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Medicare Risk Arrangement and Use and Outcomes Among Physician Groups

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Abstract

IMPORTANCE Many physician groups are in 2-sided risk payment arrangements with Medicare Advantage plans (at-risk MA). Analysis of quality and health resource use under such arrangements may inform ongoing Medicare policy concerning payment and service delivery.

OBJECTIVE To compare quality and efficiency measures under 2 payment models: at-risk MA and fee-for-service (FFS) MA.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study used Medicare encounter and enrollment data from 2016 to 2019 covering 17 physician groups, 15 488 physicians, and 35 health insurers to compare quality and health resource use for Medicare beneficiaries within the same physician groups. The data were analyzed between August 4 and October 30, 2024.

EXPOSURES Care delivered under at-risk MA and FFS MA payment arrangements by the same physicians and medical groups.

MAIN OUTCOMES AND MEASURES Twenty quality and efficiency measures across 4 domains of patient care (hospital care, avoidance of the emergency department [ED], avoidance of disease-specific admissions, and outpatient care) were examined using logistic regression analysis.

RESULTS The overall sample comprised 5 278 717 person-years (37.7% at-risk MA and 62.3% FFS MA). The mean (SD) age of beneficiaries was 73.6 (9.2) years in the at-risk MA group (56.8% women) and 71.8 (10.4) years in the FFS MA group (57.4% women). For at-risk MA compared with FFS MA, inpatient admissions and 30-day readmissions per 1000 were 10.03 (95% CI, −10.61 to −9.44) and 1.95 (95% CI, −2.18 to −1.73) lower. ED use measures per 1000 ranged from 2.95 (95% CI, −3.28 to −2.63) lower for avoidable ED visits to 26.02 (95% CI, −26.92 to −25.12) lower for overall ED visits. Avoidance of disease-specific admissions per 1000 ranged from 0.24 (95% CI, −0.35 to −0.13) lower for composite diabetes-related admissions to 2.18 (95% CI, −2.43 to −1.94) lower for the composite of chronic disease–related admissions. High-risk drug use per 1000 was 14.26 (95% CI, −14.85 to −13.67) lower. Overall, compared with FFS MA, at-risk MA was associated with higher quality and efficiency in 18 of 20 measures after adjusting for differences in demographics, Hierarchical Condition Categories Risk Adjustment Factor scores, and other health characteristics.

CONCLUSIONS AND RELEVANCE In this cross-sectional study, at-risk MA payment arrangements managed by physician groups were associated with higher quality and efficiency compared with FFS MA managed by the same groups. The population and methods used provide robust evidence that at-risk payment arrangements in MA may improve health care delivery for the MA population.

Key Points

Question Is care delivered by physician groups under 2-sided risk payment arrangements in Medicare Advantage (at-risk MA) associated with higher quality and efficiency compared with care delivered by the same physician groups under fee-for-service MA payment arrangements?

Findings In this cross-sectional study of 2016-2019 claims and enrollment data covering 5 278 717 person-years, the marginal risk differences across 4 domains of patient care (hospital care, avoidance of the emergency department, avoidance of disease-specific admissions, and outpatient care) favored higher quality and efficiency in at-risk MA compared with fee-for-service MA in 18 of 20 quality and health resource use measures.

Meaning These findings suggest that at-risk payment arrangements may improve health care delivery for MA beneficiaries.

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

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Introduction

More than half of Medicare beneficiaries opt into Medicare Advantage (MA),[1] which includes out-of-pocket spending caps and supplemental benefits (eg, dental, hearing, vision) that are not available in the traditional Medicare (TM) program.[2] A growing number of studies have indicated that MA enrollment is associated with superior quality outcomes, reductions in total cost of care, and lower out-of-pocket spending.[3-6]

Medicare Advantage plans differ in how they contract with health care professionals.[7] They may pay physicians through fee-for-service arrangements (FFS MA) or contract with physician groups under delegated 2-sided risk arrangements, under which the financial risk of delivering health care services is transferred wholly or in large part to the group (at-risk MA). These physician groups may retain financial surpluses or incur financial deficits related to the quality and efficiency of care they provide. To minimize financial risk while delivering optimal care, physician groups under at-risk payment arrangements have incentives to develop a population health management infrastructure to improve care and reduce high-cost health resource use. At-risk payment arrangements exist for some TM patients through the Accountable Care Organization Realizing Equity, Access, and Community Health model and the Medicare Shared Savings Program. However, at-risk MA incorporates a substantially greater risk than these models and gives physicians a greater range of tools with which to manage care.[8]

Studying at-risk MA compared with FFS MA therefore provides a method for evaluating the quality and health resource use of these at-risk payment arrangements. Studies have found that at-risk MA payment models are associated with higher quality and efficiency, specifically in the inpatient setting, compared with both TM[9] and FFS MA.[10] In this study, we examined a broad array of quality and efficiency measures encompassing 4 domains of patient care and studied a large sample of at-risk physician groups and primary care physicians (PCPs). We also examined risk contracts from the universe of various MA payers with which these groups contract, which are more reflective of the high-risk global capitation models that are currently prevalent.

Methods

This cross-sectional study examined the association of at-risk MA physician arrangements with quality and health care resource use. We compared at-risk MA to FFS MA for patients cared for within the same physician groups, which allowed us to isolate the extent to which MA's performance might be driven by at-risk payment arrangements and the resultant care management infrastructure built by physician groups participating in these arrangements. This study was approved by Solutions IRB, an external institutional review board. Since the study design involved a retrospective analysis of preexisting, deidentified data, it qualified as non–human participants research under institutional review board protocol and was exempted from further review and the need for informed consent. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Study Data

The study used publicly available MA encounter data from the Centers for Medicare & Medicaid Services (CMS), as well as nonpublic data on at-risk payment arrangements across a subset of 17 physician groups. The study covered the period from January 1, 2016, to December 31, 2019.

CMS Medicare data tracks health resource use and outcomes for beneficiaries in MA. Prior to our sample restrictions, the original dataset covered 100% of all MA beneficiaries, including all beneficiaries in at-risk as well as FFS payment arrangements. To address potential concerns about Medicare encounter data completeness, we included inpatient-related outcomes for which encounter data have been shown to be highly accurate. We further mitigated potential data completeness issues by focusing solely on MA patients; because the at-risk and FFS cohorts were

both tracked in encounter data, any comparison between them should not have been biased by encounter data completeness.

The physician groups dataset (eTable 1 in Supplement 1) tracked the universe of at-risk MA payment arrangements across all 17 groups that elected to participate and submit data for the study. These 17 physician groups varied in terms of size and geographic location, collectively treated a substantial fraction of all Medicare patients nationwide, and appeared to be a representative sample of physician groups broadly. For example, the physician groups were at risk for approximately 35% of their attributed MA patients compared with a rate of 24% across all groups nationwide.[11]

The physician group dataset tracked MA plans for which each group was at risk on a year-by-year basis. For each at-risk arrangement, the data tracked the specific MA plan to which the arrangement pertained, including the characteristics of that plan (eg, carrier, plan type, contract identifier, and plan identifier). The data also tracked the scope of each at-risk arrangement, specifically whether the arrangement involved a full risk for professional services only, full professional risk with shared institutional risk, or global full-risk arrangement covering all services. Most at-risk arrangements in our study were global in nature, and all but 1 physician group had meaningful risk exposure in terms of having at least one 2-sided risk arrangement covering a minimum of professional services. We were able to track all of the individual PCPs who were subject to each group's at-risk arrangements based on physician roster data obtained from the groups, which tracked the physicians affiliated with or employed by each group.

Sample and Cohorts

Our sample was restricted to the set of 17 physician groups participating in the study. To link beneficiaries to PCPs and their associated physician groups, we first attributed beneficiaries to an individual PCP using the Medicare Shared Savings Program attribution methodology, as an equivalent or near-equivalent methodology is typically used by MA plans for at-risk payment attribution.[12] We conducted attributions separately for each year on a concurrent basis to reflect each beneficiary's predominant PCP in a given calendar year and to capture year-over-year changes in PCPs. We then tied individual PCPs to participating groups based on group-provided roster data. We further limited our sample to beneficiary-year combinations in which a beneficiary had used primary care.

To avoid confounding related to disruptions during the COVID-19 pandemic, we restricted our sample to the years 2016 through 2019. We then restricted beneficiary-year combinations to individuals enrolled in both Medicare Part A and Part B for all 12 months of that year. Our sample included patients eligible for Medicare and Medicaid (dually eligible), not dually eligible, and aged 64 years or younger and 65 years or older. For pharmacy-based measures, we further restricted the sample to beneficiaries with Part D coverage for all 12 months of the measurement year. Finally, we restricted the sample to beneficiaries enrolled in MA for the entire calendar year.

We constructed 2 distinct cohorts for each calendar year: (1) at-risk MA and (2) FFS MA. The at-risk MA cohort was defined as beneficiaries whose attributed physician group was at risk for the beneficiary's MA plan for that calendar year. If a beneficiary was enrolled in multiple MA plans in a given year, we used the MA plan in which they were enrolled the longest. The FFS MA and TM cohorts were defined using an analogous approach.

Outcomes

Using MA encounter data, we calculated 20 quality and health resource use measures across 4 domains of patient care: hospital care, avoidance of emergency department (ED) care, avoidance of disease-specific admissions, and outpatient care. Outpatient measures used the Healthcare Effectiveness Data and Information Set pharmacy measures. Outcomes were defined at an individual claim level and subsequently aggregated up to a person-year level.

We tracked inpatient and ED visit volume, focusing on visit types that reflected overall care quality, such as 30-day all-cause inpatient readmissions and primary care–treatable ED visits. We also

tracked avoidable inpatient visits based on the Agency for Health Research and Quality prevention quality indicator (PQI) definitions,[13] including avoidable admissions for acute and/or chronic complications for the following conditions: diabetes, chronic obstructive pulmonary disease, hypertension, heart failure, bacterial pneumonia, and urinary tract infections. Finally, we tracked measures of outpatient care quality, including pharmacy measures of medication adherence and high-risk drug use (eMethods in Supplement 1).

Statistical Analysis

Between August 4 and October 30, 2024, we compared the at-risk MA and FFS MA cohorts over the same period and within the same physician groups. To identify the association of these different forms of coverage and mitigate potential confounding from patient mix differences, we used a set of controls including age; sex; self-reported race and ethnicity (based on Research Triangle Institute race code [American Indian or Alaska Native, Asian or Pacific Islander, Black or African American, Hispanic, non-Hispanic White, other racial, or unknown]); dual-eligibility status; calendar year; Hierarchical Condition Category (HCC) Risk Adjustment Factor score, composite version 24; and prevalence indicators for different high-level disease categories (based on high-level HCC groupings). Race and ethnicity were included as disparities exist in health outcomes and racial and ethnic differences may exist in MA enrollment and risk exposure within MA, statistically necessitating their inclusion. The HCCs are sets of medical codes linked to specific clinical diagnoses and used by the CMS for risk adjustment of individuals with serious acute or chronic conditions. The CMS used version 24 to calculate risk adjustment scores for MA plans during the years of this study. We also included an indicator for the physician group of the attributed PCP, which allowed us to mitigate potential confounding from physician differences by comparing payment arrangements within a specific physician group. We additionally restricted our analysis to the 17 physician groups participating in the study, each of which had exposure to both at-risk and FFS MA patients. Finally, we accounted for differences in MA plan mix, specifically health maintenance organization (HMO) vs preferred provider organization, between at-risk MA and FFS MA arrangements by including a control for MA HMO status.

We used a multivariable logistic regression model representing all measures as binary indicators rather than using counts, given the relatively low odds or prevalence of 0 values. As an additional robustness check, to assess the sensitivity of associations to coding intensity, we ran models adjusting for HCC, version 28 scores and groupings in place of those using version 24. Version 28 is the latest HCC version effective in 2023 and was intended to reduce the impact of coding intensity by removing revenue associated with 2294 *International Statistical Classification of Diseases, Tenth Revision* codes. Results are reported as marginal risk differences. All analyses were performed using SAS Enterprise Guide, version 7.15 (SAS Institute Inc). A 2-sided $P < .05$ by Wald χ^2 test was considered significant for the regression estimates.

Results

The final cohort of beneficiaries represented 5 278 717 person-years, of which 37.7% were in at-risk MA and 62.3% in FFS MA (eFigure in Supplement 1). The beneficiary cohort was associated with 15 488 different PCPs and 35 different health plans. The mean (SD) age of beneficiaries was 73.6 (9.2) years in the at-risk MA group and 71.8 (10.4) years in the FFS MA group. In at-risk MA and FFS MA, women comprised 56.8% and 57.4% of each group, respectively, compared with men (43.2% and 42.6%, respectively), while Non-Hispanic White beneficiaries constituted 49.2% and 36.4%, respectively, compared with 0.1% each of American Indian or Alaska Native, 5.6% and 5.0% for Asian or Pacific Islander, 8.1% and 9.9% Black or African American, 35.2% and 47.5% Hispanic, 1.1% and 0.6% other race, and 0.7% and 0.5% unknown race and ethnicity, respectively. The Pacific region had the greatest number of beneficiaries in the entire sample (28.2%). The mean (SD) HCC, version 24 score was 1.40 (1.09) for at-risk MA and 1.46 (1.14) for FFS MA (**Table 1**).

Unadjusted rates and a marginal effect risk difference comparison of study outcomes across at-risk MA and FFS MA are shown in **Table 2**, the **Figure**, and **Table 3**. At-risk MA beneficiaries were observed to have more favorable outcomes across 18 of 20 measures of quality and health resource use among the 4 domains of patient care (Figure). With respect to hospital care, acute inpatient

Table 1. Descriptive Characteristics of Sample, 2016-2019

Characteristic and level	Study group, No. (%)		
	All	At-risk MA	FFS MA
Total No. of person-years	5 278 717	1 990 869	3 287 848
Age, mean (SD), y	72.5 (10.0)	73.6 (9.2)	71.8 (10.4)
Age groups, y			
≤64	715 392 (13.6)	187 125 (9.4)	528 267 (16.1)
65-69	1 136 602 (21.5)	441 092 (22.2)	695 510 (21.2)
70-74	1 312 548 (24.9)	511 668 (25.7)	800 880 (24.4)
75-79	949 223 (18.0)	371 315 (18.7)	577 908 (17.6)
≥80	1 164 952 (22.1)	479 669 (24.1)	685 283 (20.8)
Sex			
Female	3 017 791 (57.2)	1 130 493 (56.8)	1 887 298 (57.4)
Male	2 260 926 (42.8)	860 376 (43.2)	1 400 550 (42.6)
Race and ethnicity			
American Indian or Alaska Native	5041 (0.1)	2715 (0.1)	2326 (0.1)
Asian or Pacific Islander	276 323 (5.2)	112 473 (5.6)	163 850 (5.0)
Black or African American	485 141 (9.2)	160 845 (8.1)	324 296 (9.9)
Hispanic	2 263 648 (42.9)	700 306 (35.2)	1 563 342 (47.5)
Non-Hispanic White	2 177 070 (41.2)	980 153 (49.2)	1 196 917 (36.4)
Other[a]	42 392 (0.8)	21 356 (1.1)	21 036 (0.6)
Unknown	29 102 (0.6)	13 021 (0.7)	16 081 (0.5)
Census division			
East North	45 184 (0.9)	15 725 (0.8)	29 459 (0.9)
East South	568 138 (10.8)	148 724 (7.5)	419 414 (12.8)
Mid-Atlantic	102 046 (1.9)	24 007 (1.2)	78 039 (2.4)
Mountain	166 201 (3.1)	68 522 (3.4)	97 679 (3.0)
New England	35 784 (0.7)	27 108 (1.4)	8676 (0.3)
Other, noncontiguous	1 274 094 (24.1)	173 087 (8.7)	1 101 007 (33.5)
Pacific	1 487 728 (28.2)	931 704 (46.8)	556 024 (16.9)
South Atlantic	747 295 (14.2)	123 889 (6.2)	623 406 (19.0)
West North	3064 (0.1)	771 (0.0)	2293 (0.1)
West South	849 183 (16.1)	477 332 (24.0)	371 851 (11.3)
Dually eligible	1 024 510 (19.4)	304 445 (15.3)	720 065 (21.9)
HMO plan type	4 523 492 (85.7)	1 975 815 (99.2)	2 547 677 (77.5)
HCC, version 24 score, mean (SD)	1.43 (1.13)	1.40 (1.09)	1.46 (1.14)
HCC groupings			
Blood: 2, 46, 48	569 820 (10.8)	246 163 (12.4)	323 657 (9.8)
CVD: 82, 83, 84, 85, 86, 87, 88, 96, 99, 100, 107, 108	2 585 565 (49.0)	984 116 (49.4)	1 601 449 (48.7)
Diabetes: 17, 18, 19	2 129 592 (40.3)	756 165 (38.0)	1 373 427 (41.8)
Injury: 166, 167, 168	102 154 (1.9)	40 034 (2.0)	62 120 (1.9)
Kidney: 134, 135, 136, 137, 138	1 047 855 (19.9)	431 529 (21.7)	616 326 (18.7)
Liver: 27, 28	63 905 (1.2)	25 465 (1.3)	38 440 (1.2)
Lung: 111, 112, 114, 115	1 052 529 (19.9)	387 738 (19.5)	664 791 (20.2)
Neoplasm: 8, 9, 10, 11, 12	458 647 (8.7)	164 025 (8.2)	294 622 (9.0)
Psychiatric: 57, 58, 59, 60	1 268 054 (24.0)	450 390 (22.6)	817 664 (24.9)
Substance abuse: 54, 55, 56	506 059 (9.6)	175 309 (8.8)	330 750 (10.1)
Skin: 157, 158, 159, 161, 162	108 083 (2.0)	36 593 (1.8)	71 490 (2.2)

Abbreviations: at-risk MA, Medicare Advantage beneficiaries cared for under fully accountable care organization models; CVD, cardiovascular disease; FFS MA, Medicare Advantage beneficiaries cared for under fee-for service models; HCC, Hierarchical Condition Category; HMO, health maintenance organization.

[a] Other category includes racial and ethnic minority groups other than Asian, Black, Hispanic, or American Indian.

admissions and 30-day readmission rates per 1000 were lower by 10.03 (95% CI, −10.61 to −9.44; *P* < .001) and 1.95 (95% CI, −2.18 to −1.73; *P* < .001), a difference relative to FFS MA of −8.7% and −12.9%, respectively. On the 4 measures of avoidance of ED use, ED admissions per 1000 ranged from 2.95 (95% CI, −3.28 to −2.63; *P* < .001) lower for avoidable ED visits to 26.02 (95% CI, −26.92 to −25.12; *P* < .001) lower for overall ED visits, a difference relative to FFS MA of −10.7% and −8.7%, respectively. The 9 measures of avoidance of disease-specific admissions per 1000 ranged from 0.24 (95% CI, −0.35 to −0.13; *P* < .001) lower for the PQI-93 composite of diabetes-related admissions to 2.18 (95% CI, −2.43 to −1.94; *P* < .001) lower for the PQI-92 composite of chronic disease–related admissions, a difference relative to FFS MA of −7.8% and −13.0%, respectively. Finally, looking at the 5 measures of outpatient care per 1000, high-risk drug use was 14.26 (95% CI, −14.85 to −13.67; *P* < .001) lower, and medication adherence was 3.47 (95% CI, 2.21-4.74; *P* < .001) higher for statin medications and 5.69 (95% CI, 4.49-6.89; *P* < .001) higher for antihypertensive medications. The FFS MA had higher diabetes medication adherence by 4.46 (95% CI, −6.75 to −2.17; *P* < .001) per 1000, and at-risk MA and FFS MA were statistically equivalent on the measure for diabetes-related lower extremity amputation.

As a robustness test, we conducted our main analyses on an alternative sample, which included at-risk and not-at-risk MA beneficiaries who died over the course of the year. We found that these results were effectively equivalent to those in our original analysis, indicating that the results from our original sample are robust to survivorship bias (eTables 3 and 4 in Supplement 1).

Table 2. Unadjusted Comparison of Efficiency and Quality Outcome Measures, Measurement Year 2019[a]

	Events per 1000, mean (SD)		
Domain and outcome measure	All	At-risk MA	FFS MA
Hospital care			
Acute inpatient admissions	163.6 (563.4)	142.3 (508.8)	177.3 (595.5)
30-d Readmissions	20.5 (209.4)	16.4 (178.6)	23.1 (226.9)
Avoidance of ED			
ED visits	609.7 (1689.2)	517.5 (1360.4)	668.9 (1867.7)
Avoidable ED visits	36.2 (284.4)	30.2 (243.2)	40.0 (307.9)
Primary care–treatable ED	88.9 (433.0)	67.6 (343.7)	102.6 (481.1)
Inpatient admission through ED	108.1 (459.1)	105.2 (437.6)	110.0 (472.4)
Avoidance of disease-specific admission			
COPD or asthma, older adult (≥40 y)	6.3 (99.2)	4.4 (83.0)	7.5 (108.4)
Hypertension	1.5 (41.8)	1.2 (36.2)	1.6 (45.0)
Heart failure	9.3 (126.2)	8.0 (111.2)	10.2 (134.9)
Bacterial pneumonia	4.1 (68.5)	3.2 (59.4)	4.7 (73.8)
Urinary tract infection	3.6 (65.4)	2.8 (57.1)	4.1 (70.2)
Diabetes lower extremity amputation	0.7 (29.8)	0.5 (26.1)	0.8 (32.0)
PQI-91 acute composite	7.8 (95.4)	6.0 (83.0)	8.9 (102.6)
PQI-92 chronic composite	21.3 (193.0)	16.9 (166.2)	24.1 (208.4)
PQI-93 diabetes composite	4.2 (85.3)	3.4 (75.7)	4.8 (90.9)
Outpatient care			
High-risk drug use	73.0 (260.1)	61.4 (240.0)	80.5 (272.0)
Office visits	8778.1 (7047.5)	7785.9 (6432.7)	9414.9 (7345.1)
Medication adherence			
RAS	857.4 (349.7)	881.6 (323.1)	843.0 (363.8)
Diabetes	719.2 (449.4)	735.8 (440.9)	709.5 (454.0)
Statin	845.5 (361.5)	875.9 (329.7)	826.8 (378.4)

Abbreviations: at-risk MA, Medicare Advantage beneficiaries cared for under fully accountable care organization models; COPD, chronic obstructive pulmonary disease; ED, emergency department; FFS MA, Medicare Advantage beneficiaries cared for under fee-for-service models; PQI, prevention quality indicator; RAS, renin-angiotensin system.

[a] The 2019 data included are representative. eTable 2 in Supplement 1 shows all 4 years of data.

Discussion

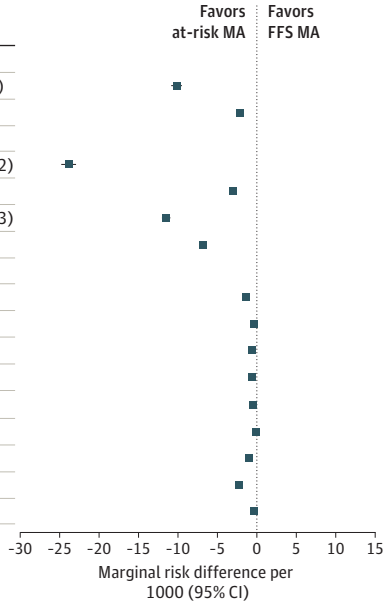
This cross-sectional study found that beneficiaries in at-risk MA experienced more favorable quality and health resource use outcomes across 4 domains of patient care compared with FFS MA beneficiaries, even after adjusting for variations in patient mix. These results are clinically and economically meaningful given that these outcomes reflect common conditions and major drivers of use,[14] including preventable inpatient admissions for multiple acute and chronic diseases.

A challenge for prior work was differences in patient mix across payment models, making the identification of causal associations difficult. We adjusted for differences in patient mix by using demographic and health risk score controls and accounted for potential differences in physician mix across different payment types by ensuring that both beneficiary cohorts received care from the same physicians and physician groups. We also accounted for differences in payer mix across payment models, specifically HMO vs preferred provider organization, between at-risk and FFS MA arrangements by including a control for MA HMO status.

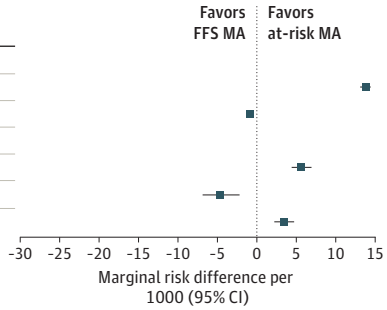
The differences observed in this study could be explained by the mix of physician groups, as groups that are taking meaningful risk may be more experienced in managing that risk than other groups previously studied. The differences might also be explained by risk-based contracts in our sample being global and all being full risk, implying that more comprehensive and stringent risk-based contracts may have more pronounced associations with outcomes.

Figure. Adjusted Risk Differences Between At-Risk Medicare Advantage (At-Risk MA) and Fee-for-Service Medicare Advantage (FFS MA) for 20 Outcome Metrics

Measure	Marginal risk difference per 1000 (95% CI)
Hospital care	
Acute IP admissions	−10.03 (−10.61 to −9.44)
30-d Readmission	−1.95 (−2.18 to −1.73)
Avoidance of ED	
ED visits	−26.02 (−26.92 to −25.12)
Avoidable ED visits	−2.95 (−3.28 to −2.63)
Primary care-treatable ED	−11.34 (−11.85 to −10.83)
IP through ED	−6.75 (−7.21 to −6.28)
Avoidance of disease-specific admissions	
COPD or asthma, older adult (aged ≥40 y)	−1.33 (−1.48 to −1.18)
Hypertension	−0.25 (−0.32 to −0.18)
Heart failure	−0.56 (−0.72 to −0.39)
Bacterial pneumonia	−0.51 (−0.64 to −0.37)
Urinary tract infection	−0.49 (−0.61 to −0.37)
Diabetes lower-extremity amputation	0.04 (0.00 to 0.09)
PQI-91 acute disease composite	−0.97 (−1.15 to −0.80)
PQI-92 chronic disease composite	−2.18 (−2.43 to −1.94)
PQI-93 diabetes composite	−0.24 (−0.35 to −0.13)



Measure	Marginal risk difference per 1000 (95% CI)
Outpatient care	
High-risk drug use	14.26 (13.67 to 14.85)
Office visits	−0.79 (−1.06 to −0.53)
Medication adherence	
RAS	5.69 (4.49 to 6.89)
Diabetes	−4.46 (−6.75 to −2.17)
Statin	3.47 (2.21 to 4.74)



Adjusted risk difference from logistic regression models for marginal effects. The probability of all outcomes were modeled in the overall cohort. Due to low event rates, risks and risk differences are reported per 1000. All models were adjusted for age groups; sex; race and ethnicity; dual-eligibility status; health maintenance organization plan type (for MA); physician groups; calendar year; and Hierarchical Condition Category score, version 24 and the following high-level groupings: blood (2, 46, 48), cardiovascular disease (82, 83, 84, 85, 86, 87, 88, 96, 99, 100, 107, 108), diabetes (17, 18, 19), injury (166, 167, 168), kidney (134, 135, 136, 137, 138), liver (27, 28), lung (111, 112, 114, 115), neoplasm (8, 9, 10, 11, 12), psychiatric (57, 58, 59, 60), substance abuse (54, 55, 56), and skin (157, 158, 159, 161, 162). COPD indicates chronic obstructive pulmonary disease; ED, emergency department; IP, inpatient; PQI, prevention quality indicator; RAS, renin-angiotensin system.

Our finding of higher quality and efficiency associated with at-risk MA compared with FFS MA is consistent with the limited data from other studies that examined outcomes associated with these payment models.[10,15] Such findings suggest that it is the at-risk payment arrangement that underpins this clinical performance and is a reminder that all of MA is not monolithic, since many MA contracts continue to pay physician groups and physicians in FFS arrangements. Furthermore, our findings suggest that these at-risk payment arrangements are a key driver through which MA achieves this clinical performance compared with other FFS models, including TM.[16]

We propose 2 key explanations for how at-risk payment arrangements achieve improved outcomes. First, physicians in at-risk MA may evolve practice patterns that support these improved outcomes, including a focus on preventive care, selective referral to high-performing specialists and efficient sites of service, attention to evidence-based medicine, and reduction in low-value care. Second is the infrastructure built to manage at-risk MA, examples of which may include population risk stratification, physician performance reporting and feedback, intensive case management, social worker and community health worker support to address health-related social needs, integrated behavioral health care and pharmacy services, and disease management programs.

Limitations

Our approach to adjusting for population differences across payment arrangements to isolate the associations of these arrangements relies on observable measures of health, demographics, and clinical risk. Despite including a broad range of measures, we may still have failed to account for residual, unobservable differences between the populations.

Table 3. Adjusted Risk for At-Risk MA vs FFS MA and Between-Group Risk Differences for 20 Outcome Metrics, 2016-2019[a,b]

Outcome	Marginal risk per 1000, mean (SE)[c]		% Difference (relative to FFS MA)	Risk difference *P* value
	At-risk MA	FFS MA		
Hospital care				
Acute inpatient admissions	105.83 (0.22)	115.86 (0.17)	−8.7	<.001
30-d Readmissions	13.16 (0.08)	15.11 (0.06)	−12.9	<.001
Avoidance of ED				
ED visits	274.52 (0.34)	300.53 (0.25)	−8.7	<.001
Avoidable ED visits	24.52 (0.12)	27.47 (0.09)	−10.7	<.001
Primary care–treatable ED	58.37 (0.19)	69.70 (0.14)	−16.3	<.001
Inpatient admission through ED	70.58 (0.16)	77.32 (0.14)	−8.7	<.001
Avoidance of disease-specific admission				
COPD or asthma, older adult (≥40 y)	4.83 (0.06)	6.17 (0.04)	−21.6	<.001
Hypertension	1.11 (0.03)	1.36 (0.02)	−18.4	<.001
Heart failure	6.38 (0.06)	6.94 (0.05)	−8.1	<.001
Bacterial pneumonia	3.60 (0.05)	4.10 (0.04)	−12.4	<.001
Urinary tract infection	2.98 (0.05)	3.47 (0.03)	−14.1	<.001
Diabetes lower extremity amputation	0.51 (0.02)	0.47 (0.01)	8.5	.07
PQI-91 acute composite	6.52 (0.07)	7.49 (0.05)	−13.0	<.001
PQI-92 chronic composite	14.65 (0.09)	16.83 (0.07)	−13.0	<.001
PQI-93 diabetes composite	2.83 (0.04)	3.07 (0.03)	−7.8	<.001
Outpatient care				
High risk drug use	78.94 (0.22)	93.20 (0.16)	−15.3	<.001
Office visits	984.32 (0.09)	985.11 (0.08)	−0.1	<.001
Medication adherence				
RAS	833.86 (0.48)	828.17 (0.30)	0.7	<.001
Diabetes	694.15 (0.90)	698.61 (0.60)	−0.6	<.001
Statin	810.60 (0.51)	807.13 (0.32)	0.4	<.001

Abbreviations: at-risk MA, Medicare Advantage beneficiaries cared for under fully accountable care organization models; COPD, chronic obstructive pulmonary disease; ED, emergency department; FFS MA, Medicare Advantage beneficiaries cared for under fee-for-service models; PQI, prevention quality indicator; RAS, renin-angiotensin system.

[a] Probability of all outcomes were modeled in the overall cohort. Due to rare event rates, risks and risk differences are reported in per 1000.

[b] All models were adjusted for age groups; sex; race and ethnicity; dual-eligibility status; health maintenance organization plan type (for MA); physician groups; calendar year; and Hierarchical Condition Category score, version 24 and the following high-level groupings: blood (2, 46, 48), cardiovascular disease (82, 83, 84, 85, 86, 87, 88, 96, 99, 100, 107, 108), diabetes (17, 18, 19), injury (166, 167, 168), kidney (134, 135, 136, 137, 138), liver (27, 28), lung (111, 112, 114, 115), neoplasm (8, 9, 10, 11, 12), psychiatric (57, 58, 59, 60), substance abuse (54, 55, 56), and skin (157, 158, 159, 161, 162).

[c] Adjusted risk parameters from logistic regression models for marginal effects.

To address one potential source of unobserved population differences, we focused on an MA-only population, given that differences in coding and enrollment composition have primarily been documented between MA and TM rather than within MA itself. Moreover, we took steps to account for possible coding and reporting differences between at-risk MA and FFS MA. First, we ran sensitivity analyses, adjusting for risk using HCC, version 28–based instead of version 24–based scores. The effects remained robust and statistically significant when based on version 28, even though results were partially attenuated compared with version 24 results (eTables 3 and 4 in Supplement 1). Given the Medicare Payment Advisory Commission's findings that chart reviews accounted for approximately half of the coding intensity differences between MA and TM during our sample period,[17] we excluded all chart reviews when generating Risk Adjustment Factor scores and other disease-related indicators. As any component of coding intensity would be expected to be similar for at-risk MA and FFS MA, we examined the difference in mean HCC scores and found that this difference was only 4%, with at-risk MA having the lower score. This small difference suggests that coding intensity was not a factor in our results.

Because at-risk MA beneficiaries have been shown to have more socioeconomic disadvantages compared with FFS MA beneficiaries, the remaining unobserved differences may attenuate rather than amplify our results.[7,18] Furthermore, when physicians enter into at-risk contracts, they do so at an MA plan or MA contract level and, consequently, accept risk for all patients in a given MA plan. These physicians are unable to select patients at an individual level, which reduces the potential opportunity for selection bias. Considering these factors, any unobserved health and coding differences between the study populations would also likely narrow rather than magnify our estimates.[19]

Conclusions

In this cross-sectional study, the at-risk MA payment arrangement model, compared with the FFS MA model, was associated with higher quality and efficiency outcomes across 4 major domains of patient care when care was delivered by the same physician groups operating under both payment arrangements. While this study was not designed to assess causality, the results provide further evidence for the benefits associated with at-risk payment models and the possibility that they lead to higher quality and more efficient use of health care resources. These findings support the vision of a health care system where particular physician payment arrangements incentivize care that results in higher quality and more efficient use of health care resources.

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SUPPLEMENT 1.

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SUPPLEMENT 2.

Data Sharing Statement