THE IMPACT OF DUAL ELIGIBLE POPULATIONS ON CMS FIVE-STAR QUALITY MEASURES AND MEMBER OUTCOMES IN MEDICARE ADVANTAGE HEALTH PLANS

INOVALON RESEARCH BRIEF

October 30, 2013

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Abstract

Background

Many studies have compared the differences between dual eligible and non-dual eligible beneficiaries in the Medicare population regarding severity of illness, frailty, and utilization costs. What remains unknown, however, is whether these differences might make it more difficult for health plans and providers caring for high proportions of dual eligibles to achieve the benchmarks of quality expected for health plans participating in the Medicare Advantage program. This study uniquely examines performance based on CMS Five-Star quality rating measure outcomes and expands in scale and granularity on what has previously been done to examine the question of quality performance among duals versus non-duals. Leveraging access to large-scale datasets, this study has been conducted at the individual Medicare Advantage (MA) member level, controlling for what otherwise would be confounding factors of plans and populations, to evaluate a material difference in these two populations with respect to the aforementioned quality outcomes measurement.

Methods

The study utilized member-level MA data extracted from Inovalon's Medical Outcomes Research for Effectiveness and Economics Registry (MORE² Registry®). The MORE² Registry provides visibility into the medical utilization of over 98 million unique and de-identified individuals nationwide covering more than 3.1 billion member-months of data from 2002 through September of 2013. Within this study, from the 11.8 million MA enrollees present within the MORE² Registry, Inovalon identified 1,335,709 enrollees in 2011 (16.6% dual eligible) and 1,605,644 enrollees in 2012 (16.2% dual eligible) from 80 individual Centers for Medicare and Medicaid Services (CMS) contracts who met the study inclusion criteria (described in the Methods section below). Rates for nine Star measures were calculated independently for the dual and non-dual eligible members and then within each of those groups stratifying by various demographic, clinical, and socioeconomic characteristics. In addition a tenth measure, plan all-cause readmission rate (PCR) was calculated using the National Committee for Quality Assurance (NCQA) risk adjustment model for MA members age 65 and older, which controls for chronic conditions and factors impacting likelihood of readmission.

Results

A significant association was found between dual eligible status and lower performance on specific Part C and D measure Star ratings. The results validate the integral role that income, race/ethnicity, and gender play on the HEDIS® and CMS Part D measures used in the Five-Star rating system. As evidenced by this analysis, the gap has widened in reported Star ratings for 2012 and 2013 compared to previous findings. When scored by either the Charlson Comorbidity Index or CMS MA risk score, dual eligible members were found to be consistently more complex to manage. Additionally, examination of 80 CMS MA contracts indicated that dual eligible members performed worse on nine of the ten Star measures that were investigated. Further, multivariate analyses controlling for demographics, socioeconomic characteristics, and severity of illness confirm dual members consistently underperform in eight of the ten measures investigated. This is an important finding demonstrating a fundamental difference in outcomes of dual members versus non-dual members even after controlling for other factors that impact outcomes. Further investigation is needed to better understand what drives this difference in outcomes. Only the PCR measure controls for differences in demographics and severity of illness; however, these adjustments do not fully capture the entire observed difference in the dual population within this measure.

Conclusions

A significant performance gap exists between dual eligible and non-dual eligible members even after adjusting for other important socioeconomic and clinical risk factors. These findings suggest that the Five-Star rating system, in its current state may penalize MA plans serving a high proportion of dual eligible beneficiaries. Lower Star ratings result in lower incentive payments and may lead to reduced services to dual eligibles. These study results suggest a need for further research into the benchmarking and refinement of Star quality measures to assure fair comparisons of performance across MA plans serving different populations.

Background

The MA Five-Star rating system was developed to drive quality improvement through public reporting and consumer choice by providing information to help beneficiaries compare the quality of care delivered by the various health plan options available to them.[1] CMS guidance for health plan selection is a record of high-quality service, defined by at least three Stars. In addition, under the Affordable Care Act (ACA), CMS has implemented a quality bonus program for plans earning three or more Stars.[1]

Plans serving predominantly dual eligible and special needs populations are rated on the same scale as other MA plans for quality reporting and incentive payments.[1] The key hypothesis of this study is that comparing plans serving a high proportion of dual eligible members to those serving relatively few will reflect the higher disease burden and socioeconomic conditions prevalent in the dual population and not the appropriateness of care delivered by providers or the care management delivered by the plans.

"This apples-to-oranges comparison could have adverse consequences on the care of this population by providing plans an unintended incentive to select healthier populations."[1] Lower performance rankings could penalize plans serving large dual eligible populations and result in lower quality-based payments, leading to fewer supplemental benefits for a population that is most in need and least capable of paying for their own care.[7] Several studies have shown that pay-for-performance systems can lead to unintended consequences in access to care and worsen health disparities in some ethnic groups and low income populations.[2]

In 2011, roughly 10 million members were jointly enrolled in Medicare and Medicaid[3] and were dual eligible either because they were 65 years or older with low income, or younger than 65 and disabled with low income. Dual eligible beneficiaries account for approximately 15% of all Medicaid beneficiaries, but for approximately 40% of Medicaid expenditures.[4]

Compared with non-dual eligible beneficiaries, dual members are more likely to be female, lack a high school diploma, have greater limitations in activities of daily living, reside in a rural area, and live in an institution.[5] Dual eligibles include more racial and ethnic minorities than the general Medicare population. One-third are black or Hispanic; these populations are vulnerable to the racial disparities that are persistent in healthcare, such as inequitable access to preventive screenings.[1] Mental illness is also more prevalent and these individuals are less likely to adhere to clinical guidelines or seek preventive screenings.[1] "Dual eligibles tend to have fewer economic resources. More than half of them report incomes below the Federal Poverty Level."[1]

"Most dual eligibles have substantial health needs: half are in fair or poor health, more than twice the rate of other Medicare enrollees."[6] Over half are under treatment for five or more chronic conditions.[7] They are also more likely to be hospitalized, to have mental health needs, and to live in nursing homes.[6]

Dual eligibles are treated differently in many situations apart from the Five-Star rating system, according to a 2012 fact sheet published by the Association for Community Affiliated Plans (ACAP). "Congress has repeatedly acknowledged the special needs of the dual population: the Medicare Modernization Act of 2003 authorized

health plans to create entities uniquely designed to serve dual eligibles and other populations with unique health needs."[1] In 2008, the Medicare Improvement for Patients and Providers Act acknowledged the need for specialized services and oversight of Special Needs Plans (SNPs) designed to serve dual eligible members.[1]

It is reasonable to expect that the performance of health plans serving the dual eligible population will continue to be under scrutiny. If standardized measures were in use across these plans, their performance could be compared. However, as recently noted by the Government Accountability Office (GAO), comparison is not possible under current requirements.[8]

The Medicare-Medicaid Coordination Office (MMCO), established under the ACA, is tasked with improving care for dual eligible enrollees by better aligning Medicare and Medicaid benefits and improving coordination between the two programs to ensure dual eligibles receive full access to benefits and services. The MMCO has engaged a multi-stakeholder group convened by the National Quality Forum (NQF) to develop a national measurement strategy for the dual eligible population, including a core quality measure set. CMS is considering linking a comprehensive database of Medicare and Medicaid claims data from which to draw measurement information.[9]

For the time being, MA plans serving largely dual eligible memberships are compared on the same metrics as other MA plans. The resulting prevalent and persistent lower performance rankings presented in this study could result in unintended consequences for plans serving dual eligible populations and for the beneficiaries they serve.

Objectives

This study presents evidence based on prior research, analysis of member-level detail, and analysis of stratified and case-mix adjusted quality performance data to evaluate three main hypotheses:

1. There is a strong correlation between socioeconomic factors and low performance on outcome measures.
2. Outcomes are lower in dual eligible members than in non-dual members, even after controlling for other risk factors affecting the outcomes, and worsen with lower socioeconomic indicators/status.
3. The Five-Star quality measures need to undergo further testing and be appropriately case-mix adjusted to accurately reflect the quality of care provided by plans serving a high percentage of dual eligible and disadvantaged special needs program members.

Review of Existing Literature

There is extensive evidence that the dual eligible population has inferior outcomes compared to non-dual eligibles. A comprehensive literature review was conducted to identify and summarize previous published studies that have assessed disparities in quality measures and outcomes between dual eligible and non-dual beneficiaries. In addition to studies directly investigating the specific impact of dual eligible status on outcome performance measures—most focused on the Medicare Fee-for-Service (FFS) population—a more extensive body of literature exists regarding the impact of race/ethnicity, socioeconomic status, and gender on health outcomes, particularly those related to the HEDIS performance measures. Since these characteristics are more prevalent among the dual eligible population, these findings can also shed light on the study research hypotheses.

A brief summary of the existing literature is presented below (a more complete review is included as *Appendix B)*:

Only one previous study was found that evaluated the association between CMS Five-Star ratings and the percentage of dual eligible special needs plan (SNP) members. The analysis found that MA contracts with 100 percent SNP members had an average Star rating of 3.11 compared to an average Star rating of 3.41 in contracts with no SNP members (a statistically significant difference) in 2010.[1] An updated comparison analysis presented in the results section below suggests this gap has widened considerably in 2012 and 2013.

Differences in healthcare utilization (e.g., office and outpatient visits, hospital inpatient, home health services) for dual eligible and Medicare-only beneficiaries have been studied. Findings indicate that black dual eligibles had significantly more office-based physician visits, outpatient visits, and home health services compared to black Medicare-only individuals.[10] Duals had about twice the rate of potentially preventable hospitalizations for pressure ulcers, diabetes and asthma compared to other Medicare beneficiaries; also were 52% more likely for urinary tract infection and 30% more likely for COPD and bacterial pneumonia hospitalization.[11] Only the rate of hospitalizations for injurious falls was higher among non-dual beneficiaries.[11]

There is significant evidence of race/ethnicity and gender effects on the HEDIS outcome measures used in the Five-Star rating system. An investigation of disparities across seven cardiovascular and diabetes-related HEDIS measures in commercial managed-care enrollees aged less than or equal to 65 found gender differences in six of seven measures. In the whole population, race/ethnicity, age, and socioeconomic status had independent influences on cardiovascular and diabetes care. Blacks and Hispanics had significantly lower rates of cholesterol screening, cholesterol control, and LDL control; and blacks had lower rates of controlling blood pressure, compared to whites, and people in disadvantaged neighborhoods had worse performance on five of the seven measures studied.[12] Dual eligible beneficiaries are also significantly less likely to receive care consistent with quality diabetic care.[13]

Immigration status has also been linked to race/ethnicity disparities in cancer screening. One study found that foreign-born white and Asian women were significantly less likely to have Pap smears compared to US born white women. Hispanics, regardless of birthplace, were significantly less likely to have Pap smears, fecal occult blood testing (FOBT), or sigmoidoscopy. Asians were less likely to report any type of cancer screening except FOBT.[14]

Dual members have higher incidence of breast cancer diagnosis, but are less likely to get mammography screenings and more likely to have delays in treatment.[15-17] One study found that dual eligibles are less likely than Medicare-only members to have breast cancer screenings.[16] Another large study assessed trends in race/ethnicity and socioeconomic disparities and found that—while screenings have increased and breast cancer incidence and mortality rates have declined for all groups—screening rates remain lower and incidence and mortality rates remain higher among more socioeconomically disadvantaged groups. Blacks had the highest mortality rates and percent of cases diagnosed beyond the local stage.[18] Women in high poverty areas or uninsured are more likely to have a diagnosis of late-stage breast cancer regardless of geographic location.[19] In addition the prevalence of self-reported breast cancer screening is lower for women with a disability.[20] Dual eligible patients diagnosed with breast or lung cancer were also more likely to experience delay of treatment initiation.[15]

There are numerous studies related to adherence to treatment guidelines. Extensive literature highlights the influence of demographics, socioeconomics, and other patient, physician, and health system factors on the PDE (Prescription Drug Event) medication adherence performance measures.[21-33] Blacks and Hispanics are significantly less likely to have osteoporosis screening prior to and after hip fracture compared to whites, and lower-income and less-educated individuals were significantly less likely to have osteoporosis screening after

controlling for other risk factors.[34] At-risk blacks and males are significantly less likely to receive prescriptions for osteoporosis medications compared to whites and females.[35]

Duals are significantly more likely to have multiple comorbidities.[36] This compounds the impact of race/ethnicity, gender, and socioeconomic factors on health outcomes.[37] Multi-morbidity (defined as co-occurrence of two or more chronic diseases) results in increased functional impairment, poor quality of life, high healthcare utilization and increased cost.[37]

Methods

Data Sources

1. **CMS Published Data Across All Medicare Advantage Plans**
   Inovalon analyzed CMS-published data on 21 Five-Star Quality Measures (the HEDIS Admin, HEDIS Hybrid and PDE measures) across all MA plans at the contract level. The 520 contracts were stratified by percentage of Special Needs Plan (SNP) members into three groups: (1) low percentage SNP, if fewer than 10% SNP enrollees; (2) medium percentage SNP, if 10–50% SNP enrollees; and (3) high percentage SNP, if more than 50% SNP enrollees. Though CMS only publishes the percent of SNP membership, the correlation between percent SNP and percent dual members was 0.94 ($p<.0001$) in the sample of 80 MA contracts used in the member level analyses conducted for this study.

2. **Inovalon's MORE² Registry®**
   The study utilized member-level MA data extracted from Inovalon's Medical Outcomes Research for Effectiveness and Economics Registry (MORE² Registry®). The MORE² Registry provides visibility into the medical utilization of over 98 million unique and de-identified individuals nationwide covering more than 3.1 billion member-months of data from 2002 through September of 2013. Within this study, from the 11.8 million MA enrollees present within the MORE² Registry, Inovalon isolated 1,335,709 enrollees in 2011 (16.6% dual eligible) and 1,605,644 enrollees in 2012 (16.2% dual eligible) within 80 individual CMS contracts who met the study inclusion criteria. These criteria examined member-level benefit requirements (e.g., medical and pharmacy coverage), enrollment requirements (e.g., continuous enrollment except for allowable gaps), and exclusion considerations (e.g., applicable of medical histories that preclude protocol applicability) as required within each of the Star Quality Measures on which this study focused to examine only those members who met the criteria for at least one measure within the two-year study period.

Outcome Measures Evaluated

The analyses of this study include in-depth evaluation of five HEDIS Admin and five PDE (drug) measures included in the Five-Star rating system. These ten measures were selected because they can be readily calculated with available administrative claims data.

1. Rheumatoid Arthritis Management (ART)
2. Breast Cancer Screening (BCS)
3. Glaucoma Testing (GSO)
4. Osteoporosis Management in Women who had a Fracture (OMW)
5. Plan All-Cause Readmissions (PCR)
6. Diabetes Treatment (BPD)
7. High Risk Medication (HRM)
8. Medication Adherence for Cholesterol (Statins) (MA-C)
9. Medication Adherence for Oral Diabetes Medications (MA-D)
10. Medication Adherence for Hypertension (RAS antagonists) (MA-H)

Together, these measures compose 25.4% of the overall Star Rating for plans providing both Part C and Part D services (MA-PD Contracts) and 48.4% of overall rating for Prescription Drug Plan (PDP) only plans. A summary of the measure definitions, exclusions, and case mix adjustments is included in *Appendix A*.

Statistical Analysis

Stratification is a method used to examine the results associated with distinct groups within a broader population. Characteristics such as race, gender, and dual eligibility status can be associated with differences in quality outcomes. Examining quality measures stratified by such factors can be useful in understanding differences between groups and in helping practitioners identify and address disparities.

For this analysis, the data were aggregated into one large file to facilitate calculation of the ten selected Star quality measures, stratified by dual eligible members versus non-dual eligible members, and were also calculated within each group for each of several demographic, socioeconomic, and clinical characteristics including: age, gender, race/ethnicity, SNP type, region, original reason for entitlement (ESRD, age, disability, or disability and ESRD), income (inferred from U.S. Census data based on members' five-digit ZIP code), low income drug subsidy amount, and institutionalized status.

In addition to the above factors, two measures of severity of illness were evaluated: Charlson Comorbidity Index scores and the CMS MA risk scores. The Charlson Comorbidity Index (CCI) is widely used in health research to assess individuals' burden of disease. The CCI provides a weighted score of a person's disease severity that accounts for both the number and severity level of comorbid conditions as they relate to risk of mortality. The index classifies 19 pre-defined comorbid conditions using ICD-9-CM codes. The presence of a comorbid condition is defined as having at least one medical claim anytime during a one year identification window. A higher score indicates higher burden of illness.[38]

The stratified measure rates were calculated for both 2011 and 2012, but since results were similar only 2012 measure rates are discussed in this report.

Results

Analysis of CMS Published Data

Table 1 shows a ranked distribution of contracts by average Star rating in 2013 (the ratings were weighted by measure weight). The results show that contracts with a low percentage of SNP members (<10%) ranked in the top 10 percent of performance 18% of the time, while plans with a high percentage of SNP members (>50%) ranked in the top 10 percent only 5% of the time. Contracts with a high percentage of SNP members ranked in the bottom 10 percent of contracts 20% of the time, compared to only 6% of contracts with a low percentage of SNP members. High percentage SNP plans ranked below the median Star rating 71% of the time.

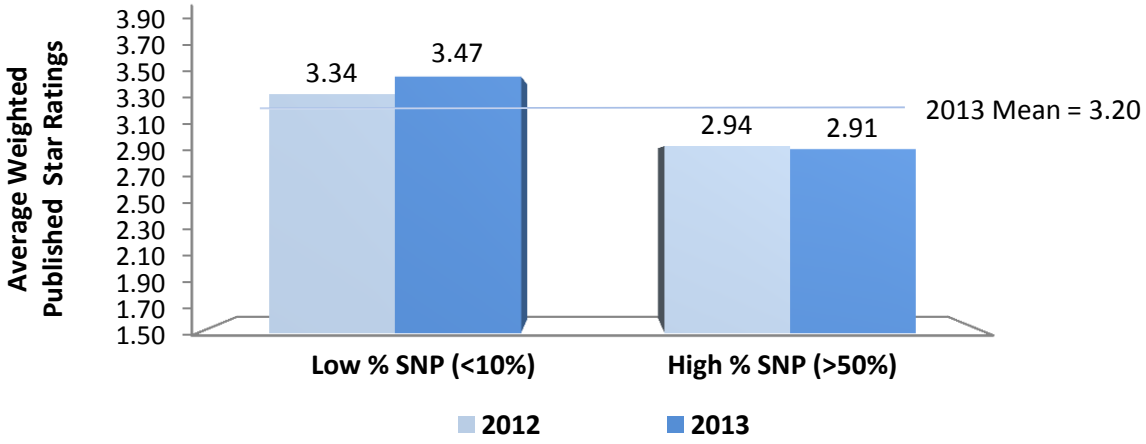
Table 1: All MA Contracts (520) —Ranked Weighted Star Rating (21 Selected Measures)

Contract Group	# MA Contracts	Bottom 10 Percent	Top 10 Percent	Below Median
Low % SNP	339	6%	**18%**	39%
Medium % SNP	69	17%	3%	**78%**
High % SNP	112	**20%**	5%	**71%**

2013 Star ratings based on 2011 data

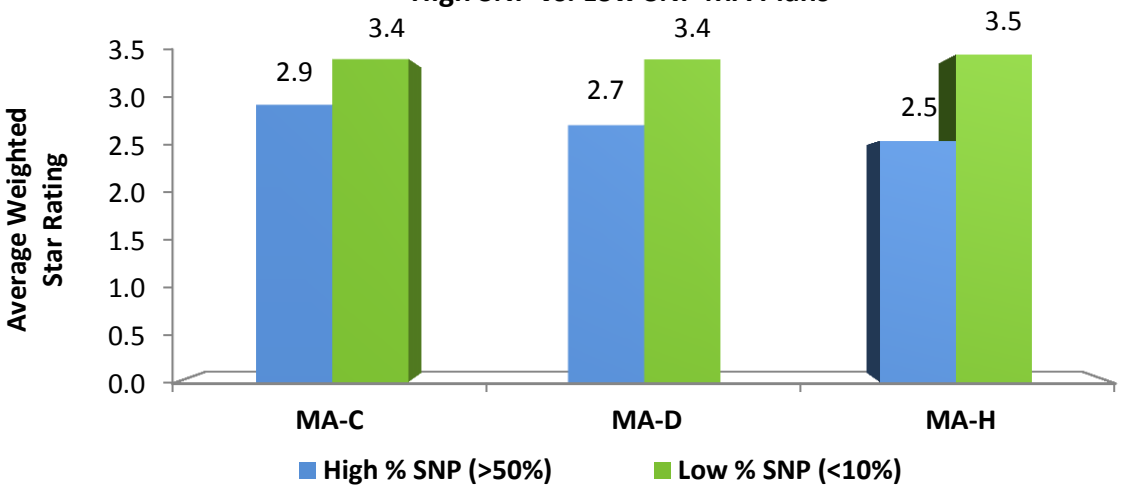
The average published Star rating stratified by percent SNP membership shows a significant difference in average rating across both groups. In 2013 the average Star rating was 3.47 for low percentage SNP plans compared to only 2.91 for high percentage SNP plans (*Figure 1*).

Figure 1. Impact of SNP Membership on 2012 and 2013 Star Ratings



Contracts with a high percentage of SNP members performed worse 86% of the time (i.e., lower rates observed on 18 of the 21 measures evaluated). For example, MA plans with low percent SNP members performed worse on all three medication adherence measures in 2013 as compared to plans with low numbers of SNP enrollees (*Figure 2*). The average Star rating was lower by 0.5 to 1.0 Star.

Figure 2. Average 2013 Star Rating on Medication Adherence Measures: High SNP vs. Low SNP MA Plans



Comparison of MORE^2 Registry® and National Medicare Data

Table 2 compares national Medicare Fee-for-Service (FFS) and Medicare Advantage (MA) membership demographics for 2011 published by the Medicare Medicaid Coordination Office (MMCO) to the MORE² Registry study sample data for the same year. The national data show a larger percent of duals in the 18-54 age group (27%) compared to the study sample (8%). The study sample has a higher percent of members in the 65-74 age group (40% vs. 26%) and slightly more in the 75-84 age group (28% vs. 20%); however, the percent of members 85+ is the same in the national data as in the sample (13%). The non-dual Medicare members are more comparably distributed in the national data and the sample file.

The study sample has a slightly higher percent of duals that are female (66% vs. 61%), slightly more representation of blacks (24% vs. 20%) and Hispanics (16% vs. 7%), and a lower percent of whites (51% vs. 64%). However, the national sample has a larger proportion of duals with original reason for entitlement of disability (41% vs. 34%), while the study sample has more members that qualified for Medicare due to age (66% vs. 57%). The national non-dual members have slightly fewer females (53% vs. 57%) than the study sample file; however, both datasets are distributed similarly by race/ethnicity and original reason for entitlement.

Table 2. Summary Statistics Comparing National Medicare (FFS and MA) in 2011 vs. Study Sample of MA Plans in 2011

		National Medicare (FFS and MA) Members[1]				Study Sample MA Members[2]			
		Dual Eligible		Non-Dual Eligible		Dual Eligible		Non-Dual Eligible	
Variable	Group	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Members		10,157,180	100%	41,397,093	100%	221,795	100%	1,113,914	100%
Age Group	18-54	2,728,205	27%	1,874,671	5%	17,300	8%	14,231	1%
	55-64	1,453,922	14%	2,762,640	7%	23,221	10%	39,431	4%
	65-74	2,681,184	26%	20,165,459	49%	89,674	40%	526,511	47%
	75-84	2,010,227	20%	11,387,004	28%	62,445	28%	384,150	34%
	85+	1,283,642	13%	5,207,319	13%	29,155	13%	149,591	13%
Gender	Female	6,215,377	61%	22,040,802	53%	146,176	66%	636,370	57%
	Male	3,941,796	39%	19,356,244	47%	75,619	34%	477,544	43%
Race/ Ethnicity	American Indian/Alaska Native	90,844	1%	138,135	0%	618	0%	993	0%
	Asian	521,578	5%	525,513	1%	8,102	4%	8,789	1%
	Black (non-Hispanic/Latino)	2,075,520	20%	3,263,587	8%	54,304	24%	133,395	12%
	Hispanic/Latino	735,182	7%	607,504	1%	35,863	16%	21,937	2%
	White (non-Hispanic/Latino)	6,470,459	64%	35,877,987	87%	112,212	51%	926,100	83%
	Other	263,597	3%	984,367	2%	10,696	5%	22,700	2%
Original Reason for Entitlement	ESRD	12,008	0%	17,646	0%	75	0%	560	0%
	Age	5,822,311	57%	36,283,098	88%	146,725	66%	973,740	87%
	Disability	4,195,798	41%	4,977,901	12%	74,940	34%	139,390	13%
	Disability and ESRD	79,939	1%	62,538	0%	24	0%	109	0%

Data Sources: [1] Medicare Medicaid Coordination Office. (2013). Data analysis brief: Medicare-Medicaid dual enrollment from 2006 through 2011. [2] 80 Medicare Advantage contracts from MORE[2] Registry®.

The MMCO data did not contain regional distributions, thus regional data were obtained from Kaiser Family Foundation Medicare FFS statistical reports. *Table 3* shows the dual population has more representation in the Midwest in the national Medicare FFS population (20% vs. 11%) and in the West (21% vs. 3%), while the MA sample file has greater representation of duals in the Northeast (54% vs. 20%). However, the sample file also has larger representation of non-duals in the Northeast and Midwest, and fewer members in the South and West.

Table 3. Summary Statistics Comparing National Medicare FFS Regional Distribution (2009) to Sample of MA Plans (2011)

		National Medicare FFS Members (2009)[1]				Sample of MA Members (2012)[2]			
		Dual Eligible		Non-Dual Eligible		Dual Eligible		Non-Dual Eligible	
Variable	**Group**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Total Members		9,390,340	100%	39,332,589	100%	260,760	100%	1,344,884	100%
Region	Midwest	1,834,546	20%	9,149,088	23%	27,733	11%	404,517	30%
	Northeast	1,920,801	20%	7,406,456	19%	141,507	54%	533,244	40%
	South	3,691,960	39%	14,590,662	37%	84,774	33%	335,375	25%
	West	1,943,033	21%	8,186,383	21%	6,683	3%	71,519	5%

Data Sources: [1] The Henry J. Kaiser Family Foundation. (2013a) Total number of Medicare beneficiaries. (2013b) Number of dual eligible beneficiaries. http://kff.org/medicare/state-indicator/total-medicare-beneficiaries/ and http://kff.org/medicare/state-indicator/dual-eligible-beneficiaries/. Accessed on 09/11/2013. [2] 80 Medicare Advantage contracts from MORE[2] Registry®.

To validate that socioeconomic status is significantly related to dual eligible status of members in the sample MA data used for this study, a logistic regression model was estimated with dual eligible status as the dependent variable. Independent variables included age, gender, race/ethnicity, region, organization type, plan type, CMS MA risk score, average household income (computed as the average Census reported household income in the member's 5-digit ZIP code), and low income subsidy amount. The analysis included 1,751,301 unique members in 80 contracts in 2011–2012.

Figure 3 shows that, after adjusting for all the factors above, plan members who live in ZIP codes with average household incomes less than $25,000 per year are much more likely to be dual eligible than any other income category. The probability of being dual eligible for all members regardless of which ZIP code they live in is 16.2%.

Figure 3. Probability of Dual Eligible Status by Income Level After Controlling for Other Risk Factors

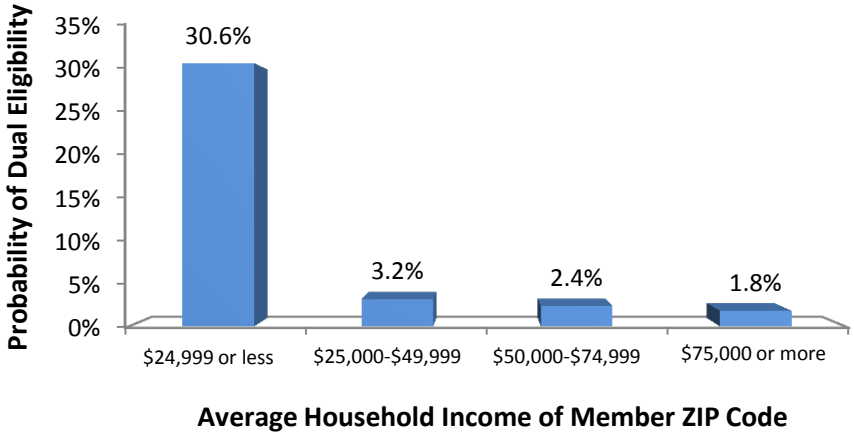
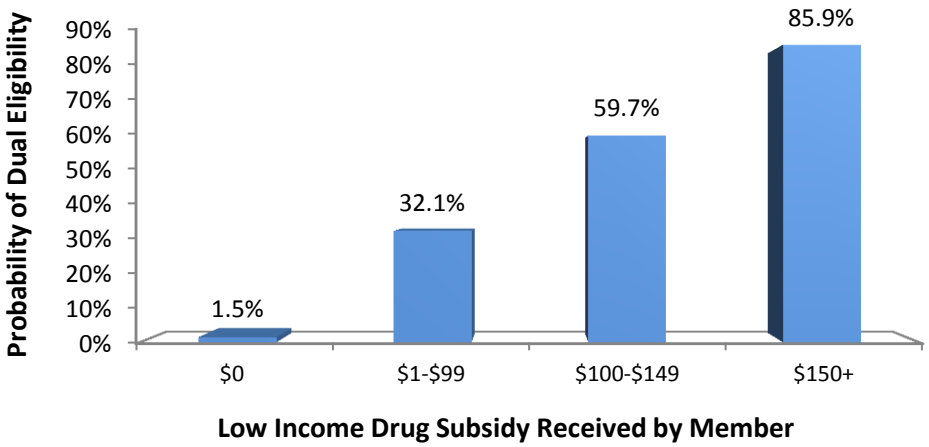


Figure 4 shows the probability of being dual eligible in four different low income drug subsidy categories. Members who receive no subsidy at all are almost never dual eligible (1.5%) after controlling for other risk factors. On the other hand, members who receive a subsidy of $150 or more have an 85% probability of being dual eligible, even after controlling for other factors leading to dual eligibility.

Figure 4. Probability of Dual Eligible Status by Low Income Drug Subsidy After Controlling for Other Risk Factors



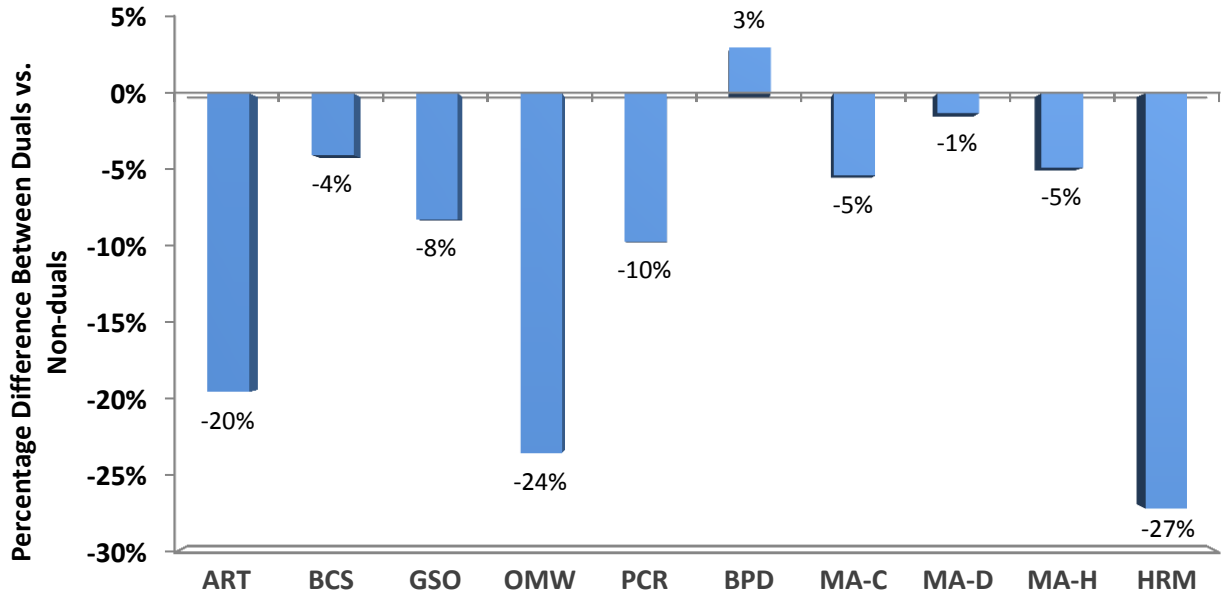
Descriptive Statistics of the Study Population from MORE^2 Registry®

Table C1 (*Appendix C*) provides summary statistics for the MA database used in the study for 2011 and 2012 and shows the study population was stable over the two-year period. The 2012 descriptive statistics show that compared to non-duals, the dual population is younger and has more females, more members that are black and Hispanic, and a high percentage of members in SNP-dual plans. Disability is more often the original reason for entitlement for duals versus non-duals (35% vs. 13%). More duals (20%) are in lowest income level compared to non-duals (4%), are significantly more likely to receive a low income subsidy (76%), and are more likely to be in a nursing home. There are fewer duals in the Midwest region compared to non-duals (11% vs. 30%) and more in the Northeast (54% vs. 40%). Fewer dual members have a Charlson severity score of zero (21% vs. 35% for non-duals) but more duals have higher severity scores >=4 (31% vs. 20%). Similarly, only 7% of duals have a CMS MA risk score less than 0.500 compared to 34% of non-duals, while 57% of duals have a risk score greater than or equal to 1.0 compared to only 32% of non-dual members.

Analysis using MORE^2 Registry®

Overall, out of the ten measures evaluated, the duals performed worse on nine, as shown in *Figure 5* (see *Appendix A* for measure and acronym descriptions). The graph shows the percentage difference between the performance of dual enrollees below (-) or above (+) the non-dual group rate. For example, the ART measure rate among all dual members is 20% lower compared to the rate among non-dual members (45% for duals; 55.9% for non-duals) (*Table C2*). The rate of compliance with osteoporosis management in women with a fracture (OMW) is 24% worse than for non-dual members. Duals perform worse on all medication adherence measures (MA-C, MA-D and MA-H) and 27% more members in the dual population receive a High Risk Medication (HRM).

Figure 5. Measure Rates Comparison (Dual Eligible vs. Non-Dual Eligible)



The only measure for which the rate is better for dual eligible members is Diabetes Treatment (BPD). Duals perform slightly better (3.0%) on this measure, with a rate of 88% compared to 85.4% for non-dual members. As described in *Appendix A*, BPD counts the percent of enrollees dispensed at least one prescription for diabetes and one prescription for hypertension who were receiving at least one fill for a RAS antagonist recommended for people with diabetes. Given the measure requires only one prescription during the measurement period (and does not require a diagnosis of either condition), the rates of compliance are high in the MA population overall (near 90%).

While further research is needed to understand why duals perform better on this one measure, and worse on all other Part D measures, one possible explanation is that it may be attributable to the higher number of office visits and utilization of healthcare services seen in the dual population.[10]

In order to more fully investigate whether duals do, in fact, have more office visits than non-duals members, two additional HEDIS measures were calculated, stratified by dual versus non-dual eligible members. The Adults' Access to Preventive/Ambulatory Health Services (AAP) measure looks at the percent of members with an ambulatory visit. The average rate on this measure was not significantly different: 94.4% of duals had at least one office visit compared to 94.8% of non-dual members. Thus, access to care does not appear to differ between duals and non-duals.

The second measure investigated was Ambulatory Care, which looks at the average number of ambulatory visits. Importantly, there is a statistically significant difference in the average number of ambulatory visits—dual members had an average of 17.3 visits compared to 13.0 visits by non-dual members (p-value < 0.0001).

The detailed results for each of the ten measures are included in *Appendix C*. Note that not every member qualifies for every measure, so the denominators vary across measures. On each table, the last two columns show (1) if the difference between the dual and non-dual rate is statistically significant (with "Yes" signifying significance at the 95% confidence level); and (2) for cohorts where the rates are statistically different, the percent by which the dual rate is lower (negative) or higher (positive) than the non-dual rate.
The key findings in *Appendix C* include:

Dual eligible members have significantly worse treatment rates:

1. Treatment for rheumatoid arthritis (ART) among dual eligible members is 19.5% lower than in non-dual members.
2. Arthritis treatment rates are lower in every age group, but worst among duals aged 89+.
3. Arthritis treatment is 38.6% lower among male dual eligibles compared to non-duals, and 41.5% lower for duals who receive no income subsidy.
4. There is a 23.5% treatment gap in osteoporosis management in women who had a fracture (OMW), with progressively worse compliance in women age 80 and older. This is important information for providers—fractures are a major problem in elderly women and following evidence-based guidelines can reduce the risk of future fractures.[39-41]

Dual eligible members have significantly worse preventive screening rates:

1. Dual eligible members have significantly lower rates of breast cancer screening (BCS).
2. Duals with a Charlson Severity Score of 0 have fewer preventive mammography screenings while those with higher comorbidity scores (>=5) do better. This could be related to higher frequency of physician visits for members with multiple comorbidities, but further research is needed to explain these utilization patterns.
3. Glaucoma testing (GSO) rates among dual eligible members are worse or similar compared to non-duals in every demographic and socioeconomic category except blacks. However, blacks have the lowest glaucoma screening rates observed in both groups.
4. American Indian/Alaska Natives show the greatest disparity in care for glaucoma preventive screening, with rates 18% lower than non-duals.

Dual eligible members have significantly worse outcomes following hospital stays:

1. Dual eligible members have a significantly greater likelihood of being readmitted to the hospital within 30 days of a prior discharge, even after accounting for other factors related to risk of readmission. This is an important finding because this is the only Five-Star measure that adjusts for patient severity and demographic risk factors.

Dual eligible members have significantly worse results on Part D drug measures:

1. The use of high risk medications (HRM) among dual eligible members is 27.2% higher compared to non-dual members.
2. Use of HRMs is 31.6% higher among duals age 65–69 and 35.9% higher in male dual eligible members.
3. Adherence rates are lower among dual eligible members for all three Part D medication adherence measures.
4. Adherence ranges 10–18% lower among duals with no low income subsidy for all three adherence measures, but highest for non-duals with no subsidy. In contrast, use of HRMs is 58.4% higher among duals with no low income subsidy.
5. Adherence rates are lowest among dual blacks and Hispanics for all three medications.
6. Adherence to cholesterol and antihypertensive medications is lowest among duals with Charlson Severity Score of 0 (10% and 8% worse adherence respectively), with similar results in duals with risk score <0.500 (13.8% and 10.8% worse adherence).
7. Adherence *to* cholesterol and antihypertensive medications is worse in every age cohort 65 and above.

Multivariate Regression Analysis

To further evaluate and isolate the impact of dual eligible status on performance measures, exploratory multivariate analyses were conducted. Regression models were developed to estimate average measure rates for dual and non-dual status for the 10 measures evaluated in this study *after* adjusting for other confounding factors including age, sex, region, plan type (e.g., HMO, PPO), reason for entitlement, Charlson comorbidity severity score, and CMS MA risk score.

The rates shown in *Table 4* are the computed average difference in measure rating between dual and non-dual plan members who are otherwise similar. After controlling for these other factors influencing the rate, dual eligible members have lower performance ratings compared to non-dual members for all but two of the measures (BCS and BPD). For example, the dual effect on OMW rates reveals a 24.8% performance gap attributable to dual status after controlling for other factors affecting the outcome.

This is an important finding demonstrating that there is a fundamental difference in outcomes between dual members and non-dual members even after controlling for other possible factors that can impact outcomes. Further investigation is needed to better understand what drives this difference in outcomes.

Table 4. Average Star Measure Rates for Dual Eligible vs. Non-Dual Eligible Members After Adjusting for Other Risk Factors*

Measure	Dual Eligible	Non-Dual Eligible	Percent Difference
MA-C	69.9%	71.9%	-2.8%
MA-D	75.5%	75.8%	-0.4%***
MA-H	76.4%	78.7%	-2.9%
ART	45.1%	54.6%	-17.5%
BCS	71.1%	69.0%	3.1%
BPD	53.0%	47.8%	10.9%
GSO	50.2%	54.4%	-7.7%
HRM**	12.8%	11.5%	11.4%
OMW	15.6%	20.7%	-24.8%
PCR**	13.6%	13.3%	2.0%

* The analysis included 1,751,301 unique members in 80 contracts in 2011-2012.
** HRM and PCR measures are inverse, so positive difference means duals perform worse.
*** MA-D was the only measure not statistically significant at a 99% confidence level.

Recommendations and Future Research

This study of existing research, published MA Five-Star rates and ratings, and stratified analysis of member-level data for more than 1.6 million beneficiaries present strong evidence of an inherent measureable performance gap between dual eligible and non-dual eligible members, including allowances for additional factors impacting outcomes. While factors of causality and strategies for resolution of the described gap undoubtedly deserve further research (something which this study was not designed to investigate), avoidance of interim compounding biasing factors arguably require similar attention. Specifically, in the setting of the material performance gap demonstrated between dual eligible and non-dual eligible members, the current CMS Five-Star system potentially penalizes MA plans serving large proportions of dual eligible beneficiaries. This may result in adverse selection of members by plans, and of plans by members. As such, in the absence of any adjustment for such dual eligible members (pending a better understanding of causality or strategies for resolution), the CMS Five-Star program may unintentionally result in lowering incentive payments to plans serving large numbers of dual eligible beneficiaries, thereby potentially resulting in the CMS Five-Star program inadvertently becoming an incentive for demographic selectivity as opposed to the desired goal of quality incentivization. These unintended consequences of focusing the CMS quality incentive away from the more vulnerable and needy dual eligible members of the Medicare Advantage population would be an unfortunate side effect of a largely positive program.

In this setting, recommendations for further research include, but are not limited to, the following: (i) investigation into causality of the identified performance gap between dual eligible and non-dual eligible members; (ii) further work to appropriately case-mix adjust the measures to allow fair comparisons of plans serving largely dual populations to plans serving the general Medicare population; (iii) benchmarking against similar plans with high numbers of dual eligible members or to a matched cohort of dual eligible members in fee-for-service plans; (iv) development and adoption of more appropriate measures for the dual eligible population that are more likely to have multiple co-morbid conditions, mental health, cognitive and behavioral issues, and limitations in functional status; and (v) determining which incentives to plans reduce health disparities in minority and low-income populations.

References

1. Medicare's quality incentive system does not adequately account for special needs of dual-eligible populations. Washington, D.C.: Association for Community Affiliated Plans, 2012. (Accessed August 19, 2013, at http://www.worldcongress.com/events/HR13000/PDF/ACAP_STARs_Fact_Sheet_May_2012.pdf.)
2. Casalino LP, Elster A, Eisenberg A, Lewis E, Montgomery J, Ramos D. Will pay-for-performance and quality reporting affect health care disparities? Health Aff 2007;26:w405-w414.
3. Report to the congress: Medicare and the health care delivery system. Washington, D.C.: Medicare Payment Advisory Commission, 2013. (Accessed August 19, 2013, at http://www.medpac.gov/documents/Jun13_EntireReport.pdf.)
4. AHIP proposal: Achieving Medicare/Medicaid integration for dually eligible beneficiaries. Washington, D.C.: America's Health Insurance Plans, 2011. (Accessed August 23, 2013, at http://www.mcoaonline.com/content/pdf/20111013-AHIPplanforDualEligibles.pdf)
5. Dual eligible beneficiaries: An overview. Washington, D.C.: Medicare Payment Advisory Commission, 2004. (Accessed August 23, 2013 at http://www.medpac.gov/publications/congressional_reports/June04_ch3.pdf.)
6. Dual eligibles: Medicaid's role for low-income Medicare beneficiaries. Washington, D.C.: The Henry J. Kaiser Family Foundation, 2011. (Accessed August 23, 2013, at http://kaiserfamilyfoundation.files.wordpress.com/2013/01/4091-08.pdf)
7. Estimated federal savings associated with care coordination models for Medicare-Medicaid dual eligibles. Washington, D.C.: America's Health Insurance Plans (AHIP), 2011. (Accessed August 23, 2013 at http://www.healthlawyers.org/News/Health%20Lawyers%20Weekly/Documents/101411/Dual-Eligible-Study-September-2011.pdf)
8. Medicare special needs plans: CMS should improve information available about dual-eligible plans' performance. Washington, D.C.: U.S. Government Accountability Office, 2012. (Accessed August 19, 2013, at http://www.gao.gov/products/GAO-12-864.)
9. Further exploration of healthcare quality measurement for the dual eligible beneficiary population. Washington, D.C.: National Quality Forum, 2012. (Accessed August 19, 2013, at http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=72550.)
10. Moon S, Shin J. Racial differences in health care use among Medicare only and dual eligibles. J Health Hum Serv Adm 2006;28:326-345.
11. Hospitalizations for potentially preventable conditions among Medicare-Medicaid dual eligible, 2008. Washington, D.C.: Agency for Healthcare Research and Quality, 2010. (Accessed August 19, 2013, at http://www.hcup-us.ahrq.gov/reports/statbriefs/sb96.pdf.)
12. Chou AF, Scholle SH, Weisman CS, Bierman AS, Correa-de-Araujo R, Mosca L. Gender disparities in the quality of cardiovascular disease care in private managed care plans. J Womens Health Issues Care 2007; 17:120-130.
13. McCall DT, Sauaia A, Hamman RF, Reusch JE, Barton P. Are low-income elderly patients at risk for poor diabetes care? Diabetes Care 2004;27:1060-5.
14. Goel MS, Wee CC, McCarthy EP, Davis RB, Ngo-Metzger Q, Phillips RS. Racial and ethnic disparities in cancer screening: The importance of foreign birth as a barrier to care. J Gen Intern Med 2003;18:1028-1035.
15. Halpern MT, Holden DJ. Disparities in timeliness of care for U.S. Medicare patients diagnosed with cancer. Curr Oncol 2012;19:e404-413.
16. Parker J, Gebretsadik T, Sabogal F, Newman J, Lawson HW. Mammography screening among California Medicare beneficiaries: 1993-1994. Am J Prev Med 1998;15:198-205.
17. Koroukian SM, Bakaki PM, Beaird H, Earle CC, Cooper GS. Cancer stage comparison between dual Medicare-Medicaid eligibles using Medicaid as a supplemental health insurance program and low-income nonduals. J Public Health Management Practice 2011; 17: 479-491.

18. Harper S, Lynch J, Meersman SC, Breen N, Davis WW, Reichman MC. Trends in area-socioeconomic and race-ethnic disparities in breast cancer incidence, stage at diagnosis, screening, mortality, and survival among women ages 50 years and over (1987-2005). Cancer Epidemiol Biomarkers Prev 2009;18:121-131.
19. Henry KA, Sherman R, Farber S, Cockburn M, Goldberg DW, Stroup AM. The joint effects of census tract poverty and geographic access on late-stage breast cancer diagnosis in 10 US states. Health Place 2013;21:110-21.
20. Courtney-Long E, Armour B, Frammartino B, Miller J. Factors associated with self-reported mammography use for women with and women without a disability. J Womens Health 2011;20:1279-86.
21. Lemstra M, Blackburn D, Crawley A, Fung R. Proportion and risk indicators of nonadherence to statin therapy: A meta-analysis. Can J Cardiol 2012;28:574-580.
22. Mauskop A, Borden WB. Predictors of statin adherence. Curr Cardiol Rep 2011;13:553-558.
23. Mann DM, Woodward M, Muntner P. Predictors of nonadherence to statins: A systematic review and meta-analysis. Ann Pharmacother 2010;44:1410-21.
24. Chan DC, Shrank WH, Cutler D, et al. Patient, physician, and payment predictors of statin adherence. Med Care 2010;48:196-202.
25. Yang Y, Thumula V, Pace PF, Banahan BF 3rd, Wilkin NE, Lobb WB. Predictors of medication nonadherence among patients with diabetes in Medicare part D programs: A retrospective cohort study. Clin Ther 2009;31:2178-88.
26. Bailey JE, Hajjar M, Shoib B, Tang J, Ray MM, Wan JY. Risk factors associated with antihypertensive medication nonadherence in a statewide Medicaid population. Am J Med Sci 2012.
27. Holmes HM, Luo R, Hanlon JT, Elting LS, Suarez-Almazor M, Goodwin JS. Ethnic disparities in adherence to antihypertensive medications of Medicare part d beneficiaries. J Am Ger Soc 2012;60:1298-1303.
28. Tiv M, Viel JF, Mauny F, et al. Medication adherence in type 2 diabetes: The ENTRED study 2007, a French population-based study. PLoS One 2012;7:e32412.
29. Sharma KP, Taylor TN. Pharmacy effect on adherence to antidiabetic medications. Med Care 2012;50:685-91.
30. Yang Y, Thumula V, Pace PF, Banahan BF 3rd, Wilkin NE, Lobb WB. Nonadherence to angiotensin-converting enzyme inhibitors and/or angiotensin II receptor blockers among high-risk patients with diabetes in Medicare part D programs. J Am Pharm Assoc 2010;50:527-31.
31. Kalyango JN, Owino E, Nambuya AP. Non-adherence to diabetes treatment at Mulago hospital in Uganda: Prevalence and associated factors. Afr Health Sci 2008;8:67-73.
32. Adams AS, Uratsu C, Dyer W, et al. Health system factors and antihypertensive adherence in a racially and ethnically diverse cohort of new users. JAMA 2013; 173(1): 54-61.
33. Weigand P, McCombs JS, Wang JJ. Factors of hyperlipidemia medication adherence in a nationwide health plan. Am J Manag Care 2012; 18(4): 193-9.
34. Neuner JM, Zhang X, Sparapani R, Laud PW, Nattinger AB. Racial and socioeconomic disparities in bone density testing before and after hip fracture. J Gen Intern Med 2007;22:1239-1245.
35. Curtis JR, McClure LA, Delzell E, et al. Population-based fracture risk assessment and osteoporosis treatment disparities by race and gender. J Gen Intern Med 2009;24:956-62.
36. Chronic disease and co-morbidity among dual eligible: Implications for patterns of Medicaid and Medicare service use and spending. Menlo Park, C.A.: The Henry J. Kaiser Family Foundation, 2010. (Accessed August 19, 2013 at http://kff.org/health-reform/report/chronic-disease-and-co-morbidity-among-dual/.)
37. Marengonia A, Anglemana S, Melisa R, et al. Aging with multimorbidity: A systematic review of the literature. Ageing Res Rev 2011;10:430-439.
38. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. J Chron Dis 1987;40:373-383.
39. Levis S, Theodore GJ. Summary of AHRQ's comparative effectiveness review of treatment to prevent fractures in men and women with low bone density or osteoporosis: Update of the 2007 report. J Manag Care Pharm 2012;18:S1-15.
40. Andrade SE, Majumdar SR, Chan K, et al. Low frequency of treatment of osteoporosis among postmenopausal women following a fracture. Arch Intern Med 2003;163:2052-2057.

41. Unnanuntana A, gladnick BP, Donnelly E, Lane JM. The assessment of fracture risk. J Bone Joint Surg 2010;92:743-753.
42. Chou AF, Brown AF, Jensen RE, Shih S, Pawlson G, Scholle SH. Gender and racial disparities in the management of diabetes mellitus among Medicare patients. J Womens Health Issues Care 2007;17:150-161.
43. Murakami Y, Lee BW, Duncan M, et al. Racial and ethnic disparities in adherence to glaucoma follow-up visits in a county hospital population. Arch Ophthalmol 2011;129:872-878.
44. Nelson K, Norris K, Mangione CM. Disparities in the diagnosis and pharmacologic treatment of high serum cholesterol by race and ethnicity. Arch Intern Med 2002;162:929-935.
45. Koroukian S, Xu F, Dor A, Cooper G. Colorectal cancer screening in the elderly population: Disparities by dual Medicare-Medicaid enrollment status. Health Serv Res 2006;41:2136-2154.
46. Hardy RE, Ahmed NU, Hargreaves MK, et al. Difficulty in reaching low-income women for screening mammography. J Health Care Poor Underserved 2000;11:45-57.
47. Weir S, Posner HE, Zhang J, et al. Disparities in routine breast cancer screening for Medicaid managed care members with a work-limiting disability. Medicare Medicaid Res Rev 2011;1:E1-19.
48. Sabogal F, Merrill SS, Packel L. Mammography rescreening among older California women. Health Care Financ Rev 2001;22:63-75.
49. Ford ES, Croft JB, Posner SF, goodman RA, Giles WH. Co-occurrence of leading lifestyle-related chronic conditions among adults in the United States, 2002-2009. Prev Chronic Dis 2013;10:1-12.
50. All patient readmissions within 30 days: National statistics, 2011. Washington, D.C.: Agency for Healthcare Research and Quality, 2011. (Accessed August 19, 2013 at http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=CB4633213BC0A2A7&Form=SelDXPR&JS=Y&Action=%3E%3ENext%3E%3E&_DXPR=PreRunDCCHPR1)
51. Adherence to long-term therapies: Evidence for action. Geneva, Switzerland: World Health Organization, 2003. (Accessed August 19, 2013, at http://www.who.int/about/structure/en/index.html.)
52. Thinking outside the pillbox: A system-wide approach to improving patient medication adherence for chronic disease. Cambridge, M.A.: New England Healthcare Institute, 2009. (Accessed August 19, 2013, at http://www.nehi.net/publications/44/thinking_outside_the_pillbox_a_systemwide_approach_to_improving_patient_medication_adherence_for_chronic_disease.)

APPENDIX A: SUMMARY OF CASE-MIX ADJUSTMENTS APPLIED TO SELECTED CMS FIVE-STAR QUALITY MEASURES

Summary of Case Mix Adjustments Applied to Current Star Measures

The Five-Star rating system includes several types of measures: (1) Healthcare Effectiveness and Data Information Set (HEDIS) quality measures developed by National Committee for Quality Assurance (NCQA); (2) Prescription Drug Event (PDE) quality measures developed by Pharmacy Quality Alliance (PQA); (3) satisfaction measures from the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey developed by the Agency for Healthcare Research and Quality (AHRQ); (4) measures based on the Medicare Health Outcomes Survey (HOS); and (5) administrative data gathered by CMS.

The analyses completed for this study include in-depth evaluation of five HEDIS Admin and five PDE measures included in the Five-Star rating system. These 10 measures were selected because they can be calculated with available administrative claims data. (The HEDIS Hybrid measures rely on claims data supplemented by data obtained from medical record reviews, and the process, CAHPS and HOS survey measures rely on data collected through surveys of members.) Together, the 10 HEDIS and PDE measures comprise 25.4% of the overall Star Rating for plans providing both Part C and Part D services (MA-PD Contracts), and 48.4% of the overall rating for Prescription Drug Plan (PDP) only plans.

In order to isolate and understand the impact of dual eligible and other socioeconomic factors on these outcomes, it is important to first understand how these measures are defined, including any exclusions or case mix (e.g., severity or "risk") adjustments that are applied that may already serve to account for some differences in populations across health plans.

The types of exclusions and adjustments applied to these 10 measures are reflective of those applied to other Star measures. There are several measures with no exclusions or adjustments applied. Several have exclusions, mostly related to prior history of the event being measured (e.g., prior fracture, prior diagnosis of glaucoma) or conditions making individuals not eligible for the measure (e.g., HIV, mastectomy, insulin treatment).

Importantly, only one measure includes any type of case mix adjustment, Plan All-Cause Readmissions (PCR). PCR is adjusted for age, gender, presence of surgeries, discharge condition, and comorbidities to control for how sick patients were when they were admitted to the hospital. Due to the characteristics of the dual eligible population, these adjustments can potentially control for the impact of some of the socioeconomic factors found in dual eligible members.

HEDIS Admin Measures

Osteoporosis Management in Women Who Had a Fracture (OMW) The percent of women 67 years and older who suffered a fracture (denominator) and who had either a bone mineral density (BMD) test or prescription for a drug to treat or prevent osteoporosis in the six months after the fracture (numerator).

Exclusions: (1) Members are excluded if they had a previous fracture (documented in an outpatient visit, observation stay, emergency department visit, non-acute inpatient encounter or acute inpatient encounter) during the 60 days (i.e., two months) prior to the index fracture. (2) Members are excluded if they had a Bone Mineral Density (BMD) test or a claim/encounter for osteoporosis therapy or received a dispensed prescription to treat osteoporosis during the 365 days (i.e., 12 months) prior to the index fracture. (3) The measure excludes fractures of skull, face, toes or fingers.

Disease-Modifying Anti-Rheumatic Drug Therapy for Rheumatoid Arthritis (ART) The percent of members who were diagnosed with rheumatoid arthritis (denominator) and who were dispensed at least one ambulatory prescription for a disease-modifying anti-rheumatic drug (DMARD) in the measurement year (numerator).

Optional exclusions: (1) diagnosis of HIV; or (2) pregnancy anytime during the member's history through December 31 of the measurement year.

Glaucoma Screening in Older Adults (GSO) The percent of Medicare members 65 years and older without a prior diagnosis of glaucoma or glaucoma suspect (denominator) who received a glaucoma eye exam by an eye care professional for early identification of glaucomatous conditions (numerator).

Optional exclusions: Prior diagnosis of glaucoma or glaucoma suspect as far back as possible in member's prior history.

Breast Cancer Screening (BCS) The percent of women 40–69 years of age (denominator) who had a mammogram to screen for breast cancer during the past two years (numerator).

Optional exclusions: Women with a bilateral mastectomy or two unilateral mastectomy codes on different dates of service or unilateral mastectomy code with a right side modifier and a unilateral mastectomy code with a left side modifier (may be on the same date of service) as far back as possible in the member's history.

Plan All-Cause Readmissions (PCR) The percent of members 65 years of age and older discharged from an acute care hospital (denominator) who were readmitted for any diagnosis within 30 days for members (numerator).

Exclusions: Same day hospitalizations; discharges for members with another discharge in prior 30 days (i.e., only the first discharge is counted, thus a readmission within 30 days followed by another admission does not count in the measure); discharges for death; and stays with a principal diagnosis of pregnancy or conditions originating in the perinatal period.

Risk adjustment: This is the only measure among those evaluated that is adjusted for case-mix severity to account for how sick patients were when they went to the hospital the first time. Categories include: age, gender, presence of surgeries, discharge condition, and comorbidities.

Prescription Drug Event (PDE) Measures

Part D Medication Adherence for Oral Diabetes Medications (MA-D) The percent of Medicare Part D beneficiaries 18 years or older who had proportion of days covered (PDC) of 80 percent or higher across the classes of diabetes medications (biguanides, sulfonylureas, thiazolidinediones, and DPP-IV Inhibitors) during the measurement period (numerator). The population includes members with at least two fills of medication(s) across the four classes (denominator). The PDC is adjusted to account for inpatient stays.

Exclusions: Beneficiaries with one of more fills for insulin in the measurement period are excluded.

Part D Medication Adherence for Cholesterol (Statins) (MA-C) The percent of beneficiaries 18 years or older who had proportion of days covered (PDC) of 80 percent or over for statin cholesterol medication(s) during the measurement period (numerator). The population includes members with at least two fills of any statin medication (denominator). The PDC is adjusted to account for inpatient stays. There are no exclusions or adjustments for this measure.

Part D Medication Adherence for Hypertension (MA-H) The percent of beneficiaries 18 years or older who had proportion of days covered (PDC) of 80 percent or higher for Renin Angiotensin System (RAS) antagonist medications (Angiotensin Converting Enzyme--ACE inhibitors, Angiotensin Receptor Blocker—ARBs and direct renin inhibitors) during the measurement period (numerator). The PDC is adjusted to account for inpatient stays. The population includes members with at least two fills of any RAS antagonist (denominator). There are no exclusions or adjustments for this measure.

Diabetes Treatment (BPD) The percent of Medicare Part D beneficiaries, 18 years or older, dispensed a medication for diabetes and a medication for hypertension who were receiving at least one fill for a Renin Angiotensin System (RAS) antagonist (Angiotensin Converting Enzyme—ACE inhibitor, Angiotensin Receptor Blocker—ARB or Direct Renin Inhibitor) which are recommended for people with diabetes (numerator). The population includes members dispensed at least one prescription for an oral hypoglycemic agent or insulin and at least one prescription for an antihypertensive agent (denominator). There are no exclusions or adjustments for this measure.

High-Risk Medication (HRM) The percent of Medicare members 65 years of age or older who received two or more fills of at least one drug with a high risk of side effects in the elderly (numerator). The denominator is number of member-years of enrolled beneficiaries. There are no exclusions or adjustments for this measure.

Part D Medication Adherence for Cholesterol (Statins) (MA-C) The percent of beneficiaries 18 years or older who had proportion of days covered (PDC) of 80 percent or over for statin cholesterol medication(s) during the measurement period (numerator). The population includes members with at least two fills of any statin medication (denominator). The PDC is adjusted to account for inpatient stays. There are no exclusions or adjustments for this measure.

APPENDIX B: REVIEW OF EXISTING LITERATURE—ADDITIONAL STUDIES

There is extensive evidence that the dual eligible population has inferior outcomes compared to non-dual eligibles. A comprehensive literature review was conducted to identify and summarize previously published studies that have assessed disparities in quality measures and outcomes between dual eligible and non-dual beneficiaries. In addition to studies directly investigating the specific impact of dual eligible status on outcome performance measures—most focused on the Medicare fee-for-service population—a more extensive body of literature exists regarding the impact of race/ethnicity, socioeconomic status, and gender on health outcomes, particularly those related to the HEDIS performance measures. Since these characteristics are more prevalent among the dual eligible population, this research can also shed light on the study research hypotheses.

There are numerous studies related to adherence to treatment guidelines. A study of Colorado Medicare fee-for-service patients aged 65 to 75 with diabetes found that dual eligibles were significantly less likely to receive an annual HbA1c test, biennial ophthalmologic examination, and biennial lipid testing than non-duals.[13] Another study using member-level data from 160 Medicare managed care plans showed that women were more likely to achieve performance standards for HbA1c screening and eye exam, but less likely to achieve performance standards for LDL cholesterol control. Blacks were less likely to have HbA1c screening, eye exam, cholesterol screening, adequate HbA1c control, and LDL cholesterol control compared to whites.[42]

A study of predictors of inconsistent glaucoma follow-up visits showed that race/ethnicity and education levels were strong predictors of inconsistent follow-up visits after adjusting for age, gender, disease severity, employment status, marital status, and health insurance coverage. Hispanics with low level of education and blacks with low-medium level of education were significantly more likely to have inconsistent follow-up visit patterns.[43] Race/ethnicity disparities in cholesterol screening and treatment of high serum cholesterol in patients aged 25 years and older was examined using data from the Third National Health and Nutrition Examination Survey (NHANES III), which consisted of an interview, physical exam, and lab tests. Results indicated that Mexican Americans and blacks, individuals who were poor, with less education, smokers, and uninsured were less likely to have a cholesterol screening. Of individuals prescribed a cholesterol lowering medication, Mexican Americans and blacks were significantly less likely to be adherent.[44]

There are limited studies evaluating the disparity in cancer screening and treatment between dual and non-dual eligible beneficiaries. A study compared breast cancer screening between dual eligible and Medicare only and found that dual members were less likely to have breast cancer screening.[16] A study of dual beneficiaries 65 years old or older reported that duals were less likely to undergo colorectal cancer screening than non-duals after adjusting for individual and county-level covariates (e.g., duals were disproportionately female, older and more likely to be non-white).[45] A study linking data from the U.S. National Cancer Institute's cancer registry to Medicare claims data found that dual eligible patients diagnosed with breast or lung cancer were also more likely to experience delay of treatment initiation.[15]

Several studies have examined socioeconomic and demographic disparities in cancer screening. A large study using data from the Surveillance, Epidemiology, and End Results (SEER) program and the U.S. National Health Interview Survey (NHIS) assessed trends in race/ethnicity and socioeconomic disparities in breast cancer incidence, stage at diagnosis, mammography screening, mortality, and survival. Results showed that breast cancer incidence and mortality rates have declined and mammography screenings have increased for all groups; however, more socioeconomic advantaged groups showed improvement at a faster rate. Breast cancer incidence and mortality rates remain higher and mammography screening rates are lower among more socioeconomic disadvantaged groups. While breast cancer incidence rates were higher for whites, blacks had the highest mortality rates and percent of cases diagnosed beyond the local stage.[18] Women in high poverty areas or uninsured are more likely to have a diagnosis of late-stage breast cancer regardless of geographic

location.[19] An intervention study was conducted to improve low-income women participation in breast cancer screening but failed due to difficulty of delivering the interventions to low-income women.[46] According to results from the CDC Behavioral Risk Factor Surveillance System, prevalence of self-reported breast cancer screening was lower for women with a disability.[20] The results are consistent with a second study that found disability status had a significant negative association with screening mammography for Medicaid managed care members after adjusting for confounders.[47] A similar study examined a cohort of continuously enrolled Medicare fee-for-service beneficiaries in California from 1992–1998 and found that irregular mammography intervals were more common among women who were older, minority, living in low income and lower education areas, and dual eligible.[48]

Barriers to medication adherence mainly include patient, physician, and the health system factors. A patient can fail to be adherent due to reasons such as attitudes toward their medications, out-of-pocket costs, their economic situation, side effects, medical history, complexity of their regimens, and poor communication with their physician.[24] Extensive literature exists that highlight the influence of demographics, socioeconomics and other patient, physician, and health system factors on the PDE (Prescription Drug Event) medication adherence performance measures.[21-33]

Systematic literature reviews and meta-analyses have been conducted to identify consistent predictors of adherence to statins. These analyses reveal that age has a U-shaped association with adherence; the oldest (≥70 years) and youngest (<50 years) patients had lower adherence than the middle-aged (50–69 years) patients. Females, lower income status, race (African America, Hispanics, and Asian), fewer lipid tests performed, and not having history of cardiovascular disease or diabetes were found to predict non-adherence to statins.[21-23]

A retrospective cohort study analyzed the potential demographic and clinical factors that predict medication non-adherence using data of Medicare Part D enrollees with diabetes from six states. The study found that patients younger than 65 years, women, black or Hispanic patients, and those with higher comorbidity scores were more likely to be non-adherent to oral anti-diabetic drugs.[25] Another retrospective cohort study found that while age and gender were not significant predictors of adherence to antihypertensive drugs, blacks and Hispanics and other non-whites, members with more comorbid conditions, and members taking more medications had significantly lower likelihood of adherence.[27]

Several studies have examined race/ethnicity and socioeconomic disparities in osteoporosis screening and treatment. For example, a study of Medicare fee-for-service data for a 30-month interval from two years before hip fracture to six months after hip fracture showed that blacks and Hispanics were significantly less likely to have osteoporosis screening prior to and after hip fracture compared to whites, and that lower-income and less-educated individuals were significantly less likely to have osteoporosis screening prior to and after hip fracture after controlling for other risk factors.[34] Another study examined disparities associated with osteoporosis treatment in patients at high risk for fracture based on a fracture risk index. Results showed that at-risk blacks and males were significantly less likely to receive prescriptions for osteoporosis medications compared to whites and females.[35]

Duals are significantly more likely to have multiple comorbidities.[36] This compounds the impact of race/ethnicity, gender and socioeconomic factors on health outcomes.[37] Multi-morbidity (defined as co-occurrence of two or more chronic diseases) results in increased functional impairment, poor quality of life, high healthcare utilization and increased cost.[37] A systematic review of the scientific evidence from 1990–2010 summarized that multi-morbidity affects more than 50% of the elderly population and prevalence increases in very old persons, women, and people with lower social class. Multi-morbidity does not affect the elderly alone—a CDC study showing a growing percentage of young adults are living with two or more chronic conditions.[49]

APPENDIX C: SUMMARY AND MEASURE STATISTICS

Notable findings from the detailed result Tables included in this Appendix are summarized below:

Table C2 shows complete results for ART stratified by all sociodemographic and clinical factors evaluated. The last column shows that, overall, the ART rate among dual eligible members is 19.5% lower than the rate among non-dual members. For ART, the rate is lower for duals in every age group, but especially worse among those aged 89+ where it is 28.6% lower. The rate for dual males is 38.6% lower than for male non-duals. The rate is significantly lower for black and white dual eligible members, and lower for duals in every income category. Importantly, the rate is 41.5% lower for duals who receive no income subsidy. The rate is worse for members with more severe co-morbidities based on the Charlson Severity Score. The rate for duals with a score of 1 is 59.2% versus 64.7% for non-duals (8.6% lower) but 22% lower performance for duals with a Charlson score of 6 or higher. This pattern holds true based on the CMS risk scores as well.

Table C3 shows results for breast cancer screening (BCS). Duals perform significantly worse overall (4.1% worse). Duals perform slightly better among women age 40–64, but worse among women age 65–69. Interestingly, dual women in the highest income group ($75,000+) perform significantly worse (19% lower rate of screening) compared to non-duals. Dual eligible women who receive an income subsidy of $100 or more perform better compared to non-duals. Rates are significantly worse for dual women in the Midwest and West, but slightly better for women in the Northeast.

For BCS, dual eligible women with a Charlson Severity Score of 0 perform significantly worse than non-duals, but dual women with higher comorbidity scores (>=5) perform better compared to non-duals. This could be related to the higher frequency of physician visits for members with multiple comorbidities, but further research is needed to determine the causes of the differences.

Table C4 shows results for Glaucoma Testing (GSO). The rate is worse, or not statistically different, in duals compared to non-duals in every demographic and socioeconomic category except among dual blacks. It is 18% lower among American Indian/Alaska Natives indicating this ethnic group has the greatest disparity in care for this screening. Rates are worse among dual members with lower comorbidity and risk scores.

Table C5 shows results for Osteoporosis Management in Women Who Had a Fracture (OMW). The rate for dual members is 16.6% compared to 21.7% among non-dual members indicating a 23.5% gap in performance. The rate is significantly worse among women age 80 and older, up to 29% lower for women age 89+. Compliance with osteoporosis treatment is also worse the higher the income subsidy received (though not significantly so for the largest subsidy group). This is important information for providers as fractures are a major problem in elderly women and following evidence-based treatment guidelines can reduce the risk of future fractures in this population.[39-41]

Table C6 shows plan all-cause readmission rates (PCR). This is an inverse measure where higher rates of readmission following a hospital discharge indicate a worse outcome. This measure was computed using the NCQA risk adjustment model for MA members age 65+, which adjusts for chronic conditions and factors impacting likelihood of readmission. Duals have 10% higher readmission rates on average (15.2% vs. 13.8%). The fact that the rate is still significantly higher for dual eligible members, after adjusting for chronic conditions, age, and other key risk factors is an important finding indicating that even after accounting for other factors related to risk of readmission, dual eligible status remains a significant predictor of higher likelihood of readmission.

The performance gap indicates 1.4 more readmissions per discharge per 100 dual eligible enrollees. Using an estimated average cost per readmission of $11,784[50], that translates into an added $164,976 per 100 discharges. In plans with high proportions of dual eligible members, this results in far greater costs to care for this population. Though readmission rates are lower among members age 65–75, the performance gap in this demographic is worse as compared to 80 years and older non-dual members. The PCR rate is 15.3% higher among duals with no low income subsidy. As expected, readmission rates increase with severity of comorbidities based on both the Charlson index and risk score.

Table C7 shows High Risk Medication (HRM) Rates. HRM is another inverse measure where higher rates indicate worse performance. The rate among dual eligible members is 16.0% compared to 12.6% among non-dual members. This 27% higher rate of high risk medication use in the dual population is reflective of the disease severity documented in the literature section. The rates of prescribing are even higher among duals age 65–69 (31.6% higher than non-duals in that age group), and 35.9% higher among male dual eligible members as compared to non-dual males. Rates are higher among duals in every region, but highest in the South.

Tables C8, C9 and C10 present results for the three medication adherence measures (MA-C, MA-D and MA-H). The rates are lower among dual eligible members for all adherence measures. Medication non-adherence has been identified by the World Health Organization as a leading cause of preventable morbidity, mortality, and healthcare costs.[51] Non-adherence, along with suboptimal prescribing, drug administration, and diagnosis results in $290 billion in avoidable healthcare costs annually.[52]

Adherence to cholesterol medications among duals is 68.1% versus 72% for non-duals (Table C8). Adherence is significantly lower among all age groups 65–88 years. Adherence among dual males is 6.5% lower than non-dual males. Adherence to cholesterol medications are lowest among duals with no income subsidy (18.2% lower), and lowest among duals with Charlson Severity Score of 0 (66.8% vs. 79.4% among healthier non-duals), with similarly worse performance in duals with risk score less than.50 (60.1% vs. 69.8% among non-duals).

Adherence to antihypertensive medications (MA-H) is 4.9% worse among duals overall (74.9% vs. 78.7% for non-duals) (Table C10). Similar to MA-C, adherence rates are lower among every age cohort greater than or equal to age 65, and lower among dual males (6.8% lower than non-dual males). Adherence rates are lowest among blacks and Hispanics. Again the lowest adherence rates are among dual members with no low income subsidy (70.6% vs. 79.0%). Rates are lower in the South. The performance gap is larger among dual members with low Charlson Severity Scores and low risk scores.

Results for adherence to diabetes medications (MA-D) are somewhat mixed (Table C9). While the rate of adherence to diabetes drugs is statistically significantly lower among dual eligible members (74.8% vs. 75.8%), the actual difference is not large, and there are many demographic cohorts where adherence is better among duals. Adherence to diabetes treatment is worse among dual males and whites. The largest performance gap is among duals with no low income subsidy, the rate is 9.7% lower than non-duals (68.5% adherence vs. 75.9%).

Table C11 Presents results for diabetes treatment (BPD) in beneficiaries with diabetes and hypertension. As discussed above, this is the only measure evaluated for which dual eligible members perform better across the board (with one exception, rates are slightly lower among duals in the Midwest region). As previously discussed, there is evidence that these members have far more office visits on average compared to non-dual members, and this may in part explain this result; but further research is needed to uncover why the performance gap does not persist for this measure compared to all other measures evaluated.

Table C1. Medicare Advantage Plan Data: Summary Statistics

Variable	Group	2011					2012				
		Dual Eligible		Non-Dual Eligible		Percent Dual Eligible	Dual Eligible		Non-Dual Eligible		Percent Dual Eligible
		Number	Percent*	Number	Percent*		Number	Percent*	Number	Percent*	
Total Members		221,795	100%	1,113,914	100%	17%	260,760	100%	1,344,884	100%	16%
Total Contracts		77	-	79	-	-	79	-	78	-	-
Age Group	18-54	17,300	8%	14,231	1%	55%	20,948	8%	16,552	1%	56%
	55-64	23,221	10%	39,431	4%	37%	28,404	11%	47,320	4%	38%
	65-69	44,390	20%	254,538	23%	15%	52,067	20%	300,039	22%	15%
	70-74	45,284	20%	271,973	24%	14%	53,496	21%	344,380	26%	13%
	75-79	36,204	16%	217,901	20%	14%	42,025	16%	259,919	19%	14%
	80-84	26,241	12%	166,249	15%	14%	30,413	12%	195,578	15%	13%
	85-88	14,529	7%	85,242	8%	15%	16,499	6%	102,599	8%	14%
	89+	14,626	7%	64,349	6%	19%	16,908	6%	78,497	6%	18%
Gender	Female	146,176	66%	636,370	57%	19%	171,581	66%	765,967	57%	18%
	Male	75,619	34%	477,544	43%	14%	89,179	34%	578,917	43%	13%
Race/Ethnicity	American Indian/Alaska Native	618	0%	993	0%	38%	742	0%	1,424	0%	34%
	Asian	8,102	4%	8,789	1%	48%	10,211	4%	9,933	1%	51%
	Black (non-Hispanic/Latino)	54,304	26%	133,395	12%	29%	63,554	26%	156,272	12%	29%
	Hispanic/Latino	35,863	17%	21,937	2%	62%	40,230	16%	23,125	2%	63%
	White (non-Hispanic/Latino)	112,212	53%	926,100	85%	11%	133,043	54%	1,125,446	86%	11%
	Unknown	10,696	-	22,700	-	32%	12,980	-	28,684	-	31%
SNP Type	Chronic or Disabling Condition	147	0%	1,878	0%	7%	231	0%	2,465	0%	9%
	Dual Eligible	135,223	61%	0	0%	100%	155,920	60%	0	0%	100%
	Institutional	35	0%	2	0%	95%	54	0%	3	0%	95%
	Not in SNP Plan	86,390	39%	1,112,034	100%	7%	104,555	40%	1,342,416	100%	7%
	Unknown	-	-	-	-	-	4,790	-	8,521	-	36%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* CMS updates Risk Scores with a six month lag for only current enrollment, yielding unknown results for all disenrolled or hospice members.
** Disproportionate increase in unknowns for 2012 caused by non-availability of CMS MMR files for some contracts.

Table C1. Medicare Advantage Plan Data: Summary Statistics

Variable	Group	2011					2012				
		Dual Eligible		Non-Dual Eligible		Percent Dual Eligible	Dual Eligible		Non-Dual Eligible		Percent Dual Eligible
		Number	Percent*	Number	Percent*		Number	Percent*	Number	Percent*	
Original Reason For Entitlement	ESRD	75	0%	560	0%	12%	113	0%	722	0%	14%
	Age	146,725	66%	973,740	87%	13%	169,249	65%	1,175,314	87%	13%
	Disability	74,940	34%	139,390	13%	35%	91,332	35%	168,577	13%	35%
	Disability and ESRD	24	0%	109	0%	18%	28	0%	110	0%	20%
Income^	$24,999 or less	44,860	21%	48,257	4%	48%	52,214	20%	55,996	4%	48%
	$25,000-$49,999	113,171	52%	457,055	42%	20%	132,410	51%	561,661	42%	19%
	$50,000-$74,999	45,234	21%	382,728	35%	11%	53,717	21%	467,857	35%	10%
	$75,000 or more	15,544	7%	212,678	19%	7%	18,982	7%	243,878	18%	7%
	Unknown	2,986	-	13,196	-	18%	3,437	-	15,492	-	18%
Low Income	$0	54,290	24%	1,065,936	96%	5%	62,334	24%	1,293,249	96%	5%
Drug Subsidy	$1-$99	22,941	10%	15,591	1%	60%	23,885	9%	15,072	1%	61%
	$100-$149	66,590	30%	25,956	2%	72%	85,048	33%	30,007	2%	74%
	$150+	77,974	35%	6,431	1%	92%	89,493	34%	6,556	0%	93%
Region	Midwest	23,262	10%	258,769	23%	8%	27,733	11%	404,517	30%	6%
	Northeast	125,744	57%	514,411	46%	20%	141,507	54%	533,244	40%	21%
	South	67,666	31%	277,092	25%	20%	84,774	33%	335,375	25%	20%
	West	5,071	2%	63,474	6%	7%	6,683	3%	71,519	5%	9%
	Unknown	52	-	168	-	24%	63	-	229	-	22%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

* CMS updates Risk Scores with a six month lag for only current enrollment, yielding unknown results for all disenrolled or hospice members.

** Disproportionate increase in unknowns for 2012 caused by non-availability of CMS MMR files for some contracts.

Table C1. Medicare Advantage Plan Data: Summary Statistics

Variable	Group	2011					2012				
		Dual Eligible		Non-Dual Eligible		Percent Dual Eligible	Dual Eligible		Non-Dual Eligible		Percent Dual Eligible
		Number	Percent*	Number	Percent*		Number	Percent*	Number	Percent*	
Charlson Severity Score	0	47,967	22%	388,637	35%	11%	54,114	21%	464,993	35%	10%
	1	44,518	20%	231,928	21%	16%	52,161	20%	278,482	21%	16%
	2	31,997	14%	162,105	15%	16%	37,596	14%	195,271	15%	16%
	3	28,959	13%	118,286	11%	20%	34,160	13%	143,926	11%	19%
	4	20,296	9%	70,381	6%	22%	24,682	9%	86,167	6%	22%
	5	15,539	7%	49,321	4%	24%	18,826	7%	60,760	5%	24%
Risk Score	0.000 - 0.499	17,509	10%	309,693	33%	5%	13,203	7%	251,121	34%	5%
	0.500 - 0.749	31,595	18%	194,550	20%	14%	33,279	18%	150,771	20%	18%
	0.750 - 0.999	31,935	18%	131,267	14%	20%	32,102	17%	100,163	13%	24%
	1.000 - 1.249	22,712	13%	88,675	9%	20%	28,042	15%	70,695	9%	28%
	1.250 - 1.499	17,301	10%	60,544	6%	22%	18,984	10%	45,946	6%	29%
	1.500 - 1.999	21,935	13%	70,882	7%	24%	23,383	13%	53,355	7%	30%
	2.000+	31,002	18%	93,421	10%	25%	35,547	19%	73,227	10%	33%
	Unknown*	47,806	-	164,882	-	22%	76,220**	-	599,606**	-	11%
Institutional Status	No	214,764	97%	1,111,666	100%	16%	252,977	97%	1,342,143	100%	16%
	Yes	7,031	3%	2,248	0%	76%	7,783	3%	2,741	0%	74%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* CMS updates Risk Scores with a six month lag for only current enrollment, yielding unknown results for all disenrolled or hospice members.
** Disproportionate increase in unknowns for 2012 caused by non-availability of CMS MMR files for some contracts.

Table C2. Medicare Advantage Plan Rheumatoid Arthritis Management (ART) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**45.0**	**4,800**	**55.9**	**17,020**	**53.5**	**21,820**	**Yes**	**-19.5%**
Age Group	18-54	50.3	660	60.5	655	55.4	1,315	Yes	-16.8%
	55-64	51.3	860	59.7	1,840	57.0	2,700	Yes	-14.1%
	65-69	49.3	791	62.0	3,251	59.5	4,042	Yes	-20.5%
	70-74	46.8	825	60.8	3,944	58.3	4,769	Yes	-23.0%
	75-79	41.7	678	55.4	3,090	52.9	3,768	Yes	-24.6%
	80-84	38.8	502	51.0	2,408	48.9	2,910	Yes	-23.8%
	85-88	31.9	254	40.0	1,136	38.5	1,390	Yes	-20.2%
	89+	21.7	230	30.5	696	28.3	926	Yes	-28.6%
Gender	Female	47.7	3,889	56.5	12,633	54.5	16,522	Yes	-15.6%
	Male	33.2	911	54.0	4,387	50.4	5,298	Yes	-38.6%
Race/Ethnicity	Asian	63.0	92	52.9	136	57.0	228	No	
	Black (non-Hispanic/Latino)	45.7	1,142	51.0	2,758	49.5	3,900	Yes	-10.4%
	Hispanic/Latino	40.8	535	36.5	513	38.7	1,048	No	
	White (non-Hispanic/Latino)	44.6	2,883	57.8	13,220	55.4	16,103	Yes	-22.8%
	Unknown	51.1	139	52.7	378	52.2	517	No	
SNP Type	Chronic or Disabling Condition	80.0	5	7.0	43	14.6	48	No	
	Dual Eligible	39.1	2,977			39.1	2,977		
	Not in SNP Plan	54.5	1,818	56.0	16,977	55.9	18,795	No	
Original Reason For Entitlement	Age	40.5	2,281	54.8	11,842	52.5	14,123	Yes	-26.0%
	Disability	49.0	2,516	58.4	5,170	55.3	7,686	Yes	-16.0%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C2. Medicare Advantage Plan Rheumatoid Arthritis Management (ART) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Income^	$24,999 or less	31.3	1,439	35.1	1,376	33.2	2,815	Yes	-10.7%
	$25,000-$49,999	51.0	1,874	56.4	6,607	55.2	8,481	Yes	-9.6%
	$50,000-$74,999	51.2	965	58.9	5,308	57.7	6,273	Yes	-13.1%
	$75,000 or more	50.6	431	59.5	3,438	58.5	3,869	Yes	-15.0%
	Unknown	44.0	91	44.0	291	44.0	382	No	
Low Income	$0	32.8	1,664	56.0	16,109	53.8	17,773	Yes	-41.5%
Drug Subsidy	$1-$99	56.0	557	50.3	318	53.9	875	No	
	$100-$149	52.5	1,767	54.6	463	53.0	2,230	No	
	$150+	45.9	812	63.1	130	48.3	942	Yes	-27.2%
Region	Midwest	56.6	493	66.2	2,665	64.7	3,158	Yes	-14.5%
	Northeast	49.8	1,575	55.7	7,847	54.7	9,422	Yes	-10.6%
	South	39.7	2,643	50.3	5,547	46.8	8,190	Yes	-21.1%
	West	52.3	88	61.6	960	60.8	1,048	No	
Charlson Severity Score	1	59.2	791	64.7	4,409	63.9	5,200	Yes	-8.6%
	2	50.5	909	57.5	3,590	56.1	4,499	Yes	-12.1%
	3	43.1	752	55.4	2,794	52.8	3,546	Yes	-22.2%
	4	44.2	660	53.0	2,157	50.9	2,817	Yes	-16.5%
	5	39.4	521	50.2	1,373	47.2	1,894	Yes	-21.6%
	6+	35.2	1,165	45.2	2,687	42.2	3,852	Yes	-22.2%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C2. Medicare Advantage Plan Rheumatoid Arthritis Management (ART) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	27.3	11	39.5	119	38.5	130	No	
	0.500 - 0.749	61.5	143	64.7	1,999	64.5	2,142	No	
	0.750 - 0.999	53.4	429	59.0	1,885	58.0	2,314	Yes	-9.5%
	1.000 - 1.249	49.7	561	57.4	1,742	55.5	2,303	Yes	-13.3%
	1.250 - 1.499	46.9	461	53.2	1,221	51.4	1,682	Yes	-11.9%
	1.500 - 1.999	43.9	695	49.3	1,730	47.7	2,425	Yes	-10.9%
	2.000+	38.4	1,418	46.7	2,471	43.6	3,889	Yes	-17.8%
	Unknown*	45.7	1,082**	58.2	5,853**	56.2	6,935	Yes	-21.5%
Institutional Status	No	45.3	4,680	55.9	16,992	53.6	21,672	Yes	-19.0%
	Yes	33.3	120	39.3	28	34.5	148	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C3. Medicare Advantage Plan Breast Cancer Screening (BCS) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**66.7**	**36,719**	**69.6**	**132,674**	**68.9**	**169,393**	**Yes**	**-4.1%**
Age Group	40-54	60.2	9,959	58.4	9,742	59.3	19,701	Yes	3.1%
	55-64	69.1	12,667	64.7	26,363	66.1	39,030	Yes	6.8%
	65-69	69.2	14,093	72.0	96,569	71.6	110,662	Yes	-3.9%
Gender	Female	66.7	36,719	69.6	132,674	68.9	169,393	Yes	-4.1%
Race/Ethnicity	American Indian and Alaska Native	67.6	105	55.7	183	60.1	288	Yes	21.3%
	Asian	60.9	1,053	58.6	1,279	59.6	2,332	No	
	Black (non-Hispanic/Latino)	65.7	10,910	65.7	22,723	65.7	33,633	No	
	Hispanic/Latino	77.7	5,377	70.3	2,746	75.2	8,123	Yes	10.5%
	White (non-Hispanic/Latino)	63.9	17,879	70.7	102,346	69.7	120,225	Yes	-9.7%
	Unknown	73.6	1,395	64.7	3,397	67.3	4,792	Yes	13.8%
SNP Type	Chronic or Disabling Condition	52.9	17	64.3	112	62.8	129	No	
	Dual Eligible	69.9	22,856			69.9	22,856		
	Not in SNP Plan	61.5	13,837	69.6	132,562	68.8	146,399	Yes	-11.5%
Original Reason For Entitlement	ESRD	45.2	31	61.3	238	59.5	269	No	
	Age	68.7	7,873	73.5	79,164	73.1	87,037	Yes	-6.6%
	Disability	66.2	28,795	63.7	53,166	64.6	81,961	Yes	3.9%
	Disability and ESRD	36.4	11	57.8	45	53.6	56	No	
Income^	$24,999 or less	74.1	6,225	72.4	6,456	73.3	12,681	Yes	2.3%
	$25,000-$49,999	67.5	19,244	69.8	56,219	69.2	75,463	Yes	-3.3%
	$50,000-$74,999	63.4	7,868	69.9	45,697	69.0	53,565	Yes	-9.3%
	$75,000 or more	54.5	2,919	67.3	22,729	65.8	25,648	Yes	-19.0%
	Unknown	68.9	463	72.1	1,573	71.4	2,036	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C3. Medicare Advantage Plan Breast Cancer Screening (BCS) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Low Income	$0	69.3	6,852	70.1	125,867	70.0	132,719	No	
Drug Subsidy	$1-$99	64.7	3,530	65.2	1,978	64.9	5,508	No	
	$100-$149	64.7	12,687	57.3	3,958	63.0	16,645	Yes	13.0%
	$150+	67.8	13,650	59.4	871	67.3	14,521	Yes	14.3%
Region	Midwest	61.9	2,471	77.2	38,019	76.3	40,490	Yes	-19.9%
	Northeast	66.7	21,204	63.4	54,269	64.3	75,473	Yes	5.2%
	South	69.0	11,696	71.0	34,402	70.5	46,098	Yes	-2.8%
	West	56.7	1,342	68.5	5,969	66.3	7,311	Yes	-17.2%
Charlson Severity Score	0	58.6	9,579	66.8	55,016	65.6	64,595	Yes	-12.2%
	1	67.1	8,516	71.8	30,328	70.8	38,844	Yes	-6.5%
	2	69.3	5,560	72.6	17,862	71.8	23,422	Yes	-4.5%
	3	71.2	4,260	73.1	11,738	72.6	15,998	Yes	-2.5%
	4	72.4	2,875	70.5	6,394	71.1	9,269	No	
	5	74.6	2,073	71.3	4,098	72.4	6,171	Yes	4.6%
	6+	68.8	3,856	66.1	7,238	67.0	11,094	Yes	4.0%
Risk Score	0.000 - 0.499	61.2	5,917	69.7	36,841	68.5	42,758	Yes	-12.3%
	0.500 - 0.749	68.5	4,586	71.5	15,195	70.8	19,781	Yes	-4.3%
	0.750 - 0.999	70.3	5,310	69.4	9,538	69.7	14,848	No	
	1.000 - 1.249	72.4	3,926	70.4	6,168	71.2	10,094	Yes	2.9%
	1.250 - 1.499	71.7	2,767	68.3	3,883	69.7	6,650	Yes	5.1%
	1.500 - 1.999	71.8	3,110	67.2	4,144	69.2	7,254	Yes	6.8%
	2.000+	66.9	4,181	62.9	5,405	64.6	9,586	Yes	6.4%
	Unknown	60.0	6,922	69.8	51,500	68.6	58,422	Yes	-13.9%
Institutional Status	No	66.9	36,553	69.6	132,649	69.0	169,202	Yes	-3.8%
	Yes	20.5	166	20.0	25	20.4	191	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C4: Medicare Advantage Plan Glaucoma Testing (GSO) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**67.2**	**154,748**	**73.2**	**1,183,139**	**72.5**	**1,337,887**	**Yes**	**-8.2%**
Age Group	65-69	70.7	28,931	77.7	224,644	76.9	253,575	Yes	-9.0%
	70-74	68.3	39,878	74.8	333,389	74.1	373,267	Yes	-8.6%
	75-79	66.1	33,138	72.1	256,942	71.5	290,080	Yes	-8.3%
	80-84	65.9	24,833	70.8	193,202	70.3	218,035	Yes	-7.0%
	85-88	65.6	13,667	69.8	100,715	69.3	114,382	Yes	-6.0%
	89+	63.5	14,301	67.8	74,247	67.1	88,548	Yes	-6.4%
Gender	Female	67.1	104,891	72.3	677,038	71.6	781,929	Yes	-7.2%
	Male	67.4	49,857	74.5	506,101	73.9	555,958	Yes	-9.5%
Race/Ethnicity	American Indian and Alaska Native	62.1	446	76.0	1,063	71.9	1,509	Yes	-18.3%
	Asian	65.4	6,547	65.6	8,977	65.5	15,524	No	
	Black (non-Hispanic/Latino)	59.1	37,255	57.1	154,561	57.5	191,816	Yes	3.5%
	Hispanic/Latino	63.6	20,766	64.7	16,485	64.1	37,251	Yes	-1.8%
	White (non-Hispanic/Latino)	72.3	83,355	76.2	980,359	75.9	1,063,714	Yes	-5.1%
	Unknown	62.0	6,379	65.8	21,694	64.9	28,073	Yes	-5.7%
SNP Type	Chronic or Disabling Condition	72.6	51	71.4	959	71.5	1,010	No	
	Dual Eligible	65.7	82,877			65.7	82,877		
	Institutional	83.8	37	100.0	1	84.2	38	No	
	Not in SNP Plan	69.0	71,783	73.2	1,182,179	73.0	1,253,962	Yes	-5.8%
Original Reason For Entitlement	ESRD	68.8	32	69.9	458	69.8	490	No	
	Age	66.4	124,270	73.1	1,082,457	72.4	1,206,727	Yes	-9.2%
	Disability	70.4	30,438	74.4	100,097	73.5	130,535	Yes	-5.4%
	Disability and ESRD	100.0	3	65.2	69	66.7	72	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C4: Medicare Advantage Plan Glaucoma Testing (GSO) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Income^	$24,999 or less	69.5	23,961	67.4	36,896	68.2	60,857	Yes	3.2%
	$25,000-$49,999	66.1	77,645	73.0	479,245	72.1	556,890	Yes	-9.4%
	$50,000-$74,999	67.7	36,099	74.4	419,841	73.8	455,940	Yes	-9.0%
	$75,000 or more	67.8	15,384	72.6	236,365	72.3	251,749	Yes	-6.6%
	Unknown	67.7	1,659	74.3	10,792	73.4	12,451	Yes	-8.9%
Low Income	$0	69.9	36,202	73.3	1,152,404	73.2	1,188,606	Yes	-4.7%
Drug Subsidy	$1-$99	75.1	12,093	75.3	7,323	75.2	19,416	No	
	$100-$149	67.9	51,906	67.9	20,778	67.9	72,684	No	
	$150+	63.0	54,547	79.7	2,634	63.8	57,181	Yes	-20.9%
Region	Midwest	74.3	20,903	77.6	369,406	77.4	390,309	Yes	-4.3%
	Northeast	62.2	93,537	67.7	530,070	66.8	623,607	Yes	-8.1%
	South	75.0	36,788	77.5	225,658	77.2	262,446	Yes	-3.3%
	West	78.2	3,496	79.8	57,811	79.8	61,307	Yes	-2.0%
	Unknown	50.0	24	78.9	194	75.7	218	Yes	-36.6%
Charlson Severity Score	0	64.0	33,206	71.5	409,588	71.0	442,794	Yes	-10.5%
	1	70.1	29,352	75.9	241,625	75.3	270,977	Yes	-7.6%
	2	69.5	22,956	75.3	175,701	74.6	198,657	Yes	-7.7%
	3	67.1	20,680	73.4	128,706	72.5	149,386	Yes	-8.5%
	4	67.1	14,817	72.4	76,956	71.5	91,773	Yes	-7.3%
	5	65.5	11,170	71.3	54,184	70.3	65,354	Yes	-8.2%
	6+	66.8	22,567	71.8	96,379	70.8	118,946	Yes	-7.0%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C4: Medicare Advantage Plan Glaucoma Testing (GSO) Rates by Dual Eligible Status (2012)									
		Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
Variable	**Group**	**Rate**	**Denom**	**Rate**	**Denom**	**Rate**	**Denom**		
Risk Score	0.000 - 0.499	67.1	5,386	72.9	218,200	72.7	223,586	Yes	-7.8%
	0.500 - 0.749	65.6	24,440	72.5	141,421	71.5	165,861	Yes	-9.6%
	0.750 - 0.999	67.0	21,970	71.8	96,434	70.9	118,404	Yes	-6.6%
	1.000 - 1.249	66.5	17,234	70.7	68,661	69.8	85,895	Yes	-5.9%
	1.250 - 1.499	66.1	12,906	70.9	45,494	69.8	58,400	Yes	-6.7%
	1.500 - 1.999	67.0	16,613	70.5	53,175	69.6	69,788	Yes	-4.9%
	2.000+	67.5	24,810	70.8	73,347	70.0	98,157	Yes	-4.7%
	Unknown	69.3	31,389	75.2	486,407	74.8	517,796	Yes	-7.8%
Institutional Status	No	67.7	148,267	73.3	1,180,857	72.7	1,329,124	Yes	-7.6%
	Yes	55.5	6,481	56.4	2,282	55.8	8,763	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C5. Medicare Advantage Plan Osteoporosis Management in Women Who Had a Fracture (OMW) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**16.6**	**2,271**	**21.7**	**10,486**	**20.8**	**12,757**	**Yes**	**-23.5%**
Age Group	67-69	23.8	164	27.0	897	26.5	1,061	No	
	70-74	18.5	325	23.4	1,884	22.7	2,209	Yes	-21.1%
	75-79	22.6	380	25.6	1,979	25.1	2,359	No	
	80-84	16.1	403	20.8	2,177	20.1	2,580	Yes	-22.5%
	85-88	16.0	382	21.0	1,675	20.0	2,057	Yes	-23.8%
	89+	10.7	617	15.1	1,874	14.0	2,491	Yes	-29.1%
Gender	Female	16.6	2,271	21.7	10,486	20.8	12,757	Yes	-23.5%
Race/Ethnicity	Asian	12.8	39	31.1	45	22.6	84	Yes	-58.8%
	Black (non-Hispanic/Latino)	19.0	284	29.1	856	26.6	1,140	Yes	-34.7%
	Hispanic/Latino	20.9	163	16.0	206	18.2	369	No	
	White (non-Hispanic/Latino)	16.1	1,750	21.1	9,251	20.3	11,001	Yes	-23.5%
	Unknown	6.5	31	26.8	123	22.7	154	Yes	-76.0%
SNP Type	Dual Eligible	17.2	1,068			17.2	1,068		
	Not in SNP Plan	16.1	1,201	21.7	10,475	21.2	11,676	Yes	-26.1%
Original Reason For Entitlement	Age	16.3	1,931	21.7	9,743	20.8	11,674	Yes	-25.0%
	Disability	18.5	340	22.1	742	21.0	1,082	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C5. Medicare Advantage Plan Osteoporosis Management in Women Who Had a Fracture (OMW) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Income^	$24,999 or less	20.0	315	13.3	377	16.3	692	Yes	50.8%
	$25,000-$49,999	16.1	984	22.7	3,850	21.3	4,834	Yes	-29.2%
	$50,000-$74,999	13.8	588	20.2	3,494	19.3	4,082	Yes	-31.7%
	$75,000 or more	20.4	353	23.8	2,661	23.4	3,014	No	
	Unknown	9.7	31	16.4	104	14.8	135	No	
Low Income	$0	20.6	496	21.8	9,839	21.8	10,335	No	
Drug Subsidy	$1-$99	14.4	215	14.5	117	14.5	332	No	
	$100-$149	16.1	885	23.3	438	18.4	1,323	Yes	-31.1%
	$150+	15.1	675	10.9	92	14.6	767	No	
Region	Midwest	11.1	549	20.4	1,853	18.3	2,402	Yes	-45.5%
	Northeast	20.3	1,017	24.8	5,534	24.1	6,551	Yes	-18.2%
	South	16.1	665	16.8	2,453	16.6	3,118	No	
	West	7.5	40	18.1	645	17.5	685	No	
Charlson Severity Score	0	14.9	261	20.3	2,272	19.7	2,533	Yes	-26.4%
	1	15.0	334	23.6	1,990	22.3	2,324	Yes	-36.5%
	2	13.3	369	22.6	1,617	20.9	1,986	Yes	-41.2%
	3	20.1	319	23.7	1,361	23.0	1,680	No	
	4	20.8	245	20.2	993	20.4	1,238	No	
	5	12.3	228	19.6	713	17.9	941	Yes	-37.5%
	6+	18.6	515	20.7	1,540	20.2	2,055	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C5. Medicare Advantage Plan Osteoporosis Management in Women Who Had a Fracture (OMW) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	0.0	6	22.6	929	22.5	935	No	
	0.500 - 0.749	15.3	111	23.7	831	22.7	942	Yes	-35.4%
	0.750 - 0.999	19.6	168	27.5	743	26.0	911	Yes	-28.5%
	1.000 - 1.249	14.4	194	27.8	787	25.2	981	Yes	-48.1%
	1.250 - 1.499	19.9	131	23.6	606	22.9	737	No	
	1.500 - 1.999	21.7	277	27.8	836	26.2	1,113	Yes	-21.9%
	2.000+	20.3	552	24.5	1,452	23.3	2,004	Yes	-17.0%
	Unknown	12.1	832	16.7	4,302	15.9	5,134	Yes	-27.2%
Institutional Status	No	17.9	2,027	21.8	10,403	21.2	12,430	Yes	-18.0%
	Yes	6.2	244	12.1	83	7.7	327	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C6. Medicare Advantage Plan All-Cause Readmissions (PCR) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**15.2**	**33,531**	**13.8**	**210,610**	**14.0**	**244,141**	**Yes**	**9.7%**
Age Group	65-69	14.7	4,640	12.5	27,706	12.9	32,346	Yes	17.4%
	70-74	14.7	6,552	12.8	45,322	13.1	51,874	Yes	15.0%
	75-79	15.5	6,786	13.9	43,618	14.1	50,404	Yes	11.1%
	80-84	15.4	6,330	14.4	42,272	14.5	48,602	Yes	7.0%
	85-88	15.9	4,174	14.9	27,003	15.1	31,177	No	
	89+	14.8	5,049	14.8	24,689	14.8	29,738	No	
Gender	Female	14.8	22,852	13.3	117,616	13.6	140,468	Yes	10.9%
	Male	15.9	10,679	14.4	92,994	14.6	103,673	Yes	10.4%
Race/Ethnicity	American Indian and Alaska Native	14.2	90	13.1	216	13.4	306	No	
	Asian	13.7	690	12.7	1,061	13.1	1,751	No	
	Black (non-Hispanic/Latino)	15.4	8,128	14.3	30,458	14.5	38,586	Yes	8.0%
	Hispanic/Latino	14.7	2,518	14.4	3,062	14.5	5,580	No	
	White (non-Hispanic/Latino)	15.2	21,318	13.7	173,159	13.9	194,477	Yes	10.5%
	Unknown	14.5	787	13.3	2,654	13.6	3,441	No	
SNP Type	Chronic or Disabling Condition	18.5	28	16.4	304	16.6	332	No	
	Dual Eligible	15.0	16,228			15.0	16,228		
	Not in SNP Plan	15.3	17,275	13.8	210,306	13.9	227,581	Yes	10.6%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

** NOTE: PCR is an inverse measure where a higher rate of readmissions indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.

Table C6. Medicare Advantage Plan All-Cause Readmissions (PCR) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	18.9	20	18.2	258	18.3	278	No	
	Age	15.0	25,964	13.6	186,038	13.8	212,002	Yes	9.6%
	Disability	15.9	7,542	15.1	24,236	15.3	31,778	No	
	Disability and ESRD	15.6	5	20.7	39	20.1	44	No	
Income^	$24,999 or less	15.3	5,634	14.2	6,987	14.7	12,621	No	
	$25,000-$49,999	15.1	15,118	13.8	85,589	14.0	100,707	Yes	9.3%
	$50,000-$74,999	15.1	8,189	13.8	74,645	13.9	82,834	Yes	9.9%
	$75,000 or more	15.2	4,105	13.9	41,706	14.0	45,811	Yes	9.5%
	Unknown	15.7	485	14.2	1,683	14.5	2,168	No	
Low Income Drug Subsidy	$0	15.9	10,263	13.8	203,164	13.9	213,427	Yes	15.3%
	$1-$99	15.1	3,039	15.3	1,897	15.2	4,936	No	
	$100-$149	14.7	12,614	14.8	4,666	14.7	17,280	No	
	$150+	15.0	7,615	14.7	883	15.0	8,498	No	
Region	Midwest	15.3	6,562	13.7	71,415	13.9	77,977	Yes	11.2%
	Northeast	15.0	15,531	13.9	94,597	14.1	110,128	Yes	7.8%
	South	15.3	10,753	13.8	36,519	14.2	47,272	Yes	10.7%
	West	14.9	678	13.4	8,052	13.5	8,730	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

** NOTE: PCR is an inverse measure where a higher rate of readmissions indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C6. Medicare Advantage Plan All-Cause Readmissions (PCR) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
Charlson Severity Score	0	9.0	894	8.6	14,233	8.7	15,127	No	
	1	10.1	2,348	9.7	22,287	9.8	24,635	No	
	2	11.3	3,550	10.8	26,691	10.9	30,241	No	
	3	12.3	4,044	12.0	27,201	12.0	31,245	No	
	4	13.6	4,170	13.1	25,156	13.2	29,326	No	
	5	14.8	3,832	14.5	22,394	14.5	26,226	No	
	6+	18.6	14,693	17.9	72,648	18.0	87,341	No	
Risk Score	0.000 - 0.499	9.6	87	7.8	5,120	7.9	5,207	No	
	0.500 - 0.749	8.2	479	8.6	6,842	8.5	7,321	No	
	0.750 - 0.999	9.4	941	9.6	8,604	9.6	9,545	No	
	1.000 - 1.249	11.2	1,449	10.8	9,616	10.9	11,065	No	
	1.250 - 1.499	11.8	1,529	11.4	9,090	11.4	10,619	No	
	1.500 - 1.999	12.4	3,236	12.0	15,422	12.1	18,658	No	
	2.000+	15.9	11,922	15.9	46,598	15.9	58,520	No	
	Unknown	16.6	13,888	14.6	109,318	14.8	123,206	Yes	13.7%
Institutional Status	No	15.0	31,249	13.8	209,943	14.0	241,192	Yes	8.5%
	Yes	17.7	2,282	18.2	667	17.9	2,949	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

** NOTE: PCR is an inverse measure where a higher rate of readmissions indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.

Table C7. Medicare Advantage Plan High Risk Medication (HRM) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**16.0**	**123,600**	**12.6**	**656,023**	**13.1**	**779,624**	**Yes**	**27.2%**
Age Group	65-69	17.2	30,567	13.0	167,068	13.7	197,635	Yes	31.6%
	70-74	16.7	32,248	12.9	177,736	13.5	209,984	Yes	29.3%
	75-79	15.8	25,480	12.7	130,675	13.2	156,154	Yes	23.6%
	80-84	15.6	17,712	12.3	94,911	12.8	112,623	Yes	27.0%
	85-88	14.1	9,025	11.6	49,184	12.0	58,209	Yes	21.7%
	89+	12.8	8,569	10.4	36,449	10.9	45,018	Yes	23.0%
Gender	Female	16.9	82,010	14.1	375,163	14.6	457,173	Yes	19.5%
	Male	14.4	41,591	10.6	280,861	11.1	322,451	Yes	35.9%
Race/Ethnicity	American Indian and Alaska Native	17.4	431	17.8	561	17.6	992	No	
	Asian	13.0	6,580	10.6	7,607	11.7	14,187	Yes	22.8%
	Black (non-Hispanic/Latino)	13.2	32,565	10.8	114,634	11.3	147,199	Yes	21.8%
	Hispanic/Latino	17.2	20,741	14.7	15,479	16.1	36,220	Yes	16.7%
	White (non-Hispanic/Latino)	17.8	56,051	13.0	498,519	13.5	554,570	Yes	36.5%
	Unknown	14.5	7,234	10.8	19,223	11.8	26,457	Yes	34.5%
SNP Type	Dual Eligible	16.9	66,878			16.9	66,878		
	Not in SNP Plan	15.0	56,723	12.6	656,023	12.8	712,746	Yes	19.0%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
** NOTE: HRM is an inverse measure where a higher rate indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.

Table C7. Medicare Advantage Plan High Risk Medication (HRM) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	13.5	34	12.3	259	12.5	293	No	
	Age	14.8	101,960	11.9	593,727	12.3	695,687	Yes	24.6%
	Disability	21.7	21,596	19.4	61,953	20.0	83,548	Yes	12.3%
	Disability and ESRD	20.4	5	9.5	42	10.7	47	No	
Income^	$24,999 or less	20.6	15,627	16.4	32,156	17.8	47,783	Yes	25.3%
	$25,000-$49,999	15.7	62,264	13.0	248,424	13.6	310,688	Yes	20.4%
	$50,000-$74,999	14.8	29,509	12.3	209,032	12.6	238,540	Yes	21.0%
	$75,000 or more	14.6	15,058	11.4	157,380	11.7	172,438	Yes	27.4%
	Unknown	21.7	1,143	14.9	9,032	15.6	10,175	Yes	46.1%
Low Income Drug Subsidy	$0	19.8	16,297	12.5	628,733	12.7	645,030	Yes	58.4%
	$1-$99	18.8	4,281	17.8	2,653	18.4	6,934	No	
	$100-$149	13.1	41,055	13.6	20,430	13.2	61,485	No	
	$150+	16.8	61,967	18.9	4,207	16.9	66,174	Yes	-11.1%
Region	Midwest	15.2	2,946	10.9	59,085	11.1	62,031	Yes	40.2%
	Northeast	14.9	102,120	11.0	377,128	11.8	479,247	Yes	35.1%
	South	22.4	16,929	15.7	178,510	16.3	195,438	Yes	42.7%
	West	22.2	1,597	16.0	41,235	16.2	42,832	Yes	39.0%
	Unknown	12.0	8	12.7	67	12.7	75	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
** NOTE: HRM is an inverse measure where a higher rate indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.
^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C7. Medicare Advantage Plan High Risk Medication (HRM) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference**
		Rate	Denom	Rate	Denom	Rate	Denom		
Charlson Severity Score	0	8.1	29,785	8.2	234,966	8.1	264,751	No	
	1	15.1	24,614	13.1	132,272	13.4	156,886	Yes	14.9%
	2	15.7	17,661	12.7	93,247	13.2	110,908	Yes	23.8%
	3	18.8	15,885	15.4	69,249	16.0	85,134	Yes	22.0%
	4	20.9	11,173	17.5	41,502	18.2	52,675	Yes	19.7%
	5	21.7	8,116	18.4	30,131	19.1	38,247	Yes	17.7%
	6+	23.3	16,367	19.8	54,657	20.6	71,024	Yes	18.0%
Risk Score	0.000 - 0.499	7.0	5,761	7.9	130,253	7.9	136,013	Yes	-11.1%
	0.500 - 0.749	9.5	20,244	10.8	77,616	10.6	97,861	Yes	-12.0%
	0.750 - 0.999	14.3	17,642	12.8	52,131	13.2	69,772	Yes	11.4%
	1.000 - 1.249	17.0	14,657	14.5	37,774	15.2	52,431	Yes	17.1%
	1.250 - 1.499	19.3	9,637	15.4	24,379	16.5	34,016	Yes	25.9%
	1.500 - 1.999	20.7	11,633	16.8	28,424	17.9	40,057	Yes	23.4%
	2.000+	21.9	15,229	18.4	37,913	19.4	53,142	Yes	19.1%
	Unknown	16.8	28,798	13.5	267,533	13.9	296,331	Yes	24.1%
Institutional Status	No	16.0	120,702	12.6	654,967	13.1	775,669	Yes	27.3%
	Yes	15.0	2,899	13.6	1,056	14.6	3,955	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
** NOTE: HRM is an inverse measure where a higher rate indicates WORSE performance on this measure, thus positive difference indicates worse performance among dual eligible members compared to non-dual members.

Table C8. Medicare Advantage Plan Medication Adherence for Cholesterol (MA-C) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**68.1**	**78,544**	**72.0**	**314,323**	**71.2**	**392,867**	**Yes**	**-5.4%**
Age Group	18-54	61.6	5,058	59.9	4,618	60.8	9,676	No	
	55-64	65.5	9,075	64.7	16,182	65.0	25,257	No	
	65-69	67.9	15,327	71.4	67,962	70.7	83,290	Yes	-4.8%
	70-74	67.6	17,527	72.3	82,258	71.5	99,785	Yes	-6.5%
	75-79	69.2	14,075	72.3	62,920	71.8	76,995	Yes	-4.4%
	80-84	69.7	9,503	73.6	45,199	72.9	54,702	Yes	-5.3%
	85-88	71.0	4,573	74.4	21,945	73.8	26,519	Yes	-4.6%
	89+	75.0	3,406	74.9	13,237	74.9	16,643	No	
Gender	Female	67.7	51,566	70.6	173,686	70.0	225,252	Yes	-4.1%
	Male	68.8	26,978	73.6	140,637	72.8	167,615	Yes	-6.5%
Race/Ethnicity	American Indian and Alaska Native	74.2	345	64.3	314	69.5	658	Yes	15.4%
	Asian	78.4	3,541	75.5	3,412	77.0	6,953	Yes	3.8%
	Black (non-Hispanic/Latino)	67.8	19,561	68.0	49,983	67.9	69,545	No	
	Hispanic/Latino	63.0	14,526	56.6	7,767	60.8	22,293	Yes	11.2%
	White (non-Hispanic/Latino)	68.8	35,955	73.3	244,191	72.7	280,145	Yes	-6.1%
	Unknown	71.8	4,616	70.0	8,656	70.6	13,272	Yes	2.4%
SNP Type	Chronic or Disabling Condition	36.7	54	34.0	461	34.3	515	No	
	Dual Eligible	65.9	44,379			65.9	44,379		
	Not in SNP Plan	70.9	34,111	72.0	313,861	71.9	347,972	Yes	-1.5%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C8. Medicare Advantage Plan Medication Adherence for Cholesterol (MA-C) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	80.5	44	72.1	237	73.4	281	No	
	Age	69.1	52,367	73.0	264,250	72.4	316,617	Yes	-5.4%
	Disability	66.2	26,110	66.3	49,736	66.3	75,846	No	
	Disability and ESRD	30.8	9	71.7	49	65.5	57	Yes	-57.1%
Income^	$24,999 or less	59.9	10,891	51.0	16,868	54.5	27,759	Yes	17.4%
	$25,000-$49,999	66.3	41,570	68.4	126,343	67.9	167,912	Yes	-3.1%
	$50,000-$74,999	72.6	17,618	74.8	98,895	74.5	116,513	Yes	-3.0%
	$75,000 or more	79.7	7,759	80.6	67,928	80.5	75,687	No	
	Unknown	60.1	707	58.2	4,288	58.5	4,995	No	
Low Income Drug Subsidy	$0	59.0	9,561	72.2	297,345	71.8	306,906	Yes	-18.2%
	$1-$99	69.7	2,943	64.3	1,822	67.7	4,765	Yes	8.4%
	$100-$149	71.7	23,712	68.8	12,429	70.7	36,141	Yes	4.2%
	$150+	68.0	42,327	70.0	2,727	68.1	45,054	Yes	-2.8%
Region	Midwest	77.9	1,672	79.4	28,500	79.4	30,172	No	
	Northeast	68.8	64,648	72.8	181,857	71.8	246,505	Yes	-5.5%
	South	61.8	11,412	66.6	86,523	66.0	97,936	Yes	-7.2%
	West	78.1	806	77.8	17,417	77.8	18,222	No	
Charlson Severity Score	0	66.8	12,360	74.3	81,157	73.3	93,517	Yes	-10.1%
	1	66.8	15,808	72.3	68,241	71.3	84,049	Yes	-7.6%
	2	68.2	11,287	71.9	47,431	71.2	58,718	Yes	-5.2%
	3	69.1	11,357	71.6	39,616	71.0	50,973	Yes	-3.4%
	4	68.0	8,489	70.8	24,922	70.1	33,410	Yes	-3.8%
	5	69.8	6,284	70.7	19,029	70.5	25,314	No	
	6+	69.1	12,959	67.9	33,927	68.2	46,886	Yes	1.8%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C8. Medicare Advantage Plan Medication Adherence for Cholesterol (MA-C) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	60.1	3,492	69.8	50,453	69.1	53,946	Yes	-13.8%
	0.500 - 0.749	64.6	10,658	69.7	37,684	68.6	48,342	Yes	-7.3%
	0.750 - 0.999	66.5	11,370	70.2	28,134	69.1	39,504	Yes	-5.3%
	1.000 - 1.249	68.9	9,846	70.2	21,103	69.8	30,950	Yes	-1.8%
	1.250 - 1.499	68.8	7,059	70.1	14,089	69.7	21,148	No	
	1.500 - 1.999	70.7	8,486	70.2	16,474	70.4	24,960	No	
	2.000+	69.7	11,502	68.0	22,517	68.6	34,019	Yes	2.5%
	Unknown	69.9	16,130	75.4	123,868	74.8	139,998	Yes	-7.4%
Institutional Status	No	68.0	77,318	72.0	313,984	71.2	391,302	Yes	-5.5%
	Yes	72.8	1,226	73.4	339	72.9	1,564	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C9. Medicare Advantage Plan Medication Adherence for Oral Diabetes Medications (MA-D) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**74.8**	**43,623**	**75.8**	**125,174**	**75.5**	**168,798**	**Yes**	**-1.3%**
Age Group	18-54	66.8	3,306	64.2	2,421	65.7	5,727	Yes	4.1%
	55-64	73.5	5,567	70.4	8,559	71.6	14,126	Yes	4.5%
	65-69	75.8	9,212	75.5	28,818	75.6	38,030	No	
	70-74	76.1	9,955	77.0	33,549	76.8	43,504	No	
	75-79	76.0	7,558	76.9	24,798	76.7	32,356	No	
	80-84	75.4	4,710	76.2	16,149	76.0	20,859	No	
	85-88	74.2	1,953	76.7	7,008	76.2	8,962	Yes	-3.3%
	89+	75.2	1,361	75.9	3,873	75.7	5,234	No	
Gender	Female	75.3	27,738	75.2	64,976	75.2	92,714	No	
	Male	74.0	15,885	76.4	60,199	75.9	76,083	Yes	-3.2%
Race/Ethnicity	American Indian and Alaska Native	81.0	219	67.1	187	74.6	406	Yes	20.7%
	Asian	86.1	2,027	81.4	1,792	83.9	3,819	Yes	5.8%
	Black (non-Hispanic/Latino)	73.7	11,890	73.8	28,969	73.8	40,859	No	
	Hispanic/Latino	73.7	8,695	67.0	4,335	71.5	13,031	Yes	10.0%
	White (non-Hispanic/Latino)	74.0	17,855	76.8	85,198	76.3	103,052	Yes	-3.6%
	Unknown	79.0	2,936	76.2	4,694	77.2	7,630	Yes	3.7%
SNP Type	Chronic or Disabling Condition	46.0	44	44.6	458	44.7	502	No	
	Dual Eligible	74.9	26,593			74.9	26,593		
	Not in SNP Plan	74.7	16,986	75.9	124,716	75.7	141,703	Yes	-1.6%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C9. Medicare Advantage Plan Medication Adherence for Oral Diabetes Medications (MA-D) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	80.1	18	61.9	69	65.8	88	No	
	Age	75.8	27,676	77.0	99,290	76.7	126,965	Yes	-1.5%
	Disability	73.0	15,920	71.2	25,788	71.9	41,708	Yes	2.5%
Income^	$24,999 or less	70.3	6,736	65.2	9,055	67.3	15,791	Yes	7.8%
	$25,000-$49,999	74.4	23,525	73.6	54,630	73.9	78,155	Yes	1.0%
	$50,000-$74,999	76.8	9,281	78.2	37,148	77.9	46,429	Yes	-1.8%
	$75,000 or more	81.6	3,659	82.3	22,308	82.2	25,968	No	
	Unknown	67.2	421	65.7	2,034	66.0	2,455	No	
Low Income Drug Subsidy	$0	68.5	5,640	75.9	116,472	75.6	122,112	Yes	-9.7%
	$1-$99	73.0	1,498	70.8	968	72.1	2,466	No	
	$100-$149	75.1	11,799	74.6	6,383	74.9	18,182	No	
	$150+	76.2	24,686	71.6	1,351	75.9	26,037	Yes	6.4%
Region	Midwest	79.0	769	81.9	8,414	81.7	9,183	Yes	-3.6%
	Northeast	75.8	36,122	76.6	74,834	76.3	110,955	Yes	-1.1%
	South	68.5	6,313	72.1	35,337	71.5	41,650	Yes	-5.0%
	West	78.9	416	78.8	6,580	78.8	6,995	No	
Charlson Severity Score	0	72.9	1,095	76.8	5,217	76.1	6,313	Yes	-5.1%
	1	73.1	8,455	77.3	31,789	76.5	40,244	Yes	-5.5%
	2	74.1	5,247	75.8	15,188	75.3	20,435	Yes	-2.2%
	3	76.7	8,034	77.2	22,693	77.0	30,728	No	
	4	76.0	6,277	75.7	14,462	75.8	20,739	No	
	5	76.8	5,087	76.2	13,228	76.4	18,316	No	
	6+	73.4	9,427	71.8	22,596	72.3	32,024	Yes	2.2%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.
^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C9. Medicare Advantage Plan Medication Adherence for Oral Diabetes Medications (MA-D) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	64.6	738	74.3	11,602	73.7	12,340	Yes	-13.0%
	0.500 - 0.749	73.5	4,489	75.6	15,353	75.1	19,842	Yes	-2.9%
	0.750 - 0.999	74.4	6,145	75.4	12,449	75.1	18,595	No	
	1.000 - 1.249	77.4	6,030	76.0	11,050	76.5	17,079	Yes	1.8%
	1.250 - 1.499	77.1	4,529	76.6	7,651	76.8	12,181	No	
	1.500 - 1.999	77.6	5,469	76.3	9,159	76.8	14,629	No	
	2.000+	74.1	7,416	71.6	12,760	72.5	20,177	Yes	3.5%
	Unknown	72.5	8,806	77.2	45,150	76.4	53,956	Yes	-6.1%
Institutional Status	No	74.8	43,006	75.8	125,035	75.5	168,041	Yes	-1.3%
	Yes	73.6	617	78.5	139	74.5	756	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C10. Medicare Advantage Plan Medication Adherence for Hypertension (MA-H) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**74.9**	**83,513**	**78.7**	**320,378**	**78.0**	**403,892**	**Yes**	**-4.9%**
Age Group	18-54	66.0	5,509	67.1	4,864	66.5	10,372	No	
	55-64	72.9	9,444	73.3	16,829	73.1	26,274	No	
	65-69	75.8	16,327	79.0	67,716	78.4	84,043	Yes	-4.0%
	70-74	75.7	18,423	79.7	82,153	78.9	100,576	Yes	-4.9%
	75-79	75.7	14,813	79.5	63,870	78.7	78,683	Yes	-4.7%
	80-84	76.0	9,937	79.0	46,136	78.5	56,073	Yes	-3.8%
	85-88	76.1	4,900	78.9	23,183	78.4	28,083	Yes	-3.5%
	89+	76.7	4,161	78.7	15,628	78.3	19,789	Yes	-2.6%
Gender	Female	75.8	54,533	79.0	180,953	78.2	235,487	Yes	-4.0%
	Male	73.2	28,980	78.5	139,425	77.6	168,405	Yes	-6.8%
Race/Ethnicity	American Indian and Alaska Native	74.5	311	72.9	314	73.7	625	No	
	Asian	82.4	3,630	80.1	3,225	81.3	6,855	Yes	2.8%
	Black (non-Hispanic/Latino)	73.6	22,760	76.1	62,562	75.4	85,322	Yes	-3.3%
	Hispanic/Latino	73.1	15,770	71.8	9,047	72.6	24,817	Yes	1.8%
	White (non-Hispanic/Latino)	75.4	36,176	79.7	236,124	79.2	272,300	Yes	-5.4%
	Unknown	77.7	4,866	78.4	9,107	78.2	13,973	No	
SNP Type	Chronic or Disabling Condition	42.3	54	42.6	449	42.6	503	No	
	Dual Eligible	74.0	48,001			74.0	48,001		
	Not in SNP Plan	76.2	35,459	78.8	319,929	78.5	355,388	Yes	-3.3%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C10. Medicare Advantage Plan Medication Adherence for Hypertension (MA-H) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	60.0	48	69.3	168	67.2	216	No	
	Age	76.0	55,942	79.7	268,420	79.1	324,362	Yes	-4.6%
	Disability	72.6	27,499	74.0	51,715	73.5	79,214	Yes	-1.9%
Income^	$24,999 or less	70.2	12,328	70.9	20,341	70.6	32,669	No	
	$25,000-$49,999	73.6	44,499	75.5	131,853	75.0	176,353	Yes	-2.6%
	$50,000-$74,999	78.1	18,109	80.6	97,636	80.2	115,745	Yes	-3.1%
	$75,000 or more	83.1	7,730	85.3	65,513	85.1	73,243	Yes	-2.6%
	Unknown	69.1	848	73.0	5,035	72.4	5,883	Yes	-5.4%
Low Income Drug Subsidy	$0	70.6	11,204	79.0	302,308	78.7	313,513	Yes	-10.6%
	$1-$99	72.6	3,077	70.9	1,991	71.9	5,068	No	
	$100-$149	77.0	24,543	75.7	13,235	76.6	37,778	Yes	1.8%
	$150+	75.0	44,689	74.0	2,844	74.9	47,533	No	
Region	Midwest	80.6	1,752	83.4	25,791	83.2	27,543	Yes	-3.3%
	Northeast	75.4	67,815	78.8	187,051	77.9	254,866	Yes	-4.3%
	South	70.8	13,038	76.9	90,331	76.1	103,369	Yes	-8.0%
	West	82.7	903	81.0	17,177	81.1	18,080	No	
Charlson Severity Score	0	74.5	12,991	81.0	78,504	80.1	91,495	Yes	-8.0%
	1	74.6	16,745	79.9	69,453	78.8	86,198	Yes	-6.6%
	2	75.4	12,135	79.4	48,616	78.6	60,751	Yes	-5.1%
	3	76.6	12,251	78.8	42,221	78.3	54,472	Yes	-2.8%
	4	75.6	9,181	77.6	26,300	77.1	35,481	Yes	-2.6%
	5	76.6	6,856	77.4	20,431	77.2	27,287	No	
	6+	72.4	13,355	72.1	34,853	72.2	48,208	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C10. Medicare Advantage Plan Medication Adherence for Hypertension (MA-H) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	70.1	3,690	78.5	49,792	77.9	53,482	Yes	-10.8%
	0.500 - 0.749	73.6	11,215	78.7	39,495	77.5	50,709	Yes	-6.5%
	0.750 - 0.999	75.2	12,090	78.5	29,780	77.5	41,870	Yes	-4.2%
	1.000 - 1.249	76.2	10,570	78.9	22,710	78.0	33,281	Yes	-3.4%
	1.250 - 1.499	76.8	7,482	78.1	15,158	77.7	22,639	Yes	-1.7%
	1.500 - 1.999	77.9	8,917	77.0	18,158	77.3	27,075	No	
	2.000+	73.7	12,031	72.3	23,644	72.8	35,675	Yes	1.9%
	Unknown	74.2	17,520	80.5	121,641	79.7	139,161	Yes	-7.8%
Institutional Status	No	74.9	82,226	78.8	319,977	78.0	402,202	Yes	-4.9%
	Yes	72.2	1,288	76.6	402	73.2	1,689	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C11. Medicare Advantage Plan Diabetes Treatment (BPD) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
All	**All**	**88.0**	**86,215**	**85.4**	**192,867**	**86.2**	**279,082**	**Yes**	**3.0%**
Age Group	18-54	88.6	7,507	85.5	4,083	87.5	11,590	Yes	3.7%
	55-64	89.5	12,573	85.2	14,712	87.2	27,285	Yes	5.0%
	65-69	90.1	17,751	88.1	43,259	88.6	61,010	Yes	2.3%
	70-74	89.3	18,516	87.2	50,411	87.8	68,927	Yes	2.4%
	75-79	88.2	13,878	85.2	37,800	86.0	51,677	Yes	3.5%
	80-84	84.7	9,040	82.6	25,360	83.2	34,400	Yes	2.6%
	85-88	82.4	4,000	79.3	11,106	80.1	15,106	Yes	3.8%
	89+	75.8	2,951	75.5	6,136	75.6	9,087	No	
Gender	Female	87.7	54,265	85.5	100,250	86.3	154,515	Yes	2.6%
	Male	88.5	31,950	85.3	92,617	86.1	124,568	Yes	3.7%
Race/Ethnicity	American Indian and Alaska Native	87.8	295	89.0	240	88.3	535	No	
	Asian	88.8	3,451	87.9	2,591	88.4	6,042	No	
	Black (non-Hispanic/Latino)	87.9	24,311	87.5	44,989	87.6	69,300	No	
	Hispanic/Latino	90.8	14,233	88.6	6,608	90.1	20,842	Yes	2.4%
	White (non-Hispanic/Latino)	86.8	39,397	84.3	131,824	84.9	171,221	Yes	2.9%
	Unknown	89.6	4,528	87.9	6,615	88.6	11,142	Yes	2.0%
SNP Type	Chronic or Disabling Condition	86.9	131	88.0	1,413	87.9	1,544	No	
	Dual Eligible	89.2	58,200			89.2	58,200		
	Not in SNP Plan	85.5	27,870	85.4	191,451	85.4	219,321	No	

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.
* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

Table C11. Medicare Advantage Plan Diabetes Treatment (BPD) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Original Reason For Entitlement	ESRD	69.9	58	51.8	219	55.6	276	Yes	34.9%
	Age	87.6	50,707	85.6	149,598	86.1	200,305	Yes	2.3%
	Disability	88.6	35,413	85.0	42,942	86.6	78,355	Yes	4.3%
	Disability and ESRD	64.2	11	41.0	55	44.9	66	No	
Income^	$24,999 or less	90.3	20,680	89.7	14,890	90.1	35,570	Yes	0.7%
	$25,000-$49,999	88.0	42,673	85.5	84,594	86.4	127,267	Yes	2.8%
	$50,000-$74,999	86.2	16,288	84.6	58,710	84.9	74,998	Yes	1.9%
	$75,000 or more	84.5	5,414	84.2	31,801	84.3	37,215	No	
	Unknown	89.6	1,160	89.1	2,871	89.2	4,031	No	
Low Income Drug Subsidy	$0	89.2	20,136	85.4	177,279	85.8	197,415	Yes	4.5%
	$1-$99	88.3	8,112	87.2	5,444	87.8	13,556	No	
	$100-$149	87.0	28,614	85.5	8,547	86.6	37,160	Yes	1.8%
	$150+	88.0	29,354	83.3	1,597	87.8	30,951	Yes	5.6%
Region	Midwest	82.5	6,270	83.9	24,993	83.7	31,263	Yes	-1.7%
	Northeast	88.0	45,636	85.4	99,025	86.2	144,661	Yes	3.1%
	South	89.1	32,378	86.0	61,961	87.1	94,339	Yes	3.6%
	West	86.8	1,907	85.3	6,865	85.6	8,772	No	
Charlson Severity Score	0	84.9	1,735	83.8	6,738	84.0	8,474	No	
	1	89.7	14,495	87.2	43,880	87.8	58,374	Yes	2.8%
	2	87.7	9,612	85.3	22,376	86.0	31,988	Yes	2.7%
	3	89.5	14,402	87.2	33,547	87.9	47,949	Yes	2.7%
	4	89.1	11,838	86.1	22,317	87.1	34,155	Yes	3.6%
	5	87.9	10,567	86.0	21,614	86.7	32,182	Yes	2.2%
	6+	85.8	23,566	81.7	42,395	83.2	65,961	Yes	5.0%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

^ Income is defined as average household income in the residing 5-digit ZIP code based on 2007 – 2011 American Community Survey 5-Year Estimates data.

Table C11. Medicare Advantage Plan Diabetes Treatment (BPD) Rates by Dual Eligible Status (2012)

Variable	Group	Dual Eligible		Non-Dual Eligible		All		Dual ≠ Non-Dual Rate*	Percent Difference
		Rate	Denom	Rate	Denom	Rate	Denom		
Risk Score	0.000 - 0.499	89.4	1,390	88.6	17,651	88.6	19,041	No	
	0.500 - 0.749	90.7	6,949	87.8	23,616	88.4	30,565	Yes	3.3%
	0.750 - 0.999	89.9	9,766	87.2	20,116	88.1	29,882	Yes	3.2%
	1.000 - 1.249	89.7	10,031	86.4	18,048	87.6	28,079	Yes	3.7%
	1.250 - 1.499	89.0	7,996	86.6	12,776	87.5	20,772	Yes	2.9%
	1.500 - 1.999	88.3	10,772	85.9	16,153	86.8	26,924	Yes	2.8%
	2.000+	86.5	18,958	81.8	25,625	83.8	44,583	Yes	5.7%
	Unknown	86.1	20,353	83.8	58,883	84.4	79,236	Yes	2.8%
Institutional Status	No	88.4	84,529	85.4	192,596	86.3	277,125	Yes	3.5%
	Yes	67.0	1,686	60.8	271	66.2	1,957	Yes	10.1%

Data Source: 80 Medicare Advantage contracts from MORE^2 Registry®.

* "Yes" indicates the difference in rates is statistically significant at the 95% confidence level.

APPENDIX D: GLOSSARY

ABA	Adult BMI Assessment (HEDIS Hybrid)
ACA	Affordable Care Act
ACAP	Association for Community Affiliated Plans
Age	Age as of the end of the measurement period; de-identified member's ages over 89 into 89+ age group
AHRQ	Agency for Healthcare Research and Quality
ART	Rheumatoid Arthritis Management (HEDIS Admin)
BCS	Breast Cancer Screening (HEDIS Admin)
BPD	Diabetes Treatment (PDE)
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CMS	Centers for Medicare & Medicaid Services
Division	US Census divisions (New England, Mid-Atlantic, East North Central, West North Central, South Atlantic (Puerto Rico included in this group), East South Central, West South Central, Mountain, Pacific)
Dual Eligible Status	The status indicative of a Medicare member who is also eligible to receive benefits from Medicaid
ESRD	End Stage Renal Disease
FFS	Fee-for-Service
Gender	Female or Male
GSO	Glaucoma Testing (HEDIS Admin)
HEDIS	Healthcare Effectiveness Data and Information Set
HMO	Health Maintenance Organization
HRM	High Risk Medication (PDE)
Income Per Household 2000	Average household per ZIP Code based on 2000 US Census data
Institutional Status	Members with 90 days or more in LTC facility (e.g., nursing facility)
Low-income drug subsidy amount	Low-income drug subsidy cost sharing amount
MA	Medicare Advantage
MA-C	Part D Medication Adherence for Cholesterol (Statins) (PDE)
MA-D	Part D Medication Adherence for Oral Diabetes Medications (PDE)
MA-H	Part D Medication Adherence for Hypertension (RAS antagonists) (PDE)
MA-PD	Medicare Advantage Prescription Drug Contracts
Measurement Year	2011 or 2012
MMCO	Medicare-Medicaid Coordination Office
NCQA	National Committee for Quality Assurance
NQF	National Quality Forum
OMW	Osteoporosis management in women who had a fracture (HEDIS Admin)
Original Reason for Entitlement	Beneficiary insured due to age, Beneficiary insured due to disability, Beneficiary insured due to ESRD, Beneficiary insured due to disability and current ESRD, None of the above
PCR	Plan All-Cause Readmissions (HEDIS Admin)
PDE	Prescription Drug Event
PDP	Prescription Drug Plan
PPO	Preferred Provider Organization

PQA	Pharmacy Quality Alliance
Race/Ethnicity	White (non-Hispanic/Latino), Black (non-Hispanic/Latino), Hispanic/Latino, Asian, American Indian and Alaska Native, Unknown
Region	US Census regions (Northeast, Midwest, South (Puerto Rico included in this group), West)
Risk Score	HCC risk score
SNP Type	Chronic or Disabling Condition, Dual Eligible, Institutional, Not in SNP Plan
Special Needs Plan (SNP)	Institutionalized (I-SNP) members who reside or are expected to reside for 90 days or more in LTC facility (e.g., nursing facility), dual eligible (D-SNP) members who are also eligible to receive benefits from Medicaid, chronic or disabling condition (C-SNP) (e.g., ESRD, diabetes, and congestive heart failure), or not in a SNP

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