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Comparison of Care Quality Metrics in 2-Sided Risk Medicare Advantage vs Fee-for-Service Medicare Programs

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Abstract

IMPORTANCE Medicare Advantage is associated with improved health outcomes, increased care efficiency, and lower out-of-pocket costs compared with fee-for-service (FFS) Medicare. When engaged in 2-sided risk arrangements, physicians are incented to offer high value for patients; however, no studies have explored the quality and efficiency outcomes in 2-sided risk Medicare Advantage models compared with FFS Medicare.

OBJECTIVE To compare quality and efficiency of care between physicians using a Medicare Advantage 2-sided risk model and FFS Medicare.

DESIGN, SETTING, AND PARTICIPANTS This retrospective cohort analysis with exact and propensity score–matched design used claims data from January 1, 2018, to December 31, 2019. Participants included beneficiaries enrolled in a Medicare Advantage 2-sided risk model (ie, physicians assumed the financial risk of total costs of care) and those in an FFS Medicare program in a 5% limited data set with part A and B coverage residing in 6 states (Arizona, California, Florida, Nevada, Texas, and Utah). Data were analyzed from February 1 to June 15, 2022.

EXPOSURES Medicare Advantage 2-sided risk model seen in practices that are part of a nationwide health care delivery organization compared with traditional FFS Medicare.

MAIN OUTCOMES AND MEASURES Comparative analysis of 8 quality and efficiency metrics in populations enrolled in a 2-sided risk-model Medicare Advantage program and 5% FFS Medicare.

RESULTS In this analytic cohort of 316 312 individuals (158 156 in each group), 46.11% were men and 53.89% were women; 32.72% were aged 65-69 years, 29.44% were aged 70-74 years, 19.05% were aged 75-79 years, 10.84% were aged 80-85 years, and 7.95% were 85 years or older. The Medicare Advantage model was associated with care of higher quality and efficiency in all 8 metrics compared with the FFS model. This included lower odds of inpatient admission (−18%; odds ratio [OR], 0.82 [95% CI, 0.79-0.84]), inpatient admission through the emergency department (ED) (−6%; OR, 0.94 [95% CI, 0.91-0.97]), ED visits (−11%; OR, 0.89 [95% CI, 0.86-0.91]), avoidable ED visits (−14%; OR, 0.86 [95% CI, 0.82-0.89]), 30-day inpatient readmission (−9%; rate ratio, 0.91 [95% CI, 0.86-0.98]), admission for stroke or myocardial infarction (−10%; OR, 0.90 [95% CI, 0.83-0.98]), and hospitalization for chronic obstructive pulmonary disease or asthma exacerbation (−44%; OR, 0.56 [95% CI, 0.50-0.62]).

CONCLUSIONS AND RELEVANCE The improvements observed in this study may be partly or fully attributed to the Medicare Advantage model. The Medicare Advantage risk adjustment system appears to be meeting its intended goal by aligning the capitation payments to the health care burden of the individual beneficiary and aggregate population served, thus providing revenue to

(continued)

Key Points

Question Are Medicare Advantage programs that assign financial risk for total cost of care to physicians associated with improved health outcomes and care efficiency compared with fee-for-service Medicare?

Findings In this cohort study of 316 312 individuals, physicians in a 2-sided risk Medicare Advantage model provided care of higher quality and efficiency compared with those practicing in a fee-for-service Medicare program in all 8 metrics measured.

Meaning These findings suggest that a Medicare Advantage payment model including 2-sided risk was associated with improvements in care quality and efficiency relative to fee-for-service Medicare.

+ Supplemental content

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

Abstract (continued)

develop infrastructure that supports improvements in quality and efficiency for the patients enrolled in Medicare Advantage models with 2-sided risk.

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Introduction

Medicare Advantage currently serves 44% of Medicare beneficiaries.[1] Compared with fee-for-service (FFS) Medicare, studies have suggested that Medicare Advantage is associated with improved outcomes, reductions in total cost of care, and lower patient out-of-pocket expense.[2-5] The Centers for Medicare & Medicaid Services (CMS) and Centers for Medicare & Medicaid Innovation have committed to moving our health care system to value-based care, including physician responsibility for total cost of care. Medicare Advantage is at the vanguard of this transformation, representing the largest risk-based insurance model in the US, eclipsing by more than 3-fold the percentage of beneficiaries in risk-based models in original Medicare, Medicaid, and commercial health plans.[6]

A 2-part 2021 article by Gilfillan and Berwick[7,8] offered a severe critique of the Medicare Advantage program. A chief criticism was that the Medicare Advantage risk-adjusted coding system results in significant overpayment because of risk score inflation.[2]

To study whether or not the improved care efficiency under Medicare Advantage is an artifact of the risk adjustment model, a retrospective study[9] looked at 2 populations of beneficiaries, 1 enrolled in Medicare Advantage and 1 in FFS Medicare, 1 year before and 1 year after they transitioned from commercial to Medicare enrollment in the 2020-2021 calendar years. The effect of coding intensity in the Medicare Advantage population was eliminated by using the diagnosis codes available for both cohorts while they were enrolled in commercial health plans. In the first year of Medicare Advantage enrollment, there was a $95 per member per month reduction in the Part A spending related to a decrease in inpatient days of 212 days per 1000 members per year. There was a reduction in total spending of $142 per member per month, which was 36% of total spending in Medicare.[8]

The patient impact of this spending reduction is important. The literature suggests that most surplus funds get passed through to patients in the form of lower out-of-pocket costs, improved supplemental benefits, and lower premiums.[10] For example, a 2017 comparative analysis of out-of-pocket costs[3] showed a $51 per member per month lower cost for Medicare Advantage compared with FFS Medicare, resulting in a yearly reduction in beneficiary out-of-pocket costs of more than $600.

Although previous studies documented improvements in care quality and efficiency when the Medicare Advantage model was compared with FFS Medicare,[2] no prior studies have compared the performance of the Medicare Advantage model with that of FFS Medicare where the Medicare Advantage physicians are engaged in 2-sided risk. In a 2-sided risk model, physicians may generate bonuses or incur deficits based on the quality, efficiency, and cost of the care they provide. An incentive therefore exists for physicians to build a population health infrastructure that may create significant improvements in both care quality and efficiency. Thus, the care improvements seen in Medicare Advantage compared with FFS Medicare may be even greater in a Medicare Advantage 2-sided risk model. As Medicare Advantage moves in the direction of increasing risk at the physician level, studying the impact of risk-based Medicare Advantage provides insight into the future of the Medicare Advantage model. The aim of the present study, therefore, is to measure the performance of the Medicare Advantage model of care in a subset of physicians who are practicing in a 2-sided risk model compared with FFS Medicare. We compared 8 quality and efficiency outcomes in the Medicare Advantage model with the FFS Medicare model in a large deidentified patient database.

Methods

Study Design

This retrospective cohort analysis used deidentified claims data in a limited data set and was determined to qualify for exemption from review and the requirement for informed consent by the Office of Human Research Affairs of UnitedHealth Group. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Medicare Advantage data consisted of a convenience sample of Medicare Advantage beneficiaries in 2-sided risk plans residing in 6 states (Arizona, California, Florida, Nevada, Texas, and Utah) and seen in practices that are part of a nationwide health care delivery organization for which we had complete data. Medicare Advantage beneficiaries included only members in value-based compensation programs in which physicians were at full medical risk. The deidentified data were extracted from a medical claims database provided by the care delivery organizations.

Traditional FFS Medicare data were obtained from a CMS 5% random sample of 2018-2019 administrative claims data files. The sample was restricted to residents of the same 6 states for which we had complete data for the Medicare Advantage group.

Study Period

Beneficiaries with coverage for the baseline period of January 1 to December 31, 2018, and follow-up period of January 1 to December 31, 2019, were eligible. Exclusion criteria included less than 2 years (2018-2019) of continuous enrollment in Parts A and B for the FFS group or medical coverage for the Medicare Advantage group; moving out of state during the study period (Medicare Advantage plans are tied to specific care delivery organizations); more than 90 days in long-term care during baseline; being in hospice; missing sex or year of birth; end-stage kidney disease during the baseline period; or being in a special needs plan. Beneficiaries for whom we could not identify a match between the Medicare Advantage vs traditional FFS groups were also excluded from the main and sensitivity analyses.

Outcomes

There were 8 metrics across 2 domains: utilization management (all-cause acute inpatient admissions, all-cause emergency department [ED] visits, and all-cause inpatient admissions through the ED), and adverse events or onset of disease (avoidable ED visits [treat and release], inpatient admission for stroke or acute myocardial infarction, chronic obstructive pulmonary disease or asthma exacerbation, inpatient readmission within 30 days, and a second ED visit within 30 days) (eTable 1 in Supplement 1). Outcomes were derived from the institutional claims data (a list of codes is provided in eTable 2 in Supplement 1). We restricted outcomes to those metrics that could be measured reliably and consistently, across both Medicare Advantage and FFS models.

Other Variables

Demographic variables included age (in 5-year age groups), sex, and state of beneficiary residence. Baseline comorbidities were derived according to the CMS hierarchical condition category (HCC), part of a risk-adjustment model that identifies individuals with serious acute or chronic conditions. Starting with the collapse of HCC into 86 categories as described in the CMS 2019 announcement and final notice,[11] standard HCC categories further were collapsed into a total of 31 HCC and comorbidity categories in which similar or related comorbidities were combined to minimize sparse cells and preserve degrees of freedom in adjusted analysis (**Table 1** and eTable 3 in Supplement 1). Baseline utilization included inpatient admission and ED visit and was derived using the same algorithms as the inpatient and ED outcome metrics.

Table 1. Descriptive Characteristics of Sample Matched on Demographic Characteristics Only

Characteristic	Patient group[a]			*P* value	SMD
	All	FFS	MA		
Cohort	316 312 (73.59)	158 156 (73.60)	158 156 (73.59)	NA	NA
Sex					
Women	170 462 (53.89)	85 231 (53.89)	85 231 (53.89)	>.99	0
Men	145 850 (46.11)	72 925 (46.11)	72 925 (46.11)	>.99	0
Age, y					
65-69	103 498 (32.72)	51 749 (32.72)	51 749 (32.72)	>.99	0
70-74	93 114 (29.44)	46 557 (29.44)	46 557 (29.44)	>.99	0
75-79	60 250 (19.05)	30 125 (19.05)	30 125 (19.05)	>.99	0
80-84	34 298 (10.84)	17 149 (10.84)	17 149 (10.84)	>.99	0
≥85	25 152 (7.95)	12 576 (7.95)	12 576 (7.95)	>.99	0
State of patient residence					
Arizona	44 866 (14.18)	22 433 (14.18)	22 433 (14.18)	>.99	0
California	19 406 (6.14)	9703 (6.14)	9703 (6.14)	>.99	0
Florida	94 058 (29.74)	47 029 (29.74)	47 029 (29.74)	>.99	0
Nevada	16 166 (5.11)	8083 (5.11)	8083 (5.11)	>.99	0
Texas	128 136 (40.51)	64 068 (40.51)	64 068 (40.51)	>.99	0
Utah	13 680 (4.32)	6840 (4.32)	6840 (4.32)	>.99	0
Subcohorts					
COPD	48 964 (15.48)	15 088 (9.54)	33 876 (21.42)	<.001	0.33
Acute IP 30-d readmission	32 977 (10.43)	18 369 (11.61)	14 608 (9.24)	<.001	−0.08
ED visit	59 123 (18.69)	31 472 (19.90)	27 651 (17.48)	<.001	−0.06
Baseline comorbidities by HCC (category No.)					
Count of HCCs, mean (SD)[b]	2.28 (2.30)	1.56 (1.82)	3.00 (2.49)	<.001	0.66
Any category (binary)	234 750 (74.21)	101 904 (64.43)	132 846 (84.00)	<.001	0.46
Amputation (HCC 189 [1])	1408 (0.45)	351 (0.22)	1057 (0.67)	<.001	0.07
Arrest (HCCs 82, 83, and 84 [2])	7959 (2.52)	3492 (2.21)	4467 (2.82)	<.001	0.04
Blood: severe hematological disorders (HCC 46 [3A])	1152 (0.36)	537 (0.34)	615 (0.39)	.02	0.01
Blood: other (HCCs 47 and 48 [3B])	36 022 (11.39)	10 568 (6.68)	25 454 (16.09)	<.001	0.30
Cerebrovascular disease (HCCs 99, 100, 103, and 104 [4])	10 039 (3.17)	4490 (2.84)	5549 (3.51)	<.001	0.04
Complications (HCC 176 [5])	3545 (1.12)	1939 (1.23)	1606 (1.02)	<.001	−0.02
Diabetes (HCCs 17, 18, and 19 [6])	87 827 (27.77)	35 623 (22.52)	52 204 (33.01)	<.001	0.24
Eye (HCCs 122 and 124 [7])	8903 (2.81)	4011 (2.54)	4892 (3.09)	<.001	0.03
Gastrointestinal: intestinal obstruction or perforation (HCC 33 [8A])	3090 (0.98)	1577 (1.00)	1513 (0.96)	.25	0
Gastrointestinal: other (HCCs 34 and 35 [8B])	3983 (1.26)	1767 (1.12)	2216 (1.40)	<.001	0.03
Heart: CHF (HCC 85 [9A])	39 704 (12.55)	14 833 (9.38)	24 871 (15.73)	<.001	0.19
Heart: other than CHF (HCCs 86, 87, 88, and 96 [9B])	59 916 (18.94)	28 749 (18.18)	31 167 (19.71)	<.001	0.04
Infection (HCCs 1, 2, and 6 [10])	5923 (1.87)	2907 (1.84)	3016 (1.91)	.15	0.01
Injury (HCCs 166, 167, 169, 170, and 173 [11])	6242 (1.97)	3055 (1.93)	3187 (2.02)	.09	0.01
Kidney (HCCs 134, 135, 136, 137, and 138 [12])	53 596 (16.94)	17 235 (10.90)	36 361 (22.99)	<.001	0.33
Liver (HCCs 27, 28, and 29 [13])	4587 (1.45)	1521 (0.96)	3066 (1.94)	<.001	0.08
Lung (HCCs 110, 111, 112, 114, and 115 [14])	55 588 (17.57)	17 751 (11.22)	37 837 (23.92)	<.001	0.34
Metabolic (HCCs 21, 22, and 23 [15])	50 529 (15.97)	13 207 (8.35)	37 322 (23.60)	<.001	0.43
Musculoskeletal: RA and inflammatory connective tissue disease (HCC 40 [16A])	26 459 (8.36)	11 550 (7.30)	14 909 (9.43)	<.001	0.08
Musculoskeletal: other than RA (HCC 39 [16B])	1913 (0.60)	916 (0.58)	997 (0.63)	.06	0.01
Neoplasm (HCCs 8, 9, 10, 11, and 12 [17])	38 385 (12.14)	20 654 (13.06)	17 731 (11.21)	<.001	−0.06
Neurological: amyotrophic lateral sclerosis and other motor neuron disease (HCC 73 [18A])	99 (0.03)	55 (0.03)	44 (0.03)	.27	0
Neurological: coma, brain compression, or anoxic damage (HCC 80 [18B])	469 (0.15)	209 (0.13)	260 (0.16)	.02	0.01
Neurological: other (HCCs 51, 52, 74, 75, 76, 77, 78, and 79 [18C])	36 322 (11.48)	9985 (6.31)	26 337 (16.65)	<.001	0.33
Openings (HCC 188 [19])	1733 (0.55)	710 (0.45)	1023 (0.65)	<.001	0.03

(continued)

Table 1. Descriptive Characteristics of Sample Matched on Demographic Characteristics Only (continued)

Characteristic	Patient group[a]			*P* value	SMD
	All	FFS	MA		
Psychiatric (HCCs 57, 58, 59, and 60 [20])	46 731 (14.77)	10 500 (6.64)	36 231 (22.91)	<.001	0.47
Skin (HCCs 157, 158, 159, 161, and 162 [21])	6103 (1.93)	2827 (1.79)	3276 (2.07)	<.001	0.02
Spinal (HCCs 70, 71, and 72 [22])	2212 (0.70)	941 (0.59)	1271 (0.80)	<.001	0.03
Substance use disorder (HCCs 54, 55, and 56 [23])	18 546 (5.86)	2764 (1.75)	15 782 (9.98)	<.001	0.36
Transplant (HCC 186 [24])	596 (0.19)	365 (0.23)	231 (0.15)	<.001	−0.02
Vascular (HCCs 106, 107, and 108 [25])	102 499 (32.40)	22 298 (14.10)	80 201 (50.71)	<.001	0.85
Baseline utilization					
IP acute admission count, mean (SD)	0.13 (0.46)	0.15 (0.49)	0.12 (0.42)	<.001	−0.07
IP acute admission binary	32 037 (10.13)	17 783 (11.24)	14 254 (9.01)	<.001	−0.07
ED visit count, mean (SD)	0.27 (0.72)	0.29 (0.76)	0.25 (0.68)	<.001	−0.06
ED visit binary	59 073 (18.68)	31 501 (19.92)	27 572 (17.43)	<.001	−0.06
IP AMI or stroke count, mean (SD)	0.01 (0.11)	0.01 (0.11)	0.01 (0.11)	.90	0
IP AMI or stroke count, binary	2907 (0.92)	1435 (0.91)	1472 (0.93)	.49	0
Baseline IP admission and ED visit categories					
No IP or ED	238 447 (75.38)	116 529 (73.68)	121 918 (77.09)	<.001	0.08
Only ED	45 828 (14.49)	23 844 (15.08)	21 984 (13.90)	<.001	−0.03
Only IP	18 792 (5.94)	10 126 (6.40)	8666 (5.48)	<.001	−0.04
Both IP and ED	13 245 (4.19)	7657 (4.84)	5588 (3.53)	<.001	−0.07

Abbreviations: AMI, acute myocardial infarction; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; ED, emergency department; FFS, fee-for-service; HCC, hierarchical condition category; IP, inpatient; MA, Medicare Advantage; NA, not applicable; RA, rheumatoid arthritis; SMD, standardized mean difference.

[a] Unless otherwise indicated for continuous variables, data are expressed as No. (%) of patients.

[b] Ranges from 1 to 31.

Statistical Analysis

Data were analyzed from February 1 to June 15, 2022. We adopted 3 matching approaches to maximize the use of observable factors in our data to balance baseline confounding and evaluate effect of potential reporting bias of comorbidities across Medicare Advantage and FFS models. The main analysis was matched exactly on age categories, sex, and state. We chose this approach over propensity matching to avoid potential bias amplification due to differential misclassification of comorbidities. Additional sensitivity analyses were performed using 2 separate propensity score matching procedures of the Medicare Advantage to FFS groups: (1) estimated as a function of demographics plus comorbidities during the baseline period and (2) based on demographics plus baseline inpatient admissions and ED visits. Using the exact and propensity score–matched samples, beneficiary characteristics were compared by calculating standardized differences (Table 1 for the primary cohort and eTable 4 in Supplement 1 for the prematched sample).

Beneficiary characteristics were described for the overall sample and by plan type. Continuous variables were summarized as means and SDs, and categorical variables as frequencies and percentages. Standardized mean differences were calculated to quantify the effect sizes between the groups before and after matching.

Unadjusted outcome measures were summarized as mean event counts, event rates, and standardized mean differences by insurance type with unadjusted χ^2-calculated *P* values of the difference (**Table 2**). The multivariate models used generalized estimating equations and generalized linear models to account for correlation within matched clusters and types of outcomes, respectively, and binomial and Poisson distributions with logit and log links for binary and count outcomes, respectively. Reported 95% CIs are based on conventional SEs. For the main models, outcomes were adjusted for baseline inpatient and ED utilization, except for inpatient admission for stroke or myocardial infarction, which was further adjusted for baseline peripheral vascular disease (HCC 25) because the postmatch standardized mean difference was large (0.85) and it was a known predictive

factor associated with myocardial infarction and stroke. For the sensitivity analyses, propensity score–matched samples were not further adjusted. We also ran a probabilistic sensitivity analysis to estimate likely effects of differential misclassification (underreporting) of HCCs among FFS beneficiaries on the associations and imputed a new binary HCC variable of more than 5000 iterations based on a range of estimated sensitivity and specificity of classifications.[12] Distribution of odds ratios (ORs) for select outcomes with direction and percentage change of their estimates are reported.

For comorbidities, baseline utilization measures, and outcomes, there were no missing data because the variables were defined by the presence of a claim with eligible diagnosis or procedure codes. The absence of such claims was interpreted as the absence of the condition or treatment. Complete analysis was performed with SAS Enterprise Guide, version 8.2 (SAS Institute Inc). Two-sided $P < .05$ indicated statistical significance.

Results

The study cohort consisted of 316 312 individuals (158 156 in each group) matched on state, sex (46.11% men and 53.89% women), and age group (32.72% aged 65-69 years; 29.44% aged 70-74 years; 19.05% aged 75-79 years; 10.84% aged 80-85 years; and 7.95% 85 years or older) (Table 1 and eFigure in Supplement 1). Race and ethnicity data were only consistently available for 1 of the 2 groups and were therefore omitted from the analysis. Starting with a Medicare Advantage sample of 703 834 individuals and an FFS sample of 3 361 177 individuals, inclusion and exclusion criteria were applied, resulting in a prematched cohort of 501 136 individuals (243 387 in FFS and 257 749 in Medicare Advantage models). Most exclusions were owing to continuous enrollment criteria for the Medicare Advantage group and state of residence and for the FFS group (eFigure in Supplement 1).

In the prematch sample, we observed statistically significant imbalances in demographic characteristics, geographical distribution, baseline inpatient and ED visits, and comorbidity burden between the Medicare Advantage and FFS groups, some of which are reported below (Table 1 and eTable 4 in Supplement 1). Matching by state resulted in the Medicare Advantage population having fewer individuals from Nevada, Texas, and Utah, which were predominant in the prematched sample

Table 2. Unadjusted Outcome Measures

Outcomes	Study group[a]			*P* value[b]	SMD, MA vs FFS
	All	FFS	MA		
Entire cohort					
No. of patients	316 312	158 156	158 156	NA	NA
IP admission	35 906 (11.35)	19 874 (12.57)	16 032 (10.14)	<.001	3.02
ED visit	63 587 (20.10)	33 819 (21.38)	29 768 (18.82)	<.001	−0.06
IP acute admission through ED	25 556 (8.08)	13 452 (8.51)	12 104 (7.65)	<.001	−0.03
ED treat and release (avoidable)	20 395 (6.45)	11 147 (7.05)	9248 (5.85)	<.001	−0.05
IP stroke or MI incident	3470 (1.10)	1676 (1.06)	1794 (1.13)	.04	0.01
COPD subcohort					
No. of patients	48 964	15 088	33 876	NA	NA
COPD exacerbation (COPD IP admission)	1430 (2.92)	682 (4.52)	748 (2.21)	<.001	−0.13
IP admission subcohort					
No. of patients (had ≥1 IP admission during the follow-up period)	32 977	18 369	14 608	NA	NA
30-d IP readmissions	5024 (15.23)	2952 (16.07)	2072 (14.18)	.001	−0.04
ED visit subcohort					
No. of patients (had ≥1 ED visit during follow-up period)	59 123	31 472	27 651	NA	NA
Second ED visit within 30 d	12 123 (20.50)	6829 (21.70)	5294 (19.15)	<.001	−0.03

Abbreviations: COPD, chronic obstructive pulmonary disease; ED, emergency department; FFS, fee-for-service; IP, inpatient; MA, Medicare Advantage; MI, myocardial infarction; NA, not applicable; SMD, standardized mean difference.

[a] Unless otherwise indicated, data are expressed as No. (%) of patients.

[b] Calculated using the χ^2 test.

(Table 1). In the prematch sample, the odds of being a Medicare Advantage beneficiary were at least 45% lower than an FFS beneficiary among the following groups based on their baseline status: a major organ transplant (HCC 186), infection-related conditions (HCCs 1, 2, or 6), and certain skin conditions (HCCs 157, 158, 159, 161, and 162) (eTables 5 and 6 in Supplement 1). The strongest comorbidity predictive factors associated with Medicare Advantage membership were peripheral vascular disease, mental health comorbidities, metabolic conditions, and amputations. Inpatient and ED utilization during the baseline period were associated with lower odds of Medicare Advantage membership in the prematch sample (ORs, 0.74 [95% CI, 0.72-0.75] and 0.89 [95% CI, 0.87-0.90], respectively) (eTable 6 in Supplement 1).

Overall, during the follow-up (2019) period, compared with the FFS Medicare group, the Medicare Advantage group had significantly lower (improved) probability of all 8 outcome metrics (**Figure**). With respect to measures indicative of improved care efficiency, we noted 18% lower odds of inpatient admission (OR, 0.82 [95% CI, 0.79-0.84]) and 11% lower odds of ED visits (OR, 0.89 [95% CI, 0.86-0.91]). With respect to metrics indicative of improved care quality, we noted a 44% reduction in odds for hospital admission for COPD or asthma exacerbation (OR, 0.56 [95% CI, 0.50-0.62]), 6% lower odds of inpatient acute admission through the ED (OR, 0.94 [95% CI, 0.91-0.97]), 6% lower rates of return to the ED within 30 days (rate ratio, 0.94 [95% CI, 0.91-0.98]), 9% lower rates of 30-day readmission (rate ratio, 0.91 [95% CI, 0.86-0.98]), 14% lower odds of avoidable ED visits (OR, 0.86 [95% CI, 0.82-0.89]), and 10% lower odds of admission for stroke or myocardial infarction (OR, 0.90 [95% CI, 0.83-0.98]).

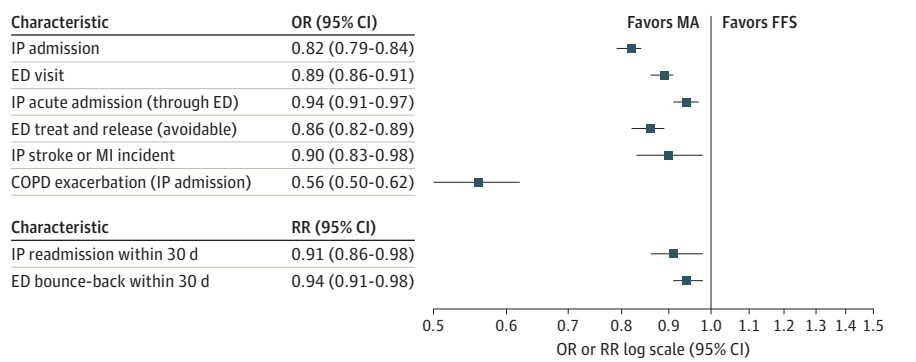
Effect Modifications

We assessed 13 potential sources of heterogeneity of effect of Medicare Advantage (demographics, baseline utilization, and 8 comorbidities). eTable 7 in Supplement 1 shows statistically significant interactions and range of ORs in subgroups based on the interaction term between Medicare Advantage membership and the potential effect modifier. The most noticeable differences were a decrease in OR of inpatient admission rate for patients with diabetes (OR range for ED utilization, 0.83-0.88; OR range for acute inpatient utilization, 0.75-0.81) and lung conditions (OR range for ED utilization, 0.76-0.86; OR range for acute inpatient utilization, 0.69-0.77). We observed effect modification by state (OR range for avoidable ED utilization, 0.71-0.97) but no disparity for psychiatric conditions or interaction between sex and baseline intensive utilization (eTable 7 in Supplement 1).

Sensitivity Analysis

Associations between Medicare Advantage membership and outcome measures were reasonably robust in a series of sensitivity analyses in which we performed propensity score matching on (1) Medicare Advantage and FFS groups based on baseline inpatient admissions and ED visits in addition

Figure. Forest Plot of Adjusted Measures of Association for 8 Outcome Metrics, Comparing Medicare Advantage (MA) With Fee-for-Service (FFS) Medicare



Groups were matched exactly on age group, sex, and state and adjusted for baseline inpatient (IP) and emergency department (ED) visits after matching. COPD indicates chronic obstructive pulmonary disease; MI, myocardial infarction; OR, odds ratio; and RR, rate ratio.

to demographics; and (2) HCC comorbidities in addition to demographic factors (eTables 8 and 9 in Supplement 1). Additional sensitivity analysis using imputed data to account for differential misclassification of HCCs attenuated the strength of the favorable ORs by less than 10% for the inpatient admissions but the reduced odds remained statistically significant (eTables 7, 8, and 10 in Supplement 1).

Discussion

We observed significant associations in both quality and efficiency encompassing all 8 metrics in the Medicare Advantage population under 2-sided risk, compared with a matched sample of the Medicare FFS population. Associations included reductions in admission for stroke and myocardial infarction, hospital admission for chronic obstructive pulmonary disease and asthma exacerbations, avoidable ED visits, overall ED visits, return visits to the ED, hospital admissions through the ED overall, and 30-day all-cause readmissions. These findings are maintained in a variety of sensitivity analyses including specific disease propensity matching using HCC codes.[7]

These associations may be indicators of improved quality and efficiency metrics related to the care management infrastructure, which in turn is funded by the risk-adjusted payment for this specific population of patients. The infrastructure includes features such as enhanced use of telephone triage to ensure urgent outpatient appointments, primary care physician–directed disease management services, investments in electronic health record point-of-care technology for the deployment of care algorithms, patient-shared decision-making, hospitalist services, and complex care coordination, among many others.

Two prior studies compared the performance of physicians within Medicare Advantage plans based on whether their reimbursement was FFS with bonus potential vs participation in 2-sided risk arrangements. In 2022, Gondi et al[13] looked at 490 000 Medicare Advantage beneficiaries and compared 3 models of downstream physician reimbursement within the Medicare Advantage model: FFS, FFS with bonus potential, and 2-sided risk. For the outcomes of all-cause and avoidable hospitalizations, observation stays, and all-cause and avoidable ED visits, physicians in 2-sided risk arrangements demonstrated improvements in utilization of 4% to 22% relative to physicians in the other 2 Medicare Advantage models. The performance of the physicians in the FFS with bonus potential model did not significantly differ from the physicians in the FFS reimbursement model. In 2017, Mandal et al[14] published a preintervention-postintervention study of community-dwelling Medicare Advantage enrollees in a single metropolitan area spanning 4 years. Two physician groups within a single Medicare Advantage organization were studied. One group migrated to a 2-sided risk model and the other group remained in an FFS model. In the group that migrated to 2-sided risk, their aggregate risk adjustment factor score, and therefore annual premium, increased. During the 4-year study period, there were significant increases in office-based visits with significant decreases in ED and hospital visits. Overall mortality decreased by 6% in the Medicare Advantage 2-sided risk population relative to the FFS population, which represented a 32.8% lower hazard risk of death during the 4 years of the study. Our study adds to this body of literature through the comparison, for the first time to our knowledge, of the care provided by physicians practicing in a 2-sided Medicare Advantage risk model with that provided by physicians practicing in the Medicare FFS model, and is consistent with these 2 studies[13,14] in demonstrating improvements in quality and efficiency seen in the 2-sided risk model.

Limitations

Our analysis has several limitations. First, the outcome data set consisted of institutional claims, limiting our ability to assess pharmacy-based outcome measures. Second, evidence of reporting bias manifested in a lower burden of comorbidities in the FFS group. To mitigate this, we ran a sensitivity analysis imputing HCC comorbidity in the FFS group and assessed the impact on direction and strength of the associations. Third, our data are only representative of 6 states, and results may not

be generalizable to a national population. Fourth, we were not able to assess baseline imbalances in social determinants of health or address them through matching owing to sparseness of the sample at the county and zip code level across Medicare Advantage and FFS groups. Last, despite matching and adjustment, there is still a possibility of adverse selection or residual confounding due to unmeasured factors.

Conclusions

To our knowledge, this cohort study is the first to compare the performance of Medicare Advantage in physician groups taking 2-sided risk with a matched sample from FFS Medicare. Within the measured metrics, the Medicare Advantage model of care was associated with improved health outcomes and care efficiency when physicians assumed financial risk for total cost of care compared with FFS Medicare. Additionally, the data suggest that the Medicare Advantage risk adjustment model may be meeting its intended goal by aligning the capitation payments to the health care burden of both the individual beneficiary and the aggregate population served. This may allow revenue to be deployed to develop the infrastructure that improves the quality and efficiency of care for the patients enrolled in Medicare Advantage plans.

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Conflict of Interest Disclosures: Dr Cohen reported being a full-time employee and owning stock in UnitedHealth Group Inc, during the conduct of the study. Dr Ameli reported being a full-time employee and owning stock in UnitedHealth Group Inc, during the conduct of the study. Ms Chaisson reported being a full-time employee and owning stock in UnitedHealth Group Inc, during the conduct of the study. Dr Catlett reported being a full-time employee and owning stock in UnitedHealth Group Inc, during the conduct of the study. Dr Kamrudin reported being an employee of UnitedHealth Group Inc/Optum Labs LLC. Dr Vabson reported receiving personal fees from Optum Health during the conduct of the study and personal fees from Verily Life Sciences, Harvard Medical School, and Veeva Systems Inc and a research partnership from Inovalon outside the submitted work. No other disclosures were reported.

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SUPPLEMENT 1.

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SUPPLEMENT 2.

Data Sharing Statement