



Evaluation of the Medicare Diabetes Prevention Program (MDPP)

Final Evaluation Report

Prepared for the Centers for Medicare & Medicaid Services

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Centers for Medicare & Medicaid Services

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Abbreviations Used

APR	Annual progression rate
BMI	Body mass index
CCW	Chronic Conditions Data Warehouse
CDC	Centers for Disease Control and Prevention
CI	Confidence interval
CM	Core Maintenance
CMS	Centers for Medicare & Medicaid Services
CPT	Current procedural terminology
CY	Calendar year
DF	Degrees of freedom
DPP	Diabetes Prevention Program
DPRP	Diabetes Prevention Reporting Program
FFS	Fee-for-service
HCPCS	Healthcare Common Procedure Coding System
HEDIS	Healthcare Effectiveness Data and Information Set
HICN	Health Insurance Claim Number
HIPAA	Health Insurance Portability and Accountability Act
MA	Medicare Advantage
MBI	Medicare Beneficiary Identifier
MDPP	Medicare Diabetes Prevention Program
NA	Not available
PCP	Primary care provider
PHE	Public health emergency
WL	Weight loss
Y-USA	YMCA of the USA Diabetes Prevention Program
ZCTA	Zip code tabulation areas

Executive Summary

Beneficiaries
participate in MDPP

Beneficiaries
enroll in MDPP

Suppliers enroll in MDPP

MDPP goals include weight loss
and other positive lifestyle changes

Long-term goals include
reducing the likelihood or
delaying the onset of diabetes
and reducing health care use
and spending



Executive Summary

Introduction to the Medicare Diabetes Prevention Program (MDPP)



On April 1, 2018, Medicare began offering beneficiaries the Medicare Diabetes Prevention Program (MDPP), an evidence-based approach to delaying or preventing type 2 diabetes. The MDPP was the first preventive service model tested by the Center for Medicare & Medicaid Innovation (CMMI) that was expanded as a Medicare-covered service for fee-for-service (FFS) and Medicare Advantage (MA) beneficiaries. MDPP is unique in many ways because it promotes health system transformation through a focus on preventive care and broadens the provider landscape by including a wider array of providers outside of the traditional health care setting. Eligible providers include not only health care providers but also community-based providers such as YMCAs, thus expanding the access to the program to beneficiaries throughout their local communities.

Overview of the Program

The MDPP is a lifestyle change program that promotes weight loss and exercise among Medicare beneficiaries who are at high risk of developing type 2 diabetes. Both Medicare FFS and MA beneficiaries are eligible to receive MDPP services if they are overweight or obese, have prediabetes documented by a clinical laboratory test, have not been previously diagnosed with diabetes or end-stage renal disease, and have not previously received MDPP services. MDPP includes at least 16 core sessions delivered over the first 6 months, followed by monthly maintenance sessions thereafter, for a total of 22 sessions.

The MDPP core sessions focus on changing eating habits and encouraging physical activity. The maintenance sessions provide additional strategies for maintaining weight loss. Lifestyle coaches lead the sessions and, in some cases, provide supplemental support to participants between sessions via email, text, or telephone. Before the COVID-19 public health emergency (PHE), sessions were required to be delivered in person, although limited virtual makeup sessions were allowed.¹ During the PHE, CMS allowed sessions to be delivered virtually, and these flexibilities were expanded in 2024 to allow virtual sessions in a live or synchronous format.

To participate as an MDPP supplier, organizations must first achieve recognition from the Centers for Disease Control and Prevention (CDC). Thus, the suppliers who enroll in the MDPP must already have experience providing diabetes prevention services and will have demonstrated that participants attend classes and achieve weight loss. In addition to CDC recognition, organizations must enroll in Medicare and meet a series of other provisions before they become an MDPP supplier. Medicare pays MDPP suppliers for FFS beneficiaries on the basis of both the number of sessions beneficiaries attend and whether beneficiaries achieve certain weight loss goals. In 2024, a supplier could receive up to \$768 per beneficiary if all performance targets (attendance and weight loss) were met.

MDPP Evaluation

The goal of the MDPP is to prevent or delay the onset of type 2 diabetes in Medicare beneficiaries with prediabetes, thereby improving their health and reducing Medicare expenditures. This final report follows the MDPP journey, including supplier enrollment (Chapter 2), beneficiary engagement and participation (Chapter 3), shorter-term health outcomes such as weight loss and physical activity (Chapter 4), and longer-term outcomes (Chapter 5).

MDPP Evaluation Results

Supplier Participation in the MDPP



As of April 2024, 1,139 organizations had received CDC recognition to provide Diabetes Prevention Program (DPP) services and thus were eligible to become MDPP suppliers; of these, 414 (36%) applied to Medicare and were approved as MDPP suppliers. Of the 414 suppliers who were approved for MDPP services, 357 (86%) have ever actively participated in the program, indicating they enrolled at least one person in MDPP since the program started. The 357 ever-active supplier organizations offer classes through 1,370 delivery sites in their respective communities.



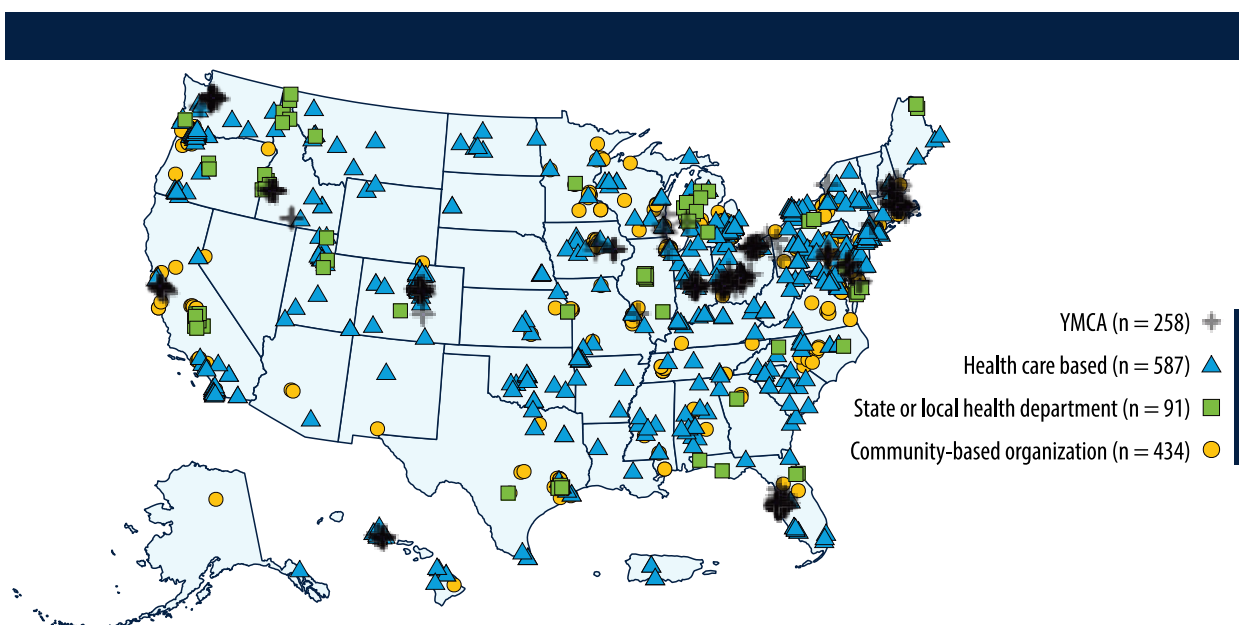
Key Takeaways

- As of April 2024, there were 414 MDPP suppliers, of which 357 (86%) have enrolled at least one person in the program.
- Most MDPP suppliers are health care organizations, followed by community-based organizations, state or local health departments, and YMCAs.
- MDPP delivery sites tend to be in areas of lower diabetes prevalence.
- Most MDPP beneficiaries (69%) live within 25 miles of their MDPP supplier.

MDPP Supplier Characteristics

Many different types of organizations have applied to become MDPP suppliers. The MDPP introduced a new class of providers to Medicare, which expanded the delivery of diabetes prevention services into both clinical and nonclinical community settings. This has extended beneficiary access to these services. Most MDPP suppliers are health care organizations (66%), followed by community-based organizations (19%), state or local health departments (8%), and YMCAs (7%). On average, MDPP suppliers offer services at four delivery sites (ranging from 1 to 149 delivery sites), although not all delivery sites are currently active.

Figure ES-1 displays the geographic distribution of MDPP delivery sites throughout the United States by organizational type. Many of the delivery sites are in the Northeast. YMCAs have many more delivery sites in these areas, thus providing broader access in those communities. There is a notable lack of delivery sites in the Mountain West and Sunbelt regions.

Figure ES-1. MDPP Supplier Locations by Organizational Type

Note: This figure includes 1,370 supplier locations for the 357 ever-active suppliers.

Data Sources: MDPP Crosswalk, Medicare Fee-for-Service (FFS) Claims, Diabetes Prevention Reporting Program (DPRP) Data, CMS April 2024 Supplier Enrollment Summary.

Beneficiary Access to Suppliers

Proximity to MDPP suppliers is an important factor in determining how easily Medicare beneficiaries can access the program, particularly for in-person sessions. Overall, 64% of MDPP beneficiaries live within 25 miles of the closest delivery site of their assigned MDPP supplier.

Although MDPP started as a predominately in-person program, the COVID-19 PHE led to an emergency expansion of the program, allowing virtual delivery. The option for virtual delivery has been renewed through 2027. Before the PHE (March 2020), almost all sessions were delivered in person. After spiking to greater than 90% of all sessions in April 2020, the percentage of virtual sessions gradually decreased to 59% as of December 2023. Since the start of the program, most MDPP beneficiaries primarily participated in person (59%), 34% primarily participated through virtual options, and the remaining 7% participated through a mix of in-person and virtual delivery modes.

Beneficiary Participation in MDPP



Between April 2018 and March 2024, MDPP served 9,015 beneficiaries. This includes 4,396 FFS beneficiaries and 4,650 MA beneficiaries.

The primary referral source for MDPP beneficiaries is a primary care physician or a specialist (50%). These referrals often happen when health care providers inform patients that they have prediabetes. Many beneficiaries said that their medical providers played a crucial role in informing them about the program, which underscores the important role health care providers play in connecting beneficiaries with the program.

Beneficiary Demographics

Among MDPP beneficiaries, about 76% were female, and 70% fell between the ages of 65 and 74. The demographics of MDPP FFS beneficiaries and MA beneficiaries were generally similar.

Beneficiary Attendance and Retention

MDPP beneficiaries attended an average of 18 sessions and were enrolled for approximately 8 months, which means the average MDPP beneficiary completed at least the core phase of the program, which is 16 sessions, and continued into the monthly maintenance phase of the program. Beneficiaries who attended a mix of in-person and virtual sessions completed the most sessions on average. This is likely because of the flexibility of having both types of delivery mode available. MDPP beneficiaries who attended the program predominately in person attended slightly fewer sessions on average, but this includes beneficiaries who had their in-person sessions disrupted (and possibly not resumed) because of the COVID-19 PHE.



Key Takeaways

- Through March 2024, 9,015 Medicare beneficiaries participated in the MDPP.
- Health care providers were the primary referral source.
- Most MDPP beneficiaries are female and 65 to 74 years of age.
- On average, beneficiaries attended 18 of the 22 possible sessions.
- The average length of enrollment is approximately 8 months.
- Beneficiaries reported being satisfied with MDPP.
- Beneficiaries also reported that having an enthusiastic, supportive, and nonjudgmental coach was a key factor contributing to their success and positive experience with the MDPP.

Weight Loss and Physical Activity Among MDPP Beneficiaries

Beneficiary Weight Loss



Among the MDPP beneficiaries who attended at least two sessions and had weight loss data, the average weight loss was 4.9% of starting body weight.

Average weight loss is strongly correlated with session attendance.

Over the first 6 years of the program, more than half of beneficiaries (52.5%) achieved at least 5% weight loss, and 24.2% of beneficiaries achieved at least 9% weight loss. Among MDPP beneficiaries who lost at least 5% of their starting weight and stayed in the program, most (80%) maintained at least 5% weight loss or lost additional weight.

Beneficiary Physical Activity and Other Health Outcomes

As part of the MDPP curriculum, lifestyle coaches work with beneficiaries to track how many physical activity minutes are completed each week of the program. The CDC curriculum emphasizes recording physical activity minutes beginning in Session 5, and the program's goal is for beneficiaries to achieve at least 150 minutes of physical activity per week. The percentage of beneficiaries that reported that they met the physical activity goal of 150 minutes was 60% by Session 6, 69% by Session 16, and 72% by Session 22. MDPP beneficiaries also report a myriad of other shorter-term benefits in addition to weight loss and increased physical activity, including improved behavioral health and other health outcomes.



Key Takeaways

- Average weight loss for MDPP beneficiaries was 4.9% of starting body weight.
- Weight loss is highly correlated with the number of sessions attended.
- More than half of beneficiaries achieved 5% weight loss, and one-quarter achieved 9% weight loss.
- Among beneficiaries who achieved at least 5% weight loss and stayed in the program, 80% maintained or lost more by the end of the program.
- Beneficiaries highlighted positive outcomes of the program, such as improved nutrition, increased physical activity, and health-related outcomes such as reductions in weight or A1c levels.

Characteristics and Diabetes Incidence Among FFS MDPP Beneficiaries



The goal of the MDPP is to help Medicare beneficiaries achieve weight loss and better health outcomes. The expectation is that with better health, beneficiaries will need fewer expensive health care services, leading to reductions in Medicare spending. Beneficiaries' self-selection into the program made it difficult to assess impacts of the model such as changes in service use and Medicare spending.

Beneficiary Characteristics

Therefore, this analysis compares MDPP FFS beneficiaries to FFS beneficiaries who were eligible for the program but not enrolled. Compared with potentially eligible FFS Medicare beneficiaries, MDPP beneficiaries are more likely to be female (75% MDPP vs. 57%); use less high-cost, acute medical care; use more preventive care; and have an indication of obesity or severe obesity in claims.

Diabetes Incidence

Individuals with prediabetes are at high risk for developing diabetes. Among 2,163 MDPP FFS beneficiaries eligible for an analysis of diabetes incidence after participating in the program (i.e., those who had at least 2 years of pre-MDPP claims data, do not have previous claims for diabetes, and had at least one year of claims data after starting MDPP), 15% developed diabetes. That is, 322 beneficiaries went on to have Medicare FFS claims where a diabetes diagnosis was recorded. MDPP beneficiaries who met the 5% weight loss goal had a 36% lower rate of diabetes incidence than MDPP beneficiaries who did not meet the 5% weight loss goal.

Conclusion

MDPP Summary of Results



The MDPP introduced a new class of providers to Medicare, which expanded the delivery of diabetes prevention services into both clinical and nonclinical community settings. This has extended beneficiary access to these services. MDPP suppliers include health care providers and systems, community-based organizations, YMCAs, and local health departments.

Overall, MDPP enrollment is lower than anticipated. Although enrollment numbers have rebounded to pre-pandemic rates since 2020, the COVID-19 PHE disrupted enrollment into the



Key Takeaways

- FFS MDPP beneficiaries are more likely to be female; use less high-cost, acute medical care; use more preventive care; and have an indication of obesity or severe obesity.
- The study sample eligible for analyses of diabetes incidence is small, but among the sample, 15% progressed to diabetes, with 5.9% progressing each year to diabetes.
- Having claims for prediabetes, obesity or severe obesity, or hypertension before starting MDPP was associated with higher rates of diabetes incidence.
- Meeting the MDPP 5% weight loss goal was associated with lower incidence of diabetes.

predominantly in-person program. Delivery modes have shifted over time, with more beneficiaries participating through virtual delivery options. In addition, once beneficiaries enroll, attendance is high, and beneficiaries tend to complete the program regardless of delivery mode.

Successful MDPP participation leads to improved shorter-term outcomes, including weight loss, dietary improvements, and increased levels of physical activity. MDPP beneficiaries lost an average of almost 5% of starting body weight, and weight loss increases as beneficiaries stay in the program longer. Once MDPP beneficiaries lose initial weight, they tend to maintain their weight loss throughout the program. Research has shown that participating in the National DPP leads to weight loss, which ultimately results in reduced risk of diabetes onset.² **Table ES-1** summarizes important findings on key metrics across the MDPP beneficiary journey and indicates where in the final report each topic is discussed.

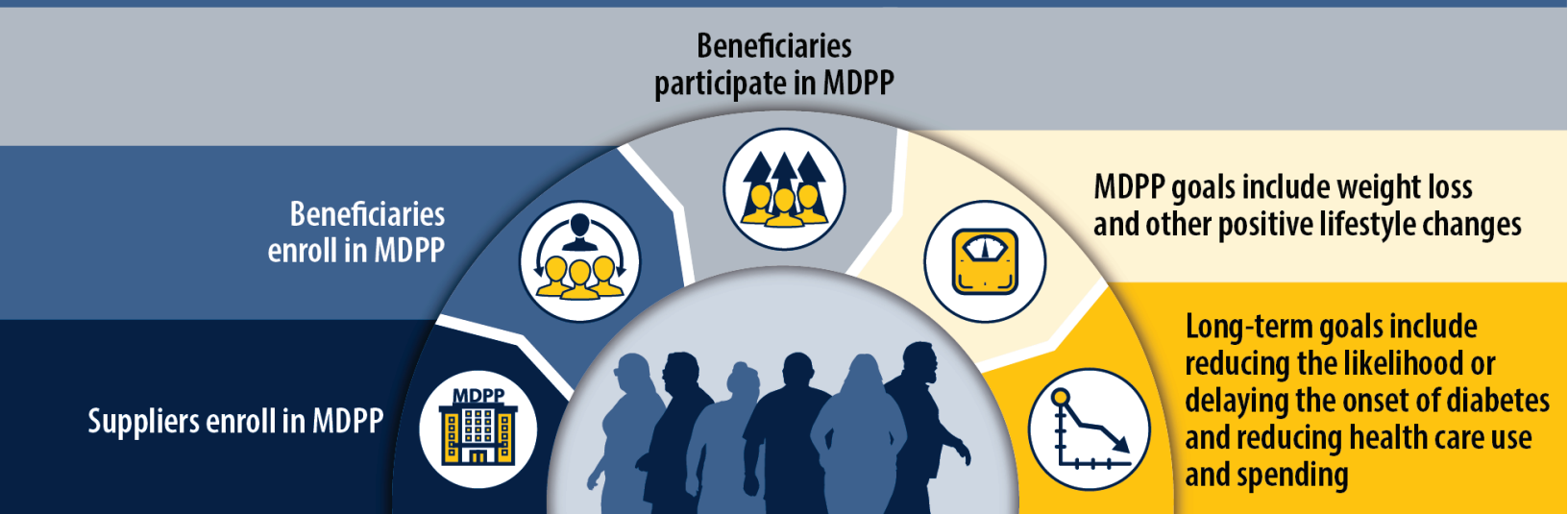
Table ES-1. MDPP Summary of Results

 Chapter 2	 Chapter 3	 Chapter 3	 Chapter 4	 Chapter 5
Suppliers enroll in MDPP	Beneficiaries enroll in MDPP	Beneficiaries participate in MDPP	MDPP goals include weight loss and other positive lifestyle changes	Longer-term goals include reducing the likelihood of diabetes onset and reduced health care use and spending
- As of April 2024, 414 suppliers have enrolled in MDPP. - Of the 414 MDPP suppliers, 357 suppliers, representing 1,370 delivery sites, have provided MDPP services to beneficiaries. - Most MDPP suppliers are health care organizations, followed by community-based organizations, state or local health departments, and YMCAs.	- From April 2018 through March 2024, 9,015 Medicare beneficiaries participated in the MDPP. - Most beneficiaries are female and are ages 65 to 74. 69% of MDPP beneficiaries live within 25 miles of their MDPP supplier. - The primary referral source for beneficiaries was a health care provider.	- On average, beneficiaries attended 18 out of the 22 possible sessions. - The average length of participation is approximately 8 months. - Beneficiaries reported being satisfied with MDPP; the focus on making realistic lifestyle changes contributed to an overall positive experience for beneficiaries. - Beneficiaries also reported that having an enthusiastic, supportive, and nonjudgmental coach kept them motivated, helped them set realistic goals, and was a key factor contributing to their success and positive experience with the MDPP.	- Average weight loss for MDPP beneficiaries was 4.9% of starting body weight. - More than half of beneficiaries achieved 5% weight loss, and one-quarter achieved 9% weight loss. - Among beneficiaries who achieved at least 5% weight loss, 80% of them maintained or lost additional weight by the end of the program. - Beneficiaries highlighted positive outcomes as a result of the program, including improved nutrition, increased physical activity, improved health-related outcomes such as weight change or change in A1c levels, and new knowledge and strategies to support health goals.	Among a small sample of FFS MDPP beneficiaries, there were 5.9 cases of new diabetes per 100 person-years. 

Notes: MDPP = Medicare Diabetes Prevention Program, DPRP = Diabetes Prevention Recognition Program, CDC = U.S. Centers for Disease Control and Prevention

Chapter 1:

Introduction: The Medicare Diabetes Prevention Program (MDPP)





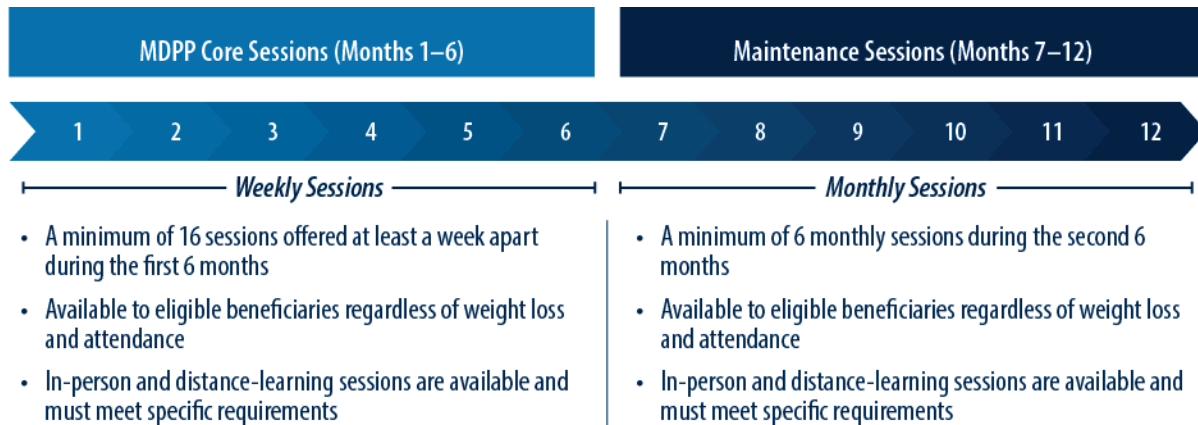
Introduction: The Medicare Diabetes Prevention Program (MDPP)

On April 1, 2018, Medicare began offering beneficiaries the Medicare Diabetes Prevention Program (MDPP), an evidence-based approach to delaying or preventing type 2 diabetes. The MDPP was the first preventive service model tested by the Center for Medicare & Medicaid Innovation that was expanded as a Medicare-covered service for fee-for-service (FFS) and Medicare Advantage (MA) beneficiaries. MDPP is unique, as it promotes health system transformation through a focus on preventive care and broadens the provider landscape by including a wider array of providers outside of the traditional health care setting. Eligible providers include not only health care providers but also community-based providers such as YMCAs, thus expanding access to the program to beneficiaries throughout their local communities.

Overview of the Program

The MDPP is a lifestyle change program, based on the National Diabetes Prevention Program (National DPP), that promotes weight loss and physical activity in Medicare beneficiaries who are at high risk of developing type 2 diabetes. Both Medicare FFS and MA beneficiaries are eligible to receive MDPP services if they are overweight or obese, have prediabetes documented by a clinical laboratory test, have not been previously diagnosed with diabetes or end-stage renal disease, and have not previously received MDPP services. The MDPP is a year-long program that includes at least 16 sessions delivered over the first 6 months, followed by monthly sessions thereafter, for a total of 22 sessions (**Figure 1-1**).

Figure 1-1. Current MDPP Program Structure

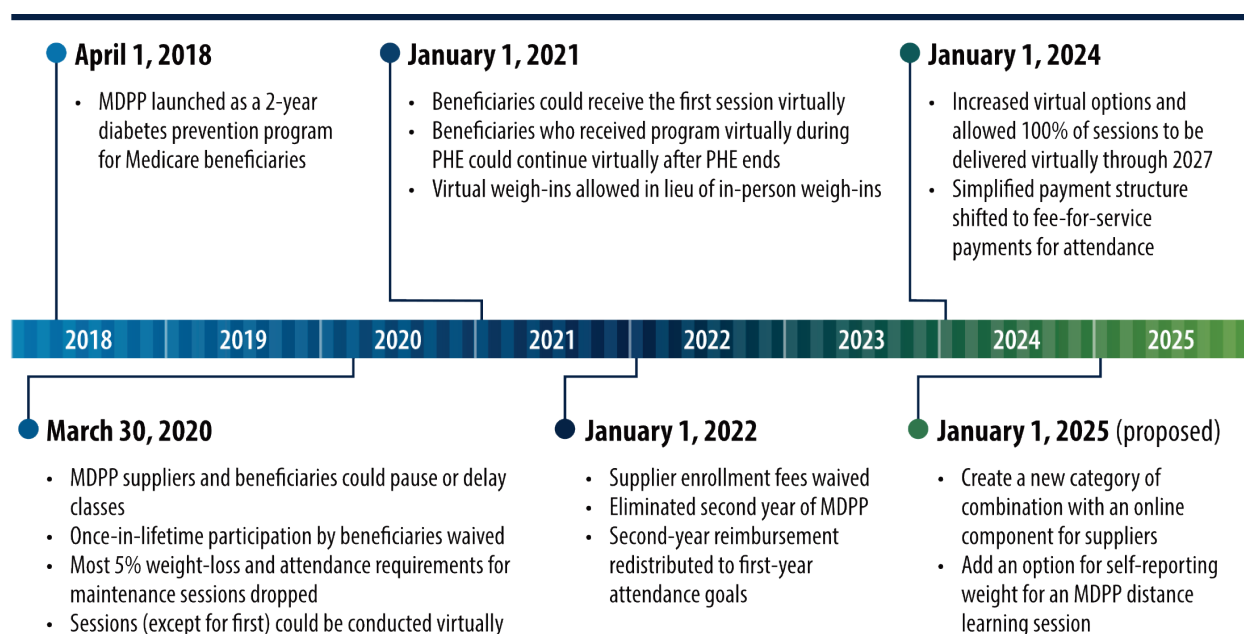


The MDPP core sessions focus on changing eating habits and encouraging physical activity. The maintenance sessions provide additional strategies for maintaining weight loss. Lifestyle coaches lead the sessions and, in some cases, provide supplementary support to participants between sessions via email, text, or telephone. An important component of the in-person sessions is a weigh-in, allowing the participant and supplier to track weight loss over time. The curriculum begins to emphasize tracking physical activity around Session 5. Before the COVID-19 public health emergency (PHE), sessions were required to be delivered in person, although limited virtual makeup sessions were allowed.¹ MDPP sessions now are allowed to be delivered virtually in a live or synchronous format.

To participate as an MDPP supplier, organizations must first be recognized by the Centers for Disease Control and Prevention (CDC) to offer the National DPP.³ Therefore, organizations that enroll in the MDPP will already have experience providing diabetes prevention services through the National DPP and will have demonstrated that participants attend classes and achieve weight loss. Once suppliers have CDC recognition, they must enroll in Medicare and meet a series of other provisions to become an MDPP supplier. Not all organizations with CDC recognition enroll to offer the MDPP. Medicare reimbursement for FFS beneficiaries is based on the number of sessions beneficiaries attend and amount of weight they lose. In 2024, a supplier could receive up to \$768 per beneficiary if all performance targets (attendance and weight loss) were met. The reimbursement schedule and performance standards are described in greater detail in **Appendix A**.

Changes to the MDPP Over Time

The Centers for Medicare & Medicaid Services (CMS) has made multiple changes to the MDPP since its launch on April 1, 2018 (**Figure 1-2**). The first two changes, prompted by the COVID-19 PHE, allowed for virtual delivery of the program in place of in-person sessions. The third change was designed to increase supplier and beneficiary participation by waiving supplier enrollment fees, eliminating the second year of the program for new beneficiaries, and redistributing second-year reimbursement rates to the first year of the program. The most-recent changes focused on increasing access to the program virtually and simplifying the payment structure to align more with an FFS methodology.

Figure 1-2. Changes to the MDPP

PHE = public health emergency

MDPP Evaluation

The short-term goal of the MDPP is to help individuals lose at least 5% of their body weight, with the longer-term goal of preventing or delaying the onset of type 2 diabetes in Medicare beneficiaries with prediabetes, thereby improving their health and reducing Medicare expenditures. The objective of the evaluation is to determine whether the MDPP is successful in achieving these goals, and the evaluation was guided by the following research questions:

- How has the MDPP evolved since its inception?
- Does participation in MDPP lead to reductions in weight?
- Does MDPP participation affect health outcomes and diabetes incidence?

Data Sources

The evaluation questions are addressed through several key sources. Data sources for suppliers include both quantitative data from CDC and CMS and qualitative data from supplier interviews and beneficiary focus groups. The three quantitative data sources are as follows:

- Supplier Crosswalk data submitted by MDPP suppliers
- Diabetes Prevention Reporting Program (DPRP) data from CDC
- Medicare claims and enrollment information from CMS

The three datasets provide complementary data that can be linked through the Supplier Crosswalk (**Table 1-1**). More details on these data sources are in **Appendix B**.

Table 1-1. Key Quantitative Data Sources

Variable	Supplier Crosswalk	Diabetes Prevention Reporting Program (DPRP)	Medicare Claims (Fee-for-Service [FFS] Beneficiaries Only)
Purpose	Identify MDPP beneficiaries and link DPRP and Medicare claims data	Provide data on demographics, session attendance, weight loss, and physical activity	Identify payments for MDPP services and measure beneficiary use and expenditures
Source	MDPP suppliers	CDC	CMS
Populations included	All enrolled MDPP participants	All enrolled MDPP participants	Medicare FFS
Data included in this report	April 2018–March 2024	April 2018–March 2024	Approved MDPP claims through March 31, 2024, for analyses of MDPP claims Approved claims through December 31, 2023, for analyses of Medicare spending and service use

To supplement the quantitative data, we also interviewed participating MDPP suppliers to understand how they implemented the MDPP, responded to the COVID-19 PHE, and recruited and enrolled beneficiaries. We also conducted a series of small focus groups with beneficiaries who were participating in or had recently completed the program. The focus groups with MDPP beneficiaries were designed to address the following questions:

- What are beneficiaries' experiences getting connected to the program, and what motivated them to join?
- What are beneficiaries' experiences participating in the program? How satisfied are they with delivery, content, curriculum, and structure?
- What are beneficiary perspectives on the effect the program has had on them?

MDPP Journey Map

This final report follows the progress of MDPP beneficiaries throughout their participation in the program (**Figure 1-3**).



Chapter 2: Before MDPP beneficiaries can enroll in MDPP, there must first be suppliers to offer the program. To enroll with Medicare, suppliers must achieve preliminary or full recognition by CDC (see [CDC Recognition Requirements for National Diabetes Prevention Program](#)). To earn this recognition, organizations must offer diabetes prevention services using a CDC-approved curriculum for at least 1 year; submit data on individuals' progress; and meet key performance standards related to

enrollment, retention, and weight loss. After achieving CDC recognition, a supplier may apply to be a MDPP supplier.



Chapter 3: After a supplier elects to offer MDPP services, the next step is for beneficiaries to enroll in the program. Medicare beneficiaries are eligible to participate if they have prediabetes and have a body mass index (BMI) of 25 or greater (23 if self-identified as Asian). Beneficiaries are referred to MDPP from a variety of sources, including their health care providers, information from CMS or their MA plan, or self-referral.



Once a beneficiary is referred and chooses to join the program, they participate in 16 weekly core sessions, which takes approximately 4 to 6 months to complete, and then six monthly maintenance sessions through Month 12. The beneficiary engagement with the program is measured through attendance and retention. MDPP beneficiaries' experience is also a key measure of program success.

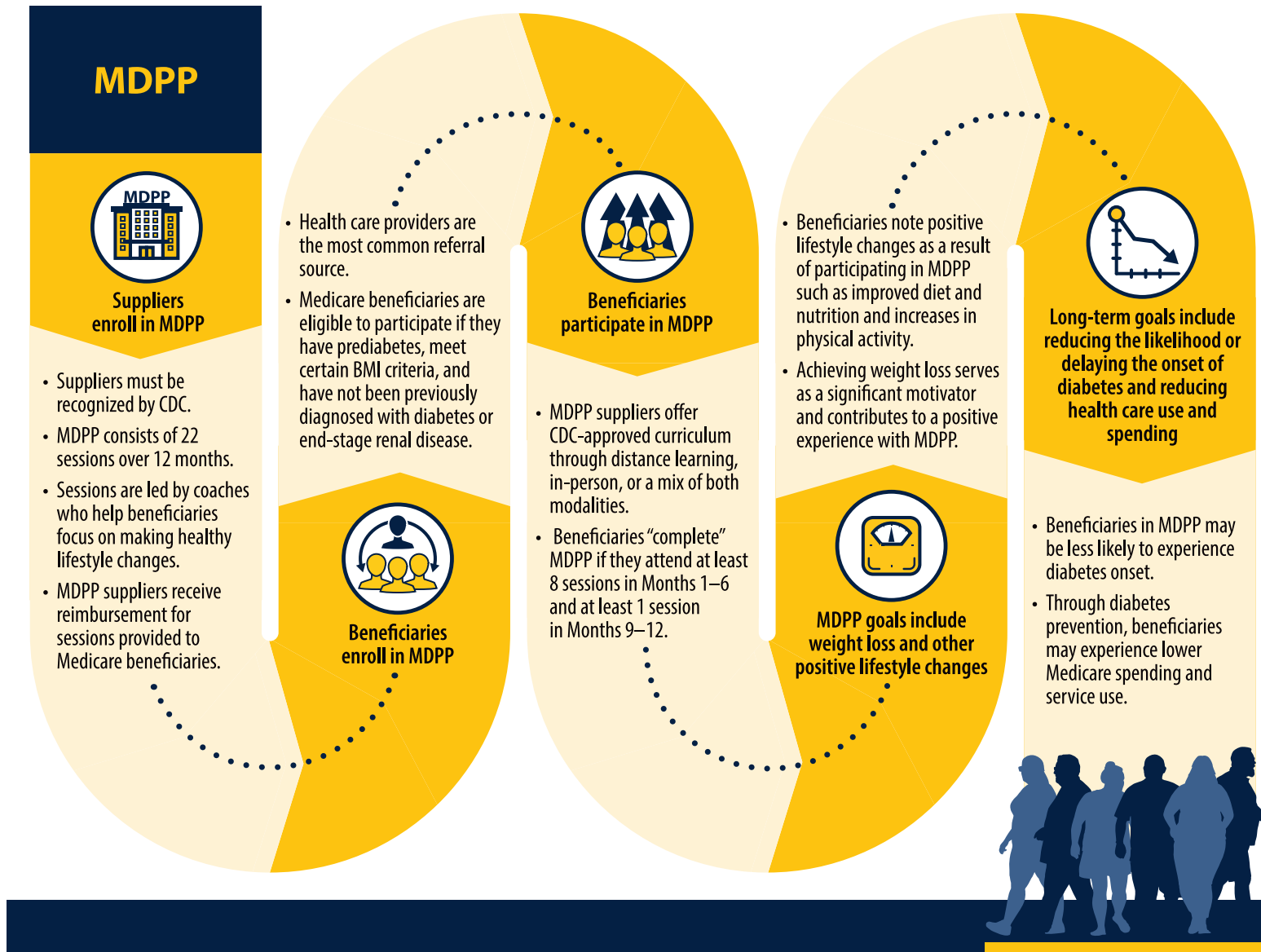


Chapter 4: The next step focuses on shorter-term outcomes that can lead to longer-term effects on overall health. Successful MDPP participation can lead to weight loss, improved dietary changes, and increased levels of physical activity. Reductions in weight, for example, can lead to reduced diabetes incidence and lower health care spending and use. In addition, Medicare gives MDPP suppliers an additional payment based on beneficiaries who lose at least 5% of their body weight over the course of the program.



Chapter 5: The expectation is that, with better health, beneficiaries will need fewer expensive health care services, leading to reductions in Medicare FFS spending. As such, this evaluation sought to answer the question, does MDPP participation lead to weight loss and affect Medicare spending, health care use, or diabetes incidence? The logic model for MDPP also summarizes this journey (see **Appendix C**).

Figure 1-3. MDPP Journey Map



Chapter 2: Supplier Participation in the MDPP

Suppliers enroll in MDPP





Supplier Participation in the MDPP

Many different types of organizations have applied to become MDPP suppliers. The MDPP introduced a new class of providers to Medicare, which expanded the delivery of diabetes prevention services into both clinical and nonclinical community settings. This in turn has extended beneficiary access to these services. MDPP suppliers include health care providers and systems as well as community-based organizations, YMCAs, and local health departments.

In this section, we distinguish between MDPP suppliers and local delivery sites. A supplier enrolls in MDPP and offers the program at local delivery sites. Suppliers can offer MDPP services at both the main supplier site, often called the administrative site, and at one or more local delivery sites throughout the community, sometimes referred to as community sites.



Key Takeaways

- As of April 2024, there were 414 MDPP suppliers, of which 357 (86%) had enrolled at least one person in the program.
- Most MDPP suppliers are health care organizations, followed by community-based organizations, state or local health departments, and YMCAs.
- MDPP delivery sites tend to be in areas of lower diabetes prevalence.
- Most MDPP beneficiaries (69%) live within 25 miles of their MDPP supplier.

MDPP Supplier Characteristics

This section is an overview of MDPP supplier organizations and delivery sites, their geographic location, and the characteristics of their communities. Understanding the makeup of suppliers and where they are located geographically provides a snapshot of where and how diabetes prevention services are being delivered to Medicare beneficiaries. Moreover, understanding the characteristics of the communities in which MDPP suppliers and delivery sites operate gives context for program delivery and implementation.

Number of Participating Suppliers

As of April 2024, 1,139 suppliers were recognized by CDC and thus eligible to become MDPP suppliers, and 414 (36%) of these suppliers had enrolled in the program. Of the 414 suppliers, 357 (86%) have ever actively participated in the program, meaning they enrolled at least one Medicare beneficiary in MDPP. MDPP suppliers also offer services to non-Medicare beneficiaries, although CMS only reimburses supplies for the Medicare participants. CMS has periodically deactivated MDPP suppliers that never submitted claims or had not submitted claims in the last year. Deactivated suppliers can apply to be re-activated. Of the 357 ever-active suppliers, 98 were deactivated or revoked as of April 2024.

The 357 “ever-active” supplier organizations offer classes through 1,370 delivery sites in their respective communities.

MDPP Supplier Organization Types

Although Medicare began covering MDPP services in April 2018, many suppliers may have been offering diabetes prevention services to individuals, some with Medicare coverage, before then. Overall, among the active MDPP suppliers, the number of years providing any DPP services ranged from 6 months to a little longer than 12 years, with an average of 7 years.

We categorized MDPP suppliers into four types of organizations: health care, community-based organizations (other than YMCAs), state or local health departments, and YMCAs. Health care organizations include MDPP suppliers such as hospitals, health care clinics, federally qualified health centers, and independent physician practices. Community-based organizations consist of MDPP suppliers such as faith-based organizations, senior and wellness centers, and other local nonprofit organizations.

Table 2-1 summarizes the 357 ever-active MDPP suppliers by organizational type and the average number of delivery sites associated with each organizational type. Most MDPP suppliers are health care organizations (66%), which represent 48% of all delivery sites and 63% of all participating beneficiaries served. In contrast, YMCAs are 7% of ever-active MDPP suppliers, but represent 18% of all delivery sites and 16% of all participating beneficiaries served.

On average, MDPP suppliers offer services at four delivery sites (range 1 to 149 delivery sites). Not all delivery sites operate concurrently, however, and some MDPP suppliers may no longer offer classes at specific delivery sites. YMCA supplier organizations, on average, offer classes at the highest number of delivery sites, with an average of 10 sites. Conversely, health care MDPP suppliers, on average, use the fewest number of delivery sites.

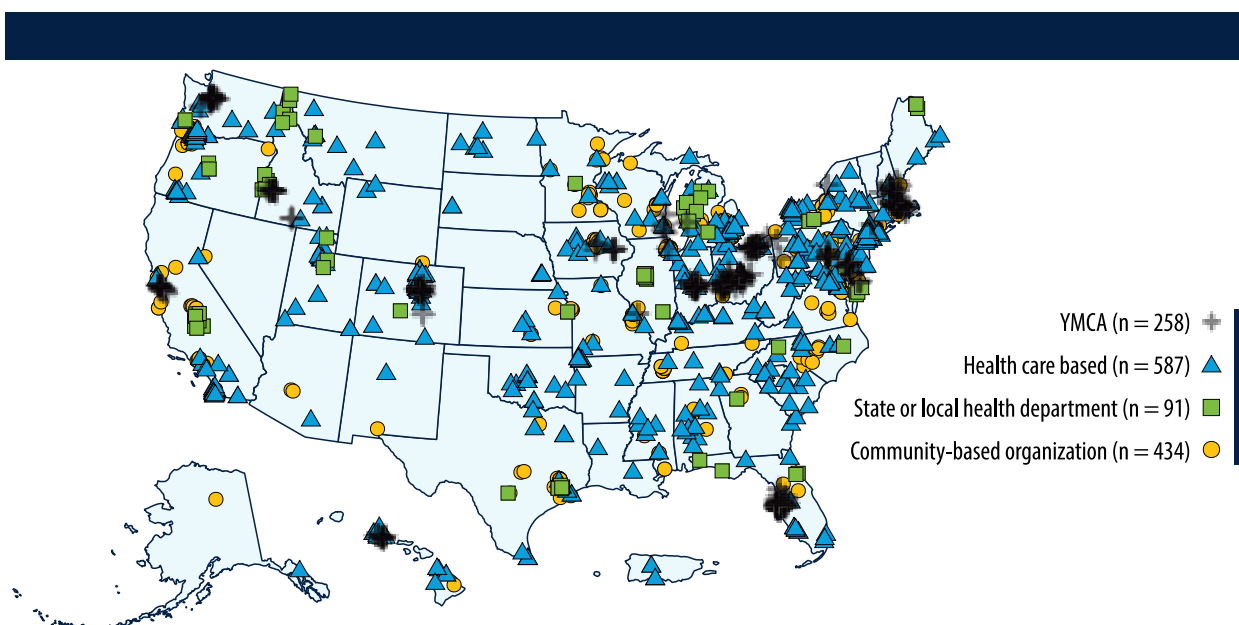
Table 2-1. MDPP Supplier Organization Type

Organization Type	Percentage of Suppliers (%)	Percentage of Delivery Sites (%)	Average Number of Delivery Sites*	Percentage of Beneficiaries Served (%)
Health care	66.2	47.6	3	62.6
Community-based (non-YMCAs)	19.0	27.0	6	18.7
State or local health department	7.8	7.8	4	3.0
YMCAs	7.0	17.6	10	15.7

* Total delivery sites = 1,370, among 357 ever-active suppliers.

MDPP Supplier Locations

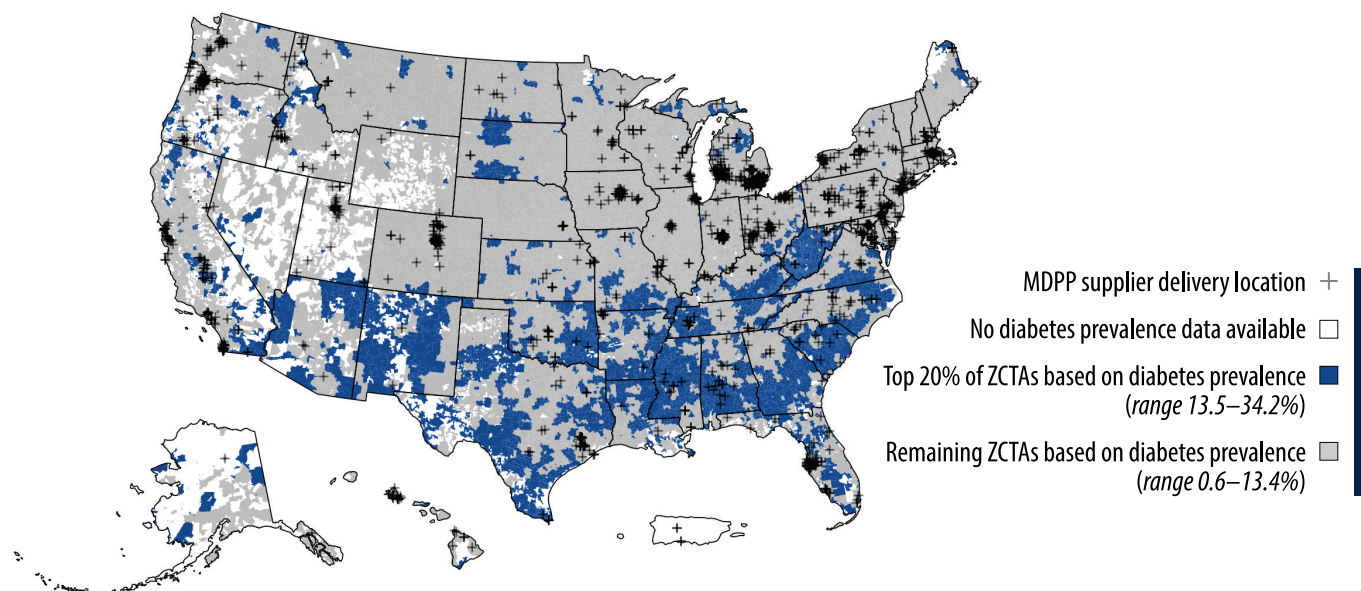
Geographic dispersion of MDPP suppliers is a measure of access to in-person MDPP services. **Figure 2-1** displays the geographic distribution of MDPP delivery sites throughout the United States by organizational type. Many of the delivery sites are in the Northeast. YMCAs have many more delivery sites in their areas, thus providing broader access in those communities. There is a notable lack of delivery sites in the Mountain West and Sunbelt regions.

Figure 2-1. MDPP Supplier Locations by Organizational Type

Note: This figure includes 1,370 supplier locations for the 357 ever-active suppliers.

Data Sources: MDPP Crosswalk, Medicare Fee-for-Service (FFS) Claims, Diabetes Prevention Reporting Program (DPRP) Data, CMS April 2024 Supplier Enrollment Summary.

MDPP delivery sites tend to be in areas with lower prevalence rates of diabetes, hypertension, and obesity than national averages. As shown in **Figure 2-2**, the highest areas of diabetes prevalence are in the Southern United States, whereas most MDPP delivery sites are in the Northeastern United States. This shows that there may be more need for MDPP suppliers in certain regions. Overall, current MDPP delivery sites are in areas with lower diabetes prevalence than the national median.

Figure 2-2. Diabetes Prevalence in the Top 20% of ZCTAs and Location of MDPP Delivery Sites

ZCTA = zip code tabulation area

Data Sources: CMS April 2024 Supplier Enrollment Summary, CDC PLACES 2023 Release.

Beneficiary Access to Suppliers

Although some beneficiaries attend classes virtually from other locations, local access to MDPP suppliers is important to consider, as some beneficiaries prefer to attend in-person classes if given the choice. In addition, access to local suppliers provides convenience and reduces travel costs for beneficiaries attending in-person sessions. Overall, among MDPP beneficiaries with zip code information available ($n = 4,279$), 64% live within 25 miles of the closest delivery site of their assigned MDPP supplier. Among the remainder, 34% live 26 to 50 miles away, and 2% live more than 50 miles away.

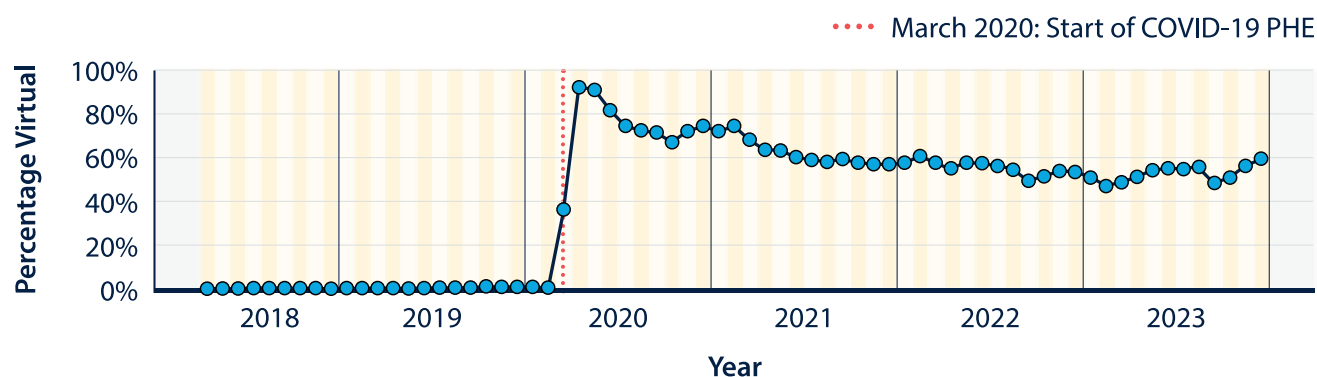
MDPP Delivery Mode

Starting in 2020, the programs experienced some major shifts because of the COVID-19 PHE. The PHE led to an emergency expansion of the program from a predominately in-person program to a mix of in-person and virtual options. The virtual delivery mode has continued since its expansion in 2020 and has been renewed through 2027.

Before the COVID-19 PHE (March 2020), almost all sessions were delivered in person (**Figure 2-3**). After spiking to greater than 90% of all sessions in April 2020, the percentage of virtual sessions gradually decreased to 59% as of December 2023. The shift to virtual sessions changed the program from a mostly in-person program to a mix of virtual and in-person sessions. As of December 2023, 59% of MDPP beneficiaries primarily participated in person,

and 34% primarily participated through virtual options. The remaining 7% participated through a mix of in-person and virtual delivery modes.

Figure 2-3. Percentage of Virtual Sessions Delivered Over Time



PHE = public health emergency

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

As shown in **Table 2-2**, proximity to nearest MDPP supplier was similar among MDPP beneficiaries that participated primarily in person (> 75% of sessions in person) and those who participated 100% virtually. These results indicate that MDPP beneficiaries are still physically located near their MDPP supplier even if they participate 100% virtually. This may change over time as more MDPP suppliers provide the program virtually.

Table 2-2. Distance to MDPP Supplier in Miles, by Primary Delivery Mode

% Virtual Sessions	0–5 Miles	5–25 Miles	26–50 Miles	50+ Miles
0–25% (n = 1,936)	30%	31%	37%	2%
100% (n = 1,097)	36%	29%	33%	3%

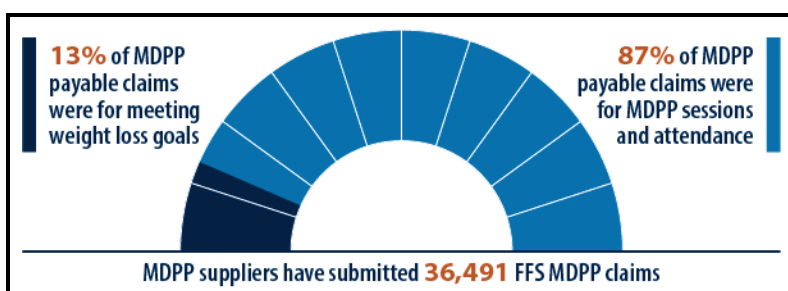
Supplier Reimbursement

Payments to MDPP suppliers are a foundational component of MDPP. These payments reimburse suppliers for MDPP program delivery and recognize suppliers that help beneficiaries meet weight loss goals. Between April 2018 and April 2024, Medicare reimbursed MDPP suppliers \$985,714 for MDPP services provided to 3,480 MDPP FFS beneficiaries. Almost one-quarter of the total payments, 24%, were for meeting the 5% or 9% weight loss targets.

MDPP suppliers received an average of \$283 per beneficiary (range: \$0 to \$824) for the 3,480 beneficiaries for whom MDPP claims were submitted. This translates into about \$24 per

beneficiary per month in additional Medicare spending per beneficiary for whom claims were submitted.

A total of 36,491 claims were submitted, of which 37% were payable, meaning the claim was for a service for which the MDPP supplier could be reimbursed. Of the claims that were payable, 13% were for meeting the weight loss goals, and the remainder (87%) were for session attendance. **Appendix D, Figure D-1**, summarizes the number of MDPP payable claims for each MDPP service.



The amount reimbursed by CMS to suppliers is lower than expected from the number of Medicare FFS beneficiaries that suppliers reported as enrolled in the program. As of March 2024, suppliers reported that 4,371 FFS beneficiaries participated in the program, but only 68% of those beneficiaries had a MDPP claim. This suggests that Medicare could have reimbursed suppliers more had suppliers submitted claims for everyone who participated. Moreover, the average amount reimbursed per participating beneficiary is quite a bit lower than the \$756 to \$806 maximum per beneficiary that could be reimbursed to suppliers in 2023 (the exact amount depends on whether a beneficiary sustains 5% weight loss).

Reimbursement Barriers and Facilitators

During interviews conducted in 2022, we spoke to some MDPP suppliers and national partners that support National DPP and MDPP suppliers. Many of the MDPP suppliers and national partners we interviewed noted that current CMS administrative processes make it difficult to focus on recruitment, as a good deal of staff time is dedicated to billing, submitting reports, and coding claims. One partner organization noted that the billing process is especially burdensome for small community-based organizations.

Several suppliers also noted that the current level of reimbursement for the program does not cover the costs to run the program and requested that CMS consider increasing the reimbursement rate.



So, the whole point of the National Diabetes Prevention Program and the MDPP is that community-based organizations can run the program. Lay people can be trained to teach this program, but if you make it so hard that we can't get reimbursed, then I don't know how you're going to keep people like us, the right people. We are the right group to be doing this, we're the health and wellness leaders in the world, and we should be doing this, but they've made it so difficult that we're really struggling.
– MDPP Supplier

To facilitate supplier participation in the MDPP, CMS has implemented several measures to simplify and streamline the program. Originally, the MDPP was designed as a 24-month program, and many suppliers expressed challenges related to Year 2 of the program. In interviews, suppliers expressed concerns about the feasibility of retaining beneficiaries for the entire duration, particularly in the second year. In January 2022, CMS re-structured the MDPP to be a 12-month program. This change reduced the administrative burden on suppliers and was intended to support retention rates among beneficiaries.

Starting on January 1, 2024, CMS adopted new streamlined Healthcare Common Procedure Coding System (HCPCS) codes for billing MDPP expanded model services. Previously, suppliers had to navigate a complex billing process that involved 15 separate HCPCS codes corresponding to different phases of a beneficiary's participation in the program, such as core sessions and maintenance sessions. The simplified process now includes six HCPCS codes,^{4, 5} making it easier for suppliers to accurately bill for services provided. This change is expected to encourage greater participation from suppliers.

Summary

The MDPP introduced a new class of providers to Medicare, which expanded the delivery of diabetes prevention services into both clinical and nonclinical community settings. This in turn has extended beneficiary access to these services. As of April 2024, 414 suppliers have enrolled in MDPP and 357 of them have ever provided MDPP services. Most suppliers are health care organizations (66%), followed by community-based organizations (19%), state or local health departments (8%), and YMCAs (7%). Overall, 64% of MDPP beneficiaries live within 25 miles of the closest delivery site of their assigned MDPP supplier regardless of how they participate in the program. Between April 2018 and April 2024, Medicare reimbursed MDPP suppliers \$985,714 for MDPP services provided to 3,480 MDPP FFS beneficiaries.

Chapter 3: Beneficiary Engagement in MDPP

Beneficiaries
enroll in MDPP

Beneficiaries
participate in MDPP





Beneficiary Participation in MDPP

After a supplier elects to offer MDPP services, the next step is for beneficiaries to be referred to the program and choose to participate. Medicare beneficiaries are eligible to participate if they have prediabetes, have a BMI of at least 25 (or 23 if self-identified as Asian), do not have end-stage renal disease, and have not participated in the program before. Beneficiaries are referred to MDPP from a variety of sources, including their health care providers, information from CMS or their MA plan, and self-referral. Beneficiary engagement with the program is measured through attendance and retention in the program. MDPP beneficiaries' experience is also a key measure of success of the program.

Beneficiary Referrals to MDPP

This section uses information from the 195 MDPP suppliers that report on beneficiary participation through the Supplier Crosswalk. Between April 2018 and March 2024, **MDPP suppliers reported serving 9,015 beneficiaries**. This includes 4,396 FFS beneficiaries and 4,650 MA beneficiaries; 31 beneficiaries had both FFS and MA during their enrollment in MDPP.

Referral Sources

The primary referral source for MDPP beneficiaries is their primary care physician or a specialist (50%). Often, these referrals happen in the context of a health care provider informing a patient that they have prediabetes. Many beneficiaries had not heard of the program before their health care provider introduced it, which underscores the important role health care providers play in connecting beneficiaries with the program.

“ My doctor gave me a referral to the dietitian and then they suggested this program ... for weight management and better eating habits. – **MDPP Beneficiary** ”

In examining the differences between FFS and MA MDPP beneficiaries, more FFS beneficiaries (56.9%) than MA beneficiaries (42.9%) reported a primary care provider or specialist as their



Key Takeaways

- Through March 2024, 9,015 Medicare beneficiaries participated in the MDPP.
- Health care providers were the primary referral source.
- Most MDPP beneficiaries are female and 65 to 74 years of age.
- On average, beneficiaries attended 18 of the 22 possible sessions.
- The average length of enrollment is approximately 8 months.
- Beneficiaries reported being satisfied with MDPP.
- Beneficiaries also reported that having an enthusiastic, supportive, and nonjudgmental coach was a key factor contributing to their success and positive experience with the MDPP.

referral source, although a higher percentage of MA beneficiaries did not report a referral source (**Table 3-1**).



I had gone in for my yearly checkup and I had been diagnosed as prediabetic ... and finally, the doctor says, “Well, we have some classes ... would you like to participate?” And I said, “Sure.” ... When they started the prediabetes classes, she enrolled me in it. And that was how I found out about it. – MDPP Beneficiary

In addition, we examined the referral source for MDPP beneficiaries who completed the program. Aligned with CDC’s definition, completers were defined as those who attended at least eight sessions in the first 6 months and an additional session after Month 6. Fifty-six percent of completers were referred by a primary care provider or specialist, in contrast to 39% of noncompleters (**Appendix E, Table E-1**).

Table 3-1. Referral Source for MDPP Beneficiaries

Referral Source	Overall (%) (n = 7,203)	FFS (%) (n = 3,659)	MA (%) (n = 3,544)
Primary care provider/office or specialist	50.0	56.9	42.9
Non-primary care health professional	6.2	6.0	6.3
Not reported	8.4	3.1	13.8
Other	35.4	33.9	36.9

FFS = fee-for-service; MA = Medicare Advantage.

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

The remaining referral sources include self-referral; information from insurance companies; media efforts, such as radio, newspaper, billboard, poster/flier, TV, internet ads, and social media platforms; and community events/organizations. For example, some MDPP beneficiaries discovered the program through general internet searches of exercise and nutrition programs after receiving a prediabetic diagnosis instead of being directly connected or referred by their health care provider. One beneficiary described being notified directly by a letter from CMS of their eligibility for the program, which prompted them to learn more about MDPP. Some beneficiaries encountered challenges with the self-referral process. For instance, one beneficiary said they did not know where to begin, whereas another mentioned contacting multiple MDPP delivery sites before finding one that was responsive and accepting new participants. However, once they identified an MDPP, beneficiaries found the enrollment process to be smooth. All beneficiaries who self-referred had recent bloodwork to confirm MDPP eligibility before enrollment.

Motivation for Enrollment

Motivation to enroll in the MDPP can differ from referral source. When asked about motivation to enroll in the program, almost half of all MDPP beneficiaries reported their health care professional as the source of motivation (48.2%) (**Table 3-2**). Blood test results were the

second-most common enrollment motivation overall (20.4%), followed by health insurance plans (7.4%). Motivation from a health insurance plan was higher for MA beneficiaries (13.8%) than for FFS beneficiaries (2.0%). Other motivators included risk test results, community-based organizations, health insurance companies, and media advertisements. Full results are in **Appendix E, Table E-2**.

Table 3-2. Enrollment Motivation for MDPP Beneficiaries

Enrollment Motivation	Overall (%) (n = 4,995)	FFS (%) (n = 2,740)	MA (%) (n = 2,255)
Health care professional	48.2	50.3	45.8
Blood test results	20.4	20.5	20.2
Health insurance plan	7.4	2.0	13.8
Community-based organization	7.0	8.7	5.0
Prediabetes risk test	5.3	5.8	4.6
Media advertisements	5.2	6.0	4.3
Family or friends	4.8	5.2	4.3
Participated in National DPP Lifestyle Change Program	0.9	1.0	0.8
Employer or employer's wellness plan	0.8	0.6	1.1

FFS = fee-for-service; MA = Medicare Advantage

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (May 2021–March 2024).

The question about beneficiary “enrollment motivation” was added to the DPRP data in May 2021; therefore, the sample size is smaller (n = 4,995) than the full DPRP matched sample (n = 7,203).

Among focus group participants, the primary motivation for enrolling in the program was to improve health, specifically to prevent diabetes or lose weight. Nearly all focus group participants mentioned they were motivated to find or join MDPP after being told that they had prediabetes either through an official diagnosis from their health care provider or from receiving elevated A1c results. Their prediabetes diagnosis was a strong impetus to prioritize health and seek ways to improve their A1c. Moreover, some beneficiaries described witnessing the detrimental effects of diabetes on their family members and expressed determination to avoid being diagnosed with diabetes themselves by taking proactive measures to safeguard their own health. Some beneficiaries also described weight loss in general as a motivation to enroll. For example, one beneficiary described how losing weight would alleviate the arthritis pain in their joints and was motivated to lose 5% of their body weight.



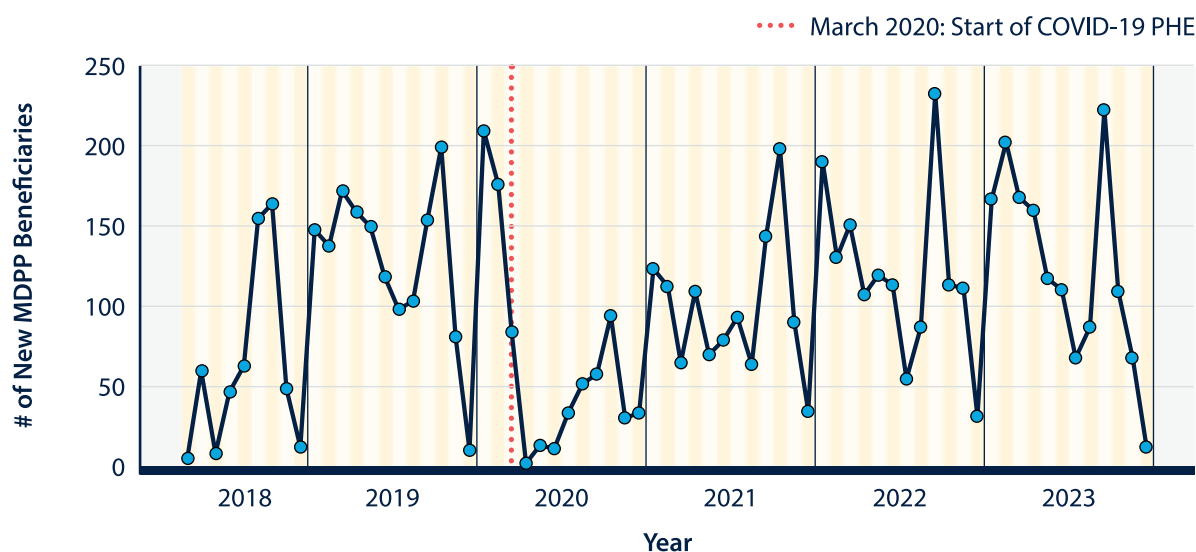
For me, my mother got type 2 diabetes in her older years, and I've been just petrified of that. And it's been my life goal not to end up there. And I've read on the medication that I have to take for not having a thyroid that you should monitor your blood sugar. So ... it's scary to me. I don't want diabetes. That's probably the more driving goal than the weight, but the weight obviously goes with it. So, I was scared into doing this. – MDPP Beneficiary

Enrollment Trends

MDPP enrollment was affected by the COVID-19 PHE, and the program is still well below anticipated enrollment. CMS originally anticipated initial year enrollment of anywhere between 65,000 and 100,000 Medicare participants because of pent-up demand followed by an average of 50,000 participants in subsequent years.⁶ Although CMS has made some changes to the MDPP to try to encourage more enrollment, such as shortening the program to 12 months, enrollment is still below 10,000 beneficiaries. The total number of new enrollees per year was highest in 2019, with 1,536 new MDPP beneficiaries. The overall number declined in 2020 to less than 1,000 because of the COVID-19 PHE. The number of new enrollees has been steadily growing since 2021, with enrollment in 2023 close to pre-PHE levels: almost 1,500 new MDPP beneficiaries joined the program.

Enrollment is also subject to monthly variation, as suppliers tend to offer more classes in the fall or early in the year. **Figure 3-1** shows the monthly variation in recruitment of new MDPP beneficiaries over time. Most beneficiaries tend to enroll in the fall. For example, September 2022 and September 2023 had the highest number of new enrollees.

Figure 3-1. Number of New MDPP Beneficiaries per Month



PHE = public health emergency

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).



Beneficiary Participation in MDPP

The demographics of MDPP beneficiaries are important to consider in determining whether the program is reaching its intended audiences. Of the 9,015 MDPP beneficiaries suppliers reported through the Supplier Crosswalk, we were able to match 7,203 to CDC DPRP data. Of these, 4,396 were Medicare FFS beneficiaries (48.6%) and 4,650 were MA beneficiaries (51.4%); 31 were in both FFS and MA during the program. Uptake overall is similar between MDPP and the National DPP. For example, of the eligible FFS Medicare beneficiaries with prediabetes, 1 out of every 985 beneficiaries (0.01%) enrolled in MDPP, and in the National DPP, 1 out of every 520 eligible individuals enrolled in the program (0.02%).⁷

Beneficiary Demographics

Approximately 76% of MDPP beneficiaries are female and 70% are ages 65 to 74 (**Table 3-3**). More than half of MDPP beneficiaries have some college education (58%). The demographics of MDPP FFS beneficiaries and MA beneficiaries are generally similar. However, compared with the overall pool of 29 million FFS Part B Medicare beneficiaries, MDPP beneficiaries tend to be younger and are more likely to be female than the overall FFS Part B Medicare population.^a

Table 3-3. MDPP Beneficiary Demographics Among Fee-for-Service (FFS) and Medicare Advantage (MA) Beneficiaries

Subgroup	Number (n)	Percentage (%)
Sex		
Female	5,440	75.5
Male	1,704	23.7
Not reported	59	0.8
Age Group		
< 65	566	7.8
65–69	2,774	38.5
70–74	2,277	31.6
75–79	1,148	15.9
> 79	438	6.1
Education Status		
Some college	4,178	58.0
Less than college	970	13.5
Education not reported	2,055	28.5

Note: Education status is not available in Medicare enrollment data. Additional demographic information available upon request.

Data Source: Diabetes Prevention Recognition Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024). MDPP Participant n = 7,203.

^a Among the FFS Part B Medicare enrollees, 55% are female, almost 47% are between 65 and 74 years, and 73% are enrolled in Part D.

MDPP beneficiaries who participate predominately virtually are more likely to be under the age of 65 (10.1% vs. 7.1%) (**Appendix E, Table E-3**). Among MDPP beneficiaries who do not complete the program, compared with all MDPP beneficiaries, a higher proportion of beneficiaries are under the age of 65 (11.3% vs. 5.6%), and a lower percentage have at least some college education (41.6% vs. 65.5%).

The high proportion of females in the MDPP is similar to the proportion in the National DPP.⁸ In the National DPP, 80% of participants are female and 24% are older than 65 years of age.

MDPP Delivery Mode

Overall, 59% of MDPP beneficiaries predominantly attended the program in person (> 75% of sessions), 7.5% of MDPP beneficiaries attended the program through a mix of in-person and virtual sessions, and 33.5% predominantly attended the program virtually.

Most of the MDPP beneficiaries we interviewed, however, participated in virtual delivery of the MDPP using platforms like Zoom or Webex. Only a small number of beneficiaries, regardless of program delivery, were given a choice of how to engage in the program. A few beneficiaries had a mixed hybrid option, enabling them to participate either in person at a nearby location or through an online platform. Among those who participated virtually or had the hybrid option, most expressed their satisfaction with these choices, citing the flexibility the choices provided when faced with challenges such as inclement weather or travel restrictions that made in-person participation difficult.

However, the few MDPP beneficiaries who followed the hybrid approach mentioned that, although they appreciated the flexibility of having a virtual option, they preferred attending the sessions in person because of the significant impact of face-to-face interactions. One beneficiary shared their experience of starting the MDPP in winter and being reluctant to drive in the dark or during poor weather conditions. As a result, they used Webex as an alternative. However, they missed the sense of camaraderie and connection that was present in the small in-person group. Another beneficiary said they preferred in-person sessions because “people cannot hide behind the computer” when meeting in-person.



[The lifestyle coach] was pretty good at getting people to talk ... but sometimes it took a little bit of time. People are reticent to start. – MDPP Beneficiary

Finally, some beneficiaries found it took some time to establish a strong group connection and maintain engagement through virtual participation. Some focus groups noted that the absence of visible participants (because of cameras being turned off) hindered interaction and active engagement among some participants, and visual aids such as serving sizes were harder to comprehend. Notably, some beneficiaries stressed the important role coaches played in the virtual setting, specifically in creating an atmosphere, and noted the importance of having coaches who were trained and effective in facilitating discussion.

Beneficiary Attendance

Attendance is a critical component of the MDPP. A beneficiary who actively attends the program without excessive absences is more likely to succeed in the program; thus, attendance is an important measure of potential success.

On average, MDPP beneficiaries attended 18 sessions (**Table 3-4**), which means the average MDPP beneficiary completed at least the core phase of the program, which is 16 sessions, and continued into the monthly maintenance phase of the program. The average number of sessions attended also includes some beneficiaries who have recently enrolled in the program and are only partway through the 22-session curriculum. We also examined the average number of sessions attended by delivery mode. Beneficiaries who attended a mix of in-person and virtual sessions on average completed the most sessions. This is likely because of the flexibility of having both types of delivery mode available. MDPP beneficiaries who attended the program predominately in person attended slightly fewer sessions on average, but this includes beneficiaries who had their in-person sessions disrupted (and possibly not resumed) because of the COVID-19 PHE. Full results are in **Appendix E, Table E-4**.

Overall, the average number of days enrolled in MDPP is 242, approximately 8 months. On average, FFS beneficiaries are enrolled longer and attend more sessions than MA beneficiaries (269 days and 19 sessions vs. 214 days and 16 sessions).

Table 3-4. Average Number of Sessions and Days Enrolled

Subgroup	Number (n)	Days Enrolled	Sessions Attended
All Beneficiaries	7,203	242	18
Fee-for-Service (FFS)	3,659	269	19
Medicare Advantage (MA)	3,544	214	16
Session Delivery Mode			
In person	4,245	217	16
Mixed	537	365	24
Virtual	2,421	258	19
Completion Status			
Completer	3,568	377	25
Noncompleter	2,250	109	10

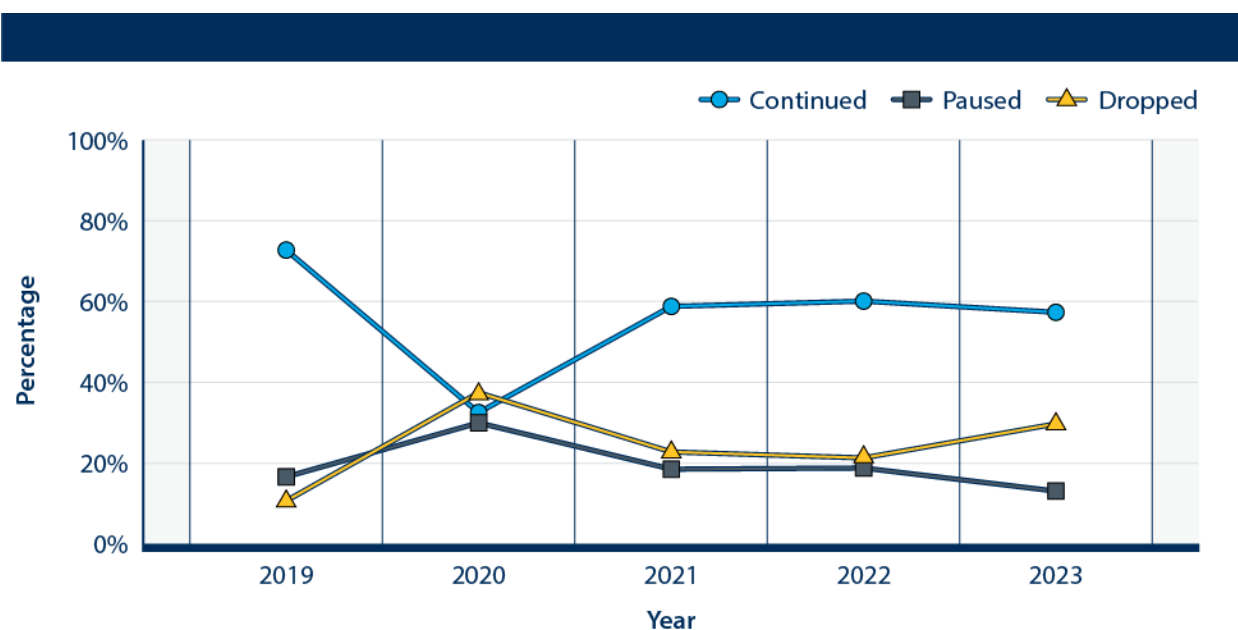
Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months or more after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date.

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

Given the differences in average number of sessions attended by delivery mode, we also examined the percentage of participants who paused, dropped out, or continued the program during each calendar year. Paused participants were defined as MDPP beneficiaries who had a

pause of greater than 30 days before continuing sessions; those that dropped out were defined as having a pause of greater than 30 days and not returning to sessions in that calendar year. MDPP beneficiaries who continued did not have a pause of greater than 30 days during the calendar year. Overall, the percentage of MDPP beneficiaries who continuously attended sessions was around 60% from 2021 through 2023 (**Figure 3-2**). The percentage continuing was highest pre-COVID-19 PHE in 2019, at 73%. The percentage of MDPP beneficiaries pausing between sessions was highest in 2020 and overall similar before and after 2020. The percentage of MDPP beneficiaries who dropped out was highest in 2020 (38%), and although that rate has stayed between 22% and 30% since 2020, the percentage is still higher than pre-COVID-19 PHE rates of 11%.

Figure 3-2. Percentage of Beneficiaries Continuing, Pausing, or Discontinuing the Program by Year



Data Source: Diabetes Prevention Reporting Program (DPRP) and Medicare Diabetes Prevention Program (MDPP) Crosswalk Data (April 2018–March 2024).

Attendance Facilitators

All the MDPP beneficiaries interviewed as part of the focus groups were either currently enrolled in the program or had successfully completed it. Several groups highlighted factors that encouraged their attendance. A strong connection to other MDPP beneficiaries while in the program helped encourage attendance and completion of program requirements outside of attending the sessions. Almost all groups noted how much they valued the accountability and support that came from connecting with other beneficiaries in their respective programs. Many groups shared how much they enjoyed getting to know other beneficiaries and how having others along the same journey kept them more adherent to their goals and made them more likely to attend MDPP sessions. A few groups discussed field trips they went on together or other ways they stayed connected between sessions, such as group texting.



The group of people that I was with, we opened up more and started sharing different ideas and things that went well and things that didn't. And it was an overall positive experience that kept me going because we were checking in weekly. – MDPP Beneficiary

Beneficiary Retention

Among MDPP beneficiaries enrolled for at least 9 months, 93% attended at least four sessions and 84% attended nine or more sessions (**Table 3-5**). In addition, 61% of MDPP beneficiaries who had been enrolled completed the program, defined as attending at least eight sessions in the first 6 months and then attending an additional session after 6 months. More FFS MDPP beneficiaries than MA MDPP beneficiaries completed the program (70% vs. 53%).

We also examined the number of sessions attended by delivery mode. Of those who attended a mix of in-person and virtual sessions, 66% attended all 22 sessions and 86% attended at least 16 sessions. Among those that primarily attended in person, just 39% completed all 22 sessions and 62% completed at least 16 sessions; however, this is likely because of those that did not complete the program during the COVID-19 PHE. The percentages are higher for those that attended primary virtually: 58% completed at least 22 sessions and 79% completed at least 16 sessions.

Results are similar between MDPP beneficiary retention rates and the National DPP for those 65 years of age and older.⁹ For example, at 18 weeks, 77% of MDPP beneficiaries were still enrolled in the program, as were 68% of the National DPP sample 65 years of age and older.

Table 3-5. Retention at Session Benchmarks

Session	MDPP Beneficiaries Enrolled at Least 9 Months (%) (n = 5,818)	In Person (%) (n = 3,469)	Mixed (%) (n = 524)	Virtual (%) (n = 1,825)
Attended at least 4 sessions	92.7	90.8	97.1	95.2
Attended at least 9 sessions	83.7	79.7	94.1	88.2
Attended at least 16 sessions	69.5	62.2	85.9	78.5
Attended at least 22 sessions	47.6	39.2	66.0	58.3

Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months or more after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date.

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

Retention Facilitators

Having a weekly structured program fostered accountability and promoted peer support. Several focus groups noted that they liked the consistency and structure of the weekly meetings, as it helped them stay on track and actively engage with the program. Some groups also noted that

the different topics each week contributed to maintaining their interest and enthusiasm. One beneficiary noted that once the program shifted to monthly, the drop-off within their group was quite substantial. In addition, several groups expressed a desire for more ongoing connection and support, even after completing the program. One beneficiary said that they have an alumni group that continues to meet monthly to go over their goals. The coach organizes the group, and alumni can drop in as needed. Another beneficiary said that their coach continues to send monthly updates and recipes, which the beneficiary greatly appreciated, as it met their want for ongoing support beyond program completion.

Seeing tangible outcomes also contributed to beneficiaries' motivation to stay with the program. Groups reported that seeing progress in weight change early on or progress in other measures, such as reductions in their A1c levels, made a big difference in their experience and encouraged them to remain in the program. For example, one beneficiary noted that the reduction in weight and A1c was what she liked most about the program because she felt as if she actually achieved the goals she had set for herself. Most beneficiaries who reported seeing positive changes and satisfaction with the program referenced weight loss as the key tangible outcome they experienced.



Well, very exciting, when I first started the program, after about, I don't know, 4 or 5 months, I was in my closet trying to decide what I was going to wear. And every pair of pants I put on was too big and I had to chuck them. I go like, "Oh wow, this is fun." – MDPP Beneficiary

Using multivariate regression, we examined the relationship between retention and an array of demographic and community characteristics, including weight loss at Session 3, as early results could be a predictor of session attendance. We found that MDPP beneficiaries that had experienced weight loss at Session 3 were significantly more likely to complete the program (**Appendix E, Tables E-6 to E-8**).

Beneficiary Experience in MDPP

Experience in MDPP is an important aspect of overall program engagement and satisfaction and can help facilitate attendance and retention outcomes. All beneficiaries we interviewed reported being satisfied with the MDPP and thought the program was simple to follow. Some discussed how the program exceeded their expectations and stated they would recommend the program to a friend. Beneficiaries within several small focus groups cited the group dynamics, the MDPP content, and lifestyle coaches as some of the factors that contributed to their positive experience.

MDPP Group Dynamic

The facilitated group sessions created a dynamic that allowed people to share ideas, be supportive, and learn from each other. The groups' overall dynamics and chance for interaction

between beneficiaries was highly regarded. In their descriptions of the MDPP, focus group participants emphasized the appeal of the group-based structure of the program and how it facilitated a sense of community. They described feeling connected with other beneficiaries in the program and liked learning from them and hearing their successes and failures. For example, they noted that they faced the same kinds of challenges with navigating healthy food choices at family events or sport events. Being in a group of peers facilitated the sharing of new ideas on how to track food or new exercises. They often shared successes and failures with their class members and felt that they were not alone in their struggles.



One thing I appreciated is in the discussions, people were honest. So, they shared what their circles were, but they also had good ideas about some food items that they found helpful. So, I then found that helpful, and so then I'd start getting ideas of things I could use with my own diet that worked for me. So that was extremely helpful. – MDPP Beneficiary

MDPP Content

The MDPP's focus on making realistic lifestyle changes contributed to an overall positive experience for beneficiaries. Several groups noted that they liked the program's dual focus on making both diet and exercise lifestyle changes because it provided a holistic approach to decreasing their risk for diabetes onset. They emphasized that they liked that the curriculum focused on teaching them how to make informed choices and finding practical ways to incorporate positive health behaviors, rather than relying on a “magic bullet” solution. Some groups discussed how they had tried other weight management and exercise programs and found that MDPP's topics and guidance transcended beyond just eating well and being physically active. The program gave them realistic strategies and actionable steps to integrate positive health behavior patterns into their lifestyle. This comprehensive approach resonated with several focus groups, as it acknowledged the complexities and challenges of making sustainable lifestyle changes. For example, some groups mentioned the use of tools like MyPlate, a simple way to ensure a balanced intake of different food groups that could be used in any situation.



That tool let me construct that mix of the three that constituted a balanced intake. So that the sugar didn't take off and spike. So, you know, you can eat all your fats in the morning and proteins in the afternoon and whatever is in the evening. But that would not be the strategy to be executed. The plate method with three parts let you execute that strategy. – MDPP Beneficiary

Tracking food and keeping up with physical activity were noted as the most challenging parts of the program, but having other group members and regular meetings brought accountability that many beneficiaries appreciated. Food journals and formal weigh-ins were difficult but kept beneficiaries on track. Some beneficiaries noted that having a formal place and structure to discuss healthy living and food choices was especially valuable to their learning and fostered

accountability. Some groups said they liked bringing all their questions to one person (i.e., the lifestyle coach) and especially liked learning about the role of good fats in diabetes prevention.

MDPP Lifestyle Change Coaches

Beneficiaries reported that having an enthusiastic, supportive, and nonjudgmental coach kept them motivated, helped them set realistic goals, and was a key factor in their success and positive experience with the MDPP. Most groups spoke about how their coaches exhibited accommodating behavior, tailoring advice and feedback to meet their specific needs, and advocated for their health without criticism or shame. Some groups specifically mentioned the welcoming and warm nature of the coaches, who openly shared their own experiences and formed connections with program participants. One group cited a coach who openly shared her struggles with weight, which helped establish relatability within their group. Beneficiaries also shared specific instances where their coaches used various techniques to enhance their learning. These techniques included demonstrations on measuring portion sizes, showcasing exercises suitable for individuals of all ages and abilities, and using props such as a 5-pound block of fat to visually represent the experience of losing that amount of weight. Coaches also proactively shared healthy food options, provided recipes, recommended relevant apps, and introduced other online tools to support the beneficiaries' progress.



[The lifestyle coach]'s everything. She's a guide. If you go to a wedding, she says enjoy yourself and have the cake. I'm halfway to my goal. I was so afraid of failing I didn't involve my family except my husband. But now, I will shout from rooftops.
– **MDPP Beneficiary**

Summary

As of April 2024, a total of 9,015 beneficiaries participated in MDPP, much lower than anticipated. Among those that enrolled, half were referred by their primary care physician or a specialist. Most beneficiaries are female and 65 to 74 years of age. On average, beneficiaries attended 18 sessions. About 60% predominantly attended the program in person, whereas about a third predominantly attended the program virtually. Reported beneficiary experience is positive. For example, beneficiaries within several small focus groups cited the group dynamics, the MDPP content, and lifestyle coaches as some of the factors that contributed to their positive experience.

Chapter 4: Weight Loss and Physical Activity Among MDPP Beneficiaries



MDPP goals include weight loss
and other positive lifestyle changes



Weight Loss and Physical Activity Among MDPP Beneficiaries

The next step of the program focuses on shorter-term outcomes that can lead to longer-term effects on overall health. Research has shown that participating in the National DPP leads to weight loss, which ultimately results in reduced risk of diabetes onset.² Successful MDPP participation can lead to weight loss, improved dietary changes, and increased levels of physical activity.

Reductions in weight, for example, can lead to reduced diabetes incidence and lower health care spending and use.

Weight Change

As of April 2024, 6,954 MDPP beneficiaries had attended at least two sessions and had weight loss data. The average weight loss was **4.9% of starting body weight (Table 4-1)**. Overall, MDPP weight loss is higher than that reported for the overall National DPP,⁸ in which average weight loss was 4.1% of starting weight among those ages 65 and older.

Among beneficiaries enrolled in Medicare FFS, average weight loss was 5.3%, compared with 4.5% among beneficiaries enrolled in MA plans. Some of this difference in recorded weight loss probably can be attributed to the number of sessions attended, as MA beneficiaries attended fewer sessions on average (17 sessions vs. 20 sessions).

Among those that attend their sessions primarily in person, the average weight loss was 4.6%, compared with an average weight loss of 5.3% among those that attend sessions virtually. Beneficiaries that completed the program lost an average of 6.6% of their starting weight, whereas “noncompleters” (those that attended less than 8 sessions) had a recorded weight loss of only 2.9%. On average, male beneficiaries lost a higher percentage of their weight than female beneficiaries (5.3% vs. 4.8%). In addition, weight loss was higher among beneficiaries who were referred from a health care provider than those who were referred to the MDPP from other sources (5.3% vs. 4.6%) (**Appendix F, Table F-1**).



Key Takeaways

- Average weight loss for MDPP beneficiaries was 4.9% of starting body weight.
- Weight loss is highly correlated with the number of sessions attended.
- More than half of beneficiaries achieved 5% weight loss, and one-quarter achieved 9% weight loss.
- Among beneficiaries who achieved at least 5% weight loss and stayed in the program, 80% maintained or lost more by the end of the program.
 - Beneficiaries highlighted positive outcomes of the program, such as improved nutrition, increased physical activity, and health-related outcomes such as reductions in weight or A1c levels.

Table 4-1. Weight Change Among MDPP Beneficiaries

Subgroup	Number	Average Weight Change (lb.)	Average Weight Change (%)	Sessions Attended
All Beneficiaries	6,954	-10	-4.9	18
Fee-for-Service (FFS)	3,585	-11	-5.3	20
Medicare Advantage (MA)	3,369	-9	-4.5	17
Session Delivery Mode				
In person	4,047	-9	-4.6	17
Mixed	536	-13	-6.2	24
Virtual	2,371	-11	-5.3	20
Completion Status				
Completer	3,568	-14	-6.6	25
Noncompleter	2,064	-6	-2.9	11

Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months or more after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date.

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

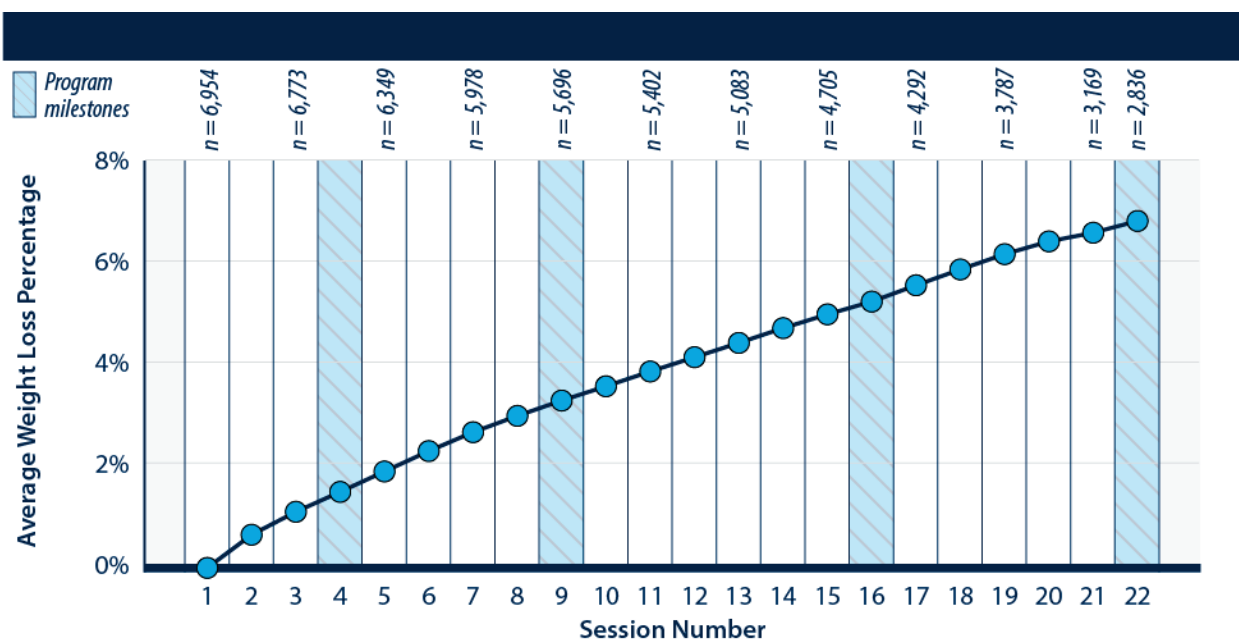
We also compared MDPP results to those of the YMCA of the USA (Y-USA) DPP, which received a Health Care Innovation Award to implement its program specifically for Medicare beneficiaries across 17 YMCA sites.¹⁰ When we applied the same inclusion criteria for the Y-USA analyses to MDPP beneficiaries, the average weight loss was 4.1% in the MDPP sample, compared with 4.6% in the Y-USA DPP sample. The starting weight was slightly higher among MDPP beneficiaries than Y-USA DPP beneficiaries.

During the small group interviews, nearly all beneficiaries shared successful weight loss experiences with the MDPP, although some beneficiaries acknowledged the ongoing challenge of maintaining weight loss after the end of the program.

Weight Loss by Number of Sessions Attended

Overall, weight loss is strongly correlated with session attendance. In **Figure 4-1**, we present average weight loss at key attendance benchmarks for MDPP performance payments (four and nine sessions attended), at the end of the core sessions (Session 16), and at the end of the program (Session 22). By Session 4, average weight loss was 1.5%; by Session 9, average weight loss was 3.4%; and by Session 16, average weight loss was 5.2%.

The nearly linear relationship between session attendance and weight loss suggests that those attending more sessions lost more weight on average, although this relationship could also reflect that beneficiaries who are more successful in losing weight remain in the program.

Figure 4-1. Weight Change by Number of Sessions Attended

Data Source: Diabetes Prevention Reporting Program (DPRP) and Medicare Diabetes Prevention Program (MDPP) Crosswalk Data (April 2018–March 2024).

Using multivariate regression, we further examined the relationship between weight change and session attendance. Overall, men lost significantly more weight than women, and those with some college education lost significantly more weight than those with no college education.

Achievement of Weight Loss Goals

The MDPP includes additional performance payments to suppliers for at least 5% or 9% weight loss overall. Over the first 6 years of the program, more than half of beneficiaries (52.5%) achieved at least 5% weight loss, and 24.2% of beneficiaries achieved at least 9% weight loss. The percentage of MDPP beneficiaries achieving the 5% weight loss goal was higher than a similar sample of beneficiaries 65 years of age and older from the National DPP,⁸ where less than half achieved 5% weight loss (43%).

Overall, the percentage of beneficiaries who achieved at least 5% weight loss was higher among those who enrolled in the MDPP from a physician referral (56%) than those enrolling from other sources (49%) (**Table 4-2**). In addition, more than half of the beneficiaries who attended MDPP virtually achieved 5% weight loss (56%), compared with a little less than half of beneficiaries who attended MDPP primarily in person. As expected, beneficiaries who attended more sessions or stayed in the program longer were more likely to achieve 5% and 9% weight loss during the program (**Figure 4-2**) (**Appendix F, Table F-2**).

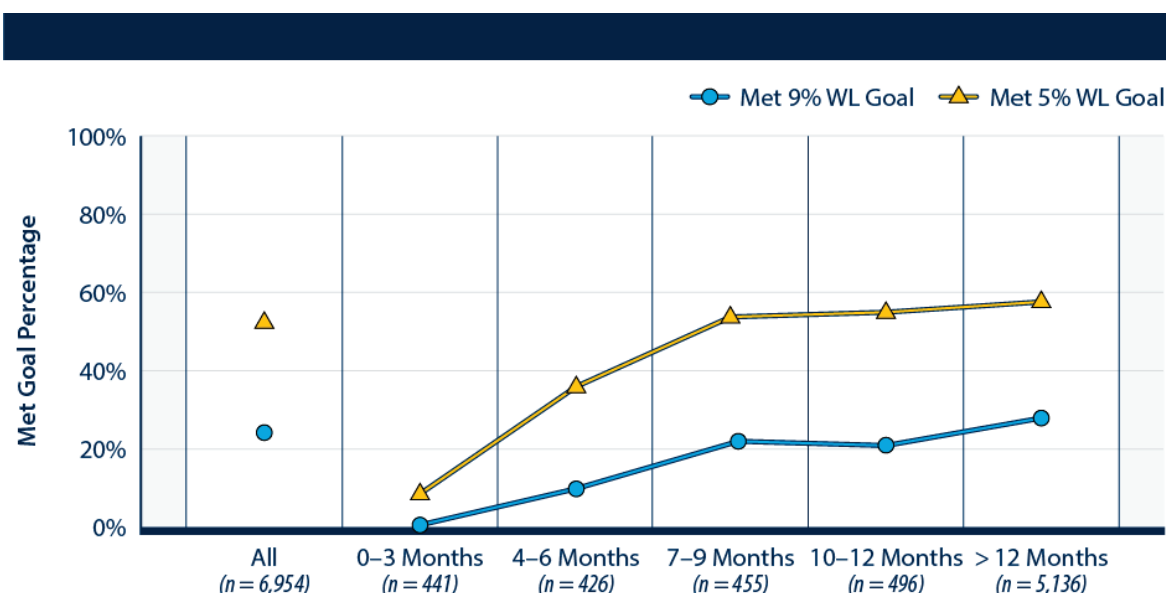
According to claims submitted, only 39% of FFS beneficiaries had an MDPP claim for 5% weight loss. As noted, however, not all MDPP suppliers submit claims for all eligible beneficiaries. Therefore, claims data likely underestimate the number of MDPP FFS beneficiaries meeting weight loss goals.

Table 4-2. Percentage of Beneficiaries Achieving Weight Loss Goals

Subgroup	Number	Met 5% Weight Loss Goal (%)	Met 9% Weight Loss Goal (%)
All Beneficiaries	6,954	52.5	24.2
Fee-for-Service (FFS)	3,585	57.5	27.2
Medicare Advantage (MA)	3,369	47.2	21.0
Session Delivery Mode			
In person	4,047	48.4	21.7
Mixed	536	69.4	35.8
Virtual	2,371	55.6	25.7
Session Count			
≥ 4	6,564	55.5	25.5
≥ 9	5,696	62.4	29.3
≥ 16	4,510	69.9	34.4
≥ 22	2,836	76.8	41.5
Enrollment Source			
Enrollment from physician	3,509	56.0	26.6
All other enrollment sources	3,445	48.9	21.7
Sex			
Female	5,265	51.2	23.2
Male	1,631	56.8	27.2

Sample size for nonreported sex is too small to accurately present weight loss (n = 58).

Data Source: Diabetes Prevention Reporting Program (DPRP) and MDPP Crosswalk Data (April 2018–March 2024).

Figure 4-2. Percentage of Beneficiaries Achieving Weight Loss (WL) Goals (5% and 9%)

Data Source: Diabetes Prevention Reporting Program (DPRP) and Medicare Diabetes Prevention Program (MDPP) Crosswalk Data (April 2018–March 2024).

Sustainability of Weight Loss

An additional metric of success of the program is not only achieving 5% weight loss but also sustaining the weight loss throughout the program. Among MDPP beneficiaries who lost at least 5% of their starting weight and continued with the program, most (80%) maintained at least 5% weight loss or lost additional weight, according to their final measured weight. An additional 12% of MDPP beneficiaries who had achieved at least 5% weight loss during the program ended the program with between 3% and 5% weight loss, and 1% of those that had initially lost at least 5% of their starting weight ended the program having gained weight. The percentage of MDPP beneficiaries maintaining at least 5% weight loss or losing additional weight was similar across delivery modes.

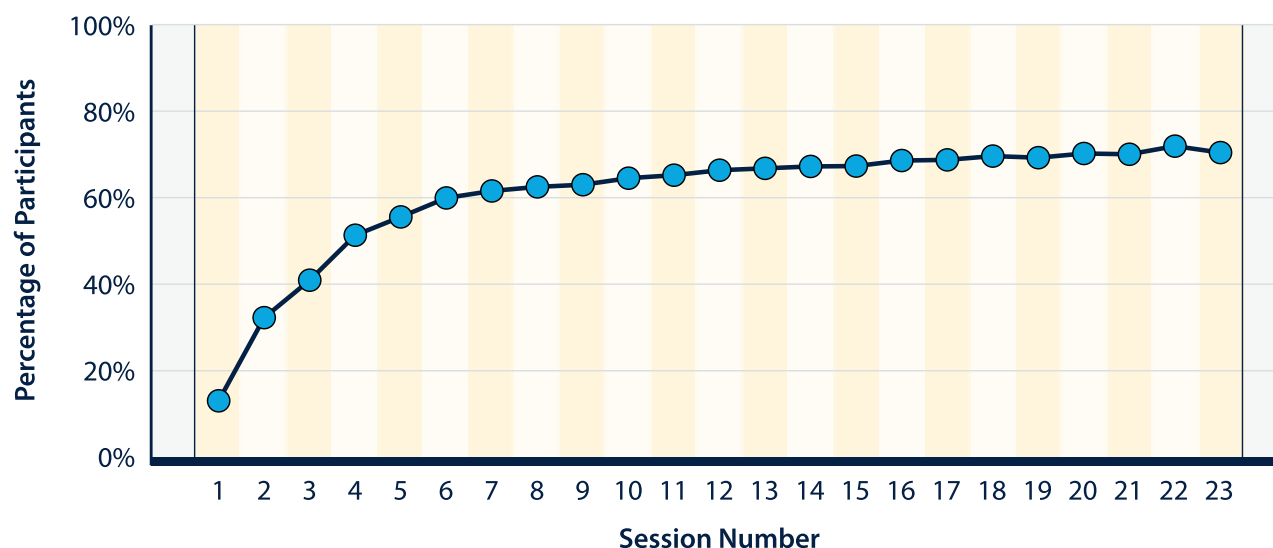


[I] lost 52 pounds ... And I [typically] didn't lose weight ... but then I really started to think about the program. ... I think now this is something I really need to do. It just kind of clicked after a while, the things we had talked about in the program.
– MDPP Beneficiary

Meeting weight loss goals was a significant motivator and contributed to a positive experience with the MDPP. Beneficiaries attributed their success to the knowledge and strategies acquired throughout the program, such as the practice of tracking food in a log to monitor calorie intake. Additionally, after completing the program, some groups described adopting the habit of daily weight monitoring to support accountability for long-term, sustained results. Although most beneficiaries discussed their weight loss achievements in general, some beneficiaries shared specific weight change outcomes, ranging from 11 to 52 pounds lost. A couple of groups talked about the difficulty of maintaining weight loss after MDPP. One shared that she had to live with her mother for 4 months and reverted to eating a lot of carbohydrates (which is how she was raised), which contributed to regaining some weight. Another beneficiary had a history of doing dozens of rounds of Weight Watchers and regaining the weight after hitting goals and was worried the same thing would happen after MDPP.

Physical Activity

As part of the MDPP curriculum, lifestyle coaches work with beneficiaries to track how many physical activity minutes are completed each week of the program. Beneficiaries self-report these data each week. The CDC curriculum emphasizes recording physical activity minutes beginning in Session 5, and the program's goal is for beneficiaries to achieve at least 150 minutes of physical activity per week. At Session 1, 14% of beneficiaries met the physical activity goal of 150 minutes. The percentage of beneficiaries that reported that they met the physical activity goal rose to 60% by Session 6, 69% by Session 16, and 72% by Session 22 (**Figure 4-3**).

Figure 4-3. Percentage of Beneficiaries Meeting Physical Activity Goal

Data Source: Diabetes Prevention Reporting Program (DPRP) and Medicare Diabetes Prevention Program (MDPP) Crosswalk Data (April 2018– March 2024).

In focus groups, nearly all beneficiaries described successfully adopting positive changes in physical activity behavior, and many sustained newly formed habits after program completion. Nearly all focus groups described increased overall physical activity. This activity took many different forms, from participating in Silver Sneakers Live classes, to joining a gym and taking classes, to taking stairs more than elevators. A few beneficiaries said they integrated physical activity into their daily routine, taking walks with their spouse or dog or using a pedal machine. One beneficiary shared that he is now more cognizant of exercising in winter months.

Even beneficiaries who were active before participating in MDPP found new ways to exercise, either by trying new workouts or fitness classes or by making modifications to existing classes (e.g., water aerobics) to increase intensity. Another beneficiary started using a fitness app to reach weekly activity goals and monitor the intensity and duration of her workouts. Overall, beneficiaries said they enjoyed physical activity and being outside more since participating in the MDPP. Nearly half of the groups reported making a permanent change of exercising on a regular basis because of the habits established or knowledge gained from the MDPP. Beneficiaries also reported tracking physical activity.



I started using an app due to this program [MDPP] ... they encourage you to do so many hours of physical exercise during the week. I was very physical before, but now I'm much more mindful of my physical activity every day. I keep track of it, and I put my eye on it. – MDPP Beneficiary

Additional Short-Term Outcomes

MDPP beneficiaries report a myriad of other shorter-term benefits in addition to weight loss and increased physical activity, including improved behavioral and health outcomes.

Improved Diet and Nutrition

All MDPP beneficiary focus groups described improvements to their nutrition or diet caused by the program. Beneficiaries reported increasing consumption of vegetables, being cognizant of portion sizes, eating more fruits, purchasing healthier snacks, and eating fast food less often. Other dietary improvements included drinking more water, eating fewer eggs and less peanut butter (because of fat content), changing their relationship with sugar (i.e., switching to another brand of yogurt that has less sugar, being more cautious of artificial sweeteners, and watching for added sugars in beverages), following the plate method to ensure balanced meals, and reviewing a restaurant menu before eating out so they felt prepared to make healthy choices. Additionally, beneficiaries highlighted the plate theory as a valuable concept they learned, which involves dividing their plate to ensure appropriate portion sizes of different foods, enabling them to easily maintain a balanced meal. Beneficiaries said these changes often had a cascading effect of improving the nutrition of other family members in the same household.



I have a greater respect for portion control.
– MDPP Beneficiary

When discussing sustained changes related to dietary health that resulted from the MDPP, beneficiaries most often reported reading nutrition labels. Other commonly mentioned permanent changes were eating fewer snacks; no longer keeping “trigger” foods in the house, which can be difficult if you live with other people; and being aware of what they eat and the kinds of food they put into their bodies (e.g., reduced consumption of butter). Beneficiaries also talked about permanently committing to intermittent fasting, adopting a vegan diet, avoiding foods with added sugar, tracking food in a diary, reducing alcohol consumption (which had the added benefit of helping with weight loss), and changing their shopping habits to no longer purchase food they should not eat.

Nearly all beneficiaries talked about new health knowledge gained as a positive outcome of participating in the MDPP. Beneficiaries often talked about learning how you can lower your risk for diabetes, which empowered them to make behavior changes. They also described learning how sugar is processed by the body and what factors can affect blood sugar levels (e.g., certain foods, stress). They learned about how limiting consumption of fats—not just carbohydrates—

could help prevent the onset of diabetes. One beneficiary learned to shop around the perimeter of the store for fresh food while avoiding the center aisles, which tend to feature processed foods.

“ [I learned] that a lot of things affect the sugar levels in your blood. Exercise affects it and your mental outlook—if you’re high-stress, the sugar is higher in your bloodstream than if you are at low stress levels. There are a lot of things that affect your actual sugar levels, besides just candy.
– **MDPP Beneficiary**

Health-Related Outcomes

Beneficiaries attributed “non-scale victories” (i.e., health goals related to weight loss beyond a number on a scale) and other positive health outcomes to MDPP participation. About half of the groups described their satisfaction with non-scale victories. A few commented on the need to buy new clothes, and one person mentioned having to get their wedding ring resized because of the weight loss. One beneficiary talked about the thrill of keeping up with their family during a trip to Disney World; before participating in the MDPP, they would have needed to take frequent breaks from walking and avoid the stairs. Additionally, several groups described having excellent bloodwork. Some beneficiaries shared that other health measures, including body fat, cholesterol, and A1c levels, were lower upon completion of the MDPP. For instance, one beneficiary was able to reduce her A1c from 6.2 to 5.2 over the course of the program.

“ Six months after I started, I took a blood test and ... I dropped 80 points in 6 months on my cholesterol, and my A1c dropped back to normal.
– **MDPP Beneficiary**

Summary

In many cases, MDPP participation leads to improved shorter-term outcomes, including weight loss, improved dietary changes, and increased levels of physical activity. On average, MDPP beneficiaries lost 4.9% of starting body weight, and weight loss increased as beneficiaries attended more sessions, regardless of delivery mode. For example, beneficiaries that completed the program lost an average of 6.6% of their starting weight, whereas beneficiaries that did not complete the program lost an average of 2.9%. Among MDPP beneficiaries who lost at least 5% of their starting weight and continued with the program, more than 80% maintained or lost additional weight to finish MDPP with more than 5% weight loss. In addition, MDPP beneficiaries reported meeting physical activity goals of at least 150 minutes per week and improving their nutrition or diet because of the program, including increasing vegetable consumption, being cognizant of portion sizes, eating more fruit, and eating fast food less often.

Chapter 5: Characteristics and Diabetes Incidence Among FFS MDPP Beneficiaries



Long-term goals include reducing the likelihood or delaying the onset of diabetes and reducing health care use and spending



Characteristics and Diabetes Incidence Among FFS MDPP Beneficiaries

The goal of the MDPP is to help Medicare beneficiaries achieve weight loss and better health outcomes. The expectation is that, with better health, beneficiaries will need fewer expensive health care services, leading to reductions in Medicare spending. However, beneficiaries' self-selection into the program made it difficult to assess changes in service use and Medicare spending. Therefore, this analysis compared MDPP FFS beneficiaries to FFS beneficiaries who were eligible for the program but not enrolled to better understand how similar (or different) MDPP beneficiaries are to those who could have enrolled.

The selection bias introduced by deciding to participate in MDPP made it difficult to identify a credible comparison group (i.e., similar Medicare beneficiaries who did not participate in MDPP), and a good comparison group is needed to robustly estimate program impacts. An estimated 9.3 million FFS Medicare beneficiaries with prediabetes were potentially eligible for MDPP from 2018 through 2023, yet only a little more than 4,000 FFS beneficiaries enrolled in the program. This low uptake suggests that those that did enroll were probably not representative of the Medicare population with prediabetes. Enrollees were aware that they were at risk for developing diabetes, were aware of the program, were motivated to make major changes to their diet and lifestyle, and had the time and interest to participate in a year-long program. This motivation is not captured in medical claims data to support identification of an equally motivated comparison group. Moreover, MDPP beneficiaries are not supposed to have diabetes before entering the program. However, 15% had claims for diabetes in the 3 years before entering MDPP. The discrepancy between program requirements and the claims patterns of MDPP beneficiaries reinforced the concern that identifying an appropriate comparison group in claims data was not feasible.

Given these challenges, analyses were limited to a comparison of MDPP beneficiaries to others potentially eligible for the program. Sociodemographic, health, and health care use characteristics of 3,784 FFS MDPP beneficiaries were compared to 9,256,341 FFS beneficiaries who were potentially eligible (i.e., had a prediabetes claim but not diabetes claims)

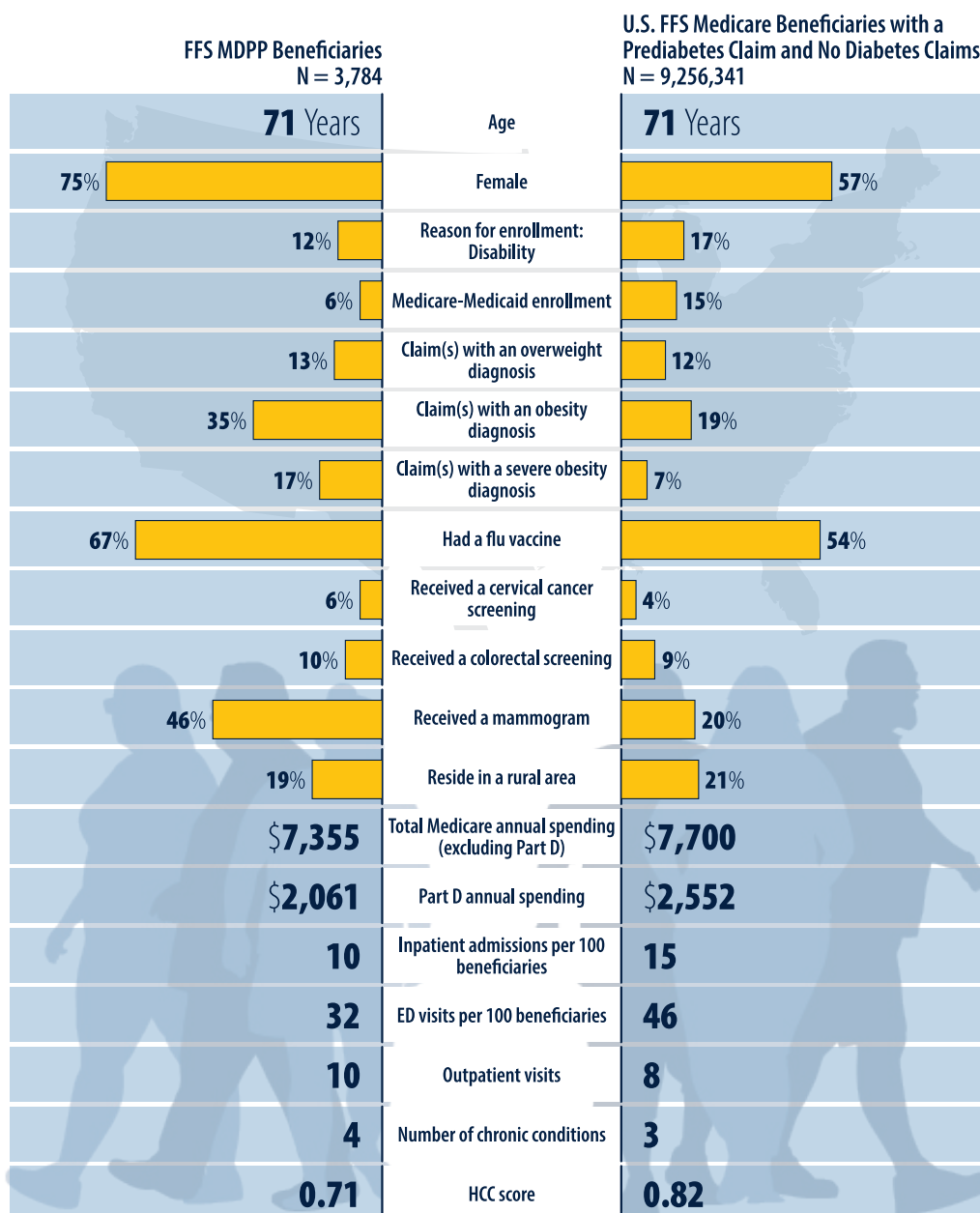


Key Takeaways

- FFS MDPP beneficiaries are more likely to be female; use less high-cost, acute medical care; use more preventive care; and have an indication of obesity or severe obesity.
- The study sample eligible for analyses of diabetes incidence is small, but among the sample, 15% progressed to diabetes, with 5.9% progressing each year to diabetes.
- Having claims for prediabetes, obesity or severe obesity, or hypertension before starting MDPP was associated with higher rates of diabetes incidence.
- Meeting the MDPP 5% weight loss goal was associated with lower incidence of diabetes.

but not enrolled.^b **Figure 5-1** summarizes the differences between the two groups, and **Appendix H, Use of Medicare FFS Claims**, describes the approach to identify the potentially eligible but not enrolled group.

Figure 5-1. Comparison of FFS MDPP Beneficiaries to FFS Medicare Beneficiaries with a Diagnosis of Prediabetes



ED = emergency department; FFS = fee-for-service; HCC = Hierarchical Condition Category

^b We do not restrict the possible comparators to those who live in geographic areas with a MDPP supplier because the MDPP now allows suppliers to deliver the curriculum virtually in a distance learning environment, so beneficiaries do not have to live near a MDPP supplier. New Medicare enrollees were excluded from both groups because they did not have the “pre-period” data needed to generate the profile presented here.

Relative to Medicare FFS beneficiaries that are eligible for the program:

MDPP beneficiaries are much more likely to be female. The high percentage of female enrollees in MDPP (75% MDPP vs. 57% potentially eligible) aligns with DPP participation more generally.^{8, 9}

MDPP beneficiaries use less high-cost acute medical care. MDPP beneficiaries have lower rates of inpatient admissions (10 admissions per 100 MDPP beneficiaries vs. 15 admissions per 100 potentially eligible beneficiaries) and emergency department visits (32 visits per 100 MDPP beneficiaries vs. 46 per 100 potentially eligible beneficiaries). However, they do have more outpatient visits (10 visits per year for MDPP beneficiaries vs. 8 visits per year for potentially eligible beneficiaries).

MDPP beneficiaries use more preventive care. More MDPP beneficiaries receive a flu vaccine and engage in cancer screenings such as cervical cancer screening, colonoscopy, and mammography.

MDPP beneficiaries are more likely to have obesity claims. More MDPP beneficiaries have claims indicating a diagnosis of obesity (35% among MDPP vs. 19% among the potentially eligible) or severe obesity (17% among MDPP vs. 7% among the potentially eligible).

As mentioned earlier, although MDPP beneficiaries are not supposed to have diabetes before entering the program, an estimated 15% do, according to claims data. These individuals are more likely to have claims indicating a diagnosis of being overweight, obese, or severely obese; have higher costs (i.e., mean annual total FFS costs of \$11,423 vs. \$6,602 mean annual costs among those without evidence of diabetes); and have higher rates of inpatient admissions, emergency department visits, and outpatient visits relative both to MDPP beneficiaries without evidence of diabetes claims before entering the program and to those potentially eligible but not enrolled.

Use of diabetes-related pharmaceuticals

Given the interest in the use of pharmaceuticals to manage prediabetes and diabetes, we also assessed diabetes-related drug use among the MDPP beneficiaries (see **Appendix H, Use of Medicare FFS Claims Data**, for more information on the diabetes drugs identified). We examined a collective group of diabetes-related drugs and examined metformin separately. Metformin was approved to treat diabetes but is also often used off-label by individuals with prediabetes to prevent or delay onset of diabetes.

Most of the study sample was enrolled in Part D. About 74% of the FFS MDPP beneficiaries were enrolled in Part D, which increased to about 80% for those that had diabetes claims before enrolling the program. An estimated 11% of FFS MDPP beneficiaries enrolled in Part D had a prescription for a diabetes-related drug in the year before entering MDPP, and the vast majority of these prescriptions were for metformin. The percentage was higher among the small sample of MDPP beneficiaries who also had diabetes claims before entering MDPP; 28% of these beneficiaries had a fill for metformin. Semaglutides (i.e., Ozempic and Rybelsus) are approved by Medicare to treat diabetes, and since their approval by the Food and Drug Administration in

2017, there has been a steady rise in use among Medicare beneficiaries. Among the FFS MDPP beneficiaries with Part D, there were almost no prescription fills for these drugs before the individual enrolled in MDPP; less than 1% of beneficiaries had a prescription fill. The low rate of semaglutide use is likely because these drugs were only coming to market at the same time MDPP was ramping up and because MDPP beneficiaries are not meant to have diabetes at the time of program enrollment and thus should not be eligible for these drugs.

Summary

MDPP uptake among Medicare FFS beneficiaries is quite low, and understanding the characteristics of those who did participate versus those who did not may help MDPP suppliers and their clinical partners recruit those who may be more likely to participate. Compared with FFS Medicare beneficiaries who were potentially eligible for MDPP but did not enroll, FFS MDPP beneficiaries are more likely to be female; use less high-cost, acute medical care; use more preventive care; and have an indication of obesity or severe obesity.

Notably, participants' claims data do not perfectly align with program requirements. Although participants are not supposed to have diabetes, 15% do have claims with diabetes diagnoses before entering the program. Because of diagnostic coding errors in claims data, it is possible that not all MDPP participants with an indication of diabetes before entering the program have diabetes. However, these individuals are quite different; they have higher FFS Medicare spending and use more high-cost services. Their success in the program may reasonably differ from those without diabetes claims.

Some FFS MDPP beneficiaries with Part D drug coverage did use diabetes-related drugs, mostly metformin. As noted previously, by virtue of participating in the program, MDPP beneficiaries have signaled a desire to act upon their health, and beneficiaries may take whatever means are available to them—pharmaceutical, clinical, or lifestyle change—to improve their health.

Diabetes Incidence Among FFS MDPP Beneficiaries

The MDPP pathway to better health assumes that weight loss will lead to absolute reductions in diabetes incidence, which, in the long run, may reduce the incidence of diabetes-related complications. We conducted descriptive analyses of 2,163 FFS MDPP beneficiaries without evidence of diabetes claims before entering MDPP to determine the percentage that go on to have diabetes claims (which is one indicator of potentially developing diabetes) after participating in MDPP. As discussed at the beginning of the chapter, we were unable to select a claims-based comparison group for the MDPP sample because of concerns about the differences inherent in those who were aware of, and chose to participate in, the program. As such, the analyses presented here are descriptive only and meant to inform policy makers of the experience of those who have participated in the program to date.

Notably, there are limitations to using claims data to infer onset of disease, and medical records or registry data generally perform better than billing data for assessing prevalent and incident cases of disease.¹¹ The claims-based algorithm for identifying beneficiaries with diabetes does

not have perfect specificity and sensitivity; it misses some people who truly have diabetes and falsely identifies some people who do not have diabetes. Because accurate diagnosis codes are not required in most cases for payment of a claim, using claims alone introduces errors in reliable detection of the presence of a condition; therefore, the estimates presented here should be interpreted with caution. An overview of the analytic methods used to estimate diabetes incidence can be found in **Appendix H, Use of Medicare FFS Claims**.

Diabetes Incidence

Among the study sample, 15% of beneficiaries progressed to diabetes; 322 beneficiaries out of 2,163 went on to have Medicare FFS claims where a diabetes diagnosis was recorded. This estimate translates into an annual progression rate of 5.9 cases per 100 person-years, meaning 5.9% of MDPP beneficiaries progress to diabetes each year after participating in MDPP.^c

In a regression model, several factors were associated with a higher rate of diabetes incidence. The rate increased by 31% if a beneficiary had at least one claim with a diagnosis of prediabetes before starting MDPP (hazard ratio: 1.31 [90% confidence interval, CI: 1.03–1.67]). The rate increased by 30% and 42% if a beneficiary had at least one claim with a diagnosis of obesity or severe obesity, respectively, before starting the program (obesity hazard ratio: 1.30 [90% CI: 1.02–1.66]; severe obesity hazard ratio: 1.42 [90% CI: 1.08–1.87]). Furthermore, the rate increased by 37% if a beneficiary had at least one claim with a diagnosis of hypertension before starting MDPP (hazard ratio: 1.37 [90% CI: 1.07–1.75]).

To examine the relationship between MDPP program engagement (e.g., completed the program, attended most MDPP sessions) and meeting weight loss goals and incidence of diabetes, we conducted subgroup analyses. The sample size for these analyses was relatively small (1,957 MDPP beneficiaries), and most findings were not statistically significant in regression models (see **Appendix G: Chapter 5 Supplemental Analysis**). However, among MDPP beneficiaries who met the 5% weight loss goal ($n = 1,228$), 13% progressed to diabetes, compared with 18% among those who did not meet the 5% weight loss goal. This difference translated into a decrease in the rate of diabetes incidence of 36% (hazard ratio: 0.64 [90% CI: 0.52–0.79]).

Summary

Among the MDPP FFS beneficiaries, the diabetes incidence rate was 5.9 cases of new diabetes per 100 person-years. This finding is a little higher than expected from other published studies. In the original randomized trial of the DPP, the group that participated in the DPP diet and exercise program had an incidence of diabetes of 4.8 cases per 100 person-years, whereas in the control (placebo) group, the incidence of diabetes was 11.0 case per 100 person-years,²

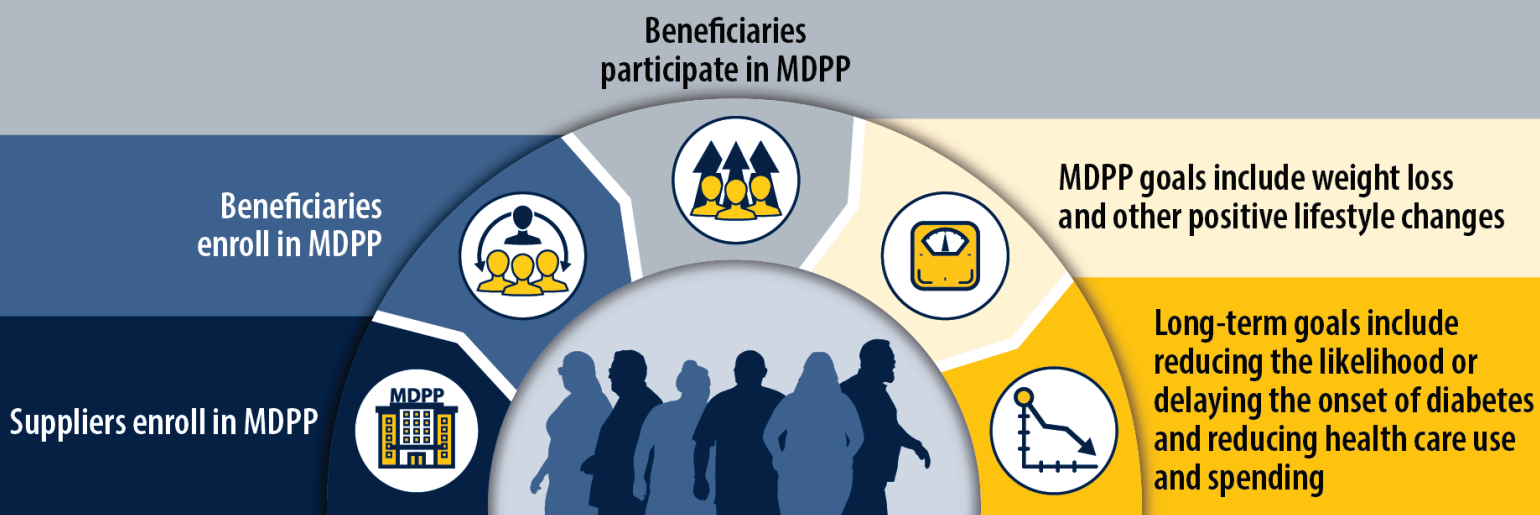
^c The annual progression rate is a standard presentation of diabetes incidence (see Koyama et al., 2022, or Knowler and the Diabetes Prevention Program Research Group, 2002, for examples). The APR is calculated as the number of new diabetes cases divided by the total number of person-years included in the follow-up period. The number of person-years in the follow-up period is the sum of all beneficiaries' person-years in that period. For example, one beneficiary may have been followed for 3 years and contributes 3 person-years, whereas another was followed for 2.3 years and contributes 2.3 person-years. The MDPP APR is $(322/5,483 \text{ person years in the follow-up period}) * 100 = 5.9$.

though the mean age (around 50 years) was much lower than in this sample. After 10 years of follow-up, the incidence rate of diabetes for the lifestyle intervention grew to 5.9 cases per 100 person-years.¹² The incidence rate of diabetes for older adults with prediabetes was more recently estimated as 5.3 cases per 100 person-years in a longitudinal electronic health record study.¹³ Other studies have found that progression to normal glycemic control or death is more common than progression to diabetes among older adults with prediabetes.^{14; 15}

As discussed at the beginning of the chapter, motivation to participate in the program introduces bias into this sample, and this same motivation may drive beneficiaries to seek out more-regular testing for diabetes. More testing can lead to more-frequent detection. Thus, the results presented here must be interpreted in light of this possibility. Moreover, rates of progression to diabetes were higher among FFS MDPP beneficiaries with a pre-MDPP claims pattern indicative of elevated health needs (i.e., having had claims with diagnoses for prediabetes, obesity, and hypertension) compared with participating FFS MDPP beneficiaries without those health-related claims. These beneficiaries with a claims history suggesting comorbidities may be even more attuned to their health conditions, and knowledge of their conditions coupled with a predisposition to improve their health by participating in the program may also prompt them to seek out diabetes-related testing after MDPP participation. Indeed, among the 4,029 FFS MDPP beneficiaries in the claims analyses, a beneficiary had on average four diabetes tests per year after enrolling in MDPP,^d suggesting that MDPP beneficiaries engage in opportunities for diabetes detection. This finding was reinforced by focus groups of MDPP beneficiaries conducted in 2023. Several groups noted that having good bloodwork, such as lower cholesterol and hemoglobin A1c levels, was a personal victory, so beneficiaries were engaging with their health care providers to check for progress.

^d Diabetes-related testing was defined as having had FFS claims for hemoglobin A1c tests (Current Procedural Terminology [CPT] 83036), results of A1c tests (CPT 3044F, 3046F, 3051F, 3052F, and 3045F), blood panel tests (CPT 80047, 80048, 80053, 80069), and glucose tests (CPT 82947, 82950, or 82951).

Chapter 6: Summary and Discussion





Summary and Discussion

Since the launch of the MDPP in 2018, the number of suppliers enrolled in the program has steadily increased to 414 (April 2024). Of the suppliers approved to offer MDPP services, 357 (86%) have enrolled at least one Medicare beneficiary in the program. The MDPP introduced a new class of providers to Medicare, which expanded the delivery of diabetes prevention services into both clinical and nonclinical community settings. This, in turn, has extended beneficiary access to these services. MDPP suppliers include health care providers and systems as well as community-based organizations, YMCAs, and local health departments. Although MDPP will continue to allow virtual delivery of the program, to date, most beneficiaries participate through a local MDPP supplier. Most beneficiaries currently do not travel far to access their local MDPP supplier, and some areas of the country still lack MDPP suppliers.

Less than 10,000 beneficiaries have participated in MDPP in total. Although enrollment numbers have rebounded since 2020, the COVID-19 PHE disrupted enrollment into the predominantly in-person program, and overall, enrollment has remained lower than anticipated. Once MDPP beneficiaries are referred to and do enroll in the program, however, attendance is high. For example, on average, MDPP beneficiaries attend 18 sessions. Delivery modes for the program have shifted as result of the PHE, however, with more beneficiaries participating through virtual delivery options. The delivery mode does not affect program attendance.

Successful MDPP participation leads to improved shorter-term outcomes, including weight loss, improved dietary changes, and increased levels of physical activity. Overall, on average, MDPP beneficiaries lost almost 5% of their starting body weight, and weight loss increases as beneficiaries stay in the program longer. Once MDPP beneficiaries lose initial weight, they tend to maintain it throughout the program. Research has shown that participating in the National DPP leads to weight loss, which ultimately results in reduced risk of diabetes onset.² **Table 6-1** provides a snapshot of key metrics at different times since the program began.

Table 6-1. Cumulative Findings on Key Variables Across the MDPP Beneficiary Journey

 Variable	 First Evaluation Report	 Second Evaluation Report	 Final Evaluation Report
 Data timeline	December 2019	December 2021	April 2024
 Enrolled suppliers	196	305	414
 Total beneficiaries	2,248	4,848	9,015
 Sessions attended (average)	15.0	17.0	17.6
 Weight loss (average)	5.1%	5.1%	4.9%
 Diabetes onset	Insufficient sample size	Insufficient sample size	15% progress to diabetes

The MDPP and Population Health

One of the long-term goals of the MDPP is to improve the population health of Medicare beneficiaries by lowering the incidence and prevalence of diabetes. Population health focuses on the health of a group rather than the health of individual patients. The effect of an intervention on population health depends on two factors:

1. The intervention's effect on individual beneficiaries
2. The intervention's reach (the share of eligible patients who receive the intervention)

Although MDPP's association with weight loss is promising, the reach of the MDPP has been limited. According to one analysis, an estimated 16 million Americans 65 years of age or older were eligible for the MDPP,¹⁶ and our analysis indicated that an estimated 9.3 million FFS Medicare beneficiaries were potentially eligible for the program. However, in the first 6 years of the program (2018–2024), fewer than 10,000 beneficiaries participated in the MDPP. Because the MDPP has had limited reach, any effect on population health has been minimal. Increasing the reach of the MDPP will be necessary to increase the program's overall effect on population health.

Several factors may explain why the reach of the MDPP has been limited; understanding these factors may offer insight into how to increase participation in the program. First, many areas do not have MDPP suppliers, and beneficiaries currently enroll in the program through local suppliers. Therefore, enrolling MDPP suppliers in areas without current ones could improve

beneficiary participation in the program. However, potential suppliers face barriers in enrolling as MDPP suppliers, including the following:

- Limited reimbursement¹⁷
- Lengthy process for recognition by CDC and CMS¹⁷
- Recruitment/retention of patients being labor- and time-intensive^{18; 19}
- Lack of or underutilized screening process²⁰
- Implementation costs¹⁷
- Lack of a HIPAA-compliant referral system for participants²¹
- Lack of space for in-person classes²²

Another factor limiting MDPP participation may be the relatively low participation rate in Medicare preventive services. Medicare covers nearly 30 preventive services but, with the exception of vaccines, overall take-up of these services tends to be low. Agarwal et al.²³ examined Medicare claims for nine prevention codes and found that the share of eligible beneficiaries who received claims for the covered services ranged from less than 1% for obesity counseling and alcohol misuse counseling to 35.8% for wellness visits (the median rate of claims for eligible beneficiaries was 3.7%). Although MDPP services were not included in this study, the low uptake for the program is consistent with the low uptake for other Medicare preventive services. The low uptake for obesity counseling is especially relevant for the MDPP because many people who have BMI of at least 30 kg/m² and are eligible for obesity counseling would also be eligible for the MDPP if they have a blood test indicating prediabetes.

Public health researchers stress the cascade of care model when evaluating whether patients receive recommended preventive care. The cascade starts with the number of patients with a condition, drops to the number of patients who are aware they have the condition, drops to the number of patients who are referred for treatment, falls further to the number of patients who accept the referral, and ends with the number of patients who ultimately complete treatment. The cascade provides insights into why participation is low and how it can be increased. Low levels of awareness lead to low levels of participation; consequently, increasing awareness offers an appealing opportunity to increase participation.

The CDC has conducted campaigns to increase awareness of prediabetes, and the diagnosed share of prediabetes has more than doubled between 2010 and 2020. Although awareness is growing, there is still plenty of room for increased awareness and diagnosis of prediabetes among eligible Medicare beneficiaries.²⁴ Further along the cascade, the reported rate of referral to diabetes prevention programs is low. Ali et al.²⁵ estimate that about 5% of people with diagnosed prediabetes are advised by a health professional to participate in a program to prevent type 2 diabetes. The uptake of the programs by those advised to participate is relatively high (39.8%). However, health care providers also give other advice to people with diagnosed prediabetes, including advice to increase physical activity (advised for 63% of persons with diagnosed prediabetes), reduce fat or calorie content in diet (59.2%), or participate in a weight loss program (21.3%).

Even beneficiaries who are aware that they have prediabetes face barriers in participating in the MDPP. In a systematic review of 95 studies (including 65 U.S. studies), Breuing et al.²⁶ identified eight major barriers to participation in diabetes prevention programs:

- Economic factors (program costs, insurance coverage, costs of healthy foods)
- Work obligations
- Family and friends (who may oppose the switch to healthy foods but may also facilitate programs by providing support)
- Social support (e.g., lack of childcare)
- Culture/religion that features traditional, but unhealthy, food
- Language, especially for migrant populations
- Limited knowledge (literature in diabetes prevention programs often focuses on Western food)
- Other barriers, including time commitment, travel costs, and insufficient personal motivation

The MDPP may be less affected by some of these barriers (e.g., Medicare covers the cost of the program), but other barriers are still important. In particular, the MDPP requires a large time commitment, meaning that beneficiaries must be very motivated to overcome this barrier. In addition, attending in-person classes requires travel costs and additional time. Given differing preferences and competing priorities, many beneficiaries who are aware that they have prediabetes will not be motivated to participate in the MDPP.

An additional factor slowing participation was the COVID-19 PHE. As discussed earlier, enrollment in the program came to a standstill during the first months of the PHE, and many beneficiaries already in the program either stopped attending or paused attendance. CMS responded by allowing existing participants to continue in the program virtually and allowing new patients to start the program virtually after January 1, 2021. These changes allowed existing participants to resume classes and new classes to start in 2021. However, momentum built in the program by the start of 2020 was lost, and the subsequent waves of the delta and omicron variants of COVID-19 likely slowed enrollment in 2021 and early 2022.

Balanced against these factors and barriers, program uptake rate by patients with diagnosed prediabetes, conditional on referral, is promising, as are the high attendance rates and weight loss for Medicare beneficiaries who enroll in the MDPP. These promising outcomes suggest that future efforts to increase participation in the program should focus on raising awareness of prediabetes, increasing the number of MDPP supplier locations, and encouraging health care providers to refer patients with prediabetes to the program.

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Appendices

Appendix A: Changes in MDPP Reimbursement for Beneficiaries Enrolling in the MDPP

As described in **Chapter 1**, CMS eliminated the second year of the program for new beneficiaries starting the program on or after January 1, 2022, and redistributed second-year reimbursement rates to the first year of the program. The redistribution of reimbursement rates and updated reimbursement rates for 2022 are shown in **Appendix Table A-1**, along with the updated reimbursement rates for 2023. The program shifted towards more of a fee-for service payment in 2024, paying \$25 per session attended and increasing the overall amount that could be paid for attendance without meeting performance standards from \$496 to \$550. The proposed rule for 2025 would eliminate the bridge payment with no additional changes to payment.

Table A-1. MDPP Payment Structure for Newly Enrolled Beneficiaries

Payment Description	2021	2022	2023	2024	2025 (Proposed)
Core Sessions (Months 1–6)					
Bridge payment	\$26	\$35	\$38	\$25	NA
Attend four core sessions	\$52	\$105	\$115	NA	NA
Attend nine core sessions	\$95	\$175	\$191	NA	NA
Attend sixteen core sessions (\$25 per session)				\$400	\$400
Core Maintenance (CM) Sessions (Months 7–12)					
Attend two CM sessions (no 5% weight loss [WL]) in Months 7–9	\$15	\$70	\$76	NA	NA
Attend two CM sessions (5% WL) in Months 7–9	\$63	\$93	\$101	NA	NA
Attend two CM sessions (no 5% WL) in Months 10–12	\$15	\$70	\$76	NA	NA
Attend two CM sessions (5% WL) in Months 10–12	\$63	\$93	\$101	NA	NA
Attend six CM sessions (\$25 per session)				\$150	\$150
Maintain 5% WL from baseline (\$8 per session)				\$48	\$48
5% WL achieved from baseline weight	\$169	\$169	\$184	\$145	\$145
9% WL achieved from baseline weight	\$26	\$35	\$38	\$25	\$25
Ongoing Maintenance (OM) Sessions (Months 12–24)*					
Attend two OM sessions in Months 13–15	\$52	NA	NA	NA	NA
Attend two OM sessions in Months 16–18	\$52	NA	NA	NA	NA
Attend two OM sessions in Months 19–21	\$53	NA	NA	NA	NA
Attend two OM sessions in Months 22–24	\$53	NA	NA	NA	NA

(continued)

Table A-1. MDPP Payment Structure for Newly Enrolled Beneficiaries (continued)

Payment Description	2021	2022	2023	2024	2025 (Proposed)
Subtotal Maximum Payment—Attendance Only	\$203	\$455	\$496	\$550	\$550
Total Maximum Payment	\$704	\$705	\$768	\$768	\$768

* Required continued 5% weight loss before the COVID-19 PHE.

NA = not available

Data Source: Federal Register, 11/19/2021 <https://www.federalregister.gov/documents/2021/11/19/2021-23972/medicare-program-cy-2022-payment-policies-under-the-physician-fee-schedule-and-other-changes-to-part>
MDPP Expanded Model Calendar Year (CY) 2022 Payment Rates
<https://innovation.cms.gov/media/document/mdpp-payment-rates-cy22>, Federal Register CY24 Physician Fee
Schedule Final Rule <https://www.federalregister.gov/documents/2023/11/16/2023-24184/medicare-and-medicaid-programs-cy-2024-payment-policies-under-the-physician-fee-schedule-and-other>, Federal Register CY25
Proposed Physician Fee Schedule <https://www.federalregister.gov/documents/2024/07/31/2024-14828/medicare-and-medicaid-programs-cy-2025-payment-policies-under-the-physician-fee-schedule-and-other>

Appendix B: MDPP Beneficiary Data Sources

Linkages Between Datasets

The Supplier Crosswalk plays a key role in linking the Diabetes Prevention Reporting Program (DPRP) data and Medicare claims, which are retrieved from the Chronic Conditions Data Warehouse (CCW) data maintained by CMS (**Appendix Table B-1**). The Supplier Crosswalk includes the following:

- The supplier's name
- An organization code assigned by CDC
- For each beneficiary:
 - A CDC participant code (randomly assigned by the supplier to the beneficiary)
 - A variable indicating whether the beneficiary has Medicare fee-for-service (FFS) or Medicare Advantage (MA) coverage

For FFS beneficiaries, the supplier also submits a Medicare identifier (either a Health Insurance Claim Number [HICN] or Medicare Beneficiary Identifier [MBI]).

For the DPRP data, the key linkage variables are the organization code and the CDC participant code. The Supplier Crosswalk data can be linked to DPRP data through the combination of the CDC organization code and the CDC participant code.

For the Medicare claims, the linkage variable is a unique beneficiary identifier (BENE_ID) used in the CCW that is distinct from the MBI. MDPP suppliers submit claims information for FFS beneficiaries to Medicare administrative contractors; once the claims are processed, the resolved claims are stored in the CCW under the BENE_ID. The Medicare claims for a beneficiary can be linked from the BENE_ID to a crosswalk between the BENE_ID and the corresponding MBI, and then to the Supplier Crosswalk.

The linked Medicare claims–Supplier Crosswalk can then be linked to the DPRP data through a combination of the CDC organization code and the CDC participant code. Because the CCW only includes claims information for FFS beneficiaries, the linked DPRP–Medicare claims dataset is limited to FFS beneficiaries.

Reporting

Suppliers begin submitting the Supplier Crosswalk 6 months after the quarter in which they begin serving MDPP beneficiaries, so there is a lag before beneficiaries served by a newly enrolled MDPP supplier begin appearing in the Supplier Crosswalk. However, once a supplier begins reporting, they submit their Supplier Crosswalk every 3 months, which is more frequent than they submit their DPRP session-level data to CDC (every 6 months). The Supplier Crosswalk may also be more up-to-date than the Medicare claims because suppliers have up to 12 months after the date of service to submit claims for processing and payment. Moreover, the

CCW only includes claims for FFS beneficiaries, so the Supplier Crosswalk provides a more complete picture of the total number of FFS and MA beneficiaries the MDPP serves. Therefore, this report uses the Supplier Crosswalk as the source for the number of MDPP beneficiaries served to date.

Table B-1. Linkages Between and Reporting Schedules for Key Beneficiary Data Sources

The three datasets provide complementary data that can be linked through the Supplier Crosswalk; however, their reporting schedules do not always align.

Variable	Supplier Crosswalk	DPRP	Medicare Claims and Enrollment Data (Fee-for-Service [FFS] beneficiaries only)
Purpose	Identify MDPP beneficiaries and provide link between Diabetes Prevention Recognition Program (DPRP) and Medicare claims and enrollment data	Provide data on demographics, session attendance, weight loss, and physical activity	Identify payments for MDPP services and measures beneficiary use and expenditures
Populations included	All enrolled MDPP participants	All enrolled MDPP participants	Medicare FFS
Key information	Provider link: Centers for Disease Control and Prevention (CDC) organization code Beneficiary link: CDC participant code Beneficiary link: Medicare beneficiary identifier (FFS beneficiaries only) Participation	Provider link: CDC organization code Beneficiary link: CDC participant code Information on MDPP sessions: payer; dates of service; session; starting weight; weight loss; physical activity; demographics	Beneficiary link: Medicare beneficiary identifier Claims Information: demographics; enrollment information; services billed; payments made by Medicare
Reporting schedule	Suppliers begin submitting 6 months after the quarter in which they begin serving MDPP beneficiaries and submit every 3 months after first submission	Suppliers submit to CDC every 6 months based on the date they receive DPRP recognition from CDC	Suppliers submit claims within 12 months of date of service
Expected lag after a MDPP service is provided	Up to 9 months after first MDPP beneficiary served by supplier; up to 3 months after first submission	Up to 6 months	Up to 12 months
Data included in this report	April 1, 2018, through March 31, 2024	April 1, 2018, through March 31, 2024	Approved MDPP claims through March 31, 2024, for analyses of MDPP claims Approved claims through December 31, 2023, for analyses of Medicare spending and service use

Although the Supplier Crosswalk provides the best estimate of the total number of MDPP beneficiaries, it does not provide information on beneficiaries' class attendance, dates of service, program outcomes, MDPP claims, health care use, or Medicare expenditures. Those variables come from either the DPRP or Medicare claims data.

Impact of Differences in Reporting Schedules on Receipt of Beneficiary Information

Because the reporting schedules differ between the Supplier Crosswalk, DPRP, and Medicare claims data sources, we cannot always or immediately link data for the same beneficiary across data sources. Examples help illustrate this point.

Suppose that Supplier A is approved by CDC on January 15, 2017. It then submits DPRP data to CDC starting in August 2017 (6 months after the first of the month after approval) and every 6 months thereafter (i.e., in February and August 2018, 2019, and so on). Suppose that Supplier A subsequently enrolls in the MDPP, receiving approval on April 12, 2019, and enrolling its first Medicare beneficiary, Beneficiary 1, on July 2, 2019. Supplier A will submit its first Supplier Crosswalk on April 15, 2020, 6 months after the quarter it served its first MDPP beneficiary. Supplier A can submit the first claim for Beneficiary 1 as late as July 1, 2020, 12 months after the first service.

Beneficiary 1 will first appear in the DPRP data that RTI receives from CDC on September 30, 2019. Beneficiary 1 will first appear in the Supplier Crosswalk submitted on April 15, 2020. Beneficiary 1 may not appear in Medicare claims data until July 1, 2020 (or even later because claims are not immediately processed and approved). Thus, Beneficiary 1 will appear in the DPRP data first, then the Supplier Crosswalk, and then the claims data. By the end of July or August 2020, Beneficiary 1 should appear in all three datasets.

A different beneficiary, who first receives services from Supplier A on March 3, 2020, will appear on the April 15, 2020, Supplier Crosswalk but will not be included on the supplier's DPRP submission until August 2020, and CDC will not submit this beneficiary to RTI until September 2020. The claims for this patient may not be submitted for processing until as late as March 2, 2021. Thus, unlike the previous case, this beneficiary will appear in the Supplier Crosswalk first, then the DPRP data, and then the claims data.

In addition, although suppliers can submit MDPP claims up to 12 months after the date of service, they have an obvious incentive—payment—to submit them earlier. Thus, an MDPP beneficiary may appear in the Medicare claims data before appearing in the Supplier Crosswalk or DPRP data.

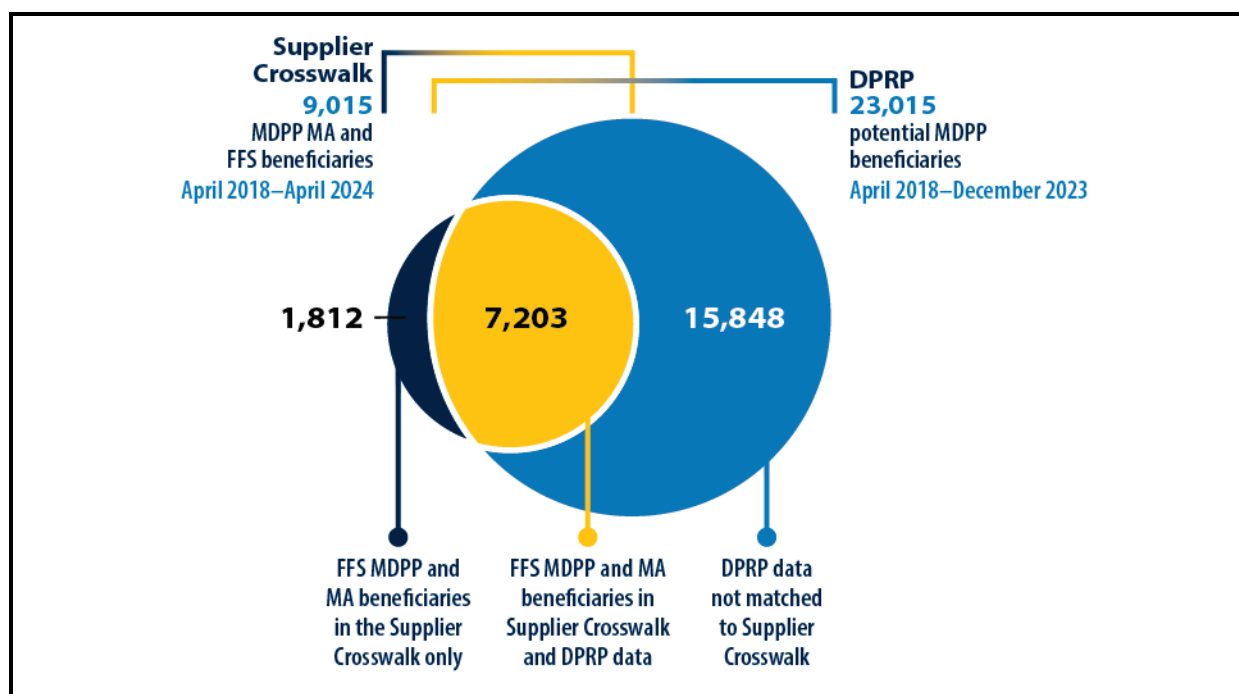
The differences in reporting schedules among datasets have several implications for interpreting the results we present in this report. First, the number of MDPP beneficiaries included in analyses will vary depending on which data source provides the best information for the analysis. Thus, our estimate of the number of MDPP beneficiaries in **Chapter 2** (9,015 unduplicated beneficiaries) is based on Supplier Crosswalk data because new beneficiaries are most likely to appear in this data source first.

Second, when we present estimates on session attendance, weight loss, and physical activity based on DPRP data, we only report results for beneficiaries included in the DPRP **and** in the Supplier Crosswalk. We do not report results for beneficiaries included in the DPRP but not in the Supplier Crosswalk. We adopted this approach because the Supplier Crosswalk reports only Medicare beneficiaries covered by the MDPP. In contrast, suppliers submit DPRP data for Medicare and privately insured participants, making it possible for payer status to be incorrectly entered. Therefore, the sample that is used to understand attendance, physical activity, and weight loss outcomes contains 7,203 MDPP beneficiaries (**Appendix Figure B-1**) who appear in both the DPRP and the Supplier Crosswalk; 1,812 MDPP beneficiaries in the Supplier Crosswalk did not match to DPRP. However, they may be matched when we receive future DPRP data submissions.

Third, the analyses based on FFS claims from the Medicare claims data include fewer beneficiaries. This is partly because claims are only available for FFS beneficiaries and partly because not all MDPP FFS beneficiaries have had claims submitted and approved (as previously noted, claims can be submitted up to 12 months after the service date).

Fourth, we expect that most beneficiaries will eventually be included in all data sources for which they are eligible. MDPP FFS beneficiaries should be included in all three sources within 12 months, and MDPP MA beneficiaries should be included in both the Supplier Crosswalk and the DPRP data within 9 months of the first session.

Figure B-1. Overlap Between the Supplier Crosswalk and DPRP Datasets

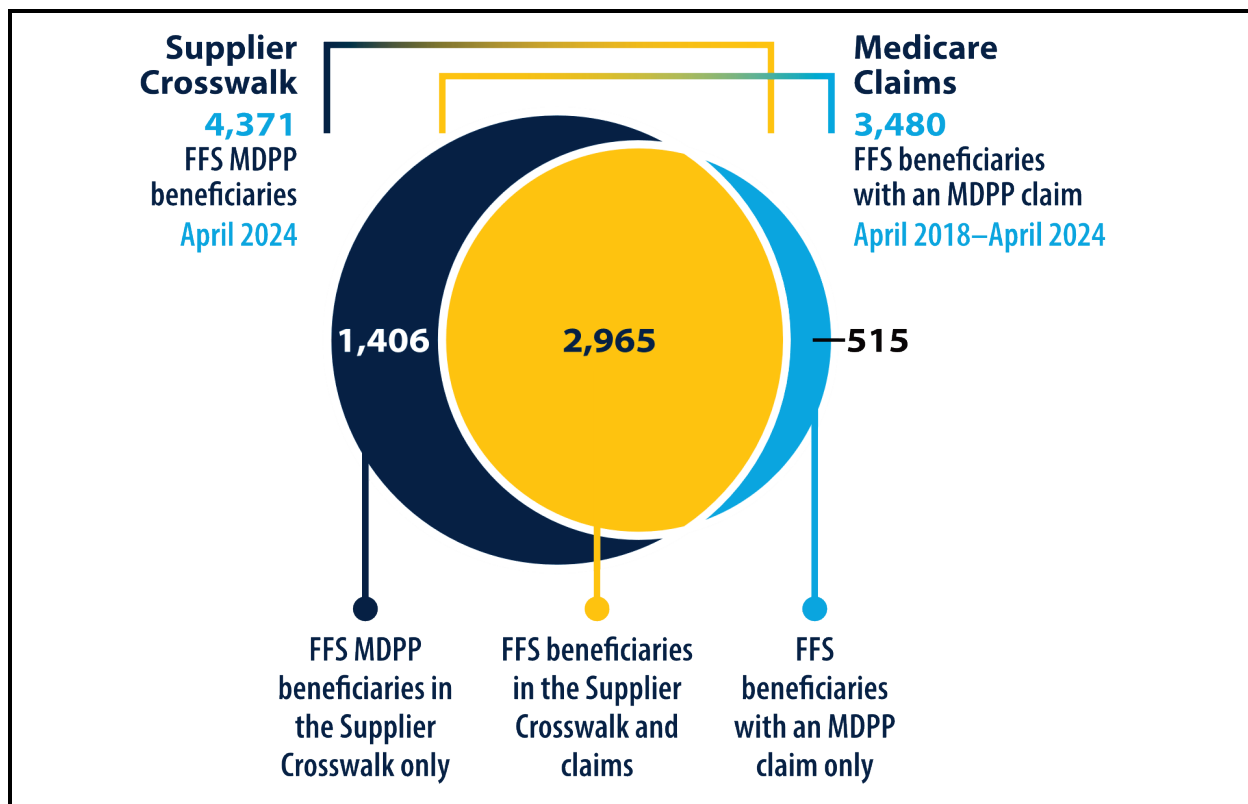


Data Source: RTI analysis of Supplier Crosswalk; DPRP datasets.

Note: Diabetes Prevention Reporting Program (DPRP) includes anyone over age 65 or whose payer is Medicare in the DPRP for suppliers who have registered to submit a MDPP Supplier Crosswalk (n = 195). Supplier Crosswalk includes the total beneficiaries with identifying information submitted by MDPP participants.

Some MDPP FFS beneficiaries identified by the Supplier Crosswalk do not have Medicare claims for MDPP services, and a few FFS beneficiaries with claims for MDPP services are not included in the Supplier Crosswalk. **Appendix Figure B-2** shows the overlap between inclusion in the Supplier Crosswalk and having MDPP claims as of March 31, 2024. Most beneficiaries with an MDPP claim were reported by suppliers as participating in MDPP. Of the 3,480 FFS beneficiaries with an MDPP claim, 85% (2,965/3,480) were in the Supplier Crosswalk, and 68% of the FFS beneficiaries reported by suppliers in the crosswalk had an MDPP claim (2,965/4,371). For 515 FFS beneficiaries, suppliers submitted MDPP claims, but the individual was not reported as an FFS participant in the Supplier Crosswalk.

Figure B-2. Overlap Between the Supplier Crosswalk Fee-for-Service (FFS) Subsample and the Medicare Claims Dataset

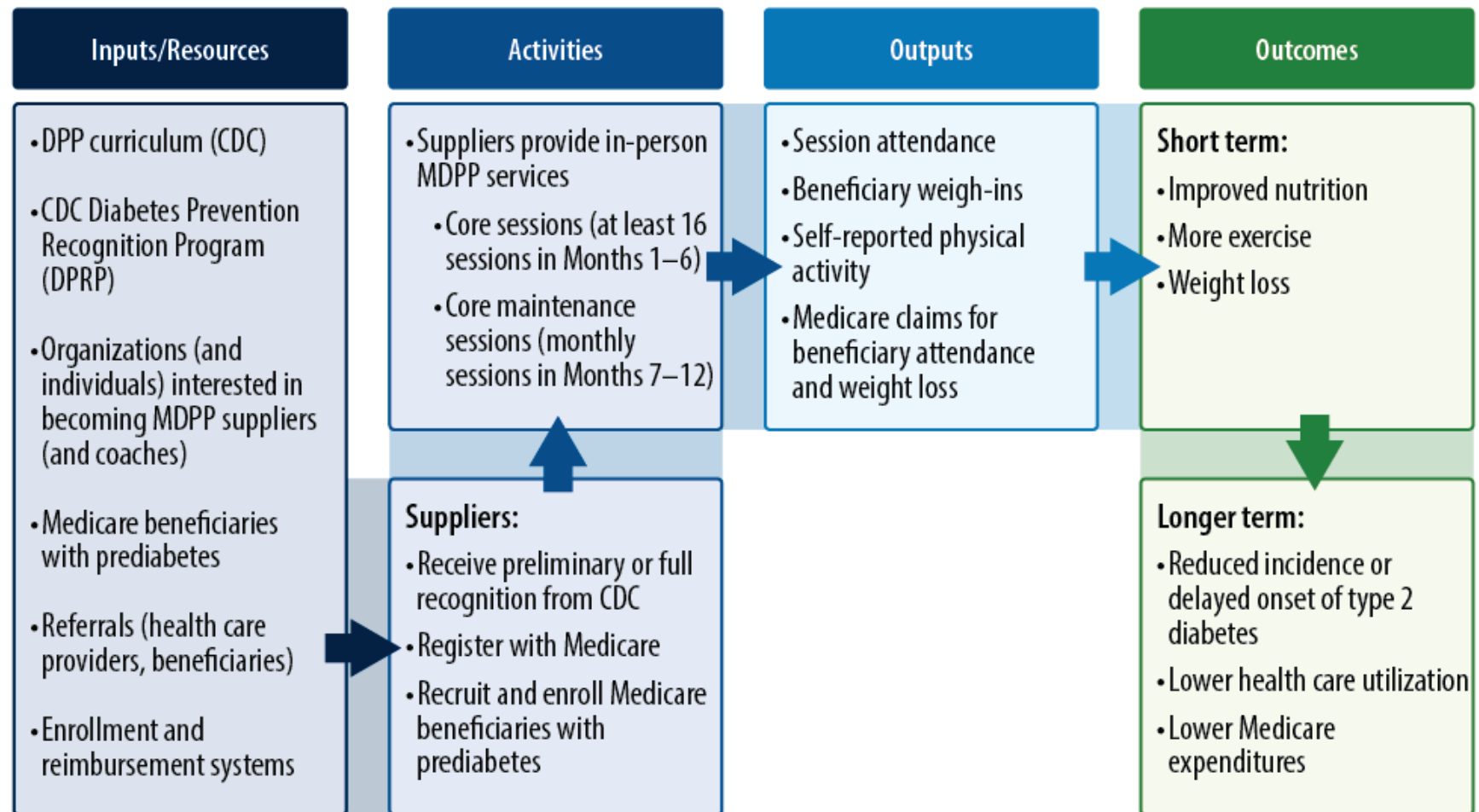


Data Source: RTI analysis of Supplier Crosswalk, and Medicare claims datasets.

Appendix C: MDPP Logic Model

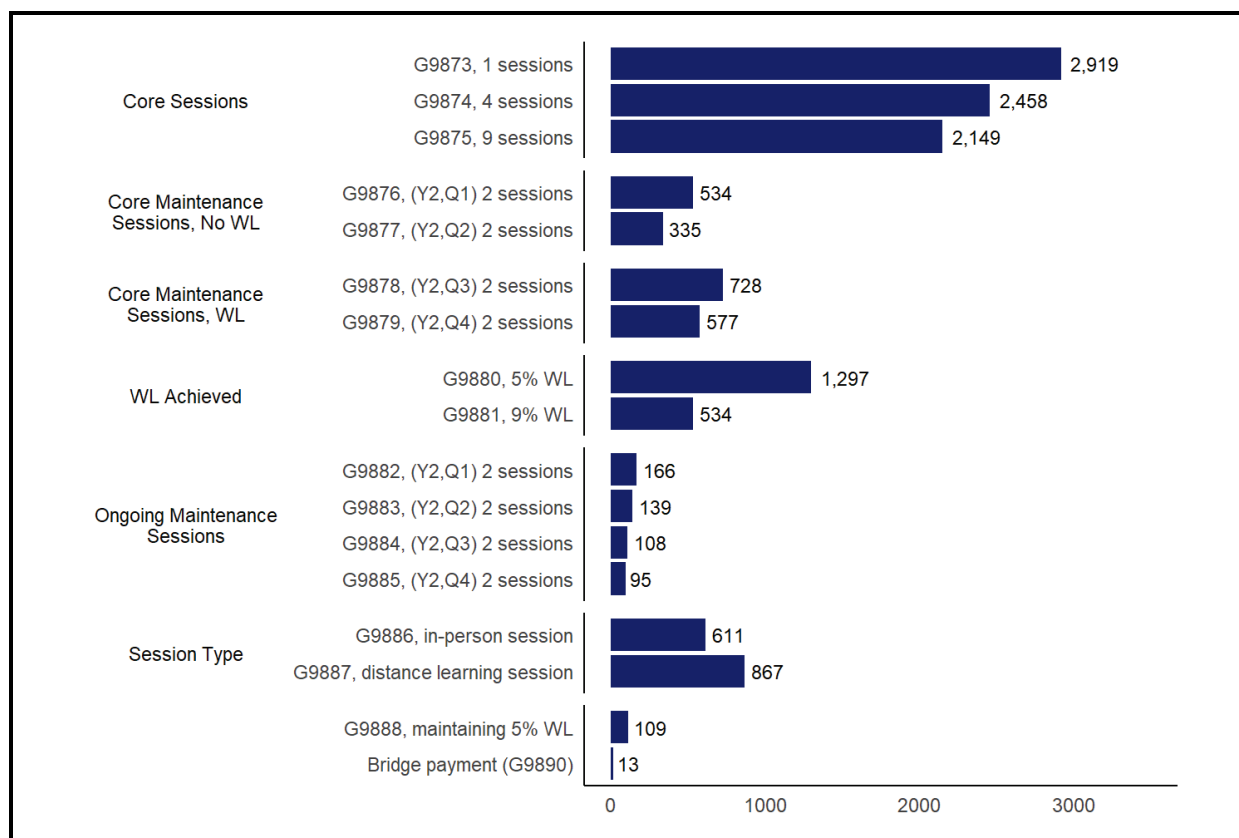
The logic model illustrates how the MDPP is expected to reach its goals.

Figure C-1. Logic Model for the MDPP



Appendix D: Chapter 2 Tables—Supplier Participation in the MDPP

Figure D-1. Number of Paid MDPP Fee-for-Service (FFS) Claims: April 1, 2018, Through March 31, 2024



WL = Weight Loss

Note: Medicare has also approved 22,852 claims for attendance at DPP sessions for which CMS does not reimburse suppliers (Healthcare Common Procedure Coding System [HCPCS] G9891), and those claims are not shown in this figure.

Data Source: Medicare claims from April 2018 through March 2024

Appendix E: Chapter 3 Tables—Beneficiary Engagement in MDPP

Table E-1. Referral Source for MDPP Beneficiaries

			Type				Session Delivery Mode						Cohorts			
	MDPP Participants (n = 7,203)		FFS		MA		In Person		Mixed		Virtual		Completers		Noncompleters	
Referral Source	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Primary care provider/office or specialist	3,603	50.0	2,083	56.9	1,520	42.9	1,721	40.5	286	53.3	1,596	65.9	1,996	55.9	865	38.4
Non-primary care health professional	445	6.2	221	6.0	224	6.3	206	4.8	29	5.4	210	8.7	218	6.1	144	6.4
Not reported	606	8.4	115	3.1	491	13.8	559	13.2	38	7.1	9	0.4	116	3.2	471	20.9
Other	2,549	35.4	1,240	33.9	1,309	36.9	1,759	41.4	184	34.3	606	25.0	1,238	34.7	770	34.2

Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date.

Table E-2. Enrollment Motivation for MDPP Beneficiaries

	MDPP Participants (n = 7,203)		Type			Session Delivery Mode						Cohorts				
			FFS		MA		In Person		Mixed		Virtual		Completers		Noncompleters	
Enrollment Motivation	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Health care professional	2,409	48.2	1,377	50.3	1,032	45.8	972	41.5	168	53.9	1,269	54.3	1,290	50.4	542	49.2
Blood test results	1,017	20.4	562	20.5	455	20.2	429	18.3	42	13.5	546	23.4	514	20.1	193	17.5
Prediabetes risk test	263	5.3	159	5.8	104	4.6	108	4.6	10	3.2	145	6.2	125	4.9	51	4.6
Community-based organization	351	7.0	238	8.7	113	5.0	230	9.8	48	15.4	73	3.1	238	9.3	80	7.3
Family or friends	239	4.8	141	5.2	98	4.3	132	5.6	9	2.9	98	4.2	113	4.4	38	3.5
Participated in National DPP Lifestyle Change Program	46	0.9	27	1.0	19	0.8	29	1.2	1	0.3	16	0.7	27	1.1	10	0.9
Employer or employer’s wellness plan	42	0.8	16	0.6	26	1.1	18	0.8	7	2.2	17	0.7	24	0.9	12	1.1
Health insurance plan	368	7.4	56	2.0	312	13.8	275	11.7	11	3.5	82	3.5	62	2.4	135	12.2
Media advertisements	260	5.2	164	6.0	96	4.3	152	6.5	16	5.1	92	3.9	166	6.5	41	3.7

FFS = fee-for-service; MA = Medicare Advantage

Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than 8 sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date.

Table E-3. Demographic Characteristics of MDPP Beneficiaries

	MDPP Participants (n = 7,203)		Type			Session Delivery Mode			Cohorts							
			FFS		MA	In Person		Mixed	Virtual	Completers		Noncompleters				
Subgroup	n	%	n	%	n	%	n	%	n	%	n	%				
Sex																
Female	5,440	75.5	2,728	74.6	2,712	76.5	3,168	74.6	420	78.2	1,852	76.5	2,656	74.4	1,688	75.0
Male	1,704	23.7	899	24.6	805	22.7	1,063	25.0	116	21.6	525	21.7	881	24.7	538	23.9
Not reported	59	0.8	32	0.9	27	0.8	14	0.3	1	0.2	44	1.8	31	0.9	24	1.1
Age Group																
< 65	566	7.8	247	6.7	319	9.0	295	7.0	27	5.0	244	10.1	200	5.6	254	11.3
65–69	2,774	38.5	1,440	39.4	1,334	37.6	1,584	37.3	206	38.4	984	40.6	1,353	37.9	877	39.0
70–74	2,277	31.6	1,159	31.7	1,118	31.6	1,379	32.5	150	27.9	748	30.9	1,179	33.1	638	28.4
75–79	1,148	15.9	583	15.9	565	15.9	709	16.7	109	20.3	330	13.6	602	16.9	349	15.5
> 79	438	6.1	230	6.3	208	5.9	278	6.6	45	8.4	115	4.7	234	6.6	132	5.8
Education Status																
Some college	4,178	58.0	2,416	66.0	1,762	49.7	2,124	50.0	328	61.1	1,726	71.3	2,338	65.5	935	41.6
Less than college	970	13.5	452	12.3	518	14.6	586	13.8	80	14.9	304	12.6	466	13.1	302	13.4
Education not reported	2,055	28.5	791	21.6	1,264	35.7	1,535	36.2	129	24.0	391	16.1	764	21.4	1,013	45.0

FFS = Fee-for-service; MA = Medicare Advantage

Note: In person is defined as attending ≥ 75% of sessions in person, virtual is defined as attending ≥ 75% of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date. Additional demographic information available upon request.

Table E-4. Attendance for MDPP Beneficiaries

Subgroup	Number of Beneficiaries (n)	Days Enrolled	Sessions Attended
All Beneficiaries	7,203	242	18
Fee-for-Service (FFS)	3,659	269	19
Medicare Advantage (MA)	3,544	214	16
Session Delivery Mode			
In person	4,245	217	16
Mixed	537	365	24
Virtual	2,421	258	19
Time Since First Class			
0–3 months	477	37	5
4–6 months	449	113	12
7–9 months	459	185	17
10–12 months	508	241	18
12 + months	5,310	276	19
Session Count			
≥ 4	6,571	264	19
≥ 9	5,698	296	21
≥ 16	4,510	338	24
≥ 22	2,836	383	26
Enrollment Source			
Enrollment from physician	3,603	258	19
All other enrollment sources	3,600	225	16
Education			
Some college	4,178	264	19
No college	970	238	17
Education level not reported	2,055	198	15
Sex			
Female	5,440	241	18
Male	1,704	243	18
Age			
Under 65	566	198	15
Body Mass Index (BMI)			
BMI at first session < 30	2,286	247	18
BMI at first session ≥ 30	4,882	241	18

(continued)

Table E-4. Attendance for MDPP Beneficiaries (continued)

Subgroup	Number of Beneficiaries (n)	Days Enrolled	Sessions Attended
Completion Status			
Completers	3,568	377	25
Noncompleters	2,250	109	10

Note: In person is defined as attending $\geq 75\%$ of sessions in person, virtual is defined as attending $\geq 75\%$ of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date. Sample size for nonreported sex is too small to accurately present attendance (n = 59). BMI not reported for 35 beneficiaries who did not have a value for weight loss. Additional demographic information available upon request.

Table E-5. Retention by Weeks Attended for MDPP Beneficiaries

Weeks Attended	Matched Cohort (N=5,818)	In Person (N=3,469)	Mixed (N=524)	Virtual (N=1,825)	Completers (N=3,568)	Noncompleters (N=2,250)
4 weeks	93.8	92.0	97.9	96.1	100.0	84.0
9 weeks	87.1	83.6	97.3	90.6	100.0	66.5
16 weeks	80.4	75.1	95.2	86.3	100.0	49.4
22 weeks	73.4	65.9	92.2	82.2	100.0	31.2
26 weeks	70.6	62.9	89.3	79.8	100.0	24.0
39 weeks	62.7	54.9	80.9	72.1	100.0	3.4
52 weeks	21.1	18.1	41.6	20.8	34.3	0.0

Table E-6. Linear Regression Model: Total MDPP Sessions

Variable	Estimate	Std Error	DF	T-Value	P-Value
Intercept	18.54	6.97	2,653	2.661	0.008
Age	0.09	0.02	3,546	4.369	0.000
Sex, Referent Group: Female					
Male	0.01	0.32	3,528	0.037	0.971
Not reported	-2.05	1.49	3,575	-1.377	0.169
Education, Referent Group: No College					
Some college	0.72	0.33	3,471	2.180	0.029
Session Delivery Mode, Referent Group: In Person					
Mixed	6.60	0.52	3,579	12.654	0.000
Virtual	1.66	0.39	2,665	4.304	0.000
BMI at First Session	-0.02	0.02	3,527	-0.964	0.335
Referral Health Care	-0.41	0.31	3,495	-1.296	0.195
Organization Type, Referent Group: Health Care–Based					
Community-based	-1.08	0.96	157	-1.118	0.265
State	0.83	1.21	183	0.685	0.494
YMCA	-0.03	0.89	136	-0.030	0.976
Broadband Access	-0.04	0.02	3,319	-1.407	0.160
Household Income	0.00	0.00	3,323	0.341	0.733
Less than Highschool	0.06	0.06	3,528	1.024	0.306
Gini	-3.76	3.95	3,547	-0.952	0.341
Medicaid	-0.07	0.04	3,248	-1.565	0.118
Medicare	-0.01	0.04	3,420	-0.405	0.685
Dual	0.19	0.19	3,542	1.028	0.304
PCP per 1,000	0.71	0.63	2,945	1.134	0.257
Urban Lower Quartile	0.23	0.43	2,383	0.526	0.599
Urban Upper Quartile	0.61	0.61	3,557	0.996	0.319
Social Deprivation Index	0.02	0.01	3,496	1.061	0.289
Gyms per 1,000	-0.32	0.98	3,310	-0.322	0.748
Parks	0.01	0.01	3,237	0.355	0.723
Stops per 1,000	-0.03	0.09	2,426	-0.334	0.738
Grocery per 1,000	-0.32	0.55	3,467	-0.595	0.552
Diabetes	0.12	0.28	1,835	0.426	0.670
Hypertension	-0.07	0.11	2,284	-0.597	0.550
Obesity	-0.02	0.07	1,689	-0.260	0.795

(continued)

Table E-6. Linear Regression Model: Total MDPP Sessions (continued)

Variable	Estimate	Std Error	DF	T-Value	P-Value
No Leisure	-0.04	0.10	1,409	-0.393	0.694
Mental Health	-0.25	0.17	1,696	-1.528	0.127
Region, Referent Group: Northeast					
Midwest	-1.22	0.95	280	-1.284	0.200
South	-0.74	0.94	365	-0.786	0.432
West	-0.85	1.06	350	-0.804	0.422
Weight Loss by Session 3	-0.72	0.09	3,540	-8.183	0.000

DF = degrees of freedom; PCP = primary care provider.

Note: Number of observations: 3,585; number of suppliers (clustered): 161. Model is a linear regression model with total sessions as the dependent variable. Total sessions are a count of total sessions attended by a beneficiary.

Model also controlled for additional demographics. Additional information available upon request.

Table E-7. Logistic Regression Model: Completing MDPP

Variable	Estimate	Standard Error	Z-Value	P-Value
Intercept	0.46	6.72	-0.409	0.682
Age	1.02	1.01	2.892	0.004
Sex, Referent Group: Female				
Male	1.04	1.09	0.401	0.689
Not reported	1.04	1.51	0.096	0.923
Education, Referent Group: No College				
Some college	1.17	1.10	1.745	0.081
Session Delivery Mode, Referent Group: In Person				
Mixed	5.77	1.20	9.672	0.000
Virtual	1.46	1.11	3.459	0.001
BMI at First Session	1.00	1.01	-0.706	0.480
Referral Health Care	0.97	1.09	-0.339	0.735
Organization Type, Referent Group: Health Care-Based				
Community-based	0.57	1.29	-2.194	0.028
State	1.41	1.38	1.068	0.286
YMCA	0.69	1.27	-1.602	0.109
Broadband Access	1.00	1.01	-0.477	0.633
Household Income	1.00	1.00	0.716	0.474
Less than Highschool	1.01	1.02	0.531	0.596
Gini	0.71	2.94	-0.317	0.751
Medicaid	0.98	1.01	-1.321	0.187
Medicare	1.00	1.01	0.355	0.723
Dual	1.06	1.05	1.131	0.258
PCP per 1,000	1.02	1.19	0.108	0.914
Urban Lower Quartile	0.90	1.12	-0.926	0.355
Urban Upper Quartile	0.97	1.18	-0.173	0.863
Social Deprivation Index	1.00	1.00	1.067	0.286
Gyms per 1,000	1.11	1.31	0.370	0.711
Parks	1.00	1.00	0.202	0.840
Stops per 1,000	0.98	1.03	-0.677	0.499
Diabetes	1.04	1.08	0.486	0.627
Hypertension	0.99	1.03	-0.210	0.834
Obesity	0.99	1.02	-0.491	0.623
No Leisure	0.99	1.03	-0.406	0.685

(continued)

Table E-7. Logistic Regression Model: Completing MDPP (continued)

Variable	Estimate	Std Error	Z-Value	P-Value
Mental Health	0.97	1.05	-0.743	0.457
Region, Referent Group: Northeast				
Midwest	0.84	1.28	-0.710	0.478
South	0.88	1.29	-0.515	0.606
West	0.73	1.33	-1.098	0.272
Weight Loss by Session 3	0.87	1.03	-5.786	0.000

BMI = body mass index; PCP = primary care provider.

Note: Number of observations: 3,585; number of suppliers (Clustered): 161. Model is a logistic regression model with completion status as the dependent variable. Completion = 1 if a person attended at least eight sessions in the first 6 months and an additional session after Month 6. Model also controlled for additional demographics. Additional information available upon request.

Table E-8. List of Variables, Definitions, and Data Sources for Community Characteristics Included in Linear and Logistic Regression Models

Variable	Definition	Data Source, Year
Neighborhood and Physical Environment		
Urbanicity*	Rural-Urban Commuting Area Codes, categorized as urban, suburban, and rural	U.S. Department of Agriculture, 2010 ²⁷
Access to broadband	Percentage with access to broadband, defined as broadband internet subscriptions in the household (such as cable, fiber optic, or DSL)	American Community Survey, 2018–2022 ²⁸
Gyms†	The number of gyms per 1,000 residents	National Neighborhood Data Archive ²⁹
Public transit†	Number of public transit stops per 1,000 residents	National Neighborhood Data Archive, 2018
Open park land	Proportion of open park land in the zip code tabulation area (ZCTA)	National Neighborhood Data Archive, 2017
Leisure time physical activity†	Percentage with no leisure time physical activity	CDC PLACES, 2023
Socioeconomic Status		
Neighborhood deprivation	The Social Deprivation Index is a composite measure of area-level deprivation based on the following demographic characteristics: percentage living in poverty, percentage with less than 12 years of education, percentage of households that are single-parent, percentage living in rented housing units, percentage living in overcrowded housing units, percentage of households without a car, and percentage of non-employed adults under 65 years of age	American Community Survey, 2018–2022
Median household income	Median household income	American Community Survey, 2018–2022
Education attainment	Percentage with less than a high school degree	American Community Survey, 2018–2022
Income inequality	Gini index, which summarizes the dispersion of income across the entire income distribution	American Community Survey, 2018–2022
Food Environment		
Density of supermarkets/grocery stores†	The number of supermarkets/grocery stores per 1,000 people	National Neighborhood Data Archive ³⁰
Health Care		
Number of primary care providers per 1,000 residents	Number of primary care physicians per 1,000 people	2022–2023 Area Health Resource File ³¹ American Community Survey, 2018–2022
Medicaid coverage	Percentage with Medicaid coverage	American Community Survey, 2018–2022

(continued)

Table E-8. List of Variables, Definitions, and Data Sources (continued)

Variable	Definition	Data Source, Year
Medicare coverage	Percentage with Medicare coverage	American Community Survey, 2018–2022
Dual enrollment	Percentage with Medicaid and Medicare dual enrollment	American Community Survey, 2018–2022
Men under/over age 65 with Medicare coverage	Percentage of those with Medicare coverage who are male divided into those under and over age 65	American Community Survey, 2018–2022
Women under/over 65 with Medicare coverage	Percentage of those with Medicare coverage who are female under/over age 65	American Community Survey, 2018–2022
Diabetes ^{†‡}	Percentage with diabetes	CDC PLACES, 2023
Hypertension ^{†‡}	Percentage with hypertension	CDC PLACES, 2023
Obesity ^{†‡}	Percentage with Medicaid obesity	CDC PLACES, 2023
Mental health ^{†‡}	Percentage mental health not good for ≥ 14 days	CDC PLACES, 2023

* The original dataset used 2010 zip codes and was converted to 2010 ZCTAs using the Uniform Data System Mapper 2010 zip code to ZCTA crosswalk. The 2010 ZCTAs were converted to 2020 ZCTAs using the Census Bureau's 2020 ZCTAs relationship file.³² In cases where one 2010 ZCTA corresponded to many 2020 ZCTAs, the urbanicity classifications for the multiple 2020 ZCTAs were set to the same classification as the single 2010 ZCTA. In cases where multiple 2010 ZCTAs corresponded to one 2020 ZCTA, the 2020 ZCTA's urbanicity classification was based on the largest share of the population within a specific urbanicity category.

† The original dataset used 2010 ZCTAs and was converted to 2020 ZCTAs using the Census Bureau's 2020 ZCTAs relationship file.³² In cases where one 2010 ZCTA corresponds to multiple 2020 ZCTAs, the value from the 2010 ZCTA was assigned to the various 2020 ZCTAs. In cases where multiple 2010 ZCTAs correspond to one 2020 ZCTA, the median value of the 2010 ZCTAs was assigned to the 2020 ZCTA.

‡ 2022 CDC PLACES data were used for Florida, as Florida did not have enough data to be included in the 2023 CDC PLACES datasets.

Note: Models also included additional demographic variables. Additional information available upon request.

Appendix F: Chapter 4 Tables—Weight Loss and Physical Activity Goals Among MDPP Beneficiaries

Table F-1. Summary Statistics for Weight Change Among MDPP Beneficiaries

Subgroup	Number of Beneficiaries (n)	Weight Change (lb.)	Weight Change (%)	Sessions Attended
All Beneficiaries	6,954	-10	-4.9	18
Fee-for-Service (FFS)	3,585	-11	-5.3	20
Medicare Advantage (MA)	3,369	-9	-4.5	17
Session Delivery Mode				
In person	4,047	-9	-4.6	17
Mixed	536	-13	-6.2	24
Virtual	2,371	-11	-5.3	20
Time Since First Class				
0–3 months	441	-4	-1.7	6
4–6 months	426	-7	-3.8	13
7–9 months	455	-10	-4.9	17
10–12 months	496	-10	-5.0	19
12 + months	5,136	-11	-5.3	20
Session Count				
≥ 4	6,564	-11	-5.2	19
≥ 9	5,696	-12	-5.7	21
≥ 16	4,510	-13	-6.3	24
≥ 22	2,836	-15	-7.1	26
Enrollment Source				
Enrollment from physician	3,509	-11	-5.3	19
All other enrollment sources	3,445	-9	-4.6	17
Education				
Some college	4,097	-11	-5.3	20
No college	936	-9	-4.6	18
Education level not reported	1,921	-9	-4.4	16

(continued)

Table F-1. Summary Statistics for Weight Change Among MDPP Beneficiaries (continued)

Subgroup	Number of Beneficiaries (n)	Weight Change (lb.)	Weight Change (%)	Sessions Attended
Sex				
Female	5,265	-9	-4.8	18
Male	1,631	-12	-5.3	19
Age				
Under 65	534	-8	-3.5	16
Body Mass Index (BMI)				
BMI at first session < 30	2,216	-8	-4.9	19
BMI at first session ≥ 30	4,738	-11	-4.9	18
Completion Status				
Completers	3,568	-14	-6.6	25
Noncompleters	2,064	-6	-2.9	11

Note: In person is defined as attending ≥ 75% of sessions in person, virtual is defined as attending ≥ 75% of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date. Sample size for nonreported sex is too small to accurately present weight loss (n = 58). Additional demographic information available upon request.

Table F-2. Percentage of Beneficiaries Meeting Weight Loss Goals, by Subgroup

Subgroup	Frequency (n)	Met 5% Weight Loss Goal (%)	Met 9% Weight Loss Goal (%)
All Beneficiaries	6,954	52.5	24.2
Fee-for-Service (FFS)	3,585	57.5	27.2
Medicare Advantage (MA)	3,369	47.2	21.0
Session Delivery Mode			
In person	4,047	48.4	21.7
Mixed	536	69.4	35.8
Virtual	2,371	55.6	25.7
Time Since First Class			
0–3 months	441	8.6	0.7
4–6 months	426	35.9	9.9
7–9 months	455	53.6	22.0
10–12 months	496	54.8	21.0
12 + months	5,136	57.3	27.9
Session Count			
≥ 4	6,564	55.5	25.5
≥ 9	5,696	62.4	29.3
≥ 16	4,510	69.9	34.4
≥ 22	2,836	76.8	41.5
Enrollment Source			
Enrollment from physician	3,509	56.0	26.6
All other enrollment sources	3,445	48.9	21.7
Education			
Some college	4,097	56.1	26.4
No college	936	49.8	23.6
Education level not reported	1,921	46.1	19.6
Sex			
Female	5,265	51.2	23.2
Male	1,631	56.8	27.2
Age			
Under 65	534	38.6	17.2

(continued)

Table F-2. Percentage of Beneficiaries Meeting Weight Loss Goals, by Subgroup (continued)

Subgroup	Frequency (n)	Met 5% Weight Loss Goal (%)	Met 9% Weight Loss Goal (%)
Body Mass Index (BMI)			
BMI at first session < 30	2,216	54.8	25.5
BMI at first session ≥ 30	4,738	51.4	23.6
Completion Status			
Completers	3,568	73.2	37.8
Noncompleters	2,064	29.3	9.1

Note: In person is defined as attending ≥ 75% of sessions in person, virtual is defined as attending ≥ 75% of sessions virtually, and mixed is defined as anything else. Completers are defined as those who attended at least eight sessions within 6 months of their first session date and attended at least one session 6 months after the first session. Noncompleters are defined as those with less than eight sessions during the first 6 months whose organization was offering classes for at least 9 months from their first session date. Sample size for nonreported sex is too small to accurately present weight loss (n = 58). Additional demographic information available upon request.

Appendix G: Chapter 5 Supplemental Analysis

Table G-1. Progression to Diabetes: Cox Proportional Hazards Model Results for Select Subgroups

Subgroup	Sample Size	Percentage Who Progressed to Diabetes	Covariate-Adjusted Hazard Ratio (90% CI)	P-Value
Completed MDPP vs.	1,291	15%	1.01 (0.81–1.27)	0.932
Did not complete	512	16%	--	--
Low engagement in MDPP vs.	260	18%	1.19 (0.89–1.59)	0.318
Medium engagement	545	13%	1.07 (0.85–1.36)	0.631
High engagement	1,152	15%	--	--
Met the 5% weight loss goal vs.	1,228	13%	0.64 (0.52–0.79)	<0.001
Did not meet the goal	729	18%	--	--

CI = confidence interval

Data Source: RTI analysis of 2018–2023 Medicare claims

Methods: The hazard ratio is derived from a covariate-adjusted Cox model that includes select sociodemographic characteristics and a beneficiary's time in Medicare (a beneficiary who spends less time in Medicare Fee-for-Service [FFS] in the year contributes less to the overall mean than a beneficiary who was enrolled in Medicare FFS for the full year). Covariate-adjusted models use information about the beneficiary before entering MDPP (e.g., sociodemographic factors and diagnosis information) to help estimate the likelihood of developing diabetes. These characteristics may also progress to diabetes, so covariate adjustment helps remove that influence on the hazard ratio estimates.

Sample Size: 1,957 of the 4,029 Medicare FFS MDPP beneficiaries included in the claims analyses were included in the diabetes onset analyses. To be included, beneficiaries had to meet time requirements (at least 2 years of pre-MDPP claims data and at least 1 year of post-MDPP claims data) and have no claims for diabetes in the 3 years before enrolling in MDPP. For the analyses of those who completed MDPP compared to those who did not, the sample size was 1,803 instead of 1,957. To be eligible for program completion, the beneficiary had to have been enrolled in the program long enough to have had attended at least eight MDPP sessions (i.e., had to have been enrolled long enough to complete MDPP).

Interpretation: A hazard ratio of one means there is no difference between groups in the rate of newly diagnosed diabetes. A value greater than one means that group has a higher rate of newly diagnosed diabetes relative to another group, and a value less than one means that group has a lower rate of newly diagnosed diabetes relative to the other group.

Appendix H: Use of Medicare FFS Claims Data

Data Sources

MDPP Supplier Crosswalk—MDPP suppliers submit a list of Medicare Beneficiary Identifiers (MBIs) for each fee-for-service (FFS) beneficiary who receives MDPP services. This crosswalk is updated quarterly and submitted to CMS and RTI. The April 15, 2024, Supplier Crosswalk contained the most-recent list of MDPP beneficiaries available for inclusion in this report.

Medicare data—We used the Medicare Master Beneficiary Summary, claims, and chronic conditions files CMS provided in the Chronic Conditions Data Warehouse (CCW). The Medicare data in the CCW include (1) sociodemographic information, (2) specific information on Medicare enrollment, (3) the claims experience for each FFS beneficiary, and (4) indicators for whether FFS beneficiaries have common chronic conditions. We used Part A, Part B, and Part D claims to create claims-based outcome measures. We used Medicare data from April 1, 2015, through March 31, 2024, to assess the frequency of billed and approved MDPP claims, and we used data from April 1, 2015, through December 31, 2023, for analyses of Medicare FFS claims.

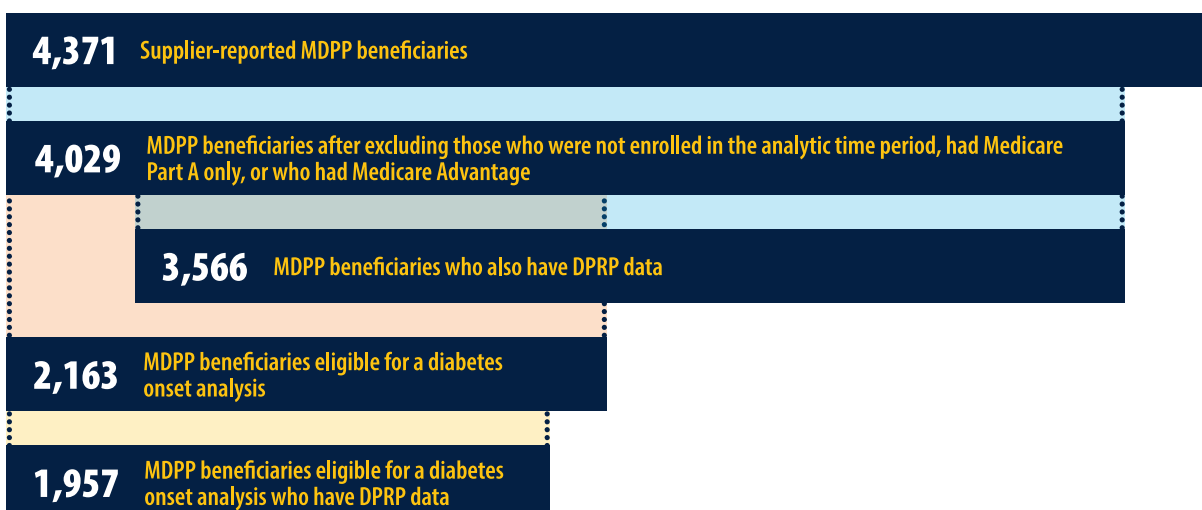
DPRP dataset—We used the DPRP dataset to identify the MDPP enrollment date for MDPP beneficiaries and other program engagement characteristics like whether the beneficiary completed the program, whether the beneficiary mainly engaged in virtual or in-person MDPP sessions, and whether weight loss was achieved. Enrollment start is defined as an MDPP beneficiary's first MDPP session date.

Data Linkage

The Supplier Crosswalk includes MDPP beneficiaries' Medicare Health Insurance Claim Number (HICN) or MBI. We used the CCW HICN/MBI to CCW BENE_ID crosswalk to assign each HICN/MBI its BENE_ID. We then linked the Supplier Crosswalk data to the Medicare claims data using the BENE_ID.

Study Sample of FFS MDPP Beneficiaries

The sample sizes are based on the analyses conducted, and Figure H-1 below details the sample sizes.

Figure H-1. FFS MDPP Beneficiaries: Study Sample Size by Analysis

DPRP = Diabetes Prevention Reporting Program; FFS = Fee-for-Service

A cumulative list of 4,371 MDPP FFS beneficiaries reported by MDPP suppliers in the April 15, 2024, Supplier Crosswalk was used as the starting point, and 4,029 beneficiaries were ultimately included in analyses of Medicare FFS data. Beneficiaries who started the MDPP after December 31, 2023, were excluded. Additionally, some beneficiaries, although reported by suppliers as eligible participants, had no months in the analysis period in which they met the criteria of being alive, having Medicare Part B, and not being enrolled in Medicare Advantage.

For analyses of progression to diabetes, the sample size was smaller: 2,163 MDPP FFS beneficiaries. These beneficiaries had at least 2 years of pre-MDPP time (adequate pre-MDPP time is needed to ensure beneficiaries do not have diabetes before program start) and do not have previous claims for diabetes. These individuals also had at least one year of claims data after MDPP program start. The mean and median follow-up time in this sample was 2.5 and 2.2 years, respectively.

For select analyses, we merged DPRP data to claims, and 1,957 FFS MDPP beneficiaries had DPRP data and met the requirements for an assessment of diabetes onset.

Identification of Potentially Eligible MDPP Beneficiaries

MDPP beneficiaries were compared to other, potentially eligible beneficiaries before MDPP beneficiaries entered the program in Figure 5-1. For each MDPP beneficiary, we gathered sociodemographic and health care use information from Medicare enrollment and FFS claims for the calendar year *preceding* the calendar year in which the MDPP beneficiary began MDPP.

To create the pool of potentially eligible beneficiaries included in Figure 5-1, we identified the first year among the years 2018 (the start of MDPP) through 2023 (the last full year of data available for this report) when a beneficiary had a prediabetes claim but no diabetes claims in the 2 years before that year (we followed the CMS algorithm for identifying diabetes, which

includes a 2-year window in which to search for at least two outpatient claims or one inpatient claim with a primary or secondary diagnosis of diabetes). We then gathered sociodemographic and health care use information for the calendar year *preceding* that first year a beneficiary was identified.

For both groups (MDPP and the potentially eligible), beneficiaries who were not enrolled in Medicare in the identified preceding year were not included because data were not available to calculate the descriptive metrics. Estimates of sociodemographic characteristics, health, and health care use were weighted by time in Medicare, as described in “Weighting Estimates of Sociodemographic, Health, and Health Care Use” below.

MDPP Start Date

MDPP FFS beneficiaries were assigned a program start date based on their first MDPP session date, as reported in the DPRP dataset. MDPP beneficiaries who did not yet have data in the DPRP were assigned start dates based on their first paid MDPP claims. Beneficiaries who had neither DPRP data nor an MDPP claim at the time of this analysis were assigned start dates based on the quarters when they first appeared in a Supplier Crosswalk; we assigned a start date as the first day of the reporting quarter associated with the Supplier Crosswalk. Of the 4,029 beneficiaries included in this analysis, 87% were assigned a start date based on DPRP data, 7% were assigned a start date based on the first paid MDPP claim, and 6% were assigned a start date based on the date of the Supplier Crosswalk in which they were first identified.

Select Measure Specifications

Measure	Definition
Diabetes-related drugs	We identified diabetes-related drugs, inclusive of metformin, and semaglutides among those enrolled in Part D in the Part D event and drug characteristics files. The diabetes-related drugs chosen were those in the 2023 CMS risk adjustment prescription drug categories 6 (insulin) and 7 (anti-diabetic agents, except insulin and metformin only), metformin, and other diabetes-related drugs identified by a working group participating in the CDC-funded Real-World Effectiveness of Interventions for Type 2 Diabetes Prevention. The semaglutides of interest were Ozempic and Rybelsus. The National Drug Code codes in this analysis can be made available upon request.
Diabetes onset	An individual was identified as having incidence (or a new case of) diabetes after MDPP if the beneficiary had no evidence of multiple outpatient visits or an inpatient visit with a diabetes diagnosis in the 3 years before entering MDPP and then had two or more outpatient visits with a primary or secondary diagnosis of diabetes or one or more inpatient admission with a primary or secondary diagnosis of diabetes within a 2-year period after MDPP. The 2-year period was imposed to ensure proximity of diagnoses. For example, if a beneficiary had one outpatient claim with a diagnosis of diabetes 6 months after enrolling in MDPP and had another outpatient claim 3 years later, that beneficiary was not flagged as having a new case of diabetes because the second claim occurred outside the 2-year window that started when a beneficiary enrolled in MDPP. The specific International Classification of Diseases, Version 10, diagnosis codes used to identify diabetes can be found in the Chronic Conditions Warehouse 30 CCW Chronic Conditions Algorithms  .

Weighting Estimates of Sociodemographic, Health, and Health Care Use

In estimating means and percentages, reported in Figure 5-1, a person-specific weight equal to the beneficiary's eligibility fraction was applied. Because some individuals were not enrolled in Medicare FFS or did not also have Part B coverage throughout the calendar year in which we pulled sociodemographic, health, and health care use data, we calculated eligibility fractions for each beneficiary. The eligibility fraction is defined as the total number of months the beneficiary was enrolled in FFS and had Part B coverage in the calendar year divided by 12 months in the year. For example, a beneficiary enrolled in Medicare FFS with Part B coverage for 6 months of a year has an eligibility fraction of 0.5 for that year. Eligibility fractions down-weight observations for beneficiaries who are not eligible for the full year. Because there is greater uncertainty about the information, the observations exert less influence on means and percentages.

Cox Proportional Hazards Model

We used a Cox proportional hazards model to assess the association of certain sociodemographic and MDPP program engagement characteristics of FFS MDPP beneficiaries on progression to diabetes. The result of this model is a “hazard ratio,” which essentially measures how often a particular event happens (i.e., newly diagnosed diabetes) over time in one group versus how often it happens in another group. The model is as follows:

$$HR = \frac{h(t|x_2)}{h(t|x_1)} = \frac{h_0(t)\exp(x_2\beta_x)}{h_0(t)\exp(x_1\beta_x)}$$

In this specification, *HR* is the hazard ratio, which is the ratio of the hazard function for one group divided by the hazard function for another group. The hazard function is expressed as a baseline hazard rate ($h_0(t)$) dependent on time alone and the exponentiation of hazard rates dependent on a set of covariates, denoted by x .

A hazard ratio of one means there is no difference between groups in the rate of newly diagnosed diabetes. A value greater than one means that group has a higher rate of newly diagnosed diabetes relative to another group, and a value less than one means that group has a lower rate of newly diagnosed diabetes relative to the other group.

Covariates. We included covariates in the Cox proportional hazards model to assess the influence of these covariates on newly diagnosed diabetes. For example, the models controlled for sociodemographic variables, distance to the nearest MDPP supplier, enrollment in Medicare and/or Medicaid, chronic conditions (e.g., obesity, prediabetes, heart disease, stroke, hypertension), number of outpatient visits, and use of preventative services. Additional information available upon request.