Medicare HMO Impact on Utilization at the End of Life

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Currently, Medicare covers approximately 44 million people, and as the baby boom generation retires and life expectancy increases, the number is predicted to reach 79 million by 2030.[1,2] These demographic changes along with rising healthcare costs fuel concern over Medicare's long-term solvency. Medicare is the main financing mechanism for health services delivered at the end of life, providing coverage for more than 80% of those who die in the United States.[3,4] Our data indicate that more than 50% of all Medicare inpatient days are used by people in their last 2 years of life. There is growing evidence that greater Medicare spending at the end of life does not necessarily result in better quality of care or patient satisfaction with care.[5-8]

Most studies of end-of-life care have focused on decedents with traditional Medicare fee-for-service (FFS) coverage because of incomplete data for Medicare managed care enrollees. Yet managed care is organized in ways that may benefit the delivery of end-of-life care. Lynn and Adamson suggest that the coordination of care across different settings and the types of care present in managed care organizations can improve end-of-life care.[9] The Dartmouth Atlas of Health Care shows that regions with more managed care tend to use fewer acute care beds, hospital days (ie, fewer "high-tech" deaths), and physician visits when treating FFS decedents with chronic illnesses.[10] Moreover, the quality of care in these regions tends to be higher, as reflected in process measures that are above average. However, little is known about how end-of-life care differs for managed care enrollees compared with those receiving FFS care. This study uses a unique dataset covering all Medicare beneficiaries in California from 1991 through 2001 to estimate the effect of 2 different HMO models on the inpatient utilization of Medicare beneficiaries relative to traditional FFS coverage before death: independent practice association (IPA) HMOs and the group model Kaiser Foundation Health Plan (Kaiser).

Objective: To estimate the effect of independent practice association (IPA) model HMOs and the Kaiser Foundation Health Plan's group model on inpatient utilization of Medicare beneficiaries in the last 2 years of life, compared with traditional fee-for-service (FFS) coverage.

Study Design: Data from the Centers for Medicare & Medicaid Services were linked to inpatient discharge data from the California Office of Statewide Health Planning and Development for 1991-2001. A sample of aged Medicare beneficiaries who died between January 1998 and June 2001 and were continuously enrolled during the 2 years before death in (1) FFS (n = 234,498), (2) an IPA (n = 109,577), or (3) Kaiser (n = 29,434) were selected.

Methods: The probability of at least 1 hospitalization, number of inpatient days given at least 1 hospitalization, and total inpatient days per year in the last 2 years of life were estimated for each subgroup. A 2-part regression model, which adjusted for age, sex, Medicaid status, race, ethnicity, and chronic condition associated with the last hospitalization, was applied to determine the HMO-FFS difference in inpatient utilization during the last 2 years of life.

Results: During their last 2 years of life, decedents in IPAs and Kaiser used approximately 34% and 51% fewer inpatient days, respectively, than decedents in FFS.

Conclusions: Medicare beneficiaries who died while enrolled in an HMO, particularly Kaiser, had many fewer hospital days during the 2 years before death than beneficiaries who died with FFS coverage.

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METHODS

Design

Our approach is designed to minimize population (selection) differences between FFS and HMO decedents to isolate the effect of managed care on inpatient utilization near the end of life. Our approach builds on the work of Fisher et al[7,8] and other retrospective studies of end-of-life care.[1,4,6,10,11] These analyses recognize that at the time of HMO enrollment, HMO enrollees are healthier (favor-

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able selection) than those who remain in FFS, but that as both groups approach death, their health status converges. Much of the favorable selection at HMO enrollment is likely reflected in lower death rates,[12] not substantially better health when dying, although some studies have found that better health earlier in life persists later in life.[13,14] Therefore, we focused on the last 2 years of life (defined not by calendar year but in 12-month increments before death) and used regression analysis to control for several observable differences in the FFS, IPA, and Kaiser samples.

Data and Study Sample

Medicare data from the Centers for Medicare & Medicaid Services Enrollment Database and the Denominator File were linked to inpatient discharge data from the California Office of Statewide Health Planning and Development.[15] As a result, we were limited to measures of inpatient utilization and have no data on costs or other services. We selected Medicare enrollees who died between January 1998 and June 2001 and who satisfied the following criteria: (1) turned age 65 and were entitled to Medicare for at least 5 years before their death, (2) did not have end-stage renal disease, (3) resided in counties with more than 500 HMO enrollees, and (4) were enrolled in a risk HMO (ie, the HMO is paid a predetermined per-member per-month payment.) Given these criteria, the minimum age at death was 70 years. The main sample was further restricted to beneficiaries who remained continuously enrolled either in FFS or an HMO during their last 2 years of life. Fewer than 5% of FFS or HMO decedents switched between systems of care during their last 2 years of life. The final sample included 381,756 Medicare decedents, about 39% of whom were enrolled in an HMO at death. Specifically, 109,577 beneficiaries were enrolled in IPA HMOs, 29,434 in Kaiser, and 8247 in other types of HMOs including group, staff model (other than Kaiser), and demonstration HMOs. HMO enrollees not in IPAs or Kaiser were controlled for in the regression analysis but omitted from the results because together they comprised only 2.2% of the study population and had unsteady enrollment patterns.

Descriptive Analysis

We compared unadjusted inpatient utilization among FFS, IPA, and Kaiser groups during the last and second-to-last years of life, as well as the 2 years combined. Utilization measures include the probability of at least 1 hospitalization, mean number of hospitalizations, and mean number of total inpatient days per hospitalization and per period. Hospitalizations with zero length of stay were excluded. For those with at least 1 hospitalization during the 2 years before death, we calculated the distribution of multiple hospitalizations for the FFS, IPA, and Kaiser samples. We also present the distribu-

tion of 11 non–mutually exclusive chronic conditions based on all diagnosis codes from the last hospitalization.[6,16]

Statistical Analysis

To correct for population differences that might be associated with health status and care preferences between FFS and HMO decedents, we applied regression analysis. The distribution of inpatient days was skewed; therefore, a 2-part model was applied.[17,18] The first part was a logit that predicts the probability of at least 1 hospitalization during the last 2 years of life. The second part was an ordinary least squares regression of the logarithm of total inpatient days for all hospital stays for those who were hospitalized at least once during the last 2 years of life. Both parts of the model were estimated using robust standard errors by FFS and HMO plan to account for correlation within plans and by county-fixed effects to control for non-measured geographic and market differences across regions.[19,20] In order to transform the change from the logarithm of days into percent change in days we exponentiated the second-part regression coefficient and applied a smearing estimate. We then recombined the resulting estimate with the predicted change in probabilities from the first part of the model to yield the estimates of the HMO effect on total days.[21]

The key independent variables indicate whether a decedent was enrolled in a particular type of HMO or FFS. If a beneficiary switched between different types of HMOs, this variable is expressed as a share of the 2-year period that he/she spent in a given plan. Control variables include race (black or not), ethnicity (Hispanic or not), sex (female or not), age at death, an indicator for age at death greater than 80 years, and year of death, as well as 2 Medicaid variables. Medicaid buy-in status was recorded monthly and entered into the model as the ratio of the number of months eligible for Medicaid divided by 24 months. In addition, because enrollment of Medicare beneficiaries into Medicaid varies with system of care and age, we also included an indicator for whether the decedent was "originally" Medicaid eligible. This variable was equal to 1 if the decedent was Medicaid eligible in the same month he/she became entitled to Medicare, or in January 1991 (the first month of data) if Medicare entitlement occurred prior to that time. The second part of the regression included the same variables, as well as whether a beneficiary was admitted from a nursing home, indicators for 11 chronic conditions, and whether a decedent had more than 1 of the 11 chronic conditions.[6,16]

RESULTS

Descriptive Statistics

There are some differences in the composition of the FFS and HMO samples (Table 1). The mean age at death was

■ **Table 1.** Medicare Decedent Characteristics by System of Care[a]

Characteristic	FFS[b]	IPA[b]	Kaiser[b]
Sample size, n	234,498	109,577	29,434
Mean age at death, y	83.3	81.9	80.6
Age >80 y	61.5	54.5	47.4
Female	58.7	52.7	47.8
Black	5.6	3.9	7.2
Hispanic	7.0	6.7	6.0
Originally Medicaid[c]	21.7	5.2	3.9
Medicaid at end of life[d]	31.9	7.8	7.4
Hospitalizations, n	181,286	84,634	21,991
Last hospitalization from nursing home	14.2	8.4	6.9
Last hospitalizations with diagnosis			
Congestive heart failure	31.6	28.7	27.3
Chronic pulmonary disease	26.9	25.8	23.8
Dementia	17.4	15.0	16.9
Cancer with a poor prognosis/metastatic	16.9	19.0	20.3
Coronary artery disease	27.0	24.6	27.7
Nutritional deficiencies	7.5	5.3	3.7
Peripheral vascular disease	5.4	4.9	5.3
Chronic renal failure	4.8	4.3	4.2
Diabetes with serious complications	2.8	2.2	2.7
Functional impairment	5.3	4.8	4.0
Severe chronic liver disease	1.3	1.4	1.7
Two or more diagnoses	55.6	48.9	50.0
None of the diagnoses	13.0	15.7	14.6

FFS indicates fee-for-service; IPA, independent practice association; Kaiser, Kaiser Foundation Health Plan.
[a]System of care was determined by the type of enrollment at the time of death. The 11 diagnoses were identified using *International Classification of Diseases, Ninth Revision, Clinical Modification* codes based on all diagnoses listed on the discharge abstract for the hospitalization closest to death.
[b]Values are percentages unless otherwise indicated.
[c]The decedent was eligible for Medicaid in (1) the same month the decedent became entitled to Medicare or (2) January 1991 if the decedent became entitled to Medicare prior to this date.
[d]Medicaid at the end of life indicates a decedent who was eligible for Medicaid at least 12 of the last 24 months of life.

higher for FFS decedents compared with IPA and Kaiser decedents (83.3 years vs 81.9 years and 80.6 years, respectively). This is because the HMO population was younger; thus, fewer HMO enrollees could have reached the age of 80 years by 1998. Approximately 59%, 53%, and 48% of the FFS, IPA, and Kaiser samples were female, respectively. At 7.2%, the Kaiser sample had proportionately more blacks than either the FFS (5.6%) or IPA (3.9%) samples. Medicare beneficiaries who received Medicaid benefits under the state buy-in agreement for at least 1 year of their last 2 years of life constituted almost a third of the FFS sample, but only about 8% of the IPA and Kaiser samples. Overall, the distribution of chronic conditions was fairly similar among the 3 samples.

Unadjusted Results

The data on unadjusted inpatient utilization by system of care are shown in Table 2. The probability of at least 1 hospitalization in the last 2 years of life was very similar among all groups (0.77 FFS; 0.77 IPA; 0.75 Kaiser), whereas the mean number of hospitalizations was greatest for FFS (2.57), then IPA (2.26), and lastly Kaiser (1.97) decedents. The FFS enrollees spent an average of 23.6 days in the hospital in their last 2 years of life, or about twice the Kaiser average of 11.4 days. The probability of at least 1 hospitalization was greater in the last year of life compared with the second-to-last year of life for each enrollment group, whereas the difference among FFS and HMO systems was larger in the second-to-last year of

■ **Table 2.** Unadjusted Inpatient Utilization in the Last 2 Years of Life by System of Care

Measure and Timing of Inpatient Utilization	FFS	IPA	Kaiser	% Difference	
				IPA-FFS	Kaiser-FFS
Last 2 years of life					
Probability of at least 1 hospitalization (SE)	0.77 (0.42)	0.77 (0.42)	0.75 (0.44)	0	–3
Mean hospitalizations (SE)	2.57 (2.74)	2.26 (2.36)	1.97 (2.11)	–12	–23
Mean total days (SE)	23.6 (44.0)	14.7 (27.9)	11.4 (19.3)	–38	–52
Last year of life					
Probability of at least 1 hospitalization (SE)	0.71 (0.45)	0.71 (0.45)	0.69 (0.46)	0	–3
Mean hospitalizations (SE)	1.87 (2.04)	1.72 (1.85)	1.51 (1.64)	–8	–19
Mean total days (SE)	17.2 (28.6)	11.4 (19.6)	9.2 (15.2)	–34	–46
Second-to-last year of life					
Probability of at least 1 hospitalization (SE)	0.34 (0.47)	0.30 (0.46)	0.27 (0.44)	–13	–21
Mean hospitalizations (SE)	0.72 (1.37)	0.56 (1.14)	0.46 (0.98)	–22	–36
Mean total days (SE)	6.6 (30.3)	3.5 (18.5)	2.3 (10.4)	–47	–65

FFS indicates fee-for-service; IPA, independent practice association; Kaiser, Kaiser Foundation Health Plan; SE, standard error.

life. During the second-to-last year of life, the Kaiser sample utilized 65% fewer total inpatient days on average than the FFS sample, in contrast to 46% fewer total days in the last year of life.

The unadjusted utilization difference between FFS and HMO Medicare beneficiaries with at least 1 hospitalization in their last 2 years of life is a result of the reduction in the number of hospitalizations as well as shorter average length of stay per hospitalization (**Table 3**). The majority of each sample had at least 2 hospitalizations during the study period. Fewer decedents had 6 or more hospitalizations, and Kaiser was much less likely than FFS to have such patients. The IPA-FFS and Kaiser-FFS differences in average length of stay were comparable across different numbers of hospitalizations. Although the differences were fairly consistent, the mean length of stay for the last hospitalization tended to be longer than that for other hospitalizations for all enrollment groups. The IPA (34.1%) and Kaiser (35.5%) samples had fewer inpatient deaths than the FFS sample (40.2%) among decedents with at least 1 hospitalization during the 2 years before death.

Regression Results

For reference, complete results for the 2 parts of the regression model are provided in **Table 4**. Regression analysis that adjusts for sociodemographic and case-mix differences largely preserved the substantial gap observed in the unadjusted data for inpatient utilization in the last 2 years of life between FFS and HMO decedents: total inpatient days were reduced about 34% for IPA decedents and 51% for Kaiser decedents rela-

tive to FFS decedents (**Table 5**). Regression results produced a stronger HMO effect on the probability of at least 1 hospitalization than the unadjusted comparison (Kaiser reduced the probability by 7% compared with 3%, and IPAs by 2% compared with 0%).

To test the robustness of our regression results, we reestimated our model under 3 different specifications. First, we tried to account for the potential bias that disenrollees and recent enrollees might have introduced, because patient preferences may drive those decisions. As opposed to the main analysis where people who changed enrollment between HMOs and FFS were excluded, the sensitivity analysis included them, but coded them as if they had stayed in their original FFS or HMO plan. In this way, high utilization after disenrollment was attributed to the plan where a person was enrolled before disenrollment. The combined effects on utilization yielded a reduction in total days that is slightly smaller by a few percentage points than the original estimates of 51% and 34% for Kaiser and IPA decedents relative to FFS decedents, respectively.

To better understand the source of FFS-HMO differences observed in our results, we reestimated our model to exclude decedents whose condition made them likely candidates for hospice care. The effect on days was nearly unchanged, suggesting that HMOs were not merely substituting hospice for inpatient care. The small difference in the percentage of patients who died in the hospital between FFS and HMO also was not large enough to suggest that hospice care accounted for the majority of the HMO effect. Finally, our descriptive

■ **Table 3.** Unadjusted Inpatient Utilization for Decedents With at Least 1 Hospitalization in the Last 2 Years of Life by System of Care

Measure of Inpatient Utilization	FFS	IPA	Kaiser	% Difference	
				IPA-FFS	Kaiser-FFS
Mean number of hospitalizations (SE)	3.3 (2.7)	2.9 (2.3)	2.6 (2.0)	−12	−21
Two or more hospitalizations, % (SE)	72.7 (44.6)	69.2 (46.2)	64.3 (47.9)	−5	−12
Six or more hospitalizations, % (SE)	16.0 (36.7)	11.4 (31.8)	8.2 (27.4)	−28	−49
Mean length of stay, d (SE)	9.0 (16.2)	6.5 (12.5)	5.9 (7.3)	−27	−34
Last hospitalization, mean length of stay, d (SE)	9.7 (23.5)	7.0 (17.6)	6.3 (10.0)	−28	−35
Mean total days (SE)	30.5 (47.9)	19.0 (30.4)	15.2 (20.9)	−38	−50
Last hospitalization from nursing home, % (SE)	14.2 (34.9)	8.4 (27.8)	6.9 (25.3)	−41	−52
Died in hospital, % (SE)	40.2 (49.0)	34.1 (47.4)	35.5 (47.8)	−15	−12

FFS indicates fee-for-service; IPA, independent practice association; Kaiser, Kaiser Foundation Health Plan; SE, standard error.

results indicate that even in the second-to-last year of life, inpatient utilization by HMO enrollees relative to FFS beneficiaries was significantly lower (−47% IPA HMOs and −65% Kaiser), when enrollment in hospice was unlikely because the median length of a hospice stay was 16 days in 2000 with the 90th percentile at 130 days.[22]

The final sensitivity test estimated 2 separate regressions of the last hospitalization's length of stay for beneficiaries hospitalized for select chronic versus acute conditions. We hypothesized that the difference in length of stay would be smaller between HMO and FFS decedents when focusing on those with an acute diagnosis (eg, heart attack) versus a chronic illness (eg, lung cancer), because many acute illnesses would lead to sudden death or the conditions could not be effectively treated in an alternate setting such as hospice and skilled nursing facilities.[23] Regression results supported this hypothesis, showing that the HMO effect on the length of stay of the last hospitalization was weaker (absolute difference in the effect was about 5% for both Kaiser and IPA decedents) for patients with a diagnosis of an acute condition compared with a diagnosis of a chronic condition.

DISCUSSION

Regression analysis indicates that even after adjusting for selected demographic and health differences, Kaiser decedents used 51% fewer total inpatient days than FFS decedents during their last 2 years of life, whereas a smaller difference of 34% was found for decedents in IPAs. The regression analysis yielded results similar to the unadjusted data, even though the coefficients on the control variables were significant and of the expected direction and magnitude (Table 4). In addi-

tion, propensity score analysis (data not shown) of the first and second parts of the model did not substantively change the coefficients (eg, the coefficient for the Kaiser effect on the logarithm of days changed from −0.54 to −0.51). The small effect of adjustment is in contrast to past studies of risk selection at the time of HMO enrollment that have documented substantial favorable selection based on demographic differences in populations.[24-28] Presumably, this is in part due to the entire sample being within 2 years of death.

The largest part of the HMO effect comes from the reduced number of total inpatient days given at least 1 hospitalization, which in turn is attributable to fewer hospitalizations as well as a shorter length of stay per hospitalization. The descriptive results indicate the reduction in average length of stay is a stronger factor than the reduction in the number of hospitalizations. Still, Kaiser decedents had 21% fewer hospitalizations and IPA decedents had 12% fewer compared with FFS decedents, given at least 1 hospitalization in the last 2 years of life. Assuming that HMO membership does not affect the time of death, HMOs also do not seem to affect the timing of the last hospitalization before death. Neither the timing of the last hospitalization nor the probability of having at least 1 hospitalization during the last 2 years of life is substantially different between HMOs and FFS, which suggests that Kaiser and IPA HMOs primarily reduce the number of hospitalizations that precede the last hospitalization.

The HMO effect on utilization often is attributed to the incentives introduced by capitated payment and the integrated structure of HMOs, particularly group models like Kaiser. It is also possible that IPA physicians systematically send their HMO patients to the hospitals that generally

■ **Table 4.** Two-part Model of the HMO Effect on Inpatient Utilization in the Last 2 Years of Life With County Fixed Effects[a]

Independent Variable	Reference Group	Part I: Any Days Odds Ratio (95% CI)	Part II: Log Days per Year Coefficient (95% CI)
HMO effect			
Enrolled in Kaiser last 2 years of life	FFS	0.740 (0.699, 0.784)	−0.543 (−0.582, −0.505)
Enrolled in IPA HMO last 2 years of life	FFS	0.911 (0.820, 1.01)	−0.366 (−0.476, −0.257)
Proportion of last 2 years of life Medicaid eligible	Not eligible	0.635 (0.613, 0.657)	0.033 (0.019, 0.047)
Originally Medicaid eligible	Not eligible	1.49 (1.45, 1.53)	0.056 (0.046, 0.066)
Admitted from nursing home	Other admission source	Not applicable	0.322 (0.253, 0.392)
Hispanic	Non-Hispanic	3.69 (3.46, 3.94)	0.043 (−0.003, 0.088)
Black	Non-black	1.33 (1.20, 1.48)	0.159 (0.094, 0.223)
Female	Male	0.770 (0.750, 0.790)	0.016 (0.011, 0.020)
Age at death, y		0.961 (0.953, 0.969)	−0.018 (−0.020, −0.017)
Age ≥80 years at death	Age <80 y	1.38 (1.31, 1.45)	0.056 (0.028, 0.084)
Diagnosis at last hospitalization	None of 11 diagnoses	Not applicable	
Congestive heart failure			0.234 (0.225, 0.243)
Chronic pulmonary disease			0.248 (0.232, 0.264)
Dementia			−0.062 (−0.073, −0.050)
Cancer with a poor prognosis/metastatic			0.039 (0.030, 0.048)
Coronary artery disease			0.100 (0.073, 0.128)
Nutritional deficiencies			0.283 (0.264, 0.302)
Peripheral vascular disease			0.082 (0.069, 0.095)
Chronic renal failure			0.368 (0.358, 0.378)
Diabetes with serious complications			0.298 (0.280, 0.316)
Functional impairment			0.353 (0.329, 0.377)
Severe chronic liver disease			0.131 (0.098, 0.165)
Two or more diagnoses			0.117 (0.095, 0.140)

CI indicates confidence interval; FFS, fee-for-service; IPA, independent practice association; Kaiser, Kaiser Foundation Health Plan.
[a]Coefficients for county-fixed effects and year dummies were omitted to conserve space.

use fewer inpatient days than the hospitals favored by FFS Medicare physicians—a possibility beyond the scope of the current analysis. HMOs may eliminate unnecessary or undesired care as well as make greater use of alternatives such as skilled nursing facilities and hospice. Physicians treating HMO patients may have a greater ability to adopt a style of care that minimizes hospitalizations. For example, HMO patients do not need to complete a 3-day hospital stay for a related condition to qualify for a skilled nursing home stay as is required by traditional FFS Medicare.

Take-away Points

End-of-life care is an important issue because it involves costly inpatient care, mainly financed by Medicare, and because there is growing concern among policymakers, clinicians, and consumers regarding its quality.

■ Using a unique panel dataset, we found that Medicare decedents in HMOs used remarkably less inpatient care in the last 2 years of life (34% to 51%) than similar decedents who received fee-for-service (FFS) care.

■ Our findings suggest that HMOs in California, particularly Kaiser, have developed approaches to end-of-life care that allow them to use far fewer inpatient resources relative to FFS providers.

Limitations and Conclusions

A key assumption of our approach was that health status differences between the HMO and FFS samples would be small during the last 2 years of life. Our findings support this assumption. The timing of the last hospitalization before death is very similar across enrollment groups, as is

the distribution of chronic conditions for that hospitalization. The smaller difference in the probability of hospitalization during the last year of life compared with the second-to-last year of life also suggests that selection differences dissipate and treatment policies converge as death approaches.

Self-selection of HMO enrollees with a preference for less intensive therapy (in particular, heroic terminal care) may still account for part of the HMO effect. However, the magnitude of the estimated reduction in utilization at the end of life makes it unlikely to be solely the result of differences in patient preferences.

Finally, our data are limited to the inpatient use of California Medicare beneficiaries and may not be comparable to data from other states or the nation as a whole. Although hospitals remain significant and important institutions in the delivery of end-of-life care, other healthcare providers could substitute for acute care. As a result, although we found a large reduction in hospital utilization by Kaiser and IPA Medicare HMOs, we do not know how this affected the utilization of other services or total costs.

Our findings suggest that the benefit from additional research could be significant. Over one quarter of Medicare spending each year is attributable to beneficiaries in their last year of life.[1,4,29] Although we do not know patients' preferences, both national and California-specific surveys indicate that the majority of individuals would prefer to die at home and at times want limits placed on their care.[30-33] Our findings suggest that physicians practicing in HMOs in California have developed approaches that allow them to use far fewer inpatient resources at the end of their patients' lives. Future research should focus on identifying and understanding how they achieve these results and whether their practices can and should be replicated elsewhere.

Table 5. Two-part Model Regression Results of Inpatient Utilization During the Last 2 Years of Life

Dependent Variable	% Difference (*P*)[a]	
	IPA-FFS	Kaiser-FFS
Part I: probability of at least 1 hospitalization	−2.0 (0.08)	−6.9 (<.001)
Part II: number of days if hospitalized[b]	−32.2 (<.001)	−47.2 (<.001)
Parts I and II combined: total inpatient days	−33.6	−50.8

FFS indicates fee-for-service Medicare; IPA, independent practice association; Kaiser, Kaiser Foundation Health Plan.
[a]*P* value for the regression coefficient that was used to estimate a particular effect.
[b]Calculated as the exponentiated regression coefficient times the smearing ratio.

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