U.S. Department of Health and Human Services
Centers for Medicare & Medicaid Services

Value in Opioid Use Disorder Treatment (VIT-OUD) Demonstration Evaluation

Final Report to Congress

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List of Acronyms

ACSC	Ambulatory Care Sensitive Condition
ASMD	Absolute Standardized Mean Difference
CCBHC	Certified Community Behavioral Health Clinic
CCN	CMS Certification Number
CMF	Care Management Fee
CMHC	Community Mental Health Center
CMS	Centers for Medicare & Medicaid Services
CPT	Current Procedural Terminology
E&M	Evaluation and Management
ED	Emergency Department
FQHC	Federally Qualified Health Center
HCPCS	Healthcare Common Procedure Coding System
HEDIS	Healthcare Effectiveness Data and Information Set
HOP	Hospital Outpatient Department
LIS	Low-Income Subsidy
MOUD	Medication for Opioid Use Disorder
N-SUMHSS	National Substance Use and Mental Health Services Survey
NPI	National Provider Identifier
OTP	Opioid Treatment Program
OUD	Opioid Use Disorder
PCP	Primary Care Provider
PBIP	Performance-Based Incentive Payment
PBPM	Per Beneficiary Per Month
POS	Place of Service
PQI	Prevention Quality Indicator
SUD	Substance Use Disorder
SUPPORT Act	Substance Use-Disorder Prevention That Promotes Opioid Recovery and Treatment for Patients and Communities Act
T-MSIS	Transformed Medicaid Statistical Information System
TIN	Tax Identification Number
VIT-OUD	Value in Opioid Use Disorder Treatment

Executive Summary

As required by section 6042 of the Substance Use Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (SUPPORT Act), the Centers for Medicare & Medicaid Services (CMS) conducted a demonstration to improve treatment for Original Medicare beneficiaries with opioid use disorder (OUD). The goal of the Value in Opioid Use Disorder Treatment (VIT-OUD) Demonstration was to evaluate whether specialized OUD care teams—supported by two new payments: a new care management fee and performance-based incentive—increased access to OUD treatment services, improved health outcomes, and reduced or did not increase Medicare expenditures. Providers participating in the demonstration established OUD care teams to address physical, behavioral, and health-related social needs for applicable beneficiaries. Providers could deliver services not otherwise eligible for payment under Medicare, such as mobile services, certified peer specialist services, and recovery supports. Original Medicare beneficiaries were eligible to participate if they were enrolled in Part A and Part B and had an OUD diagnosis. Those enrolled in Medicare Advantage were not eligible. The demonstration started on April 1, 2021, and ended on December 31, 2024.

Section 6042 of the SUPPORT Act also required the Secretary of Health and Human Services to conduct an intermediate and final evaluation of the demonstration to determine the extent to which the VIT-OUD Demonstration:

- Reduced hospitalizations and emergency department (ED) visits.
- Increased use of medications to treat opioid use disorder (MOUDs).
- Improved health outcomes of individuals with OUD, including by reducing the incidence of infectious diseases (such as hepatitis C and Human Immunodeficiency Virus).
- Avoided any increases in total spending.
- Reduced deaths from opioid overdose.
- Reduced the utilization of residential substance use disorder (SUD) treatment.

Fifty-three providers were selected to participate in the demonstration in 2021; 47 providers remained active at the end of the demonstration in December 2024. Between April 2021 and December 2024, 21 participating providers enrolled 1,403 Medicare beneficiaries. Provider participants reported multiple challenges associated with recruiting and enrolling beneficiaries, which may have contributed to the lower-than-expected enrollment. Provider participants shared that many of the beneficiaries they identified with current OUD diagnoses were either already enrolled in Medicare Advantage or were switching from Original Medicare to Medicare Advantage and thus were ineligible for the demonstration.

This report constitutes the final evaluation required by Section 6042. It contains findings from all four years of the demonstration. To address the evaluation questions, we identified a comparison group of beneficiaries who were treated for OUD at practices that did not participate in the VIT-OUD Demonstration. The following shows how VIT-OUD beneficiaries compared with this matched comparison group:

- They had 20 percent fewer hospitalizations (for all causes) and 39 percent fewer SUD-related hospitalizations.
- They had 19 percent fewer ED visits (for all causes) and 51 percent fewer SUD-related ED visits.
- They were five percent more likely to use an MOUD within 30 days of enrollment and 56 percent more likely to use an MOUD within 30 days of their earliest visit if they had not received an MOUD in the 12 months prior to their enrollment. They were 35 percent more likely to use an MOUD continuously for at least 180 days.
- They had 12 percent lower expenditures before excluding demonstration payments and 10 percent lower expenditures after excluding demonstration payments.
- They had 26 percent lower inpatient expenditures.
- They had a 35 percent lower mortality risk from opioid overdose.

The demonstration was not associated with statistically significant changes in the following:

- Use of residential SUD treatment.
- Incidence of hepatitis C.
- All-cause mortality.

Incidence of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) was too rare to report.

1 Legislative Summary

The VIT-OUD Demonstration was authorized under section 1866F of the Social Security Act and was added by section 6042 of the SUPPORT Act of 2018.

2 Background

In 2021, when the VIT-OUD Demonstration was launched, there were more than 100K drug overdose deaths in the United States. This was the largest number of yearly drug overdoses ever recorded, and data show that adults aged 65 or older had the largest percentage increase in drug overdose rates from 2020 through 2021.[1,2] Although how many of these decedents were Medicare beneficiaries is unclear, it is known that Medicare beneficiaries have experienced similar increases in opioid prescribing and subsequent rates of opioid misuse and dependence as have been observed in other U.S. populations. Between 2006 and 2016, the percentage of Medicare beneficiaries aged 65 or older who were misusing opioids doubled from 0.6 percent to 1.2 percent.[3] Another study found that, from 2015 through 2019, 14 percent of Medicare beneficiaries—regardless of age—had a past year OUD.[4] This study also highlighted that OUDs were more common among beneficiaries younger than 65 versus those aged 65 or older. Data show increases in the number of beneficiaries in Medicare with infectious diseases, which are common among individuals with OUD. For example, from 1997 to 2020, the number of Medicare beneficiaries with HIV/AIDS more than doubled.[5]

Although effective interventions for OUD such as medications, counseling, and peer services are available, a small percentage of Medicare beneficiaries with OUD used these treatments and supports. In 2019, about 960K Medicare Part D beneficiaries had an OUD diagnosis, yet only 22 percent of these beneficiaries (209K) received MOUDs through Part D.[6] Improving access to effective treatments for OUD was a key objective of the VIT-OUD Demonstration, and research highlights that access can have significant impacts on Medicare spending and other health care outcomes. For example, one study estimated that, in 2019, Original Medicare beneficiaries with OUD who had not received MOUDs had $15.8B more in health care expenditures than beneficiaries without OUD, whereas beneficiaries with OUD who had

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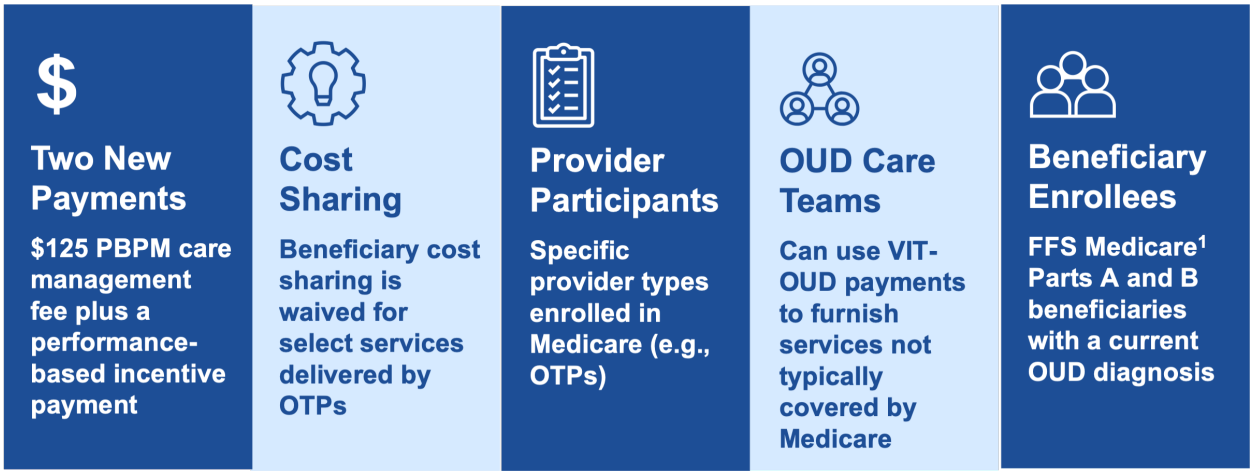
[1] Spencer MR, Miniño AM, Warner M. Drug overdose deaths in the United States, 2001–2021. NCHS Data Brief, no 457. Hyattsville, MD: National Center for Health Statistics. 2022. https://doi.org/10.15620/cdc:122556.
[2] From 2020 to 2021, drug overdose deaths increased by 28% among adults aged 65 or over, from 9.5 drug overdose deaths per 100K persons to 12.0 drug overdose deaths per 100K persons.
[3] Han BH, Sherman SE, Palamar JJ. Prescription opioid misuse among middle-aged and older adults in the United States, 2015-2016. Prev. Med. 121:94-98, Apr 2019.
[4] Parish WJ, Mark TL, Weber EM, Steinberg DG. Substance use disorders among Medicare beneficiaries: prevalence, mental and physical comorbidities, and treatment barriers. Am J Prev Med 63(2):225-232, Aug 2022. https://doi.org/10.1016/j.amepre.2022.01.021.
[5] See Medicare and People with HIV.
[6] Office of the Inspector General. Data brief. Opioid use in Medicare Part D continued to decline in 2019, but vigilance is needed as COVID-19 raises new concerns. August 2020, OEI-02-20-00320. https://oig.hhs.gov/oei/reports/OEI-02-20-00320.asp

received MOUDs only had about $4B more in health care expenditures than beneficiaries without OUD.[7]

3 Demonstration Overview

CMS launched the four-year VIT-OUD Demonstration with the goal of increasing access to OUD treatment; improving participating beneficiaries' physical and mental health outcomes; and reducing Medicare program expenditures. The demonstration began on April 1, 2021, and ended on December 31, 2024.

Figure 1. Main Components of the VIT-OUD Demonstration



[1] Medicare Advantage enrollees were not eligible to be enrolled. OTP = Opioid Treatment Program.

3.1 Two New Payments

The VIT-OUD Demonstration provided two new payments for participating providers: a per beneficiary per month (PBPM) care management fee (CMF) and a performance-based incentive payment (PBIP).[Error! Bookmark not defined.] The PBPM CMF was $125 paid to participants every quarter through the Medicare Administrative Contractor.[Error! Bookmark not defined.] CMS created a demonstration-specific G-code for providers to use to bill for the CMF.

A portion of participant CMF payments was subject to a quality withhold (i.e., the PBIP) (zero percent in performance year one; five percent in performance year two; and 10 percent in each of performance years three and four). Participants were assessed on a PBIP metric and, if they performed adequately, they earned back the withheld funds. CMS selected the prescription or administration of pharmacotherapy to treat OUD as the PBIP metric. This measure captures the percentage of a provider's VIT-OUD participating beneficiaries with OUD who filled a prescription for or were administered a U.S. Food and Drug Administration–approved MOUD within 30 days of their first OUD treatment encounter with that provider. Participant performance

[7] Mark TL, Parish WJ, Weber EM, Steinberg DG, Henretty K. The cost of opioid use disorder-related conditions in Medicare. Drug Alcohol Depend. 244, Mar 2023. https://doi.org/10.1016/j.drugalcdep.2023.109778.

was assessed on an annual basis in the second quarter following the performance year.[8] This approach allowed for three months of claims runout during the first quarter following the performance year. The performance-based incentive was paid to eligible participants based on their quality of performance, and payments were dispersed in quarter two of the following performance year. For example, payments for the second performance year (2022) were paid in quarter two 2023.

3.2 Cost Sharing

In addition to the two demonstration payments to participants, CMS used its waiver authority under section 1866F(i) of the Social Security Act to waive the requirements of Sections 1833(a) and 1833(b) for Medicare Part B payment systems, such that Medicare pays 100 percent of the cost of services furnished to applicable beneficiaries by opioid treatment programs (OTPs) and for services furnished through the OUD bundled payments finalized in the calendar year 2020 Medicare Physician Fee Schedule final rule.[9] This waiver was applied to claims submitted by participants for applicable beneficiaries for Healthcare Common Procedure Coding System (HCPCS) codes G2067–G2080, G2086–G2088, and any other HCPCS codes specified by CMS for use by OTPs.[10] These codes already had zero coinsurance, but the cost sharing waiver applied to beneficiary deductibles.

3.3 Provider Participants

3.3.1 Provider Eligibility for the Demonstration

To be eligible to participate in the VIT-OUD Demonstration, providers had to meet the following criteria:

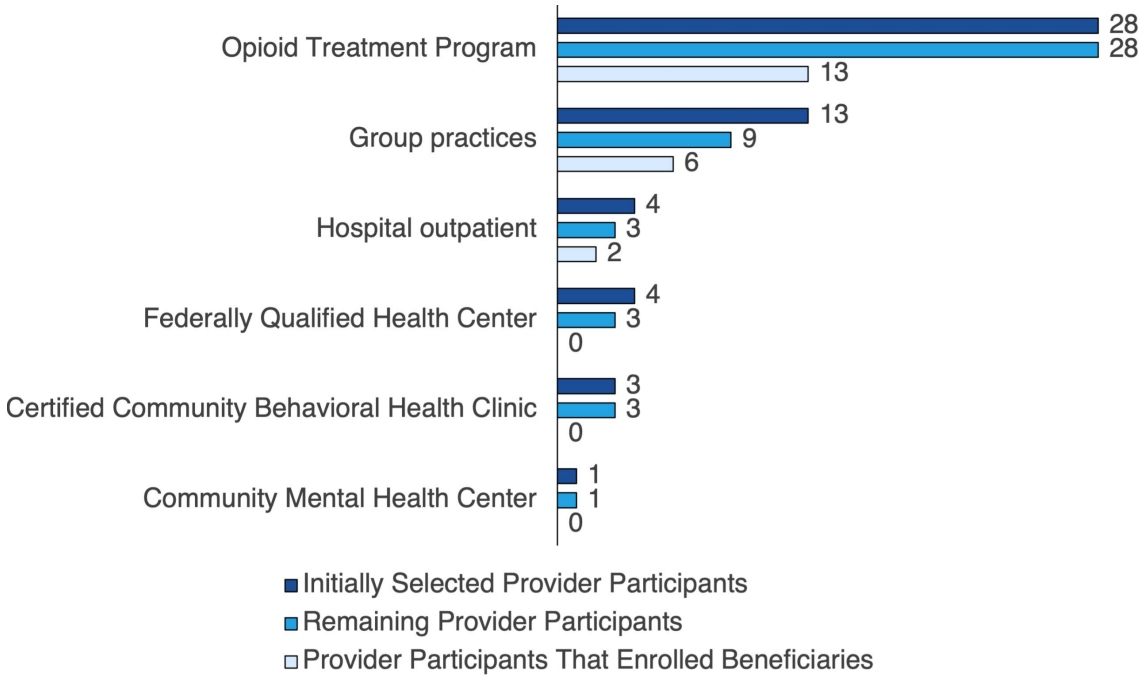
- Be enrolled in Medicare Part A or B as specified under Section 1866(j)(1)
- Establish an OUD care team and use the team to furnish or arrange for OUD treatment services in the outpatient setting
- Have applied for and been selected to participate in the demonstration program by CMS
- Be one of the following provider types: physician, group practice, hospital outpatient department (HOP), Federally Qualified Health Center (FQHC), rural health clinic, Community Mental Health Center (CMHC), certified community behavioral health clinic (CCBHC), OTP, or critical access hospital

[8] Due to the low volume of beneficiaries enrolled by each provider participant, participants were assessed in the second performance year based on a pooled population of VIT beneficiary enrollees rather than on each provider participant's beneficiary population.
[9] Current and historical physician fee schedules can be accessed online at https://www.cms.gov/medicare/payment/fee-schedules/physician.
[10] HCPCS codes G2067–G2080 and G2086–G2088 are reserved procedure codes for OTPs billing under Medicare. They are used when billing for medication and other services that OTPs provide in the treatment of OUD.

3.3.2 Types of Providers Participating in the Demonstration

Figure 2 shows that, at the start of the demonstration in April 2021, the VIT-OUD Demonstration had 53 provider participants: 28 OTPs, 13 physician/nurse practitioner group practices, four HOPs, four FQHCs, three CCBHCs, and one CMHC, of which 94 percent were for-profit entities. As of December 2024 (the end of the demonstration), six provider participants (four physician/nurse practitioner group practices, one HOP, and one FQHC) had dropped out, leaving 47 providers. Of these 47 provider participants, 21 enrolled beneficiaries during the demonstration performance period. These included 13 OTPs, 6 physician/nurse practitioner group practices, and two HOPs. This report only evaluated the performance of these 21 provider participants, as all evaluation questions focused on beneficiary-level outcomes.

Figure 2. The Number and Type of VIT-OUD Demonstration Provider Participants



Note. Initially, in April 2021, CMS selected 53 provider participants. As of December 2024, 47 provider participants remained in the demonstration. Over the course of the demonstration, however, only 21 provider participants enrolled beneficiaries.

3.3.3 OUD Care Teams

As a condition of participation in the demonstration, providers were required to have or establish an OUD care team that employed or contracted with at least one physician furnishing primary care services or addiction treatment services and at least one physician or other health care practitioner able to prescribe or dispense MOUDs. Additionally, providers could optionally include in their OUD care team one or more practitioners licensed under state law to furnish psychological, counseling, or social services.

All OUD care teams continued to include staff who could prescribe or order MOUDs, as required by the demonstration. In the final year of the demonstration, all provider participants

reported that they had at least one care team member who could prescribe or dispense MOUDs. These team members were either medical doctors or clinicians such as nurse practitioners.

Care teams varied in the number of counselors, therapists, social workers, peer specialists, and community health workers. In the final year of the demonstration, OTPs had more behavioral health clinicians (counselors, therapists, social workers, peer specialists, and community health workers) than did group practices. OTPs had an average of six demonstration beneficiary enrollees per behavioral health clinician, whereas group practices had an average of 15 demonstration beneficiary enrollees per behavioral health clinician. The number of medical doctors, nurse practitioners, registered nurses, and physician assistants were, however, similar between OTPs and group practices. These clinician types had an average of eight demonstration beneficiary enrollees at OTPs, and these clinician types had an average of seven demonstration beneficiary enrollees at group practices.

3.4 Services That Provider Participants Furnished Under the Demonstration

The demonstration required that participating providers: 1) deliver services to participating beneficiaries based on an individualized OUD treatment plan, 2) align with OUD treatment services as defined in the SUPPORT Act and with other services furnished to the beneficiary for treating OUD, and 3) have a reasonable expectation of improving or maintaining the health or overall function of the beneficiaries.

CMS anticipated that the demonstration would enable the provision of enhanced services and comprehensive care coordination by allowing participants and their OUD care teams to provide services that address physical, behavioral, and health-related social needs for beneficiaries.

Provider participants who enrolled beneficiaries reported that they provided VIT-OUD services that went beyond prescribing or administering medications. **Figure 3** shows that—across the first three years of the demonstration—the following were the most common bundles of services reported and were provided by all or most participating providers:[11]

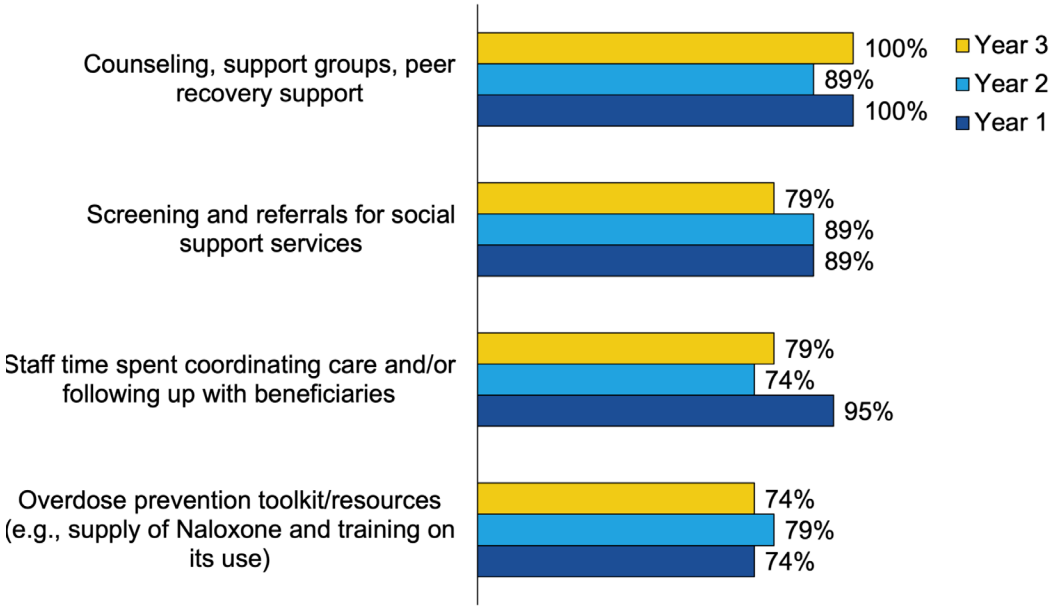
- Counseling, support groups, peer recovery support
- Screening and referrals for social support services
- Coordination of care and follow-up
- Overdose prevention toolkits or resources

Providers may or may not have added these services because of their participation in the VIT-OUD Demonstration.[12] For example, federal regulations that predate the demonstration required that OTPs offer counseling as part of their service array. However, Original Medicare

[11] Data from the last year of the demonstration were not available for a significant proportion of provider participants and were thus excluded.
[12] The survey questionnaire did not clarify whether services were added because of the VIT-OUD Demonstration nor whether they would have been provided outside of the demonstration.

does not typically cover some these services. For example, peer recovery support specialists were not eligible to bill to Medicare during most of the demonstration performance period.

Figure 3. Services That VIT-OUD Provider Participants Reported Offering to VIT-OUD Beneficiary Enrollees



Source: Calculations using a provider participant survey.
We included 19 provider participants in these calculations. These provider participants responded to all three survey waves and enrolled at least one beneficiary during the demonstration period. Two provider participants who enrolled beneficiaries were excluded. Collectively, the two excluded provider participants enrolled 30 of the 1,403 total beneficiaries.

3.5 Beneficiary Enrollees

3.5.1 Beneficiary Eligibility in the VIT-OUD Demonstration

To be eligible to enroll in the VIT-OUD Demonstration, beneficiaries had to meet the following criteria:

- Be enrolled in Medicare Part A and Part B
- Not be enrolled in a Medicare Advantage plan
- Have a current OUD diagnosis

Under the statute, applicable beneficiaries enrolled in the demonstration also had to sign an agreement form to receive OUD treatment services from a provider participant. Before submitting a claim for an applicable beneficiary under the demonstration, participants also had to notify beneficiaries via written notice of their enrollment, along with a summary of the beneficiary's rights under Section 1866(f) of the Social Security Act. These rights allowed beneficiaries to terminate enrollment in the demonstration at any time and to continue to see any Medicare provider they wish to receive medically necessary services that are covered by Medicare.

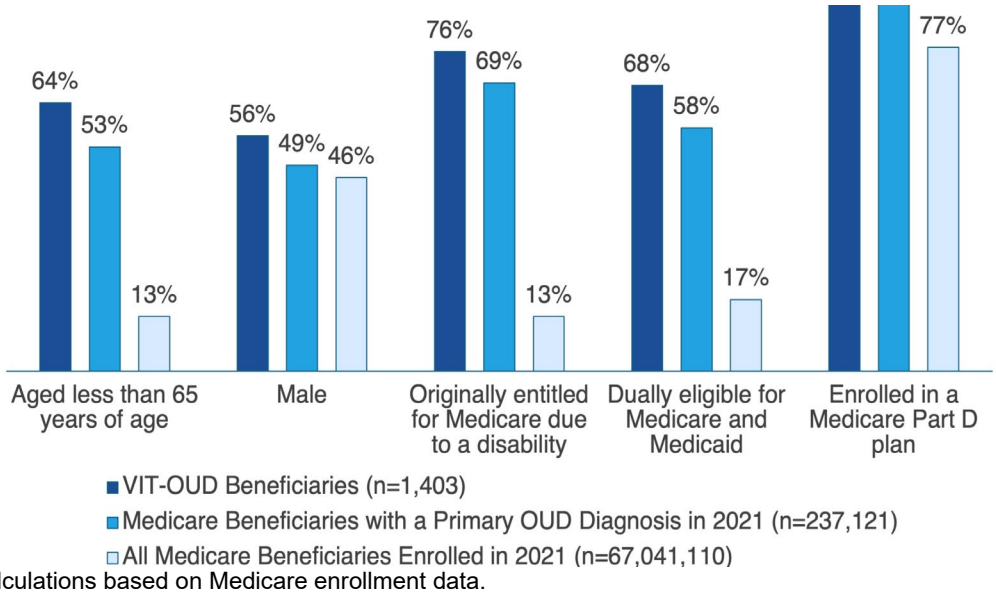
3.5.2 Beneficiary Enrollee Characteristics

Overall, 1,403 beneficiaries were enrolled in the VIT-OUD Demonstration and included in the evaluation.

VIT-OUD beneficiary enrollees differed in their characteristics from the overall Original Medicare population. However, VIT-OUD beneficiaries were like Medicare beneficiaries with OUD who did not participate in the demonstration. Specifically, **Figure 4** shows that VIT-OUD beneficiary enrollees were more likely than the overall Medicare population to be the following:

- **Younger:** VIT-OUD enrollees had a similar age distribution to all Medicare beneficiaries with an OUD diagnosis—63 versus 53 percent were younger than 65. In contrast, Medicare beneficiaries with an OUD diagnosis were much younger than all Original Medicare beneficiaries—53 versus 13 percent were younger than 65.
- **Male:** A greater proportion of VIT-OUD beneficiary enrollees (56 percent) were male than all Medicare beneficiaries with OUD (49 percent) and the overall Medicare population (46 percent).
- **Originally entitled to Medicare due to a disability:** 76 percent of VIT-OUD enrollees had a disability. In comparison, 69 percent of all Medicare beneficiaries with an OUD diagnosis and 13 percent of the overall Medicare population had a disability.
- **Dually eligible for Medicare and Medicaid:** 68 percent of VIT-OUD beneficiary enrollees were dually eligible, whereas 58 percent of all Medicare beneficiaries with an OUD diagnosis and 17 percent of the overall Medicare population were dually eligible.
- **Enrolled in a Medicare Part D plan:** 88 percent of VIT-OUD beneficiary enrollees were enrolled in a Part D plan. Similarly, 87 percent of all Medicare beneficiaries with an OUD diagnosis, but only 77 percent of the overall Medicare population were enrolled in a Part D plan.

Figure 4. Characteristics of VIT-OUD Beneficiary Enrollees Compared with Other Original Medicare Beneficiaries



Source: Calculations based on Medicare enrollment data.

Like other beneficiaries with OUD, VIT-OUD beneficiary enrollees had multiple comorbid conditions. **Table 1** shows that the top two comorbid conditions observed among all Medicare beneficiaries with an OUD diagnosis and among VIT-OUD beneficiary enrollees were chronic pain and related conditions and mental health conditions. VIT-OUD beneficiary enrollees had slightly lower rates of comorbid conditions than the broader population of Medicare beneficiaries with an OUD diagnosis. This finding may reflect that VIT-OUD beneficiary enrollees were slightly younger than other Medicare beneficiaries with OUD. On average, VIT-OUD beneficiary enrollees were 57 years of age (standard deviation: 12 years), whereas other Medicare beneficiaries with OUD were 61 years of age (standard deviation: 14 years).

Table 1. Comorbid Conditions Among VIT-OUD Demonstration Beneficiary Enrollees Compared with Medicare Beneficiaries with Primary OUD Diagnoses

Condition	VIT-OUD Demonstration Beneficiary Enrollees, 12 Months Prior to Enrollment (n=1,403)	Medicare Beneficiaries with a Primary OUD Diagnosis, 2021 (n=237,121)
Chronic Pain and Related Conditions	75%	83%
Mental Health Conditions	76%	78%
Hypertension	62%	70%
Hyperlipidemia	48%	58%
Anemia	29%	37%
Heart Disease	25%	33%
Diabetes	24%	31%
Hypothyroidism	16%	22%
Liver Disease	20%	21%
Peripheral Vascular Disease	13%	21%
Chronic Kidney Disease	13%	20%
Pneumonia	17%	20%
Viral Hepatitis	29%	18%
Stroke	10%	13%
Benign Prostatic Hyperplasia (BPH)	10%	12%
Ulcers	10%	12%
Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS)	3%	2%

Source: Calculations based on Medicare enrollment and chronic conditions data.

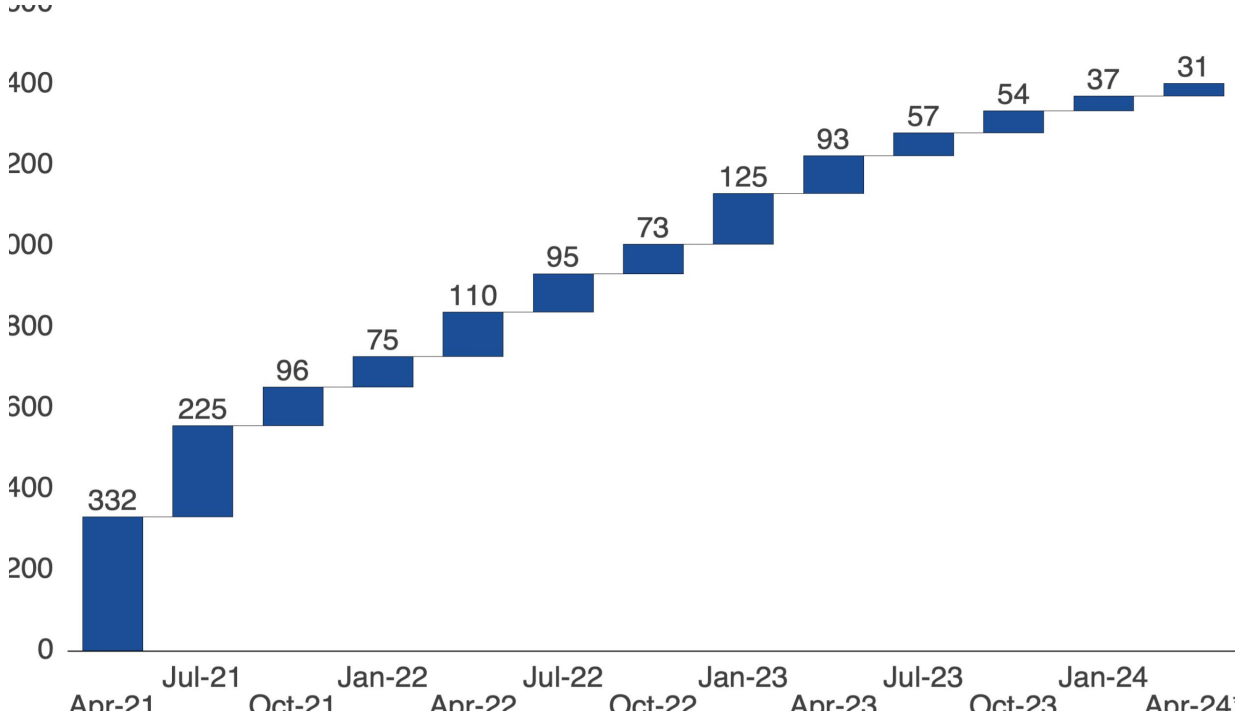
Prior to enrollment, most VIT-OUD beneficiary enrollees were already receiving MOUDs. Seventy-five percent of VIT-OUD beneficiary enrollees had received an MOUD at least once during the 12 months before enrollment. In contrast, data from 2021 show that only 45 percent of Original Medicare beneficiaries with a primary OUD diagnosis received an MOUD.

3.6 Provider Participation Challenges

Provider participants reported the following challenges related to their participation in the demonstration:

- ***Enrolling eligible beneficiaries in the demonstration***. Beneficiary enrollment was lower than expected. Only 21 of the 47 provider participants enrolled any beneficiaries in the VIT-OUD Demonstration. **Figure 5** shows, however, that enrollment of new beneficiaries was steady over most of the performance period, with decreased enrollment at the end of the demonstration. Lower-than-expected enrollment may have been due to beneficiaries primarily being enrolled in Medicare Advantage rather than in Original Medicare (beneficiaries enrolled in Medicare Advantage were not eligible for the demonstration). Also, some OTPs reported difficulty in getting beneficiaries to sign agreement forms because OTPs already provide a robust level of services, and beneficiaries do not see additional benefits of participating in the demonstration.
- ***Engaging and retaining staff***. Staff turnover was a challenge and stemmed from ongoing or downstream effects associated with staffing disruptions resulting from the COVID-19 pandemic, which was particularly impactful among these provider participants.
- ***Lack of familiarity with implementing a demonstration.*** Provider participants who were not OTPs or group practices reported because they were unfamiliar with how to implement a demonstration.
- ***Obtaining beneficiary agreement forms.*** Some provider participants reported challenges with obtaining the beneficiary agreement forms required by the demonstration. These forms asked beneficiaries to agree to participate in the VIT-OUD Demonstration and to allow their health data to be shared.
- ***Billing issues***, including difficulty successfully submitting CMF claims and incorrect denials, may have also contributed to the lower-than-expected beneficiary enrollment. Although most billing issues were resolved early in the demonstration period, some issues persisted into the third demonstration year.

Figure 5. The Number of Beneficiaries Enrolled in Each Demonstration Quarter, April 2021 to December 2024



* The last three quarters of enrollment were combined for privacy reasons. Fewer than 11 beneficiaries were enrolled in each of the last two quarters, July through September 2024 and October through December 2024.
Source: Calculations using Original Medicare claims data.
A total of 1,403 beneficiaries were enrolled over the entire demonstration period (April 2021 through December 2024).

CMS worked with provider participants to help overcome some barriers. For example, CMS conducted webinars with provider participants to identify challenges and solutions through a peer-learning environment. Also, CMS developed a billing manual that provided detailed guidance to provider participants, which resolved the billing issues.

In contrast, challenges related to enrollment were difficult for CMS to address. The SUPPORT Act made $10M available for the purpose of making CMF and incentive payments. Because of lower-than-expected enrollment, just over 20 percent of this budget was expended. Unfortunately, these funds could not be shifted to the operational budget due to statutory restrictions. Thus, CMS could not support efforts such as technical assistance, learning contractor support, and access to data systems that would allow for easier communication with providers. Moreover, CMS could not enroll a second cohort of provider participants, despite recognizing early on that beneficiary enrollment numbers were going to be lower than expected.

Provider participants identified strategies that helped with enrolling beneficiaries:

- Identifying eligible Medicare beneficiaries with an existing OUD diagnosis and enrolling during a face-to-face visit
- Conducting data analyses to identify Medicare beneficiaries with OUD in the community
- Educating external partners on VIT-OUD services

4 Evaluation Overview

4.1 Evaluation Questions

This report answers questions about the impact of the demonstration on outcomes specified in the SUPPORT Act. Specifically, the goal of this report is to answer the following questions:

1. Did the VIT-OUD Demonstration reduce hospitalizations and ED visits?
2. Did the VIT-OUD Demonstration increase the use of MOUDs?
3. Did the VIT-OUD Demonstration improve health outcomes of individuals with OUD, including by reducing the incidence of infectious diseases (such as hepatitis C and HIV/AIDS)?
4. Did the VIT-OUD Demonstration increase or not increase the total spending on items and services covered under the original Medicare legislation?
5. Did the VIT-OUD Demonstration reduce the number of deaths from opioid overdose?
6. Did the VIT-OUD Demonstration reduce the utilization of inpatient residential SUD treatment?

4.2 Evaluation Approach

To evaluate the VIT-OUD Demonstration, CMS first matched the 1,403 demonstration beneficiary enrollees with a comparison group of Medicare beneficiaries who had OUD and received care from similar provider types as the VIT-OUD provider participants. Second, CMS compared outcomes between the VIT-OUD beneficiary enrollees and the matched comparison group. For example, to assess whether the VIT-OUD Demonstration reduced hospitalizations, CMS calculated the difference in the hospitalization rate observed among VIT-OUD beneficiary enrollees post-enrollment and the hospitalization rate observed in the matched comparison group after receiving care from a comparison practice. Comparison group strategy details are provided in **Appendix A**. Question-by-question details about the approach used are provided in **Appendix B**. Outcome specifications are provided in **Appendix C**.

CMS used Original Medicare claims data from April 2021 through December 2024 to derive all outcome measures. These data represent the entire duration (four performance years) of the demonstration.

5 Evaluation Findings

5.1 Did the VIT-OUD Demonstration Reduce Hospitalizations and ED Visits?

The VIT-OUD Demonstration was associated with fewer hospitalizations, SUD-related hospitalizations, ED visits, and SUD-related ED visits. **Table 2** shows that VIT-OUD beneficiary enrollees had 20 percent fewer hospitalizations (p = .01), 39 percent fewer SUD-related hospitalizations (p = .02), 19 percent fewer ED visits (p = .01), and 51 percent fewer SUD-related ED visits (p = .004) than did the matched comparison group.

Table 2. Impacts of the VIT-OUD Demonstration on Hospitalizations and ED Visits

Outcome	VIT-OUD Demonstration Beneficiary Enrollees Outcome Rate	Post-Matched Comparison Group Outcome Rate	Difference	Percentage Difference	P-Value
Average number of hospitalizations per 1,000 beneficiaries per month	49.4	61.7	**–12.2**	**19.8%**	**.01**
Average number of SUD-related hospitalizations per 1,000 beneficiaries per month	4.2	7.0	**–2.7**	**39.1%**	**.02**
Average number of ED visits per 1,000 beneficiaries per month	107.5	133.2	**–25.7**	**19.3%**	**.01**
Average number of SUD-related ED visits per 1,000 beneficiaries per month	6.8	13.8	**–7.1**	**51.2%**	**.004**

Bolded numbers indicate estimates that are statistically significant with a p-value < .10.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.

Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample size: 1,403 demonstration beneficiaries and 4,209 comparison beneficiaries.

5.2 Did the VIT-OUD Demonstration Increase the Use of MOUDs?

The VIT-OUD Demonstration was associated with a higher likelihood of a beneficiary enrollee using an MOUD within 30 days of their first visit to a participating provider after enrolling, and of using an MOUD continuously for at least 180 days. **Table 3** shows that VIT-OUD beneficiary enrollees were five percent more likely than the matched comparison group to use an MOUD within 30 days of their earliest visit (p < .001) and 34 percent more likely to use an MOUD continuously for at least 180 days (p < .001). Among the subset of beneficiaries who had not received an MOUD at least once during the 12 months prior, VIT-OUD beneficiary enrollees were also 56 percent more likely than the matched comparison group to use an MOUD within 30 days of their earliest visit (p < .001)

Table 3. Impacts of the VIT-OUD Demonstration on Use of MOUDs

Outcome	VIT-OUD Demonstration Beneficiary Enrollees, %	Post-Matched Comparison Group, %	Difference	Percentage Difference	P-Value
Beneficiaries who used MOUDs within 30 days of their first visit	87%	83%	**4 pp**	**5%**	**<.001**
Beneficiaries who used MOUDs within 30 days of their first visit *among those who had not used MOUDs at baseline*	42%	27%	**15 pp**	**56%**	**<.001**
Beneficiaries who used an MOUD continuously for at least 180 days	60%	44%	**15 pp**	**35%**	**<.001**

Bold numbers indicate estimates that are statistically significant with a p-value < .10.
pp = percentage point.
Inclusion criteria: Beneficiaries with Medicare Part D. The percentage of beneficiaries who used an MOUD continuously for at least 180 days only includes those who had at least one MOUD prescription fill or claim at least 180 days before December 31, 2024.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.
Methods: Beneficiaries in the comparison group were propensity score matched to beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample size: 1,240 demonstration beneficiaries and 3,720 comparison beneficiaries were included in the use of MOUDs within 30 days measure. 269 demonstration beneficiaries and 807 comparison beneficiaries were included in the use of MOUDs within 30 days measure among those with no baseline MOUD use. 1,052 demonstration beneficiaries and 3,156 comparison beneficiaries were included in the continuous use of MOUDs measure.

5.3 Did the VIT-OUD Demonstration Improve Health Outcomes of Individuals with OUD, Including by Reducing the Incidence of Infectious Diseases, Such as Hepatitis C and HIV?

The VIT-OUD Demonstration was not associated with a statistically significant reduction in new diagnoses (incidence) of hepatitis C. **Table 4** shows that, among VIT-OUD beneficiary enrollees with no history of hepatitis C diagnosis in the past three years (n = 1,144), seven percent had an incident diagnosis of hepatitis C after enrollment. This percentage was not statistically significantly different from the eight percent of beneficiaries in the matched comparison group who had an incident diagnosis of hepatitis C (p = .14).

Table 4. Impact of the VIT-OUD Demonstration on Incidence of Hepatitis C

Outcome	VIT-OUD Demonstration Beneficiary Enrollees, %	Post-Matched Comparison Group, %	Difference	Percentage Difference	P-Value
Percentage of beneficiaries who had a new incident diagnosis of hepatitis C	7%	8%	–1 pp	15%	.14

pp = percentage point.
Inclusion criteria: Beneficiaries who had not had a hepatitis C diagnosis in the three years before they enrolled or were attributed to a comparison practice.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.
Methods: Beneficiaries in the comparison group were propensity score matched to beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample size: 1,144 demonstration beneficiaries and 3,432 comparison beneficiaries.

Data were insufficient to determine the impact of the demonstration on the incidence of HIV/AIDS. There were fewer than 11 new diagnoses (incident cases) of HIV/AIDS among VIT-OUD beneficiary enrollees. CMS has a policy of not reporting data on fewer than 11 cases to protect the privacy of individuals. Among the unmatched comparison group, 0.6 percent of beneficiaries had a new HIV/AIDS diagnosis.

5.4 Did the VIT-OUD Demonstration Increase Total Spending?

The VIT-OUD Demonstration was associated with lower Medicare spending. **Table 5** shows that VIT-OUD beneficiary enrollees spent 12 percent less PBPM before accounting for demonstration payments ($p = .01$) and 10 percent less PBPM after accounting for demonstration payments ($p = .04$) than did the matched comparison group. The estimated cost savings are almost entirely accounted for by lower inpatient expenditures. VIT-OUD beneficiary enrollees also spent 26 percent less PBPM on inpatient care ($p < .001$) and almost 50 percent less PBPM on SUD-related inpatient care ($p = .01$) than the matched comparison group. The differences in ED expenditures PBPM and SUD-related ED expenditures PBPM were not statistically significant.

More than 45K beneficiary-months were observed in the demonstration group. Thus, the 12 percent reduction in Medicare spending represents savings of over $15M. After accounting for demonstration payments, the 10 percent reduction in Medicare spending represents savings of over $12M. Per beneficiary, we estimate that the demonstration saved an average of $8,887.

Table 5. Impacts of the VIT-OUD Demonstration on Total Medicare Spending

Outcome	VIT-OUD Demonstration Beneficiary Enrollees, $	Post-Matched Comparison Group, $	Difference	Percentage Difference	P-Value
Total Medicare expenditures (excluding VIT-OUD demonstration payments) PBPM	$2,382.64	$2,720.97	**–$338.33**	**12.4%**	**.01**
Total Medicare expenditures (including VIT-OUD demonstration payments) PBPM	$2,454.32	$2,720.97	**–$266.65**	**9.8%**	**.04**
Inpatient expenditures PBPM	$690.77	$937.86	**–$247.09**	**26.3%**	**<.001**
SUD-related inpatient expenditures PBPM	$33.06	$65.51	**–$32.45**	**49.5%**	**.01**
ED expenditures PBPM	$82.74	$87.75	–$5.01	5.7%	.51
SUD-related ED expenditures PBPM	$5.29	$7.06	–$1.78	24.2%	.39

Bolded numbers indicate estimates that are statistically significant with a p-value < .10.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.
Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample sizes: 1,403 demonstration beneficiaries; 4,209 comparison beneficiaries.

5.5 Did the VIT-OUD Demonstration Reduce the Number of Deaths from Opioid Overdose?

There was a statistically significant difference in opioid overdose mortality risk for VIT-OUD beneficiary enrollees relative to a matched comparison group. **Table 6** shows that the opioid overdose mortality risk was 35 percent lower for VIT-OUD beneficiary enrollees than for the matched comparison group (p = .09). All-cause mortality risks were also lower, but this estimate was not statistically significant (–9 percent; p = .42).

Table 6. Impacts of the VIT-OUD Demonstration on Opioid Overdose and All-Cause Mortality Risk

Outcome	Percentage Difference in Risk	P-Value
Opioid overdose mortality risk	**–35%**	**.09**
All-cause mortality risk	–9%	.42

Bolded numbers indicate estimates that are statistically significant with a p-value < .10.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.
Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample sizes: 1,403 demonstration beneficiaries; 4,209 comparison beneficiaries.

5.6 Did the VIT-OUD Demonstration Reduce the Utilization of Inpatient Residential Treatment?

The VIT-OUD Demonstration was not associated with a statistically significant reduction in the utilization of inpatient residential SUD treatment. Medicare does not cover residential treatment for SUD. Accordingly, CMS used Medicaid claims data to assess whether utilization of residential treatment for SUD differed between the demonstration and matched comparison groups. This finding required CMS to use a subsample of beneficiaries who were dually eligible for Medicare and Medicaid and, due to data lags, to exclude beneficiaries who were enrolled after December 2022. **Table 7** shows that two percent of VIT-OUD beneficiaries who were dually enrolled in Medicare and Medicaid had at least one residential treatment visit for SUD versus one percent of the matched comparison group. The difference was not statistically significant (p = .24).

Table 7. Impacts of the VIT-OUD Demonstration on Inpatient Residential Treatment

Outcome	VIT-OUD Demonstration Beneficiary Enrollees, %	Matched Comparison Group, %	Difference	Percentage Difference	P-Value
Had at least one residential SUD treatment stay	2%	1%	.6 pp	57%	.24

pp = percentage point; SUD = substance use disorder.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2022.
Inclusion criteria: Beneficiaries who were dually eligible for Medicare and Medicaid and who were enrolled/were attributed before December 31, 2022.
Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. The impact is measured as the difference in the demonstration group outcome rate and the comparison group outcome rate.
Sample size: 708 demonstration beneficiaries and 2,124 comparison beneficiaries.

6 Discussion and Summary

The evaluation revealed that, compared with a similar group of patients treated by similar providers, VIT-OUD beneficiary enrollees were more likely to initiate use of MOUDs and to remain on MOUDs for at least 180 days. VIT-OUD beneficiary enrollees also had a lower risk of opioid overdose mortality, and they had fewer hospitalizations, fewer SUD-related hospitalizations, fewer ED visits, and fewer SUD-related ED visits than those in the matched comparison group. Medicare expenditures, with and without VIT-OUD Demonstration payments, were lower for VIT-OUD beneficiary enrollees than for those in the matched comparison group. Inpatient cost savings were the largest category of savings, with an estimated $247.09 PBPM.

Considering the high mortality and morbidity rates associated with OUD, and the challenges of engaging patients in high-quality treatment, these findings indicate that the VIT-OUD

Demonstration was highly successful in meeting its goals of improving quality and maintaining or decreasing costs.[13, 14]

The findings in this report are different from the intermediate report to Congress. Although we previously found evidence of impacts on expenditures and hospital-based utilization, we did not find evidence that the demonstration increased the use of MOUDs in the intermediate report to Congress. The findings are likely different because the final sample size was substantially larger than that of the intermediate evaluation and because there was a longer period to observe the demonstration participants. However, we also explored some additional explanations for why the demonstration could have achieved impacts on hospitalizations, ED visits, and spending outside of an increase in the use of MOUDs. Although the final evaluation shows that MOUD use increased among demonstration beneficiary enrollees, other variables may be at responsible. Based on discussions with provider participants, the demonstration provider participants perceived that they were better able to achieve treatment engagement among beneficiary enrollees. This perception coincides with the finding in this report that beneficiary enrollees were more likely to remain on MOUDs for at least 180 days. We also reviewed descriptive data that suggest that OTPs that participated in the demonstration may have offered a more-robust set of services than other OTPs that serve Medicare beneficiaries. This finding suggests that wraparound services (e.g., mentoring/peer support, various counseling services, self-help groups, counseling for infectious disease management and support) could have been a key driver of enhanced patient engagement in the demonstration. See **Appendix D** for a more detailed discussion of these exploratory analyses.

Although the demonstration had several notable impacts, we did not find statistically significant impacts on hepatitis C incidence, all-cause mortality, or residential SUD treatment. Moreover, HIV/AIDS incidence was too rare to report. Fewer than 11 new diagnoses of HIV/AIDS were observed in the demonstration group. Thus, although VIT-OUD beneficiary enrollees had a lower rate of new HIV/AIDS diagnoses than the unmatched comparison group, we cannot report exact rates for privacy reasons.

Data presented in this report also highlight that Medicare beneficiaries with OUD are likely to have multiple comorbid conditions, which may require coordination with primary care or other specialty providers, including behavioral health care specialists. A supplemental analysis showed that VIT-OUD beneficiary enrollees had fewer avoidable ED visits (see **Appendix D**) than the matched comparison group. This finding suggests that demonstration provider participants may have done a better job than comparison providers at connecting beneficiaries with services to address comorbid conditions in ambulatory settings.

Provider participants faced several challenges with enrolling beneficiaries, which contributed to lower-than-expected enrollment numbers. Over the past decade of designing and implementing new health care models, the Innovation Center has learned a lot about how to support providers

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[13] Spencer MR, Miniño AM, Warner M. Drug overdose deaths in the United States, 2001–2021. NCHS Data Brief, no 457. Hyattsville, MD: National Center for Health Statistics. 2022. https://doi.org/10.15620/cdc:122556.

[14] Han, BH, Sherman, SE, Palamar JJ. Prescription opioid misuse among middle-aged and older adults in the United States, 2015-2016. Prev. Med. 121:94-98, Apr 2019.

from an operational perspective including that providing real-time technical assistance to provider participants is critical for helping providers achieve the goals of models and demonstrations.[15] Unfortunately, the funding for the VIT-OUD Demonstration was not structured in a way that could support the delivery of technical assistance to help provider participants overcome enrollment challenges in real time.

The evaluation had some limitations. First, although we controlled for many observable differences between beneficiaries in the demonstration and comparison group, unobservable differences may have existed. For example, beneficiaries who agreed to participate in the demonstration may have been more motivated to reduce their opioid use or may have had more family and other social support than comparison beneficiaries. Second, because most VIT-OUD beneficiary enrollees were already receiving MOUDs prior to enrollment suggests that the results may not be generalizable to Medicare beneficiaries who have never received MOUDs.

The data presented in this report show that the demonstration had important clinical and economic impacts. Reductions in opioid overdose mortality risk, SUD-related hospitalizations, and SUD-related ED visits strongly suggest that beneficiary enrollees' clinical functioning improved. The reduction in total expenditures further highlights that addressing SUD for Medicare enrollees may be an effective way to lower health care costs in the Medicare program. The findings in this report support CMS' ongoing efforts at addressing behavioral health in the Medicare and Medicaid programs, such as through the recently launched Innovations in Behavioral Health (IBH) Model. In fact, when CMS was designing the IBH Model, it drew on lessons learned from VIT-OUD and other previous Innovation Center models.[16] Moreover, these findings suggest that an important component of future efforts will be finding ways to improve beneficiary engagement in their treatment.

[15] Smith, B. CMS Innovation Center at 10 Years—Progress and Lessons Learned. N Engl J Med. 384(8): 759-764, Jan 2021. https://doi.org/10.1056/NEJMsb2031138.

[16] See CMS Announces New Model to Advance Integration in Behavioral Health.

Appendix A: Comparison Group Approach

CMS used a two-phased comparison group selection strategy. In the first phase, CMS matched demonstration provider participants with a pool of comparison practices. In the second phase, CMS matched demonstration beneficiary enrollees with a pool of beneficiaries who were attributed to the practices selected in the first phase. This appendix documents details of this comparison group selection strategy.

A.1 Matching Comparison Practices

To identify comparison practices, we undertook the following steps:

- Identified practices participating in the demonstration.
- Identified potential comparison practices.
- Created practice-level and geographic-level characteristics to match demonstration and comparison practices.
- Matched comparison practices with demonstration participants on practice-level and area-level characteristics.

A.1.1 Identifying Practices that Participated in the Demonstration

As of the end of the demonstration in December 2024, there were 47 practices participating in the VIT-OUD Demonstration (see **Table A-1**). CMS used the following information to identify demonstration practices in the Medicare claims data: Tax Identification Number (TIN), CMS certification number (CCN), National Provider Identifier (NPI), demonstration state, and demonstration Social Security Administration county code. CMS decided that the following information would be used to identify demonstration practices in the claims data: TIN on noninstitutional claims (i.e., carrier claims) and CCN on institutional claims (i.e., outpatient claims).

Table A-1. Practice Entity Types Selected for Participation in the VIT-OUD Demonstration

Entity Type	Number of Demonstration Practices (%)	Number of Demonstration Practices That Enrolled Beneficiaries, April 2021–December 2024 (%)
OTP	28 (60%)	13 (62%)
Physician/Nurse Practitioner Group Practice	9 (19%)	6 (29%)
HOP	3 (6%)	2 (9%)
FQHC	3 (6%)	0 (0%)
CCBHC	3 (6%)	0 (0%)
CMHC	1 (2%)	0 (0%)
Total	47	21

Not all 47 practices enrolled beneficiaries during the study period. After identifying practices in the claims data, CMS identified the practices that had enrolled beneficiaries in the demonstration between April 2021 and December 2024. Of the 47 participating practices, only 21 enrolled beneficiaries during this time. **Table A-1** shows the distribution of practices that had enrolled beneficiaries.

CMS looked for demonstration practices (TINs and CCNs) in the carrier and outpatient claims (respectively) from April 2020 through March 2021. This period is one year before the VIT-OUD Demonstration was implemented.

A.1.2 Identifying Potential Comparison Practices

CMS used the same carrier and outpatient claims from April 2020 through March 2021 that we used to identify demonstration practices to identify a pool of potential comparison practices. We applied the following steps:

- Identify all TINs and CCNs that meet the following criteria:
  - The TIN or CCN was on at least one claim with a primary diagnosis of opioid use disorder (OUD), and
  - The TIN or CCN was on at least one claim where the practice location was within one of the states where the VIT-OUD Demonstration practices are located.

  This provided us with a set of TINs or CCNs that provided some treatment for OUD in the year before the VIT-OUD Demonstration was implemented and that were in the same states as the VIT-OUD Demonstration practices.
- Eliminate practices (TINs or CCNs) that did not overlap on entity type with the demonstration practices. **Table A-2** describes the place of service (POS), Healthcare Common Procedure Coding System (HCPCS) codes, and CCNs (referred to as provider numbers in the claims data) that were used to identify entity types.
- Identify whether any of the TINs or CCNs remaining in the pool of potential comparison practices were participating in any of the following Centers for Medicare and Medicaid Innovation models: Maryland Primary Care Physicians, Primary Care First, or Comprehensive Primary Care Plus using demonstration IDs. Practices participating in these models were ineligible to participate in the VIT-OUD Demonstration and were thus removed from the pool of potential comparison practices.

Table A-2. Algorithms for Identifying Entity Type on Carrier and Outpatient Claims

Entity Type	Algorithm for Identifying on Carrier Claims	Algorithm for Identifying on Outpatient Claims
OTP	POS = 58 plus HCPCS_CD = G2067–G2080 or G2215–G2216	HCPCS_CD = G2067–G2080 or G2215–G2216
Physician/Nurse Practitioner Group Practice	Define as a group practice if: – there is a provider specialty code for physician or nurse practitioner on at least 50% of claim line items billed by the TIN and – at least two unique NPIs are affiliated with the TIN.	Not applicable.
HOP	Not applicable.	PRVDR_NUM* = 0001–0879
FQHC	POS = 50	PRVDR_NUM* = 1800–1989
CMHC	POS = 53	PRVDR_NUM* = 1400–1499, 4600–4799, or 4900–4999

* PRVDR_NUM is a six-digit code. The first two digits represent the state, and the last four digits can be used to categorize the type of provider. All PRVDR_NUMs listed in this table represent the third through sixth digits of the six-digit number.

A.1.3 Create Practice- and Geographic-Level Characteristics to Match Demonstration and Comparison Practices

Beyond matching on entity type and state, CMS also matched on the following practice- and geographic-level characteristics:

- Number of practitioners within the practice administering MOUD
- Number of practitioners within the practice prescribing MOUD
- Number of practitioners in the practice's service location(s) that were waived by the Drug Enforcement Agency to prescribe buprenorphine

Matching on entity type is important because we anticipate that some entity types, such as OTPs, will have better outcomes across most measures because they have the existing staffing and other infrastructure to provide MOUDs and other ancillary services such as HIV testing.[17] We also matched directly on a practice's supply of practitioners who directly administer and prescribe MOUD to ensure that the comparison practices closely matched the size and capacity of demonstration practices.

Community-level supply of MOUD is another important aspect for which to control because higher levels of supply could explain better baseline access to MOUDs in the demonstration population.

Other practice- and geographic-level characteristics were considered, but not included, because preliminary testing showed that including these other factors did not produce a better-balanced sample on these or the included factors. For example, CMS initially tried to balance on not-for-profit status, but could not achieve balance on this factor, and the other factors included were

[17] Cohn A, Stanton C, Elmasry H, Ehlke S, Niaura R. Characteristics of U.S. substance abuse treatment facilities offering HIV services: results from a national survey. Psychiatr Serv. 2016 Jun 1;67(6):692-5. https://doi.org/10.1176/appi.ps.201500078. Epub 2016 Mar 15. PMID: 26975517.

less balanced than in the model we ultimately used. Thus, for practical reasons we did not balance not-for-profit status.

A.1.4 Matching Demonstration and Comparison Practices

Table A-3 shows that we identified 3,549 OTPs, physician/nurse practitioner group practices, or HOPs that could serve as potential comparison practices for the 21 demonstration practices that had enrolled beneficiaries in the VIT-OUD Demonstration. The comparison practices differed in some observable ways from the demonstration practices. Specifically, the proportion of comparison practices that are physician/nurse practitioner group practices or HOPs is substantially higher among comparison practices than among demonstration practices. In contrast, there are much fewer OTPs among the comparison practices than among demonstration practices. Most demonstration practices had practitioners administering MOUD (average 1.38 per practice), but only about one in three potential comparison practices did (average 0.33 per practice).

Table A-3. Characteristics of the Value in OUD Treatment Demonstration Practices and Potential Comparison Practices, Before Matching

Characteristic	Demonstration Practices, Mean/%	Potential Comparison Practices, Mean/%
Number	21	3,549
Entity type:		
OTP	62%	17%
Group practice	29%	52%
HOP	9%	31%
MOUD supply in practice's service location(s):		
Number of practitioners administering MOUD at practice	1.38	0.33
Number of MOUD prescribers at practice	3.81	2.58
Number of buprenorphine-waived physicians in practice's service location	31.38	28.04

Description of the matching methods employed. CMS chose to use coarsened exact matching.[18] Although CMS evaluated multiple specifications, the following approach produced the best balance as evidenced by the smallest absolute standardized mean differences (ASMDs). CMS exact matched on entity type and state. This model also matched on the number of MOUD administering practitioners and prescribers and the number of Drug Enforcement Agency–waived providers in the practice's service location(s) who could prescribe

[18] Iacus S, King G, Porro, G. Causal inference without balance checking: coarsened exact matching. Polit Anal. 2012;20(1):1-24. https://doi.org/10.1093/pan/mpr013

MOUDs. Using this method, 3,381 comparison practices were matched with the 21 demonstration practices.

Matching results. Table A-4 shows that, after matching 3,381 comparison practices with the 21 demonstration practices, there was good balance on almost all characteristics. Good balance was defined as an absolute standardized mean difference less than 0.1. The percentage of practices that were HOPs was slightly imbalanced; however, balance improved on all characteristics. We also match on entity type in the beneficiary-level matching, so a slight imbalance on HOPs was not a cause for concern.

Table A-4. Characteristics of the VIT-OUD Demonstration Practices and Potential Comparison Practices, Before and After Matching

Characteristic	Before Matching			After Matching	
	Demonstration Practices, Mean/%	Potential Comparison Practices, Mean/%	ASMD	Post-matched Comparison Practices, Mean/%	ASMD
Number	21	3,549		3,381	
Entity type:					
OTP	62%	17%	1.040	62%	<.001
Physician/nurse practitioner group practice	29%	52%	.492	25%	.087
HOP	10%	31%	.559	13%	.122
MOUD supply in practice's service location(s):					
Number of practitioners administering MOUD at practice	1.38	0.33	.738	1.20	.100
Number of MOUD prescribers at practice	3.81	2.58	.198	3.42	.060
Number of buprenorphine-waived physicians per 100K residents	31.38	28.04	.053	31.07	.007

Interpretation: ASMD < 0.1 indicates good balance between the demonstration and comparison practices.

A.2 Approach for Balancing Beneficiary-Level Characteristics

The goal of the second phase of the comparison group strategy was to identify a beneficiary comparison group. To identify a beneficiary comparison group, we undertook the following steps:

- Identified VIT-OUD Demonstration beneficiaries.
- Identified potential comparison beneficiaries.
- Created baseline and sociodemographic characteristics of the VIT-OUD beneficiary enrollees and beneficiaries who were attributed to a matched comparison practice.
- Performed 1:3 propensity score matching on baseline and sociodemographic characteristics.

A.2.1 Identifying VIT-OUD Demonstration Beneficiary Enrollees

VIT-OUD Demonstration beneficiary enrollees were identified as beneficiaries for whom the demonstration practices submitted a care management fee claim. CMF claims are defined in the claims as those claim lines wherein the following occur:

- The TIN or CCN is associated with one of the demonstration provider participants.
- The organizational NPI is one of the NPIs that CMS approved for billing under the VIT-OUD Demonstration.
- A HCPCS code is G2172.
- A demonstration code is 99.

For each beneficiary enrollee, we also recorded the first demonstration quarter in which they had a CMF claim.

A.2.2 Identifying Potential Comparison Beneficiaries

Comparison beneficiaries were identified as beneficiaries whom CMS could attribute to the matched comparison practices from the first phase of the comparison group strategy. Attribution was conducted on a quarterly basis. In each quarter, CMS identified beneficiaries who were receiving OUD treatment from the comparison practices and assigned beneficiaries to the practice at which they received most of their care during that quarter. If there were ties between comparison practices, the beneficiary was assigned to the practice where they most recently received OUD treatment within the quarter. CMS also recorded the first quarter in which each comparison beneficiary was attributed to a comparison practice. Prior to conducting this attribution, CMS excluded beneficiaries who were ever enrolled by demonstration practices. This approach ruled out the possibility of a beneficiary switching from the comparison group to the demonstration group or vice versa.

A.2.3 Creating Baseline Characteristics Upon Which to Match

CMS matched beneficiaries on the following characteristics:

- Sociodemographic characteristics: age, sex, race/ethnicity, original reason for Medicare entitlement
- Baseline clinical characteristics: Hierarchical Condition Category risk score, number of comorbid chronic conditions, co-occurring mental health diagnoses, new or existing OUD diagnosis, baseline testing for infectious diseases, baseline diagnosis of infectious diseases
- Coverage characteristics: Part D plan enrollment, enrollment in a low-income subsidy Part D plan, dual eligibility for Medicare and Medicaid
- Other characteristics: baseline use of medications to treat OUD, baseline time in treatment prior to the demonstration

In addition to these characteristics, CMS also derived measures capturing baseline use of prescription opioid analgesics and benzodiazepines; baseline health care utilization and expenditure measures, and indicators for any methadone or buprenorphine use prior to enrollment.

A.2.4 Matching Beneficiaries from the Comparison Group with Those in the Demonstration Group

To match beneficiaries from the comparison group with those from the demonstration group, CMS performed 1:3 propensity score matching. Under this approach, a Probit regression was used to estimate the probability that a beneficiary was in the demonstration group as a function of sociodemographic and baseline characteristics. The specific characteristics included were outcome dependent. For each outcome type, CMS assessed the extent to which each of the characteristics outlined above were correlated with the outcome. To ensure a parsimonious model specification, CMS only included characteristics that correlated with the outcome. This was important given the smaller sample size of the demonstration group. CMS then performed 1:3 matching on the estimated propensity score, matching exactly three beneficiaries without replacement from the comparison group for each beneficiary in the demonstration group.

A.3 Propensity Score Matching Results for Questions one, four, and five

Table A-5 shows the propensity score matching results for questions one (hospitalizations and ED visits), four (Medicare spending) and five (risk of mortality). A single propensity score matching approach was used for all outcomes.

Table A-5. Propensity Score Matching Results for Utilization and Expenditure Outcomes

Characteristic	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	1,403		4,209		
Demographic characteristics					
Aged 40 years or younger, %	10%		11%		.015
Aged 40–49 years, %	18%		18%		.007
Aged 50–59 years, %	23%		24%		.026
Aged 60–69 years, %	34%		33%		.046
Aged 70–79 years, %	12%		12%		.008
Aged 80 years or older, %	2%		2%		.005
Female, %	44%		44%		.013
Dually eligible for Medicare and Medicaid, %	68%		70%		.046
Originally eligible for Medicare due to a disability, %	76%		76%		.011
White, non-Hispanic, %	77%		75%		.038
Black, non-Hispanic, %	19%		20%		.030
Baseline OUD treatment engagement					
Had at least one MOUD event prior to enrollment, %	75%		75%		.002
Health status					
Number of chronic conditions	3	3	3	2	.012
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	3%		3%		.018
Had at least one SUD-related inpatient admission in past 12 months, %	4%		5%		.021
Total expenditures per beneficiary per month	$1,581	$2,494	$1,630	$1,849	.022
Medicare Part D coverage					

Enrolled in a Medicare Part D plan, %	88%	90%	.061
Enrolled in a Medicare Part D Low-Income Subsidy (LIS) plan with 100% premium subsidy and high copayment, %	42%	44%	.040
Enrolled in a Medicare Part D LIS plan with other subsidy arrangement, %	24%	24%	<.001
Provider type			
OTP, %	46%	46%	.003

SD = Standard Deviation, Std. Diff. = Standardized Difference.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2024).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences <.1 indicate sufficient balance.

A.4 Propensity Score Matching Results for Question two

Tables A-6 and **A-7** show the balance in beneficiary characteristics between the demonstration and comparison groups after performing 1:3 propensity score matching. **Table A-6** presents propensity score matching results for the outcome analysis of the percentage of beneficiaries who used an MOUD within 30 days of their first visit to a demonstration or comparison practice. This outcome analysis only included beneficiaries with Medicare Part D to ensure that Medicare Part D event records were available for all included beneficiaries. **Table A-7** also presents propensity score matching results for the outcome analysis of the percentage of beneficiaries who used an MOUD within 30 days of their first visit to a demonstration or comparison practice but only includes demonstration and comparison beneficiaries who had not used MOUDs at baseline. **Table A-8** presents propensity score matching results for the outcome analysis of the percentage of beneficiaries who used MOUDs continuously for at least 180 days. This outcome analysis only included beneficiaries with Medicare Part D who had received their first medication at least 180 days before December 31, 2024. Separate propensity score analyses were conducted because the samples were different across the two outcomes.

Table A-6. Propensity Score Matching Results for the Percentage of Beneficiaries Who Used an MOUD Within 30 Days of Their First Visit to a Demonstration or Comparison Provider

Characteristic	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	1,240		3,720		
Demographic characteristics					
Aged 40 years or younger, %	11%		11%		.011
Aged 40–49 years, %	19%		18%		.019
Aged 50–59 years, %	24%		24%		.003
Aged 60–69 years, %	33%		33%		.001
Aged 70–79 years, %	11%		11%		.012
Aged 80 years or older, %	2%		2%		.014
Female, %	45%		46%		.032
Dually eligible for Medicare and Medicaid, %	76%		76%		.008
Originally eligible for Medicare due to a disability, %	78%		78%		.009
White, non-Hispanic, %	76%		76%		.005

Black, non-Hispanic, %	19%		19%		.011
Baseline OUD treatment engagement					
Had at least one MOUD event prior to enrollment, %	78%		78%		.001
Health status					
Number of chronic conditions	3	3	3	2	.039
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	3%		3%		.030
Had at least one SUD-related inpatient admission in past 12 months, %	5%		5%		.015
Total expenditures per beneficiary per month	$1,659	$2,586	$1,738	$2,008	.034
Medicare Part D coverage					
Enrolled in a Medicare Part D plan with no to low subsidy, %	48%		48%		.002
Enrolled in a Medicare Part D LIS Plan with 100% premium subsidy and high copayment, %	28%		28%		.001
Provider type					
OTP, %	47%		47%		.006

SD = Standard Deviation, Std. Diff. = Standardized Difference.
Inclusion criteria: Beneficiaries with Medicare Part D.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2024).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences < 0.1 indicate sufficient balance.

Table A-7. Propensity Score Matching Results for the Percentage of Beneficiaries Who Used an MOUD Within 30 Days of Their First Visit to a Demonstration or Comparison Provider (Among Those Who Had Not Used MOUDs at Baseline)

Characteristic	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	269		807		
Demographic characteristics					
Aged 40 years or younger, %	5%		7%		.133
Aged 40–49 years, %	9%		8%		.026
Aged 50–59 years, %	20%		20%		.018
Aged 60–69 years, %	36%		37%		.025
Aged 70–79 years, %	21%		20%		.047
Aged 80 years or older, %	9%		8%		.032
Female, %	47%		47%		.012
Dually eligible for Medicare and Medicaid, %	52%		53%		.009
Originally eligible for Medicare due to a disability, %	62%		64%		.057
White, non-Hispanic, %	68%		65%		.060
Black, non-Hispanic, %	26%		27%		.018
Baseline OUD treatment engagement					
Health status					
Number of chronic conditions	4	3	4	2	.002
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	3%		3%		.017
Had at least one SUD-related inpatient admission in past 12 months, %	2%		2%		.033
Total expenditures per beneficiary per month	$1,430	$2,354	$1,471	$1,568	.020
Medicare Part D coverage					

Enrolled in a Medicare Part D plan with no to low subsidy, %	34	37	.079
Enrolled in a Medicare Part D LIS Plan with 100% premium subsidy and high copayment, %	20	16	.114
Provider type			
OTP, %	10	10	.014

SD = Standard Deviation, Std. Diff. = Standardized Difference.
Inclusion criteria: Beneficiaries with Medicare Part D.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2024).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences < 0.1 indicate sufficient balance.

Table A-8. Propensity Score Matching Results for the Percentage of Beneficiaries Who Used an MOUD Continuously for at Least 180 Days

Characteristic	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	1,052		3,156		
Demographic characteristics					
Aged 40 years or younger, %	12%		12%		.001
Aged 40–49 years, %	21%		22%		.020
Aged 50–59 years, %	25%		25%		.004
Aged 60–69 years, %	32%		33%		.005
Aged 70–79 years, %	9%		8%		.020
Aged 80 years or older, %	1%		0%		.060
Female, %	43%		44%		.014
Dually eligible for Medicare and Medicaid, %	81%		82%		.032
Originally eligible for Medicare due to a disability, %	82%		83%		.024
White, non-Hispanic, %	78%		79%		.032
Black, non-Hispanic, %	17%		16%		.032
Baseline OUD treatment engagement					
Had at least one MOUD event prior to enrollment, %	90%		90%		.005
Health status					
Number of chronic conditions	3	2	3	2	.045
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	4%		2%		.080
Had at least one SUD-related inpatient admission in past 12 months, %	6%		5%		.045
Total expenditures per beneficiary per month	$1,730	$2,696	$1,531	$2,052	.083
Medicare Part D coverage					
Enrolled in a Medicare Part D plan with no to low subsidy, %	52%		52%		.003
Enrolled in a Medicare Part D LIS Plan with 100% premium subsidy and high copayment, %	29%		29%		.005
Provider type					
OTP, %	55%		55%		.003

SD = Standard Deviation, Std. Diff. = Standardized Difference.
Inclusion criteria: Beneficiaries with Medicare Part D who had at least one prescription or claim for a medication to treat OUD at least 180 days before December 31, 2024.

Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2024).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences <.1 indicate sufficient balance.

A.5 Propensity Score Matching Results for Question three

Table A-9 shows the balance in beneficiary characteristics between the demonstration and comparison groups after performing 1:3 propensity score matching for the outcome analysis of the percentage of beneficiaries with a new diagnosis of hepatitis C. This outcome analysis included only beneficiaries who had not had a hepatitis C diagnosis on any claim in the three years prior to enrollment or prior to being assigned to a comparison practice.

Table A-9. Propensity Score Matching Results for the Percentage of Beneficiaries with a New Diagnosis of Hepatitis C

Outcome	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	1,144		3,432		
Demographic characteristics					
Aged 40 years or younger, %	10%		10%		.001
Aged 40–49 years, %	18%		18%		.003
Aged 50–59 years, %	25%		25%		.011
Aged 60–69 years, %	32%		32%		.014
Aged 70–79 years, %	12%		13%		.014
Aged 80 years or older, %	3%		3%		.026
Female, %	45%		46%		.026
Dually eligible for Medicare and Medicaid, %	64%		66%		.049
Originally eligible for Medicare due to a disability, %	75%		78%		.061
White, non-Hispanic, %	77%		76%		.023
Black, non-Hispanic, %	18%		19%		.015
Baseline OUD treatment engagement					
Had at least one MOUD event prior to enrollment, %	72%		72%		.003
Health status					
Number of chronic conditions	3	3	3	2	.031
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	3%		3%		.045
Had at least one SUD-related inpatient admission in past 12 months, %	4%		4%		.006
Total expenditures per beneficiary per month	$1,332	$2,079	$1,344	$1,747	.006
Medicare Part D coverage					
Enrolled in a Medicare Part D plan, %	87%		88%		.039
Enrolled in a Medicare Part D Low-Income Subsidy (LIS) plan with 100% premium subsidy and high copayment, %	39%		41%		.041
Enrolled in a Medicare Part D LIS plan with other subsidy arrangement, %	24%		24%		.009
Provider type					
OTP, %	43%		43%		.004

SD = Standard Deviation, Std. Diff. = Standardized Difference.

Inclusion criteria: Beneficiaries who had not had a hepatitis C diagnosis in the 3 years before they enrolled or were attributed to a comparison practice.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2024).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences < 0.1 indicate sufficient balance.

A.6 Propensity Score Matching Results for Question six

Table A-10 shows the propensity score matching results for question 6 (utilization of inpatient residential treatment). The pool of beneficiaries for both the demonstration and comparison groups were limited to dual-eligible beneficiaries for this outcome.

Table A-10. Propensity Score Matching Results for Residential Treatment Outcome

Outcome	VIT-OUD Beneficiary Enrollees Mean/%	SD	Comparison Group Beneficiaries Mean/%	SD	Std. Diff.
Number of beneficiaries	708		2,124		
Demographic characteristics					
Aged 40 years or younger, %	13%		16%		.079
Aged 40–49 years, %	20%		20%		.009
Aged 50–59 years, %	28%		28%		.017
Aged 60–69 years, %	32%		31%		.019
Aged 70–79 years, %	6%		6%		.030
Aged 80 years or older, %	0%		0%		.017
Female, %	45%		44%		.022
Originally eligible for Medicare due to a disability, %	84%		86%		.060
White, non-Hispanic, %	74%		75%		.024
Black, non-Hispanic, %	22%		21%		.037
Baseline OUD treatment engagement					
Had at least one MOUD event prior to enrollment, %	84%		85%		.012
Health status					
Number of chronic conditions	3	2	3	2	.025
Baseline health care utilization and expenditure					
Had at least one SUD-related ED visit in past 12 months, %	4%		4%		.009
Had at least one SUD-related inpatient admission in past 12 months, %	6%		5%		.041
Total expenditures per beneficiary per month	$1,719	$2,618	$1,693	$2,056	.011
Medicare Part D coverage					
Enrolled in a Medicare Part D Low-Income Subsidy (LIS) plan with 100% premium subsidy and high copayment, %	62%		62%		.011
Enrolled in a Medicare Part D LIS plan with other subsidy arrangement, %	32%		32%		.010
Provider type					
OTP, %	52%		51%		.033

SD = Standard Deviation, Std. Diff. = Standardized Difference.
Inclusion criteria: Beneficiaries who were dually eligible for Medicare and Medicaid and who were enrolled in the VIT-OUD Demonstration by December 2022.
Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice during the demonstration (i.e., April 2021 through December 2022).
Methods: 1:3 matching without replacement was conducted. A Probit specification was used to estimate the propensity score. Standardized differences < 0.1 indicate sufficient balance.

Appendix B: Question-by-Question Analytic Approach

The purpose of this appendix is to provide a research question by research question overview of the analyses that were conducted for the *Value in Opioid Use Disorder Treatment (VIT-OUD) Demonstration Evaluation: Final Report to Congress*.

B.1 Did the VIT-OUD Demonstration Reduce Hospitalizations and ED Visits?

Hospitalizations and ED visits were modeled by comparing the average number of hospitalizations and ED visits in the post-period per 1K beneficiaries between the demonstration and matched comparison group.

B.2 Did the VIT-OUD Demonstration Increase Use of Medication-Assisted Treatment for OUD?

MOUDs were defined to include all U.S. Food and Drug Administration–approved medications that have an indication for OUD treatment (i.e., methadone, buprenorphine, buprenorphine-naloxone, and naltrexone). Prescribed medications were captured from Part D prescription drug event data, and administered medications (e.g., methadone; long-acting injectable naltrexone) were captured as procedures on Part B medical claims, including the bundled payment codes that OTPs use.

CMS measured medication-assisted treatment for OUD use in two ways: 1) the probability of initiating a new medication-assisted treatment for OUD episode and 2) the probability of adhering to medication-assisted treatment for OUD for at least 180 days. Initiation of a new medication-assisted treatment for OUD episode was defined as having at least one prescription fill event or medication-assisted treatment for OUD administration claim within 30 days from the earliest visit to a demonstration provider participant. Adherence to MOUDs for at least 180 days was measured using the National Quality Forum's continuity of pharmacotherapy measure. Both outcomes were modeled by calculating the propensity score–matched difference in the percentage of beneficiaries who met each of the two outcome numerator conditions. Each matching analysis controlled for whether the beneficiaries were already receiving MOUDs prior to the beginning of the VIT-OUD Demonstration period. Other factors were controlled for and were chosen based on identifying that they were strongly correlated with the outcomes.

B.3 Did the VIT-OUD Demonstration Improve Health Outcomes of Individuals With OUD, Including by Reducing the Incidence of Infectious Diseases (Such as Hepatitis C and HIV/AIDS)?

The incidence of hepatitis C and HIV/AIDS were captured in the Medicare claims data using ICD-10 diagnosis codes (i.e., B18.2 and B20). Incidence was defined as having a diagnosis after enrolling in the VIT-OUD Demonstration or being attributed to a comparison provider AND not having been diagnosed in the three years prior. The analytic approach was the same as how we measured the impact of the demonstration on use of MOUDs. Specifically, we calculated the propensity score–matched difference in incidence rate between the demonstration and comparison groups. Preliminary data on HIV/AIDS incidence, however,

showed that incidence was too rare to report results related to this outcome. Specifically, we found that fewer than 11 beneficiaries in the demonstration group had HIV/AIDS incidence and reporting on cell sizes this small is not permissible under the CMS privacy policies.

B.4 Did the VIT-OUD Demonstration Increase the Total Spending on Items and Services Covered Under the Original Medicare Legislation?

The VIT-OUD Demonstration may result in reduced Medicare expenditures if beneficiaries shift their utilization from higher-cost services (e.g., inpatient care) to lower-cost services (e.g., medication treatment). However, to achieve this, CMS is providing additional payments to support expanded benefits for beneficiaries, and accounting for these payments is important when assessing the extent to which the VIT-OUD Demonstration affected Medicare expenditures. To do so, we measured total Medicare expenditures in two ways. First, we measured the net total Medicare payments across all fee-for-service claims, excluding claims for the CMFs and performance-based incentive payments. Second, we used the total payments calculated in the VIT-OUD Demonstration participant's annual financial reports divided by the number of beneficiaries in the annual financial reports to estimate the per-beneficiary additional costs incurred for the VIT-OUD Demonstration. These additional costs were added as a flat dollar amount to all beneficiaries in the VIT-OUD Demonstration group within each participant's list of enrolled beneficiaries to measure a gross total Medicare payment. Lastly, because the theory of change for this VIT-OUD Demonstration program is that beneficiaries are substituting high-cost services (e.g., inpatient care) for lower-cost services (e.g., peer recovery supports), we also modeled inpatient and ED expenditures. We compared averages for each outcome between the demonstration group and the matched comparison group during the post-period.

B.5 Did the VIT-OUD Demonstration Reduce the Number of Deaths from Opioid Overdose?

CMS used National Death Index (NDI) and Master Beneficiary Summary File data through December 2024 to identify all beneficiaries whose cause of death was an opioid overdose and for any reason, respectively. We measured the relative risk of mortality from opioid overdose and from any cause between the demonstration and comparison groups.

B.6 Did the VIT-OUD Demonstration Reduce the Utilization of Inpatient Residential Treatment?

Because residential SUD treatment is covered by Medicaid and not Medicare, CMS only modeled residential SUD treatment among demonstration and matched comparison beneficiaries who were dually eligible for Medicare and Medicaid. Medicaid data were only available through 2022. Thus, we also excluded beneficiaries who were first enrolled or attributed to a comparison practice after 2022. Among the dual-eligible beneficiaries, we measured whether a beneficiary received any residential SUD treatment after they enrolled or were first attributed to a comparison practice. We performed the same propensity score matching as with other outcomes and compared the percentage of the demonstration and matched comparison groups who used residential SUD treatment.

Appendix C: Measure Specifications

The purpose of this appendix is to provide details for all outcome measure specifications and are presented by research question.

C.1 Outcome Measure Specifications

C.1.1 Did the VIT-OUD Demonstration Reduce Hospitalizations and ED Visits?

- **Number of hospitalizations:** This measure is defined over the entire follow-up period and measures the number of acute care hospital admissions. The number of hospitalizations was divided by the number of months that a beneficiary was observed eligible after enrollment or assignment to a comparison practice. The number was also scaled by 1K to represent the number of hospitalizations per 1K beneficiaries. SUD-related hospitalizations were defined as those hospitalizations with a primary diagnosis of SUD.
- **Number of ED visits:** This measure is defined over the entire follow-up period and measures the number of ED visits. The number of ED visits was divided by the number of months that a beneficiary was observed eligible after enrollment or assignment to a comparison practice. It was also scaled by 1K to represent the number of ED visits per 1K beneficiaries. We identify ED visits in the outpatient claims file as visits with a line-item revenue center code equal to 0450–0459 or 0981 (ED care). Claims where the only services provided were for radiological, pathology, or laboratory services were excluded. These types of claims were identified as any claim where every line item has a procedure code equal to any of the following values: 70000–89999, G0106, G0120, G0122, G0130, G0202, G0204, G0206, G0235, G0252, G0255, G0288, G0389, S8035, S8037, S8040, S8042, S8080, S8085, S8092, or S9024. Observation stays were identified as claims with a line-item revenue center code equal to 0760; a Current Procedural Terminology code equal to G0378; and a number of times the service is performed greater than or equal to eight or line-item revenue center code equal to 0762 (treatment or observation room). Multiple ED visits or observation stays on a single day were counted only once. SUD-related ED visits were defined as any claim identified as an ED visit where the primary diagnosis on the claim was for SUD.

C.1.2 Did the VIT-OUD Demonstration Increase the Use of Medication-Assisted Treatment for OUD?

- **Percentage of beneficiaries who received an MOUD within 30 days of their first visit to a demonstration or comparison practice:** This percentage is based on a binary variable that equals one if the beneficiary had at least one medication-assisted treatment for OUD event within 30 days of their earliest visit to a demonstration or comparison practice. The denominator for this variable includes beneficiaries who have Medicare Part D insurance. The numerator is set to one if the beneficiary had any medication-assisted treatment for OUD fills or claim events within 30 days from the

earliest claim with a demonstration or comparison provider during their enrollment or attribution quarter. Medication-assisted treatment for OUD fills were determined by looking for National Drug Codes in the Part D event file, and the list of National Drug Codes will be based on the 2021 Healthcare Effectiveness Data and Information Set (HEDIS) OUD Treatment Medications list. Medication-assisted treatment for OUD claim events will be identified by looking for claims that meet the criteria for the Alcohol and Other Drug Medication Treatment value set in the 2021 HEDIS value set directory or the OUD Weekly Drug Treatment Service set.

- **Percentage of beneficiaries who used MOUDs continuously for at least 180 days:** This percentage is based on a binary variable that equals one if the beneficiary used MOUDs for at least 180 days continuously with no gap larger than seven days. The denominator includes beneficiaries who had at least one claim for medication-assisted treatment for OUD administration or at least one Part D event record for an MOUD prescription fill at least 180 days before the end of the demonstration period.

C.1.3 Did the VIT-OUD Demonstration Improve Health Outcomes of Individuals With OUD, Including by Reducing the Incidence of Infectious Diseases (Such as Hepatitis C and HIV/AIDS)?

- **Percentage of beneficiaries with a new diagnosis for hepatitis C:** This percentage is based on a binary variable that equals one if the beneficiary had any claims during the measurement period with a diagnosis code for hepatitis C: B17.10, B17.11, B18.2, Z22.52, B19.20, or B19.21. Beneficiaries with these diagnosis codes in the past three years were excluded.
- **Percentage of beneficiaries with a new diagnosis for HIV:** This percentage is based on a binary variable that equals one if the beneficiary had any claims during the measurement period with a diagnosis code for HIV: B20, B97.35, or Z21. Beneficiaries with these diagnosis codes in the past three years were excluded.

C.1.4 Did the VIT-OUD Demonstration Increase Total Spending on Items and Services Covered Under the Original Medicare Legislation?

- **Total net Medicare expenditures:** This measure represents the overall net payment amounts from all inpatient and outpatient (facility and professional) claims (i.e., Part A and Part B), excluding member cost sharing. Part D expenditures were also included. CMF payments were excluded from this measure.
- **Total gross Medicare expenditures:** This measure is defined as the total net Medicare expenditures plus the CMF payments plus performance-based incentive payments calculated at a per beneficiary per month level.
- **Inpatient facility expenditures:** This measure represents the sum of net facility payments to a hospital for covered services during all inpatient admissions. Inpatient admissions were defined as above.

- **ED visit expenditures:** This measure represents the overall net payment amount for ED visits that did not lead to hospitalization and for observation stays. ED visits and observation stays that did not lead to a hospitalization were defined as above.

C.1.5 Did the VIT-OUD Demonstration Reduce the Number of Deaths from Opioid Overdose?

- **Opioid overdose mortality:** We used National Death Index data linked to our sample to capture deaths from an opioid overdose. Opioid overdose as a cause of death was identified as an ICD-10 diagnosis code of X40–X44, X60–X64, X85 or Y10–Y14 and a record condition code of T40, T400–T404, or T406.
- **All-cause mortality:** We used date-of-death information from the Master Beneficiary Summary File to identify all-cause mortality among the demonstration and comparison beneficiary populations.

C.1.6 Did the VIT-OUD Demonstration Reduce the Utilization of Inpatient Residential Treatment?

- **Utilization of Inpatient Residential Treatment:** Because Medicare does not cover inpatient residential treatment, this analysis was limited to demonstration and comparison beneficiaries who were dually eligible for Medicare and Medicaid, the latter of which covers these services. Unique beneficiary identifiers were used to link demonstration and comparison beneficiaries identified in Medicare claims data to CMS' Transformed Medicaid Statistical Information System (T-MSIS), the equivalent claims data for Medicaid. Among these dually eligible beneficiaries, we identified those receiving SUD-related residential inpatient services. Residential SUD treatment encounters were identified by claims with a POS code of 55 (residential substance abuse treatment facility), a HCPCS code of H0008–H0011, or a revenue center code of 1002 (residential treatment-chemical dependency). Because the release of T-MSIS data lags behind releases of Medicare claims data, this analysis was only conducted through the latest finalized T-MSIS data, covering the period through December 2022.

Appendix D: Supplemental Data and Results

This appendix provides details about two supplemental analyses. These analyses were undertaken after the intermediate report to Congress was completed and before new data were available for the final report to Congress. As such, the goal of these analyses were to better understand how the VIT-OUD Demonstration could have impacted hospital-based utilization and expenditure outcomes without affecting use of MOUDs. Although we have found that the demonstration has impacted the use of MOUDs, these two supplemental analyses provide additional information that remains relevant.

The first analysis examined whether demonstration OTPs differed in reported services from OTPs that did not participate in the demonstration. To support this analysis, we used 2022 data from the National Substance Use and Mental Health Services Survey (N-SUMHSS).

The second analysis examined whether the demonstration had impacts on outcomes related to ambulatory care. We hypothesized that demonstration provider participants could have done a better job of coordinating with primary and other specialty providers, which could explain the reduction in hospital-based utilization and expenditures we observed. Specifically, this analysis assessed whether the demonstration affected primary care, nonbehavioral health specialist, and behavioral health specialist visits and ambulatory care sensitive condition inpatient admissions and avoidable ED visits.

D.1 Service Provision Among OTPs That Did and Did Not Participate in the VIT-OUD Demonstration

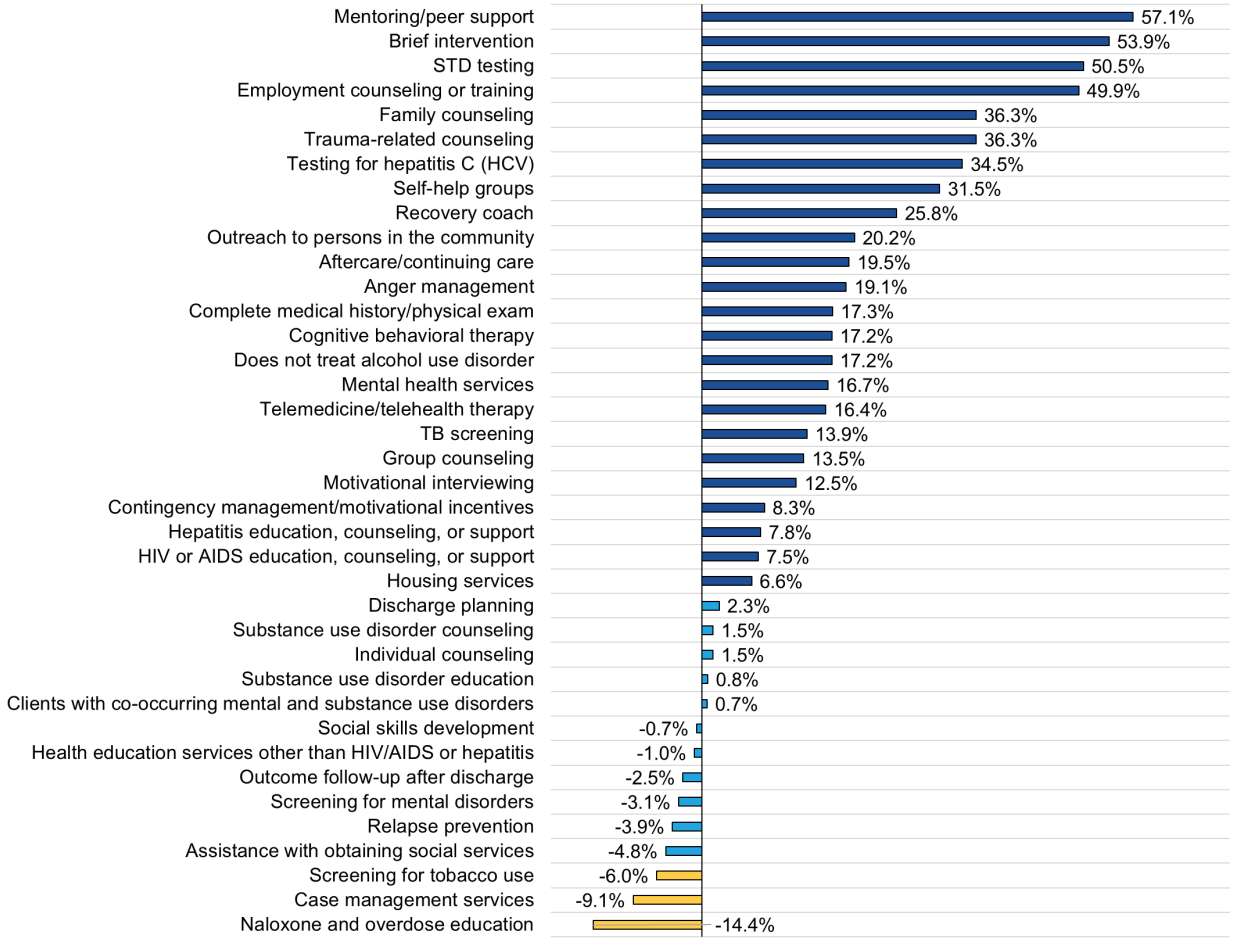
To understand whether provider participants may have added or improved the services they deliver to demonstration beneficiary enrollees, CMS used data from the 2022 N-SUMHSS to document differences between services offered among OTPs that participated in the VIT-OUD Demonstration and services offered among OTPs that did not participate in the VIT-OUD Demonstration. We focused on 2022 because these were the latest available data and cover the first full calendar year of the demonstration. We only included OTPs because other practice entity types are not available in the N-SUMHSS database, which only captures specialty substance use or mental health practices.

To isolate meaningful differences, we excluded services that fewer than 50 percent of demonstration OTPs offered. We also excluded methadone and related services and focused on the types of counseling and wraparound services that providers offer. We then calculated the percentage difference in the proportion of providers that offered each service between VIT-OUD Demonstration OTPs versus those OTPS that did not participate in the demonstration.

In calendar year 2022, **Figure D-1** shows that OTPs that participated in the VIT-OUD Demonstration were more likely than those that did not participate to provide several specific services. Many of the services that were more likely to be offered by demonstration OTPs were wraparound services, such as employment counseling or training, testing or screening for physical health conditions such as hepatitis C or tuberculosis, and housing services.

Demonstration OTPs were also offered a greater array of treatment services for OUD, including mentoring and peer support, a variety of counseling services including trauma-related counseling, and a variety of recovery and aftercare services. **Collectively, these data suggest that demonstration OTPs may be offering a higher quality of care.** A few services were less likely to be offered by demonstration OTPs, such as assistance with obtaining social services, screening for tobacco use, case management services, and naloxone and overdose education. However, we know from the intermediate report to Congress that, at least for naloxone and overdose education, there was a substantial increase in offering this service over time. These findings are purely descriptive, and differences are based on a small number of participating OTPs.

Figure D-1. The Percentage Difference in the Proportion of Providers Offering Treatment and Wraparound Services Between OTPs in the VIT-OUD Demonstration and OTPs That Did Not Participate in the VIT-OUD Demonstration, 2022



Source: Calculations using data from the 2022 N-SUMHSS.
Definitions: AIDS = acquired immune deficiency syndrome; HIV = human immunodeficiency virus; N-SUMHSS = National Substance Use and Mental Health Services Survey; OTP = opioid treatment program; STD = sexually transmitted disease; TB = tuberculosis; VIT-OUD = Value in Treatment-Opioid Use Disorder.

D.2 Supplemental Impact Analyses on Care Coordination Related Outcomes

CMS conducted additional analyses to determine whether the demonstration had an impact on the number of primary care and planned behavioral health and nonbehavioral health specialist visits as a sign of greater care coordination. Additionally, we assessed demonstration impacts on the incidence of unplanned institutional service use including avoidable ED visits and inpatient admissions for ACSCs.

D.2.1 Did the VIT-OUD Demonstration Affect Primary Care and Specialist Visits?

Table D-1 shows that there were no statistically significant impacts on primary care provider, nonbehavioral health specialist provider, or behavioral health specialist provider visits. Although the estimates were not statistically significant, on average, beneficiaries who enrolled in the VIT-OUD Demonstration had higher rates of PCP, nonbehavioral health specialist provider, and behavioral health specialist provider visits than beneficiaries in the matched comparison group. The difference in behavioral health specialist provider visits was the largest difference, with 14 percent higher rate of use in the demonstration group than in the matched comparison group.

Table D-1. Impacts on Primary Care, Nonbehavioral Health Specialist, and Behavioral Health Specialist Provider Visits

Outcome	VIT-OUD Demonstration Beneficiary Enrollees	Post-Matched Comparison Group	Difference	Percent Difference	P-Value
Number of PCP visits per 1,000 beneficiaries	741	726	14	2%	0.54
Number of nonbehavioral health specialist provider visits per 1,000 beneficiaries	507	504	4	1%	0.87
Number of behavioral health specialist provider visits per 1,000 beneficiaries	61	53	8	14%	0.23

Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.

Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. An average treatment effect on the treated was estimated as the difference in the demonstration group average and the matched comparison group average.

Sample size: 1,403 demonstration beneficiaries and 4,209 comparison beneficiaries.

D.2.2 Did the VIT-OUD Demonstration Affect Avoidable Inpatient Admissions and ED Visits?

Table D-2 shows that, compared with the matched comparison group, VIT-OUD Beneficiaries had eight fewer avoidable ED visits per 1K beneficiaries (p = .09). The impact on ACSC admissions was not statistically significant. Although avoidable ED visits were affected, it could have been due to better management of beneficiary's OUD or due to better management of comorbid conditions.

Table D-2. Impacts on Avoidable ED Visits and ACSC Admissions

Outcome	VIT-OUD Demonstration Beneficiary Enrollees	Post-Matched Comparison Group	Difference	Percentage Difference	P-Value

Number of avoidable ED visits per 1,000 beneficiaries	41	49	**–8**	**16%**	**0.09**
Number of ACSC admissions per 1,000 beneficiaries	8	8	–1	7%	0.65

Bolded numbers indicate estimates that are statistically significant with a p-value < .10.

Time frame: Data include beneficiaries who were enrolled or assigned to a comparison practice between April 2021 and December 2024.

Methods: Beneficiaries in the comparison group were propensity score matched with beneficiaries in the demonstration group. An average treatment effect on the treated was estimated as the difference in the demonstration group average and the matched comparison group average.

Sample size: 1,403 demonstration beneficiaries and 4,209 comparison beneficiaries.

D.2.3 Measure Specifications and Technical Approach for Care Coordination Related Outcomes

Number of PCP visits: This measure is the number of in-person or telehealth primary care visits during the measurement period per beneficiary. PCP visits were identified using Current Procedural Terminology (CPT) codes associated with evaluation and management (E&M) visits and revenue center codes associated with ambulatory care. We used the following codes in the 2016 Healthcare Effectiveness Data and Information Set Ambulatory Visit Value Set (either one of HCPCS codes or one of the revenue center codes):

- HCPCS codes: 99201–99205, 99211–99215, 99241–99245, 99341–99345, 99347–99350, 99381–99387, 99391–99397, 99401–99404, 99411, 99412, 99420, 99429, G0403, G0438, G0439, T1015, 92002, 92004, 92012, 92014, 99304–99310, 99315, 99316, 99318, 99324–99328, 99334–99337, S0620, or S0621
- Revenue center codes: 0519–0529, 0982, or 0983
- Telehealth visits were identified using the following:
- HCPCS codes 99202–99215, 99341–99345, 99347–99350, G0438, G0439, 92002, 92004, 92012, 92014, 99304–99310, 99315, 99316, 99324–99328, 99334–99337, 99441–99443, and HCPCS modifier 95 or GT
- HCPCS codes 99421–99423, G2061–G2063, G2012, or G2010

Visits were then classified as a primary care provider visit if the provider's specialty was any of the following:

- 01: General practice
- 08: Family practice
- 11: Internal medicine
- 37: Pediatrics
- 38: Geriatric medicine
- 50: Nurse practitioner
- 70: Multispecialty clinic or group practice
- 84: Preventive medicine
- 89: Certified clinical nurse specialist
- 97: Physician assistant

Number of Behavioral Health Specialist Visits: This measure is the number of in-person or telehealth visits with a behavioral health specialist during the measurement period per

beneficiary. Behavioral health specialist visits were identified using the same CPT codes associated with E&M visits and revenue center codes associated with ambulatory care. We counted behavioral health specialist visits as those that were identified as an E&M visit in the PCP visit measure where the provider's specialty was one of the following:

- 26: Psychiatry
- 27: Geriatric psychiatry
- 62: Psychologist (billing independently)
- 68: Clinical psychologist
- 80: Licensed clinical social worker

Number of Nonbehavioral Health Specialist Visits: This measure is the number of in-person or telehealth visits with a nonbehavioral health specialist during the measurement period per beneficiary. Nonbehavioral health specialist visits were identified using the same CPT codes associated with E&M visits and revenue center codes associated with ambulatory care. We counted nonbehavioral health specialist visits as those that were identified as an E&M visit in the PCP visit measure where the provider's specialty was any specialty except for those identified for the PCP visit or behavioral health specialist visit measures.

Preventable/avoidable ED visits: This measure is created using the New York University (NYU) algorithm[19] for identifying emergency care provided in an ED that is for a condition that might have been avoided if timely and effective ambulatory care had been provided. The algorithm assigns a weight between zero and 100 for each primary diagnosis code that could appear on an ED claim, and these weights can then be used to construct a measure of the weighted average number of ED visits that were potentially preventable or avoidable.

Number of admissions for an ACSC: This measure is limited to the population 18 years of age or older. The measure is a count variable that is equal to the number of inpatient discharges that meets the inclusion and exclusion rules for any of the following 11 prevention quality indicators (PQIs) that comprise the Overall Composite (PQI #90):

- PQI #01, Diabetes Short-Term Complications Admission Rate
- PQI #03, Diabetes Long-Term Complications Admission Rate
- PQI #05, Chronic Obstructive Pulmonary Disease or Asthma in Older Adults Admission Rate
- PQI #07, Hypertension Admission Rate
- PQI #08, Heart Failure Admission Rate
- PQI #10, Dehydration Admission Rate
- PQI #11, Bacterial Pneumonia Admission Rate
- PQI #12, Urinary Tract Infection Admission Rate
- PQI #14, Uncontrolled Diabetes Admission Rate
- PQI #15, Asthma in Younger Adults Admission Rate
- PQI #16, Rate of Lower-Extremity Amputation Among Patients with Diabetes

[19] Billings J, Parikh N, and Mijanovich T. Emergency department use: the New York story. Commonw. Fund Issue Brief 434:1–12, 2000.