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Hospital Readmissions in Medicare Advantage and Medicare's Traditional Fee-for-Service Program

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This report is the first publication based on a collaborative research program between MedAssurant, Inc. and America's Health Insurance Plans' Center for Policy and Research.

Hospital Readmissions in Medicare Advantage and Medicare's Traditional Fee-for-Service Program

Cary Sennett, Ray Wang, Jeff Lemieux[1]

SUMMARY

Persistently high hospital readmission rates should be a source of profound concern for clinicians, hospitals, and payers. Based on 2004 data, Dr. Stephen Jencks et. al. found a 30-day readmission rate of 19.6 percent in Medicare's traditional fee-for-service (FFS) program (*New England Journal of Medicine*, 2009). Anderson and Steinberg found almost exactly the same results in 1981, suggesting very little improvement in the intervening 23 years (*New England Journal of Medicine*, 1984).

This report is the first publication based on a collaborative research program between MedAssurant, Inc. and America's Health Insurance Plans (AHIP). Using identical methods as the Jencks study on pooled, de-identified data from 2006-2008 from the Medicare Advantage (MA) plans in MedAssurant's Medical Outcomes for Research on Economics and Effectiveness research database (the *MORE^2 Registry*™) we find an unadjusted 30-day hospital readmission rate in the MA sample of 14.5 percent – about 25 percent less than FFS.

After adjusting for health risk, we estimate that the MA readmission rates were still 17 to 21 percent lower than FFS. These remaining differences in health plan performance are not attributable to differences in admission type or severity of illness. We believe this provides a strong signal that MA plans have instituted strategies that successfully reduce the rate of rehospitalization for Medicare Advantage enrollees.

The results presented here are similar to those found by AHIP using data from nine states' hospital discharge datasets, and to a prior AHIP study based on data gathered from 10 MA plans (in a total of 18 areas) and compared with FFS in the same areas. The results are also consistent with comparisons of national FFS readmission rates with data from 13 MA plans done by Dr. Gerard Anderson of Johns Hopkins University for the Association of Community Health Plans (ACHP).

[1] Cary Sennett, MD, PhD, is Chief Medical Officer for MedAssurant, Inc.; Ray Wang is Senior Analyst at MedAssurant, Inc.; and Jeff Lemieux is SVP of AHIP's Center for Policy and Research (www.ahipresearch.org).

Additional research is needed on how to risk adjust for readmission rates. Possible follow-up studies using the MedAssurant data may explore additional adjustment techniques for risk and location, as well as research into which types of clinical or patient interventions may be associated with lower readmission rates and the prevention of hospitalizations that commonly lead to readmissions. Another area of possible study would be to consider hospital readmissions in a broader "population health" context. Researchers may wish to consider efforts to reduce readmission rates in the context of public health considerations.

INTRODUCTION

In April 2009, Dr. Stephen Jencks and his colleagues published a detailed study of hospital readmissions within Medicare's traditional FFS program in the *New England Journal of Medicine*.[2] The Jencks study was notable both for the high rates of readmissions found – a 19.6 percent 30-day readmission rate in 2004 – and for the finding that in approximately half of those readmissions, there was no physician visit in the interim. The Jencks study also implied that there has been no substantial improvement in FFS readmission rates in the 23 years since the benchmark readmissions study by Anderson and Steinberg published in 1984 (studying FFS data from 1981).[3] The lack of physician visits following hospital discharge suggests possible system failures or poorly coordinated follow-up care. Dr. Jencks estimated that the cost of unplanned rehospitalizations exceeded $17 billion in FFS Medicare in 2004.[4]

Hospital readmission rates are a commonly used measure for studying health care performance.[5] First, they are relatively easy to measure accurately from administrative and claims data, and thus can be consistently studied from existing datasets. Second, although any particular readmission may be planned or unavoidable, statistical reductions in readmission rates represent clinical success and have real potential to reduce overall health care costs including the costs (both financial and human) to Medicare enrollees and their families associated with hospitalization. Third, in-depth comparisons of readmission rates between enrollees in MA and (unmanaged) FFS coverage arrangements could yield important insights into the most effective methods of preventing readmissions and could help identify interventions or programs that are successful. To the extent that there are differences between rates of rehospitalization among MA and FFS Medicare plans, it may be instructive to learn from the success of those MA plans and diffuse the underlying strategies to FFS Medicare.

Comparing patient outcomes in MA plans and Medicare's traditional FFS program allows a

[2] Jencks, S., Williams, M., and Coleman, E., "Rehospitalizations in the Medicare Fee-for-Service Program," *New England Journal of Medicine* (April 2, 2009), available at http://content.nejm.org/cgi/content/full/360/14/1418.

[3] Anderson, G.F., Steinberg, E.P., "Hospital readmissions in the Medicare population." *New England Journal of Medicine.* 1984;311:1349-53.

[4] As a shorthand, we use the terms "readmissions" and "rehospitalizations" synonymously throughout this report; likewise the terms hospital "discharges" and "admissions," while not always identical in meaning, are often used interchangeably where, for counting purposes, the meaning is the same.

[5] For example, the Medicare program started publishing FFS hospital readmission rates relative to average for certain conditions in 2009, and the Patient Protection and Affordable Care Act of 2010 requires CMS to establish a hospital readmissions reduction program beginning in 2013. The program would reduce payments to specified hospitals for certain readmissions.

convenient test of the effectiveness of efforts by health plans to manage care and improve quality. Capitated reimbursement (a fixed, risk-adjusted amount per enrollee) gives MA plans strong financial incentives to attempt to reduce avoidable rehospitalizations via care management or network contracting arrangements. In general, these sorts of tools used by MA plans are not available in the FFS Medicare program.

The aim of this report is to directly compare FFS readmission rates with those of the MA plans from the MedAssurant *MORE^2 Registry*™. First, we compare the MedAssurant results with the Jencks results, using the same methods as the Jencks study. The Jencks FFS data are from 2004; the MedAssurant MA data are from 2006-2008. Second, we compare a measure of readmission rates from FFS in 2006-2008 – calculated by Dr. Gerard Anderson of Johns Hopkins University – to the MA plan results for the same three-year period.

OTHER RECENT STUDIES

Several recent studies have compared hospital readmission rates and other measures between enrollees in Medicare Advantage plans and Medicare's traditional fee-for-service program (a mostly unmanaged population).

In May 2010, AHIP presented preliminary comparisons of health care use by beneficiaries in traditional Medicare FFS coverage and MA plans in nine states, including same-quarter readmissions for the same diagnosis related group (DRG) or on an "any DRG" basis. The MA enrollees in this study included HMO, PPO, and private fee-for-service (PFFS) enrollees. The underlying data were from state-based hospital discharge datasets compiled by the federal Agency for Healthcare Research and Quality (AHRQ) for the years 2006 and 2007, as well as state discharge data acquired directly from the states of Pennsylvania and Texas for 2007. Risk adjustment was through CMS-style "risk scores" (age, sex, and HCC code from hospitalization diagnoses) and alternatively by the distribution of DRGs and their relative likelihoods of readmissions. In states where the underlying data seemed most reliable, AHIP estimated that risk-adjusted readmission rates were lower in MA than FFS by about 14-17 percent measured per hospitalization, 16-18 percent per person with an admission, and 27-29 percent per enrollee.[6]

In 2009, AHIP presented two working papers comparing a broad set of utilization rates for MA and FFS enrollees, including same DRG readmissions. The first paper compared results from eight smaller or regional MA HMOs with FFS in the same local service areas,[7] and the second compared two larger, multi-state MA HMO plans in a total of 10 local areas.[8] Data were for full-year (12 month) enrollees, and thus excluded many enrollees in the first year of

[6] AHIP Center for Policy and Research, *Using State Hospital Discharge Data to Compare Readmission in Medicare Advantage and Medicare's Traditional FFS Program* (working paper, May 2010), available at www.ahipresearch.org/pdfs/9State-Readmits.pdf. A preliminary report using only AHRQ data from California and Nevada in 2006 was released in September 2009 and is available at AHIP Center for Policy and Research, *Reductions in Hospital Days, Readmissions, and Potentially Avoidable Admissions Among Medicare Advantage Enrollees in California and Nevada, 2006* (revised October 2009), http://www.ahipresearch.org/pdfs/CAvsNV.pdf.

[7] AHIP Center for Policy and Research, *A Preliminary Comparison of Utilization Measures Among Diabetes and Heart Disease Patients in Eight Regional Medicare Advantage Plans and Medicare Fee-for-Service in the Same Service Areas* (working paper, revised September 2009), http://www.ahipresearch.org/pdfs/MAvsFFS.pdf.

[8] AHIP Center for Policy and Research, *Comparisons of Utilization in Two Large, Multi-State Medicare Advantage HMOs and Medicare Fee-for-Service in the Same Service Areas* (working paper, December 2009), http://www.ahipresearch.org/pdfs/MAvsFFS-CO9and10.pdf.

Medicare enrollment and the last year of life. In the FFS comparison data, Medicaid "dual" enrollees were excluded. Risk adjustment was through CMS-style risk scores based on diagnosis codes from inpatient, outpatient, and physician office claims. On average, compared with Medicare FFS beneficiaries in 18 local areas, risk-adjusted MA HMO enrollees had 11 percent fewer hospital admissions, 20 percent fewer hospital days, 24 percent fewer emergency room visits, 39 percent fewer "same DRG" hospital readmissions within a calendar quarter, and 10 percent fewer potentially avoidable admissions (as defined by AHRQ).[9] Since overall hospitalization rates were about 11 percent lower in the MA plans, estimated per-admission rehospitalization rates would be approximately 27-28 percent lower than FFS. Based on 11 local comparison areas where comparable outpatient data were available, risk-adjusted MA enrollees had about the same rates of hospital outpatient visits as FFS enrollees on average, and the MA enrollees had a 25 percent higher rate of physician visits.[10]

Two other recent studies have compared MA and FFS utilization rates. In September 2009, Dr. Gerard Anderson conducted a study of hospital readmissions and potentially avoidable admissions for the Alliance of Community Health Plans (ACHP). The data compared results from 13 ACHP member plans (mostly group and staff model HMOs) with FFS nationally. Among other findings, the study reported that the average 30-day readmission rate (likelihood of a readmission for any DRG within 30 days) for the 13 ACHP member plans reporting was 27 percent less for MA patients than the national FFS rate.[11] The ACHP comparisons were not risk-adjusted.

In 2009, researchers Niall Brennan and Mark Shepard of the Brookings Institution derived preliminary results for certain HEDIS measures in Medicare FFS from datasets built for different purposes, and then compared the FFS HEDIS results with those reported by MA plans. The Brennan and Shepard results do not include hospital readmissions, although readmissions are being considered for inclusion in the HEDIS measures.[12]

DATA AND METHODS

The source of MA data for this report is MedAssurant's *MORE² Registry*™. The data are de-identified, longitudinal, clinically enriched, patient-level administrative and claims data for approximately 50 million insured Americans, including data for enrollees in Medicare Advantage, commercial health plans and Medicaid.

For the MA results in this study, the data included approximately 5.6 million observations (enrollee years) in the three-year period 2006-2008 in 11 MA plans (pooled). The MA plans in the dataset were

[9] Details and specifications at AHRQ Prevention Quality Indicators, Technical Specifications, October 2001 (Version 3.1, March 12, 2007); technical details accessed at http://www.qualityindicators.ahrq.gov/pqi_download.htm. For more general information, please see AHRQ's Guide to the Prevention Quality Indicators, accessible at http://www.qualityindicators.ahrq.gov.

[10] There was a relatively wide degree of variation in the hospital outpatient and physician office visit results from plan to plan, so these differences between MA and FFS rates are more uncertain than the results for inpatient hospitalization and ER visits.

[11] Gerard Anderson, "The Benefits of Care Coordination: A Comparison of Medicare Fee-for-Service and Medicare Advantage," report prepared for the Alliance of Community Health Plans (September 1, 2009) http://www.achp.org/policy/health_care_reform/study_of_ma_plans_vs_ffs/index.1.html.

[12] Niall Brennan and Mark Shepard, Quality of Care in the Medicare Fee-For-Service and Medicare Advantage Programs (unpublished manuscript, 2009).

those from which MedAssurant had complete data for the whole period (see Table 1). In the aggregate, the demographic distribution of the MA enrollees is similar to that of FFS in most respects (see Table 2). However, MA enrollees in the MedAssurant data are somewhat more likely than FFS enrollees to live in the South and less likely to live in the West or Northeast. The MA enrollees were less likely than the FFS enrollees to be under age 65 and enrolled in Medicare via disability.

Based only on their state of enrollment, we estimate that the MA enrollees in the MedAssurant sample would be expected to have 2 percent more hospital admissions and readmissions than FFS enrollees in the national sample. However, there was no substantial difference in the expectation of readmissions per admission caused by the differences in MA and FFS enrollment locations in the samples.

The 2006-2008 FFS data in this study were tabulated by Dr. Gerard Anderson of Johns Hopkins University specifically for the purpose of comparison with the MA data from MedAssurant. The FFS data are from the 5 percent sample files made available to Johns Hopkins University by the Centers for Medicare & Medicaid Services (CMS). FFS beneficiaries under age 65 eligible via end-stage renal disease (ESRD) were excluded.

Alternative Readmission Rate Calculations. MedAssurant computed readmission rates in two ways. The first method used calculation methods identical to those used in the Jencks study, based on the "any DRG" concept (and following the Jencks method of excluding readmissions identified with the DRG for rehabilitation). This method tracks "initial" or index admissions from the fourth quarter of the prior year. It excludes patients who died or switched coverage types during the study period. Thus, the MedAssurant 2006-2008 results using this method are directly comparable to the Jencks 2004 results.

Second, MedAssurant used a simplified method of calculating readmission rates in 2006-2008 that is directly comparable to updated calculations of readmission rates in those years computed by Dr. Anderson. This method takes the total number of readmissions in a year divided by the total number of admissions. Thus, this method does not reduce the denominator of the readmission rate calculation to account for patients who died. These alternative methods produce similar 30-day readmission rates, but the 60-day and 90-day rates are noticeably lower in the second method, because the denominator for the rate is higher.

The second method (which we label the "Anderson method") allows contemporaneous comparisons of MA and FFS in the 2006-2008 period. It is also easier to compute than the Jencks measure, and will allow up-to-date comparisons with the MedAssurant data and from the annual FFS sample files as they become available.

Risk Adjustments. We recognize that the underlying severity of patients' health conditions could be different in MA and FFS. The current risk adjustment system used by CMS for reimbursement of MA plans provides a general measure of patients' health costs, but it does not directly measure the probability of a readmission. Therefore, we developed a risk adjustment measure directly associated with readmission risk.

We compared admissions per DRG in the MA and FFS data to help control for the likelihood that the distribution of DRGs in the MA data might have a higher or lower tendency toward readmissions. This

method of risk adjustment involves a technique that was suggested by Dr. Anderson and was used in the May 2010 AHIP report on MA and FFS comparisons from nine states' hospital discharge datasets. The idea is straightforward: we created an index of probabilities for the extent to which each DRG was associated with readmission, using the national FFS 5 percent sample files data as a base. Then we compared the distribution of MA admissions against this base. If the FFS admission distribution had higher rates of admissions for DRGs that are more commonly associated with readmissions than the MA distribution, a proportional adjustment to the readmission rates could be computed.

For example, if the MA admissions in a local comparison area tended to have more DRGs with low benchmark readmission rates, and the FFS admissions in that area tended toward DRGs with higher readmission rates, we would proportionately "risk adjust" the MA readmission rate higher and the FFS readmission rate lower to account for the different admission types experienced.[13]

Since the DRG coding system changed annually in the 2006-2008 period, we compared indexes of readmission risk based on three sets of DRG data: admissions coded with DRG version 24 (mostly from late 2006 and the first three quarters of 2007), admissions with MS-DRG version 25 (mostly from late 2007 and the first three quarters of 2008), and MS-DRG version 26 (mostly the fourth quarter of 2008). While the new DRG versions were made available at the beginning of the fourth quarter of these years, not all admission records in the MA data switched at precisely that time.

Appendix A illustrates this method of risk adjustment calculations, using the MS-DRGs (version 26) as an example.

COMPARISONS OF MA AND FFS READMISSION RATES

Unadjusted comparisons were done using the Jencks method (comparing MA in 2006-2008 with FFS in 2004) and via the Anderson method (comparing both MA and FFS in 2006-2008). Risk adjustments are shown for the Anderson-method comparisons.

Comparisons with the Jencks 2004 Results. Table 3 compares unadjusted readmission rates found in the MA plans with the Jencks results for FFS. The MA 30-day readmission rates in 2006, 2007, and 2008 were remarkably consistent across each of the years, with an overall 30-day readmission rate of 14.5 percent, just over 25 percent lower than the FFS rate of 19.6 percent. The 60-day and 90-day readmission rates in the MA plans were similarly consistent over the three-year period, and were also about 25 percent lower than FFS.

Readmission rates were similarly lower among the MA plans when compared by the conditions of the initial or "index" admissions (see Table 4). MA readmission rates were comparably lower for both medical and surgical index admissions, although the MA plans had a higher share of readmissions associated with surgical index admissions (and a correspondingly lower share associated with medical index admissions) than FFS.

[13] The AHIP nine-state report also uses a CMS-style risk adjuster, which is based on the age, sex, and occurrence of certain high-cost diagnosis codes in hospital admission records. For this report, we have not yet attempted to compute a CMS-style risk adjuster for readmission rates from the MA data in the MedAssurant database. In the AHIP paper, the differences in the CMS-style and "readmission index" type of risk adjuster used here were usually small, especially in states with large, robust hospital discharge datasets, such as California.

Among the MA plans, however, there was considerably more variation when compared with the national FFS benchmark (see Figure 1). The simple average 30-day readmission rate among the MA plans was 14.4 percent, slightly lower than the pooled result of 14.5 percent. However, the MA readmission rates by plan ranged from nearly 19 percent to less than 10 percent. Many of the MA plans in the MedAssurant dataset have multi-state enrollment. Some of the variation against the national benchmark could be related to plan performance and some could be related to the location of enrollees. The Anderson-method comparisons presented below contain a state-by-state analysis.

Comparisons with Anderson 2006-2008 Results. To compare contemporaneous readmission rates in the 2006-2008 period, we used a simpler calculation: total readmissions (30-day, 60-day, or 90-day) divided by total admissions. This measure does not reduce the denominator of the readmission rate calculation for patients who are not at risk of readmission because of death or disenrollment. Thus, the average readmission rates calculated by this method for both MA and FFS in 2006-2008 are lower than the Jencks results for 2004 due to the technique – the lower rates do not indicate a temporal trend.

The FFS 30-day readmission rate in the 2006-2008 period – calculated using the Anderson method described above – is 18.4 percent, compared with a 14.0 percent rate for the MA plans (see Table 5).

Table 6 shows MA and FFS 30-day readmission rates among the states in the MedAssurant dataset with the highest MA enrollment. To help ensure that the MA plans in the MedAssurant data are not identifiable, the states in this table are not presented in any particular order. The percentage difference between MA and FFS 30-day readmission rates in this set of states ranged from -9 percent to -55 percent.

Risk-Adjusted Comparisons with Anderson 2006-2008 Results. Table 7 illustrates the impact of risk adjustment based on indexes of readmission risk for each version of DRG. This method of risk adjustment would lower the percentage reduction in readmission rates in MA from about 24 percent (unadjusted) to a range of about 17 to 21 percent, depending on the risk adjuster chosen.

The three versions of DRGs produced somewhat different results. The index of readmission risk based on the distribution of version 24 DRGs implied a adjustment of +4.7 percent in the raw MA readmission rate and -4.7 percent in FFS readmission. (We chose to apply risk adjustment proportionately; these are percentage adjustments, not "percentage point" adjustments.) The version 24 DRG adjustment had the effect of lowering estimated FFS readmission rates by about 0.8 percent points, from an 18.4 percent unadjusted rate to a 17.6 percent risk in 2006-2008, and raising the MA rate from 14.0 percent to a risk-adjusted rate of 14.7 percent.

The estimated difference in risk indexes based on version 25 MS-DRGs implied a proportionate +1.7 percent adjustment for MA and -1.7 percent adjustment for FFS. Thus, this alternative risk adjuster would have the effect of lowering the FFS readmission rate from 18.4 percent to 18.1 percent, and raising the MA rate from 14.0 percent to 14.2 percent. The readmission rate index based on version 26 DRGs indicated a 5.7 percent lower rate in MA than FFS (+2.8 and -2.8 percent adjustments), which would lower the FFS rate to 17.9 percent and raise the MA rate to 14.4 percent.

For each DRG version used, the indexes of expected readmission risk point to a risk adjustment that would reduce FFS readmission rates and raise MA rates. Moreover, these results fall within the general range of risk adjustments computed by AHIP using the same basic method for MA vs. FFS comparisons in several states. For example, AHIP computed readmission risk indexes that ranged from about 2 percent lower expected risk of readmission in MA plans in Pennsylvania and North Carolina (2007) to about 4 percent lower risk of readmission for MA in California (2006 and 2007), Washington (2006), and Texas (2007) to about 7 percent lower in Nevada (2006 and 2007) and Arkansas (2007).

AHIP's calculations of CMS-style reimbursement-oriented risk score differences between MA and FFS have also been in this general range, both in statewide comparisons from hospital discharge data and using more comprehensive information from inpatient, outpatient and office claims in both MA and FFS.

All risk adjustment contains a large element of uncertainty. In theory, comparisons based on MS-DRGs should produce a richer measure of readmission risk, because they incorporate the severity of a hospitalization to a greater degree than the version 24 DRGs. We believe that the risk adjustment range computed here is reasonable and consistent with AHIP's prior research on comparable risk scores and risk of readmission in MA and FFS. In any case, it is doubtful that any plausible method of risk adjustment would erase 25 percent differences in readmission rates.

DISCUSSION

We entered into this research project with several objectives. First, we wanted to duplicate the Jencks results for a large sample of MA plans and examine the differences in readmission rates between MA and FFS. Second, we attempted to show that simple calculation methods produce similar results to the more complex calculations done by Jencks and colleagues. These measures can be easily repeated in years to come, so that future changes in readmission rates can be measured and tracked.

The finding that MA plans may be reducing risk-adjusted readmission rates by 17 to 21 percent is consistent with other recent research. We hope that the measurements presented in this report will help lead to significant efforts to lower both MA and FFS readmission rates, and help reduce many preventable hospital admissions in the first place.

The study of readmissions is often associated with evaluating hospitals and health care providers. We also hope these measurement efforts will help focus policymakers on the impact of readmissions on larger issues of population health, and that the health plans' efforts to reduce preventable readmissions will be an important part of the policy discussion.

Table 1. Basic Data Characteristics, Medicare Advantage Plans in the MedAssurant *MORE²* *Registry*™ with Complete Data for 2006-2008

	2006		2007		2008	
	Frequency	%	Frequency	%	Frequency	%
Age						
<55	73,765	5.6	98,920	5.3	132,010	5.5
55-64	94,970	7.2	127,667	6.8	162,093	6.7
65-69	234,751	17.8	418,890	22.3	621,419	25.7
70-74	301,163	22.9	422,232	22.4	514,692	21.3
75-79	251,982	19.2	342,917	18.2	416,918	17.3
80-84	188,860	14.4	253,938	13.5	310,426	12.9
85-89	110,768	8.4	144,784	7.7	175,950	7.3
>89	59,548	4.5	73,516	3.9	82,928	3.4
Sex						
Female	738,153	56.1	1,062,514	56.4	1,377,815	57.0
Male	577,655	43.9	820,360	43.6	1,038,643	43.0
Region						
West	140,588	10.7	186,299	9.9	261,155	10.8
Midwest	290,743	22.1	518,324	27.5	749,358	31.0
South	711,456	54.1	831,178	44.1	954,225	39.5
Northeast	147,924	11.2	325,879	17.3	436,813	18.1
Other	25,097	1.9	21,194	1.1	14,907	0.6
Total Enrollment	1,315,808	100.0	1,882,874	100.0	2,416,458	100.0

Source: MedAssurant, Inc.
Notes: Some records did not specify the enrollee's age.

Table 2. Basic Data Characteristics, Medicare FFS Enrollment, 2004 and 2006-2008

	2004		2006		2007		2008	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Age								
<55	3,445,120	10.2	3,480,200	10.5	3,512,960	10.7	3,513,560	10.7
55-64	2,396,740	7.1	2,530,600	7.6	2,604,480	7.9	2,660,180	8.1
65-69	8,062,500	23.9	7,947,500	23.9	7,900,200	24.0	8,023,280	24.5
70-74	6,648,680	19.7	6,342,060	19.1	6,203,880	18.8	6,112,120	18.7
75-79	5,751,740	17.0	5,443,680	16.4	5,240,740	15.9	5,021,360	15.3
80-84	4,123,460	12.2	4,103,000	12.3	3,984,740	12.1	3,903,640	11.9
85-89	2,186,020	6.5	2,213,220	6.7	2,265,120	6.9	2,277,600	7.0
>89	1,182,160	3.5	1,203,860	3.6	1,212,140	3.7	1,212,660	3.7
Sex								
Female	18,891,840	55.9	18,451,840	55.5	18,193,820	55.3	18,006,440	55.0
Male	14,904,580	44.1	14,812,280	44.5	14,730,440	44.7	14,717,960	45.0
Region								
West	5,253,860	15.5	5,296,180	15.9	5,340,620	16.2	5,448,720	16.7
Midwest	8,336,780	24.7	8,166,060	24.5	7,958,200	24.2	7,752,060	23.7
South	12,883,720	38.1	12,759,680	38.4	12,614,120	38.3	12,645,900	38.6
Northeast	6,373,560	18.9	6,290,820	18.9	6,239,800	19.0	6,128,580	18.7
Other	948,500	2.8	751,380	2.3	771,520	2.3	749,140	2.3
Total Enrollment	33,796,420	100	33,264,120	100	32,924,260	100	32,724,400	100

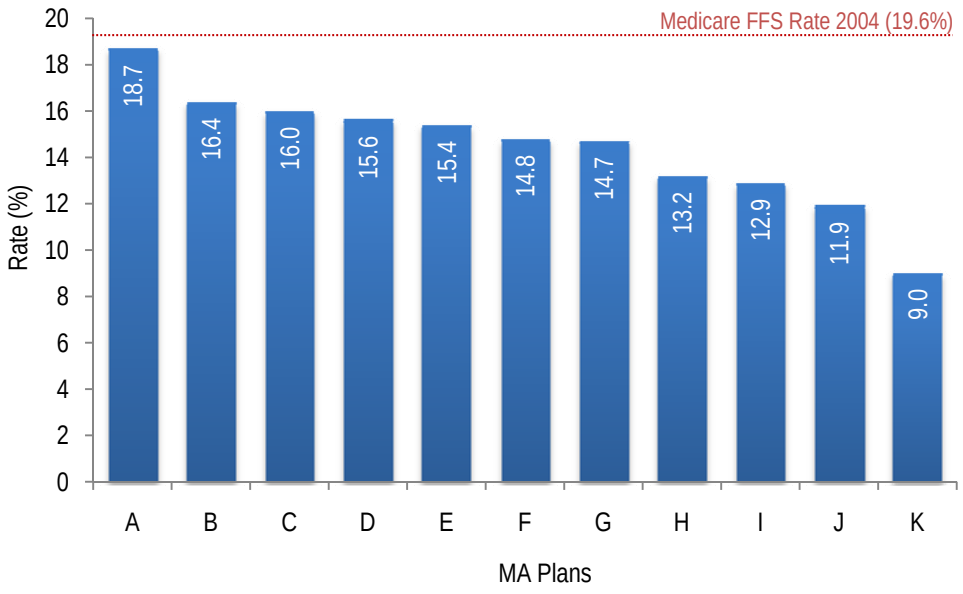
Source: AHIP Center for Policy and Research. Based on the CMS FFS 5 percent sample files.
Notes: These data represent the total Medicare FFS enrollment – the 5 percent files used contain one-twentieth of these numbers of records for analysis. Data are shown for full-year (12 month) FFS enrollees.

Table 3. MA vs. FFS Readmission Rates (Jencks Method), All Discharges (Medical and Surgical), MA Plans (MedAssurant, 2006-2008) and National FFS (Jencks, 2004)

Interval after Discharge	Patients at Risk at Beginning of Period	%	Cumulative Rehospitalizations by End of Period	%	Cum. Death or Disenrollment w/o Rehospitalization by End of Period	%
2004 (Jencks)						
0-30 days	2,961,460	100.0%	579,903	19.6%	103,741	3.5%
31-60 days	2,277,816	76.9%	834,369	28.2%	134,697	4.5%
61-90 days	1,992,394	67.3%	1,006,762	34.0%	151,901	5.1%
91-180 days	1,802,797	60.9%	1,325,645	44.8%	177,234	6.0%
2006 (MA Plans / MedAssurant)						
0-30 days	62,012	100.0%	9,069	14.6%	817	1.3%
31-60 days	52,126	84.1%	13,288	21.4%	1,323	2.1%
61-90 days	47,401	76.4%	16,147	26.0%	1,696	2.7%
91-180 days	44,169	71.2%	21,661	34.9%	2,491	4.0%
2007 (MA Plans / MedAssurant)						
0-30 days	75,847	100.0%	11,013	14.5%	1,152	1.5%
31-60 days	63,682	84.0%	15,968	21.1%	1,840	2.4%
61-90 days	58,039	76.5%	19,496	25.7%	2,374	3.1%
91-180 days	53,977	71.2%	26,327	34.7%	3,419	4.5%
2008 (MA Plans / MedAssurant)						
0-30 days	93,226	100.0%	13,559	14.5%	1,424	1.5%
31-60 days	78,243	83.9%	19,675	21.1%	2,125	2.3%
61-90 days	71,217	76.4%	23,845	25.6%	2,490	2.7%
91-180 days	66,643	71.5%	31,902	34.2%	3,041	3.3%

Source: Jencks et. al. (NEJM April 2009), MedAssurant, Inc./AHIP.
Notes: Not risk-adjusted.

Figure 1. Thirty-Day Rehospitalization Rate, National FFS (2004) vs. MA Plans (2006-2008, Pooled), Jencks Method



Source: MedAssurant, Inc. for MA; NEJM (Jencks, 2009) for FFS.
Notes: Not risk-adjusted.

Table 4. Distribution of MA and FFS Readmission Rates by Major Condition Category and Index Discharge, MA Plans (MedAssurant, 2006-2008) and FFS (Jencks, 2004)

Condition at Index Discharge	Jencks FFS 30-Day Rehospitalization Rate	MA 30-Day Rehospitalization Rate	Jencks FFS Proportion of All Rehospitalizations	MA Proportion of All Rehospitalizations
Medical				
All Medical	21.1%	15.8%	77.6%	68.3%
Heart Failure	26.9%	21.1%	7.6%	4.5%
Pneumonia	20.1%	14.1%	6.3%	3.5%
COPD	22.6%	17.6%	4.0%	3.2%
Psychoses	24.6%	15.7%	3.5%	1.2%
GI Problem (Esophagitis)	19.2%	11.9%	3.1%	3.2%
Surgical				
All Surgical	15.6%	11.7%	22.4%	31.7%
Cardiac Stent	14.5%	12.5%	1.6%	3.9%
Major Joint Replacement	9.9%	7.6%	1.5%	4.0%
Other Vascular Surgery	23.9%	17.5%	1.4%	1.1%
Major Bowel Procedures	16.6%	14.7%	1.0%	1.3%
Other Hip & Femur	17.9%	14.8%	0.8%	1.2%

Source: Jencks et. al. (NEJM April 2009), MedAssurant, Inc.
Notes: Not risk-adjusted.

Table 5. MA vs. FFS Readmission Rates (Anderson Method), All Discharges (Medical and Surgical), MA Plans (MedAssurant) and National FFS (Anderson), 2006-2008

	Discharges	30-Day Readmissions	60-Day Readmissions	90-Day Readmissions	30-Day Readmission Rate	60-Day Readmission Rate	90-Day Readmission Rate
Fee-for-Service							
2006	337,505	62,259	90,750	111,031	18.4%	26.9%	32.9%
2007	313,235	57,270	83,396	102,110	18.3%	26.6%	32.6%
2008	308,735	56,822	82,737	100,876	18.4%	26.8%	32.7%
2006-2008	959,475	176,351	256,883	314,017	18.4%	26.8%	32.7%
MA Plans							
2006	247,420	33,970	47,503	55,549	13.7%	19.2%	22.5%
2007	386,602	54,183	75,815	88,738	14.0%	19.6%	23.0%
2008	456,778	64,187	90,176	105,651	14.1%	19.7%	23.1%
2006-2008	1,090,800	152,340	213,494	249,938	14.0%	19.6%	22.9%

Sources: Gerard Anderson/Johns Hopkins University for FFS; MedAssurant, Inc. for MA.
Notes: Not risk-adjusted.

Table 6. Thirty-Day Readmission Rates (Anderson Method), MA Plans (MedAssurant) vs. Medicare FFS in the Same States, 2006-2008 (Pooled)

States with Largest MA Enrollment in MedAssurant Database	FFS (Anderson)	MA (MedAssurant)	Percentage Difference (MA vs. FFS)
State 1	18.8%	15.9%	-15%
State 2	16.6%	13.6%	-18%
State 3	19.3%	14.6%	-24%
State 4	16.8%	12.7%	-25%
State 5	19.3%	15.7%	-19%
State 6	18.6%	14.6%	-21%
State 7	17.8%	14.6%	-18%
State 8	17.3%	13.9%	-20%
State 9	18.1%	15.1%	-16%
State 10	20.7%	9.4%	-55%
State 11	19.2%	15.6%	-19%
State 12	17.9%	14.7%	-18%
State 13	19.1%	14.3%	-25%
State 14	17.6%	14.9%	-15%
State 15	21.5%	10.1%	-53%
State 16	15.9%	11.7%	-26%
State 17	19.5%	13.4%	-31%
State 18	19.5%	16.9%	-13%
State 19	18.4%	13.1%	-29%
State 20	18.0%	13.4%	-26%
State 21	18.5%	13.7%	-26%
State 22	16.9%	15.4%	-9%
State 23	20.9%	15.6%	-25%
State 24	18.5%	15.1%	-18%
State 25	17.5%	12.5%	-28%
State 26	16.5%	13.2%	-20%
National	18.4%	14.0%	-24%

Source: AHIP/MedAssurant based on data from Gerard Anderson/Johns Hopkins University for FFS; MedAssurant, Inc. for MA.
Note: Not risk-adjusted.

Table 7. Risk-Adjusted and Unadjusted Thirty-Day Readmission Rates (Anderson Method), MA Plans (MedAssurant) vs. Medicare FFS, 2006-2008

	FFS	MA	Percentage Difference (MA vs. FFS)
Readmissions per Admission			
Unadjusted	18.4%	14.0%	-24%
Adjustment for DRG Distribution (version 24 DRGs)	-4.7%	+4.7%	
Risk-adjusted	17.6%	14.7%	-17%
Adjustment for DRG Distribution (version 25 DRGs)	-1.7%	+1.7%	
Risk-adjusted	18.1%	14.2%	-21%
Adjustment for DRG Distribution (version 26 DRGs)	-2.8%	+2.8%	
Risk-adjusted	17.9%	14.4%	-20%

Source: AHIP/MedAssurant based on data from Gerard Anderson/Johns Hopkins University for FFS; MedAssurant, Inc. for MA.

Appendix A: Risk Adjustment Based on Likelihood of Readmission by DRG

Based on the suggestion of Dr. Gerard Anderson, we computed an alternative form of risk adjustment based on the degree to which the distribution of admissions by DRG in MA and FFS tended to be associated with higher or lower rates of readmissions. Table A-1 shows an example of the calculations using MS-DRG (version 26) for national FFS Medicare and the MedAssurant/Medicare Advantage data.

The first step in this process is to gather samples of admissions by DRG, as shown in Table A-1. The second step is to compare the distribution of admissions by DRG between MA and FFS against a (FFS) benchmark of the likelihood that an admission with that DRG is associated with a readmission (see Table A-2).[14] Finally, an index of the "riskiness" of the MA and FFS admissions distributions is calculated. If MA plans tended to have admissions that were associated with lower-than-average expected rates of readmissions relative to FFS, then this risk adjuster would raise reported MA readmission rates (and lower those of FFS) in proportion to the difference in the index.

For example, the MA plans in the MedAssurant sample had a greater likelihood of having admissions with MS-DRG (version 26) number 003 (0.297 percent of admissions) than FFS (0.180 percent of admissions). DRG number 003 had a lower-than-average "expected" readmission rate (same quarter, any DRG), 20.6 percent for DRG 003 vs. a 24.0 percent average for all DRGs. Thus, admissions for this DRG contributed to a lower expected readmission rate index for MA.

Likewise, the MA plans in the MedAssurant sample had a lower likelihood of having admissions with DRG number 057 (0.594 percent of admissions) than FFS (0.647 percent of admissions). DRG 057 had a higher-than-average "expected" readmission rate (same quarter, any DRG), 26.5 percent for DRG 057 vs. the 24.0 percent average for all DRGs. Thus, admissions for this DRG also contributed to a lower expected readmission rate index for MA.

The percentage by which the expected readmission rate index differs from FFS is then the basis for the risk adjustment.

[14] These benchmark readmission rates for each DRG were based on the same quarter, any DRG, any hospital readmission rates in the FFS sample.

Table A-1. Number of Inpatient Admissions and Distribution per DRG

	National FFS		Medicare Advantage / MedAssurant	
MS-DRG version 26	Number of Admissions per DRG	Percent of Admissions	Number of Admissions per DRG	Percent of Admissions
001	10	0.006%	18	0.015%
002	4	0.003%	6	0.005%
003	277	0.180%	368	0.297%
004	265	0.172%	300	0.242%
...				
054	109	0.071%	66	0.053%
055	167	0.108%	146	0.118%
056	232	0.150%	132	0.107%
057	998	0.647%	734	0.594%
...				
999	66	0.043%	127	0.103%
Sum	154,195	100%	123,741	100%

Source: AHIP/MedAssurant.

Table A-2. Number of National FFS Admissions and Readmissions, Readmission Rates and Ratios to Average Rate per DRG

	FFS Benchmark			
MS-DRG version 26	Number of Admissions per DRG	Number of Same Quarter Readmissions per DRG	Readmission Rate per DRG	Ratio to Average
001	10	5	50.0%	2.08
002	4	0	0.0%	0.00
003	277	57	20.6%	0.86
004	265	92	34.7%	1.44
...				
054	109	31	28.4%	1.18
055	167	35	21.0%	0.87
056	232	76	32.8%	1.36
057	998	264	26.5%	1.10
...				
999	66	17	25.8%	1.07
Sum	154,195	37,050	24.0%	

Source: AHIP/MedAssurant.

America's Health Insurance Plans

601 Pennsylvania Ave., NW
South Building
Suite Five Hundred
Washington, D.C. 20004

202.778.3200
www.ahip.org

MedAssurant™

4321 Collington Road
Bowie, Maryland 20716

301-809-4000
www.medassurant.com