

## RESEARCH ARTICLE

# Impact of the Medicare Shared Savings Program on utilization of mental health and substance use services by eligibility and race/ethnicity

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## Abstract

**Objective:** To assess the impact of the Medicare Shared Savings Program (MSSP) ACOs on mental health and substance use services utilization and racial/ethnic disparities in care for these conditions.

**Data sources:** Five percent random sample of Medicare claims from 2009 to 2016.

**Study design:** We compared Medicare beneficiaries in MSSP ACOs to non-MSSP beneficiaries, stratifying analyses by Medicare eligibility (disability vs age 65+). We estimated difference-in-difference models of MSSP ACOs on mental health and substance use visits (outpatient and inpatient), medication fills, and adequate care for depression adjusting for age, sex, race/ethnicity, region, and chronic medical and behavioral health conditions. To examine the differential impact of MSSP on our outcomes by race/ethnicity, we used a difference-in-difference-in-differences (DDD) design.

**Data collection/extraction methods:** Not applicable.

**Principal findings:** MSSP ACOs were associated with small reductions in outpatient mental health (Coeff:  $-0.012$ ,  $P < .001$ ) and substance use (Coeff:  $-0.001$ ,  $P < .01$ ) visits in the disability population, and in adequate care for depression for both the disability- and age-eligible populations (Coeff:  $-0.028$ ,  $P < .001$ ; Coeff:  $-0.012$ ,  $P < .001$ , respectively). MSSP ACO's were also associated with increases in psychotropic medications (Coeff:  $0.007$  and Coeff:  $0.0213$ , for disability- and age-eligible populations, respectively, both  $P < .001$ ) and reductions in inpatient mental health stays (Coeff:  $-0.004$ ,  $P < .001$ , and Coeff:  $-0.0002$ ,  $P < .01$  for disability- and age-eligible populations, respectively) and substance use-related stays for disability-eligible populations (Coeff:  $-0.0005$ ,  $P < .05$ ). The MSSP effect on disparities varied depending on type of service.

**Conclusions:** We found small reductions in outpatient and inpatient stays and in rates of adequate care for depression associated with MSSP ACOs. As MSSP ACOs are placed at more financial risk for population-based treatment, it will be important to include more robust behavioral health quality measures in their contracts and to monitor disparities in care.

**KEYWORDS**

Accountable Care Organizations, Medicare, mental health services, racial/ethnic disparities, substance use disorders

**1 | INTRODUCTION**

Only 43% of adults with a mental illness receive any mental health care, and 11% of adults with a substance use disorder (SUD) receive specialty treatment.<sup>1</sup> Access to these services is even lower among Black, Latino, and Asians when compared to Whites.<sup>1</sup> Accountable Care Organizations (ACOs) hold promise for improving these low rates of behavioral health treatment given their focus on improved quality and coordination of care. However, little is known about ACOs' impact on behavioral health services or disparities in treatment.

ACOs are networks of health care providers that cooperate to offer coordinated care for a set of patients across health care settings. The Centers for Medicare and Medicaid Services (CMS) have authorized and financially incentivized the creation of ACOs caring for Medicare beneficiaries with the goal of improving quality of care and reducing overall Medicare expenditures. ACOs choosing to participate can share in the savings with Medicare if the costs for serving their beneficiary population are lower than a predetermined benchmark for their organization while also maintaining or improving quality of care in specified measures. The Pioneer ACO Model, started in 2012 and discontinued in 2016, was designed for existing ACOs or other health care organizations experienced in coordinating care and taking financial risks through contracts with payers. The Pioneer ACO Model included downside risk, or a decrease in reimbursement from CMS, if providers failed to meet their benchmarks. The Medicare Shared Savings Program (MSSP), initiated in mid-2012 and continuing to date, is a permanent ACO program in Medicare. Until 2019, ACOs participating in the MSSP could choose between four tracks varying in degrees of downside and upside risk (increased shared savings with CMS). As of 2019, 518 ACOs participated in the MSSP program, with over 10 million Medicare beneficiaries assigned to the program.<sup>2</sup> The Next Generation ACO model, initiated in 2016 and lasting five years, features higher levels of both financial risk and rewards than the Pioneer or MSSP models.<sup>3</sup>

Prior evaluations have shown that Medicare's Pioneer and MSSP ACOs reduced costs while maintaining or improving quality of care,<sup>4-7</sup> although some studies have also shown that the MSSP does not result in savings or in improvement in quality of care when accounting for nonrandom attrition of providers.<sup>8</sup> The evaluation of the first three years of the Next Generation ACO Model showed a reduction in spending by ACOs (though net spending by CMS did not change after accounting for shared savings) and no changes in quality.<sup>3</sup> Yet, despite the fact that individuals with behavioral (mental health and SUD) conditions have higher rates of costly services (eg, inpatient stays and emergency department visits)<sup>9-12</sup> that may reduce ACOs' savings, there is little research on the impact of ACOs on behavioral health care. One of two existing studies that focused on mental

**What is already known on this topic**

- Accountable Care Organizations (ACOs) are voluntary networks of health care providers that cooperate to offer coordinated care for a set of patients across health care settings with the goal of improving quality of care and reducing overall expenditures
- ACOs participating in the Medicare Shared Savings Program (MSSP) can share in the savings with Medicare if the costs for serving their beneficiary population are lower than a predetermined benchmark for their organization while also maintaining or improving quality of care in specified measures
- Most studies evaluating MSSP ACOs have not examined their impact on mental health or substance use services, or in racial/ethnic disparities in these services

**What this study adds**

- MSSP ACOs were associated with small reductions in outpatient and inpatient mental health and substance use care visits, and an increase in psychotropic medications
- The effect of MSSP ACOs on racial/ethnic disparities in these services was mixed
- As MSSP ACOs are placed at higher financial risks, more mental health and substance use quality measures should be monitored as part of their contracts, and the impact on disparities in care should be evaluated

health care showed that, through 2013, the effects of these programs on mental health services were limited. The Pioneer ACO Model was associated with reduced inpatient mental health admissions, but with no changes in mental health outpatient use or quality of care.<sup>13</sup> The MSSP ACOs were associated with small, negative changes in the proportion of patients identified with depression, but there was no significant impact of the MSSP on mental health care utilization.<sup>13</sup> The other study found that among patients with depression, Pioneer and MSSP ACOs were associated with improved antidepressant adherence.<sup>14</sup> To our knowledge, no studies have been conducted on the more recent impact of Medicare ACOs on mental health utilization. Also, under previous regulations, CMS was required to redact all SUDs claims from person-specific files, preventing the study of the impact of MSSP ACOs on SUD service utilization.

Any efforts by ACOs to improve behavioral health care may benefit racial/ethnic minority groups to a higher degree than their White

counterparts. In general, Blacks, Latinos, and Asians report lower access to mental health care compared to Whites.<sup>15-23</sup> Disparities have also been documented in access to SUD treatment.<sup>24</sup> Because patients who are racial/ethnic minorities tend to have more fragmented care, and ACO payment models encourage coordination across providers, minority patients may receive greater benefit than White patients. Previous policies to improve care management, such as the introduction of managed care into Medicare and Medicaid, reduced Black-White and Latino-White disparities in access to care.<sup>25,26</sup>

Additionally, MSSP agreements require ACOs to achieve set rates in quality measures (eg, percent of patients screened for depression, and if positive, that a follow-up plan is documented), which may disproportionately benefit racial/ethnic minorities since they are likely to have lower levels of quality of care before ACO implementation.<sup>27</sup>

In contrast, it is possible that Medicare ACO payment models may exacerbate behavioral health care racial/ethnic disparities or fail to mitigate them. Providers that serve higher proportions of minority patients tend to have fewer resources,<sup>28,29</sup> and thus may be less likely to implement new initiatives for increasing access and improving care.<sup>30</sup> The present study adds to the limited literature on the impact of MSSP ACOs on behavioral health treatment by examining a longer period of implementation of MSSP through 2016 and by investigating the impact of the program on SUD treatment. We also extend prior research on the effects of the MSSP by examining its impact on racial/ethnic disparities in treatment. Specifically, the objectives of this study are to: 1) examine the impact of MSSP ACOs on mental health and SUD visits (outpatient care, inpatient admissions), psychotropic and addiction medications, and adequate care for depression; and 2) identify whether the impact of the MSSP ACOs on mental health and SUD care varied based on beneficiaries' race/ethnicity. Given the mixed or nonexistent prior studies, we did not have specific a priori hypotheses for the impact of the MSSP on mental health and SUD service utilization. Based on prior literature, we hypothesized that the MSSP reduced racial/ethnic disparities in access to mental health and SUD services, and in quality of care for depression.

## 2 | METHODS

### 2.1 | Study data and sample

We used enrollment and claims for a 5% random sample of Medicare beneficiaries for 2009-2016. For each study year, we used data of beneficiaries who were continuously enrolled for 12 months in Medicare Parts A and B, and who were never enrolled in Part C (Medicare Advantage plan data were not available). We excluded beneficiaries who were eligible for Medicare because of end-stage renal disease.

We attributed each beneficiary in each year to the MSSP group using Medicare's MSSP Program rules<sup>31</sup> with some modifications as done in previous studies.<sup>5,13</sup> Briefly, beneficiaries were assigned to the MSSP or control group using the taxpayer identification number (TIN) that accounted for the most allowed charges for the service

year. In the process of attribution of beneficiaries to groups, qualifying office visits were limited to office visits with primary care physicians. We did this because many ACOs include no, or at best a few, specialty practices in the TINs that make up their contracting network. Including visits to more costly specialty practices would have resulted in the disproportionate assignment to the control group of beneficiaries who were receiving more costly care (even if most of their care in a year had been in outpatient primary care from an ACO). This modification achieves a better balance in the beneficiary characteristics between the MSSP and control groups. Beneficiaries that were attributed to the Pioneer Program during the year were excluded. Details on the methodology used for attribution for both the MSSP and Pioneer Program can be found elsewhere.<sup>5,13</sup>

### 2.1.1 | Variables

#### 2.1.1.1 | Mental Health and SUD Services Utilization

Our mental health treatment measures were as follows: 1) any outpatient mental health visit in a given year, 2) any psychotropic medication fill in a given year, 3) any mental health inpatient stay in a given year, 4) number of inpatient mental health stays among those with at least one stay in that year, and 5) adequate care for depression. Our SUD treatment measures were as follows: 1) any outpatient SUD visit in a given year, 2) any addiction medication fill in a given year, 3) any SUD inpatient stay in a given year, and 4) number of inpatient SUD stays among those with at least one stay in that year. Outpatient visits were identified using Part B Carrier Claim or Outpatient Claims records with a mental health or SUD diagnosis code as the primary diagnosis. Inpatient visits were identified if those codes appeared as primary diagnosis in the inpatient file claims (See Appendix S1 for details on how outpatient visits and inpatient stays were defined and the specific ICD-9 and ICD-10 codes used). Medication fills were identified using the Part D Prescription Drug Event File. Psychotropic medications included antidepressants, antipsychotics, mood stabilizers and anti-seizure medications, other anxiolytics (eg, buspirone), and miscellaneous psychotropics (eg, zolpidem, zaleplon).<sup>32</sup> SUD medications included buprenorphine, naltrexone, methadone, disulfiram, and acamprosate. Following previous research, adequate depression treatment was defined as having at least four outpatient behavioral health visits and a psychotropic medication fill in a calendar year; or, if no psychotropic medication had been filled, having at least eight outpatient mental health visits.<sup>33</sup> Depression was determined using data from the Chronic Conditions Data Warehouse (CCW) depression end-of-year indicator.<sup>34</sup> The CCW, developed by CMS to facilitate research, includes variables of common chronic or potentially disabling conditions.

#### 2.1.1.2 | Race/Ethnicity

We used the CMS Research Triangle Institute race/ethnicity variable, which improves the reporting of Hispanic/Latino and Asian race/ethnicities.<sup>35</sup> We include Hispanics, and Non-Hispanic Whites, non-Hispanic Blacks, non-Hispanic Asian/Pacific Islanders, and

**TABLE 1** Characteristics of beneficiaries included in analyses and outcomes, by original Medicare eligibility criteria and intervention group (Person Years)

	Originally eligible because of disability			Originally eligible because of age		
	Control N = 1, 675, 928	MSSP N = 853, 953	p-value of test of difference between Control and MSSP samples*	Control N = 5, 492, 387	MSSP N = 2, 917, 299	P-value of test of difference between Control and MSSP samples*
Race/ethnicity						
White	72.7%	74.2%	<.001	86.2%	87.8%	<.001
Black	17.1%	17.5%		6.4%	6.3%	
Asian	1.3%	1.1%		2.5%	2.1%	
Latino	7.8%	6.7%		4.5%	3.6%	
Native American	1.2%	0.5%		0.5%	0.2%	
Age (mean, SD)	58.6 (13.5)	58.0 (13.4)	<.001	77.0 (7.8)	76.3 (7.4)	<.001
Sex						
Female	48.4%	46.3%	<.001	61.8%	61.6%	<.001
Male	51.6%	53.7%		38.2%	38.4%	
Region						
Midwest	22.5%	27.2%	<.001	22.4%	27.0%	<.001
Northeast	16.3%	20.6%		16.9%	20.4%	
South	43.9%	42.5%		41.0%	41.0%	
West	17.3%	9.7%		19.7%	11.6%	
Any physical or potentially disabling chronic conditions	87.1%	88.4%	<.001	93.1%	93.6%	<.001
Number of physical or potentially disabling chronic conditions (mean, sd)	3.78 (3.1)	3.84 (3.0)	<.001	4.14 (2.8)	4.08 (2.7)	<.001
Any chronic behavioral health conditions	60.4%	62.6%	<.001	32.3%	31.0%	<.001
Number of chronic behavioral health conditions (mean, SD)	1.41 (1.7)	1.51 (1.7)	<.001	0.52 (0.9)	0.49(0.9)	<.001
Depression	29.5%	31.9%	<.001	12.6%	12.4%	<.001
Anxiety	20.4%	22.1%	<.001	8.7%	9.0%	<.001
Alcohol use disorder	4.3%	4.4%	.0740	1.2%	1.3%	<.001
Other substance use disorder	7.4%	7.9%	<.001	0.87%	0.86%	.1000
Use of mental health and substance use services and medications						
Any outpatient mental health visits	26.3%	28.6%	<.0001	8.2%	8.1%	.5053
Any psychotropic Rx fills	55.1%	55.8%	<.0001	27.5%	26.8%	<.0001
Any mental health inpatient admissions	2.3%	2.5%	<.0001	0.32%	0.25%	<.0001
# of inpatient admissions among those with an inpatient admission (mean, SD)	1.66 (1.3)	1.70 (1.3)	.4777	1.22 (0.6)	1.24 (0.6)	<.0001
Adequate care for those with depression	28.5%	30.7%	<.0001	9.6%	10.8%	<.0001
Any outpatient substance use visits	2.5%	2.6%	<.0001	0.32%	0.33%	.2893
Any addiction medications	1.9%	1.8%	.1143	0.15%	0.13%	<.001

(Continues)

TABLE 1 (Continued)

	Originally eligible because of disability			Originally eligible because of age		
	Control N = 1, 675, 928	MSSP N = 853, 953	p-value of test of difference between Control and MSSP samples*	Control N = 5, 492, 387	MSSP N = 2, 917, 299	P-value of test of difference between Control and MSSP samples*
Any inpatient substance use disorder admissions	0.49%	0.52%	<.001	0.050%	0.050%	<.01
# of inpatient admissions among those with an inpatient admission (mean, SD)	1.36 (1.0)	1.39 (1.0)	<.01	1.13 (0.5)	1.12 (0.4)	<.0001

Note: MSSP, Medicare Shared Savings Program.

\*Using chi-square tests or t tests.

non-Hispanic Native Americans in this analysis. We excluded any beneficiaries who had “unknown” or “other” as their race/ethnicity for that variable.

#### 2.1.1.3 | Covariates

Age, sex, and region of residence (measured annually) were demographic variables used as covariates in regression models. Our models also included as covariates the total number of physical chronic conditions and number of behavioral health conditions in the observation period using the data from CCW (see Appendix S1 for a list of these conditions).

### 2.1.2 | Statistical analyses

The identification strategy is a difference-in-difference strategy that exploits differences by MSSP enrollment and timing of the initiation of the MSSP program (pre- and post-MSSP initiation excluding 2012 because MSSP programs were initiated mid-2012). Our unit of analysis is person-year. We assessed disability- and age-eligible Medicare beneficiaries separately because disability-eligible Medicare beneficiaries have substantially higher prevalence of mental health and substance use disorders and very different age distributions than age-eligible Medicare beneficiaries.

We first conducted descriptive analyses comparing demographic, physical health, and behavioral health, and utilization measures of the MSSP and control groups by eligibility group (disability and age 65+). To examine the impact of the MSSP on our utilization measures of interest, we conducted difference-in-difference analyses, clustered at the individual beneficiary level so that standard errors account for the multiple observations within each individual beneficiary. We estimated linear (OLS) models using the following equation:

$$Y_{it} = \beta_0 + \beta_1 MSSP_i + \beta_2 * Post_{it} + \beta_3 MSSP_i * Post_{it} + \beta_4 * Race_i + \beta_5 Covariates_{it} + \varepsilon_{it},$$

where Y represents each of our outcomes for beneficiaries “i” in year “t”, and MSSP is a dummy variable indicating whether beneficiary “i”

was assigned to the MSSP group. Post had a value of 0 in years 2009-2011 for all beneficiaries. Among beneficiaries in the MSSP group, Post had a value of 1 in the year they were attributed to the MSSP. We randomly assigned a proportion of the control group to be in the “Post” group each year. This “Post” group within the control group matched the proportion of beneficiaries who were allocated to an MSSP in that year out of all beneficiaries who had been allocated to an MSSP at any point in time. The proportion of the control population allocated to the “post” group was about 45% each year 2013-2016.

To examine the differential impact of MSSP on our outcomes by race/ethnicity, we conducted difference-in-difference-in-difference (DDD) by adding interaction terms for (a) MSSP\*Race, (b) Post\*Race, and (c) MSSP\*Post\*Race.

Given the large size of our samples, effect sizes that are small can still be statistically significant. Therefore, it is important to focus on effect size and its relation to the baseline.

In our main analysis, we focused on all beneficiaries as opposed to beneficiaries who had been previously diagnosed with a behavioral health condition since, in claims data, all beneficiaries with a previous diagnosis have accessed at least one visit. Given the large percentages of individuals with mental health and substance use disorders that do not access any treatment, and because of documented differences by race/ethnicity in access to mental health and substance use services, we believe this is the least biased way to conduct the analysis. Assessing access to treatment among those with a behavioral health diagnosis in the prior year does answer an important, albeit different research question. Therefore, in secondary analyses, we re-estimated access to care models among those with a mental health diagnosis/depression/SUD diagnoses in the prior year.

## 3 | RESULTS

### 3.1 | Description of samples

Table 1 shows the demographic characteristics of the MSSP and control samples during the observation period, separately by eligibility

	Mental health care		Substance use services	
	Disability population	Aged population	Disability population	Aged population
	Model coefficients	Model coefficients	Model coefficients	Model coefficients
Any outpatient visits				
Post × MSSP	-0.0119 <sup>***</sup>	0.0021 <sup>***</sup>	-0.0014 <sup>**</sup>	0.0000
Any inpatient stays				
Post × MSSP	-0.0038 <sup>***</sup>	-0.0002 <sup>**</sup>	-0.0005 <sup>*</sup>	-0.0001
Number of inpatient visits for patients with at least one inpatient visit				
Post × MSSP	-0.0392 <sup>**</sup>	-0.0379 <sup>*</sup>	-0.0116	0.0682 <sup>*</sup>
Any psychotropic/addiction prescriptions filled				
Post × MSSP	0.0071 <sup>***</sup>	0.0213 <sup>***</sup>	-0.0025 <sup>***</sup>	-0.0001
Adequate care for patients with depression				
Post × MSSP	-0.0284 <sup>***</sup>	-0.0119 <sup>***</sup>	-	-

Note: Models were adjusted for age, race/ethnicity, sex, region, number of physical chronic or potentially disabling conditions, and number of behavioral health chronic or potentially disabling conditions.

Abbreviation: MSSP, Medicare Shared Savings Program.

\* $P < .05$

\*\* $P < .01$

\*\*\* $P < .001$

criteria (disability and age). Among both the disability and aged populations, MSSP (vs. control group) beneficiaries were more likely to be White, slightly younger, male, live in the Midwest or Northeast; have physical chronic or potentially disabling conditions; and have anxiety. In the disability population, MSSP (vs. control group) beneficiaries were more likely to have behavioral health chronic or potentially disabling conditions and a higher mean number of these conditions. However, most of these differences were small.

Table 1 also shows unadjusted behavioral health services utilization of the control and MSSP samples. In most comparisons of the disability population, the MSSP sample had slightly higher rates of use of mental health and substance use treatment services, and MSSP individuals with depression were more likely to receive adequate care for depression than the control group. Among the aged population, beneficiaries in the MSSP sample had slightly lower use of most services, but were slightly more likely to receive adequate care for depression.

### 3.2 | Impact of MSSP ACOs on mental health and SUD care

Table 2 shows the results of the difference-in-difference analyses examining the impact of MSSP enrollment on mental health and SUD care after adjustment for age, race/ethnicity, sex, region, and number of physical and behavioral chronic or potentially disabling conditions.

MSSP enrollment was associated with a 1.2% ( $P < .001$ ) decrease in the probability that a person from the disability population would

**TABLE 2** Difference-in-difference models examining impact of MSSP on mental health and substance use medications and services utilization

have an outpatient mental health visit in a year and a 0.4% ( $P < .001$ ) decrease in the probability of having a mental health inpatient stay. MSSP enrollment was also associated with a reduction in the mean number of inpatient mental health visits (conditional on having at least one inpatient mental health visit) (coefficient =  $-0.04$ ,  $P < .001$ ) and with a 2.8% ( $P < .001$ ) decrease in the probability that a beneficiary with depression would receive adequate care. On the contrary, MSSP enrollment was associated with a 0.7% increase in the probability that a beneficiary would have a psychotropic medication filled. MSSP enrollment was also associated with significant reductions in the probability of having any SUD outpatient visit (0.14%,  $P < .01$ ) and SUD inpatient stays (0.05%,  $P < .05$ ), and with a significant reduction in the probability that a beneficiary would fill an addiction medication (0.25%,  $P < .001$ ), relative to the control group.

For the most part, MSSP enrollment had similar effects on mental health care use among beneficiaries eligible due to age and beneficiaries eligible due to disability. Although MSSP enrollment was associated with a 0.21% ( $P < .001$ ) increase in the probability that a beneficiary from the aged population would have an outpatient mental health visit in a year, relative to the control group, MSSP enrollment was associated with a reduction of 0.02% ( $P < .001$ ) in the probability of having a mental health inpatient stay and a reduction in the mean annual mental health inpatient stays among those with at least one stay (coefficient =  $-0.04$ ,  $P < .001$ ). MSSP enrollment was associated with a 2.1% increase in the probability of a psychotropic medication fill in this population. Finally, MSSP enrollment was associated with a 1.2% decrease in the probability that a beneficiary with depression would receive adequate care ( $P < .001$ ). In terms of SUD

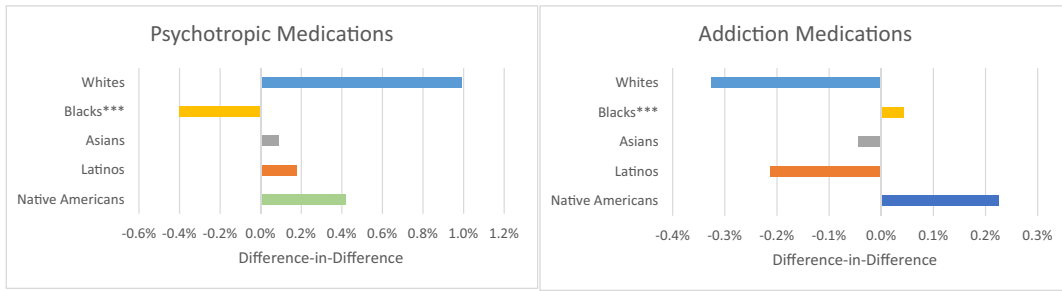


FIGURE 1 Difference-in-difference results of effects of MSSP on mental health and substance use care by race/ethnicity (difference-in-difference-in difference)—disability population

Notes: Results shown are differences in predicted population marginal means. Models were adjusted for age, sex, region, number of physical chronic or potentially disabling conditions, and number of behavioral health chronic or potentially disabling conditions. MSSP = Medicare Shared Savings Program. \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$  for differences-in-differences within a racial/ethnic group being significantly different to differences within Whites.

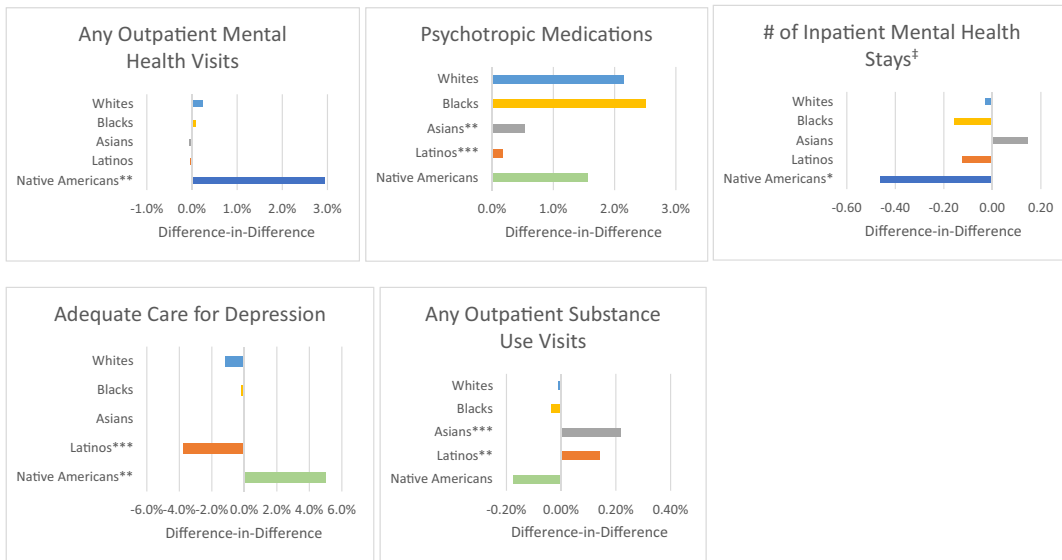


FIGURE 2 Difference-in-difference results of effects of MSSP on mental health and substance use care by race/ethnicity (difference-in-difference-in difference)—aged population

Notes: Results shown are differences in predicted population marginal means. Models were adjusted for age, sex, region, number of physical chronic or potentially disabling conditions, and number of behavioral health chronic or potentially disabling conditions. †Among clients with at least one inpatient visit. MSSP = Medicare Shared Savings Program. \* $P < .05$ , \*\* $P < .01$ , \*\*\* $P < .001$  for differences-in-differences within a racial/ethnic group being significantly different from differences within Whites.

care, MSSP enrollment was associated with an increase in the mean number of SUD inpatient visits in a year among those who had at least one SUD inpatient stay (coefficient = 0.06,  $P < .001$ ), but was not associated with a significant change in the probability that a beneficiary would fill an addiction medication, or in the probability of SUD outpatient visits or inpatient stays among this population.

### 3.3 | Examination of the differential impact of MSSP ACOs by race/ethnicity

The results from our DDD analyses indicate that MSSP enrollment had differential impacts on several measures of behavioral health services utilization based on beneficiaries' race/ethnicity. We

include in the Appendix S1 the differential effects by race/ethnicity using marginal means derived from our DDD models, and Figures 1 and 2 show a graphic representation of the difference-in-difference findings by race/ethnicity for both the disability and aged populations where the DDD interactions were significant. Among the disability population, the impact of MSSP enrollment on psychotropic and addiction medications varied based on beneficiary's race/ethnicity. Although claims for psychotropic medications increased at a higher rate for White beneficiaries in the MSSP group compared to the control group, MSSP enrollment was associated with a reduction on psychotropic medications for Black beneficiaries (DDD = -0.4%,  $P < .001$ ). Although MSSP enrollment was associated with an increase in use of addiction medications among White beneficiaries, it was associated with a greater increase in addiction medications



among Black beneficiaries (DDD = 0.4%,  $P < .001$ ). None of the other DDDs in the disability population were significant, suggesting that the effect of MSSP enrollment (if any) on the other service utilization measures was similar across the different racial/ethnic groups.

MSSP enrollment also had a differential effect by race/ethnicity on utilization of some behavioral health services outcomes in the aged population. While outpatient mental health visits increased for Whites and Native Americans in the MSSP groups compared to the control group, this increase was higher among Native American beneficiaries (DDD = 2.7%,  $P < .01$ ). While claims for psychotropic medications increased at higher rate for beneficiaries in the MSSP group compared to the control group, the increase was smaller for Latinos (DDD = -2.0%,  $P < .001$ ) and Asians (DDD = -1.6%,  $P < .01$ ). Furthermore, MSSP enrollment was associated with a greater decrease in the number of annual inpatient mental health admissions among Native American beneficiaries with at least an annual mental health stay, compared with their White counterparts (DDD = -0.43,  $P < .05$ ). Also, while MSSP enrollment was associated with a decrease in probability of adequate care for depression among White beneficiaries, MSSP enrollment was associated with an even larger decrease in probability of adequate care among Latinos (DDD = -2.6%,  $P < .001$ ), but was associated with an increase among Native American beneficiaries (DDD = 6.2%,  $P < .01$ ). Finally, while MSSP enrollment was not associated with an increase in outpatient SUD visits among White beneficiaries, MSSP enrollment was associated with an increase in the probability of a SUD outpatient visit among Asian (DDD = 0.23%,  $P < .001$ ) and Latino beneficiaries (DDD = 0.15,  $P < .01$ ).

### 3.4 | Secondary analyses

In secondary analyses, we limited the samples to those who had had a either a mental health or SUD service in the prior year, depending on the outcome. Our results of the difference-in-difference models were similar among the disability-eligible population when we used the entire sample, with the exception that the impact of the MSSP on SUD outpatient visits and medications was not significant. Among the age-eligible population with a mental health or SUD service in the prior year, the MSSP was only significantly associated with an increase in psychotropic medications. The differential impact of MSSP on our outcomes was mostly similar, except that the MSSP no longer had a differential impact on SUD medications by race/ethnicity among the disability population and the effect of the MSSP on outpatient mental health visits did not differ for Asians among the aged population. The results of these analyses can be found in the Appendix S1.

## 4 | DISCUSSION

Using Medicare claims data from 2009 through 2016, we found that with few exceptions, the MSSP was not associated with increases in

mental health or SUD care services, but was associated with small reductions in several of our measures of utilization of outpatient and inpatient mental and SUD health care.

The reduction in behavioral health inpatient stays is consistent with findings of the early implementation of the MSSP.<sup>13</sup> While these associations were small (less than 1% MSSP effect) on an absolute scale, the decrease is between 8% and 13% relative to the predicted inpatient admissions for the MSSP sample prior to implementation of the MSSP program. A reduction in inpatient admissions could be the result of improved care coordination that is integral to ACOs resulting in better behavioral health care and improved outcomes. The high costs of inpatient stays, and the financial stress, family difficulties, and missed work attributable to inpatient psychiatric stays<sup>36,37</sup> make fewer admissions a desirable outcome. Utilization management programs may benefit patients and reduce inpatient admissions if they are linked to adequate and effective outpatient care. However, from our data, it is not possible to determine whether this was the case or if instead, individuals in need for inpatient stays (eg, those with more severe mental health and SUD conditions) were diverted from receiving needed inpatient treatment in pursuit of savings.

Among the disability-eligible beneficiaries, for the most part, the MSSP was associated with small reductions in mental health and SUD services and in adequate care for depression. These decreases ranged between 4% and 14% relative to the baseline. Given the high rates of behavioral health conditions and high level of need for services among this population, these reductions are concerning. Policy makers should monitor whether these decreases in service use are linked to poorer patient outcomes. Currently, MSSP ACO's receipt of shared savings is contingent on only one mental health measure: depression screening with follow-up plan for positive screens.<sup>38</sup> There are several other existing mental health and SUD quality measures that should be considered.<sup>39</sup> Also, research is needed to determine whether Medicare patients with disability in MSSP ACOs are more likely to encounter barriers to getting needed comprehensive mental health and SUD care than those who are not receiving care from providers in an MSSP ACO.

We identified important racial/ethnic group differences in the impact of the MSSP program. Our analyses show that the MSSP led to small reductions in disparities in some types of behavioral health treatment. For example, overall increases in outpatient mental visits associated with MSSP among age-eligible beneficiaries were even greater for Native American beneficiaries who tended to have lower baseline use outpatient services. Conversely, the MSSP may have aggravated disparities for some groups. For instance, the reduction in adequate care for depression was greater for Latino beneficiaries in the age-eligible population than their White counterparts. Going forward, emphasis should be placed on monitoring and reducing disparities in behavioral health care, particularly for Black and Native American beneficiaries with disabilities who have lower rates of use of outpatient mental health care, disparities which were not reduced by the MSSP. Resources and staffing allocated to improving the availability of behavioral health providers who demonstrate cultural humility<sup>40</sup> and



to providing outreach and engagement programs that understand the unique role of stigma and prior discrimination in the behavioral health care field,<sup>41-44</sup> are also needed to reduce existing disparities.

Provider organizations participating in the MSSP are one of three generations of ACOs organized by CMS to incentivize coordinated medical and mental health treatment for Medicare beneficiaries. As of 2019, 518 ACOs serving over 10 million Medicare beneficiaries are participating in MSSP, transforming the coordination of care in the Medicare program. The MSSP program continues to evolve and at the end of 2018, CMS issued a final rule for redesigning the MSSP and set a new direction to the program ("Pathways to Success") which discontinued some of the tracks and made the transition time to performance-based risk shorter and the downside risks higher. Results from MSSP evaluations such as the one in the present study can directly inform the evolution of the MSSP program and inform new Medicare models of ACOs that move away from fee for service to population-based payments.

As changes are made to Medicare ACO models, it will be important to track how these changes impact provision and quality of mental health and substance use services and disparities in care. Given our findings on reductions of outpatient and inpatient care, it will be crucial that additional quality measures for these conditions are monitored to ensure that as ACOs try to reduce costs, they do not do so at the risk of reducing needed care for individuals suffering from these conditions, and increase disparities. In light of the massive system shock induced by COVID-19, including the rapid shift to telehealth, and the expected negative impact of the pandemic on mental health and substance use, and disproportionate impact among individuals of color, it will even be more critical to continue examining the role of Medicare ACOs on access, quality of care, and equity in care for these conditions.

#### 4.1 | Limitations

Our study has several limitations. First, participation by provider organizations in the MSSP is voluntary, and there is thus a risk of selection bias. In the case of the demonstration of improved outcomes (eg, increase in outpatient mental health visits among the age-eligible), the impact of the MSSP could be alternatively explained by the fact that provider organizations who have patients that are more amenable to improve (eg, because of unobserved neighborhood contextual or community mental health stigma norms) may be more likely to participate in the MSSP program. This is addressed in part by estimating difference-in-difference models differencing out the time invariant unobserved characteristics but does not completely diminish the possibility of unmeasured time-varying individual patient and provider organization characteristics acting as confounders to our causal identification strategy. Second, because our sample size is large, many of the effects are statistically significant, even when the effect size is small. Finally, the categories for race/ethnicity in Medicare claims are broad. Findings from prior studies have shown that mental health service utilization varies by subgroups

within these broad racial/ethnic categories,<sup>45</sup> and our broad categorization does not allow for assessment of these important within-group differences.

## 5 | CONCLUSIONS

This is the first study that focuses exclusively on the impact of Medicare MSSP on mental health care over the maturation of the MSSP program into 2016, and, to our knowledge, the first to focus on the impact of the MSSP on SUD care. This study also adds to the literature on MSSP evaluations by examining the impact of MSSP ACOs on behavioral health care by race/ethnicity. Findings from this study suggest that MSSP ACOs are reducing inpatient stays. Furthermore, as ACOs are placed at greater financial risk for population-based treatment and are asked to adhere to an ever-evolving set of quality measures, it will become more important to explore how these changes impact behavioral health care utilization, patient satisfaction, and experiences of quality of behavioral health treatment, especially for racial/ethnic minority beneficiaries that experience the lowest levels of access and quality of treatment.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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