of IAH practices compared with similar beneficiaries who did not receive home-based primary care. This reduction in Medicare spending and the cost of incentive payments paid by CMS to IAH practices must net out to lower overall spending.

Exhibit I.1. Requirements for practices to participate in the IAH demonstration

- Be led by physicians or nurse practitioners who provide home-based primary care as part of a team
- Be organized at least partly for the purpose of providing physician services
- Have experience providing home-based primary care to patients with several chronic illnesses
- Make in-home primary care visits and be available around the clock every day
- Use electronic medical records, remote monitoring, and mobile diagnostic technology
- Provide services to at least 200 IAH-eligible beneficiaries each year
- Report information on patients, services provided, and quality measures to CMS

¹ Home-based primary care is primary care clinicians providing services in the home (including assisted living facilities and other group residences) rather than in an office.

² The previous evaluation reports are available at <https://innovation.cms.gov/initiatives/independence-at-home/>.

The law enacting the IAH demonstration describes the eligibility requirements for practices and beneficiaries. Demonstration practices must have experience delivering home-based primary care and have teams led by physicians or nurse practitioners; the teams can also include physician assistants, clinical staff, and other health and social services staff. The practices must adhere to guidelines consistent with providing high quality home-based primary care (Exhibit I.1).

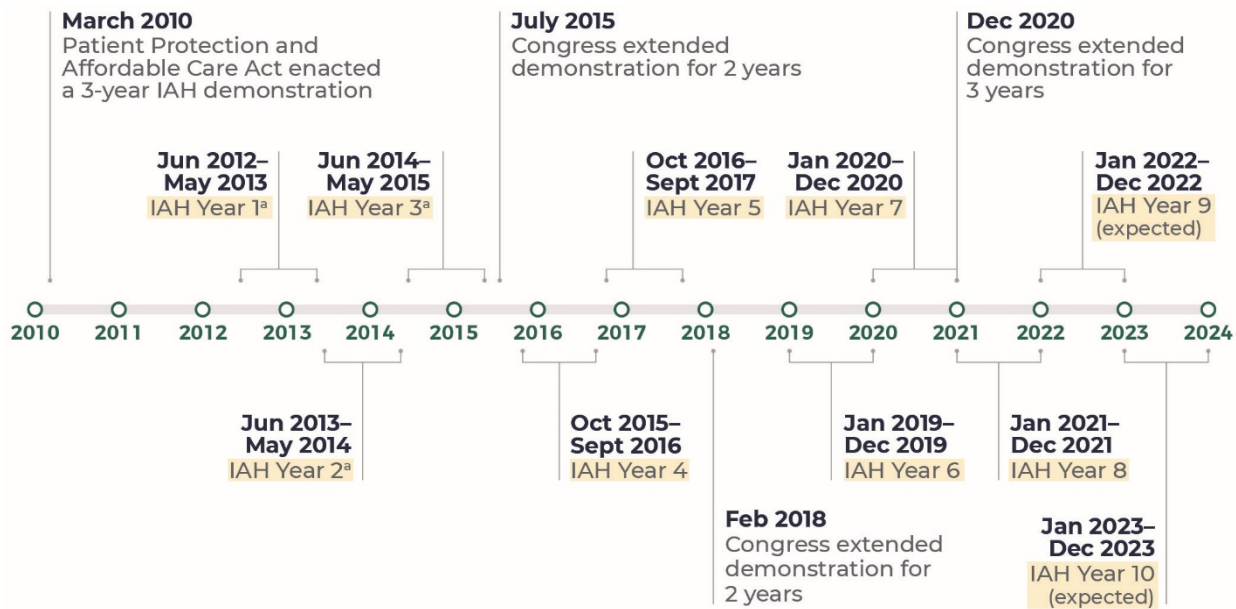
Exhibit I.2. Requirements for beneficiaries to participate in the IAH demonstration

- Have at least two chronic conditions
- Require human assistance with at least two activities of daily living
- Have been hospitalized and received acute or subacute rehabilitation services in the prior 12 months
- Be enrolled in fee-for-service Medicare
- Not be in long-term care or hospice at the time of enrollment in the demonstration

Beneficiaries who receive care from the IAH practices are eligible for the demonstration if they meet several criteria related to their health and use of health care (Exhibit I.2). Congress limited the demonstration to 10,000 beneficiaries in each of the first five years, 15,000 beneficiaries in Years 6 and 7, and 20,000 beneficiaries in Years 8 to 10. However, the increase in the enrollment cap was inconsequential in Year 6 because the practices that participated in the demonstration in that year had far fewer than 10,000 patients enrolled in the demonstration.

The demonstration began in June 2012 and was originally intended to last three years. It has been extended by Congress three times (Exhibit I.3).

Exhibit I.3. Key dates related to the IAH demonstration

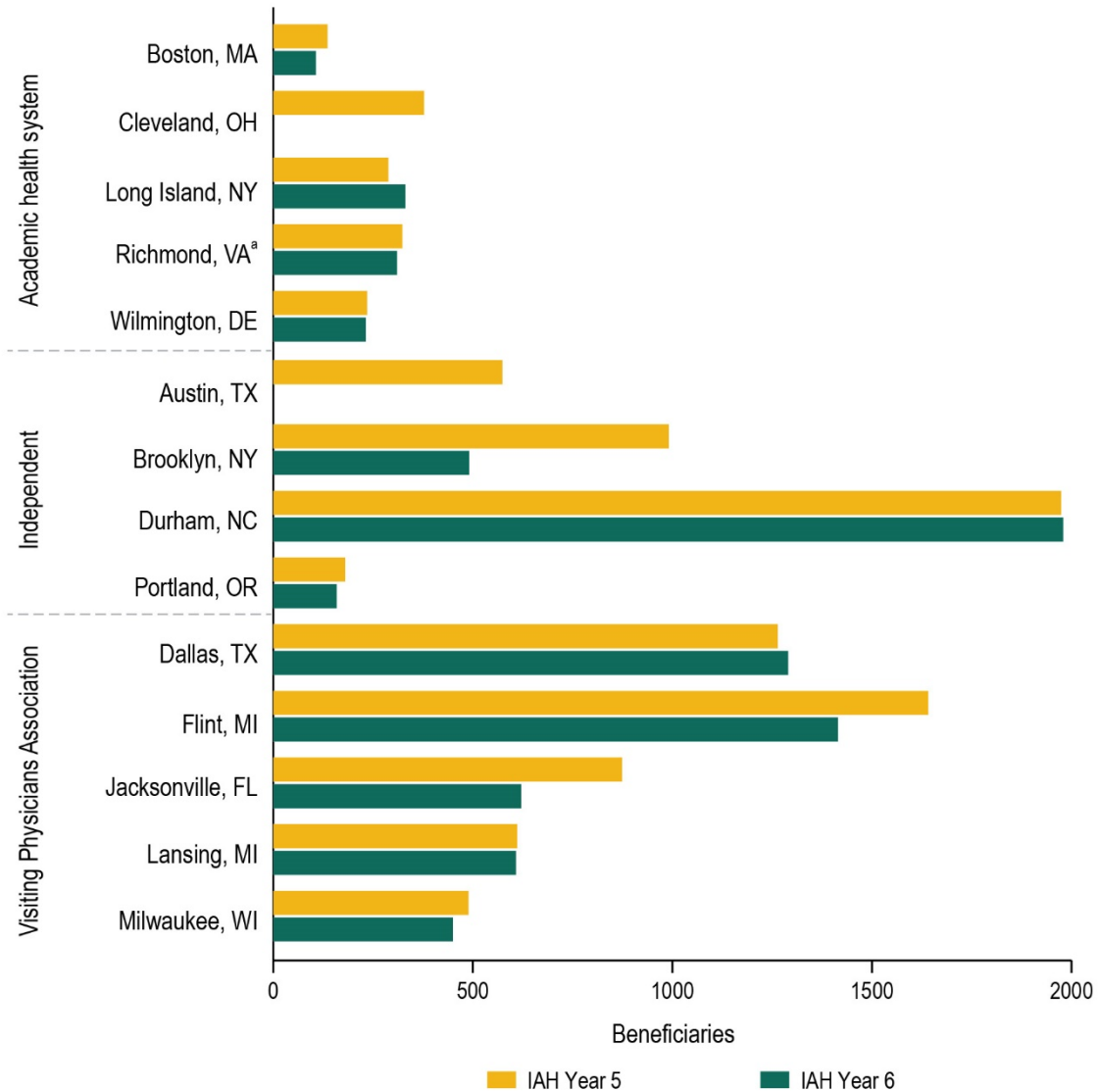


^a Three participants started Years 1 to 3 on September 1.

The demonstration began with 15 participants, and CMS added three participants in September 2012. We refer to each of these participants as sites (or practices), though four of them were consortia that consisted of multiple organizations. Four sites left the demonstration before Year 4 and two sites left the demonstration after completing Year 5 in September 2017 (Exhibit A.1). Thus, 14 sites contributed to our analyses of Years 1 to 5, and 12 sites contributed to our analyses of Year 6 in this evaluation report (Exhibit I.4). These sites include one remaining consortium that consists of three organizations. One

practice left the demonstration in the last quarter of Year 6; we retained this practice in the evaluation for Year 6 because it participated in the demonstration for most of the year. Substantial variation across the practices in the number of IAH beneficiaries in the evaluation sample contributed to some practices influencing the overall evaluation results more than others.

Exhibit I.4. Number of beneficiaries in the evaluation sample per IAH practice in Years 5 and 6



Source: Mathematica’s analysis of data from the Independence at Home implementation contractor and Medicare claims and enrollment data from the Chronic Conditions Warehouse from 2015–2019.

Notes: The evaluation sample is not constrained by the statutory limit on IAH enrollment (10,000 beneficiaries in Year 5 and 15,000 in Year 6). For more information about differences between the evaluation sample and the list of beneficiaries enrolled in the demonstration, see Appendix A. Cleveland and Austin left the demonstration after Year 5. Durham left the demonstration in the last quarter of Year 6, and Boston left the demonstration after Year 6. Durham was retained in the evaluation for Year 6 because it participated in the demonstration for most of the year.

^a Richmond included three practices that participated as a consortium; these included practices that operated in Richmond, Philadelphia, and Washington, DC.

All sites met the demonstration organizational requirements listed in Exhibit I.1, but they had different structural characteristics and different approaches to delivering care such as the extent to which the practices were integrated with other health care providers. Five practices are part of the Visiting Physicians Association, a corporation whose leadership team has sought to standardize operations and care delivery across all participating practices. Three practices that participated in Year 6 began the demonstration privately owned and not attached to an overarching health system or corporation, though the Brooklyn site was acquired by a national home visiting service company during Year 6. The remaining four sites that participated in Year 6 (including a consortium of three individual practices) are part of health systems affiliated with a university or medical school. Compared with other practices, the practices embedded in academic health systems could potentially obtain more technical, managerial, and financial resources to implement the demonstration and manage patient care.

B. Summary of previous evaluation reports and related literature

In our evaluation reports, we have examined the effects of two features of IAH: the provision of home-based primary care and the payment incentive. The legislation required an evaluation of the IAH demonstration to determine how it affects Medicare expenditures and other health-related outcomes. Ideally, we would have examined the effects of the entire demonstration, including the payment incentive and the home-based care delivery model, in a single analysis. To do this, we would have needed an IAH group that consisted of beneficiaries who met IAH eligibility requirements and were new patients of the IAH practices. However, we could not evaluate the IAH demonstration using this approach for two reasons. First, the number of new patients of the IAH practices who met IAH eligibility requirements was too small to obtain estimates of the effect. Second, the legislation allows for those already receiving home-based primary care from the IAH practice to enroll in the demonstration. Using an IAH group that consisted only of new patients of the IAH practices would have excluded a substantial group of the demonstration beneficiaries, whom Congress intended to include. Because of these limitations, we examined separately the effects of home-based primary care and the demonstration payment incentive. In doing so, we answered two key questions:

1. Does receiving home-based primary care result in less expenditures and hospital use for chronically ill and functionally limited Medicare beneficiaries?

In a previous evaluation report, we found that home-based primary care did not reduce expenditures for IAH-eligible patients compared with similar patients who did not receive home-based primary care.³ Our results were similar to the results from a systematic review of nine studies of home-based primary care among older adults, which showed little evidence that this care reduced hospital use (Stall et al. 2014). Our results differed, however, from some previous research that suggested home-based primary care for chronically ill or functionally impaired older adults reduces expenditures (Beck et al. 2009; De Jonge et al. 2014; Edes et al. 2014; Jones et al. 2020). As we discussed in the previous evaluation report, these conflicting results could be because of differences in study design, differences in the model of home-based primary care, or both.³

³ For more information, refer to the [evaluation report](#) which covered Years 1 to 4 of the IAH demonstration.

2. Did the possibility of earning an incentive payment result in less expenditures, less hospital use, better quality of care and improved health outcomes for chronically ill and functionally limited Medicare beneficiaries?

Based on analysis of data collected from IAH practices through Year 5, we found that the IAH payment incentive prompted IAH practices to change care delivery with the goal of improving care.⁴ Among the most common changes were those designed to make care more comprehensive and responsive to patients' needs with the hope of reducing hospital use. Examples included increasing follow-up for patients with high rates of hospital use and improving communication and coordination of round-the-clock coverage for care. In surveys, most patients and their caregivers reported high levels of satisfaction with home-based primary care, that they found the care accessible, and that clinicians take their opinions into account.

In our earlier report on the evaluation of the demonstration through Year 4, we estimated that the reduction in Medicare expenditures associated with the IAH payment incentive in Year 4 was \$282 per beneficiary per month (PBPM). This estimate was the largest reduction in expenditures in any of the first four years, but it was not statistically significant. In Year 5, the estimated reduction in expenditures was \$330 PBPM; this estimated reduction was statistically significant, but it was driven by a single influential site that stopped delivering home-based primary care after the end of the year. Without that site, the estimated effects were much smaller and not statistically significant in Year 5 or across the five years. We did not include that site (or another site that left the demonstration after Year 5) in our analysis of Year 6.

No other studies have examined the effect of payment incentives like the one used in IAH on home-based primary care, so we cannot compare these results with other studies. In addition, as we discuss in Chapter II and Appendix A, differences in the objectives and analytic strategies used by CMS to calculate incentive payments and used by the evaluation team to calculate the effects of the IAH payment incentive mean that the two sets of results are not equivalent.

C. Overview of the report

In this evaluation report, we examine the effects through Year 6 of the two key components of the demonstration: the demonstration payment incentive and the receipt of home-based primary care for certain subgroups of patients. In Chapter II, we examine whether the payment incentive resulted in less expenditures, less hospital use, and improved outcomes for chronically ill and functionally limited Medicare beneficiaries in Year 6. We also examine how the IAH practices changed the way they delivered care during the demonstration and whether those changes affected the quality of care. Although our previous analysis found no evidence that home-based primary care reduced expenditures for IAH-eligible beneficiaries, some population subgroups may benefit more from home-based primary care than the average beneficiary: those who are poor and those who are near the end of life. Therefore, in this report, we examine the effects of home-based primary care for the following subgroups: (1) beneficiaries who are dually eligible for Medicare and Medicaid (Chapter III) and (2) beneficiaries who are within 12 months of the end of life (Chapter IV). In Chapter V, we conclude by summarizing and discussing the key findings from the report.

⁴ For more information, refer to the [evaluation report](#) which covered Years 1 to 5 of the IAH demonstration.

II. What were the effects of the demonstration payment incentive through Year 6?

A. Key takeaways

- [The IAH payment incentive did not affect total Medicare expenditures in Year 6.](#) The estimated effect of the payment incentive on total Medicare expenditures in Year 6 was a reduction of \$41 (1.0 percent) PBPM, which was not statistically significant. The chance that the payment incentive reduced total Medicare expenditures in Year 6 by \$41 PBPM (1 percent) or more was 45 percent.
- [The IAH payment incentive did not affect the number of hospital admissions in Year 6.](#) We estimated that the payment incentive increased hospital admissions by 25 per 1,000 beneficiaries (1.4 percent), but this increase was not statistically significant.
- [The IAH payment incentive did not affect the number of ED visits in Year 6.](#) While still not statistically significant, the estimated reduction in ED visits was somewhat larger than the estimated changes in expenditures or hospital admissions.
- [The IAH payment incentive did not affect potentially avoidable hospital use or the chance of having an unplanned readmission in Year 6.](#)
- [Across key outcomes, Year 6 results were less favorable than Year 5 in large part because of a single influential site that left the demonstration after Year 5.](#) This practice—which no longer provides home-based primary care—accounted for most of the estimated reduction of \$330 PBPM in Medicare expenditures in Year 5. The fact that this practice was not in the sample used to evaluate Year 6 played a large role in the differences in results across the two years.
- [We found no evidence that the IAH payment incentive improved key outcomes in Year 6 relative to Year 5 for practices that participated in both Year 5 and Year 6.](#) In fact, in most cases, effects were more unfavorable in Year 6 than in Year 5 among the practices that participated in both years.
- [We did not find evidence that the IAH payment incentive affected the mortality rate or probability of entry into institutional long-term care.](#)
- [Many IAH practices did not meet standards for all six quality measures tied to payment, even though doing so would have increased the amount of their incentive payments.](#)

B. Introduction

The IAH demonstration tests whether a payment incentive applied to the delivery of home-based primary care can improve outcomes and lower costs among chronically ill and functionally limited Medicare beneficiaries. In this chapter, we estimate the effect of the IAH payment incentive on Medicare expenditures, hospital use, quality of care, and health outcomes and examine IAH practices' performance on the quality measures used to calculate incentive payments. We use qualitative data collected from IAH practices about changes made since Year 5 to interpret these quantitative data.

We used a quasi-experimental difference-in-differences design to study the effects of the IAH payment incentive on key outcomes. Under this design, we estimated effects as the change in outcomes for beneficiaries meeting IAH eligibility criteria and receiving care from IAH practices before and after the start of the demonstration relative to the change during to the same period for a matched comparison group that did not receive home-based primary care. We refer to beneficiaries who received care from an

IAH practice as IAH beneficiaries. The matched comparison group consists of beneficiaries who met the IAH eligibility criteria and lived in the same geographic areas as IAH beneficiaries. We constructed our sample of IAH and comparison beneficiaries for each of eight years: two pre-demonstration years and six demonstration years. To supplement our understanding of how the IAH payment incentive may affect beneficiaries' outcomes, we collected information on operations and changes from IAH practices and examined performance on the quality measures used in the demonstration.

Changes in practice participation in the demonstration after Year 5 affected estimation and interpretation of results for Year 6: two sites left the demonstration after Year 5, leaving 12 sites that participated in Year 6. Unless otherwise noted, estimates of effects from Years 1 to 5 use the 14 sites that participated in Year 5, and estimates of effects from Year 6 use the 12 sites that participated in Year 6.⁵ Appendix A contains additional details on the data, sample, and methods.

C. Effects of the payment incentive on Medicare expenditures

1. Effects in Year 6

Key takeaway: The IAH payment incentive did not affect total Medicare expenditures in Year 6.

In the sixth year of the demonstration, we found no evidence that the payment incentive reduced total Medicare expenditures. On average, expenditures decreased by \$41 PBPM or 1.0 percent⁶ (Exhibits II.1 and B.2a), but the difference was not statistically significant. To understand the likelihood that expenditures decreased for the IAH group relative to the comparison group, we also estimated the probability that the payment incentive led to a reduction of at least \$41 PBPM (1 percent). The probability that the payment incentive reduced total Medicare expenditures in Year 6 by at least \$41 PBPM was 45 percent (Exhibit B.3).

The estimated reduction of \$41 PBPM in total Medicare expenditures we observed in Year 6 was driven largely by a reduction in the largest service category, inpatient expenditures, of \$66 PBPM (4.1 percent) (Exhibit B.4a), which also was not statistically significant.

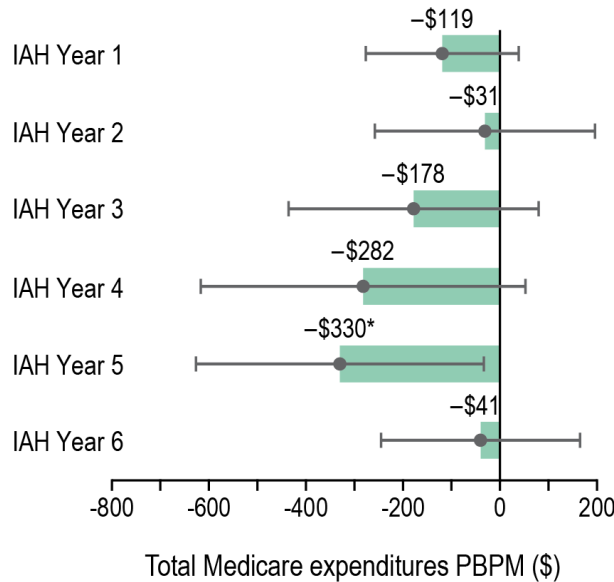
There were statistically significant changes in two smaller expenditure categories: durable medical equipment (DME) decreased \$19 PBPM (13.6 percent) and hospice increased \$30 PBPM (18.2 percent). Both IAH and comparison beneficiaries reduced spending on DME between the year before the demonstration and Year 6, but IAH beneficiaries reduced DME spending more. The estimated reduction in DME expenditures was similar in earlier years of the demonstration. The changes made by some IAH practices, such as providing timely follow-up visits after hospital discharges and ED visits, may have prevented unnecessary or duplicative orders for DME, but we have no direct qualitative evidence to support this hypothesis. Both IAH and comparison beneficiaries increased hospice spending from before the demonstration to Year 6, but IAH beneficiaries increased hospice spending more. The increase in hospice expenditures could reflect one or more of the following: more beneficiaries using hospice or longer or more intensive use of hospice services. Descriptive analysis suggested more IAH beneficiaries used hospice in Year 6 than Year 5; the unadjusted share of beneficiaries who used hospice increased

⁵ We did not estimate an average annual effect over the full six years of the demonstration because the number of participating practices changed between Years 1 to 5 and Year 6.

⁶ We calculated percent changes in outcomes by comparing the estimated effect in Year 6 with the mean outcomes of beneficiaries who met IAH eligibility criteria and received care from IAH practices in the year before the demonstration.

somewhat more for IAH beneficiaries than comparison beneficiaries. These increases were not driven by any one IAH site (Exhibit B.5a). That is, hospice expenditures increased substantially for most IAH sites in Year 6 relative to Year 5.^{7,8} However, we interpret the estimated increase in hospice expenditures with caution for the following reasons: (1) hospice expenditures did not change substantially in any year before Year 6; (2) in our interviews with the IAH practices in Year 6, none reported substantial changes in their approach to hospice relative to earlier in the demonstration; and (3) hospice expenditures changed differentially for IAH and comparison beneficiaries before the demonstration, violating the parallel-trend assumption required for unbiased estimation of results.

Exhibit II.1. The IAH payment incentive did not reduce total Medicare expenditures in Year 6



Source: Mathematica’s analysis of data from the IAH implementation contractor and 2009–2019 Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: The exhibit shows the estimated effects of the IAH payment incentive on total Medicare expenditures in each year. Results for Years 1 to 5 included the 14 sites that participated in Year 5 (N = 295,292 beneficiaries). We estimated results for Year 6 separately using a sample that included only the 12 sites that participated in Year 6 (N = 290,514 beneficiaries). Thus, differences between Year 5 and Year 6 estimates represent both the change in participating sites as well as any differences in the effect of the IAH payment incentive over time. The horizontal lines represent 90 percent confidence intervals. If zero was within the confidence interval (denoted by horizontal lines), the estimated effect (denoted by dots) was not statistically significantly different from zero at the 90 percent confidence level. In this case, the large confidence intervals suggest that the estimated effects were associated with great uncertainty.

*/**/*** The difference is statistically significant at the 0.10/0.05/0.01 level.

PBPM = per beneficiary per month.

⁷ After a beneficiary elects the Medicare hospice benefit, an IAH clinician may still provide care to the beneficiary in two circumstances. First, if the beneficiary chooses the IAH clinician to supervise hospice care, the IAH clinician will continue to make home-based primary care visits related to the terminal illness and will bill Medicare directly, assuming that that clinician is not employed by the hospice agency. Second, if a different clinician supervises hospice care, the IAH clinician may continue to provide care for conditions other than the terminal illness.

⁸ We might be concerned that IAH practices have an incentive to steer patients towards hospice, leading to increased expenditures. This is because, if the clinician supervising hospice care is not an IAH clinician, a beneficiary who is enrolled in the demonstration and counted in the incentive payment calculations is removed from the enrollee list after they elect the hospice benefit. However, this has been true in all demonstration years. When we examined data for the IAH group in Years 5 and 6, we did not identify changes in hospice use related to demonstration enrollment.

Key takeaway: Across key outcomes, Year 6 results were less favorable than Year 5 in large part because of a single influential site that left the demonstration after Year 5. We found no evidence that the IAH payment incentive improved key outcomes in Year 6 relative to Year 5 for sites that participated in both years.

The Year 6 estimate of -\$41 PBPM was considerably smaller than the estimated difference in expenditures in Year 5 (-\$330 PBPM). The smaller estimate is attributable in large part to the different samples used to produce the two estimates. The Year 6 estimate comes from a sample that includes just the 12 sites that participated through Year 6, whereas the Year 5 estimate includes the 14 sites that participated through Year 5 (Exhibit B.2b). To compare Year 5 with Year 6 more directly, we ran separate models that excluded the two sites that left the demonstration after

Year 5 in all years. Among the 12 practices that participated in Years 5 and 6, the estimated effect in Year 5 was -\$113 PBPM, which was not statistically significant (Exhibit B.2a). This alternative Year 5 estimate suggests two things. First, as much as two-thirds of the estimated effect in Year 5 (-\$113 PBPM in Year 5 using 12 sites versus -\$330 PBPM in Year 5 using 14 sites) was driven by a single influential site that discontinued participation in the demonstration after Year 5 and no longer provides home-based primary care. We observed a similar pattern in our analysis of Year 5 when we excluded IAH sites one at a time and estimated the effect of IAH on expenditures.⁹ Second, even when comparing estimates from models with the same 12-site sample in all years, the Year 6 estimated reduction (-\$41 PBPM) in Medicare expenditures was smaller than the Year 5 estimated reduction (-\$113 PBPM), though the difference between the two estimates was not statistically significant. At a minimum, there is no evidence sites that remained in the demonstration improved their ability to reduce average Medicare expenditures in Year 6. But because we did not include data from the 15 months that passed between the end of Year 5 (September 2017) and the start of Year 6 (January 2019), we cannot determine whether the change from -\$113 to -\$41 was part of a trend that began during the 15-month gap or limited to Year 6 alone. Respondents we interviewed at IAH practices, however, reported no major changes in care processes during the 15-month gap.

As the demonstration continues with fewer practices over time, there is a greater chance that any one IAH practice will substantially influence the results for the full sample. To better understand the effects of IAH in Year 6, we conducted two sensitivity analyses: (1) we estimated the effect of the payment incentive on total Medicare expenditures in Year 6 leaving out one practice at a time from the sample and (2) we used an alternative weighting scheme that gave each practice equal weight in all demonstration years, rather than a weight proportional to its size. Estimated effects of the IAH payment incentive on expenditures in Year 6 varied somewhat when excluding one practice at a time, but none were statistically significant (Exhibits B.5a and B.5b). When estimating the effects of the IAH payment incentive on expenditures using an alternative weighting scheme that gives each practice equal weight, we estimated an *increase* in total Medicare expenditures that also was not statistically significant (Exhibit B.6a). Taken together, these results and our main results for total Medicare expenditures suggest that the payment incentive had no substantive effect on total Medicare expenditures in Year 6.

⁹ Our previous [evaluation report](#) which covered Years 1 to 5 of the IAH demonstration provided estimates of the effect of IAH in Year 5 excluding one practice at a time from the group of 14 practices that participated in Year 5. One of the two practices that left the demonstration after Year 5 substantially influenced the result for this group of 14 practices.

2. Accounting for Merit-based Incentive Payment System adjustments and participation in an accountable care organization

Practices or individual clinicians serving IAH or comparison beneficiaries might participate in CMS initiatives that could change how they provide health services or how they are paid for those services. If other initiatives affect IAH practices differently than they affect practices serving comparison beneficiaries during the demonstration period, and these differences did not exist before the demonstration, our method of estimating the effect of the IAH payment incentive by netting out the change in outcomes for comparison practices before and after the demonstration period could produce biased results that do not reflect the effects of the IAH payment incentive. We examined how our estimates of the effect of the IAH payment incentive changed after accounting for participation in two initiatives: (1) the Merit-based Incentive Payment System (MIPS) and (2) accountable care organizations (ACOs).

In 2019 (IAH Year 6), CMS issued payments to clinicians for the first time under MIPS as part of its Quality Payment Program. Under MIPS, CMS adjusts payment to individual clinicians on the basis of quality and efficiency metrics from care delivered two years prior. In the first year of issuing payments, payments were small, with a maximum adjustment of just 1.9 percent (Navathe et al. 2019). Still, these adjustments could affect the estimate of the IAH payment incentive on total Medicare expenditures if IAH practices received larger (or smaller) MIPS adjustments than did comparison practices. To determine whether these payment adjustments affected the Year 6 results, we removed MIPS payment adjustments from total Medicare expenditures and estimated the effect of the IAH payment incentive on this alternative expenditure measure. The estimates of the effect of the IAH payment incentive in Year 6 were nearly identical when excluding MIPS adjustments and when using our primary measure of expenditures, which included MIPS adjustments (Exhibit B.7).

ACOs are groups of providers that coordinate the care of an assigned population of Medicare fee-for-service (FFS) beneficiaries; they are held financially accountable for the quality, cost, and experience of care they provide. Created as part of the Affordable Care Act, ACOs have become more common over time. By 2019, there were 487 ACOs in the Medicare program with 10.4 million assigned Medicare beneficiaries, up from 220 organizations and 3.2 million beneficiaries at the start of 2013 (CMS 2021a). Most of the IAH practices joined an ACO during the demonstration, and by Year 6, nearly three-quarters of IAH practices (representing 75 percent of IAH beneficiaries) and nearly half of comparison beneficiaries participated in an ACO. Practices participating in ACOs may change the way they provide care. For example, three IAH practices worked with their ACO to implement a uniform process aimed at reducing hospital use among patients with a urinary tract infection (UTI) or chronic obstructive pulmonary disorder.

“We saw a real high ambulatory sensitive admission rate for UTI. The first sign of UTI in an elderly person is usually confusion. What ends up happening is they go in the hospital, and they’re confused and then all of a sudden they’re getting this massive work-up for the confusion when in reality it’s just the UTI. So that was one of the things that we tried to work on.” —IAH practice administrator

If ACO participation were associated with differential reductions in expenditures or health care use, estimates of the effect of the IAH payment incentive on total expenditures might not be accurate without accounting for ACO participation. To account for these issues, we repeated our analysis of total Medicare

expenditures controlling for whether a beneficiary in the IAH or comparison group participated in an ACO in our regression modeling. Accounting for ACO participation did not substantively change the estimated effect of the IAH payment incentive in Year 6 (-\$29 PBPM, Exhibit B.8). Additional details about our ACO analysis are available in Appendix A.

3. Aggregate effects

Results expressed as changes in expenditures PBPM reflect the estimated effect of the IAH payment incentive for the average participating beneficiary. In contrast, aggregate effects on expenditures across all participating beneficiaries give a sense of the scale of the demonstration in total dollars and provide an opportunity to compare total expenditures directly with total incentive payments made by CMS to IAH practices. We estimated the aggregate effect of the IAH payment incentive on total expenditures by multiplying our estimate of the average PBPM effect by the total number of beneficiary months. In Year 6, we estimated an aggregate effect of -\$3.2 million; the estimated effect was relatively close to zero compared with earlier years and had a large 90 percent confidence interval (between -\$19.2 million and \$12.9 million), meaning we do not have strong evidence that the payment incentive decreased (or increased) expenditures in Year 6 (Exhibit II.2). Because CMS made incentive payments to practices of \$11 million in Year 6, there is a strong possibility that Year 6 of the demonstration led to a net loss for CMS. Our Year 6 aggregate effect estimate was smaller than the last few demonstration years mostly because of a smaller estimated reduction in PBPM expenditures in Year 6. In addition, having fewer IAH beneficiaries in Year 6 contributed to the smaller aggregate estimate because two practices exited the demonstration and some practices provided home visits to fewer IAH-eligible beneficiaries in Year 6 than in Year 5.

Exhibit II.2. Aggregate effects of the IAH payment incentive were much smaller in Year 6 than recent years with large uncertainty surrounding the Year 6 estimate, but incentive payments made by CMS increased in Year 6

	Total expenditures		Total incentive payments to IAH practices
	Aggregate effect	90 percent confidence interval	
Year 1	-\$9,448,124	-\$22,116,947; \$3,220,699	\$11,668,023
Year 2	-\$2,162,808	-\$18,115,610; \$13,789,994	\$5,322,343
Year 3	-\$12,854,270	-\$31,623,671; \$5,915,131	\$7,219,783
Year 4	-\$25,442,886	-\$55,868,337; \$4,982,565	\$8,095,010
Year 5	-\$31,350,990*	-\$59,793,938; -\$2,908,042	\$6,855,823
Year 6	-\$3,190,507	-\$19,231,594; \$12,850,579	\$11,050,083

Source: Mathematica’s analysis of data from the IAH implementation contractor and 2009–2019 Medicare claims and enrollment data from the Chronic Conditions Warehouse. Incentive payment results are provided by CMS at <https://innovation.cms.gov/initiatives/independence-at-home>.

Notes: This exhibit shows the aggregate estimated effects of the IAH payment incentive on total Medicare expenditures for IAH-eligible beneficiaries across all IAH practices in Years 1 to 6 of the demonstration. These calculations are based on the beneficiary-level estimates shown in Exhibit II.1 and the number of IAH beneficiary months in each year. Results for Years 1 to 5 included the 14 sites that participated in Year 5. We estimated results for Year 6 separately using a sample including only the 12 sites that participated in Year 6. See Appendix A for information about differences between the calculation of effects on expenditures for the evaluation and incentive payments to IAH practices.

*/**/** The difference is statistically significant at the 0.10/0.05/0.01 level.

The strategy that we used to assess the effect of the demonstration payment incentive on Medicare expenditures differs from the strategy CMS uses to calculate incentive payments for IAH practices. CMS's incentive payment calculation is based on whether the IAH practices had lower Medicare expenditures than their estimated spending target (which is based on actuarial predictions) and whether the IAH practices met required quality criteria. By contrast, the evaluation compares changes in outcomes over time for beneficiaries who receive care from IAH practices with changes for similar beneficiaries who do not to measure whether the IAH incentive payment tied to the delivery of home-based primary care affects expenditures and other outcomes. Differences in their objectives (evaluating the effect of the demonstration payment incentive and calculating the actual incentive payments) and analytic strategies mean that the incentive payments that CMS reported during the demonstration are not equivalent to the expenditure reductions reported here as effects of the IAH payment incentive. In addition, the incentive payment calculation changed substantially between Years 5 and 6. See Appendix A for more information about differences between the calculation of effects on expenditures for the evaluation and incentive payments to IAH practices and changes between Years 5 and 6.

D. Effects of the payment incentive on hospital use

IAH sites could respond to the payment incentive by changing how they provide care in ways that reduce hospital admissions and ED visits. In a previous report, we described several types of changes made by IAH practices in the first several years of the demonstration.¹⁰ During interviews we conducted with IAH practice administrators and clinicians in Year 6, several practices reported making changes aimed at reducing hospital use since Year 5. A few practices implemented new formal risk stratification processes to identify patients at high risk for hospital admissions and provide additional care management services to those patients. More than half of the practices reported changing care team meetings to focus on patients with the highest rates of hospital use, including analysis of electronic health record data.

“The physician on call the prior week [is] asked each week to [identify] admissions that they think [were] potentially preventable for either medical or social reasons. [They] talk specifically about what they thought the preventable thing was, and then the team contributes ideas for, you know, what can we do differently? Do we need to identify people who need social work earlier?...One example was that we hadn't proactively helped patients identify a secondary caregiver. So, if their hands-on caregiver unexpectedly gets sick—this has happened to a couple of our patients....We now have this process where we're trying to identify things that are causing preventable admissions.” —IAH practice medical director

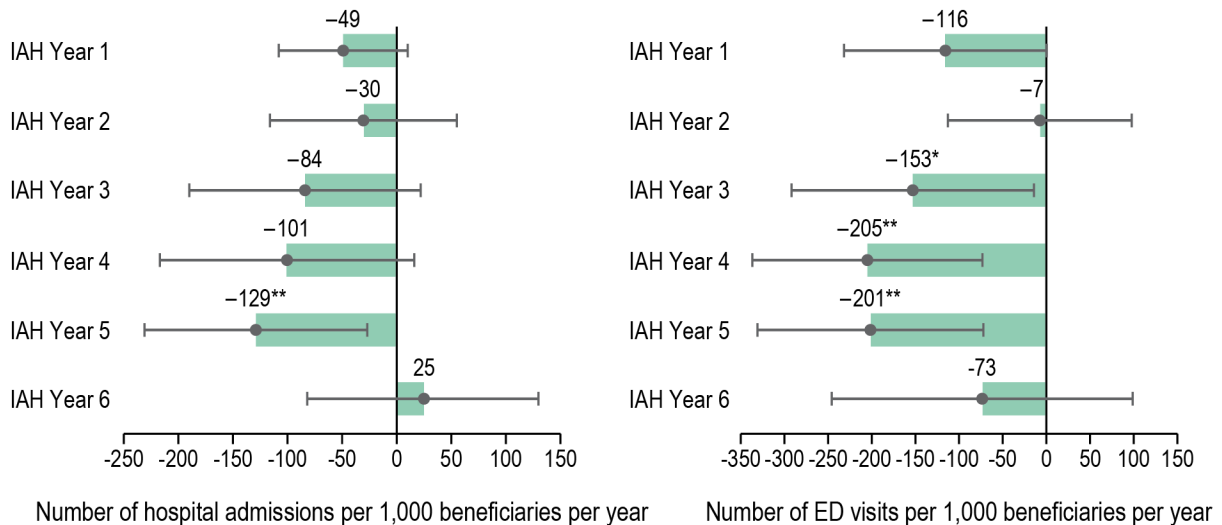
Key takeaway: The IAH payment incentive did not affect the number of hospital admissions or ED visits in Year 6.

As with Medicare expenditures, however, we found no strong evidence that IAH reduced hospital use in Year 6. Specifically, in Year 6, we estimated an increase in hospital admissions of 25 admissions per 1,000 beneficiaries (1.4 percent increase), though the estimated increase was not statistically significant (Exhibit II.3). We estimated that the payment incentive reduced ED visits in Year 6 by 73 per 1,000 beneficiaries (2.6 percent). Although the estimated 2.6 percent reduction in ED visits was not statistically significant, it was larger as a percentage relative to the estimated changes in expenditures (1.0 percent decrease) and hospital admissions (1.4 percent increase).

¹⁰ For more information, refer to the [evaluation report](#) which covered Years 1 to 4 of the IAH demonstration.

Similar to our findings on Medicare expenditures, our Year 6 estimates for hospital care deviated from Year 5. Again, we attribute most of the difference between Year 6 and Year 5 to a single influential site leaving the demonstration after Year 5 (Exhibits B.9a and B.9b). Still, when examining results only for the 12 practices that participated in Year 6, the estimated effects on hospital admissions and ED visits were less favorable in Year 6 than in Year 5, particularly for hospital admissions (2.1 percent decrease in Year 5 and 1.4 percent increase in Year 6, which is not a statistically significant difference). These results suggest that the payment incentive may have had a less favorable effect in Year 6 independent of the change in sample.

Exhibit II.3. The IAH payment incentive did not reduce hospital admissions or ED visits in Year 6



Source: Mathematica’s analysis of data from the IAH implementation contractor and 2009–2019 Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: The exhibit shows the estimated effect of the IAH payment incentive on hospital admissions and ED visits in each year. Years 1 to 5 are estimated from a sample including 14 sites that participated in Year 5 (N = 295,292 beneficiaries). Year 6 was estimated separately from a sample including only the 12 sites that participated in Year 6 (N = 290,514 beneficiaries). Thus, differences between Year 5 and Year 6 estimates represent both the change in participating sites as well as any differences in the effect of the IAH payment incentive over time. The horizontal lines represent 90 percent confidence intervals. If zero was within the confidence interval (denoted by horizontal lines), the estimated effect (denoted by dots) was not statistically significantly different from zero at the 90 percent confidence level. In this case, the large confidence intervals suggest that the estimated effects were associated with great uncertainty.

*/**/** The difference is statistically significant at the 0.10/0.05/0.01 level.

ED = emergency department.

E. Effects of the payment incentive on quality of care

1. Performance on quality measures used to calculate incentive payments

To be eligible to receive an incentive payment in Year 6, an IAH practice must have met performance thresholds for six quality measures (Exhibit II.4). The implementation contractor used Medicare claims

and site-reported data to calculate six site-level performance measures.¹¹ If a practice met the standards for all six quality measures tied to payment, then it earned the entire available maximum payment. If a practice achieved the threshold for five, four, or three quality measures, it earned, respectively, 83 percent, 67 percent, or 50 percent of the maximum payment. For example, the threshold for documenting patient preferences was 80 percent. If a practice met the threshold set for this measure, payment did not vary by how much the practice exceeded 80 percent.

Exhibit II.4. Quality measures used to calculate IAH incentive payments

Site-reported measures	Claims-based measures
Follow-up contact within 48 hours of hospital admissions, hospital discharges, and ED visits for at least 50 percent of the events	Hospital admissions for selected ambulatory care-sensitive conditions less than or equal to average utilization in a similar population ^a
Medication reconciliation in the home within 48 hours of hospital discharges and ED visits for at least 50 percent of the events	ED visits for selected ambulatory care-sensitive conditions less than or equal to average utilization in a similar population ^a
Patient preferences documented annually for at least 80 percent of IAH enrollees	All-cause hospital readmissions within 30 days less than or equal to average utilization in a similar population

^a Ambulatory care sensitive conditions include diabetes, congestive heart failure, and chronic obstructive pulmonary disease.

ED = emergency department.

In this section, we describe the extent to which quality measure performance changed over time in the demonstration and compare quality measure performance with practices’ improvement efforts reported during interviews. The performance and qualitative data reflect the 11 practices that participated in all months of Year 6, including one consortium consisting of three sites.¹² We interviewed one clinician and one practice administrator from each practice from November 2019 to February 2020 (the end of Year 6 and beginning of Year 7). The goal of the interviews was to identify any changes that practices made in their approaches to delivering care to IAH beneficiaries and meeting demonstration quality of care requirements since our last round of interviews in April 2017 (during Year 5).

Most practices reported no major changes in care processes during the gap in the demonstration or Year 6. The majority of practices reported that they were already providing care that was largely consistent with IAH demonstration requirements and quality measures before participating in IAH, and several practices noted that delivering care in a manner that meets IAH quality measures had become their standard of care across all patients. As we describe in Exhibits II.5 and II.6, some practices reported relatively minor changes in care delivery that they hoped would improve performance on one or more quality measures.

However, if the sites were trying to maximize their incentive payments, we would expect to see improvements in meeting these measures across time unless they were already meeting the required threshold for all six quality measures tied to payment. In Year 6, for each of the three claims-based measures, 9 or more of the 11 sites met the required threshold for receiving payment. In contrast, for each of the site-reported measures, 4 or fewer sites met the required threshold. Thus, there was room for

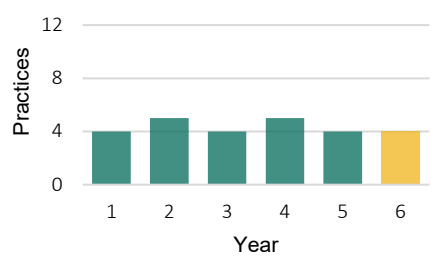
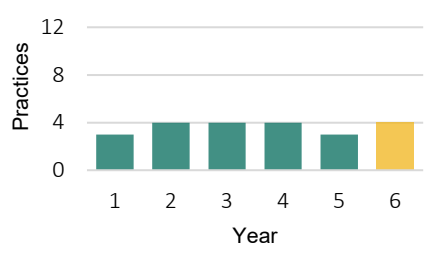
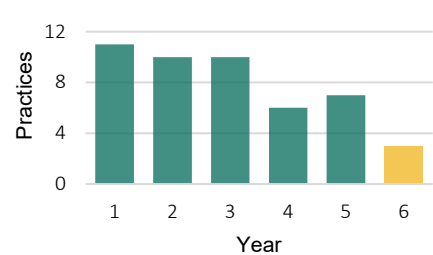
¹¹ These site-level measures reflect beneficiaries enrolled in the demonstration; see Appendix A for information about differences between the implementation contractor’s count of IAH enrollees and the IAH beneficiaries we include in the analysis sample for the evaluation.

¹² We report quality measure performance data for the consortium as a single practice. We did not have quality measure performance data for Durham because the practice left the demonstration late in Year 6.

Key takeaway: Many IAH practices did not meet standards for all six quality measures tied to payment, even though doing so would have increased the amount of their incentive payments.

improvement, particularly in the site-reported outcomes. Yet for all measures except documentation of patient preferences, the number of practices that met the required standard for payment did not vary much from year to year, including between Years 5 and 6 (Exhibits II.5 and II.6). The lack of change over time suggests that across the 12 sites, there were no consistent, successful efforts to improve or report most measures, even though reaching the performance threshold for additional measures would have led to larger incentive payments in Year 6 for 6 practices.

Exhibit II.5. Most IAH practices did not improve performance on reported quality measures from Year 5 to Year 6

Number of practices that met required threshold by demonstration year	Changes reported by IAH practices and changes in performance in Year 6														
<p data-bbox="181 693 1421 730">Follow-up contact within 48 hours of hospital admissions, hospital discharges, and ED visits^a</p>  <table border="1" data-bbox="203 756 633 1018"> <caption>Follow-up contact within 48 hours of hospital admissions, hospital discharges, and ED visits^a</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>4</td></tr> <tr><td>2</td><td>5</td></tr> <tr><td>3</td><td>4</td></tr> <tr><td>4</td><td>5</td></tr> <tr><td>5</td><td>4</td></tr> <tr><td>6</td><td>4</td></tr> </tbody> </table>	Year	Practices	1	4	2	5	3	4	4	5	5	4	6	4	<p>No practices reported changes in approaches to provide and document follow-up visits in Year 6. The seven practices that did not meet the performance threshold for this measure in Year 5 also failed to meet the threshold in Year 6.</p>
Year	Practices														
1	4														
2	5														
3	4														
4	5														
5	4														
6	4														
<p data-bbox="181 1039 1421 1077">Medication reconciliation in the home within 48 hours of hospital discharges and ED visits^a</p>  <table border="1" data-bbox="203 1102 633 1354"> <caption>Medication reconciliation in the home within 48 hours of hospital discharges and ED visits^a</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>3</td></tr> <tr><td>2</td><td>4</td></tr> <tr><td>3</td><td>4</td></tr> <tr><td>4</td><td>4</td></tr> <tr><td>5</td><td>3</td></tr> <tr><td>6</td><td>4</td></tr> </tbody> </table>	Year	Practices	1	3	2	4	3	4	4	4	5	3	6	4	<p>Although five practices reported increased focus on documenting medication reconciliation more consistently because of poor performance on this quality measure in prior years, none of these practices showed improvement or met the performance threshold in Year 6. It may, however, be too soon to see results of recent efforts to train clinicians on documenting medication reconciliation in the electronic health record reflected in the quality measure data.</p>
Year	Practices														
1	3														
2	4														
3	4														
4	4														
5	3														
6	4														
<p data-bbox="181 1365 1421 1402">Patient preferences documented annually</p>  <table border="1" data-bbox="203 1428 633 1680"> <caption>Patient preferences documented annually</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>10</td></tr> <tr><td>2</td><td>9</td></tr> <tr><td>3</td><td>9</td></tr> <tr><td>4</td><td>6</td></tr> <tr><td>5</td><td>7</td></tr> <tr><td>6</td><td>3</td></tr> </tbody> </table>	Year	Practices	1	10	2	9	3	9	4	6	5	7	6	3	<p>One of the four practices that failed to meet the required threshold on this measure in Year 5 reported efforts to improve consistency in documenting patients' preferences in its electronic health record; this practice met the threshold in Year 6. But several other practices had worse performance on this measure in Year 6—the number of practices that met the required threshold on this measure decreased from 7 in Year 5 to 3 in Year 6.</p>
Year	Practices														
1	10														
2	9														
3	9														
4	6														
5	7														
6	3														

Source: IAH implementation contractor and interviews conducted by Mathematica with IAH practices in 2019.

^a Some of the lowest-performing practices may have offered a follow-up visit and medication reconciliation more often than reported, but they may not have been able to document and report them systematically.

ED = emergency department.

The number of practices that met the required threshold for documentation of patient preferences decreased from 7 in Year 5 to 3 in Year 6. Interview respondents from the practices that stopped meeting the threshold did not report changes that would explain the difference in their performance on this measure from Year 5 to Year 6. We do not know whether these sites continued to gather most patients' preference information but did not document it or whether they gathered this information for fewer patients over time. Either way, the payment incentive did not motivate most of the sites to continue meeting the threshold for this quality measure in Year 6.

“I think many of us [physicians] don't really like [documenting patient preferences]. ... I feel it's just a checklist for us to do that doesn't really impact anything we do really with the family.”—IAH clinician

“[The challenge is] with your staff. You know, everyone has different comfort levels with having these kinds of discussions. It takes ... building extra time into your visit, which isn't always possible. So, my job sometimes, I feel is like cracking the whip on everybody. ... making sure that [the staff] understand that this needs to be done.” —IAH administrator

Exhibit II.6. Despite reports of new efforts to prevent hospital use in Year 6, the number of practices meeting the required performance thresholds did not increase from Year 5

Number of practices that met required threshold by demonstration year	Changes reported by IAH practices and changes in performance in Year 6														
Hospital admissions for selected ambulatory care-sensitive conditions^a															
<table border="1"> <caption>Hospital admissions for selected ambulatory care-sensitive conditions^a</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>10</td></tr> <tr><td>2</td><td>10</td></tr> <tr><td>3</td><td>11</td></tr> <tr><td>4</td><td>10</td></tr> <tr><td>5</td><td>10</td></tr> <tr><td>6</td><td>7</td></tr> </tbody> </table>	Year	Practices	1	10	2	10	3	11	4	10	5	10	6	7	<p>Several practices reported new efforts to prevent hospital use, but the number of practices that met the required performance threshold did not improve. Two practices that implemented formal risk stratification processes to identify patients at high risk for hospital use showed a reduction in the ratio of observed-to-expected hospital admissions. In addition, two practices that revised care team meetings and implemented a process to reduce hospital use related to COPD showed improved performance.</p>
Year	Practices														
1	10														
2	10														
3	11														
4	10														
5	10														
6	7														
ED visits for selected ambulatory care-sensitive conditions^a															
<table border="1"> <caption>ED visits for selected ambulatory care-sensitive conditions^a</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>11</td></tr> <tr><td>2</td><td>9</td></tr> <tr><td>3</td><td>11</td></tr> <tr><td>4</td><td>9</td></tr> <tr><td>5</td><td>10</td></tr> <tr><td>6</td><td>8</td></tr> </tbody> </table>	Year	Practices	1	11	2	9	3	11	4	9	5	10	6	8	<p>Several practices reported new efforts to prevent ED use, but the number of practices that met the required performance threshold did not improve. Two practices that implemented formal risk stratification processes to identify patients at high risk for hospital use showed a reduction in the ratio of observed-to-expected ED visits. In addition, two practices that revised care team meetings and implemented a process to reduce hospital use related to COPD showed improved performance.</p>
Year	Practices														
1	11														
2	9														
3	11														
4	9														
5	10														
6	8														
All-cause hospital readmissions within 30 days															
<table border="1"> <caption>All-cause hospital readmissions within 30 days</caption> <thead> <tr> <th>Year</th> <th>Practices</th> </tr> </thead> <tbody> <tr><td>1</td><td>11</td></tr> <tr><td>2</td><td>11</td></tr> <tr><td>3</td><td>11</td></tr> <tr><td>4</td><td>11</td></tr> <tr><td>5</td><td>11</td></tr> <tr><td>6</td><td>10</td></tr> </tbody> </table>	Year	Practices	1	11	2	11	3	11	4	11	5	11	6	10	<p>Several practices reported new efforts to prevent hospital and ED use in Year 6, but the number of practices that met the required performance threshold did not improve.</p>
Year	Practices														
1	11														
2	11														
3	11														
4	11														
5	11														
6	10														

Source: IAH implementation contractor and interviews conducted by Mathematica with IAH practices in 2019.

^a Ambulatory care-sensitive conditions include diabetes, congestive heart failure, and COPD.

COPD = chronic obstructive pulmonary disease. ED = emergency department.

2. Effects of the payment incentive on potentially avoidable hospital admissions and ED visits

Some hospital admissions and ED visits might be prevented if primary and specialty care is provided in a timely and effective manner, including hospital use for conditions such as hypertension and urinary tract infections. Using the same analytic approach we used for expenditures and hospital use, we examined whether the IAH payment incentive reduced potentially avoidable hospital admissions, potentially avoidable ED visits, and the probability of an unplanned readmission relative to the comparison group. Overall, we found little evidence that the demonstration improved these quality measures in Year 6.

Key takeaway: The IAH payment incentive did not affect potentially avoidable hospital use or the chance of having an unplanned readmission in Year 6.

We estimated a reduction in potentially avoidable hospital admissions of 8 admissions per 1,000 beneficiaries in Year 6 (1.9 percent), which was not statistically significant (Exhibit II.7). Potentially avoidable ED visits increased in Year 6 by 17 visits per 1,000 beneficiaries (9.0 percent). This result, though large compared with the estimated effects on potentially avoidable hospital admissions (1.9 percent reduction) and total ED visits (2.6 percent reduction, Exhibit II.3), was also not statistically significant. The demonstration had no measurable effect on the probability of unplanned readmission in Year 6 (-0.02 percentage points).

Responses to a survey we conducted early in the demonstration of IAH beneficiaries and caregivers and interviews with IAH practice administrators and clinicians throughout the demonstration provide some context for the practices not effectively lowering the number of potentially avoidable outpatient ED visits. Practices reported trying to reduce hospital admissions and ED visits by providing more comprehensive care, case management services, and other targeted approaches but noted multiple obstacles.¹³

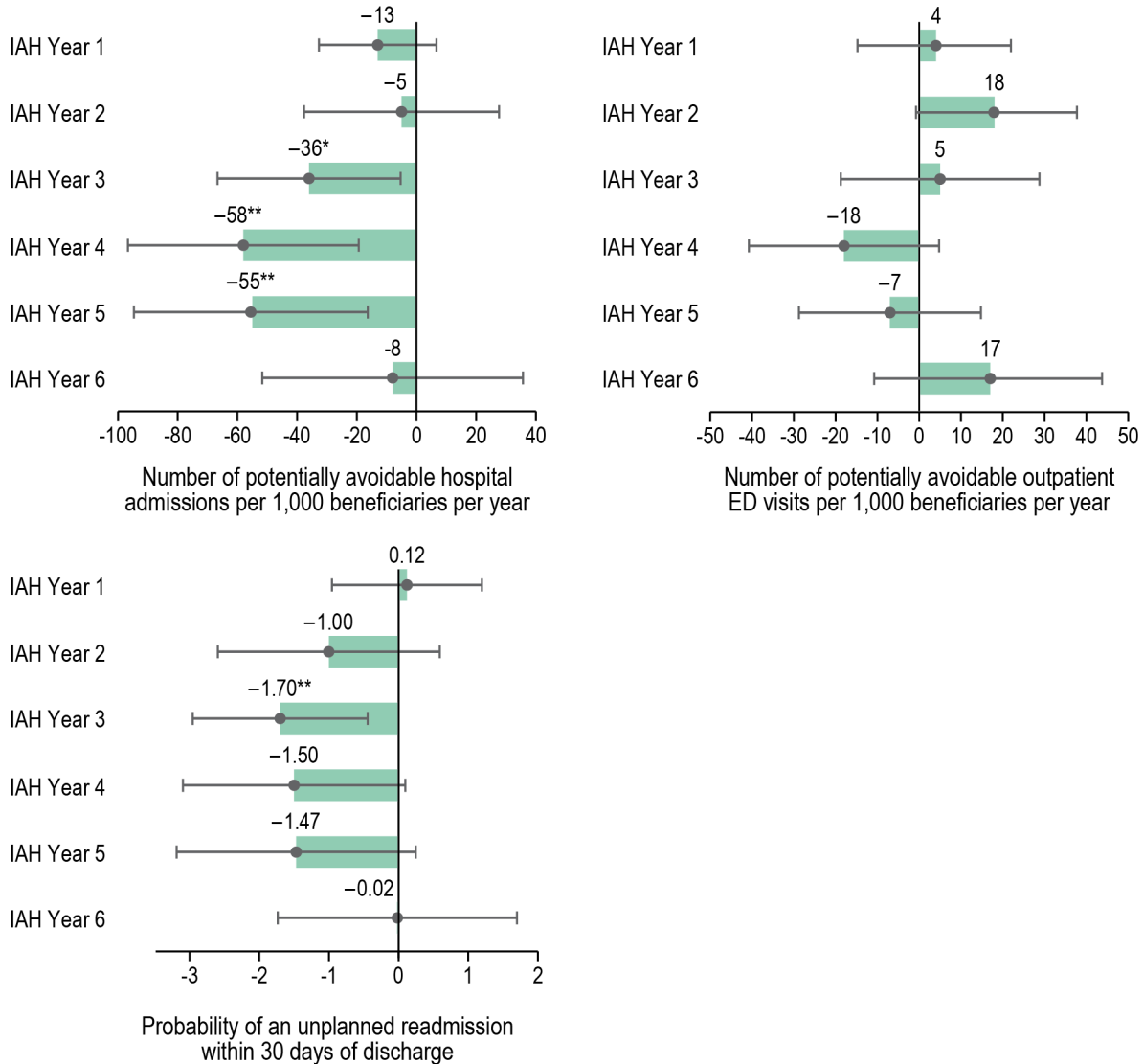
“[We have to revisit the idea of calling the practice instead of going to the emergency department] with our post-hospital patients because they forgot or didn’t remember. Or maybe when we told them they understood, but now they have some cognitive ... changes and maybe we might actually be having to work with caregivers.” —IAH practice administrator

“If cousin Sue isn’t there just to hold their hand, then the patient’s going to get nervous and call 911 ... So, [avoiding going directly to the hospital without calling the practice first] absolutely does not work without social support.” —IAH clinician

A sizable minority of beneficiaries and caregivers reported they would prefer to visit the ED—instead of contacting the IAH practice—if they were unsure whether symptoms required emergency care. Beneficiaries commonly cited two reasons why they would not contact the IAH practice: (1) the beneficiary’s caregiver or someone else prefers that the beneficiary go directly to the ED and (2) the beneficiary feels that the ED provides better and more convenient care when it is unclear whether a problem is serious.

¹³ For more information, refer to the [evaluation report](#) which covered Years 1 to 4 of the IAH demonstration.

Exhibit II.7. The IAH payment incentive did not affect potentially avoidable hospital use or the chance of having an unplanned readmission in Year 6



Source: Mathematica’s analysis of data from the IAH implementation contractor and 2009–2019 Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: The exhibit shows the estimated effect of the IAH payment incentive on potentially avoidable use of care and probability of unplanned readmission in each year. Years 1 to 5 are estimated from a sample including 14 sites that participated in Year 5 (N = 295,292 beneficiaries). Year 6 was estimated separately from a sample including only the 12 sites that participated in Year 6 (N = 290,514 beneficiaries). Thus, differences between Year 5 and Year 6 estimates represent both the change in participating sites as well as any differences in the effect of the IAH payment incentive over time. The horizontal lines represent 90 percent confidence intervals. If zero was within the confidence interval (denoted by horizontal lines), the estimated effect (denoted by dots) was not statistically significantly different from zero at the 90 percent confidence level. In this case, the large confidence intervals suggest that the estimated effects were associated with great uncertainty.

*/**/** The difference is statistically significant at the 0.10/0.05/0.01 level.

ED = emergency department.

Similar to Medicare expenditures and hospital use, the estimated reductions in potentially avoidable hospital admissions and probability of unplanned readmission decreased sharply from Year 5 to Year 6 (-55 to -8 visits for hospital admissions and -1.47 to -0.02 percentage points for probability of readmission). Again, we attribute most the difference to the change in participants in Year 6 (Exhibits B.10a and B.10b). As with expenditures and hospital use, however, we observed some difference between Year 6 and Year 5 estimates from within the same 12 sites participating in both years (that is, independent of changes in site participation). All of these changes were not associated with better performance for IAH practices (for example, the estimated reduction in potentially avoidable hospital admissions declined from 8.3 percent in Year 5 to 1.9 percent in Year 6).

F. Effects of the payment incentive on health outcomes

Finally, we examined the payment incentive's effect on two health outcomes: mortality and entry into institutional long-term care. As with any initiative that incentivizes reduced expenditures and hospital use, policymakers may be concerned that health outcomes (for example, mortality) are adversely affected, especially for a chronically ill, functionally limited population such as IAH beneficiaries. In the case of IAH, a higher probability of entering institutional long-term care may indicate that practices are encouraging high-cost patients to enter long-term care because residence in such a facility removes them from the demonstration when calculating incentive payments.

Key takeaway: We did not find evidence that the IAH payment incentive affected the mortality rate or probability of entering institutional long-term care.

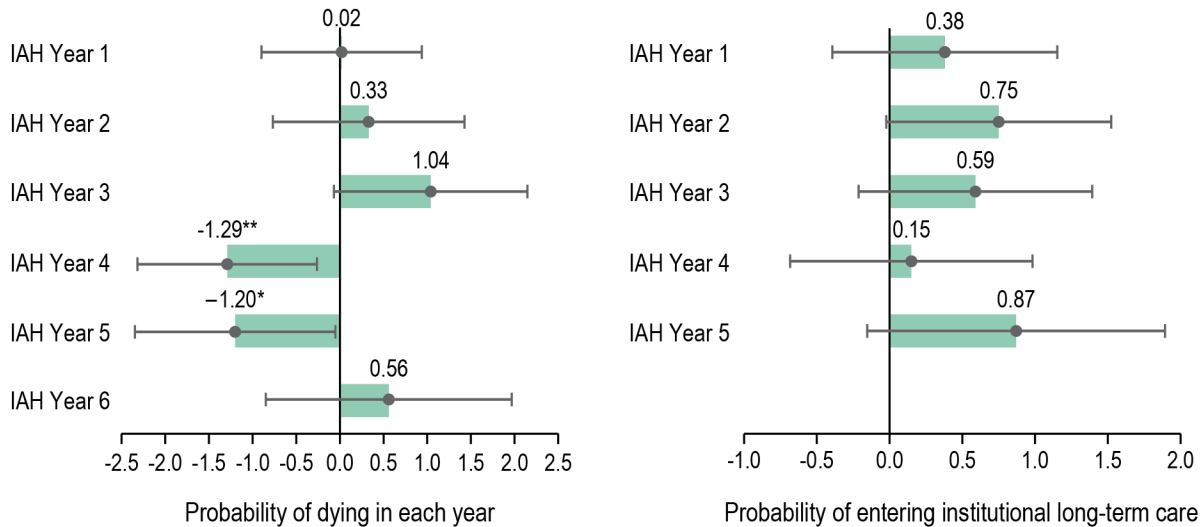
Overall, the IAH payment incentive did not significantly affect mortality in Year 6. We estimated an increase of 0.56 percentage points (3.8 percent) in the probability of death that was not statistically significant (Exhibit II.8). Though the size of effect in Year 6 was relatively large in percentage terms, we interpret results for mortality from all years with caution for two reasons. First, mortality rates for the IAH group rose substantially relative to the comparison group before the demonstration began, which violates an assumption required for our study design to produce an unbiased estimate (Exhibit B.11a). Second, estimated effects of the payment incentive on mortality have changed substantially year to year, even before the sample changed when two practices left the demonstration after Year 5 (Exhibit B.11b).

For entry into institutional long-term care, we examined the effect of the IAH payment incentive through Year 5 using all practices that participated in Years 1 to 5 because the data we used to measure entry into institutional long-term care were not available for Year 6 (2019) at the time we wrote this report. We found limited evidence (large in magnitude, but not statistically significant) of increased probability of entering long-term care in Year 5—an increase of 0.87 percentage points (12.3 percent). The estimated effect in Year 5 increased compared with Year 4, but the estimate is generally consistent with earlier years of the demonstration and not statistically significant at the 0.10 level in any year.

In addition to lack of statistical significance, there are two other reasons we do not interpret these results as strong evidence of the payment incentive causing an increase in entering long-term care. First, because entry into institutional long-term care is a rare occurrence for IAH beneficiaries, small changes in the percentage of the sample that entered institutional long-term care can appear large in terms of percentage change from the pre-demonstration period. The predicted probability of entering institutional long-term care was about 8 percent for IAH and comparison beneficiaries in the year before the demonstration. Second, there has been a national trend of shifting from institutional to community-based care for patients

who require long-term supports and services (Murray et al. 2021), and this trend could have affected IAH and comparison beneficiaries differently during (or before) the demonstration period.

Exhibit II.8. The IAH payment incentive did not significantly affect mortality in Year 6 or entry into institutional long-term care in Year 5



Source: Mathematica’s analysis of data from the IAH implementation contractor and 2009–2019 Medicare claims and enrollment data from the Chronic Conditions Warehouse.

Notes: The exhibit shows the estimated effect of the IAH payment incentive on the probability of dying and on the probability of entering institutional long term care in each year. Years 1 to 5 are estimated from a sample including 14 sites that participated in Year 5 (N = 295,292 beneficiaries). Year 6 was estimated separately from a sample including only the 12 sites that participated in Year 6 (N = 290,514 beneficiaries). Thus, differences between Year 5 and Year 6 estimates represent both the change in participating sites as well as any differences in the effect of the demonstration over time. The horizontal lines represent 90 percent confidence intervals. If zero was within the confidence interval (denoted by horizontal lines), the estimated effect (denoted by dots) was not statistically significantly different from zero at the 90 percent confidence level. In this case, the large confidence intervals suggest that the estimated effects were associated with great uncertainty.

*/**/** The difference is statistically significant at the 0.10/0.05/0.01 level.

G. Discussion and limitations

Evidence from this report strongly suggests that the IAH payment incentive did not reduce Medicare expenditures, hospital admissions, or ED visits in the demonstration’s sixth performance year. In addition, we found no compelling evidence that the payment incentive improved quality of care or negatively affected health outcomes. Although the evidence from the first five years of the demonstration suggested that the demonstration may produce positive results as the practices learned more, it became apparent after Year 5 that the most promising results were driven by a single practice that withdrew from the demonstration after Year 5 and no longer provides home-based primary care. Further, the practices that remained in the demonstration in Year 6 have not measurably progressed in lowering Medicare expenditures or improving outcomes. When we compared results from Year 5 with Year 6 for the 12 practices that participated in both years, the estimated effects from Year 6 were somewhat less favorable than the effects from Year 5.

In addition, six of the nine practices that qualified for an incentive payment in Year 6 earned only 50 percent of the maximum payment because they failed to meet the required standards for the three practice-reported quality measures (follow-up contact within 48 hours of hospital admission, hospital discharge, or ED visit; medication reconciliation in the home within 48 hours of hospital discharge or ED visit; and documenting patient preferences annually). Also, one practice earned none of the payment because of poor performance on the quality measures. Earlier in the demonstration, some clinicians reported that a follow-up contact within 48 hours was not warranted in some cases, so it may be the case that some practices do not view meeting these measures as clinically important. Alternatively, clinicians may have conducted these three processes (follow-up contacts, medication reconciliations, or discussing patient preferences) with some beneficiaries but did not systematically report those data for quality measurement purposes. In most cases, however, the six practices that earned only 50 percent of the maximum payment in Year 6 either did not report changes designed to improve consistency of providing or documenting these three processes in Year 6 or reported changes but did not show improved performance. In sum, although failing to meet the standard for one or more quality measures meant that a site would fail to earn the entire available maximum payment, in many cases we observed no evidence that sites responded to the payment incentive in ways that successfully improved their performance on quality measures.

Given relatively low performance by most IAH practices on the three practice-reported quality measures, it is perhaps unsurprising that most practices reported they made no major changes in their care processes during the 15-month gap between Years 5 and 6. In general, practices reported that changes they made previously because of the IAH payment incentive contributed to a standard of care that they implement for all their patients, including beneficiaries who are in ACOs and other incentive programs, and thus there was no reason to change in response to the absence of IAH. Some practices did not inform their clinicians of the gap in the demonstration, instead aiming to help clinicians focus on patient care and meeting standards that applied more broadly than IAH. When asked about how they used IAH incentive payments, most administrators of practices that participated in Year 6 viewed IAH payments as one additional source of funding used to support practice-wide changes. These practices cited that their efforts to improve care as part of the IAH demonstration align with other care transformation work, including participating in other value-based payment initiatives.

The demonstration and the evaluation have several limitations that should be considered when reviewing these results. First, because Congress limited the size of the demonstration (See Section 3024 of the Patient Protection and Affordable Care Act), the number of participating practices was small, and the number of beneficiaries who met the demonstration criteria was a subset of those practices' patients. With such small numbers of participants, site-level payment calculations and evaluation results could be subject to random fluctuations, which could lead to (1) a higher chance of deviations from the true mean (that is, estimated effects that differ from the unknown true effect of the IAH payment incentive) and (2) wider confidence intervals (that is, less chance of an estimated effect being statistically significant).

Second, this demonstration was not designed to draw conclusions about how a payment incentive would affect outcomes for Medicare FFS beneficiaries who do not meet IAH eligibility criteria or patients of other home-based primary care providers. It shows only how the payment incentive affected outcomes for chronically ill and functionally limited Medicare FFS beneficiaries who received home-based primary care from a small number of practices that volunteered for and participated in the demonstration. Attrition from the demonstration (both before and after Year 5) combined with the fact that five of the 12 practices that remained in Year 6 are operated by the same corporation, means that the results for Year 6 of the

demonstration are unlikely to inform what might happen if other home-based primary care providers were subject to a payment incentive similar to IAH.

Third, the longer the demonstration, the higher the risk of bias in the estimated effect, or the less confident we can be that the estimated results reflect effects (or lack thereof) of changes made by IAH practices in response to the IAH payment incentive. The evaluation needs a baseline to account for pre-demonstration differences in outcomes by the IAH and comparison groups. However, the extended length of the demonstration, combined with the 15-month gap in demonstration operations between Years 5 and 6, results in a baseline that is seven years before Year 6 (2011–2012 versus 2019). Over that time period, factors other than the payment incentive may have affected expenditures differently for IAH and comparison beneficiaries. For example, if the patient mix in the IAH and comparison groups changed differently over time in ways that we could not measure, and those changes affected expenditures, then the results could misrepresent the actual effects of the payment incentive. Furthermore, CMS launched several competing alternative payment models and other initiatives since the IAH baseline year, in addition to ACOs examined here, that may have affected IAH and comparison beneficiaries differently in ways that are difficult to measure.

When assessing the risk of bias due to the length of the demonstration, we considered whether results for the 12 practices that participated in Year 6 changed substantially from results for these same practices during previous demonstration years. We focused on Years 3 to 5 since we would not have expected changes made by the practices to substantially improve outcomes in the first two years of the demonstration. Results for these 12 practices did not change substantially from previous demonstration years to Year 6. The estimated 1.0 percent decrease in total expenditures in Year 6 was well within the range of estimated effects for these same 12 practices in Years 3 to 5 (an increase of 1.3 percent to a decrease of 2.7 percent). We found a similar pattern for hospital use, which has contributed the most to total expenditures. These relatively small changes from year to year suggest that the extended time from the baseline year to Year 6 probably did not introduce substantial bias in the Year 6 results. However, we cannot rule out the possibility that some degree of bias existed in results for Year 6 or earlier years.

Finally, the eligibility criteria made it challenging to use administrative data to identify IAH patients and comparison beneficiaries who were at the same stage in their disabilities and chronic illnesses. The beneficiaries who qualified for the demonstration could have recently been ill (a recent hospital admission) or relatively stable (with a hospital admission up to one year prior). Qualifying beneficiaries could also be temporarily disabled (with expectations to recover) or permanently disabled. Identifying the severity is important because patients whose disabilities and chronic illnesses are more severe may be on different trajectories of care (for example, near death or long-term hospital admission) which are associated with different levels of expenditures. If the comparison group was on a different trajectory from the IAH group, the effects of the IAH payment incentive may have been over- or underestimated.

Given that no study design can alleviate all of the evaluation's limitations imposed by the demonstration—including the small size, lack of generalizability to other home-based primary care providers and beneficiaries who did not meet IAH eligibility criteria, length of the demonstration, and difficulty identifying beneficiaries with the same trajectory of care in the comparison group—we believe that this evaluation provides the most robust estimate of the effect of the payment incentive for participating practices in Year 6. Based on our analysis of the effects of the payment incentive, along with qualitative information and data on performance on demonstration quality measures, we conclude that the IAH payment incentive did not materially reduce Medicare expenditures, enhance quality of care, or improve health outcomes in Year 6 of the demonstration

III. What were the effects of home-based primary care for dually eligible beneficiaries?

A. Key takeaways

- [Receiving home-based primary care had no effect on total Medicare and Medicaid expenditures.](#) The estimated effect of home-based primary care on total Medicare and Medicaid expenditures for dually eligible beneficiaries was an increase of \$252 (3.3 percent) PBPM in the first year and \$20 (0.3 percent) PBPM in the second year, but neither of these estimates was statistically significant.
- [Receiving home-based primary care had no effect on total Medicare expenditures.](#) The estimated effect of home-based primary care on total Medicare FFS expenditures alone was an increase of \$205 (4.1 percent) PBPM in the first year and \$22 (0.5 percent) PBPM in the second year, but neither of these estimates was statistically significant. Because all beneficiaries had a hospital admission in the baseline year, and only some had a hospital admission subsequently, total Medicare FFS expenditures declined in the two years after the start date for both groups; the comparison group, however, had greater declines than the home-based primary care recipients in the first year.
- [Receiving home-based primary care had no effect on total Medicaid expenditures.](#)¹⁴ The estimated effect of home-based primary care on total Medicaid FFS and capitated expenditures was an increase of \$46 (1.7 percent) PBPM in the first year and a reduction of \$2 (0.1 percent) PBPM in the second year, but neither of these estimates was statistically significant. Home-based primary care recipients and matched comparison beneficiaries both had increases in total FFS and capitated Medicaid expenditures in the two years after the start date.
- [Receiving home-based primary care had no effect on hospital use or quality of care.](#) Receiving home-based primary care did not affect the number of hospital admissions or potentially avoidable hospital admissions, the number of ED visits or potentially avoidable ED visits, or the chance of having an unplanned readmission.
- [Home-based primary care recipients received more Medicare and Medicaid services in the home and fewer services in nursing facilities.](#) Home-based primary care decreased Medicare FFS skilled nursing facility (SNF) expenditures and Medicaid FFS institutional expenditures (such as expenditures for nursing facilities).¹⁵ In addition, home-based primary care increased expenditures for Medicare FFS home health services and Medicaid FFS home and community-based services (such as expenditures for personal care services).¹⁶

¹⁴ Medicaid FFS expenditures included expenditures for institutional services; prescription drugs; inpatient hospital services; home and community-based services; and physician, clinic, and outpatient services expenditures other than for home and community-based services. These expenditures included all Medicaid expenditures, including those for Medicare deductibles and co-payments. Capitated expenditures included all capitated payments for Medicaid benefits. For more information on the categories of Medicaid expenditures, see Exhibit C.8.

¹⁵ Medicaid FFS institutional expenditures included expenditures for nursing facilities, intermediate care facilities for people with intellectual disabilities, psychiatric hospitals, and independent (that is, freestanding) psychiatric wings of acute care hospitals.

¹⁶ Medicaid FFS home and community-based services expenditures were defined as case management; round-the-clock services; supported employment; day services; nursing; home-delivered meals; rent and food expenses for live-in caregivers; home-based services; caregiver support; other mental health and behavioral services; other health and therapeutic services; services supporting participant direction; participant training; equipment, technology, and modifications; non-medical transportation; community transition services; and other services. For more information on the categories of Medicaid expenditures, see Exhibit C.8.

B. Introduction

Many home-based primary care patients are eligible for and enrolled in both Medicare and Medicaid. This subpopulation of people may differ from the population only covered by Medicare in several ways, including demographic characteristics, health status, access to home and community-based services such as personal care and home health aide services, and ability to access health care because of factors such as transportation. Although our previous analysis examining the effects of home-based primary care found no evidence that such care reduced Medicare expenditures, we examined those who are dually eligible because differences between the full population of IAH-eligible beneficiaries and this subgroup could be related to important differences in the effects of home-based primary care on key outcomes measured using Medicare and Medicaid claims data.

To examine the effects of home-based primary care on outcomes for dually eligible beneficiaries, we used panels of new entrants into home-based primary care that we previously constructed to study the effect of home-based primary care among all Medicare FFS beneficiaries who met the IAH eligibility criteria but were not necessarily visited by providers with an IAH practice. With those panels, we applied additional sample limitations based on the Medicaid administrative data, including eligibility for full Medicaid benefits (Exhibit III.1). We limited our samples to beneficiaries in the 2010 and 2011 panels because of the availability of Medicaid data at the time of our analysis; see Appendix C for more details on sample identification, data, and methods.¹⁷ The matched comparison group consisted of beneficiaries selected in the same years who met the same IAH eligibility criteria and lived in the same geographic area as the home-based primary care recipients but did not receive home-based primary care. The final sample included 1,327 home-based primary care recipients and 6,635 matched comparison beneficiaries.

Exhibit III.1. Overview of Medicare and Medicaid beneficiary sample inclusion criteria

- Met the Independence at Home eligibility criteria described in Exhibit I.2
- Had no home-based primary care visits within two years before the start date
- Had two or more home-based primary care visits during the six-month period starting with (and including) the start visit
- Received most evaluation and management visits in the home or an assisted living facility during the six-month period starting on the start date (and including the start visit)
- Lived in the sample state for all years of the analysis
- Eligible for full Medicaid benefits for all 12 months before starting home-based primary care and the start month
- Resided in the community as of the start date

To examine the effects of home-based primary care on Medicare and Medicaid expenditures and hospital use, we performed a difference-in-differences analysis. We measured the effect as the change in the home-based primary care group after netting out any change from other trends in the health care system underway before and during the same time period, as observed in the matched comparison group. We followed each beneficiary for three years: one year before the intervention (which we refer to as the baseline year) and two years after the intervention.

¹⁷ We examined outcomes through 2012 for all sample states, but we were able to examine outcomes through 2013 for only 8 of the 13 sample states (Massachusetts, Michigan, New York, Ohio, Oregon, Pennsylvania, Texas, and Virginia). These years covered the two-year post-intervention period for the 2010 and 2011 panels.

C. Effects of home-based primary care on expenditures

1. Effects on total Medicare and Medicaid expenditures

Key takeaway: Receiving home-based primary care had no effect on total Medicare and Medicaid expenditures.

The estimated effect of home-based primary care for dually eligible beneficiaries was an increase in total Medicare and Medicaid expenditures of \$252 (3.3 percent) PBPM in the first year and \$20 (0.3 percent) PBPM in the second year, but these estimates were not statistically significant (Exhibit C.10).

2. Effects on Medicare expenditures alone

Key takeaway: Receiving home-based primary care had no effect on total Medicare expenditures.

The estimated effect of home-based primary care was an increase in total Medicare FFS expenditures of \$205 (4.1 percent of the home-based primary care beneficiaries' mean expenditures in the year before starting home-based primary care) PBPM in the first year and \$22 (0.5 percent) PBPM in the second year, but these estimates were not statistically significant. Total Medicare FFS expenditures declined in

each of the two years after the start date for home-based primary care recipients and the matched comparison group, but the comparison group had greater declines than home-based primary care recipients (Exhibit III.3). The primary reason that total Medicare expenditures declined for both groups from the baseline year to the two years after is that all beneficiaries in the sample incurred substantial Medicare expenditures in the baseline year because of a hospital admission (or observation stay), but only some beneficiaries had a hospital admission in the following two years. Inpatient expenditures were the largest component of Medicare total expenditures, and the estimated effects of home-based primary care on inpatient expenditures—an increase of \$50 PBPM in the first year and a reduction of \$46 PBPM in the second year—were also not statistically significant (Exhibits III.2 and C.10).

Exhibit III.2. For dually eligible beneficiaries, receiving home-based primary care significantly affected all categories of Medicare expenditures except inpatient expenditures

Period	Inpatient	Home health ^a	Outpatient	SNF	Clinician/supplier	Hospice	DME
One year post	\$50 (\$140)	\$287*** (\$20)	-\$40*** (\$14)	-\$290*** (\$39)	\$91*** (\$23)	\$32** (\$16)	\$73*** (\$12)
Two years post	-\$46 (\$144)	\$153*** (\$22)	-\$12 (\$19)	-\$237*** (\$43)	\$38 (\$27)	\$84*** (\$27)	\$41** (\$16)

Source: Mathematica's analysis of Medicare and Medicaid claims, assessment, and enrollment data for 2009 to 2013 obtained from the Chronic Conditions Warehouse.

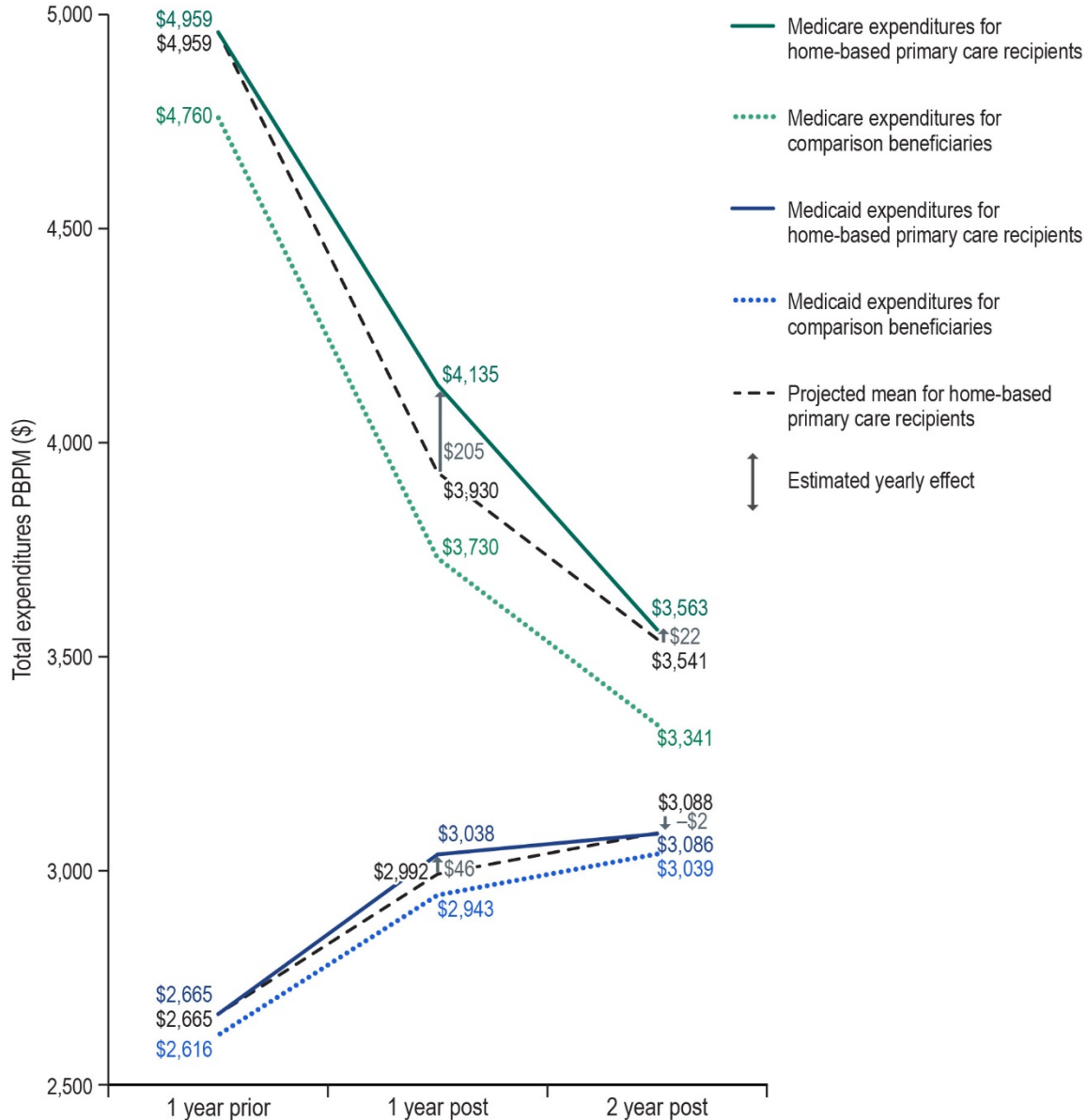
Note: This exhibit reports the difference-in-differences estimates (and standard errors) for Medicare expenditure categories for dually eligible beneficiaries over two years from starting home-based primary care. The regression-adjusted means of the home-based primary care and matched comparison groups and the percentage impact relative to home-based primary care group mean in the year before starting home-based primary care are reported in Exhibit C.10. Estimates are reported as the average per beneficiary per month Medicare FFS expenditures.

^a Total home health expenditures include Part A, Part B, and other home health expenditures.

*/**/** The difference is statically significant at the 0.10/0.05/0.01 level.

DME = durable medical equipment; FFS = fee for service; SNF = skilled nursing facility.

Exhibit III.3. Receiving home-based primary care had no effect on total Medicare or Medicaid expenditures for dually eligible beneficiaries



Source: Mathematica’s analysis of Medicare and Medicaid claims, assessment, and enrollment data for 2009 to 2013 obtained from the Chronic Conditions Warehouse.

Notes: This exhibit reports the mean annual Medicare total expenditures and Medicaid total expenditures for dually eligible home-based primary care recipients and comparison beneficiaries. The home-based primary care recipients included 1,327 beneficiaries, and the matched comparison group included 6,635 beneficiaries. None of the estimated yearly effects were statistically significant at the 0.10 level.

PBPM = per beneficiary per month.

Although home-based primary care did not have a statistically significant effect on total Medicare expenditures, it had statistically significant effects on some components of Medicare expenditures: reductions in SNF and outpatient expenditures as well as increases in home health, clinician/supplier, hospice, and DME expenditures (Exhibit III.2). These changes are consistent with home-based primary care recipients receiving more care in the home and less in institutional and outpatient settings.

3. Effects on Medicaid expenditures alone

Key takeaway: Receiving home-based primary care had no effect on total Medicaid expenditures.

The estimated effect of home-based primary care was an increase in total Medicaid expenditures of \$46 (1.7 percent) PBPM in the first year and a reduction of \$2 (0.1 percent) PBPM in the second year (Exhibit III.3). These estimates were not statistically significant. Unlike Medicare expenditures, which decreased for both groups because of the large reduction in inpatient expenditures after the

baseline period, home-based primary care recipients and matched comparison beneficiaries had increases in total Medicaid expenditures in each of the two years after the start date.

FFS home and community-based services, capitated, and FFS institutional expenditures were the largest components of total Medicaid expenditures. We found statistically significant effects of home-based primary care on several components of total Medicaid expenditures, including reductions in FFS institutional expenditures (such as nursing facilities) and increases in FFS home and community-based services; capitated; and other physician, clinic, and outpatient services (Exhibits III.4 and C.10).

Key takeaway: Home-based primary care recipients received more Medicare and Medicaid services in the home and fewer services in nursing facilities.

Like what we found for Medicare expenditures, the changes for Medicaid expenditures are consistent with home-based primary care recipients receiving more care in the home and less in institutional settings. Medicaid FFS institutional expenditures decreased by about the same amount that Medicaid FFS home and community-based services expenditures increased, resulting in no effect on overall Medicaid long-term services and supports expenditures (Exhibit C.12).

Exhibit III.4. Dually eligible home-based primary care recipients had less Medicaid expenditures for institutional services and more Medicaid expenditures for home and community-based services

Period	FFS institutional	FFS prescription drug	FFS inpatient hospital	FFS home and community-based services	FFS physician, clinic, and outpatient ^a	Medicaid capitated
One year post	-\$281*** (\$39)	\$0 (\$1)	-\$6 (\$19)	\$286*** (\$67)	\$6 (\$7)	\$41* (\$24)
Two years post	-\$282*** (\$62)	\$1 (\$2)	-\$14 (\$20)	\$214** (\$93)	\$15* (\$9)	\$64 (\$43)

Source: Mathematica’s analysis of Medicare and Medicaid claims, assessment, and enrollment data for 2009 to 2013 obtained from the Chronic Conditions Warehouse.

Note: This exhibit reports the difference-in-differences estimates (and standard errors) for Medicaid expenditure categories for dually eligible beneficiaries over two years from starting home-based primary care. The regression-adjusted means of the home-based primary care and matched comparison groups and the percentage impact relative to home-based primary care group mean in the year before starting home-based primary care are reported in Exhibit C.10. Estimates are reported as the average per beneficiary per month Medicaid expenditures. For more information on the categories of Medicaid expenditures, see Exhibit C.8.

^a FFS physician, clinic, and outpatient services expenditures include expenditures from the MAX OT file, less expenditures for FFS home and community-based services.

*/**/** The difference is statically significant at the 0.10/0.05/0.01 level.

FFS = fee for service; MAX = Medicaid Analytic eXtract; OT = other services.

D. Effects of home-based primary care on hospital use and quality of care

Key takeaway: Receiving home-based primary care had no effect on hospital use or quality of care.

Home-based primary care had no statistically significant effects on any of the hospital use or quality of care outcomes in either of the two years after starting home-based primary care (Exhibit C.13). Home-based primary care recipients and matched comparison beneficiaries both had reductions in the number of hospital admissions and potentially avoidable hospital admissions, the number of ED visits and potentially avoidable ED visits, and the chance of having an unplanned readmission in each of the two years after intervention compared with the baseline year.¹⁸

E. Discussion and limitations

Receiving home-based primary care did not have a statistically significant effect on total Medicare or Medicaid expenditures in the two years after recipients started home-based primary care. Total Medicare FFS expenditures declined in each of the two years after the start date for home-based primary care recipients and the matched comparison group, and total Medicaid FFS and capitated expenditures increased; neither change, however, was significantly different for home-based primary care recipients relative to matched comparison beneficiaries. In addition, home-based primary care did not affect inpatient care or quality of care as measured by hospital admissions and ED visits, potentially avoidable hospital admissions and ED visits, and Medicare inpatient expenditures. Both groups experienced declines in total Medicare and inpatient expenditures in the post-period because all beneficiaries in the sample incurred substantial Medicare expenditures in the baseline year given their hospital admission (or observation stay), but only some beneficiaries had a hospital admission in the post-period.

Yet home-based primary care did affect some other types of services received, as evidenced by large, statistically significant differences in expenditures for several key components of total expenditures. We found a large and statistically significant decrease in Medicare SNF expenditures but a large and statistically significant increase in Medicare home health expenditures for home-based primary care recipients relative to matched comparison beneficiaries, indicating that home-based primary care recipients were more likely to go home after hospital discharge rather than to a SNF. At the same time, we also found a large and statistically significant decrease in Medicaid institutional expenditures and a moderate and statistically significant increase in Medicaid home and community-based services expenditures for home-based primary care recipients relative to matched comparison beneficiaries. This finding indicates that home-based primary care recipients have shorter (or fewer) Medicare-funded SNF stays for which Medicaid covers the Medicare deductibles and co-payments, lower entry into institutional long-term care for which Medicaid pays, or both, and that recipients use more home-based services. Taken together, these findings suggest that for dually eligible beneficiaries, receiving home-based primary care could delay or prevent short- and long-term stays in nursing facilities, but doing so requires additional services in the home from Medicare and Medicaid providers.

There are several limitations to consider when interpreting our findings. First, we used many recent health status measures in our matching, but we could be missing more nuanced information about beneficiaries' health care needs or preferences that affected selection into home-based primary care and the outcomes we assessed. If those unmeasured factors were related to our outcomes, and if they changed over time

¹⁸ The number of hospital admissions (and observation stays) declined for both groups because our sample inclusion criteria required all beneficiaries to have a hospital admission or observation stay in the baseline year, but only some beneficiaries had a hospital admission or observation stay in the period after intervention.

differently for the home-based primary care group and comparison group, they could bias our impact estimates. Although trends in Medicare expenditures in the two years before the intervention (baseline year and the prior year) were similar for the dually eligible home-based primary care and comparison groups, we could not examine these trends for Medicaid expenditures because some members of the sample were not enrolled in Medicaid in the year before the baseline year.

Second, we identified home-based primary care recipients and comparison beneficiaries based on home-based primary care use in the first six months after the start date and used an intent-to-treat design (see more details in Appendix C). Specifically, beneficiaries in the home-based primary care group had two or more home-based primary care visits during the six-month period starting with (and including) the first visit, and comparison beneficiaries had no home-based primary care visits during the six-month period after the start date (the first day of the calendar month). Therefore, any effect of home-based primary care could be a conservative estimate because home-based primary care recipients and comparison beneficiaries could have switched groups after the first six months.

Third, we lack data on how the non-IAH providers delivered home-based primary care in our sample, so we do not know which aspects of home-based primary care contributed to our results. (In Appendix E, we present results from a descriptive analysis of home visit episodes for all Medicare FFS beneficiaries and for patients of IAH practices.) We also cannot extrapolate to dually eligible beneficiaries residing outside the areas that we examined in our analysis because of possible geographic differences, which is particularly true for Medicaid expenditure outcomes because of differences in Medicaid programs across states.

Finally, we were limited by Medicaid data availability at the time of our analysis, so our analysis covered through 2012 for 13 states and through 2013 for eight states. States have increasingly focused on shifting expenditures from institutions to home and community-based services, so these findings may not capture more recent changes in state Medicaid programs (Murray et al. 2021). Our sample was small because of the limited number of states and years, which made it less likely that an estimated effect of 3 to 4 percent would be statistically significant.

Despite the limitations, this analysis provides important insights into the effect of home-based primary care for beneficiaries who are dually eligible for Medicare and Medicaid. As with our analysis of the effect of home-based primary care on Medicare expenditures alone for a combined group of dually and non-dually eligible Medicare beneficiaries,¹⁹ we did not find that home-based primary care reduced total Medicare and Medicaid expenditures. Our findings about changes in key components of total expenditures, however, indicate that dually eligible home-based primary care recipients receive more services in the home, including Medicaid home and community-based services, and fewer services in nursing facilities.

¹⁹ For more information, refer to the [evaluation report](#) which covered Years 1 to 4 of the IAH demonstration.

IV. Is home-based primary care associated with differences in Medicare expenditures at the end of life?

A. Key takeaways

- [Receiving home-based primary care was associated with lower Medicare expenditures during the last three months of life.](#) Average Medicare expenditures were \$391 PBPM (4.2 percent) lower for users of home-based primary care than nonusers during the three-month end-of-life period. When broken out by intensity of use, high-intensity users incurred the lowest Medicare expenditures. Compared with nonusers, medium- and high-intensity users incurred \$421 (4.5 percent) and \$647 (6.9 percent) PBPM lower expenditures, respectively, during the three months before death. There was not a statistically significant difference in the expenditures of low-intensity users compared with nonusers.
- [However, in the last 6 and 12 months of life, receiving home-based primary care was associated with higher Medicare expenditures.](#) Medicare PBPM expenditures were \$285 (3.8 percent) and \$618 (11.1 percent) higher for users than nonusers during the 6- and 12-month end-of-life periods, respectively. Among all users, high-intensity users had the lowest expenditures, and low-intensity users had the highest monthly expenditures during the 6- and 12-month end-of-life periods. However, over the last 12 months of life, even high-intensity users had higher expenditures than nonusers (\$379 PBPM).
- [In the last three months of life, total Medicare expenditures were lower for home-based primary care recipients mainly because of lower inpatient expenditures.](#) During the three-month end-of-life period, home-based primary care users incurred lower expenditures in the following categories: inpatient, SNF, outpatient, and clinician/supplier. Home-based primary care users had higher hospice, home health, and DME expenditures than nonusers. Home-based primary care users incurred higher expenditures in almost all categories of spending during the last 6 and 12 months of life.

B. Introduction

In our report on the IAH evaluation of Years 1 to 4, we found that home-based primary care did not reduce expenditures for IAH-eligible patients compared with similar patients receiving office-based care.²⁰ Likewise, in our analysis of Medicare and Medicaid expenditures for IAH-eligible beneficiaries enrolled in both Medicare and Medicaid that we described in Chapter III, we did not find evidence that home-based primary care reduced expenditures. Home-based primary care use at the end of life could, however, be associated with lower Medicare expenditures through better advance care planning, discussion of patients' preferences, symptom management, palliative care, and coordination with social services and hospice when appropriate.²¹ In addition, Medicare beneficiaries in their final months of life may differ from the rest of the IAH-eligible beneficiary population in several ways, including demographic characteristics and health status. In particular, Medicare beneficiaries are likely to be older, have more severe conditions, and have more comorbidities—all factors that could be related to the effect of home-based primary care on Medicare expenditures at the end of life.

To examine the relationship between home-based primary care and expenditures during the end-of-life period, we identified approximately 193,000 beneficiaries in Medicare FFS who met the IAH eligibility criteria as of December 2016, lived in an area in which home-based primary care was available, did not

²⁰ For more information, refer to the [evaluation report](#) that covered Years 1 to 4 of the IAH demonstration.

²¹ Hospice physicians oversee care related to a beneficiary's terminal illness but do not address other potential health care issues.

use home-based primary care in 2015 or 2016, and died in 2017 or 2018 (see Appendix D for more details on sample identification, data, and methods; we show sample sizes in Appendix Exhibit D.1). Of these beneficiaries, 13 percent had at least one home-based primary care visit in 2017 or 2018 (Exhibit D.2). We measured the correlation between use of home-based primary care and Medicare expenditures PBPM over the 3, 6, and 12 months preceding death, adjusting for beneficiaries' demographic characteristics and health conditions. All results in this chapter were statistically significant at the 0.10 level unless noted otherwise.

In addition to comparing users with nonusers of home-based primary care, we examined the relationship between home-based primary care and Medicare expenditures in the final months of life by intensity of use. We categorized home-based primary care into three equal-sized groups based on the frequency of home-based primary care visits between the month of the first home-based primary care visit and the month of death (Exhibit D.5). We categorized people with a visit every 11 weeks or less on average as low-intensity users, people with a visit more often than every 11 weeks but no more often than every five weeks as medium-intensity users, and people with visits more often than every five weeks as high-intensity users.

C. Association of home-based primary care use with end-of-life expenditures

Key takeaway: Receiving home-based primary care was associated with lower Medicare expenditures during the last 3 months of life and higher Medicare expenditures in the last 6 and 12 months of life.

Beneficiaries who had at least one home-based primary care visit between January 1, 2017 and their date of death incurred on average \$391 (4.2 percent) lower Medicare expenditures in the three months before death compared with nonusers (Exhibit IV.1). Conversely, home-based primary care users had higher expenditures during the 6- and 12-month end-of-life periods (\$285 and \$618 higher PBPM, respectively).

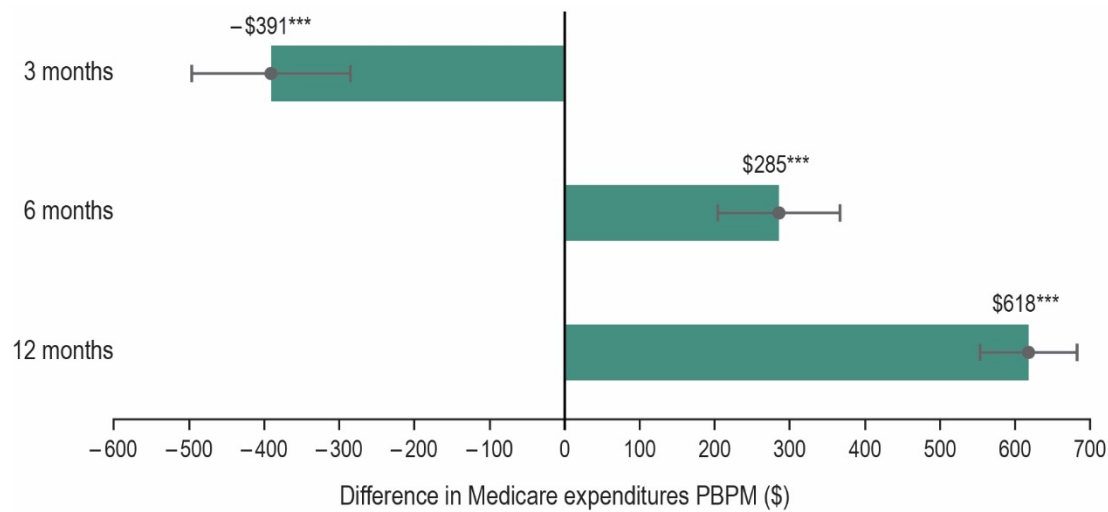
Key takeaway: In the last three months of life, total Medicare expenditures were lower for home-based primary care recipients mainly because of lower inpatient expenditures.

Exhibit IV.2 summarizes the results for the components of total Medicare expenditures. Compared with nonusers during the three-month end-of-life period, home-based primary care users had lower expenditures for the following services: inpatient (-\$624 PBPM or 11.9 percent lower), SNF (-\$85 PBPM or 8.5 percent lower), outpatient (-\$40 PBPM or 8.8 percent lower), and clinician/supplier (-\$25 PBPM or 2.0 percent lower). On the other hand, home-based primary care users had greater

hospice (\$253 PBPM or 21.8 percent higher), home health (\$118 PBPM or 60.4 percent higher), and DME expenditures (\$12 PBPM or 24.5 percent higher) than nonusers during the three-month end-of-life period.

As the end-of-life period is extended from 3 to 6 to 12 months, the differences in inpatient and SNF expenditures that we observed in the 3-month period decreased in size or became positive. At the same time, home-based primary care users continued to have higher home health and hospice expenditures than nonusers. Unlike the 3-month period, higher home health and hospice expenditures were not offset by lower inpatient expenditures.

Exhibit IV.1. Receiving home-based primary care was associated with lower Medicare expenditures during the last 3 months of life and higher expenditures during the last 6 and 12 months of life



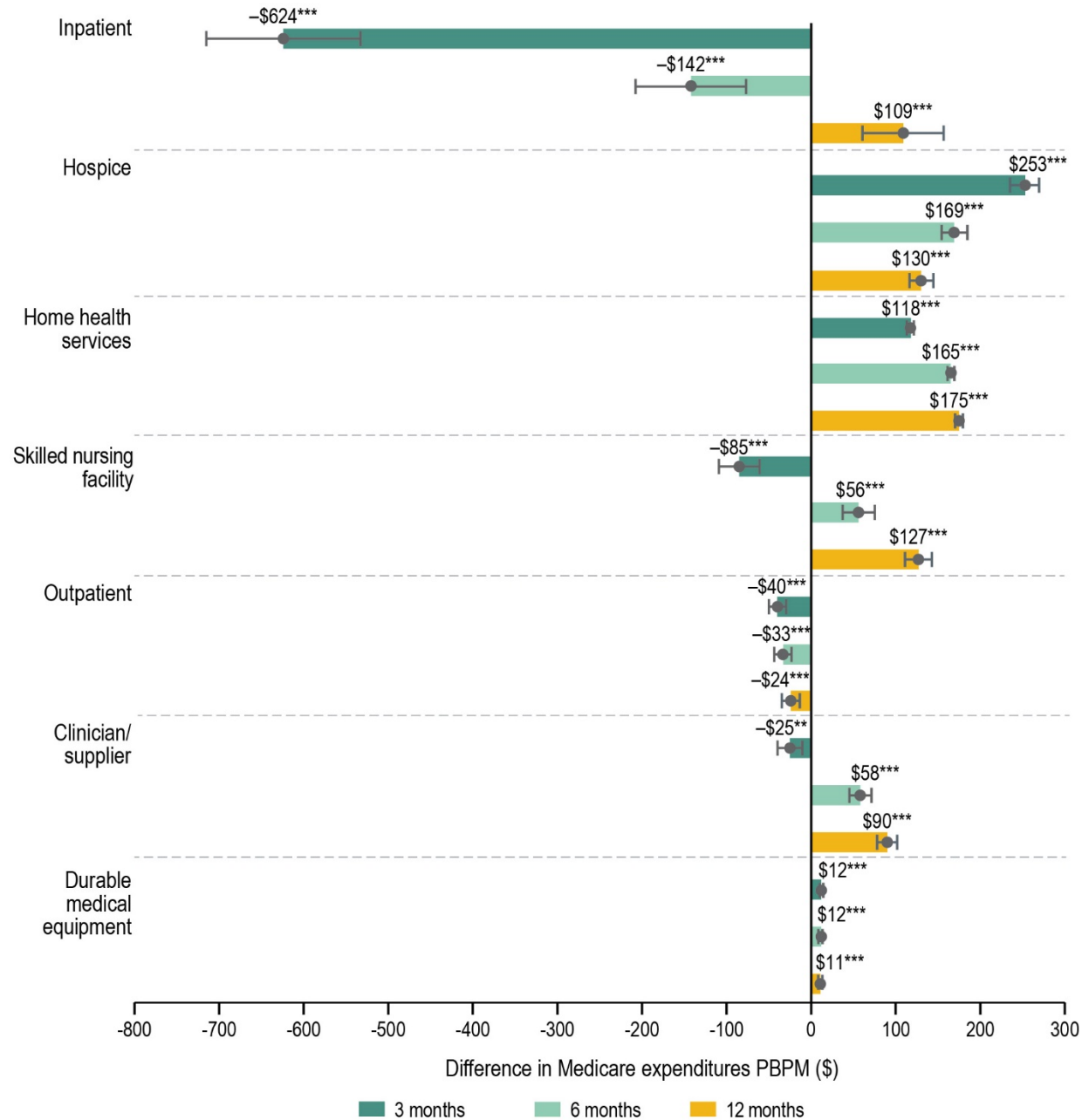
Source: Mathematica’s analysis of Medicare claims, assessment, and enrollment data for 2015–2018 from the Chronic Conditions Warehouse.

Note: The exhibit reports the regression-adjusted difference in total expenditures of home-based primary care users compared with nonusers during the 3, 6, and 12 months preceding death. The horizontal lines represent 90 percent confidence intervals. If zero is within the confidence interval, the estimated difference (denoted by dots) was not statistically significant at the 90 percent confidence level. See Exhibit D.2 for sample size information.

*** The difference is statistically significant at the 0.01 level.

PBPM = per beneficiary per month.

Exhibit IV.2. Differences between home-based primary care users and nonusers in expenditures during the last 3, 6, and 12 months of life varied by expenditure category and length of end-of-life period



Source: Mathematica’s analysis of Medicare claims, assessment, and enrollment data for 2015–2018 from the Chronic Conditions Warehouse.

Note: The exhibit reports the regression-adjusted difference in expenditures of home-based primary care users compared with nonusers during the 3, 6, and 12 months preceding death. The horizontal lines represent 90 percent confidence intervals. If zero is within the confidence interval, the estimated difference (denoted by dots) was not statistically significant at the 90 percent confidence level. See Exhibit D.2 for sample size information.

/ The difference is statistically significant at the 0.05/0.01 level, respectively.

PBPM = per beneficiary per month.

D. Association of low, medium, and high home-based primary care use with end-of-life expenditures

The association of home-based primary care with expenditures could vary depending on the intensity of home-based primary care use. Receiving primary care at home regularly may facilitate better management of chronic conditions, more discussion of a beneficiary's preferences for advance care planning, and early identification of potential health issues. On the other hand, receiving as few as one or two visits could also be associated with differences in expenditures (for example, if some users create an advance care plan that states their desire to avoid hospital use at the end of life).

1. Three-month end-of-life period

High- and medium-intensity users of home-based primary care had \$647 PBPM (6.9 percent) and \$421 PBPM (4.5 percent) lower expenditures, respectively, in the three-month end-of-life period than nonusers (Exhibit IV.3). Low-intensity home-based primary care users had a small and not statistically significant difference in expenditures (-\$126 PBPM or 1.3 percent lower).

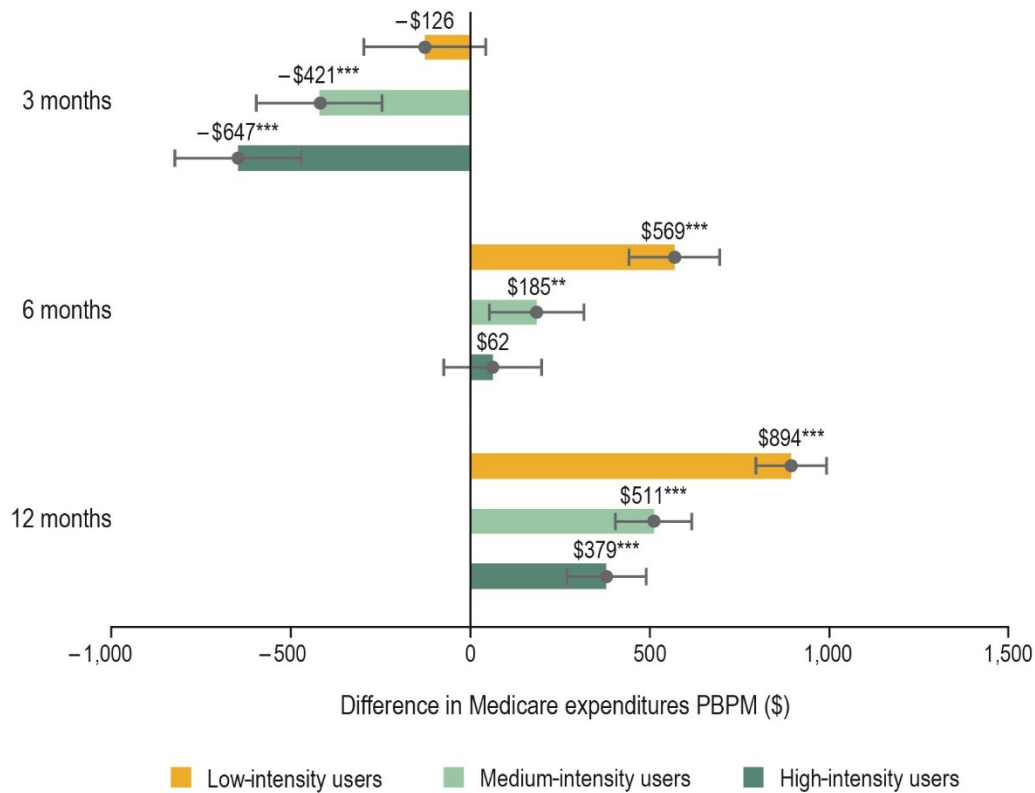
The subgroups of users defined by intensity of use differed from nonusers (Exhibit IV.4) and with one another (Exhibit D.9) in their expenditure patterns. Although most subgroups of users had lower inpatient and outpatient expenditures and higher home health and hospice expenditures during the three-month end-of-life period than nonusers, there were important differences between the three subgroups.

First, in two categories of expenditures in which home-based primary care users tended to spend less than nonusers during the three-month end-of-life period—inpatient and SNF—high-intensity users spent less than medium- and low-intensity users. For example, high-intensity users spent the least relative to nonusers in the inpatient setting (-\$749 PBPM or 14.3 percent lower), followed by medium-intensity users (-\$619 PBPM or 11.8 percent lower) and low-intensity users (-\$513 PBPM or 9.8 percent lower). The pattern for clinician/supplier expenditures went the opposite direction: high-intensity users spent the most relative to nonusers and low-intensity users spent the least. Outpatient expenditures was the fourth category in which home-based primary care users spent less than nonusers in the three-month end-of-life period. Medium-intensity users had the lowest outpatient expenditures followed by low-intensity users, and there was no statistically significant difference in outpatient expenditures between high-intensity users and nonusers.

Second, in two categories of expenditures in which home-based primary care users tended to spend more than nonusers during the three-month end-of-life period—home health and DME—high-intensity users spent more than medium- and low-intensity users. For example, high-intensity users spent the most relative to nonusers on home health (\$232 PBPM or 118.7 percent higher), followed by medium-intensity users (\$125 PBPM or 64.1 percent higher) and low-intensity users (\$6 PBPM or 3.1 percent higher, a difference that was not statistically significant). Home health expenditures were consistently higher for home-based primary care users relative to nonusers, potentially indicating that home health is an important supplement to home-based primary care.

Whereas home-based primary care users tended to spend more than nonusers in the hospice setting during the three-month end-of-life period, high-intensity users spent the least relative to nonusers, and low-intensity users spent the most. There was no statistically significant difference in hospice expenditures between high-intensity users and nonusers in the three-month end-of-life period.

Exhibit IV.3. High-intensity users of home-based primary care had lower total Medicare expenditures than medium- and low-intensity users during the last 3, 6, and 12 months of life



Source: Mathematica’s analysis of Medicare claims, assessment, and enrollment data for 2015–2018 from the Chronic Conditions Warehouse.

Note: The exhibit reports the regression-adjusted difference in total Medicare expenditures for low-, medium-, and high-intensity home-based primary care users compared with nonusers during the 3, 6, and 12 months preceding death. We categorized home-based primary care users as high-, medium-, and low-intensity users based on the number of monthly visits between the month of the first home-based primary care visit in 2017 or 2018 and the month of death. The horizontal lines represent 90 percent confidence intervals. If zero is within the confidence interval, the estimated difference (denoted by dots) was not statistically significant at the 90 percent confidence level. See Exhibit D.5 for sample size information.

/ The difference is statistically significant at the 0.05/0.01 level, respectively.

PBPM = per beneficiary per month.

2. Six- and twelve-month end-of-life periods

All subgroups of home-based primary care users had higher total expenditures during the 6- and 12-month end-of-life period compared with nonusers, although the difference was not statistically significant for high-intensity users in the 6-month period. Among all users, high-intensity users continued to have the lowest expenditures, and low-intensity users had the highest monthly expenditures during the 6- and 12-month end-of-life periods. Low-intensity use of home-based primary care was not associated with lower overall expenditures relative to nonusers for any duration end-of-life period, potentially indicating that a minimum level of home-based primary care is necessary to achieve lower expenditures.

The patterns in categories of expenditures that we observed across levels of intensity in the 3-month end-of-life period also held in the 6- and 12-month periods. Broadly, as intensity of use increased from low to

medium to high, inpatient, SNF, and hospice expenditures decreased. At the same time, home health, clinician/supplier, and DME expenditures increased (Exhibit IV.4).

Exhibit IV.4. Differences between home-based primary care users and nonusers in expenditures during the months preceding death varied by intensity of use, expenditure category and length of end-of-life period

	Difference in regression-adjusted mean relative to nonusers (standard error)		
	Low-intensity users	Medium-intensity users	High-intensity users
Inpatient			
3 months	-\$513*** (\$91)	-\$619*** (\$93)	-\$749*** (\$94)
6 months	-\$5 (\$64)	-\$190** (\$67)	-\$251*** (\$69)
12 months	\$221*** (\$46)	\$47 (\$50)	\$32 (\$52)
Skilled nursing facility			
3 months	\$34 (\$25)	-\$89*** (\$25)	-\$211*** (\$26)
6 months	\$143*** (\$20)	\$39* (\$21)	-\$26 (\$21)
12 months	\$211*** (\$16)	\$116*** (\$17)	\$30* (\$18)
Home health			
3 months	\$6 (\$5)	\$125*** (\$5)	\$232*** (\$5)
6 months	\$64*** (\$5)	\$177*** (\$5)	\$269*** (\$6)
12 months	\$106*** (\$6)	\$196*** (\$6)	\$241*** (\$6)
Hospice			
3 months	\$464*** (\$19)	\$254*** (\$19)	\$21 (\$19)
6 months	\$376*** (\$16)	\$157*** (\$17)	-\$58*** (\$17)
12 months	\$290*** (\$14)	\$108*** (\$16)	-\$51** (\$16)
Outpatient			
3 months	-\$42*** (\$11)	-\$61*** (\$11)	-\$15 (\$11)
6 months	-\$33** (\$11)	-\$47*** (\$11)	-\$19* (\$12)
12 months	-\$7 (\$11)	-\$41*** (\$12)	-\$29** (\$13)
Clinician/supplier			
3 months	-\$78*** (\$16)	-\$44** (\$16)	\$52** (\$17)
6 months	\$19 (\$13)	\$34** (\$14)	\$129*** (\$14)
12 months	\$65*** (\$12)	\$72*** (\$13)	\$142*** (\$14)
Durable medical equipment			
3 months	\$2 (\$3)	\$13*** (\$4)	\$23*** (\$4)
6 months	\$5 (\$4)	\$14*** (\$4)	\$18*** (\$4)
12 months	\$7* (\$4)	\$13** (\$4)	\$14*** (\$4)

Source: Mathematica’s analysis of Medicare claims, assessment, and enrollment data for 2015–2018 from the Chronic Conditions Warehouse.

Note: The exhibit reports the difference in regression-adjusted mean Medicare expenditures per beneficiary per month between home-based primary users and nonusers by intensity of home-based primary care use. We categorized users as high-, medium-, and low-intensity users based on the number of monthly visits. Expenditure differences that are more than 10 percent higher or 10 percent lower relative to nonusers are shaded in dark orange and dark green, respectively. Expenditure differences that are less than 10 percent higher or 10 percent lower relative to nonusers are shaded in light orange and light green, respectively.

*/**/** The difference is statistically significant at the 0.10/0.05/0.01 levels, respectively.

E. Discussion and limitations

In a prior analysis, we did not find evidence that home-based primary care reduced expenditures for IAH-eligible patients compared with similar patients who received office-based care.²² In this analysis, we examined whether there is a relationship between home-based primary care and Medicare expenditures in the final months of life. In the 3-month end-of-life period, home-based primary care users had lower Medicare expenditures than nonusers. But when we extended the end-of-life period to 6 or 12 months, home-based primary care users incurred more expenditures relative to nonusers. The decrease in expenditures associated with home-based primary care use in the 3-month end-of-life period was largest for high-intensity users, and similarly, the increase in expenditures in the 12-month period was smallest for high-intensity users.

In the last 3 months of life, home-based primary care users had higher home health, hospice, and DME expenditures and lower expenditures on inpatient care, SNF, outpatient, and clinician/supplier, which is consistent with home-based primary care recipients receiving more care provided in the home and less in inpatient and outpatient settings. As with the 3-month end-of-life period, users had higher expenditures for home health, hospice, and DME in the 6- and 12-month end-of-life periods; unlike the 3-month period, however, users did not have large decreases in inpatient and SNF services in the 6- and 12-month periods.

Because the study design was cross-sectional and observational, we cannot interpret the results as evidence of a causal relationship between home-based primary care and Medicare expenditures. It is possible that home-based primary care caused the differences in expenditures that we observed, but factors we could not observe might also have caused (or contributed to) these differences. There were notable differences in the demographic and health characteristics of home-based primary care users and nonusers (Exhibit D.6). Home-based primary care users were older on average, less likely to be originally entitled to Medicare because of disability, much more likely to have dementia, and less likely to have a large number of chronic conditions; in addition, users had lower total expenditures in 2015 and 2016 (not regression adjusted). Considering these observed differences, there may have been unobserved differences in health or preferences for the type of care received that we could not control for and that could have resulted in differences in the patterns of spending between these two groups. For example, the families that chose home-based primary care for a parent could be the same families that placed more importance on being at home (rather than in a nursing facility) and less importance on pursuing aggressive care in the final months of life. If so, expenditures for these beneficiaries would have been lower than expenditures for beneficiaries who pursued aggressive care.

Comparisons across subgroups of beneficiaries with different levels of home-based primary care use could also be biased if high-intensity users differed from medium- or low-intensity users in ways that we could not observe. For example, high-intensity users may have had more primary care visits at home because they were relatively healthy in the period before death compared with medium- or low-intensity users and thus more likely to be at home versus in a hospital or nursing facility. We found some evidence of this pattern; the average Hierarchical Condition Category (HCC) score was lowest for the high-intensity users and increased monotonically for medium, low, and nonusers. This explanation is consistent with the results we found; specifically, high-intensity users tended to have the lowest inpatient and SNF expenditures and the highest home health and DME expenditures among the three subgroups.

²² For more information, refer to the [evaluation report](#) which covered Years 1 to 4 of the IAH demonstration.

Alternatively, the fact that medium- and low-intensity users had substantially more hospice expenditures than high-intensity users could suggest that home-based primary care sometimes substituted for hospice.

Finally, our results apply only to beneficiaries who met the IAH eligibility criteria and could differ for other Medicare beneficiaries, such as those without functional impairments or recent hospital use.

Despite these limitations, this analysis provides important insight into the association of home-based primary care use with Medicare expenditures in the months leading up to death. These findings indicate that those receiving home-based primary care had lower expenditures in the three months preceding death, though not between 6 and 12 months preceding death. Reduced expenditures just before death might possibly be achieved through better advance care planning, discussion of patients' and caregivers' preferences, symptom management, palliative care, or coordination with social services and hospice when appropriate. High-intensity use of home-based primary care was associated with the largest decrease in spending in the 3-month end-of-life period, and low-intensity users did not have a statistically significant difference in spending relative to nonusers. For all end-of-life periods, low-intensity use of home-based primary care services was not associated with lower expenditures relative to nonusers, possibly indicating that a minimum level of home-based primary care use is necessary to achieve lower health care expenditures.

V. Conclusion

A. Summary of results

The Patient Protection and Affordable Care Act mandated creation of the IAH demonstration to test a payment incentive and service delivery model that provides home-based primary care to chronically ill and functionally limited Medicare beneficiaries. The legislation authorizing IAH requires an independent evaluation to determine the impact of the demonstration on beneficiaries' Medicare expenditures and other health-related outcomes. In this evaluation report, Mathematica examined the effects of the IAH payment incentive through Year 6 of the demonstration as well as effects of home-based primary care on key subgroups of IAH-eligible beneficiaries who may benefit more from home-based primary care than the average beneficiary: those who are poor and those who are near the end of life.

1. Effects of the IAH payment incentive

Results of the evaluation of the first six years of the demonstration provide no compelling evidence that the payment incentive affected the delivery of care by IAH practices in a way that measurably improved outcomes. The estimated effects on hospital admissions and ED visits were small and estimated imprecisely because of the small number of participating practices, providing no strong evidence that the payment incentive affected them. Because of the lack of evidence regarding an effect on these important drivers of Medicare expenditures, it is not surprising that the evaluation also found no strong indication that the IAH payment incentive decreased total Medicare expenditures.

Similarly, we did not find evidence that the payment incentive improved health outcomes or quality of care. The payment incentive did not affect mortality, entry into institutional long-term care, or potentially avoidable hospital admissions and ED visits. In addition, we did not observe positive trends in performance on the quality measures used to calculate incentive payments. Although some practices made changes designed to improve performance on one or more measures, several practices performed worse over time on documenting patient preferences. And of the 10 practices that qualified for an incentive payment in Year 6, six practices earned only 50 percent of the maximum payment because they failed to meet the required standards for three measures, and one practice earned none of the payment.

2. Effects of home-based primary care on population subgroups

Beneficiaries who are eligible for Medicare and Medicaid (that is, dually eligible beneficiaries) may benefit more from home-based primary care. For example, they typically have poorer health status than other beneficiaries and, because of their low income, may have less ability to access health care if they lack reliable transportation. We found no evidence, however, that home-based primary care resulted in lower Medicare expenditures or Medicaid expenditures for dually eligible patients. Instead, we found beneficiaries in home-based primary care had lower expenditures on institutional care, and higher expenditures on home-based services. More specifically, although dually eligible home-based primary care recipients had lower Medicare expenditures on SNFs, they had higher Medicare expenditures on home health. For the Medicaid program, lower expenditures on nursing home care were offset by an increase in receipt of home and community-based services. These trade-offs resulted in no net effect on Medicare expenditures, Medicaid expenditures, or total Medicare and Medicaid expenditures.

A second group that could benefit from home-based primary care more than the average Medicare beneficiary who meets IAH eligibility criteria is those near the end of life. Providing care in the home,

where the clinician can observe and learn about the patient and family in the home setting, may allow for better advance care planning, discussion of patients' and caregivers' preferences, symptom management, palliative care, and coordination with social services and hospice when appropriate. We found that those who received home-based primary care had lower expenditures in the last 3 months of life, but they had higher expenditures in the last 6 and 12 months of life. The beneficiaries who used relatively more home-based primary care (higher frequency of visits) had lower expenditures than those who received less home-based care across all three periods (3, 6 and 12 months prior to death). Home-based primary care users had higher expenditures in the last three months of life for home health and lower inpatient and SNF expenditures. This pattern was similar to results from the analysis of dually eligible beneficiaries, in which increases in expenditures for home-based services were offset by decreases in expenditures from nursing facilities and SNFs.

B. Discussion

When considering whether the IAH demonstration met its stated goals through Year 6—to reduce Medicare spending and improve health outcomes—we considered changes reported by IAH practices, the consistency of the direction (increase or decrease) of the estimated effects of the payment incentive, the possibility that the effects grew during the six-year period, and IAH practices' performance on the quality measures. We also considered challenges the demonstration has faced, including the small number of participating practices—which makes it less likely that we would detect statistically significant changes in outcomes—and departures from the demonstration, as we discuss here.

- **What have we learned about the effects of the payment incentive?** The most promising results were achieved in Year 5, largely because of a single influential site. Because this practice stopped providing home-based primary care soon after Year 5, it may not be representative of the practices that participated in the demonstration. As a result, the estimated Year 5 effect that includes that practice may be of limited interest for understanding the implications of the IAH payment incentive. The Year 6 results showed a reduction in Medicare expenditures of only 1 percent and was not statistically significant. The chance that the IAH payment incentive actually reduced expenditures by this amount was 45 percent. These results suggest that, unlike in Years 3 to 5, total incentive payments (\$11.1 million) in Year 6 were actually greater than our best estimates of the reduction in expenditures (\$3.2 million). There is little information to suggest this new result will reverse itself in the future given (1) the withdrawal of the influential site after Year 5; (2) no evidence of improvement on expenditures from Year 5 to Year 6 for the practices that participated in both years; and (3) changes after Year 5 in how incentive payments were calculated.²³
- **What have we learned about performance by IAH practices on quality measures?** Many IAH practices did not meet standards for all six quality measures tied to payment, even though doing so would have increased the amount of their incentive payments. This suggests that the payment incentive motivation is limited.
- **What have we learned from attrition among IAH practices?** By the end of Year 7, 11 of the 18 original participants (61 percent) ended their participation in the demonstration. The most common reasons for leaving the demonstration were (1) being required to leave because a practice did not enroll the required 200 beneficiaries, (2) being required to leave because a practice did not reduce expenditures below their spending targets, and (3) a desire to participate in a new Innovation Center

²³ See Chapter IX of Appendix A for more information about changes in the incentive payment methodology.

model. This high level of attrition suggests a lack of ability or desire to participate in the demonstration as presently structured.

- **What have we learned about how IAH practices view the IAH demonstration?** In many cases, practices that continued into Year 6 of the demonstration felt that participating in IAH helped them develop and refine what they view as best practices for delivering home-based primary care. Practices viewed the IAH quality measures as setting more rigorous standards for their patient care, particularly consistent timely follow-up after a hospital or ED visit (although some practices reported that follow-up within 48 hours was not always clinically necessary). The majority of the practices reported they have applied changes they made because of IAH to deliver better care to all their patients, not just IAH beneficiaries. In addition to reporting some positive views of the demonstration, practices reported some dissatisfaction. Because IAH eligibility required a beneficiary to have had a hospital admission in the past year, practices felt that their most successful patients were excluded from the demonstration. Also, practices reported concerns about the payment system. In the beginning of the demonstration, the practices perceived that the payment system did not adequately account for the illness level and frailty of their patients. Throughout the course of the demonstration, several practices reported that the incentive payments were not large enough to compensate for costs related to changing care delivery for IAH beneficiaries. CMS changed the payment method four times, in part from the practices' feedback. Finally, several practices reported dissatisfaction with the amount of time that elapsed between the end of each demonstration year and receipt of incentive payments.
- **What have we learned about how IAH practices have used incentive payments?** In general, practices reported that changes they made during the demonstration because of the IAH payment incentive contributed to a standard of care that they implement for all their patients, including beneficiaries who are in ACOs and other initiatives. When asked about how they used IAH incentive payments, most administrators of practices that participated in Year 6 viewed IAH payments as one additional source of funding used to support practice-wide changes. These practices cited that their efforts to improve care as part of the IAH demonstration align with other care transformation work, including participating in other value-based payment initiatives. All but one of the seven practices that remained in the demonstration after Year 7 participate in the Medicare Shared Savings Program, an ACO program. If the IAH demonstration were to end, we expect that most of these practices' patients enrolled in IAH would be attributed to the practices' ACOs.

In sum, although the IAH payment incentive motivated practices to make some care delivery changes, there is a lack of compelling evidence that the IAH payment incentive reduced expenditures or led to performance improvements on quality measures for IAH beneficiaries.

References

- Beck, R.A., A. Arizmendi, C. Purnell, B.A. Fultz, and C.M. Callahan. “House Calls for Seniors: Building and Sustaining a Model of Care for Homebound Seniors.” *Journal of the American Geriatrics Society*, vol. 57, no. 6, 2009, pp. 1103–1109.
- Centers for Medicare & Medicaid Services (CMS). “Shared Savings Program Fast Facts – As of January 1, 2021” Baltimore, MD: CMS, 2021a. Available at <https://www.cms.gov/files/document/2021-shared-savings-program-fast-facts.pdf>. Accessed August 27, 2021.
- De Jonge, K.E., N. Jamshed, D. Gilden, J. Kubisiak, S.R. Bruce, and G. Taler. “Effects of Home-Based Primary Care on Medicare Costs in High-Risk Elders.” *Journal of the American Geriatrics Society*, vol. 62, no. 10, 2014, pp. 1825–1831.
- Edes, T., B. Kinoshian, N.H. Vuckovic, L.O. Nichols, M.M. Becker, and M. Hossain. “Better Access, Quality, and Cost for Clinically Complex Veterans with Home-Based Primary Care.” *Journal of the American Geriatrics Society*, vol. 62, no. 10, 2014, pp. 1954–1961.
- Jones, A., S.E. Bronskill, H. Seow, D. Feeny, L. Lapointe-Shaw, F. Mowbray, and A.P. Costa. “Physician Home Visit Patterns and Hospital Use Among Older Adults with Functional Impairments.” *Journal of the American Geriatrics Society*, vol. 68, no. 9, 2020, pp. 2074–2081.
- Murray, C., A. Tourtellotte, D. Lipson, and A. Wysocki. “Medicaid Long Term Services and Supports Annual Expenditures Report: Federal Fiscal Years 2017 and 2018.” Chicago, IL: Mathematica, January 7, 2021.
- Navathe, A.S., C.T. Dinh, A. Chen, and J.M. Liao. “Findings and Implications from MIPS Year 1 Performance Data.” Health Affairs blog, January 18, 2019. Available at <https://www.healthaffairs.org/doi/10.1377/hblog20190117.305369/full/>. Accessed June 9, 2021.
- Stall, N., M. Nowaczynski, and S.K. Sinha. “Systematic Review of Outcomes from Home-Based Primary Care Programs for Homebound Older Adults.” *Journal of the American Geriatrics Society*, vol. 62, no. 12, 2014, pp. 2243–2251.



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