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Quality of Ambulatory Care in Medicare Advantage HMOs and Traditional Medicare

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Abstract

To compare quality of care nationally between Medicare Advantage health maintenance organizations (HMOs) and traditional Medicare and determine how various types of Medicare HMOs differed in quality from traditional Medicare, we assessed performance measures of the quality of ambulatory care from the among beneficiaries matched by demographic characteristics within local areas during 2003–2009. HMO enrollees were consistently more likely than traditional Medicare beneficiaries to receive appropriate breast cancer screening, diabetes care, and cholesterol testing for cardiovascular disease. Personal physicians were rated less highly in HMOs than traditional Medicare in 2003, but more highly in 2009. Not-for-profit, larger, and older HMOs performed consistently more favorably on clinical measures and ratings of care than for-profit, smaller, and newer HMOs. The effects on ambulatory quality of care of more integrated delivery systems in Medicare HMOs may outweigh the potential incentives to restrict care under capitated payments.

Keywords

Medicare; quality of care; managed care; elderly

Medicare beneficiaries have had the option of joining private health maintenance organizations (HMOs) since 1976.¹ Following the Medicare Modernization Act, enrollment in private health plans in the Medicare Advantage program has grown from 5.3 million beneficiaries in 2003 to 13.1 million beneficiaries in 2012. HMO enrollees represent 65 percent of Medicare Advantage and 18 percent of all Medicare beneficiaries.²

As enrollment in Medicare Advantage grows, policymakers, health care providers, and Medicare beneficiaries have a correspondingly greater need to understand how the quality and costs of care in Medicare Advantage health plans compare to traditional fee-for-service Medicare. Whereas traditional Medicare has lacked explicit systems to improve quality of care or limit costs, a major objective of Medicare HMOs has been to improve the integration and coordination of care in ways that could enhance quality of care. However, because HMOs receive capitated payments from Medicare, these organizations have incentives to limit the volume of care, which could undermine quality. With the recent introduction of bonus payments related to quality of care for Medicare Advantage health plans and for accountable care organizations in traditional Medicare, the need to understand the relative quality of care in Medicare Advantage and traditional Medicare has increased.

One prior study compared clinical quality measures in Medicare Advantage and traditional Medicare in state-level analyses but did not adjust for sociodemographic factors or assess performance of individual Medicare Advantage health plans.³ In two other studies of survey

measures, Medicare Advantage enrollees were more likely to report having received pneumococcal and influenza vaccinations, but traditional Medicare enrollees rated their care more favorably than those in Medicare Advantage.^{4, 5}

We compared the quality of ambulatory care nationally during 2003 through 2009 in Medicare HMOs and traditional Medicare, adjusting for sociodemographic factors and controlling for geography. We also assessed whether the quality of ambulatory care varied by health plan characteristics relative to traditional Medicare in the same local areas. We thus provide new evidence to guide policymakers overseeing Medicare.

METHODS

Study Design & Data Sources

We conducted an observational cohort study comparing quality of care between Medicare beneficiaries enrolled in Medicare HMOs matched to those in traditional Medicare in the same local areas from 2003 through 2009. Since 1997, CMS has required Medicare HMOs to report Healthcare Effectiveness Data and Information Set (HEDIS®) quality measures for eligible enrollees each year.^{6, 7} Health plans, defined by a CMS contract in a single state or up to three adjacent states, collect these data from administrative billing or encounter data, or using a hybrid approach in which medical records are also reviewed for services that may not be recorded in administrative data.⁸ CMS has audited clinical quality measures reported by Medicare HMOs and found them to be highly accurate and consistent with technical specifications provided by the National Committee for Quality Assurance.⁹ We created comparable clinical performance measures for a 20% sample of traditional Medicare enrollees,¹⁰ using the most recent available Medicare Part A and Part B claims through 2009 that were available in October 2011.

To elicit beneficiaries' views of quality of care, CMS has administered the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey in Medicare Advantage since 1997 and in traditional Medicare since 2000. These surveys are conducted by mail with telephone follow-up for stratified random samples of 600 or more enrollees per Medicare HMO contract and in states or sub-state areas for traditional Medicare. Response rates since 2003 have ranged from 61% to 80% for Medicare Advantage and 57% to 69% for traditional Medicare.

Medicare Beneficiary Summary files from CMS for 2003 through 2009 provided demographic data (age, sex, race/ethnicity, zip code, county, and state of residence), vital status, and information on enrollment in a Medicare Advantage HMO or traditional Medicare for each beneficiary. Our study protocol was approved by the Human Studies Committee of Harvard Medical School and the CMS Privacy Board.

Study Cohort

For the analysis of clinical performance measures, we excluded beneficiaries in each year who we could not link to the Medicare Beneficiary Summary File; those in preferred provider organizations, which were uncommon prior to 2006; those in private fee-for-service plans that were not required by CMS to report measures before 2010; and beneficiaries under age 65 and those enrolled less than 12 months (Appendix Exhibit A1).¹¹ We also excluded HMOs with fewer than 100 enrollees per measure or implausible data (from 0 to 5.7% by measure), defined as plan-year estimates that were less than 1/3 of the grand mean across all HMOs for that year or two standard deviations above or below an individual HMO's average across all years (Technical Appendix).¹¹

After these exclusions, we matched HMO enrollees to traditional Medicare beneficiaries, using statistical weighting by age, sex and race/ethnicity among beneficiaries who resided in the same five-digit zip code (78-90% of HMO enrollees per measure per year), county (9-20% of HMO enrollees), or state (0-2% of HMO enrollees) (Technical Appendix).¹¹ In 2009 the final study cohort for clinical quality measures included 508,676 HMO enrollees eligible for breast cancer screening, 106,529 HMO enrollees with cardiovascular disease, and 127,771 HMO enrollees with diabetes matched to comparable numbers of beneficiaries in traditional Medicare.

For survey measures, we excluded HMOs with fewer than 500 enrollees and otherwise applied eligibility criteria similar to those described above. We restricted this analysis to counties with survey respondents from both HMOs and traditional Medicare (Appendix Exhibit A2).¹¹ In 2009 the final study cohort for these measures included 128,706 HMO enrollees and 103,254 beneficiaries in traditional Medicare.

Study Variables

The National Committee for Quality Assurance provided detailed specifications for clinical performance measures in each study year for five evidence-based clinical performance measures that could be readily created from Medicare claims for traditional Medicare.¹⁰ These included screening mammography in the current or prior year for women ages 65-69, low-density lipoprotein cholesterol testing in the current year for enrollees ages 65-75 with cardiovascular disease, and three monitoring services for enrollees ages 65-75 with diabetes, including hemoglobin A1c testing and low-density lipoprotein cholesterol testing in the current year and a diabetic retinal exam in the current or prior year. Because specifications for cholesterol testing for cardiovascular disease and diabetes changed in 2006, we restricted our analysis of these two measures to 2006 and 2009; all other clinical quality measures were analyzed in 2003 and 2009.

The Consumer Assessment of Healthcare Providers and Systems survey asks enrollees if they received the influenza vaccine in the current year and if they ever received the pneumococcal vaccine. The survey also obtains ratings of personal doctors, specialists, and overall care. We analyzed these measures in 2003 and 2009.

From the Beneficiary Summary File we obtained each HMO's total enrollment by year. CMS provided the tax status of HMOs.

Statistical Analysis

For clinical quality measures, we compared the age, sex, race/ethnicity and Census region of enrollees in HMOs and traditional Medicare before and after matching on these characteristics. For survey measures, we compared these variables and subjects' self-reported health status.

To provide nationally representative estimates of overall HMO performance relative to traditional Medicare, we assessed clinical quality measures in the matched cohorts of HMO and traditional Medicare enrollees in each year weighted by each HMO's contract enrollment (Technical Appendix).¹¹ To assess variation in performance of HMOs relative to matched traditional Medicare in local areas, we used hierarchical regression models with correlated bivariate random effects for each HMO and its matched traditional Medicare sample and fixed effects for HMO characteristics. These characteristics included total enrollment in each year (<25,000 (smaller) vs. ≥25,000 (larger)), year of entry to Medicare Advantage (established before 2006 vs. 2006 or later, in post-2005 models), and tax status (not-for-profit vs. for-profit), with separate coefficients for HMOs and traditional Medicare samples.

We assessed performance on survey measures in HMOs and traditional Medicare by comparing county-level adjusted means for each measure in each year that controlled for enrollees' age, sex, race/ethnicity, and health status. We weighted these means by total HMO enrollment in each county to create national estimates (Technical Appendix).¹¹ To categorize survey measures similarly to the dichotomous clinical quality measures, we assessed the proportion of respondents who rated their personal doctors and specialists at 9 or 10 on a 0-to-10 scale. As described above, we used hierarchical regression models to assess the survey performance measures for individual HMOs and by HMO characteristics.

Analyses were conducted with SAS version 9.2 (Cary, NC). We present the first and last year of data available for each measure between 2003 and 2009; findings for the intervening years (data not shown) showed consistent trends between the years presented. Two-tailed p-values are reported for statistical tests.

Strengths

A major strength of our study was its broad national comparison of quality of care for matched enrollees in HMOs and traditional Medicare through 2009 after passage of the Medicare Modernization Act in 2003. To account for large geographic differences in quality of care within traditional Medicare,¹⁰ which are strongly correlated with quality of care in Medicare Advantage plans in the same local areas,¹² we matched almost all HMO enrollees to traditional Medicare beneficiaries with equivalent demographic characteristics in the same zip codes or counties.

Another strength of our study was its comparison of quality performance measures for individual HMOs relative to the traditional Medicare program within local areas, using hierarchical models to adjust for organizational characteristics and random effects of individual HMOs.

Limitations

Our study has at least five potential limitations. First, while the number of clinical performance measures has grown considerably since 1997, we could create comparable variables from traditional Medicare claims for only five measures, all concerning processes rather than outcomes of care. Many other measures require data on medications or test results that were not available for traditional Medicare enrollees.

Second, most HMOs use a combination of administrative data and medical records to ascertain clinical quality measures, whereas measures we created for traditional Medicare were based only on Medicare claims. A prior study reported that 94% of elderly women who had a mammogram were accurately identified by Medicare claims.¹³ Thus, if mammograms were similarly under-reported for traditional Medicare in our national study, the 13.5 percentage point lower rate of mammography in 2009 would be narrowed to 9.5 percentage points, but this difference would remain clinically important. Another prior study of diabetes measures in three Medicare health plans found hemoglobin A1c and cholesterol testing – but not diabetic retinal exams – were substantially under-reported for elderly patients using administrative data alone,¹⁴ because capitation or other payment arrangements that do not require claims submissions for payment may contribute to under-reporting of lab tests in administrative records of Medicare HMOs. This finding suggests that information from medical records in HMOs raised the accuracy of their clinical measures based on the completion of lab tests closer to the more complete recording of billed lab services in traditional Medicare claims. With the advent of financial incentives for Medicare Advantage health plan performance on these measures,¹⁵ the accuracy of HMO administrative data may improve.

Third, we could not adjust clinical quality measures for health status, as we did for survey measures of vaccinations and ratings of care. Nonetheless, reporting standards for clinical quality measures do not call for case-mix adjustment, and these measures apply to well-defined subgroups of patients for whom the service is almost always clinically indicated. Thus, unmeasured selection effects related to health status should have little effect on provision of these services, but selection effects related to beneficiaries' preferences for preventive care may still contribute to the differences we observed.

Fourth, if better-performing HMOs have spillover effects on quality of care for traditional Medicare beneficiaries in local areas,^{16, 17} we may have underestimated the impact of Medicare HMOs on overall quality of care. Finally, we were unable to assess whether increased payments to Medicare HMOs since the Medicare Modernization Act contributed to their better performance on clinical quality measures relative to traditional Medicare.

RESULTS

The number of HMOs more than doubled from 120 in 2003 to 280 in 2009, with a corresponding increase in total enrollment from approximately 3.1 million to 5.6 million members (Appendix Table A3).¹¹ Over this period, the proportion of enrollees in for-profit HMOs rose from 57.5% to 62.4%, as the number of for-profit HMOs rose from 79 to 200. The proportion in HMOs with 25,000 or more members rose from 71.6% to 74.2%, even as the number of smaller HMOs rose from 86 to 215. The proportion of enrollees in newer HMOs rose from 4.3% in 2006 to 19.0% in 2009 as 160 new HMO contracts were initiated.

Before matching by demographic characteristics and area of residence for clinical quality measures, HMO enrollees were younger, less likely to be white, and more likely to reside in the Northeast or West than traditional Medicare enrollees (all $p < 0.001$). After matching, the distributions of these characteristics were identical (shown for 2009 in Appendix Exhibit A4).¹¹ In counties with survey respondents from HMOs and traditional Medicare, HMO respondents were more likely to be ages 70-79 (48.0% vs. 44.0%), less likely to be white (79.4% vs. 86.2%), and slightly less likely to report fair or poor health (24.5% vs. 25.6%) (illustrated for 2009 in Appendix Exhibit A5).¹¹ We controlled for these characteristics in adjusted analyses.

Exhibit 1 compares clinical quality measures nationally for HMOs relative to matched traditional Medicare enrollees in their local areas during 2003 or 2006 and 2009. Over this period, rates were significantly higher in HMOs than in traditional Medicare for all measures in all years ($p < 0.001$). For screening mammography, the gap between HMOs and traditional Medicare narrowed from 17.9 to 13.5 percentage points as performance in traditional Medicare improved while HMO performance was stable. A similar pattern was evident for hemoglobin A1c testing, with greater improvements in traditional Medicare and narrowing of the gap between HMO and traditional Medicare performance from 11.6 to 8.6 percentage points ($p < 0.001$). In contrast, performance of diabetic eye exams improved more in HMOs than in traditional Medicare, thereby widening the gap from 15.6 to 17.1 percentage points. Persistent differences of similar magnitude were noted between 2006 and 2009 for cholesterol testing among enrollees with diabetes (9 percentage points) and those with cardiovascular disease (7 percentage points).

In Exhibit 2 showing survey measures, the rate of influenza vaccinations was higher in HMOs than traditional Medicare in 2003 (75.9% vs. 72.0%, $p < 0.001$) but this difference narrowed by 2009 (72.1% vs. 71.2%, $p < 0.001$) as HMO performance declined. Similarly, the rate of pneumococcal vaccinations was notably higher among HMO enrollees in 2003 (71.1% vs. 64.4%, $p < 0.001$) but this difference was smaller in 2009 as traditional Medicare

improved (72.7% vs. 69.8%, $p<0.001$). During 2003, HMO enrollees were less likely than those in traditional Medicare to give high ratings of their personal physicians (65.2% vs. 66.9%, $p<0.001$) and specialists (66.1% vs. 69.7%, $p<0.001$). In 2009, these differences were reversed for ratings of personal physicians (74.1% vs. 72.1%, $p<0.001$) and remained slightly better for ratings of specialists in traditional Medicare (70.0% vs. 70.8%, $p=0.02$).

As shown in Exhibit 3, the differences between HMOs and traditional Medicare on clinical and survey quality measures in 2009 varied widely by HMOs' organizational characteristics. Enrollees in the 21 HMOs that were not-for-profit, larger, and established before 2006 (representing 27.0% of all HMO enrollees) experienced the highest quality of care relative to matched traditional Medicare beneficiaries. In contrast, HMOs that were for-profit, smaller, or newer demonstrated consistently smaller differences in performance relative to traditional Medicare. For influenza and pneumococcal vaccinations in 2009, the 109 HMOs with all three of these characteristics (representing 7.6% of all HMO enrollees) performed substantially worse on average than traditional Medicare.

In 2009, enrollees in HMOs that were not-for-profit, larger, and more established reported better ratings of personal physicians and slightly worse ratings of specialists relative to local enrollees in traditional Medicare (Exhibit 3). Enrollees in HMOs that were for-profit, smaller, and newer rated all three of these dimensions of care less favorably than their counterparts in traditional Medicare.

Exhibit 4 shows different patterns when examining the average performance of individual HMOs relative to matched enrollees from the same local areas in traditional Medicare during 2009. For screening mammography, most HMOs performed substantially better than traditional Medicare, but the differences narrowed in areas with better performance for traditional Medicare. For influenza vaccinations, the numbers of HMOs performing better and worse than traditional Medicare were closely balanced. Appendix Exhibits A6 and A7 show the variability in performance for individual HMOs on these two measures, respectively.

DISCUSSION

Our study comparing quality of care in Medicare HMOs and traditional Medicare has three main findings. First, from 2003 through 2009 performance measures of breast cancer screening, diabetes care, and cholesterol testing for cardiovascular disease were consistently better in HMOs than in traditional Medicare overall, but differences in breast cancer screening and hemoglobin A1c testing narrowed somewhat as traditional Medicare improved. Second, rates of influenza and pneumococcal vaccinations in 2003 were higher in HMOs than in traditional Medicare but were much more similar by 2009. Third, ratings of personal physicians were less favorable for HMOs relative to traditional Medicare in 2003, but by 2009 were better in HMOs than in traditional Medicare. Given very similar rates of outpatient visits in Medicare HMOs and traditional Medicare in 2009,¹⁸ our results suggest that the effects on ambulatory quality of care of more integrated delivery systems in Medicare HMOs may have outweighed the potential incentives to restrict care under capitated payments.

Our study also demonstrated substantial differences in performance among different types of HMOs relative to traditional Medicare. As in prior studies,¹⁹⁻²¹ not-for-profit HMOs performed better than for-profit HMOs. Larger, more established HMOs also performed consistently better relative to traditional Medicare than smaller or newer HMOs, suggesting the former group has more effective systems to promote quality of care or to contract

selectively with higher-quality providers.²² Better-performing HMOs may also reduce or eliminate enrollee cost sharing for specific services, such as screening mammography.²³

The policy importance of performance measures of quality of care has increased with the Affordable Care Act of 2010, which authorized CMS to begin providing financial bonuses in 2012 to Medicare Advantage health plans. These bonuses are based on a “star” rating system for health plans that demonstrate superior performance on clinical quality and survey measures.¹⁵ Furthermore, the Affordable Care Act has authorized CMS to begin contracting with accountable care organizations that will share financial risk with CMS for the costs and quality of care received by traditional Medicare beneficiaries they serve.²⁴ Through the Medicare Pioneer Accountable Care Organizations and Shared Savings Programs, these organizations are eligible to receive bonus payments, initially related to reporting quality measures and subsequently to achieving higher quality of care.²⁵ The performance measures include survey measures similar to those analyzed in this study and several clinical quality measures, such as screening mammography and hemoglobin A1c testing, that can be derived from Medicare claims.¹⁰

These recent parallel expansions of financial incentives for achieving better quality of care in Medicare Advantage and traditional Medicare heighten the need for performance measures that can be compared between these two major components of the Medicare program. Such measures will enable policymakers, health care providers, and Medicare beneficiaries to assess whether the quality of care in Medicare Advantage health plans differs from care provided within accountable care organizations and from care provided outside these organizations in the traditional Medicare program.

Technical Appendix

Matching of Medicare Advantage and traditional Medicare enrollees

For the clinical quality measures obtained from the Healthcare Effectiveness Data and Information Set and Medicare claims, we matched Medicare HMO enrollees to beneficiaries in traditional Medicare with the same demographic characteristics and the best possible geographic match. We tabulated the eligible population for each quality measure in cells defined by age (5-year ranges), sex, race, and 5-digit zip code, county and state of residence, as specified in the Medicare Beneficiary Summary File. We calculated summary rates from traditional Medicare claims defined by the same demographic and geographic variables. We then matched every Medicare Advantage cell to a corresponding cell in traditional Medicare with identical demographic characteristics and the same zip code if it had traditional Medicare beneficiaries eligible for the measure, to the county summary if no matching data were available in the zip code, or to the overall state summary for the demographic cell if no matching data were available within the county. Finally, for each Medicare Advantage contract we calculated a weighted mean of the traditional Medicare summary means with weights defined by the frequencies of the age-sex-race-area cells in Medicare Advantage.

For the quality measures obtained from the Consumer Assessment of Healthcare Providers and Systems survey, we selected counties with survey respondents from both Medicare Advantage and traditional Medicare. We calculated county-level means for each measure in Medicare Advantage and traditional Medicare. Using an approach to case-mix adjustment similar to that used in public reporting of these survey measures,^{*} we adjusted these means for differences between the two components of Medicare by age, sex, race/ethnicity, and

^{*}Zaslavsky AM, Zaboriski LB, Ding L, Shaul JA, Cioffi MJ, Cleary PD. Adjusting performance measures to ensure equitable plan comparisons. *Health Care Financ Rev* 2001; 22:109-126.

self-reported health status (on a 5-point scale from poor to excellent) in linear regression models. We weighted these means by county-level HMO enrollment to derive national estimates.

Removing implausible health plan data

To remove implausible data, for each measure we eliminated plan-year submissions with rates less than $1/3^{\text{rd}}$ of the grand mean of all plans for that year. We then deleted data for a given year if plans had rates more than two standard deviations above or below the plan's submissions for all other years. This review resulted in reductions that ranged from a maximum of 5.7% of possible plan-year submissions for hemoglobin A1c testing for diabetes to no reduction of plan-year submissions for low-density lipoprotein cholesterol testing for patients with cardiovascular disease.

Modeling quality measures for enrollees in Medicare Advantage HMOs and traditional Medicare

The model is of the form $y_{cj} = \beta_{0j} + \sum_{i=1}^4 \beta_{ij} x_{ci} + \delta_{cj} + \varepsilon_{cj}$, where y_{cj} is the estimated mean quality score for contract c (if $j=1$) or for the corresponding matched traditional Medicare sample (if $j=2$), β_{ij} is a coefficient for the intercept ($i=0$) or one of three plan characteristics ($i=1,2,3$), x_{ci} is the value of the corresponding plan characteristic variable, δ_{cj} is a random effect, and ε_{cj} is sampling error, both for cohort j in contract c . We further assume that $\varepsilon_{cj} \sim N(0, v_{cj})$ where v_{cj} is the sampling variance of the corresponding mean, and that

$\begin{pmatrix} \delta_{c1} \\ \delta_{c2} \end{pmatrix} \sim N(0, \Sigma)$ where $\Sigma = \begin{pmatrix} \sigma_{11} & \sigma_{12} \\ \sigma_{12} & \sigma_{22} \end{pmatrix}$ is an unconstrained covariance matrix. The slope of the regression of HMO quality on matched traditional Medicare measures is calculated as σ_{12}/σ_{22} in the corresponding model without covariates, where σ_{12} is the covariance of the random effects for traditional Medicare and HMO and σ_{22} is the variance of the traditional Medicare random effects.

Appendix Exhibit A1

Specification of HMO Cohorts for Clinical Quality Measures in 2009

	Overall Sample		Breast Cancer Screening for Women Age 65–69		Diabetes Care		Cardiovascular Disease – Cholesterol Testing	
	N	Retained from prior step	N	Retained from prior step	N	Retained from prior step	N	Retained from prior step
Initial Sample	10,644,399		1,003,399		426,499		210,393	
Linked to Beneficiary Summary File	10,521,679	98.8%	994,724	99.1%	417,010	97.8%	206,925	98.4%
Residing in 50 States	10,065,813	95.7%	951,948	95.7%	404,270	96.9%	202,290	97.8%
Enrolled in HMO Plans	7,406,740	73.6%	713,566	75.0%	161,380	39.9%	122,270	60.4%
Age 65 or older	6,589,482	89.0%	517,547	72.5%	131,951	81.8%	108,365	88.6%
<i>Samples used for matching with traditional Medicare</i>								
Full year enrollment	5,631,384	85.5%	508,676	98.3%	127,771	96.8%	106,529	98.3%
Number of Plans	280		278		280		278	
Number of Plans After Plan-level Exclusions [*]			264		280		271	

Source: Authors' analysis of Medicare Beneficiary Summary File, Healthcare Effectiveness Data and Information Set measures for Medicare HMOs, and Part A and B claims from CMS

Notes:

* A small number of additional respondents excluded for HMOs with <100 enrollees per measure or implausible data on each measure

Appendix Exhibit A2

Specification of Traditional Medicare and HMO Cohorts for Survey Quality Measures by Year

	Year 2003				Year 2009			
	Traditional Medicare		HMO		Traditional Medicare		HMO	
	N	%	N	%	N	%	N	%
Initial Sample	120974		132420		170640		245262	
Exclusions								
Outside 50 states	1007	1	871	1	3493	2	8050	3
Age <65 yrs	12828	11	7628	6	25702	15	26012	11
Non-HMO	NA		23401	18	NA		82491	34
Sample eligible for matching	107139	89	100520	76	141445	83	128709	53
Number of counties	3100		915		3107		1262	
County-matched sample	70316	66	100519	100	103254	73	128706	100
Number of counties with both traditional Medicare & HMO respondents	914		914		1260		1260	

Source: Authors' analysis of Medicare Beneficiary Summary File and the Medicare Consumer Assessment of Healthcare Providers and Systems survey from CMS

Appendix Exhibit A3

Characteristics and Enrollment of Medicare Advantage Health Maintenance Organizations (HMOs) in 2003, 2006, and 2009

Characteristics	2003		2006		2009	
	Plans	Enrollment (%)	Plans	Enrollment (%)	Plans	Enrollment (%)
	N=120	N=3,121,651	N=163	N=3,695,090	N=280	N=5,630,284
Tax status						
Not for profit	41	42.5	46	38.4	80	37.6
For profit	79	57.5	117	61.6	200	62.4
Enrollment						
25,000	34	71.6	44	72.9	65	74.2
<25,000	86	28.4	119	27.1	215	25.8
Initial participation in Medicare						
Before 2006	--	--	122	95.7	120	81.0
2006 or later	--	--	41	4.3	160	19.0

Source: Authors' analysis of HMO participation and enrollment in Medicare Beneficiary Summary file and CMS data on HMO tax status.

Appendix Exhibit A4

Characteristics of Enrollees in Traditional Medicare (TM), Medicare HMOs, and Matched Traditional Medicare for Clinical Quality Measures in 2009

Characteristic	Breast Cancer Screening			Diabetes Care			Cholesterol Testing for Cardiovascular Disease		
	TM	HMOs	Matched TM	TM	HMOs	Matched TM	TM	HMOs	Matched TM
N	470,207	508,377		598,463	127,493		347,111	93,344	
Sex									
Male	--	--	--	49.0%	48.3%	48.3%	62.2%	63.3%	63.3%
Female	100%	100%	100%	51.0%	51.7%	51.7%	37.8%	36.7%	36.7%
Race / Ethnicity									
White	85.9%	80.8%	80.8%	80.7%	73.7%	73.7%	88.9%	82.1%	82.1%
Black	9.1%	11.5%	11.5%	12.5%	13.6%	13.6%	6.9%	9.7%	9.7%
Hispanic	1.4%	2.0%	2.0%	2.0%	3.0%	3.0%	1.1%	1.8%	1.8%
Other	3.6%	5.7%	5.7%	4.8%	9.7%	9.7%	3.1%	6.4%	6.4%
Age (yrs)									
65–69	100.0%	100%	100%	43.0%	42.2%	42.2%	33.6%	39.2%	39.2%
70–75	0.0%	0.0%	0.0%	57.0%	57.8%	57.8%	66.4%	59.8%	59.8%
Census Region									
Northeast	16.6%	24.8%	24.8%	16.7%	13.5%	13.5%	18.4%	11.8%	11.8%
Midwest	23.7%	12.2%	12.2%	24.0%	14.1%	14.1%	23.6%	14.3%	14.3%
South	42.2%	23.9%	23.9%	43.7%	20.7%	20.7%	44.6%	23.4%	23.4%
West	17.5%	39.1%	39.1%	15.6%	51.7%	51.7%	13.4%	50.5%	50.5%

Source: Authors' analysis of Medicare Beneficiary Summary File, Healthcare Effectiveness Data and Information Set measures for Medicare HMOs, and Part A and B claims for traditional Medicare

Appendix Exhibit A5

Characteristics of Beneficiaries in Traditional Medicare and Medicare HMOs for Survey Quality Measures in 2009

Characteristics	Traditional Medicare		Medicare HMOs	
	N	%	N	%
N	103,254		128,706	
Age (yrs)				
65–69	24,399	27.6	29,662	25.4
70–74	25,017	24.2	33,169	25.8
75–79	20,425	19.8	28,504	22.2
80–84	16,138	15.6	19,884	15.5
85	13,231	12.8	14,452	11.2
Sex				
Male	41,878	40.6	51,665	40.1
Female	61,376	59.4	77,041	59.9

		Traditional Medicare		Medicare HMOs	
Characteristics		N	%	N	%
Race / ethnicity *	White	88,949	86.2	102,212	79.4
	Black	7,378	7.2	15,962	12.4
	Hispanic	1,789	1.7	4,188	3.3
	Asian	2,135	2.1	3,183	2.5
	Other	3,003	2.9	3,161	2.5
Self-reported Health	Excellent	8,217	8.0	10,086	7.8
	Very good	26,828	26.0	31,643	24.6
	Good	36,537	35.4	44,896	34.9
	Fair	20,825	20.2	26,002	20.2
	Poor	5,611	5.4	5,560	4.3
	Missing	5,236	5.1	10,519	8.2

Source: Authors' analysis of Medicare Consumer Assessment of Healthcare Providers and Systems survey data from CMS

Notes: Analysis limited to counties with both HMO and traditional Medicare respondents.

* Based on the Medicare Beneficiary Summary File

Exhibit A6. Screening Mammography in Medicare HMOs Matched to Local Traditional Medicare Beneficiaries in 2009

Source: Authors' analysis of clinical quality measures for Medicare HMOs and Part A and B claims data for traditional Medicare.

Notes: Estimates are derived from hierarchical regression models weighted by HMO enrollment and with random effects for individual health plans. The y-axis depicts performance for HMO plans and the x-axis depicts the corresponding performance for matched traditional Medicare enrollees in the same local areas. Circles and triangles represent not-for-profit and for-profit HMOs, respectively, and larger symbols indicate HMOs with ≥25,000 enrollees. Points above the lighter diagonal line indicate HMOs that performed better than traditional Medicare, and points below this line indicate worse HMO performance than traditional Medicare. The bolded regression line summarizes the overall differences across the range of HMO performance.

Exhibit A7. Influenza Vaccinations in Medicare HMOs Matched to Local Traditional Medicare Beneficiaries in 2009

Source: Authors' analysis of Medicare Consumer Assessment of Healthcare Providers and Systems survey data.

Notes: Estimates are derived from hierarchical regression models weighted by HMO enrollment and with random effects for individual health plans. The y-axis depicts performance for HMO plans and the x-axis depicts the corresponding performance for matched traditional Medicare enrollees in the same local areas. Circles and triangles represent not-for-profit and for-profit HMOs, respectively, and larger symbols indicate HMOs with ≥ 25,000 enrollees. Points above the lighter diagonal line indicate HMOs that performed better than traditional Medicare, and points below this line indicate worse HMO performance than traditional Medicare. The bolded regression line summarizes the overall differences across the range of HMO performance.

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Exhibit 1. Quality of Care on Clinical Measures for Medicare HMOs Matched to Traditional Medicare Beneficiaries in 2003 or 2006 and 2009

Source: Authors' analysis of HMO clinical quality data and Part A and B claims data for traditional Medicare from CMS

Notes: HMO and traditional Medicare enrollees were matched by age, sex and race/ethnicity in local areas and weighted by HMO plan enrollment to derive national estimates. For cholesterol testing, the measure specifications changed in 2006 so earlier years are not presented. All differences between HMOs and traditional Medicare were statistically significant ($p < 0.001$) for each measure in each study year.

Exhibit 2. Quality of Care on Survey Measures for Medicare HMOs Matched to Traditional Medicare Beneficiaries in 2003 and 2009

Source: Authors' analysis of Medicare survey data from CMS

Notes: HMO and traditional Medicare enrollees were matched by age, sex, race/ethnicity self-reported health status within counties and weighted by HMO plan enrollment to derive national estimates with two-tailed p values for each measure by study year. For ratings of personal doctor and specialists, proportions represent ratings of 9 or 10 on a 0-10 scale. All differences between HMOs and traditional Medicare were statistically significant for each measure in each study year ($p < 0.001$ for all measures except $p = 0.02$ for ratings of specialists in 2009).

Exhibit 4. Screening Mammography and Influenza Vaccinations in Medicare HMOs Matched to Local Traditional Medicare Beneficiaries in 2009

Source: Authors' analysis of HMO clinical quality and survey data and Part A and B claims data for traditional Medicare.

Notes: Estimates are derived from hierarchical regression models weighted by HMO enrollment and with random effects for individual health plans. The y-axis depicts performance for HMO plans, and the x-axis depicts the corresponding performance for matched traditional Medicare enrollees in the same local areas. The bolded and dashed regression lines summarize the overall differences across the range of HMO performance for screening mammography and influenza vaccinations, respectively. The area above the 45-degree diagonal line indicates better HMO performance than traditional Medicare, and the area below this line indicates worse HMO performance than traditional Medicare.

Exhibit 3

Performance Measures for Medicare HMOs and Matched Traditional Medicare (TM) Beneficiaries by HMO Characteristics in 2009

Measure	Not-for-profit larger, older HMOs			For-profit smaller, newer HMOs		
	HMO (%)	Matched TM (%)	Absolute Difference (%)	HMO (%)	Matched TM (%)	Absolute difference (%)
Screening mammography	81.9	65.0	16.9	67.4	63.2	4.3
Diabetes care						
Hemoglobin A1c Testing	95.2	85.8	9.5	88.8	83.9	5.0
Retinal exam	82.3	58.4	23.9	59.7	55.8	3.8
Cholesterol Testing	93.2	83.9	9.2	86.1	81.6	4.4
Cardiovascular disease						
Cholesterol testing	92.9	85.1	7.8	88.3	84.7	3.7
Vaccinations						
Influenza	76.9	73.1	3.8	65.7	70.8	-5.2
Pneumococcal	76.3	70.9	5.5	64.0	70.6	-6.5
Ratings of care *						
Personal doctor	75.9	71.7	4.2	73.0	72.6	0.5
Specialists	71.3	71.6	-0.3	68.4	71.2	-2.8

Source: Authors' analysis of HMO clinical quality data from CMS, Part A and B claims data for traditional Medicare, and Medicare survey data from CMS

Notes: Estimates derived from hierarchical logistic regression models and weighted by HMO plan enrollment. Smaller HMOs had <25,000 enrollees, and newer HMOs joined Medicare in 2006 or later.

* 9 or 10 on 0–10 scale