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Working Paper: Comparisons  
of Utilization in Two Large  
Multi-State Medicare  
Advantage HMOs and  
Medicare Fee-for-Service in the  
Same Service Areas

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# Working Paper: Comparisons of Utilization in Two Large Multi-State Medicare Advantage HMOs and Medicare Fee-for-Service in the Same Service Areas

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## SUMMARY

This report is the second in a series of working papers comparing patterns of care among patients with Medicare Advantage (MA) coverage and in Medicare's traditional fee-for-service (FFS) program.<sup>1</sup> The comparisons presented in this report are based on data from two large, multi-state MA HMO plans and Medicare's FFS 5 percent sample claims files in the same operating areas. We compared results within sets of counties in regions where the MA plan had substantial enrollment. As in the prior working paper, the comparisons were risk-adjusted for age, sex, and health status data from 70 claims-based diagnosis code groupings.

One MA plan (labeled Company 9) provided data in three operating areas for the same utilization measures included in AHIP's prior "eight-company" working paper: hospital admissions and days, re-admissions, "potentially avoidable" admissions, as well as outpatient, emergency room (ER), and office visits. The other MA plan (Company 10) provided data on hospital inpatient use (admissions, days, re-admissions, ER visits, and potentially avoidable admissions) for MA enrollees in its seven main service areas.

The new data from Companies 9 and 10 bring the total number of comparison areas up to eighteen – eleven for data derived from enrollee records for all types of utilization (eight smaller and regional plans, and three operating areas for Company 9), and seven for areas based on records for hospitalization (the seven areas served by Company 10).

Based on the simple average of all 18 areas, the risk-adjusted comparisons showed reductions in hospital days (-20 percent), admissions (-11 percent), ER visits (-24 percent), same DRG re-admissions in a calendar quarter (-39 percent), and potentially avoidable admissions (-10 percent) among MA enrollees compared with FFS enrollees. Based on the average from the 11 comparison sets with data on outpatient and office visits, risk-adjusted rates of office visits were somewhat higher in MA, with an average increase of 25 percent (median increase of 9 percent).

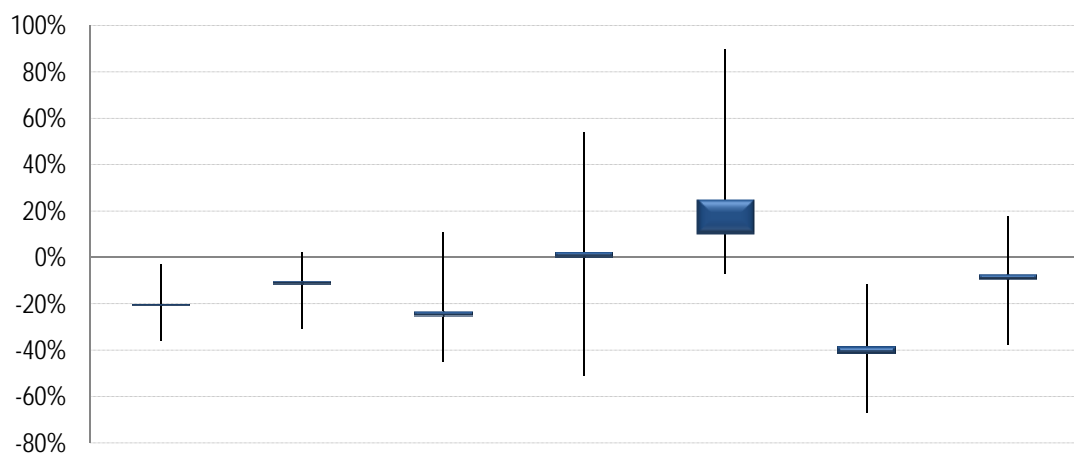
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<sup>1</sup> AHIP Center for Policy and Research, *A Preliminary Comparison of Utilization Measures Among Diabetes and Heart Disease Patients in Eight Regional Medicare Advantage Plans and Medicare Fee-for-Service in the Same Service Areas* (working paper, revised September 2009), <http://www.ahipresearch.org/pdfs/MAvsFFS.pdf>.

Risk-adjusted rates of outpatient hospital visits were about the same in MA and FFS. There was wide variation in the results for office and outpatient visits from comparison to comparison (see Summary Figure). Comparative differences in utilization were similar for all enrollees and for subsets of patients with diabetes patients or heart disease (see Summary Table).

A preliminary study of hospital discharge data from the states of California and Nevada produced analogous results for inpatient days, same-DRG re-admissions, and potentially avoidable admissions.<sup>2</sup> Hospital discharge data are in many ways less suitable for the study of patient utilization patterns, because the data are limited to only those patients with at least one hospital admission, because local area practice patterns can be more difficult to assess, and for other reasons.<sup>3</sup> Nevertheless, the results from these two states indicate the same basic patterns as the company-based studies.

**Summary Figure.** Percentage Difference in Risk-Adjusted Utilization Rates, Medicare Advantage vs. FFS in Local Comparison Areas, Eight Small or Regional Medicare Advantage Plans and Two Large Multi-State Medicare Advantage Plans



	Inpatient Days	Inpatient Admissions	ER Visits	Outpatient Visits	Office Visits	Re-Admissions	Avoidable Admissions
Mean	-20%	-11%	-24%	2%	25%	-39%	-10%
High	-3%	2%	11%	54%	90%	-12%	18%
Low	-36%	-31%	-45%	-51%	-7%	-67%	-37%
Median	-21%	-12%	-25%	0%	9%	-42%	-8%
Areas	18	18	18	11	11	18	18

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims and data from eight regional Medicare Advantage HMO plans and two multi-state Medicare Advantage HMO plans in 2005-2006.

<sup>2</sup> AHIP Center for Policy and Research, *Reductions in Hospital Days, Re-Admissions, and Potentially Avoidable Admissions Among Medicare Advantage Enrollees in California and Nevada, 2006* (revised October 2009), <http://www.ahipresearch.org/pdfs/CAvsNV.pdf>.

<sup>3</sup> The California and Nevada report includes some comparisons for sub-regions of the state.

**Summary Table.** Percentage Difference in Risk-Adjusted Utilization Rates, Medicare Advantage vs. FFS

Comparisons for 2005 and 2006 (Pooled)	Inpatient Days	Inpatient Admissions	ER Visits	Same Quarter Re- Admissions (Same DRG)	13 Potentially Avoidable Admissions
MA Rate vs. FFS Rate (Per Risk Score* Value)					
<b>Company 9 (Three Area Average)</b>					
All Patients	-25%	-7%	-27%	-51%	-8%
Diabetes Patients	-22%	-7%	-30%	-53%	-13%
Heart Disease Patients	-22%	-6%	-30%	-52%	-9%
<b>Company 10 (Seven Area Average)</b>					
All Patients	-21%	-13%	-19%	-31%	-7%
Diabetes Patients	-22%	-14%	-19%	-29%	-9%
Heart Disease Patients	-16%	-8%	-19%	-26%	1%
<b>Companies 1-8 (Average)</b>					
All Patients	-18%	-10%	-27%	-42%	-13%
Diabetes Patients	-20%	-13%	-30%	-43%	-15%
Heart Disease Patients	-14%	-7%	-28%	-36%	-9%

Source: AHIP calculations based on data from eight regional Medicare Advantage HMO plans and two multi-state Medicare Advantage HMO plans in 2005-2006 and the FFS 5 percent claims sample in the same state service areas.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status.

## INTRODUCTION

Direct comparisons of patient health status and utilization rates between Medicare beneficiaries enrolled in Medicare Advantage (MA) and in the traditional fee-for-service (FFS) program are difficult to obtain. Since 1997, MA plans have reported several indicators of health care quality or appropriateness based on HEDIS measures.<sup>4</sup> However, FFS providers are not required to report HEDIS data. Researchers at the Brookings Institution have derived preliminary FFS results for certain HEDIS measures from datasets built for different purposes, but these results are not yet published.<sup>5</sup> And while the HEDIS measures are very precisely defined, they are based on a relatively small list of specific preventive screenings and recommended care processes. Thus, even if HEDIS comparisons of MA and FFS were widely available, they still would not address broader patterns of health care use or outcomes.

To more fully assess health care use and health status, Medicare's 5 percent sample claims files provide a rich set of information on the demographics, diagnoses, and utilization patterns of FFS beneficiaries. Until now, however, researchers have not had equivalent data from MA plans.

In early 2008, AHIP developed a detailed data specification for MA plans that would allow direct comparisons of a variety of utilization measures with

FFS data from the 5 percent sample files in local areas where the MA plan had substantial enrollment.<sup>6</sup>

The measures include: inpatient hospital days, inpatient hospital admissions, emergency room (ER) visits, hospital outpatient visits, provider office visits, hospital re-admissions for the same diagnosis-related group (DRG) within the same calendar quarter, and 13 potentially avoidable hospital admissions categories for "ambulatory-treatable" conditions, which range from uncontrolled diabetes to dehydration and are precisely defined by the Agency for Healthcare Research and Quality (AHRQ).

Preliminary results were published in July 2009 (and revised slightly in September 2009), based on data from eight small to medium-sized regional HMOs that had completed their datasets for 2005 and 2006 in early 2009.<sup>7</sup>

This report presents new data from two additional MA plans, both of which are large, multi-state plans. One plan (called Company 9 in this report) returned complete results in three operating areas (but based on fewer diagnosis codes per claim than are available in FFS). For comparability, we created a special FFS comparison dataset with risk scores based on the same limited number of diagnoses per claim.

Another large MA plan (called Company 10 here) returned results from its nationwide enrollment, which

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<sup>4</sup> Descriptions of Healthcare Effectiveness Data and Information Set (HEDIS) measures are available from the National Committee for Quality Assurance (NCQA) website at [www.ncqa.org](http://www.ncqa.org). HEDIS is a registered trademark of the NCQA.

<sup>5</sup> Niall Brennan and Mark Shepard, *Quality of Care in the Medicare Fee-For-Service and Medicare Advantage Programs* (unpublished manuscript, 2009).

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<sup>6</sup> The authors would like to thank Julie Lee, PhD, formerly of the Brookings Institution's Engelberg Center for Health Care Reform, for providing technical commentary throughout the design and data-gathering phases of this project.

<sup>7</sup> 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>. The revision reflected updated counts of the numbers of hospital outpatient visits from one of the eight companies.

we show in the seven most concentrated enrollment areas, each located in a different state. Under its research policies, Company 10 does not provide to researchers information on certain types of admissions, diagnosis codes, and outpatient utilization related to AIDS or behavioral health and substance abuse. To create FFS comparisons with Company 10's data, we therefore excluded FFS hospital inpatient claims for the identical DRGs omitted from Company 10's submission, and we also excluded the same diagnosis codes for AIDS, substance abuse and behavioral health that were not included in Company 10's data.

Based on its policy, Company 10 also did not submit information for outpatient and office visits associated with mental health and substance abuse benefits. At this time, we are not able to exclude outpatient and office visits in FFS that would have been provided under the same sorts of substance abuse and mental health benefits. Thus we are unable to present FFS comparisons of outpatient and office visits for Company 10.

As with the prior working paper, we report the Company 9 and 10 data with particular emphasis on each plan's patients with diabetes and heart disease. Comparison data from the FFS program reflect health care use among patients with diabetes and heart disease in Medicare's 5 percent sample claims files within the same sets of counties. In some of the tables, particularly in the appendices, we also have provided nationwide FFS figures for reference. The national and local FFS comparison figures for Company 9 are affected by the limitation on the number of diagnosis codes per claim; the national and local FFS figures associated with the Company 10 comparisons reflect the fact that certain types of admissions and diagnosis codes for claims associated with AIDS, behavioral health and substance abuse are not in the comparisons.

## RELATED AND COMPLEMENTARY RESEARCH

In addition to the new Brookings research comparing HEDIS measures noted above, AHIP and other researchers have presented new research using other methods to compare utilization measures directly between MA and FFS coverage in the last several months.

First, AHIP is developing methods for comparing MA and FFS patients from hospital discharge data for various states obtained via the Health Care Utilization Project (H-CUP) at AHRQ and from states directly.

Although information obtained from hospital discharge datasets may not be ideal in some respects – because only patients with at least one admission to a hospital are represented and for other reasons – direct comparisons of risk-adjusted hospital inpatient days, re-admissions, and potentially avoidable admissions are possible. Preliminary results for the states of California and Nevada were published in September 2009 (and revised in October 2009).<sup>8</sup>

These data from California and Nevada show patterns of utilization that are analogous to those found here and in the earlier “eight-company” report. For example, among patients with at least one hospitalization, the California data indicated that MA enrollees had lower risk-adjusted rates of hospital days (-30 percent), same-DRG re-admissions (-15 percent), and potentially avoidable admissions (-6

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<sup>8</sup> AHIP Center for Policy and Research, *Reductions in Hospital Days, Re-Admissions, and Potentially Avoidable Admissions Among Medicare Advantage Enrollees in California and Nevada, 2006* (revised October 2009), <http://www.ahipresearch.org/pdfs/CAvsNV.pdf>. The revision stemmed from a minor correction in the risk score calculations for certain MA and FFS beneficiaries with multiple admissions during the year with different reported ages.

percent) than their FFS counterparts. In Nevada, the MA patients had reductions in risk-adjusted rates of hospital days (-23 percent), same-DRG re-admissions (-33 percent), and potentially avoidable admissions (-6 percent) relative to FFS.

Second, Dr. Gerard Anderson conducted a study of hospital re-admissions for the Alliance of Community Health Plans (ACHP), which was released in September 2009. Among other things, the study found that the average 30-day re-admission rate (all DRGs) for 13 ACHP member plans reporting was 27 percent less for MA patients than the national FFS rate.<sup>9</sup>

Third, Dr. Cary Sennett of MedAssurant, Inc. presented a detailed three-year (2006-2008) study of 30-day, 90-day, and one-year re-admission rates (all DRGs) for 11 MA plans at an AHIP conference in November 2009, and he compared those results with national FFS re-admission rates computed by Dr. Steve Jencks for 2004 in a recent study in the *New England Journal of Medicine*.<sup>10</sup>

See Appendix A for a brief review of other relatively recent studies that have compared MA and FFS on various concepts.

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<sup>9</sup> 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](http://www.achp.org/policy/health_care_reform/study_of_ma_plans_vs_ffs/index.1.html).

<sup>10</sup>For FFS re-admission rates in 2004, see 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>.

## DATA AND METHOD BASICS

Demographic data gathered from the MA plans for this report include age, sex, and county of residence. Each record also includes the number of member months of enrollment during the year and type of MA plan – including HMOs, regional preferred provider organizations (PPOs), local PPOs, special needs plans (SNPs), and private fee-for-service (PFFS) plans. Thus far, we have focused only on HMO enrollees from the 10 responding companies – enrollment in other types of MA plans in 2005 and 2006 was not large enough to analyze.

Diagnosis codes were grouped using Hierarchical Condition Categories (HCCs) for 70 serious diseases. Specifically, a marker for each HCC was generated using ICD-9 diagnosis codes found on each beneficiary claim for inpatient, outpatient, and physician services, including primary and secondary diagnoses. For Company 9, comparisons were based on up to 6 diagnoses per claim for both the MA and FFS data. For Company 10, up to 12 diagnoses were used.

Risk scores were calculated for each record using the predicted age/sex and HCC relative cost factors used by CMS for MA risk adjustment (but not including factors related to program or institutional status, or disease interaction factors). For both Companies 9 and 10, we calculated comparable HCCs for FFS patients from the detailed diagnosis codes submitted in the 5 percent sample claims files for inpatient, outpatient, and physician services.

Appendix B provides detailed examples and reference information on the computation of HCCs and risk scores.

*Re-Admissions and Potentially Avoidable Admissions.* The FFS data do not allow computation of 30-day and 90-day hospital re-admissions for the same DRG (the typical computations used by private health insurance plans) because the 5 percent FFS sample claims data available to us do not show specific dates of service. However, the FFS data do report the calendar quarter in which the service occurred. Therefore, we asked MA plans to submit re-admissions within the same calendar quarter for comparison with FFS data.<sup>11</sup>

Potentially avoidable admissions were defined by AHRQ in 13 disease categories: dehydration, bacterial pneumonia, urinary tract infection, hypertension, angina, perforated appendix, asthma, uncontrolled diabetes, diabetes with short-term complications, diabetes with long-term complications, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and lower extremity amputation for patients with diabetes.<sup>12</sup>

Appendix C provides detailed information on the main utilization measures used, and Appendix D illustrates the process for computing potentially avoidable admissions.

*Number of Records.* For simplicity, the preliminary comparisons in this report use pooled data for 2005 and 2006, and they include only records marked as 12-month enrollees (using Part A enrollment for the

FFS data). Records of patients who died in December (and were thus recorded in both the FFS and MA datasets as 12-month enrollees) were included. We included only beneficiaries between the ages of 65 and 89, and for the MA plans, we included only people with HMO coverage.<sup>13</sup>

We also excluded certain likely Medicaid beneficiaries from the FFS comparison data for both Company 9 and 10 for the comparisons presented.<sup>14</sup> (At this time, we are not able to exclude Medicaid enrollees from the MA plans' data.)<sup>15</sup> The health and utilization characteristics of dual eligible Medicaid and Medicare enrollees in FFS appear to be very different from those of Medicare FFS beneficiaries overall. Dual eligibles appear to have higher rates of certain diseases, such as renal or kidney disease, higher-than-average numbers of HCCs overall, and higher rates of utilization. Excluding the Medicaid enrollees

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<sup>11</sup> We compared the same-quarter, same DRG re-admission rates with 30- and 90-day re-admission rates for seven of the eight MA plans in the original "eight-company" study and in all regions represented by Companies 9 and 10. In general, the same-quarter rate fell between the 30- and 90-day rates. On average, the same-quarter re-admission rate was 30 percent less than the 90-day rate and 15 percent more than the 30-day rate.

<sup>12</sup> 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](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>.

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<sup>13</sup> Privacy rules regarding research datasets of these kinds do not allow ages to be reported by year for those 90 and above. As with Companies 1-8 in the prior study, Companies 9 and 10 reported little PPO, SNP, and PFFS enrollment in 2005 and 2006. We hope for a greater amount of data from these alternative forms of coverage more companies respond and as companies are able to report 2007 and 2008 data.

<sup>14</sup> The FFS 5 percent sample claims file (the "denominator" file) does not specifically identify enrollees who were dually eligible; however, we chose to presume dual eligibility by using the buy-in indicator in the dataset and excluded enrollees with 12 months of buy-in for both Parts A and B. By this method, the numbers of Medicare/Medicaid dual eligibles were likely undercounted. See Dual Medicare-Medicaid Enrollees and the Medicare Denominator File, Technical Note, ResDAC Publication Number TN-010, March 2006. Research Data Assistance Center, University of Minnesota, Minneapolis, MN. <http://www.resdac.umn.edu>.

<sup>15</sup> We did not ask for Medicaid enrollment in the original data request. Company 10 has subsequently agreed to try to estimate the percentage of their MA/HMO enrollees who are dually Medicaid enrollees – that information may be presented in a future (revised or expanded) version of this report. Among the eight smaller and regional companies in the prior report, three indicated that the numbers of Medicaid enrollees in their care were probably small (2-5 percent), and suggested that MA enrollment may be a substitute for Medicaid enrollment. Another estimated that its percentage of MA enrollees with Medicaid was about the same (11 percent) as national FFS (10.3 percent).

narrowed the observed differences between FFS and MA with respect to co-morbidities and utilization.<sup>16</sup>

In these datasets, a “record” is defined as a data element for a (de-identified) beneficiary in a year. We use the term “record” interchangeably with “person,” “patient,” “beneficiary,” or “enrollee” in this report. However, because we have pooled the data from 2005 and 2006, there may be two records for the same person in either the FFS or MA plan data.

We did not exclude any data records from the Company 9 and 10 datasets – the data appear to be very “clean,” without obviously erroneous records. As with the prior eight-company study, we did exclude several records in the FFS data where the number of inpatient days exceeded 365 in a year. There were two records in the Company 9 dataset where the number of outpatient visits exceeded 365 – an average of more than one per day. However, in our data specification we did not restrict the number of outpatient visits to a maximum of one per day, and, based on the HCC codes associated with these records – primarily dialysis status and protein-calorie malnutrition – and very few inpatient days reported for these records, we have assumed that the observations of extremely high numbers of outpatient visits are accurate and have left the data in place as submitted.

*Comparison Areas and Data Limitations.* The data from Company 9 represent its MA enrollment in three

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<sup>16</sup> In the original “eight-company” report, Appendix M was devoted to showing the comparisons for Companies 1-8 with Medicaid enrollees included in the FFS comparison samples. In general, including the Medicaid enrollees in the comparison samples for FFS tended to widen the reported differences in utilization, on a per-person or a risk-adjusted basis. We have chosen to exclude the Medicaid enrollees from the FFS comparison samples where possible so as to not possibly exaggerate the differences between MA and FFS. Comparisons including Medicaid in the FFS comparison groups for the Company 9 and 10 results are available from the authors.

areas: two sets of counties fully within two particular states and one set of counties in two adjacent states, which we have labeled comparison areas 9A, 9B, and 9C. Likewise, the Company 10 data are for seven sets of counties, each within a different state. In each case, these areas make up a large share of the company’s MA enrollment, although companies may have had some enrollment outside of these study areas.

As with the original eight-company study, the areas were chosen for their geographical coherence; our belief is that the overall health cost structure and the general clinical practice and utilization patterns within areas should be relatively uniform.

Currently, the data use agreements governing this research require that the identities of the responding companies remain confidential. We have attempted to characterize the demographic and health status information from enrollees of these two companies fairly, but in a way that does not allow their identities to be inferred.

Both Company 9 and Company 10 are large, for-profit health plans that use extensive networks of health care providers in their MA HMOs. Company 9 noted that it makes use of capitated or partially capitated reimbursement arrangements with physicians or medical groups, and it is possible that their datasets for outpatient visits and office visits in 2005 and 2006 could have inadvertently missed some of these visits in cases where a medical group did not send a discrete claim for services that would have been considered covered under a capitation arrangement. Therefore, counts of outpatient and office visits shown for Company 9 in the three comparison areas could be slightly understated, and HCC counts based on diagnoses from any unreported claims could also be slightly low. However, we believe any slight understatements of

office or outpatient visits for Company 9 are likely to be relatively small, and would not affect the basic direction of the results.

We have not shown comparisons of outpatient and office visits for Company 10 because of uncertainties defining a comparison dataset in FFS without the AIDS and behavioral health or substance abuse claims. To calculate comparable risk scores, we excluded all HCCs for AIDS (HCC 1), Drug/Alcohol Psychosis (HCC 51), Drug/Alcohol Dependence (HCC 52), Schizophrenia (HCC 54), and Major Depressive, Bipolar, and Paranoid Disorders (HCC 55) from the FFS comparison datasets. It is possible that the HCC counts and risk scores for Company 10 still could be slightly understated in certain areas due to the issues with excluded outpatient claims for AIDS and behavioral health/substance abuse – by excluding the claims, the diagnosis codes were not counted toward HCCs and risk scores. However, we believe any possible understatement of Company 10's HCC counts and risk scores for this reason would be small.

## DATA CHARACTERISTICS

*Company 9.* Table 1 shows the numbers of records and overall HCC markers in the three comparison areas of Company 9 for beneficiaries with diabetes (HCCs 15, 16, 17, 18, or 19) and beneficiaries with heart disease (HCCs 79, 80, 81, 82, 83, 92, 104, or 105), respectively, as well as the average ages in the samples. There were 499,572 records for patients with a diabetes HCC and 670,461 records for patients with a heart disease HCC in the comparable national FFS sample (excluding Medicaid), based on HCCs computed from a maximum of 6 diagnosis codes per claim.<sup>17</sup>

<sup>17</sup> The national totals for the numbers of records with diabetes and heart disease records reported in the prior “eight-company” report

Table 2 shows the relative rates of HCC codes overall and for cancer (HCCs 7, 8, 9, or 10), diabetes, heart disease, and kidney disease (HCCs 130, 131, or 132), as well as the calculated risk scores for FFS nationally and in the three local comparison areas for Company 9. The average risk scores reflect the 70 HCCs in the samples, as well as the impact of age and sex factors used by CMS to make risk-adjusted payments.<sup>18</sup>

Both the record counts and risk scores of the Company 9 and comparable FFS samples are affected by use of only 6 diagnosis codes per claim. Thus, there were fewer records of patients with diabetes and heart disease in the national FFS comparison dataset for Company 9 than in the earlier “eight-company” report, which used up to 12 diagnosis codes per claim. Likewise, risk scores for Company 9 would be higher if 12 diagnosis codes per claim had been available.

The FFS risk scores for Company 9's three comparison areas were considerably higher than the comparably computed national FFS average. However, Company 9's risk scores were slightly lower than local FFS in each of the three comparison areas.

*Company 10.* Table 3 shows the record counts and HCC totals and Table 4 shows HCC rates and overall risk scores for Company 10's seven areas. To be sure, we do not have a comparison FFS dataset for outpatient and office visits that directly matches those

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are higher, because HCCs in that report were based on as many as 12 diagnosis codes per claim.

<sup>18</sup> Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

computed by Company 10, due to uncertainties interpreting the exclusion of utilization data from Company 10's claims related to AIDS, behavioral health and substance abuse. However, as noted above, we believe that by excluding the same HCC codes in both the FFS and MA data, the risk scores are comparable.

Three of the seven comparison areas used for Company 10 had lower FFS risk scores than the comparably computed national FFS average, and four areas had higher-than-average risk scores. In five of the seven areas, the Company 10's MA risk scores were higher or equal to local FFS; in two areas, Company 10's MA risk scores were lower. On average, the Company 10 enrollees were older than local FFS enrollees in every area.

In general, areas with high FFS risk scores also had high MA risk scores in the Company 10 comparisons, and areas with low FFS risk scores also had low MA risk scores. However, there were two exceptions: in Area B, the MA enrollees had a considerably higher average risk score than local FFS, and in Area D, the MA risk score was noticeably lower than FFS.

## COMPARISONS OF UTILIZATION

*Company 9.* Tables 5, 6 and 7 present preliminary comparisons of utilization for all enrollees, diabetes patients, and heart disease patients, respectively. On average, patients in Company 9's three comparison areas had lower risk-adjusted rates of inpatient days (-25 percent), inpatient admissions (-7 percent), ER visits (-27 percent), same-DRG re-admissions (-51 percent), and potentially avoidable admissions (-8 percent) than the local FFS comparison samples. These comparisons are for all enrollees and represent the simple average of the risk-adjusted

percentage differences found in Company 9's three comparison areas.

Risk-adjusted rates of outpatient visits were mixed, with slightly higher rates in one area, equal rates in another, and lower rates in the third. Risk-adjusted rates of office visits were likewise mixed, with lower rates in one area and higher rates in the other two. This pattern of mixed rates of outpatient and office visits was followed for diabetes and heart disease patients as well.

*Company 10.* Tables 8, 9, and 10 show comparisons of utilization for Company 10's enrollees and FFS enrollees in the seven areas. The comparisons are for all enrollees, diabetes patients, and heart disease patients, respectively. On a risk-adjusted basis, patients in Company 10's seven comparison areas had lower rates of inpatient days (-21 percent), inpatient admissions (-13 percent), ER visits (-19 percent), same DRG re-admissions (-31 percent), and potentially avoidable admissions (-7 percent) than the local FFS comparison samples. As with the Company 9 comparisons, these comparisons are for all enrollees and represent the simple average of the risk-adjusted percentage differences found in Company 10's seven comparison areas.

Additional details on the data underlying these comparisons are shown in Appendix E (for Company 9) and Appendix F (Company 10). Importantly, the respective FFS comparisons, including the national totals, reflect the adjustments made to create comparisons to each company's submitted datasets. Thus, the FFS results used for comparison with the Company 9 data are based on a maximum of 6 diagnosis codes per claim; the FFS results comparable to Company 10's data do not include certain HCCs and DRGs associated with AIDS, behavioral health and substance abuse.

## DISCUSSION AND ONGOING RESEARCH

Results from these two large, multi-state companies are consistent with the results gathered in the original eight-company study of smaller and regional MA plans, and with recent outside research. The new data suggest that a wide variety of MA plans in various parts of the country – large and small, regional or national, for-profit or not-for-profit – are able to help patients avoid inpatient hospital stays, ER visits, re-admissions, and potentially avoidable admissions, relative to the results shown in FFS.

The next steps in this data-gathering project include working with additional companies and expanding the data response to 2007 and 2008. We have created a revised data specification that reflects updates to the crosswalks between detailed diagnosis codes and HCC groups, changes in the specifications for potentially avoidable admissions, and changes related to the switchover to new DRG coding beginning in 2007.

In particular, the new data specification for 2007 and 2008 will include additional re-admission variables, including same-quarter any DRG re-admissions, and an expanded version of the same-quarter same DRG concept that includes related DRGs, such as DRGs for the same basic condition with or without complications.

The next working paper in this series will address the potential usefulness and challenges surrounding the use of state-based hospital discharge datasets to make similar comparisons. We will present data from several additional states as well as some additional data from the states of California and Nevada.

In particular, the forthcoming report will discuss some analytic issues related to working with data for only those people with a hospital admission, as well as the many technical issues that arise from the nature of the state-based datasets, such as:

- Issues related to the validity of the “person” IDs and tests for the likelihood of problems;
- Issues with out-of-state residents, part-year residents and “snowbird” retirees, and cross-border medical care;
- Issues of completeness of the state data and comparisons between the state datasets and the FFS data from the Medicare 5 percent sample files; and
- Issues with the identification of MA enrollees.

A key goal for future study will be to more closely examine care patterns in particular areas and situations to see how reductions in certain types of avoidable admissions and re-admissions are achieved.

## ACKNOWLEDGEMENTS

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**Table 1.** Sample Characteristics: HMO Enrollees in Company 9 and FFS Enrollees Nationally and in Three Local Comparison Areas

Data for 2005 and 2006 (Pooled)	Average Age (All Enrollees)	Enrollees with Diabetes (HCCs 15-19)		Enrollees with Heart Disease (HCCs 79-83, 92, 104, 105)	
		Number of Records	Total HCCs	Number of Records	Total HCCs
<b>National</b>					
FFS Including Medicaid	74.2	598,607	1,875,038	781,219	2,631,467
FFS Medicaid Only	75.1	<u>99,035</u>	<u>372,217</u>	<u>110,758</u>	<u>456,187</u>
FFS Without Medicaid	74.2	499,572	1,502,821	670,461	2,175,280
<b>Company 9, Area A</b>					
MA Plan	74.4	10,466	32,101	13,661	46,357
Local FFS Without Medicaid	74.7	17,528	58,718	24,339	83,289
<b>Company 9, Area B</b>					
MA Plan	74.8	4,936	15,589	7,115	23,970
Local FFS Without Medicaid	74.4	11,698	40,798	15,369	55,426
<b>Company 9, Area C</b>					
MA Plan	74.4	11,714	36,582	16,463	56,433
Local FFS Without Medicaid	75.0	14,039	48,123	21,279	74,033

Source: Author's calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = enrollees in Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees. HCC is Hierarchical Condition Category; the study asked for HCC markers for 70 serious illness categories. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. A record is a data element for each beneficiary in a year. Based on beneficiaries aged 65-89, with 12 months of enrollment in a year (MA) or 12 Part A enrollment months (FFS). Determination of FFS Medicaid enrollees based on 12 months of reported state buy-in, from the FFS 5 percent sample claims demographic file.

**Table 2. Average Rates of Illness Diagnoses (HCC Groups) and Overall Risk Scores\* - Medicare FFS and Company 9 Medicare Advantage HMO Plans in Three Areas**

Average HCC Markers per Beneficiary Record, 2005 and 2006 (Pooled)	Average HCCs (All Enrollees)	Cancer (HCCs 7-10)	Diabetes (HCCs 15-19)	Heart Disease (HCCs 79-83, 92, 104, 105)	Kidney and Renal Disease (HCCs 130 - 132)	Average Overall Computed Risk Score *
<b>National</b>						
FFS Including Medicaid	1.47	0.14	0.29	0.48	0.05	1.02
FFS Medicaid Only	2.31	0.12	0.51	0.70	0.10	1.40
FFS Without Medicaid	1.38	0.14	0.27	0.45	0.05	0.97
<b>Company 9, Area A</b>						
MA Plan	1.57	0.14	0.28	0.56	0.06	1.06
Local FFS Without Medicaid	1.69	0.17	0.34	0.59	0.05	1.11
<b>Company 9, Area B</b>						
MA Plan	1.58	0.16	0.26	0.57	0.06	1.08
Local FFS Without Medicaid	1.65	0.18	0.32	0.54	0.05	1.10
<b>Company 9, Area C</b>						
MA Plan	1.63	0.16	0.27	0.58	0.06	1.08
Local FFS Without Medicaid	1.64	0.17	0.31	0.57	0.06	1.10

Source: Author's calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = enrollees in Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees. HCC is Hierarchical Condition Category; the study asked for HCC markers for 70 serious illness categories. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. A record is a data element for each beneficiary in a year. Based on beneficiaries aged 65-89, with 12 months of enrollment in a year (MA) or 12 Part A enrollment months (FFS). Determination of FFS Medicaid Enrollees based on 12 months of reported state buy-in, from the FFS 5 percent sample claims demographic file.

\* Risk scores for FFS and MA enrollees are based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 3.** Sample Characteristics: HMO Enrollees in Company 10 and FFS Enrollees Nationally and in Seven Local Comparison Areas

Data for 2005 and 2006 (Pooled)	Average Age (All Enrollees)	Enrollees with Diabetes (HCCs 15-19)		Enrollees with Heart Disease (HCCs 79-83, 92, 104, 105)	
		Number of Records	Total HCCs	Number of Records	Total HCCs
<b>National</b>					
FFS Including Medicaid	74.2	631,916	2,275,874	851,110	3,246,157
FFS Medicaid Only	75.1	<u>104,325</u>	<u>448,222</u>	<u>122,878</u>	<u>561,406</u>
FFS Without Medicaid	74.2	527,591	1,827,652	728,232	2,684,751
<b>Company 10, Area A</b>					
MA Plan	75.0	19,279	57,373	23,245	81,280
Local FFS Without Medicaid	73.9	4,652	15,765	7,408	26,493
<b>Company 10, Area B</b>					
MA Plan	76.7	27,570	90,086	31,655	116,624
Local FFS Without Medicaid	73.9	17,207	59,623	24,532	89,784
<b>Company 10, Area C</b>					
MA Plan	75.5	12,026	38,364	17,566	62,332
Local FFS Without Medicaid	73.9	1,963	6,742	3,080	11,426
<b>Company 10, Area D</b>					
MA Plan	74.7	15,293	48,297	19,837	69,656
Local FFS Without Medicaid	74.5	13,579	48,945	20,563	76,752
<b>Company 10, Area E</b>					
MA Plan	75.1	17,331	62,204	23,247	87,399
Local FFS Without Medicaid	74.2	4,090	15,742	6,497	24,492
<b>Company 10, Area F</b>					
MA Plan	75.1	17,213	60,938	21,605	84,944
Local FFS Without Medicaid	74.5	12,587	46,041	17,118	66,508
<b>Company 10, Area G</b>					
MA Plan	74.6	27,318	90,946	31,674	116,999
Local FFS Without Medicaid	73.6	7,078	25,032	10,182	38,282

Source: Author's calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = enrollees in Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees. HCC is Hierarchical Condition Category; the study asked for HCC markers for 70 serious illness categories. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. A record is a data element for each beneficiary in a year. Based on beneficiaries aged 65-89, with 12 months of enrollment in a year (MA) or 12 Part A enrollment months (FFS). Determination of FFS Medicaid enrollees based on 12 months of reported state buy-in, from the FFS 5 percent sample claims demographic file.

**Table 4. Average Rates of Illness Diagnoses (HCC Groups) and Overall Risk Scores\* - Medicare FFS and Company 10 Medicare Advantage HMO Plans in Seven Areas**

Average HCC Markers per Beneficiary Record, 2005 and 2006 (Pooled)	Average HCCs (All Enrollees)	Cancer (HCCs 7-10)	Diabetes (HCCs 15-19)	Heart Disease (HCCs 79-83, 92, 104, 105)	Kidney and Renal Disease (HCCs 130 - 132)	Average Overall Computed Risk Score*
<b>National</b>						
FFS Including Medicaid	1.68	0.15	0.33	0.57	0.06	1.11
FFS Medicaid Only	2.63	0.13	0.58	0.85	0.11	1.54
FFS Without Medicaid	1.57	0.16	0.30	0.54	0.05	1.06
<b>Company 10, Area A</b>						
MA Plan	1.26	0.13	0.24	0.37	0.06	0.95
Local FFS Without Medicaid	1.45	0.16	0.24	0.48	0.05	1.01
<b>Company 10, Area B</b>						
MA Plan	1.56	0.15	0.36	0.46	0.08	1.11
Local FFS Without Medicaid	1.42	0.16	0.26	0.47	0.04	1.00
<b>Company 10, Area C</b>						
MA Plan	1.36	0.12	0.24	0.45	0.07	1.02
Local FFS Without Medicaid	1.43	0.16	0.23	0.45	0.06	1.01
<b>Company 10, Area D</b>						
MA Plan	1.50	0.15	0.29	0.50	0.05	1.02
Local FFS Without Medicaid	1.79	0.19	0.32	0.62	0.05	1.14
<b>Company 10, Area E</b>						
MA Plan	1.73	0.14	0.38	0.54	0.13	1.16
Local FFS Without Medicaid	1.75	0.16	0.32	0.62	0.07	1.14
<b>Company 10, Area F</b>						
MA Plan	1.80	0.15	0.37	0.61	0.08	1.17
Local FFS Without Medicaid	1.78	0.17	0.36	0.62	0.07	1.15
<b>Company 10, Area G</b>						
MA Plan	1.64	0.12	0.40	0.53	0.08	1.09
Local FFS Without Medicaid	1.54	0.15	0.30	0.51	0.05	1.05

Source: Author's calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = enrollees in Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees. HCC is Hierarchical Condition Category; the study asked for HCC markers for 70 serious illness categories. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of 12 diagnosis codes per claim. HCCs 1, 27, 52-55 not included. Based on beneficiaries aged 65-89, with 12 months of enrollment in a year (MA) or 12 Part A enrollment months (FFS). Determination of FFS Medicaid enrollees based on 12 months of reported state buy-in, from the FFS 5 percent sample claims demographic file.

\* Risk scores for FFS and MA enrollees are based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 5.** Percentage Difference in Observed Utilization Rates Among All Patients, Company 9 Medicare Advantage HMOs in Three Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 9, Area A	Company 9, Area B	Company 9, Area C	Company 9, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Inpatient</b>				
Hospital Days	-33%	-24%	-27%	-28%
Hospital Admissions	-8%	-8%	-17%	-11%
<b>Outpatient</b>				
ER Visits	-27%	-23%	-40%	-30%
Outpatient Visits	4%	-2%	-12%	-3%
Office Visits	-11%	3%	5%	-1%
Same-Quarter Re-Admissions for Same DRG	-49%	-47%	-62%	-53%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-9%	-4%	-21%	-11%
MA Rate vs. FFS Rate (Per HCC)				
<b>Inpatient</b>				
Hospital Days	-28%	-20%	-23%	-24%
Hospital Admissions	0%	-4%	-13%	-6%
<b>Outpatient</b>				
ER Visits	-21%	-20%	-37%	-26%
Outpatient Visits	12%	2%	-8%	2%
Office Visits	-4%	7%	10%	4%
Same-Quarter Re-Admissions for Same DRG	-45%	-45%	-60%	-50%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-2%	0%	-17%	-6%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Inpatient</b>				
Hospital Days	-30%	-22%	-23%	-25%
Hospital Admissions	-3%	-6%	-13%	-7%
<b>Outpatient</b>				
ER Visits	-23%	-22%	-37%	-27%
Outpatient Visits	9%	0%	-8%	0%
Office Visits	-7%	5%	9%	3%
Same-Quarter Re-Admissions for Same DRG	-46%	-46%	-60%	-51%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-5%	-2%	-17%	-8%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 6.** Percentage Difference in Observed Utilization Rates Among Patients with Diabetes, Company 9 Medicare Advantage HMOs in Three Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 9, Area A	Company 9, Area B	Company 9, Area C	Company 9, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Inpatient</b>				
Hospital Days	-32%	-20%	-27%	-27%
Hospital Admissions	-6%	-8%	-21%	-12%
<b>Outpatient</b>				
ER Visits	-27%	-31%	-43%	-34%
Outpatient Visits	7%	16%	-14%	3%
Office Visits	-14%	-8%	-3%	-8%
Same-Quarter Re-Admissions for Same DRG	-51%	-48%	-68%	-56%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-15%	-10%	-28%	-18%
MA Rate vs. FFS Rate (Per HCC)				
<b>Inpatient</b>				
Hospital Days	-26%	-12%	-20%	-19%
Hospital Admissions	2%	2%	-14%	-3%
<b>Outpatient</b>				
ER Visits	-21%	-24%	-37%	-27%
Outpatient Visits	17%	28%	-5%	13%
Office Visits	-6%	1%	7%	1%
Same-Quarter Re-Admissions for Same DRG	-47%	-43%	-65%	-52%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-7%	0%	-21%	-9%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Inpatient</b>				
Hospital Days	-29%	-15%	-22%	-22%
Hospital Admissions	-2%	-2%	-16%	-7%
<b>Outpatient</b>				
ER Visits	-24%	-27%	-38%	-30%
Outpatient Visits	12%	23%	-7%	9%
Office Visits	-10%	-3%	4%	-3%
Same-Quarter Re-Admissions for Same DRG	-49%	-45%	-66%	-53%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-11%	-4%	-23%	-13%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with diabetes defined as HCCs 15, 16, 17, 18, or 19. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Table 7. Percentage Difference in Observed Utilization Rates Among Patients with Heart Disease, Company 9 Medicare Advantage HMOs in Three Areas Relative to Local FFS**

Data from 2005 and 2006 (Pooled)	Company 9, Area A	Company 9, Area B	Company 9, Area C	Company 9, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Inpatient</b>				
Hospital Days	-27%	-25%	-21%	-24%
Hospital Admissions	-1%	-9%	-14%	-8%
<b>Outpatient</b>				
ER Visits	-25%	-30%	-39%	-32%
Outpatient Visits	13%	11%	-17%	3%
Office Visits	-14%	-8%	-3%	-8%
Same-Quarter Re-Admissions for Same DRG	-45%	-52%	-61%	-53%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-6%	-12%	-16%	-11%
MA Rate vs. FFS Rate (Per HCC)				
<b>Inpatient</b>				
Hospital Days	-26%	-19%	-20%	-22%
Hospital Admissions	0%	-3%	-13%	-5%
<b>Outpatient</b>				
ER Visits	-25%	-25%	-38%	-29%
Outpatient Visits	14%	19%	-16%	6%
Office Visits	-13%	-1%	-1%	-5%
Same-Quarter Re-Admissions for Same DRG	-44%	-49%	-60%	-51%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-5%	-6%	-15%	-9%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Inpatient</b>				
Hospital Days	-27%	-21%	-20%	-22%
Hospital Admissions	-1%	-5%	-12%	-6%
<b>Outpatient</b>				
ER Visits	-25%	-27%	-38%	-30%
Outpatient Visits	13%	17%	-15%	5%
Office Visits	-14%	-3%	-1%	-6%
Same-Quarter Re-Admissions for Same DRG	-45%	-50%	-60%	-52%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-5%	-8%	-14%	-9%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with heart disease defined as HCCs 79-83, 92, 104, 105. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Table 8.** Percentage Difference in Observed Utilization Rates Among All Enrollees, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area A	Company 10, Area B	Company 10, Area C	Company 10, Area D
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-19%	-15%	-25%	-22%
Inpatient Admissions	-7%	5%	-15%	-21%
ER Visits	-1%	6%	-15%	-41%
Same-Quarter Re-Admissions for Same DRG	-38%	-2%	-32%	-34%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	12%	20%	-6%	-26%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	-7%	-23%	-21%	-8%
Inpatient Admissions	7%	-5%	-11%	-6%
ER Visits	14%	-4%	-10%	-30%
Same-Quarter Re-Admissions for Same DRG	-29%	-11%	-29%	-21%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	28%	9%	-1%	-12%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-15%	-24%	-25%	-13%
Inpatient Admissions	-2%	-6%	-16%	-12%
ER Visits	4%	-5%	-15%	-35%
Same-Quarter Re-Admissions for Same DRG	-35%	-12%	-32%	-26%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	18%	8%	-6%	-17%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 8 Continued.** Percentage Difference in Observed Utilization Rates Among All Enrollees, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area E	Company 10, Area F	Company 10, Area G	Company 10, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-34%	-10%	-20%	-21%
Inpatient Admissions	-30%	-6%	-11%	-12%
ER Visits	-39%	-17%	-20%	-18%
Same-Quarter Re-Admissions for Same DRG	-57%	-10%	-38%	-30%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-36%	-2%	-3%	-6%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	-33%	-10%	-25%	-18%
Inpatient Admissions	-29%	-7%	-16%	-10%
ER Visits	-38%	-17%	-25%	-16%
Same-Quarter Re-Admissions for Same DRG	-56%	-11%	-42%	-28%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-36%	-3%	-9%	-3%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-35%	-11%	-24%	-21%
Inpatient Admissions	-31%	-8%	-15%	-13%
ER Visits	-40%	-18%	-24%	-19%
Same-Quarter Re-Admissions for Same DRG	-57%	-12%	-40%	-31%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-37%	-4%	-8%	-7%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Table 9.** Percentage Difference in Observed Utilization Rates Among Patients with Diabetes, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area A	Company 10, Area B	Company 10, Area C	Company 10, Area D
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-21%	-34%	-27%	-16%
Inpatient Admissions	-7%	-16%	-19%	-17%
ER Visits	3%	-12%	-15%	-40%
Same-Quarter Re-Admissions for Same DRG	-35%	-18%	-47%	-23%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	7%	0%	-4%	-20%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	-10%	-30%	-22%	-4%
Inpatient Admissions	6%	-11%	-12%	-6%
ER Visits	17%	-7%	-9%	-32%
Same-Quarter Re-Admissions for Same DRG	-26%	-13%	-42%	-12%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	22%	6%	3%	-8%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-14%	-33%	-25%	-6%
Inpatient Admissions	2%	-15%	-16%	-7%
ER Visits	12%	-12%	-13%	-33%
Same-Quarter Re-Admissions for Same DRG	-29%	-17%	-45%	-14%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	16%	1%	-1%	-10%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with diabetes defined as HCCs 15, 16, 17, 18, or 19. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 9 Continued.** Percentage Difference in Observed Utilization Rates Among Patients with Diabetes, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area E	Company 10, Area F	Company 10, Area G	Company 10, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-41%	-13%	-30%	-26%
Inpatient Admissions	-39%	-11%	-23%	-19%
ER Visits	-44%	-19%	-32%	-23%
Same-Quarter Re-Admissions for Same DRG	-59%	-10%	-37%	-33%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-48%	-7%	-19%	-13%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	-37%	-11%	-26%	-20%
Inpatient Admissions	-34%	-8%	-18%	-12%
ER Visits	-40%	-16%	-28%	-16%
Same-Quarter Re-Admissions for Same DRG	-56%	-8%	-33%	-27%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-45%	-4%	-14%	-6%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-39%	-12%	-27%	-22%
Inpatient Admissions	-37%	-9%	-19%	-14%
ER Visits	-42%	-17%	-29%	-19%
Same-Quarter Re-Admissions for Same DRG	-58%	-9%	-34%	-29%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-47%	-5%	-15%	-9%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with diabetes defined as HCCs 15, 16, 17, 18, or 19. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Table 10.** Percentage Difference in Observed Utilization Rates Among Patients with Heart Disease, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area A	Company 10, Area B	Company 10, Area C	Company 10, Area D
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-2%	-17%	-24%	-9%
Inpatient Admissions	9%	3%	-14%	-8%
ER Visits	6%	-2%	-13%	-38%
Same-Quarter Re-Admissions for Same DRG	-24%	-10%	-30%	-21%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	35%	23%	0%	-12%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	0%	-17%	-20%	-3%
Inpatient Admissions	12%	2%	-10%	-2%
ER Visits	8%	-2%	-9%	-34%
Same-Quarter Re-Admissions for Same DRG	-23%	-10%	-27%	-16%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	38%	22%	4%	-6%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-3%	-20%	-23%	-4%
Inpatient Admissions	8%	-2%	-13%	-3%
ER Visits	5%	-6%	-13%	-35%
Same-Quarter Re-Admissions for Same DRG	-25%	-14%	-30%	-17%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	34%	18%	0%	-7%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with heart disease defined as HCCs 79-83, 92, 104, 105. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Table 10 Continued.** Percentage Difference in Observed Utilization Rates Among Patients with Heart Disease, Company 10 Medicare Advantage HMOs in Seven Areas Relative to Local FFS

Data from 2005 and 2006 (Pooled)	Company 10, Area E	Company 10, Area F	Company 10, Area G	Company 10, Average
MA Rate vs. FFS Rate (Per Person)				
<b>Hospital</b>				
Inpatient Days	-29%	-7%	-21%	-15%
Inpatient Admissions	-26%	-4%	-12%	-7%
ER Visits	-38%	-17%	-29%	-19%
Same-Quarter Re-Admissions for Same DRG	-51%	-5%	-36%	-25%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-32%	0%	-5%	1%
MA Rate vs. FFS Rate (Per HCC)				
<b>Hospital</b>				
Inpatient Days	-28%	-8%	-19%	-14%
Inpatient Admissions	-26%	-6%	-10%	-6%
ER Visits	-38%	-18%	-27%	-17%
Same-Quarter Re-Admissions for Same DRG	-51%	-6%	-35%	-24%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-32%	-1%	-3%	3%
MA Rate vs. FFS Rate (Per Risk Score* Value)				
<b>Hospital</b>				
Inpatient Days	-29%	-9%	-20%	-16%
Inpatient Admissions	-27%	-7%	-11%	-8%
ER Visits	-39%	-19%	-28%	-19%
Same-Quarter Re-Admissions for Same DRG	-52%	-7%	-35%	-26%
13 "Potentially Avoidable" Admissions (AHRQ Definitions)	-33%	-2%	-4%	1%

Source: AHIP calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage plan.

Notes: FFS = enrollees with Medicare's traditional fee-for-service coverage; MA = Medicare Advantage enrollees; ER = Emergency Room; patients with heart disease defined as HCCs 79-83, 92, 104, 105. FFS does not include certain Medicaid enrollees (defined as those with 12 months of state assistance in the 5 percent sample claims data).

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. Therefore, these computed risk scores may not be exactly the same as those used for risk adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

## APPENDIX A: RECENT STUDIES COMPARING MA AND FFS QUALITY OR SERVICE INDICATORS

Outside of the new research from AHIP and the Alliance for Community Health Plans and the (as yet unpublished) Brookings and MedAssurant, Inc. research, empirical studies comparing the patient outcomes or utilization patterns in MA plans and FFS tend to be fairly old and have shown mixed results.

In their 2002 *Health Affairs* meta-analysis of 79 studies released from 1997-2001, Miller and Luft reported results suggesting that HMO and FFS plans (including non-MA coverage) provide roughly comparable quality of care, while HMOs reduce use of hospital and other expensive resources somewhat. However, HMO enrollees reported less favorable results on access to care and satisfaction measures compared with their FFS counterparts. The researchers concluded that health care quality results were heterogeneous, varying widely among providers, plans (HMO and non-HMO), and geographic regions.<sup>1</sup>

A 2003 report in *Inquiry* (Davidson), based on a study of more than 80,000 patients with three chronic conditions (asthma, diabetes, and congestive heart failure), found that health plan patients were more likely than those with FFS coverage to see primary care physicians and specialists within a year and less likely to use hospital emergency rooms or have inpatient admissions.<sup>2</sup>

An October 2004 study in *Health Services Research* (Dhanani) on hospital use among Medicare HMO and FFS beneficiaries in California found that when beneficiaries joined a group/staff HMO, their total inpatient days per year were 18 percent lower than if they had remained in Medicare FFS.

Medicare group/staff and IPA-model HMO members had approximately 60 percent of the total inpatient days per thousand in 1995 as did FFS beneficiaries. The study did not compare the quality of care received by the two groups.<sup>3</sup>

A report in the May 2003 issue of *JAMA* (McCarthy) found that Medicare health plan members who were dying from cancer had higher rates of hospice use than did those with FFS Medicare. Among hospice users, length of stay was longer for Medicare health plan members than for those with FFS coverage.<sup>4</sup>

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<sup>1</sup> Miller, R., & Luft, H.S. (2002). HMO Plan Performance Update: An Analysis of the Literature, 1997-2001. *Health Affairs*. 21(4). 63-86.

<sup>2</sup> Davidson, S.M. (2003). Utilization of Services by Chronically Ill People in Managed Care and Indemnity Plans: Implications for Quality. *Inquiry*. 40(Spring 2003). 57-70.

<sup>3</sup> Dhanani, N., et al. (2004). The Effect of HMOs on the Inpatient Utilization of Medicare Beneficiaries. *Health Services Research*. 39(5). 1607-1627.

<sup>4</sup> McCarthy, E. et al. (2003). Hospice Use Among Medicare Managed Care and Fee-for-Service Patients Dying with Cancer. *JAMA*. 289(17). 2238-2245.

A 2004 article in *JAMA* (Landon) showed that Medicare health plan members reported fewer problems with paperwork, information, and customer service than did beneficiaries with Medicare FFS coverage. In addition, those in Medicare health plans were more likely to report having received shots for flu and pneumonia, and smokers in Medicare health plans were more likely than those with Medicare FFS coverage to report having been counseled to quit. However, those with FFS Medicare rated their experiences with care higher than did those in Medicare health plans.<sup>5</sup>

A 2004 study in *Inquiry* (Meara) found that the presence of Medicare health plans in a local market had a slight spillover effect in FFS Medicare with respect to use of a diagnostic procedure for heart attack patients. Specifically, increased penetration of Medicare managed care in local markets modestly reduced the likelihood that beneficiaries in FFS Medicare who were hospitalized for heart attacks would receive the diagnostic imaging procedure known as coronary angiography (also called cardiac catheterization) for all categories of appropriateness (appropriate, discretionary, or inappropriate).<sup>6</sup>

Based on analysis and modeling of data from the Medicare Current Beneficiary Survey (MCBS) cost and use files, Michael Chernew (NBER 2008) found that a one percentage point increase in Medicare HMO penetration in a county was associated with reduced spending on Medicare FFS beneficiaries by 0.9 percent. This relationship was driven by beneficiaries with at least one chronic condition, and there was no systematic relationship for beneficiaries with no reported chronic conditions.<sup>7</sup>

Recently, MedPAC has focused mostly on relative costs, not quality, comparing the county-by-county estimates of projected FFS costs with MA plan reimbursements<sup>8</sup> and consumer satisfaction surveys. In its March 2008 Report to Congress, MedPAC reported that beneficiaries in FFS and MA had similar experiences in accessing care, obtaining needed care, and delaying care because of costs, based on data derived from the 2005 MCBS. Higher proportions of FFS beneficiaries reported not having a usual source of care or a usual doctor.

A recent non-empirical study in *Health Affairs* by Marsha Gold of Mathematica Policy Research, Inc. concluded that private fee-for-service (PFFS) plans, a subset currently comprising about 20 percent of all MA plans, would likely not be able to raise quality levels because of inherent difficulties coordinating care with non-network physicians.<sup>9</sup>

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<sup>5</sup> Landon, B. (2004). Comparison of Performance of Traditional Medicare vs Medicare Managed Care. *JAMA*. 291(14). 1744-1752.

<sup>6</sup> Meara, E. (2004). The Effect of Managed Care Market Share on Appropriate Use of Coronary Angiography Among Traditional Medicare Beneficiaries. *Inquiry*. 41(Summer 2004). 144-158.

<sup>7</sup> Chernew, M. et al. (2008). Managed Care and Medical Expenditures of Medicare Beneficiaries. Working Paper 13747. Cambridge, MA: National Bureau of Economic Research.

<sup>8</sup> See, for example, Chapter 3 of MedPAC's "Report to Congress: Medicare Payment Policy" (March 2008), and Carlos Zarabosa and Scott Harrison, "Payment Policy and the Growth of Medicare Advantage," *Health Affairs* (January 2009).

<sup>9</sup> Gold, M. "Medicare's Private Plans: A Report Card on Medicare Advantage." *Health Affairs*. (January 2009). Gold's article asserted that there were "no apparent quality gains" among all MA plans, but the analysis of the potential for quality improvements was not empirical and was based only on PFFS plans.

## APPENDIX B: RISK SCORE DESCRIPTION AND METHODOLOGY

In this study, we used the main elements of the risk scores developed for payment purposes by CMS. The CMS risk scores are based on the beneficiaries' demographic status and relative cost values of their Hierarchical Condition Categories<sup>1</sup> (HCCs), which are major diagnosis groups.

HCC codes were derived from the ICD-9 diagnosis codes assigned to each Medicare discharge for beneficiaries in the California and Nevada datasets. Table C-1 is an example of the ICD-9 to HCC crosswalk for HCC 79 (Cardio-Respiratory Failure and Shock). In addition to the primary diagnosis code, there were up to 24 secondary diagnoses in the California data and up to 14 secondary diagnoses in the Nevada data. Risk scores for each patient were based on diagnoses from all discharges in the year. If a beneficiary had an ICD-9 diagnosis within the HCC category, the beneficiary was assigned the value of "1" for the HCC. The patient's risk score was then calculated as the sum of each value that the CMS risk adjustment system provides each of the 70 HCCs, as well as the elements for the age and sex of the beneficiary (see Tables B-1, B-2, and B-3).

The risk scores used for comparison in this study are not identical to the CMS risk scores used for payment purposes. First, we did not use the CMS risk score elements for disease interaction, disability, or institutional status elements. Second, the risk score calculations were based on a limited number of diagnosis codes per claim (six) for Company 9, and they do not include HCCs for AIDS, behavioral health or substance abuse for Company 10.

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<sup>1</sup> The definitions of HCCs are based on the concept of disease hierarchies. Condition Categories (CCs) and RxGroups (RxGs) are grouped into hierarchies within clinically related medical conditions (CCs) or pharmaceutical groups (RxGs). The hierarchies are used in the risk calculation process to diminish the risk inflation caused when a single individual has two or more closely related conditions. The imposition of the hierarchies causes the lesser conditions within each hierarchy to be ignored for the purpose of calculating risk. <http://www.dxcg.com/docs/news-events/Glossary.pdf>.

**Table B-1.** Example of ICD-9-CM Code Crosswalk with Hierarchical Condition Category 79

ICD-9-CM Code	ICD9_Description	CMS-HCC Model Category	Category Name
4274	Ventricular Fibrillation/Flutter	79	Cardio Respiratory Failure And Shock
42741	Ventricular Fibrillation	79	Cardio Respiratory Failure And Shock
42742	Ventricular Flutter	79	Cardio Respiratory Failure And Shock
4275	Cardiac Arrest	79	Cardio Respiratory Failure And Shock
5184	Acute Lung Edema Nos	79	Cardio Respiratory Failure And Shock
5185	Post Traumatic Pulmonary Insufficiency	79	Cardio Respiratory Failure And Shock
51881	Acute Respiratory Failure	79	Cardio Respiratory Failure And Shock
51882	Other Pulmonary Insufficiency	79	Cardio Respiratory Failure And Shock
51883	Chronic Respiratory Failure	79	Cardio Respiratory Failure And Shock
51884	Acute & Chronic Respiratory Fail	79	Cardio Respiratory Failure And Shock
7855	Shock Without Trauma	79	Cardio Respiratory Failure And Shock
78550	Shock Nos	79	Cardio Respiratory Failure And Shock
78551	Cardiogenic Shock	79	Cardio Respiratory Failure And Shock
798	Sudden Death Cause Unknown	79	Cardio Respiratory Failure And Shock
7980	Sudden Infant Death Syndrome	79	Cardio Respiratory Failure And Shock
7981	Instantaneous Death	79	Cardio Respiratory Failure And Shock
7982	Death Within 24 Hr Symptom	79	Cardio Respiratory Failure And Shock
7989	Unattended Death	79	Cardio Respiratory Failure And Shock
7990	Asphyxia	79	Cardio Respiratory Failure And Shock
79901	Asphyxia	79	Cardio Respiratory Failure And Shock
79902	Hypoxemia	79	Cardio Respiratory Failure And Shock

Source: The ICD-9-CM to HCC crosswalk are from Humana, Inc., "CMS-HCC Medicare Risk Adjustment Model" and can be found at [http://www.humana.com/providers/MedPlans/MRA\\_PFFS.asp?plan=H3](http://www.humana.com/providers/MedPlans/MRA_PFFS.asp?plan=H3).

**Table B-2.** Age/Sex Risk Factor Values

Sex, Age	Risk Factor Value
Female, Age 65-69	0.307
Female, Age 70-74	0.384
Female, Age 75-79	0.483
Female, Age 80-84	0.572
Female, Age 85-89	0.665
Male, Age 65-69	0.346
Male, Age 70-74	0.453
Male, Age 75-79	0.577
Male, Age 80-84	0.657
Male, Age 85-89	0.79

Source: Age/sex risk factor values are from the 2005 MA Ratebook compiled by the Centers for Medicare and Medicaid Services (CMS).

**Table B-3. Disease Group Factors**

HCC	Description	Risk Factor Value
HCC1	HIV/AIDS	0.685
HCC2	Septicemia/Shock	0.89
HCC5	Opportunistic Infections	0.652
HCC7	Metastatic Cancer and Acute Leukemia	1.464
HCC8	Lung, Upper Digestive Tract, and Other Severe Cancers	1.464
HCC9	Lymphatic, Head and Neck, Brain, and Other Major Cancers	0.69
HCC10	Breast, Prostate, Colorectal and Other Cancers and Tumors	0.233
HCC15	Diabetes with Renal or Peripheral Circulatory Manifestation	0.764
HCC16	Diabetes with Neurologic or Other Specified Manifestation	0.552
HCC17	Diabetes with Acute Complications	0.391
HCC18	Diabetes with Ophthalmologic or Unspecified Manifestation	0.343
HCC19	Diabetes without Complication	0.2
HCC21	Protein-Calorie Malnutrition	0.922
HCC25	End-Stage Liver Disease	0.9
HCC26	Cirrhosis of Liver	0.516
HCC27	Chronic Hepatitis	0.359
HCC31	Intestinal Obstruction/Perforation	0.408
HCC32	Pancreatic Disease	0.445
HCC33	Inflammatory Bowel Disease	0.307
HCC37	Bone/Joint/Muscle Infections/Necrosis	0.496
HCC38	Rheumatoid Arthritis and Inflammatory Connective Disease Tissue	0.322
HCC44	Severe Hematological Disorders	1.011
HCC45	Disorders of Immunity	0.83
HCC51	Drug/Alcohol Psychosis	0.353
HCC52	Drug/Alcohol Dependence	0.265
HCC54	Schizophrenia	0.543
HCC55	Major Depressive, Bipolar, and Paranoid Disorders	0.431
HCC67	Quadriplegia/Other Extensive Paralysis	1.181
HCC68	Paraplegia	1.181
HCC69	Spinal Cord Disorders/Injuries	0.492
HCC70	Muscular Dystrophy	0.386
HCC71	Polyneuropathy	0.268
HCC72	Multiple Sclerosis	0.517
HCC73	Parkinson's and Huntington's Diseases	0.475
HCC74	Seizure Disorders and Convulsions	0.269
HCC75	Coma, Brain Compression/Anoxic Damage	0.568
HCC77	Respirator Dependence/Tracheostomy Status	2.102
HCC78	Respiratory Arrest	1.429
HCC79	Cardio-Respiratory Failure and Shock	0.692

**Table B-3 Continued. Disease Group Factors**

HCC80	Congestive Heart Failure	0.417
HCC81	Acute Myocardial Infarction	0.348
HCC82	Unstable Angina and Other Acute Ischemic Heart Disease	0.348
HCC83	Angina Pectoris/Old Myocardial Infarction	0.235
HCC92	Specified Heart Arrhythmias	0.266
HCC95	Cerebral Hemorrhage	0.392
HCC96	Ischemic or Unspecified Stroke	0.306
HCC100	Hemiplegia/Hemiparesis	0.437
HCC101	Cerebral Palsy and Other Paralytic Syndromes	0.164
HCC104	Vascular Disease with Complications	0.677
HCC105	Vascular Disease	0.357
HCC107	Cystic Fibrosis	0.376
HCC 108	Chronic Obstructive Pulmonary Disease	0.376
HCC111	Aspiration and Specified Bacterial Pneumonias	0.693
HCC112	Pneumococcal Pneumonia, Emphysema, Lung Abscess	0.202
HCC119	Proliferative Diabetic Retinopathy and Vitreous Hemorrhage	0.349
HCC130	Dialysis Status	3.076
HCC131	Renal Failure	0.576
HCC132	Nephritis	0.273
HCC148	Decubitus Ulcer of Skin	1.03
HCC149	Chronic Ulcer of Skin, Except Decubitus	0.484
HCC150	Extensive Third-Degree Burns	0.962
HCC154	Severe Head Injury	0.568
HCC155	Major Head Injury	0.242
HCC157	Vertebral Fractures without Spinal Cord Injury	0.49
HCC158	Hip Fracture/Dislocation	0.392
HCC161	Traumatic Amputation	0.843
HCC164	Major Complications of Medical Care and Trauma	0.262
HCC174	Major Organ Transplant Status	0.722
HCC176	Artificial Openings for Feeding or Elimination	0.79
HCC177	Amputation Status, Lower Limb/Amputation Complications	0.843

Source: Age/Sex risk factor values are from the 2005 MA Ratebook compiled by the Centers for Medicare and Medicaid Services (CMS).

## APPENDIX C: UTILIZATION DEFINITIONS AND ISSUES

*Utilization Definitions.* We attempted to define utilization variables strictly, so that there would be as little plan-to-plan variation in measurement as possible, and so that comparison variables could be computed as closely as possible from the FFS claims. The coding logics and programming syntax that we used for the FFS calculations were provided to the MA plans in advance, including the lists of ICD-9 diagnosis codes that comprise the HCC aggregations, the precise algorithms for using diagnosis and procedure codes in the computation of potentially avoidable admissions, and the general utilization definitions. In some cases, plans could use this syntax directly in their internal systems; in other cases, the logics could be used although the MA plans used different software.<sup>1</sup>

For the purpose of calculating admissions and days, hospitals were defined as “acute care facilities ... a short-term hospital that has facilities, medical staff and all necessary personnel to provide diagnosis, care and treatment of a wide range of acute conditions, including injuries.” Thus, admissions and stays in post-acute care, long-term or rehabilitation hospitals were not included.

Office visits were defined as “each interface between a provider and a patient for a given day, at the provider’s office.” Specific procedure codes were sent to the MA plans to help define this variable. Home health visits, telephone consultations, nurse help-line calls, remote telemedicine events, and secure e-visits with health providers via e-mail or an MA plan’s Internet or other computerized systems were not included.

Outpatient visits were characterized in the instructions as follows: “visits to a facility outpatient setting ... [a]n outpatient setting is one where the patient can receive treatment or diagnosis of a condition, but is not hospitalized in an inpatient facility; e.g. ambulatory surgery center, dialysis center, MH-SA clinics. Includes in-and-out same day hospital events that don’t require an overnight stay. Exclude ER and physician office visits.”

*Issues in Defining Utilization Variables.* In general, the potentially avoidable admissions were defined very strictly, and plans reported no problems creating those data points. Likewise, the calculations of hospital admissions and days were relatively straightforward. However, computing the numbers of ER visits can be tricky. For example, a health plan may receive separate bills from the hospital, a radiology group, and a diagnostic testing unit resulting from one ER visit. Even a short ER visit can span two calendar days if, for example, a patient entered the ER near midnight and was sent home in the early morning hours of the next day. For the FFS data, we created logic for defining unique ER

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<sup>1</sup> Our preliminary coding is available to researchers at [www.ahipresearch.org](http://www.ahipresearch.org). Comments and suggestions to improve or make corrections to the coding systems would be welcomed by the authors. Although the ICD-9 codes vary slightly from year to year, we used the CMS revision dated November 19, 2007 for the computation of HCCs in 2005 and 2006.

visits leading to an admission from the hospital inpatient claims file and a separate logic for finding ER visits not leading to an admission from the outpatient claims data. Although these logics were also shared with the MA plans, their responses often required independent judgment and programming.

The definitions of outpatient facility visits and office visits also have some gray areas. One plan asked if it should count a separate outpatient facility visit if a patient came to a hospital to donate his or her own blood a few days before a surgery. (Our answer was “yes,” and we presume such visits were also captured for FFS from the 5 percent claims data.) Other MA plans that use self-contained, 24-hour urgent care centers wondered if some visits to these centers should be considered outpatient hospital or ER visits, especially since they could often serve patients who would otherwise end up in an ER or have their conditions treated at an outpatient facility. In general, we asked that visits to these centers be considered office visits, even if they involved complex procedures or multi-disciplinary work (e.g., X-rays, lab work) in addition to the primary provider visit. One MA plan used hospitalist physicians for post-discharge follow-up care. We coded these as outpatient facility visits. Thus the intensity of some office visits at MA plans that have multi-disciplinary or urgent care facilities may be higher in some instances than some routine outpatient hospital visits associated with other plans.

In general, our current data specification is not detailed enough to determine whether some plans are substituting in-home or remote patient contacts for in-person office visits themselves, or using highly intense office visits at multi-disciplinary clinics or urgent care centers as a substitute for outpatient hospital visits.

In the FFS 5 percent sample file, certain claims have some technical issues that can place duplicative diagnosis and utilization information in the same claim. To avoid double-counting HCCs or utilization on these FFS claims, we used a simple screening method suggested by Dr. Chris Hogan of Direct Research, LLC.<sup>2</sup>

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<sup>2</sup> The FFS claims files are designed so that each claim, including its utilization information, diagnosis information, and revenue codes, can occasionally have more than one “segment.” Multiple segments are the result of the claim containing more revenue codes than are able to be captured in a single line of data – typical lines can hold up to 45 revenue codes. When that number is exceeded, a new “segment” is created for the overflow. While each new segment (for a single claim) contains unique additional, non-duplicated revenue code information, all other information is duplicated (diagnosis, demographics, etc.). Therefore, counting utilization and diagnosis information from claims with multiple segments can cause duplication. Potential double-counting of utilization or diagnosis information is avoided by only counting one segment per claim. We believe this avoids counting duplicate utilization or diagnosis information from the FFS claims. The authors would like to thank Dr. Hogan for very helpful suggestions on this topic.

## APPENDIX D: POTENTIALLY AVOIDABLE ADMISSIONS DESCRIPTION AND METHODOLOGY

The potentially avoidable admissions definitions in this report were based on criteria developed by the Agency for Health Research and Quality (AHRQ) – the Prevention Quality Indicators – to measure inpatient admissions for ambulatory care sensitive conditions. AHRQ’s research has found that patients with these conditions would benefit from early intervention and outpatient care to potentially avoid hospitalization and worsening of the conditions.

For this study we used 13 of the 14 potentially avoidable admissions targeted by AHRQ. (One of the conditions, low birth weight, was not applicable to the population we studied.) The 13 AHRQ classifications we studied were:

- Diabetes, short-term complications
- Perforated appendicitis
- Diabetes, long-term complications
- Chronic obstructive pulmonary disease
- Hypertension
- Congestive heart failure
- Dehydration
- Bacterial pneumonia
- Urinary tract infections
- Angina without procedure
- Uncontrolled diabetes
- Adult asthma
- Lower extremity amputations among patients with diabetes

Each condition has a specified set of diagnosis codes and procedures to include or exclude in order to identify an individual with the potentially avoidable hospitalization. As an illustration, Table D-1 describes the criteria used to identify individuals with a potentially avoidable inpatient admission for bacterial pneumonia.

**Table D-1. Criteria for Identifying Preventable Admissions for Bacterial Pneumonia**

INCLUSIONS	EXCLUSIONS
ICD-9-CM Principal Diagnosis Codes for Bacterial Pneumonia	Exclude These Cases
481 (Pneumococcal Pneumonia)	Transferring From Another Institution (SID ASOURCE=2)
4822 (H.Influenzae Pneumonia)	MDC 14 (Pregnancy, Childbirth, And Puerperium)
48230 (Strep Pneumonia Unspecified)	MDC 15 (Newborn And Other Neonates)
48231 (Grp A Strep Pneumonia)	With Diagnosis Code For Sickle Cell Anemia Or HB-S Disease (see below)
48232 (Grp B Strep Pneumonia)	
48239 (Oth Strep Pneumonia )	Exclude These ICD-9-CM Diagnosis Codes
4829 (Bacterial Pneumonia Nos)	28241 (Thalassemia HB-S W/O Crisis)
4830 (Mycoplasma Pneumonia)	28242 (Thalassemia HB-S W Crisis)
4831 (Chlamydia Pneumonia Oct96-)	28260 (Sickle Cell Disease Nos)
4838 (Oth Spec Org Pneumonia)	28261 (HB-S Disease W/O Crisis)
485 (Bronchopneumonia Org Nos)	28262 (HB-S Disease W Crisis)
486 (Pneumonia, Organism Nos)	28263 (HB-S/HB-C Disease W/O Crisis)
	28264 (HB-S/HB-C Disease W Crisis)
	28268 (HB-S Disease W/O Crisis Nec)
	28269 (HB-Ss Disease Nec W Crisis)

Source: AHRQ Quality Indicators, Prevention Quality Indicators: Technical Specifications; Department of Health and Human Services, Agency for Healthcare Research and Quality, <http://www.qualityindicators.ahrq.gov>. October 2001. Version 3.1 (March 12, 2007).

## APPENDIX E: COMPANY 9 DETAILED DATA TABLES

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**Appendix Table E-1.** Company 9: Characteristics of Diabetes Patients in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of Patients with Diabetes (HCCs 15, 16, 17, 18, or 19)	499,572	17,528	10,466	11,698	4,936	14,039	11,714
Average Diabetes HCCs (Per MA Enrollee)	0.270	0.343	0.278	0.319	0.260	0.308	0.272
Average Diabetes HCCs (Per Patient with Diabetes)	1.281	1.337	1.096	1.289	1.107	1.365	1.109
Average Age of Patients with Diabetes	74.4	75.1	74.5	75.3	74.7	75.6	74.2
Age Distribution:							
Percent 85-89	8%	8%	5%	11%	6%	10%	5%
Percent 80-84	16%	19%	14%	19%	15%	20%	15%
Percent 75-79	23%	24%	26%	23%	26%	26%	26%
Percent 70-74	25%	24%	35%	23%	34%	22%	29%
Percent 65-69	<u>28%</u>	<u>24%</u>	<u>20%</u>	<u>25%</u>	<u>20%</u>	<u>22%</u>	<u>25%</u>
	100%	100%	100%	100%	100%	100%	100%
County Distribution							
		12%	17%	10%	10%	7%	1%
		6%	3%	23%	15%	14%	5%
		7%	24%	15%	7%	10%	2%
		9%	9%	24%	20%	4%	1%
		4%	2%	5%	7%	12%	2%
		6%	6%	6%	13%	6%	7%
		5%	1%	<u>17%</u>	<u>29%</u>	5%	14%
		11%	1%			6%	16%
		8%	6%			6%	1%
		6%	1%			9%	11%
		14%	12%			6%	2%
		5%	7%			11%	37%
		1%	1%			<u>5%</u>	<u>1%</u>
		<u>7%</u>	<u>8%</u>				
		100%	100%	100%	100%	100%	100%

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients. The percentages in this table may not sum to 100% due to rounding.

**Appendix Table E-2.** Company 9: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Diabetes Patients in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Diabetes	1,502,821	58,718	32,101	40,798	15,589	48,123	36,582
Average	3.008	3.350	3.067	3.488	3.158	3.428	3.123
Total Risk Score* Values Among Patients with Diabetes	771,065	29,977	17,125	20,857	8,295	24,823	19,301
Average	1.543	1.710	1.636	1.783	1.680	1.768	1.648
Selected Co-Morbidities Among Diabetes Patients							
HCCs 79, 80, 81, 82, 83, 92, 104, or 105 (Heart Disease)							
Number of HCCs	371,924	16,001	9,130	10,906	4,480	13,009	10,428
Average (Total Heart Disease HCCs Per Diabetes Patient)	0.744	0.913	0.872	0.932	0.908	0.927	0.890
HCC 96 (Stroke)							
Number of HCCs	26,541	1,010	711	830	327	934	862
Average (Total Stroke HCCs Per Diabetes Patient)	0.053	0.058	0.068	0.071	0.066	0.067	0.074
HCCs 111 or 112 (Pneumonia)							
Number of HCCs	7,857	279	197	235	71	275	182
Average (Total Pneumonia HCCs Per Diabetes Patient)	0.016	0.016	0.019	0.020	0.014	0.020	0.016
HCCs 130, 131, or 132 (Kidney and Renal Disease)							
Number of HCCs	55,137	2,055	1,319	1,260	664	1,859	1,592
Average (Total Kidney and Renal Disease HCCs Per Diabetes Patient)	0.110	0.117	0.126	0.108	0.135	0.132	0.136

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table E-3.** Company 9: Utilization Measures for Patients with Diabetes in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>							
Total	1,374,808	53,813	21,885	39,518	13,281	50,205	30,397
Average (Per Person)	2.752	3.070	2.091	3.378	2.691	3.576	2.595
Average (Per HCC)	0.915	0.916	0.682	0.969	0.852	1.043	0.831
Average (Per Risk Score* Value)	1.783	1.795	1.278	1.895	1.601	2.023	1.575
Max	359	309	157	251	296	248	279
<b>Inpatient Admissions</b>							
Total	241,980	8,318	4,650	5,614	2,183	8,828	5,797
Average (Per Person)	0.484	0.475	0.444	0.480	0.442	0.629	0.495
Average (Per HCC)	0.161	0.142	0.145	0.138	0.140	0.183	0.158
Average (Per Risk Score* Value)	0.314	0.277	0.272	0.269	0.263	0.356	0.300
Max	30	16	13	13	11	13	18
<b>Outpatient Hospital Visits</b>							
Total	2,554,252	54,503	34,867	37,591	18,447	66,869	48,175
Average (Per Person)	5.113	3.109	3.331	3.213	3.737	4.763	4.113
Average (Per HCC)	1.700	0.928	1.086	0.921	1.183	1.390	1.317
Average (Per Risk Score* Value)	3.313	1.818	2.036	1.802	2.224	2.694	2.496
Max	320	103	184	92	396	117	312
<b>ER Visits</b>							
Total	263,229	6,283	2,725	3,728	1,088	6,732	3,226
Average (Per Person)	0.527	0.358	0.260	0.319	0.220	0.480	0.275
Average (Per HCC)	0.175	0.107	0.085	0.091	0.070	0.140	0.088
Average (Per Risk Score* Value)	0.341	0.210	0.159	0.179	0.131	0.271	0.167
Max	140	18	15	20	15	29	18
<b>Office or Clinic Visits</b>							
Total	5,125,004	208,669	107,417	145,711	56,341	145,163	117,792
Average (Per Person)	10.259	11.905	10.263	12.456	11.414	10.340	10.056
Average (Per HCC)	3.410	3.554	3.346	3.572	3.614	3.016	3.220
Average (Per Risk Score* Value)	6.647	6.961	6.272	6.986	6.792	5.848	6.103
Max	215	117	82	172	135	125	66

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

**Appendix Table E-3 Continued.** Company 9: Utilization Measures for Patients with Diabetes in FFS and MA (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Hospital Re-Admissions (Same Quarter, Same DRG)</b>							
Total	9,296	386	112	246	54	443	117
Average (Per Person)	0.019	0.022	0.011	0.021	0.011	0.032	0.010
Average (Per HCC)	0.006	0.007	0.003	0.006	0.003	0.009	0.003
Average (Per Risk Score* Value)	0.012	0.013	0.007	0.012	0.007	0.018	0.006
Max	19	6	9	5	3	6	5
<b>13 Potentially Avoidable Admissions</b>							
Total	50,480	1,785	908	1,132	431	1,870	1,121
Average (Per Person)	0.101	0.102	0.087	0.097	0.087	0.133	0.096
Average (Per HCC)	0.034	0.030	0.028	0.028	0.028	0.039	0.031
Average (Per Risk Score* Value)	0.065	0.060	0.053	0.054	0.052	0.075	0.058
Max	25	10	8	6	8	10	10
<b>Selected Specific "Potentially Avoidable" Admissions</b>							
<b>Congestive Heart Failure (CHF)</b>							
Total	17,044	651	162	323	72	686	278
Average (Per Person)	0.034	0.037	0.015	0.028	0.015	0.049	0.024
Average (Per HCC)	0.011	0.011	0.005	0.008	0.005	0.014	0.008
Average (Per Risk Score* Value)	0.022	0.022	0.009	0.015	0.009	0.028	0.014
Max	14	10	4	5	3	9	7
<b>Chronic Obstructive Pulmonary Disease (COPD)</b>							
Total	4,896	171	92	72	29	179	126
Average (Per Person)	0.010	0.010	0.009	0.006	0.006	0.013	0.011
Average (Per HCC)	0.003	0.003	0.003	0.002	0.002	0.004	0.003
Average (Per Risk Score* Value)	0.006	0.006	0.005	0.003	0.003	0.007	0.007
Max	22	6	4	3	3	5	6

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table E-4.** Company 9: Characteristics of Heart Disease Patients in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of Patients with Heart Disease (HCCs 79, 80, 81, 82, 83, 92, 104, or 105 )	670,461	24,339	13,661	15,369	7,115	21,279	16,463
Average Heart Disease HCCs (Per MA Enrollee)	0.454	0.592	0.558	0.541	0.569	0.575	0.581
Average Heart Disease HCCs (Per Patient with Heart Disease)	1.604	1.662	1.684	1.666	1.682	1.679	1.685
Average Age of Patients with Heart Disease	76.4	76.9	75.7	77.0	75.8	77.6	75.8
Age Distribution:							
Percent 85-89	13%	14%	8%	16%	9%	17%	9%
Percent 80-84	22%	24%	19%	23%	19%	26%	20%
Percent 75-79	24%	25%	27%	24%	26%	25%	28%
Percent 70-74	22%	20%	31%	20%	31%	18%	26%
Percent 65-69	19%	17%	15%	17%	15%	15%	17%
	100%	100%	100%	100%	100%	100%	100%
County Distribution							
		15%	20%	8%	8%	6%	1%
		6%	3%	20%	13%	14%	5%
		6%	23%	18%	7%	8%	2%
		8%	8%	25%	20%	3%	1%
		3%	2%	5%	8%	14%	3%
		5%	5%	5%	14%	7%	7%
		5%	1%	18%	30%	5%	16%
		10%	1%			7%	18%
		9%	6%			6%	1%
		6%	1%			10%	10%
		13%	11%			6%	2%
		5%	7%			11%	35%
		2%	2%			4%	1%
		7%	9%				
		100%	100%	100%	100%	100%	100%

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients. The percentages in this table may not sum to 100% due to rounding.

**Appendix Table E-5.** Company 9: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Heart Disease Patients in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Heart Disease	2,175,280	83,289	46,357	55,426	23,970	74,033	56,433
Average	3.244	3.422	3.393	3.606	3.369	3.479	3.428
Total Risk Score* Values Among Patients with Heart Disease	1,181,009	44,968	25,195	29,832	13,161	40,296	30,517
Average	1.761	1.848	1.844	1.941	1.850	1.894	1.854
Selected Co-Morbidities Among Heart Disease Patients							
HCCs 15-19 (Diabetes)							
Number of HCCs	291,799	12,539	5,619	8,220	2,705	10,085	6,421
Average (Total Diabetes HCCs Per Heart Disease Patient)	0.435	0.515	0.411	0.535	0.380	0.474	0.390
HCC 96 (Stroke)							
Number of HCCs	47,022	1,770	1,171	1,234	573	1,820	1,554
Average (Total Stroke HCCs Per Heart Disease Patient)	0.070	0.073	0.086	0.080	0.081	0.086	0.094
HCCs 111 or 112 (Pneumonia)							
Number of HCCs	16,518	511	335	416	158	550	367
Average (Total Pneumonia HCCs Per Heart Disease Patient)	0.025	0.021	0.025	0.027	0.022	0.026	0.022
HCCs 130, 131, or 132 (Kidney and Renal Disease)							
Number of HCCs	74,569	2,733	1,804	1,637	966	2,616	2,298
Average (Total Kidney and Renal Disease HCCs Per Heart Disease Patient)	0.111	0.112	0.132	0.107	0.136	0.123	0.140

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table E-6.** Company 9: Utilization Measures for Patients with Heart Disease in FFS and Medicare Advantage (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>							
Total	2,653,222	197,339	39,980	67,809	23,647	94,057	57,242
Average (Per Person)	3.957	3.999	2.927	4.412	3.324	4.420	3.477
Average (Per HCC)	1.220	1.169	0.862	1.223	0.987	1.270	1.014
Average (Per Risk Score* Value)	2.247	2.165	1.587	2.273	1.797	2.334	1.876
Max	359	259	157	345	202	276	279
<b>Inpatient Admissions</b>							
Total	477,739	15,594	8,659	9,759	4,098	17,073	11,319
Average (Per Person)	0.713	0.641	0.634	0.635	0.576	0.802	0.688
Average (Per HCC)	0.220	0.187	0.187	0.176	0.171	0.231	0.201
Average (Per Risk Score* Value)	0.405	0.347	0.344	0.327	0.311	0.424	0.371
Max	30	16	13	20	11	19	18
<b>Outpatient Hospital Visits</b>							
Total	4,108,115	91,198	57,991	55,886	28,826	120,602	77,645
Average (Per Person)	6.127	3.747	4.245	3.636	4.051	5.668	4.716
Average (Per HCC)	1.889	1.095	1.251	1.008	1.203	1.629	1.376
Average (Per Risk Score* Value)	3.478	2.028	2.302	1.873	2.190	2.993	2.544
Max	189	103	275	212	396	117	340
<b>ER Visits</b>							
Total	449,889	10,453	4,379	5,766	1,868	11,675	5,499
Average (Per Person)	0.671	0.429	0.321	0.375	0.263	0.549	0.334
Average (Per HCC)	0.207	0.126	0.094	0.104	0.078	0.158	0.097
Average (Per Risk Score* Value)	0.381	0.232	0.174	0.193	0.142	0.290	0.180
Max	324	40	9	85	15	32	18
<b>Office or Clinic Visits</b>							
Total	7,809,989	315,855	152,615	207,482	88,438	236,725	178,350
Average (Per Person)	11.649	12.977	11.172	13.500	12.430	11.125	10.833
Average (Per HCC)	3.590	3.792	3.292	3.743	3.690	3.198	3.160
Average (Per Risk Score* Value)	6.613	7.024	6.057	6.955	6.720	5.875	5.844
Max	296	296	137	242	135	125	97

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table E-6 Continued.** Company 9: Utilization Measures for Patients with Heart Disease in FFS and MA (HMO) in Three Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 9A		Area 9B		Area 9C	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Hospital Re-Admissions (Same-Quarter, Same DRG)</b>							
Total	17,175	672	207	448	99	726	221
Average (Per Person)	0.026	0.028	0.015	0.029	0.014	0.034	0.013
Average (Per HCC)	0.008	0.008	0.004	0.008	0.004	0.010	0.004
Average (Per Risk Score* Value)	0.015	0.015	0.008	0.015	0.008	0.018	0.007
Max	19	8	3	16	4	8	5
<b>13 Potentially Avoidable Admissions</b>							
Total	89,945	2,931	1,553	1,774	722	3,094	2,004
Average (Per Person)	0.134	0.120	0.114	0.115	0.101	0.145	0.122
Average (Per HCC)	0.041	0.035	0.034	0.032	0.030	0.042	0.036
Average (Per Risk Score* Value)	0.076	0.065	0.062	0.059	0.055	0.077	0.066
Max	25	10	8	9	4	10	10
<b>Selected Specific "Potentially Avoidable" Admissions</b>							
<b>Congestive Heart Failure (CHF)</b>							
Total	32,426	1,164	265	622	141	1,192	500
Average (Per Person)	0.048	0.048	0.019	0.040	0.020	0.056	0.030
Average (Per HCC)	0.015	0.014	0.006	0.011	0.006	0.016	0.009
Average (Per Risk Score* Value)	0.027	0.026	0.011	0.021	0.011	0.030	0.016
Max	17	10	4	6	3	9	7
<b>Chronic Obstructive Pulmonary Disease (COPD)</b>							
Total	11,071	374	210	158	59	348	282
Average (Per Person)	0.017	0.015	0.015	0.010	0.008	0.016	0.017
Average (Per HCC)	0.005	0.004	0.005	0.003	0.002	0.005	0.005
Average (Per Risk Score* Value)	0.009	0.008	0.008	0.005	0.004	0.009	0.009
Max	22	7	5	8	3	5	6

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 9 and FFS comparison samples developed from inpatient, outpatient, and office visits with a maximum of six diagnosis codes per claim. There are 14 counties in comparison area 9A, 7 in area 9B, and 13 in area 9C. The comparison areas are in different states (Area 9C contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to six ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims. Therefore these computed risk scores may not be exactly the same as those used for risk-adjustment purposes. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

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**Appendix Table F-1.** Company 10: Characteristics of Diabetes Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	Area 10A			Area 10B		Area 10C		Area 10D	
	National FFS (5%)	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of Patients with Diabetes (HCCs 15, 16, 17, 18, or 19)	527,591	4,652	19,279	17,207	27,570	1,963	12,026	13,579	15,293
Average Diabetes HCCs (Per MA Enrollee)	0.304	0.241	0.245	0.261	0.360	0.235	0.243	0.317	0.292
Average Diabetes HCCs (Per Patient with Diabetes)	1.365	1.361	1.299	1.359	1.509	1.411	1.349	1.369	1.292
Average Age of Patients with Diabetes	74.5	74.6	74.8	74.7	76.3	74.4	75.6	75.0	74.6
Age Distribution:									
Percent 85-89	8%	9%	7%	8%	9%	8%	9%	9%	7%
Percent 80-84	17%	17%	17%	18%	22%	17%	19%	17%	16%
Percent 75-79	23%	22%	26%	22%	30%	21%	27%	25%	25%
Percent 70-74	25%	25%	28%	24%	25%	23%	27%	24%	30%
Percent 65-69	<u>27%</u>	<u>27%</u>	<u>23%</u>	<u>28%</u>	<u>14%</u>	<u>30%</u>	<u>18%</u>	<u>25%</u>	<u>22%</u>
	100%	100%	100%	100%	100%	100%	100%	100%	100%
County Distribution									
		73%	50%	6%	4%	12%	17%	5%	6%
		22%	46%	5%	1%	19%	17%	12%	3%
		<u>5%</u>	<u>4%</u>	5%	4%	12%	2%	4%	1%
				3%	1%	20%	26%	11%	22%
				34%	26%	3%	3%	12%	14%
				1%	0%	19%	25%	6%	2%
				13%	7%	<u>15%</u>	<u>11%</u>	9%	13%
				9%	4%			17%	30%
				5%	2%			11%	4%
				3%	4%			<u>12%</u>	<u>5%</u>
				3%	8%				
				7%	19%				
				1%	3%				
				<u>6%</u>	<u>14%</u>				
		100%	100%	100%	100%	100%	100%	100%	100%

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients. The percentages in this table may not sum to 100% due to rounding.



**Appendix Table F-2.** Company 10: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Diabetes Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10A		Area 10B		Area 10C		Area 10D	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Diabetes	1,827,652	15,765	57,373	59,623	90,086	6,742	38,364	48,945	48,297
Average	3.464	3.389	2.976	3.465	3.268	3.435	3.190	3.604	3.158
Total Risk Score* Values Among Patients with At Least One Admission	923,966	8,045	30,595	30,387	48,366	3,451	20,543	24,380	24,407
Average	1.751	1.729	1.587	1.766	1.754	1.758	1.708	1.795	1.596
Selected Co-Morbidities Among Diabetes Patients									
HCCs 79, 80, 81, 82, 83, 92, 104, or 105 (Heart Disease)									
Number of HCCs	486,042	3,902	12,643	15,117	19,132	1,561	9,173	13,287	12,425
Average (Total Heart Disease HCCs Per Diabetes Patient)	0.921	0.839	0.656	0.879	0.694	0.795	0.763	0.978	0.812
HCC 96 (Stroke)									
Number of HCCs	37,547	283	1,046	1,265	1,879	100	595	1,005	1,049
Average (Total Stroke HCCs Per Diabetes Patient)	0.071	0.061	0.054	0.074	0.068	0.051	0.049	0.074	0.069
HCCs 111 or 112 (Pneumonia)									
Number of HCCs	11,090	165	374	477	537	40	215	275	251
Average (Total Pneumonia HCCs Per Diabetes Patient)	0.021	0.035	0.019	0.028	0.019	0.020	0.018	0.020	0.016
HCCs 130, 131, or 132 (Kidney and Renal Disease)									
Number of HCCs	69,067	606	3,156	2,128	5,061	285	1,918	1,449	1,623
Average (Total Kidney and Renal Disease HCCs Per Diabetes Patient)	0.131	0.130	0.164	0.124	0.184	0.145	0.159	0.107	0.106

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to twelve ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, for patients with at least one hospital admission. HCCs for AIDS, behavioral health, and substance abuse not included. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-2 Continued.** Company 10: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Diabetes Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10E		Area 10F		Area 10G	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Diabetes	1,827,652	15,742	62,204	46,041	60,938	25,032	90,946
Average	3.464	3.849	3.589	3.658	3.540	3.537	3.329
Total Risk Score* Values Among Patients with Patients with Diabetes	923,966	7,992	32,666	23,304	31,270	12,760	46,835
Average	1.751	1.954	1.885	1.851	1.817	1.803	1.714
Selected Co-Morbidities Among Diabetes Patients							
HCCs 79, 80, 81, 82, 83, 92, 104, or 105 (Heart Disease)							
Number of HCCs	486,042	4,245	14,186	12,589	16,337	6,283	21,673
Average (Total Heart Disease HCCs Per Diabetes Patient)	0.921	1.038	0.819	1.000	0.949	0.888	0.793
HCC 96 (Stroke)							
Number of HCCs	37,547	341	1,157	978	1,377	533	1,920
Average (Total Stroke HCCs Per Diabetes Patient)	0.071	0.083	0.067	0.078	0.080	0.075	0.070
HCCs 111 or 112 (Pneumonia)							
Number of HCCs	11,090	114	287	324	384	158	433
Average (Total Pneumonia HCCs Per Diabetes Patient)	0.021	0.028	0.017	0.026	0.022	0.022	0.016
HCCs 130, 131, or 132 (Kidney and Renal Disease)							
Number of HCCs	69,067	675	4,550	1,914	2,939	1,054	4,780
Average (Total Kidney and Renal Disease HCCs Per Diabetes Patient)	0.131	0.165	0.263	0.152	0.171	0.149	0.175

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 11 counties in comparison area 10E, 11 in area 10F, and 6 in area 10G. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to twelve ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, for patients with at least one hospital admission. HCCs for AIDS, behavioral health, and substance abuse not included. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-3.** Company 10: Utilization Measures for Patients with Diabetes in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10A		Area 10B		Area 10C		Area 10D	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>									
Total	1,518,155	12,457	40,591	43,271	45,937	5,292	23,511	33,539	31,687
Average (Per Person)	2.878	2.678	2.105	2.515	1.666	2.696	1.955	2.470	2.072
Average (Per HCC)	0.831	0.790	0.707	0.726	0.510	0.785	0.613	0.685	0.656
Average (Per Risk Score* Value)	1.643	1.548	1.327	1.424	0.950	1.534	1.144	1.376	1.298
Max	353	128	270	353	295	101	189	139	211
<b>Inpatient Admissions</b>									
Total	262,930	2,288	8,854	7,315	9,877	917	4,574	5,879	5,465
Average (Per Person)	0.498	0.492	0.459	0.425	0.358	0.467	0.380	0.433	0.357
Average (Per HCC)	0.144	0.145	0.154	0.123	0.110	0.136	0.119	0.120	0.113
Average (Per Risk Score* Value)	0.285	0.284	0.289	0.241	0.204	0.266	0.223	0.241	0.224
Max	30	12	14	14	13	13	9	12	10
<b>Emergency Room Visits</b>									
Total	239,562	1,825	7,775	6,235	8,759	868	4,504	4,740	3,193
Average (Per Person)	0.454	0.392	0.403	0.362	0.318	0.442	0.375	0.349	0.209
Average (Per HCC)	0.131	0.116	0.136	0.105	0.097	0.129	0.117	0.097	0.066
Average (Per Risk Score* Value)	0.259	0.227	0.254	0.205	0.181	0.252	0.219	0.194	0.131
Max	140	9	23	25	14	13	21	12	13
<b>Hospital Re-Admissions (Same-Quarter, Same DRG)</b>									
Total	9,788	68	184	225	297	29	95	170	147
Average (Per Person)	0.019	0.015	0.010	0.013	0.011	0.015	0.008	0.013	0.010
Average (Per HCC)	0.005	0.004	0.003	0.004	0.003	0.004	0.002	0.003	0.003
Average (Per Risk Score* Value)	0.011	0.008	0.006	0.007	0.006	0.008	0.005	0.007	0.006
Max	19	4	5	7	10	8	2	3	3
<b>13 Potentially Avoidable Admissions</b>									
Total	54,309	386	1,708	1,258	2,020	153	898	1,076	974
Average (Per Person)	0.103	0.083	0.089	0.073	0.073	0.078	0.075	0.079	0.064
Average (Per HCC)	0.030	0.024	0.030	0.021	0.022	0.023	0.023	0.022	0.020
Average (Per Risk Score* Value)	0.059	0.048	0.056	0.041	0.042	0.044	0.044	0.044	0.040
Max	25	5	12	12	9	11	5	6	7

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states (area 9c contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to 12 ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, but do not include HCCs for AIDS, behavioral health, or substance abuse. Factors were taken from:

<http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-3 Continued.** Company 10: Utilization Measures for Patients with Diabetes in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10E		Area 10F		Area 10G	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>							
Total	1,518,155	13,290	33,256	38,895	46,038	23,477	63,264
Average (Per Person)	2.878	3.249	1.919	3.090	2.675	3.317	2.316
Average (Per HCC)	0.831	0.844	0.535	0.845	0.755	0.938	0.696
Average (Per Risk Score* Value)	1.643	1.663	1.018	1.669	1.472	1.840	1.351
Max	353	130	239	280	198	214	324
<b>Inpatient Admissions</b>							
Total	262,930	2,418	6,263	6,798	8,300	3,518	10,512
Average (Per Person)	0.498	0.591	0.361	0.540	0.482	0.497	0.385
Average (Per HCC)	0.144	0.154	0.101	0.148	0.136	0.141	0.116
Average (Per Risk Score* Value)	0.285	0.303	0.192	0.292	0.265	0.276	0.224
Max	30	16	12	14	13	12	14
<b>Emergency Room Visits</b>							
Total	239,562	1,925	4,587	5,515	6,108	3,277	8,572
Average (Per Person)	0.454	0.471	0.265	0.438	0.355	0.463	0.314
Average (Per HCC)	0.131	0.122	0.074	0.120	0.100	0.131	0.094
Average (Per Risk Score* Value)	0.259	0.241	0.140	0.237	0.195	0.257	0.183
Max	140	12	25	28	16	39	31
<b>Hospital Re-Admissions (Same-Quarter, Same DRG)</b>							
Total	9,788	90	156	241	295	103	251
Average (Per Person)	0.019	0.022	0.009	0.019	0.017	0.015	0.009
Average (Per HCC)	0.005	0.006	0.003	0.005	0.005	0.004	0.003
Average (Per Risk Score* Value)	0.011	0.011	0.005	0.010	0.009	0.008	0.005
Max	19	4	5	9	5	3	4
<b>13 Potentially Avoidable Admissions</b>							
Total	54,309	554	1,211	1,380	1,750	692	2,157
Average (Per Person)	0.103	0.135	0.070	0.110	0.102	0.098	0.079
Average (Per HCC)	0.030	0.035	0.019	0.030	0.029	0.028	0.024
Average (Per Risk Score* Value)	0.059	0.069	0.037	0.059	0.056	0.054	0.046
Max	25	8	8	9	8	7	8

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 11 counties in comparison area 10E, 11 in area 10F, and 6 in area 10G. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to 12 ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, but do not include HCCs for AIDS, behavioral health, or substance abuse. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-4.** Company 10: Characteristics of Heart Disease Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10A		Area 10B		Area 10C		Area 10D	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of Patients with Heart Disease (HCCs 79, 80, 81, 82, 83, 92, 104, or 105)	728,232	7,408	23,245	24,532	31,655	3,080	17,566	20,563	19,837
Average Heart Disease HCCs (Per MA Enrollee)	0.538	0.480	0.374	0.469	0.464	0.448	0.451	0.621	0.504
Average Heart Disease HCCs (Per Patient with Heart Disease)	1.749	1.704	1.648	1.709	1.694	1.716	1.716	1.773	1.721
Average Age of Patients with Heart Disease	76.4	76.6	76.6	76.8	78.4	77.0	77.3	76.5	76.1
Age Distribution:									
Percent 85-89	13%	13%	12%	15%	18%	16%	14%	13%	11%
Percent 80-84	22%	24%	22%	24%	27%	24%	24%	22%	20%
Percent 75-79	24%	23%	27%	23%	28%	22%	27%	25%	26%
Percent 70-74	22%	22%	23%	20%	19%	21%	23%	21%	26%
Percent 65-69	<u>19%</u>	<u>18%</u>	<u>15%</u>	<u>19%</u>	<u>8%</u>	<u>18%</u>	<u>12%</u>	<u>18%</u>	<u>17%</u>
	100%	100%	100%	100%	100%	100%	100%	100%	100%
County Distribution									
		71%	48%	5%	4%	10%	14%	6%	7%
		24%	48%	5%	2%	21%	19%	11%	3%
		<u>5%</u>	<u>4%</u>	5%	5%	13%	2%	4%	1%
				3%	1%	20%	24%	10%	20%
				33%	23%	4%	4%	13%	13%
				1%	1%	21%	28%	7%	2%
				14%	9%	<u>12%</u>	<u>8%</u>	8%	13%
				9%	5%			17%	33%
				5%	3%			10%	3%
				3%	5%			<u>14%</u>	<u>4%</u>
				4%	7%				
				6%	18%				
				2%	5%				
				<u>6%</u>	<u>13%</u>				
		100%	100%	100%	100%	100%	100%	100%	100%

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients. The percentages in this table may not sum to 100% due to rounding.



**Appendix Table F-5.** Company 10: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Heart Disease Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10A		Area 10B		Area 10C		Area 10D	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Heart Disease	2,684,751	26,493	81,280	89,784	116,624	11,426	62,332	76,752	69,656
Average	3.687	3.576	3.497	3.660	3.684	3.710	3.548	3.733	3.511
Total Risk Score* Values Among Patients with Heart Disease	1,426,310	14,250	45,155	48,150	64,948	6,184	35,103	39,990	36,706
Average	1.959	1.924	1.943	1.963	2.052	2.008	1.998	1.945	1.850
<b>Selected Co-Morbidities Among Heart Disease Patients</b>									
<b>HCCs 15-19 (Diabetes)</b>									
Number of HCCs	374,089	3,114	10,103	11,749	17,398	1,260	7,233	10,177	9,160
Average (Total Diabetes HCCs Per Heart Disease Patient)	0.514	0.420	0.435	0.479	0.550	0.409	0.412	0.495	0.462
<b>HCC 96 (Stroke)</b>									
Number of HCCs	67,437	610	1,867	2,390	3,268	258	1,190	1,930	1,872
Average (Total Stroke HCCs Per Heart Disease Patient)	0.093	0.082	0.080	0.097	0.103	0.084	0.068	0.094	0.094
<b>HCCs 111 or 112 (Pneumonia)</b>									
Number of HCCs	22,472	325	923	975	1,154	131	580	548	463
Average (Total Pneumonia HCCs Per Heart Disease Patient)	0.031	0.044	0.040	0.040	0.036	0.043	0.033	0.027	0.023
<b>HCCs 130, 131, or 132 (Kidney and Renal Disease)</b>									
Number of HCCs	94,369	972	3,973	2,891	5,954	423	2,873	2,252	2,212
Average (Total Kidney and Renal Disease HCCs Per Heart Disease Patient)	0.130	0.131	0.171	0.118	0.188	0.137	0.164	0.110	0.112

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to twelve ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, for patients with at least one hospital admission. HCCs for AIDS, behavioral health, and substance abuse not included. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-5 Continued.** Company 10: HCCs, Risk Scores,\* and Selected Co-Morbidities Among Heart Disease Patients in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10E		Area 10F		Area 10G	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
Number of All HCCs Among Patients with Heart Disease	2,684,751	24,492	87,399	66,508	84,944	38,282	116,999
Average	3.687	3.770	3.760	3.885	3.932	3.760	3.694
Total Risk Score* Values Among Patients with Heart Disease	1,426,310	13,121	47,514	35,255	45,540	20,465	62,894
Average	1.959	2.020	2.044	2.060	2.108	2.010	1.986
Selected Co-Morbidities Among Heart Disease Patients							
HCCs 15-19 (Diabetes)							
Number of HCCs	374,089	3,255	13,466	9,648	12,154	5,323	19,117
Average (Total Diabetes HCCs Per Heart Disease Patient)	0.514	0.501	0.579	0.564	0.563	0.523	0.604
HCC 96 (Stroke)							
Number of HCCs	67,437	640	1,963	1,693	2,218	1,060	3,136
Average (Total Stroke HCCs Per Heart Disease Patient)	0.093	0.099	0.084	0.099	0.103	0.104	0.099
HCCs 111 or 112 (Pneumonia)							
Number of HCCs	22,472	230	626	604	743	337	808
Average (Total Pneumonia HCCs Per Heart Disease Patient)	0.031	0.035	0.027	0.035	0.034	0.033	0.026
HCCs 130, 131, or 132 (Kidney and Renal Disease)							
Number of HCCs	94,369	942	5,940	2,671	3,951	1,383	5,332
Average (Total Kidney and Renal Disease HCCs Per Heart Disease Patient)	0.130	0.145	0.256	0.156	0.183	0.136	0.168

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plan.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 11 counties in comparison area 10E, 11 in area 10F, and 6 in area 10G. The comparison areas are in different states. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to twelve ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, for patients with at least one hospital admission. HCCs for AIDS, behavioral health, and substance abuse not included. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-6.** Company 10: Utilization Measures for Patients with Heart Disease in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	Area 10A			Area 10B		Area 10C		Area 10D	
	National FFS (5%)	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>									
Total	2,849,344	27,378	84,053	83,829	90,203	12,220	53,075	68,458	60,297
Average (Per Person)	3.913	3.696	3.616	3.417	2.850	3.968	3.021	3.329	3.040
Average (Per HCC)	1.061	1.033	1.034	0.934	0.773	1.069	0.851	0.892	0.866
Average (Per Risk Score* Value)	1.998	1.921	1.861	1.741	1.389	1.976	1.512	1.712	1.643
Max	353	128	270	353	295	101	189	172	211
<b>Inpatient Admissions</b>									
Total	511,341	5,303	18,154	14,802	19,594	2,147	10,591	12,375	11,013
Average (Per Person)	0.702	0.716	0.781	0.603	0.619	0.697	0.603	0.602	0.555
Average (Per HCC)	0.190	0.200	0.223	0.165	0.168	0.188	0.170	0.161	0.158
Average (Per Risk Score* Value)	0.359	0.372	0.402	0.307	0.302	0.347	0.302	0.309	0.300
Max	30	13	15	14	14	13	12	18	10
<b>Emergency Room Visits</b>									
Total	417,418	3,896	12,959	11,502	14,577	1,850	9,134	8,857	5,301
Average (Per Person)	0.573	0.526	0.557	0.469	0.460	0.601	0.520	0.431	0.267
Average (Per HCC)	0.155	0.147	0.157	0.128	0.125	0.162	0.147	0.115	0.076
Average (Per Risk Score* Value)	0.293	0.273	0.287	0.239	0.224	0.299	0.260	0.221	0.144
Max	324	14	23	83	38	13	18	28	13
<b>Hospital Re-Admissions (Same-Quarter, Same DRG)</b>									
Total	17,582	158	375	456	531	57	226	364	277
Average (Per Person)	0.024	0.021	0.016	0.019	0.017	0.019	0.013	0.018	0.014
Average (Per HCC)	0.007	0.006	0.005	0.005	0.005	0.005	0.004	0.005	0.004
Average (Per Risk Score* Value)	0.012	0.011	0.008	0.009	0.008	0.009	0.006	0.009	0.008
Max	19	4	5	7	7	8	3	12	3
<b>13 Potentially Avoidable Admissions</b>									
Total	95,276	760	3,229	2,396	3,799	335	1,905	2,046	1,738
Average (Per Person)	0.131	0.103	0.139	0.098	0.120	0.109	0.108	0.099	0.088
Average (Per HCC)	0.035	0.029	0.040	0.027	0.033	0.029	0.031	0.027	0.025
Average (Per Risk Score* Value)	0.067	0.053	0.072	0.050	0.058	0.054	0.054	0.051	0.047
Max	25	6	12	12	9	11	5	17	7

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 3 counties in comparison area 10A, 14 in area 10B, 7 in area 10C, and 10 in area 10D. The comparison areas are in different states (area 9c contains counties in two adjacent states). Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to 12 ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, but do not include HCCs for AIDS, behavioral health, or substance abuse. Factors were taken from:

<http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.

**Appendix Table F-6 Continued.** Company 10: Utilization Measures for Patients with Heart Disease in FFS and Medicare Advantage (HMO) in Seven Comparison Areas

Data from 2005 and 2006 (Pooled)	National FFS (5%)	Area 10E		Area 10F		Area 10G	
		Local FFS	MA Plan	Local FFS	MA Plan	Local FFS	MA Plan
<b>Inpatient Days</b>							
Total	2,849,344	25,889	66,096	70,449	82,707	46,329	114,138
Average (Per Person)	3.913	3.985	2.843	4.115	3.828	4.550	3.604
Average (Per HCC)	1.061	1.057	0.756	1.059	0.974	1.210	0.976
Average (Per Risk Score* Value)	1.998	1.973	1.391	1.998	1.816	2.264	1.815
Max	353	130	239	280	198	214	324
<b>Inpatient Admissions</b>							
Total	511,341	4,876	12,946	12,797	15,427	7,111	19,540
Average (Per Person)	0.702	0.751	0.557	0.748	0.714	0.698	0.617
Average (Per HCC)	0.190	0.199	0.148	0.192	0.182	0.186	0.167
Average (Per Risk Score* Value)	0.359	0.372	0.272	0.363	0.339	0.347	0.311
Max	30	16	13	14	13	12	14
<b>Emergency Room Visits</b>							
Total	417,418	3,485	7,677	9,271	9,718	6,153	13,671
Average (Per Person)	0.573	0.536	0.330	0.542	0.450	0.604	0.432
Average (Per HCC)	0.155	0.142	0.088	0.139	0.114	0.161	0.117
Average (Per Risk Score* Value)	0.293	0.266	0.162	0.263	0.213	0.301	0.217
Max	324	12	16	28	30	39	31
<b>Hospital Re-Admissions (Same-Quarter, Same DRG)</b>							
Total	17,582	166	290	405	488	221	440
Average (Per Person)	0.024	0.026	0.012	0.024	0.023	0.022	0.014
Average (Per HCC)	0.007	0.007	0.003	0.006	0.006	0.006	0.004
Average (Per Risk Score* Value)	0.012	0.013	0.006	0.011	0.011	0.011	0.007
Max	19	5	5	9	9	3	5
<b>13 Potentially Avoidable Admissions</b>							
Total	95,276	944	2,297	2,446	3,083	1,281	3,787
Average (Per Person)	0.131	0.145	0.099	0.143	0.143	0.126	0.120
Average (Per HCC)	0.035	0.039	0.026	0.037	0.036	0.033	0.032
Average (Per Risk Score* Value)	0.067	0.072	0.048	0.069	0.068	0.063	0.060
Max	25	8	8	8	8	7	8

Source: Authors' calculations, based on the Medicare 5 percent sample files for hospital and physician claims, and data from a large, multi-state Medicare Advantage HMO plans.

Notes: FFS = Medicare traditional fee-for-service program; MA = Medicare Advantage. HCCs for Company 10 and FFS comparison samples developed from inpatient, outpatient, and office visits, with a maximum of 12 diagnoses per claim. HCCs 1, 27, 52-55 not included. There are 11 counties in comparison area 10E, 11 in area 10F, and 6 in area 10G. Comparisons are for beneficiaries aged 65-89, enrolled 12 months of the calendar year. FFS enrollees do not include full-year Medicaid recipients.

\* Risk scores for FFS and MA enrollees based on age/sex and HCC relative cost values used in Medicare risk adjustment for beneficiaries living in the community, but do not include disease interactive factors, or factors related to disability or institutional status. HCCs based on up to 12 ICD-9 diagnosis codes per claim for inpatient, outpatient, and office claims, but do not include HCCs for AIDS, behavioral health, or substance abuse. Factors were taken from: <http://www.cms.hhs.gov/MedicareAdvgtgSpecRateStats/>. Accessed March 19, 2009.



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