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Original Study

Differences in Nursing Home Quality Between Medicare Advantage and Traditional Medicare Patients



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A B S T R A C T

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Background: Medicare Advantage (MA) enrollment is steadily growing, but little is known about the quality of nursing home (NH) care provided to MA enrollees compared to enrollees in traditional fee-for-service (FFS) Medicare.

Objectives: To compare MA and FFS enrollees' quality of NH care.

Design: Cross-sectional.

Setting: US nursing homes.

Participants: 2.17 million Medicare enrollees receiving care at an NH during 2011.

Measurements: CMS methodology was used to calculate the 18 Nursing Home Compare quality measures as applicable for each enrollee.

Results: Among Medicare enrollees using NH in 2011, 17% were in MA plans. Most quality scores were similar between MA and FFS. After adjusting for facility, beneficiary age and gender, CMS Hierarchical Condition Category score, and geographic region, short-stay MA enrollees had statistically significantly lower rates of new or worsening pressure ulcers [relative risk (RR) = 0.76, 95% confidence interval (CI) = 0.71–0.82] and new antipsychotic use (RR = 0.82, 95% CI = 0.80–0.83) but higher rates of moderate to severe pain (RR = 1.09, 95% CI = 1.07–1.12), compared with short-stay FFS enrollees. MA long-stay enrollees had lower rates of antipsychotic use (RR = 0.94, 95% CI = 0.93–0.96) but had higher rates of incontinence (RR = 1.08, 95% CI = 1.06–1.09) and urinary catheterization (RR = 1.10, 95% CI = 1.06–1.13), compared with long-stay FFS enrollees.

Conclusion: Overall, we found few differences in NH quality scores between MA and FFS Medicare enrollees. MA enrollment was associated with better scores for pressure ulcers and antipsychotic use but worse scores for pain control, incontinence, and urinary catheterization. Results may be limited by residual case-mix differences between MA and FFS patients or by the small number of short-stay measures reported.

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The Centers for Medicare and Medicaid Services was able to review and approve the manuscript prior to submission, but did not have any role in design or conduct of the study or analysis and interpretation of the data.

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Medicare managed care, currently known as Medicare Advantage (MA), was originally introduced as a way of managing rising costs among traditional fee-for-service (FFS) Medicare patients.¹ Enrollment has steadily increased since 2003 and now accounts for 31% of Medicare enrollees nationwide.¹ Multiple studies have compared patient health outcomes or quality measures between MA and FFS Medicare for primary care,² preventive care,^{3,4} and selected conditions.^{5–13} However, few studies have focused on non-acute institutional settings, such as nursing home (NH) and postacute care.^{7,14,15} As admissions and costs for postacute NH care continue to rise steeply,^{16,17} the quality of NH care requires greater scrutiny. The advent of public reporting through Nursing Home Compare in 2002 led to increased attention to technical quality of care rather than “hotel services” provided by NHs.¹⁸ However, NH quality remains variable across facilities. In this study, we add to the existing literature by comparing the quality of NH care provided to MA and FFS beneficiaries nationally in 2011.

Methods

Conceptualization and Hypotheses

Patient outcomes may be affected by NH-specific factors including staff or leadership turnover,^{19–21} culture,²² staffing levels,²³ physician commitment and medical staff organization,^{24,25} ownership,^{26,27} and payer source.^{28,29} Other factors are patient-specific such as acuity or hospital-specific such as quality of interfacility information transfer.³⁰ Because short-stay patients spend a limited time in NHs, we hypothesize that patient acuity will be the predominant outcome driver in this group. MA plans may influence patient acuity by selecting which patients are transferred to NH, either directly or through contracted medical practices that are at financial risk for inpatient and short-stay NH use. For example, MA patients may be sent “quicker and sicker” from the hospital to NH,³¹ whereas healthier patients may be sent home with home health rather than using NH, resulting in MA NH patients having a higher acuity than FFS. In contrast, hospice-eligible MA patients may be sent to hospice at home rather than NH, resulting in a less acute group of MA patients in NH.^{32–34} The net effect of these conflicting forces may be neutral with respect to acuity, and thus neutral with respect to outcome-based measures of care quality.

For long-stay residents, we hypothesize that MA plans will have less direct influence over measured quality of care, because of changes in financing from Medicare to other sources (out-of-pocket payments, Medicaid, or other insurance) after 100 days in NH, with the possible exception of patients enrolled in an Institutional Special Needs Plan (I-SNP). A type of MA coordinated care plan, I-SNPs enroll MA-eligible individuals who require the level of care provided in NHs, inpatient psychiatric facilities, or assisted living facilities for at least 90 days. Other types of SNPs are Dual Eligible (D-SNP), which enroll patients with both Medicare and Medicaid, and Chronic Condition (C-SNP), which enroll patients with severe or disabling chronic conditions such as HIV, cancer, or schizophrenia.

Study Design and Data Sources

We conducted a retrospective population-based study of Medicare enrollees using merged 2011 data sets from Centers for Medicare & Medicaid Services (CMS) beneficiary enrollment files and the quarterly long-term care Minimum Data Set (MDS) 3.0 files. The MDS 3.0 is completed for all residents of Medicare-certified NHs, regardless of payer. CMS provided cross-sectional extracts of Medicare enrollment files containing patient Health Insurance Claim number, Social Security number, date of birth, and enrollment information as of December 2011. CMS also provided patient Institutional CMS–Hierarchical

Condition Category (HCC) scores.³⁵ The CMS–HCC model risk-adjusts payments to private Medicare plans using demographics and 70 categorized diagnoses derived from administrative medical encounter data over the past year to estimate future expenditures, and it has also been shown to be a significant predictor of health outcomes such as mortality.³⁶ The work carried out for this study underwent review by the RAND Human Subjects Protection Committee.

Quality Measures

We generated the 18 NH quality measures listed in Table 1 at the patient level by following existing methodology for developing the facility-level measures used in Nursing Home Compare.³⁷ Quality measures were categorized by length of NH stay, reflecting changes in how NH care is reimbursed after 100 days. Short-stay measures include all residents in an episode whose cumulative days in the facility (CDIF) are 100 days or less at the end of the target period, and long-stay measures include residents with CDIF greater than 100 days. Eight of the quality measures were process measures and 10 were outcome measures. The short-stay pressure ulcer measure and long-stay pain and urinary catheterization measures were risk adjusted using resident-level covariates.³⁷ In addition, all measures other than pneumococcal vaccination excluded some patients from the denominator, to ensure the quality measure was targeted to the appropriate

Table 1
Quality Measures Reported in Nursing Home Compare

Length of Stay	Quality Measure	Event Desirability
Short stay	Percent of residents who self-report moderate to severe pain	Undesired
	Percent of residents with pressure ulcers that are new or worsened	Undesired
	Percent of residents who were assessed and appropriately given the seasonal influenza vaccine	Desired
	Percent of residents assessed and appropriately given the pneumococcal vaccine	Desired
	Percent of residents who newly received an antipsychotic medication	Undesired
	Percent of residents experiencing 1 or more falls with major injury	Undesired
Long stay	Percent of residents who self-report moderate to severe pain	Undesired
	Percent of high-risk residents with pressure ulcers	Undesired
	Percent of residents assessed and appropriately given the seasonal influenza vaccine	Desired
	Percent of residents assessed and appropriately given the pneumococcal vaccine	Desired
	Percent of residents with a urinary tract infection	Undesired
	Percent of low-risk residents who lose control of their bowels or bladder	Undesired
	Percent of residents who have/had a catheter inserted and left in their bladder	Undesired
	Percent of residents who were physically restrained	Undesired
	Percent of residents whose need for help with activities of daily living has increased	Undesired
	Percent of residents who lose too much weight	Undesired
	Percent of residents who have depressive symptoms	Undesired
	Percent of residents who received an antipsychotic medication	Undesired

patients.³⁷ All remaining eligible Medicare NH patients were included in the denominator when calculating rates for NH quality measures. For individual quality measures, only the patients meeting the criteria for the specific measure were included in the numerator. The measure-specific criteria could be positive, such as appropriately receiving a vaccination, or negative, such as having a new or worsening pressure ulcer. In cases where a patient was admitted to an NH more than once during the study period, we only included data from the last NH admission.

Analysis

We calculated the relative risks (RRs) of being in the numerator of the quality measure as a function of MA versus FFS enrollment, using 4 different regression models that progressively adjusted for increasing numbers of characteristics.³⁸ The first model accounts for facility-level random effect, adjusting for the facility's overall level of quality. The second model adds adjustments for beneficiary age and gender, and the third model adjusts for patient comorbidities with the CMS-HCC score. The fourth and final model adds fixed effects to account for large-area geographic variations based upon the 9 Census divisions in order to account for regional differences in facility quality, Medicare markets, intensity of practice,³⁹ coding intensity, and other unobserved variation. RRs with $P < .05$ were considered statistically significant for the specific measure.

Results

Overall, 2.17 million Medicare patients had an eligible nursing home stay with at least 1 quality measure recorded during the

12-month study period; 17% of these patients were covered by an MA plan (Table 2). Furthermore, 58% of all patients were at least 80 years old, and 65% of all patients were female. There was a bimodal distribution of CDIF, with 52% of patients staying 100 days or fewer and 37% staying at least 300 days. The data also show differences in proportions of MA and FFS beneficiaries by geographic region, reflecting different MA penetration rates (ie, market share) across the country (Appendix A). Finally, the FFS population has a higher percentage of long-term care patients with over 300 days in the facility.

When we compared MA versus FFS enrollment using the 4 different regression models, RRs were virtually unchanged. We therefore only show results from the first and the final models in Tables 3 and 4 for simplicity. Overall, MA enrollees had similar outcomes compared to FFS for the majority of quality measures. Eight of the 18 measures had statistically significant differences between MA and FFS patients. Although differences were extremely small for the vaccination measures, 6 quality measures showed greater differences. After adjustment, short-stay MA patients had better quality scores for pressure ulcers [RR = 0.76, 95% confidence interval (CI) = 0.71–0.82] and new receipt of antipsychotics (RR = 0.82, 95% CI = 0.80–0.83) but worse scores for moderate to severe pain (RR = 1.09, 95% CI = 1.07–1.12). MA long-stay patients had better scores for antipsychotic use (RR = 0.94, 95% CI = 0.93–0.96) but worse scores for loss of bowel or bladder control (RR = 1.08, 95% CI = 1.06–1.09) and urinary catheterization (RR = 1.10, 95% CI = 1.06–1.13).

Discussion

In this study, we investigated how NH quality of care may differ for MA enrollees compared to FFS. MA plans could theoretically improve

Table 2
Characteristics of the Study Population*

Characteristic	Overall		Long Stay				Short Stay			
			MA		FFS		MA		FFS	
	n	%	n	%	n	%	n	%	n	%
Total sample	2,171,834		134,668		900,656		236,973		899,537	
Age										
<65	212,035	9.8%	7577	5.6%	95,199	10.6%	17,555	7.4%	91,704	10.2%
65–69	175,075	8.1%	6836	5.1%	58,517	6.5%	23,643	10.0%	86,079	9.6%
70–74	222,890	10.3%	11,005	8.2%	74,266	8.2%	32,335	13.6%	105,284	11.7%
75–79	300,726	13.8%	17,390	12.9%	105,685	11.7%	42,192	17.8%	135,459	15.1%
80–84	406,985	18.7%	25,905	19.2%	157,285	17.5%	48,962	20.7%	174,833	19.4%
85–89	440,650	20.3%	31,227	23.2%	192,391	21.4%	42,932	18.1%	174,100	19.4%
90+	413,695	19.0%	34,744	25.8%	217,379	24.1%	29,386	12.4%	132,186	14.7%
Gender										
Female	1,416,142	65.2%	93,775	69.6%	623,424	69.2%	141,015	59.5%	557,928	62.0%
Male	755,692	34.8%	40,893	30.4%	277,232	30.8%	95,958	40.5%	341,609	38.0%
Division										
New England	151,603	7.0%	11,133	8.3%	60,100	6.7%	13,237	5.6%	67,133	7.5%
Mid-Atlantic	354,409	16.3%	31,574	23.4%	143,014	15.9%	45,501	19.2%	134,320	14.9%
East North Central	408,827	18.8%	22,707	16.9%	169,689	18.8%	41,472	17.5%	174,959	19.4%
West North Central	191,342	8.8%	18,007	13.4%	88,526	9.8%	18,378	7.8%	66,431	7.4%
South Atlantic	390,023	18.0%	16,956	12.6%	154,243	17.1%	35,940	15.2%	182,884	20.3%
East South Central	136,376	6.3%	4068	3.0%	68,562	7.6%	9134	3.9%	54,612	6.1%
West South Central	211,591	9.7%	6435	4.8%	114,187	12.7%	12,711	5.4%	78,258	8.7%
Mountain	100,669	4.6%	8676	6.4%	28,961	3.2%	19,307	8.1%	43,725	4.9%
Pacific	227,216	10.5%	15,128	11.2%	73,440	8.2%	41,325	17.4%	97,323	10.8%
Cumulative days in facility (CDIF)										
≤25 or fewer	607,007	27.9%					146,772	61.9%	460,235	51.2%
26–50	301,581	13.9%					56,272	23.7%	245,309	27.3%
51–100	228,062	10.5%					33,961	14.3%	194,101	21.6%
101–200	140,320	6.5%	20,827	15.5%	119,493	13.3%				
201–300	99,281	4.6%	14,601	10.8%	84,680	9.4%				
>300	795,805	36.6%	99,256	73.7%	696,549	77.3%				
SNP enrollment										
C-SNP			1067	0.8%			4070	1.7%		
D-SNP			23,634	17.5%			19,783	8.3%		
I-SNP			31,949	23.7%			2686	1.1%		

*Includes all patients included in at least 1 quality measure, derived from the 2011 MDS.

Table 3
Short-Stay Nursing Home Quality Measures: Within-Facility Relative Risk (95% Confidence Intervals) Comparing Medicare Advantage Enrollment to Fee-for-Service Enrollment

Description	Unadjusted			Model Adjusted*	
	Mean Rate (FFS)	Mean Rate (MA)	Ratio	Model 1	Model 4
Moderate to severe pain	21.6%	23.7%	1.10	1.13 (1.06–1.21)	1.09 (1.07–1.12)
Pressure ulcers new or worsened	2.17%	1.36%	0.63	0.79 (0.71–0.88)	0.76 (0.71–0.82)
Given seasonal influenza vaccination	81.1%	79.1%	0.98	1.14 (0.88–1.48)	1.01 (0.95–1.07)
Given pneumococcal vaccination	84.6%	83.3%	0.99	0.99 (0.98–1.00)	1.00 (0.98–1.01)
Newly received an antipsychotic	12.0%	9.35%	0.78	0.84 (0.77–0.91)	0.82 (0.80–0.83)

*Model 1 contains facility-level random effects; model 4 contains facility-level random effects, age, gender, HCC score, and Census division. Values shown as relative risks for MA enrollment; bold numbers are statistically significant with a P value <.05.

NH patient outcomes by promoting high-quality, coordinated care before the NH admission and by selecting facilities that meet internal network standards for metrics such as staffing levels, readmission rates and length of stay.^{14,40–42} However, MA and FFS patients had very similar outcomes for individual quality measures overall, with MA performing slightly better or slightly worse than FFS across some measures. Among the 6 NH quality measures with larger differences between MA and FFS enrollees, MA patients did not have consistently better outcomes. Short-stay MA enrollees had 24% lower relative risk of pressure ulcers and 18% lower risk of new antipsychotic use, but FFS enrollees had 9% lower risk of moderate to severe pain. Long-stay MA enrollees continued to have lower risk of new antipsychotic use, but the relative reduction was modest at 6%. Long-stay FFS enrollees had 8% lower risk of urinary incontinence and 10% lower risk of urinary catheterization. Progressive adjustment for increasing numbers of variables in our analysis did not change these results.

Multiple factors may have resulted in similar outcomes between the 2 groups. Dominant MA plans in a region with high MA penetration may have increased influence over NH practices, resulting in a halo effect extending to FFS patients within the same facility. As we adjusted for facility-level effects, we only compared outcomes for MA and FFS enrollees at the same NHs. We could not determine if there were systematic differences among FFS enrollees admitted to NHs that did or did not admit MA enrollees. The number and mix of Nursing Home Compare quality measures may have also limited our ability to detect true differences. There are only 5 quality measures for short-stay enrollees, and 2 are process measures related to vaccinations. As hypothesized, we found that most of the long-stay quality measures did not differ significantly between MA and FFS patients. MA plans may only be able to influence NH quality to the degree that they have preselected facilities for contracts; they may not have much ability to influence care provided within the facility once the patient is

admitted or once a patient exceeds 100 days at the facility and begins to rely on alternate payment sources. Among long-stay patients, some outcomes occurred infrequently, such as use of physical restraints (Table 5). Additionally, the pressure ulcer measure was not risk adjusted for long-stay patients.

Our analysis was limited by several factors. First, although we adjusted for beneficiary age, gender, and comorbidities, we were unable to account for other patient demographic factors such as socioeconomic status. We also could not adjust for MA plan characteristics that may affect results, such as type of plan, for-profit or nonprofit status, size, and years established.⁴³ Second, we could not determine based on our data whether there was a difference in proportion of dual-eligible patients in MA plans compared with FFS. Dual-eligible patients are more likely to have lower socioeconomic status and become long-stay NH patients compared with Medicare-only patients.⁴⁴ Third, using weighted HCC scores to estimate burden of comorbidities may not adequately account for provider inconsistency in coding conditions, negative interactions that may occur between conditions, or condition severity. Regional intensity of diagnostic practice can also affect such diagnosis-based risk adjustment, as the chance of a disease diagnosis being recorded in claims data is higher for patients receiving care in regions where physicians systematically order more diagnostic tests or subspecialist referrals.³⁹ Fourth, we only included the most recent nursing home admission within the study period; we did not adjust for frequency of nursing home admissions for postacute care or other reasons. For short-stay patients receiving postacute care in NHs, we were unable to adjust for preceding hospital length of stay.

Fifth, most of the NH quality measures are for long-stay patients. However, a smaller proportion of MA patients are long-stay patients compared with FFS, which may reflect disenrollment from MA among long-stay patients,⁴⁵ or differences in types of patients admitted to NH

Table 4
Long-Stay Nursing Home Quality Measures: Within-Facility Relative Risk (95% Confidence Intervals) Comparing Medicare Advantage Enrollment to Fee-for-Service Enrollment

Description	Unadjusted			Model Adjusted*	
	Mean Rate (FFS)	Mean Rate (MA)	Ratio	Model 1	Model 4
Fall(s) with major injury	3.41%	3.38%	0.99	1.02 (0.99–1.06)	1.02 (0.98–1.06)
Moderate to severe pain	11.5%	11.3%	0.99	1.03 (0.98–1.07)	1.03 (1.00–1.06)
High-risk with pressure ulcers	6.61%	6.36%	0.96	1.00 (0.95–1.05)	1.03 (0.98–1.08)
Given seasonal influenza vaccination	87.2%	85.9%	0.99	0.99 (0.98–0.99)	0.99 (0.98–0.99)
Given pneumococcal vaccination	93.8%	93.8%	1.00	1.00 (0.99–1.00)	0.99 (0.99–1.00)
Urinary tract infection	7.63%	7.23%	0.95	0.97 (0.94–0.99)	0.98 (0.95–1.01)
Low-risk who lose control of bowel or bladder	42.4%	48.1%	1.14	1.13 (1.11–1.15)	1.08 (1.06–1.09)
Catheterized	4.03%	4.36%	1.08	1.11 (1.06–1.16)	1.10 (1.06–1.13)
Physically restrained	2.39%	2.24%	0.94	0.97 (0.91–1.04)	1.03 (0.97–1.10)
Increased need with activities of daily living	16.8%	16.6%	0.99	1.08 (0.93–1.24)	1.06 (0.98–1.14)
Lose too much weight	7.07%	7.21%	1.02	1.05 (1.02–1.08)	1.05 (1.02–1.08)
Depressive symptoms	7.36%	7.38%	1.00	1.01 (0.96–1.06)	1.02 (0.95–1.10)
Received an antipsychotic	23.9%	21.6%	0.90	0.90 (0.87–0.92)	0.94 (0.93–0.96)

*Model 1 contains facility-level random effects; model 4 contains facility-level random effects, age, gender, HCC score, and Census division. Values shown as relative risks for MA enrollment; bold numbers are statistically significant with a P value <.05.

Table 5
Median Facility Values for Nursing Home Compare Quality Measures*

Measure	% Frequency
LS with 1 or more falls with major injury	2.9
SS self-report moderate to severe pain	22.1
LS self-report moderate to severe pain	10.0
SS with pressure ulcers new or worsened	0.9
LS high-risk with pressure ulcers	6.2
SS assessed and appropriately given seasonal flu vaccine	85.6
LS assessed and appropriately given seasonal flu vaccine	94.3
SS assessed and appropriately given pneumococcal vaccination	88.5
LS assessed and appropriately given pneumococcal vaccination	98.4
LS with urinary tract infection	6.7
LS low-risk who lose control of bowel or bladder	42.6
LS catheterized	3.5
LS physically restrained	0.0
LS with increased need with activities of daily living	15.4
LS lose too much weight	6.4
LS with depressive symptoms	3.7
LS received antipsychotic	22.3
SS newly received antipsychotic	2.0

*Calculation of median rates exclude facilities with fewer than 30 patients for long-stay measures and 20 patients for short-stay measures, according to CMS standards for reporting.

because of the availability of alternative care options. In our analysis, we included patients with any short-stay or long-stay measure. However, short- and long-stay patients may differ in comorbidities, reason for nursing home admission, and types of insurance coverage available. It may be important to separate short- and long-stay patients in future analyses or adjust for different factors among long-stay patients. In our sample, 42% of MA long-stay NH patients were enrolled in an SNP, with the majority in either an I-SNP or D-SNP (Table 2). Although SNPs aim to improve care management and coordination, there are several possible reasons why long-stay quality measures were similar for MA (including SNPs) and FFS. Early SNPs were not necessarily structured to provide coordinated care, and Congress temporarily halted SNP expansion in 2009 for further study.⁴⁶ In the 2013 Medicare Payment Advisory Commission report to Congress, I-SNPs had lower than expected hospital readmission rates.⁴⁷ Care coordination may have greater effects on service utilization than on NH-specific quality measures. However, utilization was not a Nursing Home Compare quality measure at the time of our study. The same report found that D-SNPs generally had average to below-average performance on quality measures compared with the other SNPs and regular MA plans. Not all D-SNPs had contracts with state Medicaid programs, and existing state contracts varied in degree of coordination of Medicaid benefits.⁴⁸

Finally, geography can affect quality measures due to variation in market forces (eg, number of competing MA plans), degree of MA market penetration, and number of nursing homes. Regional differences in practice can also affect the likelihood of postacute nursing home admission for a given condition.⁴⁹ Most MA plans are constrained geographically into aggregations of counties called Contract Service Areas, NH regulatory stringency varies by state,⁵⁰ and most patients select facilities closer to home. However, adjusting for Census region had little effect on the comparison of MA performance on quality measures to FFS. Other approaches such as controlling for county- or state-level variation may have a stronger impact.

Conclusion

Overall, differences in NH quality measures between MA and FFS beneficiaries were not consistent in direction or magnitude. MA

enrollees had better outcomes for 3 measures related to antipsychotic use and pressure ulcers, with stronger effects found for the short-stay measures. FFS patients had better outcomes for 3 measures related to pain control, incontinence, and urinary catheterization. In July 2016, NH Compare added 4 short-stay quality measures related to resource utilization, functional improvement, and successful discharge to community,⁵¹ which will allow for comparisons of quality that might be more sensitive to differences between MA and FFS. Future studies may also include MA encounter data to improve matching between MA and FFS patients, when such data become generally available, as well as linking hospital data.

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Supplementary Data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jamda.2016.07.017>.

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