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Cite this article as:

Health Affairs 32, no.7 (2013):1228-1235

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THE CARE SPAN

Medicare Beneficiaries More Likely To Receive Appropriate Ambulatory Services In HMOs Than In Traditional Medicare

ABSTRACT With quality-of-care bonus payments now available for Medicare Advantage health maintenance organizations (HMOs) and for accountable care organizations in traditional Medicare, the need to understand the relative quality of care delivered to Medicare enrollees has increased. We compared the quality of ambulatory care from 2003 through 2009 between beneficiaries enrolled in Medicare Advantage HMOs and those enrolled in traditional Medicare, and we assessed how the performance of various types of Medicare HMOs differed from that of traditional Medicare for these same measures. We found that beneficiaries in Medicare HMOs were consistently more likely than those in traditional Medicare to receive appropriate breast cancer screening, diabetes care, and cholesterol testing for cardiovascular disease. We also found that Medicare HMO physicians were rated less favorably by their patients than were physicians in traditional Medicare in 2003; however, by 2009 the opposite was true. Not-for-profit, larger, and older Medicare HMOs performed consistently more favorably on clinical measures and ratings of care than for-profit, smaller, and newer HMOs. Our results suggest that the positive effects of more-integrated delivery systems on the quality of ambulatory care in Medicare HMOs may outweigh the potential incentives to restrict care under capitated payments.

Medicare beneficiaries have had the option of joining private health maintenance organizations (HMOs) since 1976.1 Following the passage of the Medicare Prescription Drug, Improvement, and Modernization Act, enrollment in private health plans in the Medicare Advantage program grew from 5.3 million beneficiaries in 2003 to 14.4 million in 2013. HMO enrollees represent 65 percent of Medicare Advantage and 18 percent of all Medicare beneficiaries.2

As enrollment in Medicare Advantage grows, policies makers, health care providers, and 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 the 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 also improve the quality of care. However, because HMOs receive capitated payments from Medicare, they have incentives to limit the volume of care, which could undermine
quality. The recent introduction of bonus payments related to the quality of care for Medicare Advantage health plans and for accountable care organizations in traditional Medicare has brought with it a greater need to understand the relative quality of care in Medicare Advantage and traditional Medicare.

Previous studies have attempted to address this issue. One prior study compared clinical quality measures in Medicare Advantage and traditional Medicare in state-level analyses. However, it neither adjusted for sociodemographic factors nor assessed performance of individual Medicare Advantage health plans. 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.

We compared the quality of ambulatory care nationally during 2003–09 in Medicare HMOs and traditional Medicare, adjusting for sociodemographic factors and controlling for geographic region. 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 policy makers overseeing Medicare.

Study Data And Methods

STUDY DESIGN AND DATA SOURCES We conducted an observational cohort study comparing quality of care between beneficiaries enrolled in Medicare HMOs matched to those in traditional Medicare in the same local areas during 2003–09. Since 1997 the Centers for Medicare and Medicaid Services (CMS) has required Medicare HMOs to report Healthcare Effectiveness Data and Information Set (HEDIS) quality measures for eligible enrollees each year. 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 sets or using a hybrid approach in which medical records are also reviewed for services that might not be recorded in administrative data. 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. We created comparable clinical performance measures for a 20 percent sample of traditional Medicare enrollees, using the most recent Medicare Part A and Part B claims data through 2009 that were available in October 2011.

To elicit beneficiaries’ views on the 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 substate areas for traditional Medicare. Response rates since 2003 have been 61–80 percent for Medicare Advantage and 57–69 percent for traditional Medicare.

Medicare Beneficiary Summary files from CMS for 2003 through 2009 provided demographic data (age, sex, race or ethnicity, and ZIP code, county, and state of residence), information on 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.

A major strength of our study was its broad national comparison of quality of care for matched enrollees in HMOs and traditional Medicare from when the Medicare Modernization Act became law in 2003 through 2009. To account for large geographic differences in the quality of care within traditional Medicare, which are strongly correlated with quality of care in Medicare Advantage plans in the same local areas, 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.

STUDY COHORT For the analysis of clinical performance measures, we excluded beneficiaries in each year whom we could not link to the Medicare Beneficiary Summary File; those in preferred provider organizations, which were relatively 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 sixty-five and those enrolled less than twelve months (see online Appendix Exhibit AI). We also excluded HMOs with fewer than 100 enrollees per measure or implausible data (from 0 to 5.7 percent of observations by measure), defined as plan-year estimates that were less than one-third 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 (see the Appendix).
After these exclusions, we matched HMO enrollees to traditional Medicare beneficiaries, using statistical weighting by age, sex, and race or ethnicity among beneficiaries who resided in the same five-digit ZIP code (78–90 percent of HMO enrollees per measure per year), county (9–20 percent), or state (0–2 percent) (see the 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 50 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. 9 These included screening mammography in the current or prior year for women ages 65–69; low-density lipoprotein (LDL) 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 (HbA1c) 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.

CAHPS asks enrollees if they received the influenza vaccine in the current year and if they ever received the pneumococcal vaccine. This 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 or 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 (see the Appendix). 11 To assess variation in the performance of HMOs relative to that of matched traditional Medicare in local areas in 2009, we used hierarchical linear 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—less than 25,000 (smaller) versus 25,000 or more (larger); year of entry to Medicare Advantage—established before 2006 versus in 2006 or later, in post-2005 models; and tax status—not-for-profit versus 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 or ethnicity, and health status. We weighted these means by total HMO enrollment in each county to create national estimates (see the 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 0–10 scale. As described above, we used hierarchical regression models to assess the survey performance measures for individual HMOs and by HMO characteristics in 2009.

Analyses were conducted using the statistical software SAS, version 9.2. 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.

**LIMITATIONS** Our study had at least five potential limitations. First, although the number of clinical performance measures has risen 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 the mea-
ures we created for traditional Medicare were based only on Medicare claims. A prior study reported that 94 percent of elderly women who had a mammogram were accurately identified by Medicare claims. Thus, if mammograms were similarly underreported 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 that HbA1c and cholesterol testing—but not retinal exams for people with diabetes—were substantially underreported for elderly patients using administrative data alone, because capitation or other payment arrangements that do not require claims submissions for payment may contribute to underreporting of lab tests in Medicare HMOs’ administrative records. 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, 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 the 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 the quality of care for traditional Medicare beneficiaries in local areas, we may have underestimated the impact of Medicare HMOs on the 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.

Study 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 Exhibit A3). Over this period, the proportion of enrollees in for-profit HMOs rose from 57.5 percent to 62.4 percent, 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 percent to 74.2 percent, even as the number of smaller HMOs rose from 86 to 215. The proportion of enrollees in newer HMOs rose from 4.3 percent in 2006 to 19.0 percent in 2009, as 160 new HMO contracts were initiated.

Before being matched 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). In counties with survey respondents from HMOs and traditional Medicare, HMO respondents were more likely to be ages 70–79 (48.0 percent versus 44.0 percent), less likely to be white (79.4 percent versus 86.2 percent), and slightly less likely to report fair or poor health (24.5 percent versus 25.6 percent) (illustrated for 2009 in Appendix Exhibit A5). 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. For screening mammography, the gap between HMOs and traditional Medicare narrowed from 17.9 percentage points to 13.5 percentage points as performance in traditional Medicare improved while HMO performance was stable. A similar pattern was evident for HbA1c testing, with greater improvements in traditional Medicare and narrowing of the gap between HMO and traditional Medicare performance from 11.6 percentage points to 8.6 percentage points. In contrast, performance of eye exams for people with diabetes improved more in HMOs than in traditional Medicare, thereby widening the gap from 15.6 percentage points 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, the rate of influenza vaccinations was higher in HMOs than traditional Medicare in 2003 (75.9 percent versus 72.0 percent), but this difference narrowed by 2009 (72.1 percent versus 71.2 percent) as HMO performance declined. Similarly, the rate of pneumococcal
Exhibit 1

Quality Of Care On Clinical Quality Measures For Beneficiaries In Medicare Health Maintenance Organizations (HMOs) Matched To Traditional Medicare Beneficiaries In 2003 Or 2006 And 2009

Source: Authors’ analysis of HMO clinical quality data and Parts A and B claims data for traditional Medicare from the Centers for Medicare and Medicaid Services. Notes: HMO and traditional Medicare enrollees were matched by age, sex, and race or 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 Beneficiaries In Medicare Health Maintenance Organizations (HMOs) Matched To Traditional Medicare Beneficiaries In 2003 And 2009

Source: Authors’ analysis of Medicare survey data from the Centers for Medicare and Medicaid Services. Notes: HMO and traditional Medicare enrollees were matched by age, sex, race or ethnicity, and 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).
vaccinations was notably higher among HMO enrollees in 2003 (71.1 percent versus 64.4 percent), but this difference was smaller in 2009 as traditional Medicare improved (72.7 percent versus 69.8 percent). During 2003 HMO enrollees were less likely than those in traditional Medicare to give high ratings of both their personal physicians (65.2 percent versus 66.9 percent) and specialists (66.1 percent versus 69.7 percent). In 2009 these differences were reversed for ratings of personal physicians (74.1 percent versus 72.1 percent) and remained slightly better for ratings of specialists in traditional Medicare (70.0 percent versus 70.8 percent).

The differences between HMOs and traditional Medicare on clinical and survey quality measures in 2009 varied widely by HMOs’ organizational characteristics (Exhibit 3). Enrollees in the twenty-one HMOs that were not-for-profit, larger, and established before 2006 (representing 27.0 percent of all HMO enrollees) experienced the highest quality of care relative to matched traditional Medicare beneficiaries. In contrast, HMOs that were for-profit, smaller, and newer demonstrated consistently less favorable 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 percent of all HMO enrollees) performed 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 both of the vaccinations and their specialists less favorably than their counterparts in traditional Medicare.

Exhibit 4 shows different patterns evident 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 much better than traditional Medicare, but the differences narrowed in areas with better performance in 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.

### Exhibit 3

**Performance Measures For Beneficiaries In Medicare Health Maintenance Organizations (HMOs) And Matched Traditional Medicare Beneficiaries, By HMO Characteristics In 2009**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Not-for-profit larger, older HMOs</th>
<th>Matched traditional Medicare</th>
<th>Absolute difference</th>
<th>For-profit smaller, newer HMOs</th>
<th>Matched traditional Medicare</th>
<th>Absolute difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening mammography</td>
<td>81.9%</td>
<td>65.0%</td>
<td>16.9</td>
<td>67.4%</td>
<td>63.2%</td>
<td>4.3</td>
</tr>
<tr>
<td>DIABETES CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c testing</td>
<td>95.2</td>
<td>85.8</td>
<td>9.5</td>
<td>88.8</td>
<td>83.9</td>
<td>5.0</td>
</tr>
<tr>
<td>Retinal exam</td>
<td>82.3</td>
<td>58.4</td>
<td>23.9</td>
<td>59.7</td>
<td>55.8</td>
<td>3.8</td>
</tr>
<tr>
<td>Cholesterol testing</td>
<td>93.2</td>
<td>83.9</td>
<td>9.2</td>
<td>86.1</td>
<td>81.6</td>
<td>4.4</td>
</tr>
<tr>
<td>CARDIOVASCULAR DISEASE CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol testing</td>
<td>92.9</td>
<td>85.1</td>
<td>7.8</td>
<td>88.3</td>
<td>84.7</td>
<td>3.7</td>
</tr>
<tr>
<td>IMMUNIZATIONS</td>
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</tr>
<tr>
<td>Influenza</td>
<td>76.9</td>
<td>73.1</td>
<td>3.8</td>
<td>65.7</td>
<td>70.8</td>
<td>-5.2</td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>76.3</td>
<td>70.9</td>
<td>5.5</td>
<td>64.0</td>
<td>70.6</td>
<td>-6.5</td>
</tr>
<tr>
<td>RATINGS OF CARE</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal doctor</td>
<td>75.9</td>
<td>71.7</td>
<td>4.2</td>
<td>73.0</td>
<td>72.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Specialists</td>
<td>71.3</td>
<td>71.6</td>
<td>-0.3</td>
<td>68.4</td>
<td>71.2</td>
<td>-2.8</td>
</tr>
</tbody>
</table>

**Source:** Authors’ analysis of HMO clinical quality data from the Centers for Medicare and Medicaid Services (CMS). Parts A and B claims data for traditional Medicare, and Medicare survey data from CMS. **Notes:** Estimates were derived from hierarchical linear regression models and weighted by HMO plan enrollment. Smaller HMOs had fewer than 25,000 enrollees, and newer HMOs joined Medicare in 2006 or later. All absolute differences between not-for-profit, larger, older HMOs and traditional Medicare were significant for each measure (p < 0.001) except for ratings of specialists (p = 0.70), as were all differences between for-profit, smaller, newer HMOs and traditional Medicare (p < 0.02) except for ratings of personal doctors (p = 0.62). The differences between these differences for the two types of HMOs were also significant for each measure (p < 0.002) except for ratings of specialists (p = 0.06). *Percentage points. **Rated 9 or 10 on a 0–10 scale.”
Discussion

Our study comparing quality of care in Medicare HMOs and traditional Medicare produced three main findings. First, performance measures of breast cancer screening, diabetes care, and cholesterol testing for cardiovascular disease during 2003–09 were consistently better in HMOs than in traditional Medicare overall, but differences in breast cancer screening and HbA1c 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 they were better in HMOs than in traditional Medicare. Given very similar rates of outpatient visits in Medicare HMOs and traditional Medicare in 2009, our results suggest that the effects on the quality of ambulatory care provided by 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, 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, which suggests that the former group has more effective systems to promote quality of care or to contract selectively with higher-quality providers. Better-performing HMOs may also reduce or eliminate enrollee cost sharing for specific services, such as screening mammography.

Conclusion

The policy importance of performance measures of quality of care has increased with passage of the Affordable Care Act, which authorized CMS to begin providing financial bonuses to Medicare Advantage health plans in 2012. These bonuses are based on a “star” rating system for health plans that demonstrate superior performance on clinical quality and survey measures. Furthermore, the Affordable Care Act 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 the traditional Medicare beneficiaries they serve. 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. The performance measures include survey measures similar to those analyzed in this study and several clinical quality measures, such as screening mammography and HbA1c testing, that can be derived from Medicare claims.

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 policy makers, health care providers, and Medicare beneficiaries to assess whether the quality of care in Medicare Advantage health plans differs from that provided within accountable care organizations and from that provided outside these organizations in the traditional Medicare program.
An abstract of this article was presented at the International Health Economics Association–iHEA 8th World Congress in Health Economics, July 11, 2011. This study was supported by a grant from the National Institute on Aging (P01 AG032952). John Ayanian and Bruce Landon are consultants to a not-for-profit research firm, RTI International, on the development of risk adjustment models for the Centers for Medicare and Medicaid Services to adjust payments to Medicare Advantage plans. Joseph Newhouse is a director of and holds equity in Aetna, which sells Medicare Advantage plans; he is also a director of the National Committee for Quality Assurance, which owns and maintains the Healthcare Effectiveness Data and Information Set (HEDIS) measures. Robert Saunders is employed by the National Committee for Quality Assurance. The authors are grateful to Lin Ding and Jeffrey Souza for statistical programming, Jean Roth and Chris Afendulis for assistance with accessing Medicare claims, and Debby Collins for assistance with preparing the manuscript.

NOTES

11 To access the Appendix, click on the Appendix link in the box to the right of the article online.