

Submitted electronically to: PartCandDStarRatings@cms.hhs.gov

October 31, 2014

Marilyn Tavenner
Administrator
Centers for Medicare & Medicaid Services
Department of Health and Human Services
P.O. Box 8013
Baltimore, MD 21244-8013

Re: Request for Information – Data on Differences in Medicare Advantage (MA) and Part D Star Rating Quality Measurements for Dual-Eligible versus Non-Dual-Eligible Enrollees

Dear Ms. Tavenner:

WellPoint, Inc. (WellPoint) appreciates this opportunity to respond to the Centers for Medicare & Medicaid Services' (CMS') request for information (RFI), "Data on Differences in Medicare Advantage (MA) and Part D Star Rating Quality Measurements for Dual-Eligible versus Non-Dual-Eligible Enrollees," released on September 9, 2014. To date, WellPoint serves over 913,370 members in MA and Part D plans. Of that number, approximately 170,000 are either dual eligible or low-income subsidy eligible members. As a committed participant in the MA and Part D programs, WellPoint looks forward to working with CMS to ensure that Star Ratings accurately reflect the quality of care provided to Medicare beneficiaries by plan sponsors.

WellPoint is working to transform health care with trusted and caring solutions. Our health plan companies deliver quality products and services that give their members access to the care they need. With nearly 69 million people served by its affiliated companies, including more than 37 million enrolled in its family of health plans, WellPoint is one of the nation's leading health benefits companies. WellPoint companies serve members as the Blue Cross licensee for California; and as the Blue Cross and Blue Shield licensees for Colorado, Connecticut, Georgia, Indiana, Kentucky, Maine, Missouri (excluding 30 counties in the Kansas City area), Nevada, New Hampshire, New York (as the Blue Cross Blue Shield licensee in 10 New York City metropolitan and surrounding counties and as the Blue Cross or Blue Cross Blue Shield licensee in selected upstate counties only), Ohio, Virginia (excluding the Northern Virginia suburbs of Washington, D.C.), and Wisconsin. In most of these service areas, WellPoint does business as Anthem Blue Cross, Anthem Blue Cross and Blue Shield, Blue Cross and Blue Shield of Georgia and Empire Blue Cross Blue Shield, or Empire Blue Cross (in the New York service areas). It also serves customers in other states through its Amerigroup, CareMore and UniCare subsidiaries. To find out more about WellPoint, go to wellpoint.com.

Overview

We strongly believe and there is ample evidence to support the view that the current MA and Part D Star Ratings system does not accurately reflect the significant impact that low-socioeconomic status (SES) has on plan performance. The failure to account for SES in the Star Ratings impacts the MA and Part D markets, and adversely affects dual-eligible special needs plans (D-SNPs) that serve some of the programs' most vulnerable beneficiaries. As requested, we included data from WellPoint's MA plans that highlights these issues, as well as supporting research on the impact of low-SES on Star Ratings performance.

As we work with CMS to ensure the accuracy of the Star Ratings program, we believe it is important to take a comprehensive look at enrollee composition in MA and Part D plans, and urge the Agency to use the following principles to guide care coordination and quality efforts for the future.

Characteristics of Low-Socioeconomic Populations Influence Health Outcomes

- Individual health is significantly influenced by SES; as SES declines, overall health outcomes have a tendency to worsen.¹
- Those with low-SES are more likely to become sick, get diagnosed and treated later, and die sooner than individuals with higher SES.²

Low-Socioeconomic Status and Dual-Eligibility Negatively Impact MA Star Performance

- CMS' current quality rating system penalizes MA plans that care for a high proportion of low-SES, dual-eligible beneficiaries by failing to account for the full impact that these factors have on plan performance, which influences consumer choice and plan reimbursement.³
- Contracts with enrollment concentrated in D-SNPs are particularly affected by the failure of the Star Ratings to account for socioeconomic factors since they focus solely on beneficiaries with low-SES.⁴
- WellPoint found that dual-eligibles performed worse than non-duals on six out of 13 clinical measures examined, including Breast Cancer Screening, Colorectal Cancer Screening, and several components of Diabetes Care.
- Dual-eligibles were less likely to comply with preventive care screenings and exams, demonstrating a need for consideration of how the Star Ratings system measures quality for plans that serve large proportions of these beneficiaries.

¹ Bell, Judith. "Why Place Matters: Building a Movement for Health Communities." (2007). *Policy Link*. The California Endowment.

² Bell, Judith and Mary M. Lee. "Why Place and Race Matter." (2011). *Policy Link*. The California Endowment.

³ "The Impact of Dual Eligible Populations on CMS Five-Star Quality Measures and Member Outcomes in Medicare Advantage Health Plans." (2013). Inovalon Inc.

⁴ "Medicare Advantage Special Needs Plans." (2013). Medicare Payment Advisory Commission.

Low-SES Limits Plans Ability to Achieve Comparable Improvement / Results

- Low-SES and dually eligible individuals are more likely to experience complicating factors, like challenges with feeding and walking, that make plan interventions more complex.⁵
- Lower baseline levels of health combined with increased complexity mean that plans may be unable to achieve the same outcomes as plans serving non-dual eligible members, despite significant investment.

Star Ratings Impede Integration Efforts for Dual-Eligibles

- Some states' intentions to use D-SNPs as an alternative pathway to integrate care for duals may be threatened by the Star Ratings system if participating plans' low star ratings leads to their termination or withdrawal from the MA program, leaving few or no options for duals enrollment in these states.⁶
- Despite limited plan engagement in the Financial Alignment Demonstration (FAD; "duals demonstration"), CMS prohibits plans that earn less than three stars from participating in a state's passive enrollment process.⁷
- CMS' policy creates barriers for plans that have actual experience in managing dual-eligibles, since their Star Ratings performance is often lower due to the impact of low-SES and dual-eligible enrollees.

Low-SES Has an Adverse Impact on Part D Plans

- Poor health status and low-SES are correlated with poor medication adherence.^{8,9}
- Failure to account for the impact of low-SES on Star Ratings limits the accuracy of the plan performance information that informs beneficiary plan selection.

WellPoint's detailed response on the impact of low-SES on Star Ratings performance and the MA and Part D programs can be found below.

Characteristics of Low-Socioeconomic Populations Influence Health Outcomes

Individual health is significantly influenced by SES. The higher an individual's income, the more likely they are to seek timely health services, receive preventive care, and engage in health-

⁵ "Integrating Care for Dual Eligibles." (2010). Federal Coordinated Health Care Office, CMS.

⁶ "Medicare Advantage Special Needs Plans." (2013). Medicare Payment Advisory Commission.

⁷ Medicare and Medicaid Coordination Office Memo to Prospective Plans. "2014 Capitated Financial Alignment Demonstration Timeline." (2013).

⁸ Peters B, Van Tongelen I, Boussery K, Mehuys E, Remon JP, Willems S. "Factors associated with medication Adherence to oral hypoglycemic agents in different ethnic groups suffering from type 2 diabetes: a systematic literature review and suggestions for further research." *Diabetic Med.* 2011; 28(3):262–75.

⁹ Young, Gary J., et al. "Socioeconomic Characteristics of Enrollees Appear to Influence Performance Scores for Medicare Part D Contractors." *Health Affairs.* 33.1 (2014): 140-146.

enhancing behaviors. As SES declines, overall health outcomes have a tendency to worsen. Mounting research shows that low-SES is strongly correlated with lower levels of education and poor health. Individuals who do not attain a high school diploma, college education, or graduate degree tend to be sicker than their better-educated peers,¹⁰ and are also more likely to engage in health-harming behaviors, such as smoking, lack of physical activity, and poor diet.¹¹

As a whole, individuals with low-SES have been shown to have higher blood pressure, greater psychological stressors, and less access to employment-based sick days and health insurance. Moreover, those in low-wage positions are more apt to experience depression and suffer from heart disease, arthritis, chronic pain, and tension headaches.¹²

Evidence consistently shows that those with low-SES characteristics are more likely to become sick, get diagnosed and treated later, and die sooner than individuals with higher SES.¹³ As inequalities in wealth and resources grow in the U.S., SES is likely to play a larger role in dictating individual health outcomes, and it continues to have a significant effect on how individuals use the health care system.¹⁴

Low-Socioeconomic Status and Dual-Eligibility Negatively Impact MA Star Performance

Since beneficiaries with low-SES often have worse overall health, they more frequently require additional health services to manage complex, chronic conditions than do those with higher-SES. Among the low-SES population in Medicare are individuals who are eligible for both Medicare and Medicaid (“dual-eligibles”), many of whom enroll in special needs plans (SNPs) focused on dual-eligibles (D-SNPs).

D-SNPs serve some of the programs’ most vulnerable beneficiaries, and dual-eligibles face a unique set of challenges that require a different treatment approach. Research shows that dual-eligibles are poorer, less likely to be married and/or have in-home support, and more likely to live in an institutional setting than non-dual Medicare beneficiaries. They also experience poor health more frequently, utilize more health care services, and demonstrate lower functional status and health literacy.¹⁵

¹⁰ Bell, Judith. "Why Place Matters: Building a Movement for Health Communities." (2007). *Policy Link*. The California Endowment.

¹¹ Pampel, Fred C., Patrick M. Krueger, and Justin T. Denney. "Socioeconomic Disparities in Health Behaviors." *Annual Review of Sociology* 36.1 (2010): 349-70.

¹² Bell, Judith. "Why Place Matters: Building a Movement for Health Communities." (2007). *Policy Link*. The California Endowment.

¹³ Bell, Judith and Mary M. Lee. "Why Place and Race Matter." (2011). *Policy Link*. The California Endowment.

¹⁴ "Work Stress & Health & Socioeconomic Status." (2006). American Psychological Association.

¹⁵ "The Diversity of Dual Eligible Beneficiaries: An Examination of Services and Spending for People Eligible for Both Medicaid and Medicare." (2011). Kaiser Family Foundation.

For instance, evidence shows that dual-eligible beneficiaries have a significantly greater prevalence of serious mental illness (SMI) and cognitive impairment compared to non-dual beneficiaries. On average, 40 percent of dual-eligibles have behavioral health and cognitive problems,¹⁶ and SMI has been shown to negatively impact quality of life, increase risk of hospitalization, and decrease life expectancy. SMI is also associated with higher rates of co-occurring substance abuse disorders,¹⁷ all of which negatively affects a beneficiary's ability to access health care. In addition, individuals with mental illness are less likely to seek preventive care and follow clinical guidelines.¹⁸

These characteristics greatly affect quality of care and health care costs. Yet, Medicare payment policies and quality ratings fail to account for the full impact of low-SES and dual-eligibility on MA Star Ratings performance. A growing body of literature indicates that CMS' current quality rating system may actually penalize MA plans that care for a high proportion of low-SES, dual-eligible beneficiaries.¹⁹

For example, one study examined more than one million enrollees across 80 MA contracts and found that dual-eligible status and low performance on Star Ratings were highly correlated. The analysis found evidence that race/ethnicity, gender, and income all influence Star Ratings performance, and that contracts enrolling high proportions of dual-eligible members performed worse than those with low numbers of dual-eligible members on nine of the ten measures examined, including medication adherence, diabetes treatment, and plan all-cause readmissions. Even when quality measures were stratified by socioeconomic factors, demographics, and illness severity—plans serving dual beneficiaries still underperformed on eight of the ten quality measures, indicating that dual status alone negatively impacts plans' Star Ratings performance.²⁰ An additional, more recent, study analyzed member-level MA data and confirmed that dual eligible members performed significantly worse than non-dual eligible members on ten of eighteen measures evaluated, and on six of the eight Star Ratings measures evaluated.²¹ Therefore, it is essential that the Star Ratings system accurately reflect the quality of care provided by plan sponsors in order for these metrics to be an effective tool for beneficiaries making enrollment decisions as well as for ongoing viability of plans that serve these complex enrollees.

¹⁶ "Integrating Care for Dual Eligibles in New York: Issues and Options." (2012). NYS Health Foundation.

¹⁷ "Medicare Beneficiaries with Severe Mental Illness and Hospitalization Rates," (2013). The Scan Foundation.

¹⁸ "Medicare's Quality Incentive System Does Not Adequately Account for Special Needs of Dual-Eligible Populations." (2012). Association for Community Affiliated Plans.

¹⁹ "The Impact of Dual Eligible Populations on CMS Five-Star Quality Measures and Member Outcomes in Medicare Advantage Health Plans." (2013). Inovalon Inc.

²⁰ Ibid.

²¹ "An Investigation of Medicare Advantage Dual Eligible Member Level Performance on CMS Five-Star Quality Measures." Inovalon. (2014).

Furthermore, an assessment of more than 30 peer-reviewed sources identified a strong association between SNP enrollees’ characteristics and lower health care quality scores. In the review, MA contracts with a large number of D-SNP enrollees consistently had lower quality scores compared to those with no D-SNP members.^{22, 23} On average, D-SNP contracts most commonly received 2.5 stars, whereas contracts with no D-SNP members often received an average 3.5 stars; and as a whole, D-SNPs perform 5 to 12 percent lower than other SNPs and regular MA plans on nearly all quality measures.²⁴ Similarly, a 2010 analysis illustrated that while D-SNPs and non-D-SNPs performed at comparable levels on efficiency and timeliness of appeals, D-SNP quality scores were regularly lower on clinical quality measures. Duals enrollment was a strong predictor of low performance on quality measures, and individual health status was noted as a leading factor affecting Star Ratings.²⁵

An analysis of WellPoint’s data showed that dual-eligibles performed worse than non-duals on six of 13 clinical stars measures examined, including Breast Cancer Screening, Colorectal Cancer Screening, and several components of Diabetes Care (see table below). To investigate the relationship between dual-eligible status and performance on specific clinical stars measures, WellPoint used multivariate regression to quantify its experience, while controlling for other covariates.

Measure number	Measure	Odds ratio (Duals=1)	P(dual) at mean	P(non-dual) at mean	Delta
C01	Breast Cancer Screening	0.638	58.52%	68.87%	-10.4%
C02	Colorectal Cancer Screening	0.711	38.98%	47.33%	-8.4%
C03	Diabetes Care - Cholesterol Screening	0.837	83.01%	85.37%	-2.4%
C13	Osteoporosis Management	<i>not significant (univariate)</i>			
C14	Diabetes Care – Eye Exam	0.813	45.71%	50.89%	-5.2%
C15†	Diabetes Care - Kidney Disease Monitoring	1.132	87.01%	85.61%	1.5%
C16(sc)	Diabetes Care - Blood Sugar Screening (not control)	0.881	88.33%	89.58%	-1.2%
C19	Rheumatoid Arthritis Management	<i>not significant (modeled)</i>			
D09	High risk meds	1.295	12.4%	9.9%	2.5%
D10	Diabetes Treatment	<i>not significant</i>			

²² Bishop, S. “Are MA Star Ratings Biased Against Plans Serving Disadvantaged Populations?” (2012). Amerigroup Corp.

²³ Bishop, S. “Building a Framework For Paying for Social Determinants of Health In Medicare.” (2013). Simon Morgan.

²⁴ “Medicare Advantage Special Needs Plans.” (2013). Medicare Payment Advisory Commission.

²⁵ “Medicare’s Quality Incentive System Does Not Adequately Account for Special Needs of Dual-Eligible Populations.” (2012). Association for Community Affiliated Plans.

		<i>(modeled)</i>			
D11	Adherence – Oral Diabetes	<i>not significant (univariate)</i>			
D12	Adherence - Hypertension	<i>not significant (modeled)</i>			
D13	Adherence – Cholesterol	<i>not significant (univariate)</i>			

† *Duals perform better than non-duals*

Probability estimates, P(duals) and P(non-duals), were calculated using the following formula:

$$p = 1/[1 + \exp(-\mathbf{a} - \mathbf{B}\mathbf{X})]$$

Where **a** represents the model’s intercept, **B** represents the array of parameter estimates in the model, and **X** represents the model covariates. To calculate P (duals), we set **X** values at the mean for each covariate, and set the duals covariate at 1. To calculate P (non-duals), we set **X** values at the mean for each covariate and set the duals covariate at 0.

We found that the duals indicator was significant in seven of our 13 modeling analyses, and that in six of the seven cases, dual-eligibles had worse performance than non-duals, as indicated by the odds ratio for the duals variable. The one exception to this was for the Diabetes Care Kidney Disease Monitoring measure, where we found that duals performed slightly better than non-duals. In the remaining six measures, we found no differences in performance. Measures that saw the largest difference in performance were population based measures, such as Breast Cancer Screening and Colorectal Cancer Screening.

In our initial univariate analysis, we found that three measures—Rheumatoid Arthritis Management, Diabetes Treatment, and Adherence to Hypertension Medications—showed statistically different results for duals versus non-duals. However, after using regression to account for other underlying differences between these populations, including a member’s burden of illness as measured by DxCG prospective risk and Charlson comorbidity index, the dual variable was no longer statistically significant. This finding is reflected in the above table.

These results demonstrate the need for closer consideration of how the Star Ratings system measures quality for plans that serve a high proportion of dual-eligible beneficiaries. Our findings show that dual-eligibles are less likely to comply with preventive care screenings and exams compared to non-dual beneficiaries, and that statistically significant differences exist between these populations. This data supports the notion that dual status alone is a major indicator of health outcomes, and therefore, should be adequately accounted for in performance ratings so that plans are able to provide comprehensive care to vulnerable beneficiaries.

Methodology

To arrive at these results, multiple logistic models were created by applying a 1/0 binary outcome variable for each compliance measures. Dependent, or outcome variables, were based on performance year 2013 results. For example, a member was a “1” if he/she was compliant for Breast Cancer Screening by the end of calendar year 2013 and “0” otherwise. All WellPoint Blue Medicare plans were modeled together for a particular measure allowing for a larger sample size and resulting power. Prescription Drug Plans were not included.

In addition to the dual/non-dual indicator, the following list of covariates was included in all models:

- Member’s age
- Gender
- Contract (ex. OH HMO, OH LPPO, RPPO)
- Charlson comorbidity index
- DxCG Prospective Risk Score (as of Dec 2013)
- Urban/Rural (RUC variable determined based on member’s zip code)
- Institutionalized (indicator from MMR)
- Disabled (from MMR)
- Indicator EGR (member part of WellPoint’s employee retiree group population)

Other covariates were not included:

- Income – Income largely defines being dual/non-dual so not included.
- Provider – Given time restraints and challenges with finding a good proxy variable, we did not include a covariate to consider provider.

For more details, see the complete methodology and analysis in Appendix A.

Low-SES Limits Plans Ability to Achieve Comparable Improvement / Results

As described above, low-SES and dual-eligibility are associated with poorer baseline health status and plan performance ratings. Low-SES and dual status also impact plan ability to improve outcomes and, consequently, performance. For example, low-SES and dually eligible individuals are more likely to experience limitations in activities of daily living, including feeding and walking.²⁶ Dual-eligible beneficiaries often rely on assisted transportation services to reach care settings,²⁷ and frequently encounter obstacles when transitioning between sites of

²⁶ “Integrating Care for Dual Eligibles.” (2010). Federal Coordinated Health Care Office, CMS.

²⁷ “Medicare Special Needs Plans: Lessons from Dual-Eligible Demonstrations for CMS, States, Health Plans, and Providers.” (2007). Brandeis University.

service. Many beneficiaries remain in a constant flux between acute and long-term care settings,²⁸ and often use a vast range of medical services.

These added variables not only impact beneficiary health, but also increase the complexity and intensity of plan interventions, making it more difficult for plans to achieve significant gains in outcomes. Plans must undertake additional efforts to coordinate care in order to reconcile multiple points of care contacts, manage payment streams, and ensure continuity of care for these enrollees. Some of these variables limit the potential for improvement among this population. For example, low-SES and dually eligible individuals have higher levels of impairment and lower levels of health literacy compared to higher-SES and non-dual peers.²⁹ Lower baseline health status, combined with other attributes – like health literacy – that make this population more difficult to engage, mean that plans may be unable to achieve the same outcomes as plans serving non-dual eligible members, despite significant intervention. We suggest that CMS consider evaluating the year-over-year improvement of dual-eligible versus other beneficiaries to demonstrate this impact.

Star Ratings Impede Integration Efforts for Dual-Eligibles

Currently, dual-eligibles must navigate a non-integrated system of Medicare and Medicaid providers, benefits, and cost sharing. It is well-established that dual-eligible beneficiaries stand to benefit from care coordination; and when properly managed, collaboration between plans and providers can ultimately lead to high quality care and improved health status which result in reduced health care costs. Integrating care helps to lessen duplicative and/or missed services, align payment mechanisms, and ensure that the right care is received in the best setting. Integrated care also provides greater flexibility for the types of services that beneficiaries have access to, while simultaneously reducing confusion and simplifying interactions with the health care system. By combining these services, policymakers are better able to create budget predictability and tailor multidisciplinary, primary care teams to the patient’s needs and preferences. This further promotes data-sharing, stronger consumer protections, and more robust provider networks.³⁰ States are taking different approaches to integration, including through CMS’ Financial Alignment Demonstration (FAD) and alternative pathways like D-SNPs.

States like Arizona, Florida, New Jersey, and Tennessee have elected to use D-SNPs, instead of participating in the FAD, to further integrate care and address members’ complex needs. Though D-SNPs are well-designed to provide for the unique challenges that dual-eligibles face, the Star Ratings system makes it difficult for these contracts to continue serving high-need

²⁸ “The Dual Eligible Opportunity.” 2010. American Progress.

²⁹ “The Dual Eligible Opportunity.” 2010. American Progress.

³⁰ “Encouraging Integrated Care for Dual Eligibles.” (2009). The Commonwealth Fund.

beneficiaries.³¹ D-SNP contracts with high dual-eligible enrollment tend to receive fewer stars on quality performance, largely due to the impact of low-SES and dual-eligibility on health outcomes. As a result, D-SNPs receive lower reimbursement, compromising their ability to provide comprehensive care for their vulnerable enrollees. Without sound financial support, D-SNPs' struggle further to improve their Star Ratings, making them more likely to be terminated or withdraw from the market—eroding integration efforts. This cycle demonstrates that, though D-SNPs are valuable pathways to integrating care, their ability to do so is directly threatened by the performance rating system.

Likewise, in CMS' FAD, Medicare-Medicaid plans (MMPS) that earn less than three stars on the MA Star Ratings are prohibited from participating in a state's passive enrollment process, which the majority of states utilize.³² This creates an additional barrier for states that are already having a difficult time attracting plans because states are unable to guarantee that plans with low Star Ratings will have meaningful enrollment.

Rather than serving to promote integration efforts, the exclusion of low-star rated plans impedes them. MA plans serving high proportions of dual-eligible beneficiaries often receive the lowest Star Ratings because the current system disadvantages plans that serve predominantly duals or low-SES populations.³³ As a result, these plans do not compete on a level playing field with other MA plans that do not have similar proportions of dual-eligible enrollment. MA plans serving high proportions of dual-eligible beneficiaries perform worse and are limited in their participation in the FAD. D-SNPs and other plans serving large numbers of dual-eligibles are the plans that have the most experience in coordinating care for dual-eligible beneficiaries and should be included in the FAD. Moreover, low performance on the Star Ratings is also reflected in PlanFinder, which influences beneficiary choice. This directly impacts plan enrollment and leads beneficiaries to select plans based on inaccurate quality information.

Finally, should MMPs become subject to the Star Ratings system in the future, it is likely that these plans will encounter the same challenges that D-SNPs are experiencing today. If held to the same standards as MA plans, MMPs will compete on an unlevelled playing field due to their member composition. As a result, MMP participation could erode, undercutting integration efforts.

³¹ "Medicare Advantage Special Needs Plans." (2013). Medicare Payment Advisory Commission.

³² Medicare and Medicaid Coordination Office Memo to Prospective Plans. "2014 Capitated Financial Alignment Demonstration Timeline." (2013).

³³ Bishop, S. "Are MA Star Ratings Biased Against Plans Serving Disadvantaged Populations?" (2012). Amerigroup Corp.

Low-SES Has an Adverse Impact on Part D Plans

Low-SES also has an impact on Star Ratings in Medicare Part D. In 2015, CMS will use 14 quality measures to assess performance by Part D plans. Among these measures are: Medication Adherence for Diabetes Medications, Medication Adherence for Hypertension (RAS antagonists), and Medication Adherence for Cholesterol (Statins), determined based on prescription refill data. CMS gives these intermediate outcomes measures the greatest weight (3x) in determining a plan's overall Star Rating.

In WellPoint's analysis of our MA plans, as described above, before controlling for health status, duals showed statistically significant worse performance than non-duals on both adherence to hypertension medications and diabetes treatment measures. (A table summarizing univariate analysis results is available in the appendix on page 16.) Once we controlled for health status, dual-eligible status was not a significant predictor of performance for these measures. Details of this observation in our modeling analysis are available in the appendix, see model 9 and model 10. However, as described above, individuals with low-SES, including duals, tend to have worse health status. And poor health status has been found to be associated with worse adherence to prescription medication regimens.^{34, 35}

In addition, multiple other studies have shown that medication adherence is, "positively associated with patients' socioeconomic characteristics such as education and income."³⁶ One study went as far as to conclude that, "Administrative data likely do not capture many complex mechanisms underlying adherence."³⁷ A recent analysis lends support to this claim, finding that dual-eligibles performed significantly worse than non-duals on all three medication adherence measures, including antidepressant medication management. Moreover, dual-eligibles that were disabled, living with alcohol/drug/substance abuse issues, or residing in a designated primary care or mental health shortage area, performed worse than other duals and non-duals alike.³⁸ Indeed, a broad array of factors has been found to be correlated with beneficiary medication adherence, including demographic, disease-related and treatment-related, socio-economic and cultural factors.³⁹ Part D plans face an uphill battle in managing the wide range of personal

³⁴ Burge, Sandra, et al. "Correlates of Medication Knowledge and Adherence: Findings From the Residency Research Network of South Texas." *Family Medicine*. 2005; 37(10):712-8.

³⁵ Lee, GK, et al. "Determinants of Medication Adherence to Antihypertensive Medications Among a Chinese Population using Morisky Medication Adherence Scale." *PLoS One*. 2013 Apr 25;8(4):e62775.

³⁶ Young, Gary J., et al. "Socioeconomic Characteristics of Enrollees Appear to Influence Performance Scores for Medicare Part D Contractors." *Health Affairs*. 33.1 (2014): 140-146.

³⁷ Chan DC, Shrank WH, Cutler D, Jan S, Fischer MA, Liu J, et al. "Patient, physician, and payment predictors of statin adherence." *Med Care*. 2010; 48(3):196-202.

³⁸ "An Investigation of Medicare Advantage Dual Eligible Member Level Performance on CMS Five-Star Quality Measures." Inovalon. (2014).

³⁹ Peters B, Van Tongelen I, Boussery K, Mehuys E, Remon JP, Willems S. "Factors associated with medication Adherence to oral hypoglycemic agents in different ethnic groups suffering from type 2 diabetes: a systematic literature review and suggestions for further research." *Diabetic Med*. 2011; 28(3):262-75.

characteristics that influence individual adherence behaviors; much of which falls outside of their control.

Furthermore, a recent analysis of data from CMS and the U.S. Census Bureau shows that a plan's composition of enrollees has a significant impact on its Part D performance ratings. Contracts with a high proportion of enrollees who were minorities, who qualified for low-income subsidies, or who did not have a high school diploma were significantly more likely to receive lower medication adherence scores.⁴⁰ Overall, socioeconomic variables explained one-third of the variation in contract scores.

If the Star Ratings do not accurately reflect the experience of members in a particular PDP, then they are not a reliable tool for beneficiary shopping and decision making. When beneficiaries review their plan options through PlanFinder each year, they look to the Star Ratings to help them find the best-quality plans. It is essential that the information beneficiaries use to purchase plans is accurate and transparent.

Opportunities Exist to Improve the Star Ratings System

There is a strong body of evidence to support the view that the current MA and Part D Star Ratings system does not accurately reflect the impact that low-SES and dual-eligibility have on plan performance (Appendix B). Failure to account for these factors in the Star Ratings negatively impacts the MA and Part D markets, and adversely affect D-SNPs that provide for some of the most vulnerable beneficiaries.

To improve the Star Ratings system, WellPoint has identified numerous opportunities, such as defining a set of measures more appropriate for a dual-eligible member population, which could augment the current system. We are eager to engage with CMS and further discuss these ideas as the agency explores innovative approaches to enhance care integration efforts for beneficiaries.

We share your goal of improving care for this vulnerable population and believe that dual-eligible beneficiaries will be best served when a diverse range of plan options are available to them. However, we are concerned that without changes, plans focused on the duals population including D-SNPs may not continue to be viable. We remain eager to work with you to ensure that dual-eligibles are able to accurately compare and select plans that provide the high-quality, integrated, and specialized services they need.

⁴⁰ Young, Gary J., et al. "Socioeconomic Characteristics of Enrollees Appear to Influence Performance Scores for Medicare Part D Contractors." *Health Affairs*. 33.1 (2014): 140-146.



Response to CMS RFI on Impact of Duals on Medicare Plan Performance

October 28, 2014

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Background

In order to investigate the relationship between dual status on specific clinical Stars measures, regression modeling was used. By using a multivariate regression approach, we were able to understand the specific impact of dual status while controlling for other covariates.

Approach

Multiple logistic models were created by creating 1/0 binary outcome variable for each of our compliance measures. Dependent, or outcome variables, were all based on performance year 2013 results. For example, a member was a "1" if she was compliant for Breast Cancer Screening (per HEDIS specifications) by the end of calendar year 2013, and "0" otherwise.

All WellPoint Blue Medicare plans were modeled together for a particular measure allowing for larger sample size and resulting power. PDP plans were not included for pharmacy measures.

We included the following list of covariates in all models, in addition to the dual/non-dual indicator:

- Member's age
- Gender
- Contract (ex. OH HMO, OH LPPO, RPPO)
- Charlson comorbidity index
- DxCG Prospective Risk Score (as of Dec 2013)
- Urban/Rural (RUC variable determined based on member's zip code)
- Institutionalized (indicator from MMR)
- Disabled (from MMR)
- Indicator EGR (member part of WellPoint's employee retiree group population)

See detailed "Covariate reference" table at end of document for a complete list and technical definitions.

Detailed model results for each measure only include covariates that were found to be statistically significant.

Specific covariates that have not been included:

- Income – Income largely defines being dual/non-dual so not included.
- Provider – Given time restraints and challenges with finding a good proxy variable, we did not include a covariate to consider provider.

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Technical details

- Software: SAS 9.2, specifically using PROC LOGISTIC with stepwise selection
- Data source:
 - Administrative HEDIS data was used for all HEDIS measures. Note for hybrid measures we did not limit the submitted sampled results, but used the full denominator eligible population and resulting administrative results.
 - Internal calculations and results were used for the Part D measures simply given the availability and ease of access to that data. We mine our medical and pharmacy claims to calculate these measures according to specifications. We have done internal validations of our internal calculations against Acumen's results and have found little to no variance.
 - Covariates were gathered from: CMS MMR files (Duals/Non-Duals, Institutionalized, Gender), claims mining to calculate DxCG prospective risk and Charlson comorbidity
 - The following definition was used to identify "Duals" using the MMR file: Medicaid Indicator (Field 21)='Y' or Current Medicaid Status (Field 40) = '1'

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Summary of univariate analysis results:

Results from our univariate analysis are summarized in the table below. Based on these results, we modeled all measures except C13, D11 and D13 where no difference between duals and non-duals was observed.

Measure number	Measure	Univariate Results		Z-Val	P-Val
		Population size (duals and nonduals)	Delta (duals – non duals)		
C01	Breast Cancer Screening	82,534	-11.3%	-19.0	<.0001
C02	Colorectal Cancer Screening	208,183	-7.3%	-17.5	<.0001
C03	Diabetes Care - Cholesterol Screening	74,770	-4.9%	-11.5	<.0001
C13*	Osteoporosis Management	5,978	-0.7%	-0.4	0.704
C14	Diabetes Care – Eye Exam	74,770	-8.0%	-14.5	<.0001
C15†	Diabetes Care - Kidney Disease Monitoring	74,770	0.9%	2.5	0.0187
C16(sc)	Diabetes Care - Blood Sugar Screening (not control)	74,770	-2.2%	-5.9	<.0001
C19	Rheumatoid Arthritis Management	5,735	-5.0%	-10.4	0.0034
D09	High risk meds	440,765	6.7%	36.5	<.0001
D10	Diabetes Treatment	78,292	-1.7%	-4.5	<.0001
D11*	Adherence – Oral Diabetes	69,509	-0.6%	-1.2	0.221
D12	Adherence - Hypertension	199,271	-2.3%	-7.9	<.0001
D13*	Adherence - Cholesterol	198,201	0.6%	1.8	0.074

* No statistical difference between duals and non-duals observed in univariate analysis

† Duals perform better than non-duals

Of the 13 measures analyzed, we found 9 measures showed duals performed worse than non-duals, 1 measure duals outperformed non-duals (i.e. Diabetes Care – Kidney Disease Monitoring) and 3 showed no difference in performance.

Appendix A: WellPoint’s Analysis: Impact of Duals on Medicare Plan Performance

Summary of model results

Results from our regression analyses are summarized in the table below. Where we found the duals covariate significant we have included the following information:

- Odds Ratio for Dual/Non-Dual covariate, *and*
- Probability estimate for Duals and Non-Duals at means for all the other covariates, and the resulting “delta” between these two estimates

Measure number	Measure	Odds ratio	P(dual) at mean	P(non-dual) at mean	Delta
C01	Breast Cancer Screening	0.638	58.52%	68.87%	-10.4%
C02	Colorectal Cancer Screening	0.711	38.98%	47.33%	-8.4%
C03	Diabetes Care - Cholesterol Screening	0.837	83.01%	85.37%	-2.4%
C13	Osteoporosis Management	<i>not significant (univariate)</i>			
C14	Diabetes Care – Eye Exam	0.813	45.71%	50.89%	-5.2%
C15†	Diabetes Care - Kidney Disease Monitoring	1.132	87.01%	85.61%	1.5%
C16(sc)	Diabetes Care - Blood Sugar Screening (not control)	0.881	88.33%	89.58%	-1.2%
C19	Rheumatoid Arthritis Management	<i>not significant (modeled)</i>			
D09	High risk meds	1.295	12.4%	9.9%	2.5%
D10	Diabetes Treatment	<i>not significant (modeled)</i>			
D11	Adherence – Oral Diabetes	<i>not significant (univariate)</i>			
D12	Adherence - Hypertension	<i>not significant (modeled)</i>			
D13	Adherence – Cholesterol	<i>not significant (univariate)</i>			

† *Duals perform better than non-duals*

Summarizing results from both our univariate and modeling results for the 13 measures analyzed, we found 6 measures show duals perform worse than non-duals, 1 measure duals outperform non-duals and for the remaining 6 measures we found no difference in performance.

Measures that saw the largest difference in performance were population based measures: Breast Cancer Screening and Colorectal Cancer Screening.

We found three measures that showed statistically different results in our univariate analysis, however after using regression to account for other underlying differences between these populations, specifically a member’s illness burden measured by DxCG prospective risk and Charlson comorbidity index, the dual variable no longer proved statistically significant. These measures were: Rheumatoid Arthritis Management, Diabetes Treatment and Adherence to

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Hypertension medications. This finding is reflected in the above table. Examples of this finding in our modeling efforts are included in the sections for D10 Diabetes Treatment and D12 Adherence for Hypertension Medications.

Probability estimates were calculated using the following formula:

$$p = 1/[1 + \exp(-\mathbf{a} - \mathbf{B}\mathbf{X})]$$

Where \mathbf{a} represents the model's intercept, \mathbf{B} represents the array of parameter estimates in the model, and \mathbf{X} represents the model covariates. To calculate P(duals), we set \mathbf{X} values at the mean for each covariate, and set duals covariate at 1. To calculate P(non-duals), we set \mathbf{X} values at the mean for each covariate and set duals covariate at 0.

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 1: Breast Cancer Screening

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	4.4686	0.2316	372.2437	<.0001
AGE	1	-0.0482	0.00327	216.8214	<.0001
AGE_64 (Y/N)	1	-4.0682	0.3996	103.6535	<.0001
AGE_AGE64_INTX	1	0.0571	0.00643	78.9814	<.0001
DxCG_BELOW5 (Y/N)	1	-1.0744	0.035	942.9368	<.0001
DxCG_COST	1	-0.0294	0.00233	159.3769	<.0001
DxCG_BELOW5_INTX	1	0.3491	0.00843	1713.641	<.0001
EGR (Y/N)	1	0.3772	0.0436	74.9321	<.0001
CMScontract_H3370 (Y/N)	1	0.1428	0.0237	36.1638	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.4497	0.0263	291.3499	<.0001
INSTITUTE (Y/N)	1	-1.8209	0.2105	74.8539	<.0001
Rural (Y/N)	1	-0.2055	0.0273	56.574	<.0001
Suburban (Y/N)	1	-0.1178	0.0197	35.8003	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
AGE	0.953	0.947	0.959
AGE_64 (Y/N)	0.017	0.008	0.037
AGE_AGE64_INTX	1.059	1.046	1.072
DxCG_BELOW5 (Y/N)	0.342	0.319	0.366
DxCG_COST	0.971	0.967	0.975
DxCG_BELOW5_INTX	1.418	1.395	1.441
EGR (Y/N)	1.458	1.339	1.588
CMScontract_H3370 (Y/N)	1.154	1.101	1.208
DUAL_ELIGIBLE (Y/N)	0.638	0.606	0.672
INSTITUTE (Y/N)	0.162	0.107	0.245
Rural (Y/N)	0.814	0.772	0.859
Suburban (Y/N)	0.889	0.855	0.924

Appendix A: WellPoint’s Analysis: Impact of Duals on Medicare Plan Performance

Association of Predicted Probabilities and Observed Responses

Percent Concordant	60.5	Somers 'D	0.216
Percent Discordant	38.8	Gamma	0.218
Percent Tied	0.7	Tau-a	0.095
Pairs	1495749264	c	0.608

Interpretation of BCS model:

We focus on the odds ratio for the “Dual_eligible” variable to understand the impact of this factor. In our model for Breast Cancer Screening, we find an odds ratio of 0.633, which we can interpret as: the odds of compliance for the Breast Cancer Screening measure for duals is 1.57 times *less* likely than the odds of compliance for non-duals, (i.e. 1/0.638=1.57).

Breaking it down further, the odds ratio for the Dual_eligible variable is

$$\frac{p(dual)/(1-p(dual))}{p(non-dual)/(1-p(non-dual))} = 0.638$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	58.52%
Non-Dual	68.87%
Delta (Duals - Non-duals)	-10.4%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 2: Colorectal Cancer Screening

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	-0.8898	0.0652	186.0316	<.0001
FEMALE (Y/N)	1	0.0925	0.00909	103.5172	<.0001
AGE	1	0.0151	0.000917	269.5663	<.0001
DxCG_BELOW5 (Y/N)	1	-1.0745	0.0214	2532.67	<.0001
DxCG_COST	1	0.00422	0.00122	11.9119	0.0006
DxCG_BELOW5_INTX	1	0.2868	0.0051	3157.445	<.0001
EGR (Y/N)	1	0.4382	0.0212	426.3756	<.0001
CMScontract_H3342 (Y/N)	1	-0.1003	0.0155	42.0165	<.0001
CMScontract_H3370 (Y/N)	1	0.1177	0.0163	51.9704	<.0001
CMScontract_H8552 (Y/N)	1	-0.1418	0.0166	72.7044	<.0001
CMScontract_R5941 (Y/N)	1	-0.1676	0.0119	197.9199	<.0001
Charlson_Capped12 (Y/N)	1	0.0477	0.00325	215.2462	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.3413	0.0177	371.9614	<.0001
INSTITUTE (Y/N)	1	-0.487	0.1124	18.7676	<.0001
Rural (Y/N)	1	-0.2899	0.0169	292.4655	<.0001
Suburban (Y/N)	1	-0.1226	0.0125	97.0364	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	1.097	1.078	1.117
AGE	1.015	1.013	1.017
DxCG_BELOW5 (Y/N)	0.341	0.327	0.356
DxCG_COST	0.996	0.993	0.998
DxCG_BELOW5_INTX	1.332	1.319	1.346
EGR (Y/N)	1.55	1.487	1.616
CMScontract_H3342 (Y/N)	0.905	0.878	0.932
CMScontract_H3370 (Y/N)	1.125	1.089	1.161
CMScontract_H8552 (Y/N)	0.868	0.84	0.897
CMScontract_R5941 (Y/N)	0.846	0.826	0.866
Charlson_Capped12 (Y/N)	1.049	1.042	1.056

Appendix A: WellPoint’s Analysis: Impact of Duals on Medicare Plan Performance

DUAL_ELIGIBLE (Y/N)	0.711	0.687	0.736
INSTITUTE (Y/N)	0.614	0.493	0.766
Rural (Y/N)	0.748	0.724	0.774
Suburban (Y/N)	0.885	0.863	0.906

Association of Predicted Probabilities and Observed Responses

Percent Concordant	60.9	Somers' D	0.224
Percent Discordant	38.5	Gamma	0.226
Percent Tied	0.5	Tau-a	0.112
Pairs	10789336012	c	0.612

Interpretation of COL model:

We focus on the odds ratio for the “Dual_eligible” variable to understand the impact of this factor. In our model for Colorectal Cancer Screening, we find an odds ratio of 0.711, which we can interpret as: the odds of compliance for the Colorectal Cancer Screening measure for duals is 1.41 times *less* likely than the odds of compliance for non-duals, (i.e. $1/0.711=1.43$).

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1-p(dual))}{p(non-dual)/(1-p(non-dual))} = 0.711$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	38.98%
Non-Dual	47.33%
Delta (Duals - Non-duals)	-8.4%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 3: Diabetes Care – Cholesterol Screening

Analysis of Maximum Likelihood Estimates

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	0.9948	0.1033	92.6881	<.0001
FEMALE (Y/N)	1	0.1253	0.0207	36.7028	<.0001
AGE	1	0.0172	0.00146	137.7529	<.0001
DxCG_BELOW5 (Y/N)	1	-0.8277	0.0474	304.3453	<.0001
DxCG_COST	1	-0.0356	0.00159	498.181	<.0001
DxCG_BELOW5_INTX	1	0.2512	0.0133	359.2106	<.0001
CMScontract_H3342 (Y/N)	1	0.473	0.0439	115.9954	<.0001
CMScontract_H3370 (Y/N)	1	-0.2045	0.0324	39.9207	<.0001
CMScontract_R5941 (Y/N)	1	-0.2538	0.0231	120.2727	<.0001
Charlson_Zero (Y/N)	1	-1.2548	0.0298	1767.774	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.1779	0.0305	34.0918	<.0001
INSTITUTE (Y/N)	1	-0.7441	0.1517	24.0531	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	1.134	1.088	1.18
AGE	1.017	1.014	1.02
DxCG_BELOW5 (Y/N)	0.437	0.398	0.48
DxCG_COST	0.965	0.962	0.968
DxCG_BELOW5_INTX	1.286	1.253	1.319
CMScontract_H3342 (Y/N)	1.605	1.472	1.749
CMScontract_H3370 (Y/N)	0.815	0.765	0.868
CMScontract_R5941 (Y/N)	0.776	0.741	0.812
Charlson_Zero (Y/N)	0.285	0.269	0.302
DUAL_ELIGIBLE (Y/N)	0.837	0.788	0.889
INSTITUTE (Y/N)	0.475	0.353	0.64

Association of Predicted Probabilities and Observed Responses

Percent Concordant	64.6	Somers' D	0.301
Percent Discordant	34.5	Gamma	0.304
Percent Tied	1	Tau-a	0.081
Pairs	755066424	c	0.65

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Interpretation of Diabetes Care – Cholesterol screening model:

We focus on the odds ratio for the “Dual_eligible” variable to understand the impact of this factor. In our model for Diabetes Care-Cholesterol screening, we find an odds ratio of 0.837, which we can interpret as: the odds of compliance for the Diabetes Care-Cholesterol screening measure for duals is 1.19 times *less* likely than the odds of compliance for non-duals, (i.e. $1/0.837=1.19$).

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1 - p(dual))}{p(non - dual)/(1 - p(non - dual))} = 0.837$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	83.01%
Non-Dual	85.37%
Delta (Duals - Non-duals)	-2.4%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 4: Diabetes Care – Eye Exam

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	-2.6628	0.205	168.681	<.0001
FEMALE (Y/N)	1	0.2558	0.0154	277.1	<.0001
AGE	1	0.0379	0.0029	171.1845	<.0001
AGE_64 (Y/N)	1	1.2868	0.2548	25.509	<.0001
AGE_Age64_INTX	1	-0.0225	0.00394	32.456	<.0001
DxCG_BELOW5 (Y/N)	1	-0.9351	0.0386	585.4628	<.0001
DxCG_COST	1	-0.0269	0.00174	238.0029	<.0001
DxCG_BELOW5_INTX	1	0.2446	0.00997	601.3865	<.0001
EGR	1	0.4069	0.0334	148.6616	<.0001
CMScontract_H3342 (Y/N)	1	0.1361	0.0275	24.5257	<.0001
CMScontract_H3370 (Y/N)	1	0.4886	0.0259	356.5328	<.0001
CMScontract_H5529 (Y/N)	1	0.247	0.0389	40.3592	<.0001
CMScontract_R5941 (Y/N)	1	-0.1409	0.0198	50.4136	<.0001
Charlson_Capped5	1	0.1608	0.00676	566.2749	<.0001
Charlson_Zero (Y/N)	1	-0.4352	0.0316	189.9779	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.2074	0.0242	73.3321	<.0001
ESRD	1	0.5044	0.0844	35.7222	<.0001
Rural (Y/N)	1	-0.301	0.0272	122.0551	<.0001
Suburban (Y/N)	1	-0.1739	0.0205	72.2693	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	1.291	1.253	1.331
AGE	1.039	1.033	1.045
AGE_64 (Y/N)	3.621	2.198	5.966
AGE_Age64_INTX	0.978	0.97	0.985
DxCG_BELOW5 (Y/N)	0.393	0.364	0.423
DxCG_COST	0.973	0.97	0.977
DxCG_BELOW5_INTX	1.277	1.252	1.302
EGR	1.502	1.407	1.604
CMScontract_H3342 (Y/N)	1.146	1.086	1.209

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CMScontract_H3370 (Y/N)	1.63	1.549	1.715
CMScontract_H5529 (Y/N)	1.28	1.186	1.381
CMScontract_R5941 (Y/N)	0.869	0.835	0.903
Charlson_Capped5	1.174	1.159	1.19
Charlson_Zero (Y/N)	0.647	0.608	0.688
DUAL_ELIGIBLE (Y/N)	0.813	0.775	0.852
ESRD	1.656	1.404	1.954
Rural (Y/N)	0.74	0.702	0.781
Suburban (Y/N)	0.84	0.807	0.875

Association of Predicted Probabilities and Observed Responses

Percent Concordant	65	Somers' D	0.303
Percent Discordant	34.6	Gamma	0.304
Percent Tied	0.4	Tau-a	0.152
Pairs	1397575725	c	0.652

Interpretation of Diabetes Care – Eye Exam model:

We focus on the odds ratio for the “Dual_eligible” variable to understand the impact of this factor. In our model for Diabetes Care – Eye Exam, we find an odds ratio of 0.813, which we can interpret as: the odds of compliance for the Diabetes Care – Eye Exam measure for duals is 1.23 times *less* likely than the odds of compliance for non-duals, (i.e. $1/0.813=1.23$).

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1 - p(dual))}{p(non - dual)/(1 - p(non - dual))} = 0.813$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	45.71%
Non-Dual	50.89%
Delta (Duals - Non-duals)	-5.2%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 5: Diabetes Care – Kidney Disease Monitoring

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi- Square	Pr > ChiS q
Intercept	1	-0.2281	0.1073	4.5181	0.0335
AGE	1	0.0274	0.00148	341.0698	<.0001
DxCG_BELOW5 (Y/N)	1	-0.371	0.0506	53.7648	<.0001
DxCG_COST	1	0.0071	0.00325	4.7702	0.029
DxCG_BELOW5_INTX	1	0.098	0.0126	60.1914	<.0001
CMScontract_H3342 (Y/N)	1	-0.1654	0.0377	19.2127	<.0001
CMScontract_H3370 (Y/N)	1	-0.1901	0.034	31.2084	<.0001
CMScontract_H8552 (Y/N)	1	-0.1866	0.0432	18.6816	<.0001
CMScontract_R5941 (Y/N)	1	-0.1971	0.0249	62.75	<.0001
Charlson_Capped12	1	0.1371	0.00848	261.4568	<.0001
Charlson_Zero (Y/N)	1	-0.7812	0.0329	562.6824	<.0001
DUAL_ELIGIBLE (Y/N)	1	0.1241	0.0334	13.7859	0.0002
ESRD	1	4.4713	1.0013	19.9414	<.0001
INSTITUTE (Y/N)	1	-1.0869	0.169	41.3684	<.0001

Odds Ratio Estimates

1

Effect	Point Estimate	95% Wald Confidence Limits	
AGE	1.028	1.025	1.031
DxCG_BELOW5 (Y/N)	0.69	0.625	0.762
DxCG_COST	1.007	1.001	1.014
DxCG_BELOW5_INTX	1.103	1.076	1.131
CMScontract_H3342 (Y/N)	1.146	1.086	1.209
CMScontract_H3370 (Y/N)	1.63	1.549	1.715
CMScontract_H8552 (Y/N)	1.28	1.186	1.381
CMScontract_R5941 (Y/N)	0.869	0.835	0.903
Charlson_Capped12	1.147	1.128	1.166
Charlson_Zero (Y/N)	0.458	0.429	0.488
DUAL_ELIGIBLE (Y/N)	1.132	1.06	1.209
ESRD	87.474	12.291	622.55 8
INSTITUTE (Y/N)	0.337	0.242	0.47

Appendix A: WellPoint’s Analysis: Impact of Duals on Medicare Plan Performance

Association of Predicted Probabilities and Observed Responses

Percent Concordant	63.4	Somers' D	0.279
Percent Discordant	35.5	Gamma	0.282
Percent Tied	1	Tau-a	0.074
Pairs	745295544	c	0.64

Interpretation of Diabetes Care – Kidney Disease monitoring model:

The odds ratio for this measure is >1, i.e. 1.132, indicating duals perform better than non-duals for this measure. This is consistent with the univariate analysis.

We can interpret this odds ratio as: the odds of compliance for the Diabetes Care – Kidney Disease monitoring measure for duals is 1.132 times *more* likely than the odds of compliance for non-duals.

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1 - p(dual))}{p(non - dual)/(1 - p(non - dual))} = 1.132$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	87.07%
Non-Dual	85.61%
Delta (Duals - Non-duals)	1.5%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 6: Diabetes Care – Blood Sugar SCREENING (not control)

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	1.6708	0.1192	196.5496	<.0001
FEMALE (Y/N)	1	0.1881	0.0236	63.2636	<.0001
AGE	1	0.0117	0.00169	48.2735	<.0001
DxCG_BELOW5 (Y/N)	1	-0.6891	0.0531	168.488	<.0001
DxCG_COST	1	-0.0308	0.00174	314.0037	<.0001
DxCG_BELOW5_INTX	1	0.262	0.0151	302.6152	<.0001
EGR (Y/N)	1	0.2291	0.0577	15.793	<.0001
CMScontract_H3342 (Y/N)	1	0.2115	0.0469	20.3401	<.0001
CMScontract_H3370 (Y/N)	1	-0.3624	0.036	101.334	<.0001
CMScontract_R5941 (Y/N)	1	-0.2257	0.0274	67.8808	<.0001
Charlson_Zero (Y/N)	1	-1.9642	0.0305	4154.094	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.1266	0.0351	13.0165	0.0003
DISABLE (Y/N)	1	-0.3453	0.0984	12.3073	0.0005

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	1.207	1.152	1.264
AGE	1.012	1.008	1.015
DxCG_BELOW5 (Y/N)	0.502	0.452	0.557
DxCG_COST	0.97	0.966	0.973
DxCG_BELOW5_INTX	1.3	1.262	1.338
EGR (Y/N)	1.257	1.123	1.408
CMScontract_H3342 (Y/N)	1.236	1.127	1.354
CMScontract_H3370 (Y/N)	0.696	0.649	0.747
CMScontract_R5941 (Y/N)	0.798	0.756	0.842
Charlson_Zero (Y/N)	0.14	0.132	0.149
DUAL_ELIGIBLE (Y/N)	0.881	0.823	0.944
DISABLE (Y/N)	0.708	0.584	0.859

Appendix A: WellPoint’s Analysis: Impact of Duals on Medicare Plan Performance

Association of Predicted Probabilities and Observed Responses

Percent Concordant	69.1	Somers' D	0.392
Percent Discordant	29.8	Gamma	0.397
Percent Tied	1.1	Tau-a	0.085
Pairs	606172536	c	0.696

Interpretation of Diabetes Care – Blood Sugar SCREENING (not control):

Note: Due to incomplete lab data, we cannot calculate administrative rates for the control measure across a broad population. Here, we consider rates of members receiving A1C Blood Sugar Screening test.

In our model for Diabetes Care – Blood Sugar SCREENING, we find an odds ratio of 0.881, which we can interpret as: the odds of compliance for the Diabetes Care – Blood Sugar SCREENING for duals is 1.135 (i.e. $1/0.881=1.135$) times *less* likely than the odds of compliance for non-duals.

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1 - p(dual))}{p(non - dual)/(1 - p(non - dual))} = 0.881$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	88.33%
Non-Dual	89.58%
Delta (Duals - Non-duals)	-1.2%

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 7: Rheumatoid Arthritis Management

Duals covariate did not enter this model. Best model results are included below:

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	5.1824	0.4159	155.2952	<.0001
AGE	1	-0.0478	0.00549	76.0561	<.0001
AGE_64 (Y/N)	1	-4.07	0.75	29.449	<.0001
AGE_Age64_INTX	1	0.0582	0.0123	22.5524	<.0001
EGR (Y/N)	1	0.4287	0.1353	10.0385	0.0015
CMScontract_H3655 (Y/N)	1	0.4343	0.0909	22.8126	<.0001
CMScontract_H5529 (Y/N)	1	0.6281	0.1826	11.828	0.0006
Charlson_Zero (Y/N)	1	-2.1086	0.1438	214.9204	<.0001
DxCG_COST	1	-0.0482	0.00546	78.0745	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
AGE	0.953	0.943	0.964
AGE_64 (Y/N)	0.017	0.004	0.074
AGE_Age64_INTX	1.06	1.035	1.086
EGR	1.535	1.178	2.001
CMScontract_H3655 (Y/N)	1.544	1.292	1.845
CMScontract_H5529 (Y/N)	1.874	1.31	2.681
Charlson_Zero (Y/N)	0.121	0.092	0.161
DxCG_COST	0.953	0.943	0.963

Association of Predicted Probabilities and Observed Responses

Percent Concordant	65	Somers' D	0.308
Percent Discordant	34.2	Gamma	0.31
Percent Tied	0.8	Tau-a	0.105
Pairs	5603014	c	0.654

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Model 8: High Risk Medication

Analysis of Maximum Likelihood Estimates

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > Chi Sq
Intercept	1	-2.2906	0.0521	1932.789	<.0001
FEMALE	1	0.5237	0.0102	2623.3495	<.0001
AGE_FLOORED65	1	-0.0134	0.000693	371.5983	<.0001
EGR	1	0.1225	0.0171	51.4768	<.0001
CMScontract_H3342 (NY LPPO)	1	-0.367	0.0184	397.1352	<.0001
CMScontract_H3370 (NY HMO)	1	-0.1746	0.015	134.8037	<.0001
CMScontract_H3655 (OH HMO)	1	-0.1026	0.0136	57.3284	<.0001
CMScontract_H5529 (OH LPPO)	1	-0.103	0.0252	16.701	<.0001
CMScontract_H8552 (CA LPPO)	1	0.127	0.0177	51.7231	<.0001
Charlson_ZERO	1	-0.1879	0.0119	251.3414	<.0001
DUAL_ELIGIBLE	1	0.2582	0.0161	258.3729	<.0001
DISABLE	1	-0.2627	0.0533	24.3215	<.0001
Rural	1	0.0844	0.0182	21.5824	<.0001
DxCG_FORTILE	1	0.0484	0.000549	7785.2311	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE	1.688	1.655	1.723
AGE_FLOORED65	0.987	0.985	0.988
EGR	1.13	1.093	1.169
CMScontract_H3342 (NY LPPO)	0.693	0.668	0.718
CMScontract_H3370 (NY HMO)	0.84	0.815	0.865
CMScontract_H3655 (OH HMO)	0.902	0.879	0.927
CMScontract_H5529 (OH LPPO)	0.902	0.859	0.948
CMScontract_H8552 (CA LPPO)	1.135	1.097	1.175
Charlson_ZERO	0.829	0.81	0.848
DUAL_ELIGIBLE	1.295	1.254	1.336

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DISABLE	0.769	0.693	0.854
Rural	1.088	1.05	1.127
DxCG_FORTILE	1.05	1.048	1.051

Association of Predicted Probabilities and Observed Responses

Percent Concordant	67.1	Somers' D	0.35
Percent Discordant	32.1	Gamma	0.353
Percent Tied	0.8	Tau-a	0.072
Pairs	19843111596	c	0.675

Interpretation of High Risk Medication model results:

High Risk Medication is a measure where a lower rate is preferable. We find an odds ratio of 1.295, which we can interpret as: the odds of a member being on a high risk medication for duals is 1.295 times *more* likely than the odds for non-duals.

Breaking it down further, the odds ratio for the Dual_eligible variable in this model is:

$$\frac{p(dual)/(1 - p(dual))}{p(non - dual)/(1 - p(non - dual))} = 1.295$$

We calculated the marginal probability difference between duals and non-duals by setting all other covariates in the model at the mean, and calculating the predicted difference between Duals and Non-Duals by varying this covariate only:

Dual-Eligible	Rate: P(compliance)
Dual	12.39%
Non-Dual	9.85%
Delta (Duals - Non-duals)	2.5%

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Model 9: Diabetes Treatment - Duals covariate did not enter model

Best model results for **Diabetes Treatment** included below:

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > ChiS q
Intercept	1	4.4795	0.1202	1389.952	<.0001
FEMALE (Y/N)	1	-0.1154	0.0205	31.711	<.0001
AGE	1	-0.0332	0.00159	433.9223	<.0001
AGE_64 (Y/N)	1	-2.747	0.2722	101.8663	<.0001
AGE_Age64_INTX	1	0.0375	0.00454	68.1947	<.0001
CMScontract_H8552 (Y/N)	1	0.1627	0.0442	13.5753	0.0002
Charlson_Zero (Y/N)	1	-0.3245	0.039	69.2249	<.0001
ESRD (Y/N)	1	-0.673	0.1008	44.6098	<.0001
INSTITUTE (Y/N)	1	-0.7207	0.1006	51.3042	<.0001
DxCG_COST	1	-0.0334	0.00153	478.8667	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	0.891	0.856	0.927
AGE	0.967	0.964	0.97
AGE_64 (Y/N)	0.064	0.038	0.109
AGE_Age64_INTX	1.038	1.029	1.047
CMScontract_H8552 (Y/N)	1.177	1.079	1.283
Charlson_Zero (Y/N)	0.723	0.67	0.78
ESRD (Y/N)	0.51	0.419	0.622
INSTITUTE (Y/N)	0.486	0.399	0.592
DxCG_COST	0.967	0.964	0.97

Association of Predicted Probabilities and Observed Responses

Percent Concordant	59.5	Somers' D	0.205
Percent Discordant	39	Gamma	0.208
Percent Tied	1.5	Tau-a	0.054
Pairs	743404116	c	0.602

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

We note that if you do not include DxCG or Charlson comorbidity index in the model, the Duals variable *does* enter. However, if you give all covariates (i.e. DxCG, Charlson comorbidity and Duals indicator) and use the Stepwise selection in SAS, DxCG enters first and Duals will not be selected. For completeness we have included model results where DxCG was removed from suite of candidate variables:

Model results for **Diabetes Treatment**, removing DxCG score and Charlson comorbidity variables:

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > ChiS q
Intercept	1	4.4928	0.1157	1506.987	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.0721	0.0287	6.296	0.0121
AGE	1	-0.0371	0.00153	586.8618	<.0001
AGE_64 (Y/N)	1	-3.0111	0.2681	126.1166	<.0001
AGE_Age64_INTX	1	0.0399	0.00447	79.9281	<.0001
CMScontract_H3655 (Y/N)	1	-0.0869	0.0247	12.4076	0.0004
CMScontract_H8552 (Y/N)	1	0.1538	0.0441	12.1774	0.0005
Charlson_Zero (Y/N)	1	-0.1903	0.0373	25.9753	<.0001

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
DUAL_ELIGIBLE (Y/N)	0.93	0.88	0.984
AGE	0.964	0.961	0.966
AGE_64 (Y/N)	0.049	0.029	0.083
AGE_Age64_INTX	1.041	1.032	1.05
CMScontract_H3655 (Y/N)	0.917	0.874	0.962
CMScontract_H8552 (Y/N)	1.166	1.07	1.271
Charlson_Zero (Y/N)	0.827	0.768	0.889
DUAL_ELIGIBLE (Y/N)	0.93	0.88	0.984
AGE	0.964	0.961	0.966

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Association of Predicted Probabilities and Observed Responses

Percent Concordant	55.5	Somers' D	0.136
Percent Discordant	41.9	Gamma	0.139
Percent Tied	2.6	Tau-a	0.036
Pairs	816204672	c	0.568

We note that this model has worse overall performance than the prior model where Dual did not enter.

Appendix A: WellPoint's Analysis: Impact of Duals on Medicare Plan Performance

Models 10: Adherence Hypertension - Duals covariate did not enter model

Best model results for **Adherence Hypertension** included below:

Parameter	D F	Estimate	Standard Error	Wald Chi-Square	Pr > ChiS q
Intercept	1	1.2878	0.0675	363.8855	<.0001
FEMALE (Y/N)	1	-0.0411	0.0115	12.8109	0.0003
AGE	1	0.00338	0.000866	15.2209	<.0001
AGE_64 (Y/N)	1	-1.6499	0.1548	113.6385	<.0001
AGE_Age64_INTX	1	0.0224	0.00261	74.0572	<.0001
DxCG_BELOW5 (Y/N)	1	-0.0317	0.025	1.6004	0.2058
DxCG_COST	1	-0.0345	0.00139	614.6074	<.0001
DxCG_BELOW5_INTX	1	0.0371	0.00641	33.4707	<.0001
EGR	1	0.2369	0.0232	103.8986	<.0001
CMScontract_H3342 (Y/N)	1	0.1021	0.0205	24.8447	<.0001
CMScontract_H3655 (Y/N)	1	0.1071	0.0153	49.0352	<.0001
CMScontract_H5529 (Y/N)	1	0.2038	0.0305	44.7599	<.0001
CMScontract_H8552 (Y/N)	1	-0.1922	0.0215	79.9881	<.0001
INSTITUTE (Y/N)	1	0.3205	0.0928	11.9309	0.0006

Odds Ratio Estimates

Effect	Point Estimate	95% Wald Confidence Limits	
FEMALE (Y/N)	0.96	0.938	0.982
AGE	1.003	1.002	1.005
AGE_64 (Y/N)	0.192	0.142	0.26
AGE_Age64_INTX	1.023	1.017	1.028
DxCG_BELOW5 (Y/N)	0.969	0.922	1.018
DxCG_COST*	0.966	0.963	0.969
DxCG_BELOW5_INTX	1.038	1.025	1.051
EGR	1.267	1.211	1.326
CMScontract_H3342 (Y/N)	1.107	1.064	1.153
CMScontract_H3655 (Y/N)	1.113	1.08	1.147

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CMScontract_H5529 (Y/N)	1.226	1.155	1.301
CMScontract_H8552 (Y/N)	0.825	0.791	0.861
INSTITUTE (Y/N)	1.378	1.149	1.653

Association of Predicted Probabilities and Observed Responses

Percent Concordant	55.9	Somers' D	0.143
Percent Discordant	41.6	Gamma	0.146
Percent Tied	2.5	Tau-a	0.046
Pairs	6384304854	c	0.571

We note that if you do not include DxCG and remove the Age<64 and corresponding Age interaction variable from the model, the Duals variable *does* enter. For completeness we have included model results where DxCG and Age variables mentioned above were removed from suite of candidate variables:

Model results for **Adherence Hypertension**, remove DxCGs score, Age<65 and Age interaction variables:

Parameter	DF	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	1	0.4629	0.0466	98.5109	<.0001
AGE	1	0.0136	0.000637	456.2315	<.0001
EGR	1	0.2363	0.0232	103.7034	<.0001
CMScontract_H3342 (Y/N)	1	0.136	0.0204	44.5777	<.0001
CMScontract_H3655 (Y/N)	1	0.0891	0.0152	34.3226	<.0001
CMScontract_H5529 (Y/N)	1	0.1941	0.0304	40.8806	<.0001
CMScontract_H8552 (Y/N)	1	-0.1729	0.0215	64.9744	<.0001
Charlson_Capped12	1	-0.0686	0.00288	567.8396	<.0001
DUAL_ELIGIBLE (Y/N)	1	-0.06	0.0182	10.9184	0.001
ESRD (Y/N)	1	-0.5008	0.0877	32.6242	<.0001

AGE	1.014	1.012	1.015
EGR	1.267	1.21	1.325
CMScontract_H3342 (Y/N)	1.146	1.101	1.192
CMScontract_H3655 (Y/N)	1.093	1.061	1.126
CMScontract_H5529 (Y/N)	1.214	1.144	1.289

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CMScontract_H8552 (Y/N)	0.841	0.807	0.877
Charlson_Capped12	0.934	0.928	0.939
DUAL_ELIGIBLE (Y/N)	0.942	0.909	0.976
ESRD (Y/N)	0.606	0.51	0.72

Association of Predicted Probabilities and Observed Responses

Percent Concordant	54.7	Somers' D	0.113
Percent Discordant	43.4	Gamma	0.116
Percent Tied	1.9	Tau-a	0.036
Pairs	6384304854	c	0.557

We note that this model has worse overall performance than the prior model where Dual did not enter.

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Covariate reference (in alphabetical order):

Covariate	Definition	Model indicated
Age	Continuous integer value of age	BCS, COL, ART, Diab - LDL screen, Diab_eye, Diab_Kidney, Diab_A1c, Diab Trmt, Adh Hyp
Age_64	Age<=64 then Age_64=1, else Age>=65 then Age_64=0	BCS, COL, ART, Diab_eye, Diab Trmt, Adh Hyp
Age_Age64_INTX	Interaction between Age and Age_64	BCS, COL, ART, Diab_eye, Diab Trmt, Adh Hyp
Age_Floored65	Continuous integer value of age, floored at 65	HRM
Charlson Comorbidity Index	Charlson comorbidity index calculated using a member's past 12 months of claims (Jan - Dec 2013)	
Charlson_Index	Charlson comorbidity index raw score	
Charlson_Zero	Indicator variable, if Charlson_index=0 then Charlson_zero=1, else Charlson_zero=0	Diab - LDL screen, Diab_eye, Diab_Kidney, Diab_A1C, ART, Diab Trmt, HRM
Charlson_capped 5	Charlson comorbidity index calculated capped at a value of 5	Diab_eye
Charlson_capped 12	Charlson comorbidity index calculated capped at a value of 12	COL, Diab_Kidney
Disable	From MMR 1 if 'Y' = aged/disabled factor applicable to beneficiary, 0 otherwise	Diab_A1C, HRM
Duals	The following definition was used to identify "Duals" using the MMR file: Medicaid Indicator (Field 21)='Y' or Current Medicaid Status (Field 40) = '1'	BCS, COL, Diab - LDL screen, Diab_eye, Diab_Kidney, Diab_A1c, HRM
DxCG	Verisk's DxCG prospective risk score (model 26) predicting a members relative total cost risk (medical claims and pharmacy) based on prior year's results. Covariates using DxCG are specified in a variety of ways depending on the measure and underlying relationship.	
DxCG_BELOW5	If DxCG score<=5 then DxCG_BELOW5=1, else DxCG_BELOW5=0	BCS, COL, Diab_LDL, Diab_eye, Diab_Kidney, Diab_A1C, Adh Hyp
DxCG_COST	DxCG score untransformed	BCS, COL, Diab_LDL, Diab_eye, Diab_Kidney, Diab_A1C, Diab Trmt, Adh Hyp
DxCG_BELOW5_INTX	Interaction between DxCG_BELOW5 and DxCG_COST	BCS, COL, Diab_LDL, Diab_eye, Diab_Kidney, Diab_A1C, Adh Hyp
DxCG_FORTILE	Re-creates a continuous variable by creating 40 equally sized groups rank	HRM

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	ordered using the DxCG score and creating a score from 0 to 39 where 0 is the group with the lowest scores and 39 is the group with the highest scores	
EGR	If member is part of an employee retiree group then EGR=1, else EGR=0	BCS, COL, Diab_eye, Diab_A1C, ART, HRM, Adh Hyp
ESRD	If member has ESRD (defined from MMR file) then ESRD=1, otherwise ESRD=0	Diab_eye, Diab_Kidney, Diab Trmt
Female	If member is female, then Female=1, otherwise Female=0	COL, Diab - LDL screen, Diab_eye, Diab_A1C, Diab Trmt, HRM
Institute	Data from MMR file, Part C Long-Term Institutional='Y' then Institute=1, otherwise Institute=0	BCS, COL, Diab - LDL screen, Diab_Kidney, Diab Trmt, Adh Hyp
Rural	Based on ZIP Code RUCA approximation. If member's zip code indicates per RUCA they are in a rural area, Rural=1, otherwise Rural=0	BCS, COL, Diab_eye, HRM
Suburban	Based on ZIP Code RUCA approximation. If member's zip code indicates per RUCA they are in a suburban area, Suburban=1, otherwise Suburban=0	BCS, COL, Diab_eye

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Appendix B: Research Pertaining to the Impact of Low Socioeconomic Status on Star Ratings Performance

	Title of Article*	Author/ Journal	Key Take-Away	Date Published	Page Number
How Low-SES Impacts Star Performance					
1	The Impact of Dual Eligible Populations on CMS Five-Star Quality Measures and Member Outcomes in Medicare Advantage Health Plans	Inovalon, Inc.	The current Five-Star rating system may penalize MA plans that provide care for a greater proportion of dual beneficiaries. A significant association exists between dual eligible status and lower performance on Part C and D Star ratings. Dual beneficiaries are consistently more complex to manage than non-dual populations, and even after adjusting for socioeconomic characteristics, demographics, and illness severity, plans serving dual beneficiaries underperform on the majority of quality measures.	10/30/2013	Pg 10, Average 2013 Star Ratings Pg 15, Dual Analysis on Health Outcomes
2	An Investigation of Medicare Advantage Dual Eligible Member Level Performance on CMS Five-Star Quality Measures	Inovalon, Inc.	This study examined member-level data from 81 Medicare Advantage contracts to determine the impact of dual-eligible status on 18 Five-Star quality measures, and found that dual-eligibles' clinical, demographic, and socioeconomic characteristics led to worse performance on quality measures. Dual-eligibles performed significantly worse than non-duals on all three medication adherence measures, including antidepressant medication management. Moreover, dual-eligibles that were disabled, living with alcohol/drug/substance abuse issues, or residing in a designated primary care or mental health shortage area, performed worse than other duals and non-duals alike.	10/28/2014	
3	Are MA Star Ratings Biased Against Plans Serving Disadvantaged Populations?	Bishop, S. Amerigroup Corp.	CMS's Five-Star quality rating system may be biased against plans that predominantly serve disadvantaged populations, e.g. SNPs. A review of more than 30 peer-reviewed sources found a strong association between SNP beneficiary characteristics and lower healthcare quality scores. The geographic distribution of high-rated plans is heavily concentrated, and MA contracts with a large number of D-SNP enrollees consistently have lower quality scores compared to those with no D-SNP members. Furthermore, CMS's rating system assumes that plans and providers are solely responsible for clinical and outcomes measures, even though evidence shows that individual and community factors play a significant role in health outcomes.	10/2012	Pg 12, Geographic Concentration Pg 15, Characteristics of SNP populations Pg 20, Income and SES
4	Medicare's Quality Incentive System Does Not Adequately Account for Special Needs of Dual-Eligible Populations	Association for Community Affiliated Plans (ACAP)	Plans dedicated to serving dual eligibles (D-SNPs) are significantly disadvantaged under Medicare's Quality Bonus Payment System. A 2010 analysis by Ingenix Consulting showed that D-SNPs and non-D-SNPs perform on comparable levels on measures of efficiency, member complaints, and timeliness of appeals. Yet, D-SNP quality scores are consistently lower on clinical quality measures. On average, D-SNP contracts most commonly receive 2.5 stars, whereas contracts with no D-SNP members often receive an average 3.5 stars. D-SNP enrollment was a strong predictor of low performance on quality measure, indicating that individual health status is a leading factor influencing Star ratings.	05/2012	Pg 3, Dual Eligibles: Financial and Health Resources Pg 5, Ratings of D-SNPs Reflect Member Characteristics
5	Building a Framework	Bishop, S.	Medicare payment policies and quality ratings do not account for the social	11/05/2013	Pg 21, MA

*Articles ordered by relevance

Appendix B: Research Pertaining to the Impact of Low Socioeconomic Status on Star Ratings Performance

	Title of Article*	Author/ Journal	Key Take-Away	Date Published	Page Number
	For Paying for Social Determinants of Health In Medicare		determinants of health, and current payment readjustments are narrowly tailored to medical diagnoses. A strong body of research shows that low levels of income, education, and job status play a significant role in how individuals use the healthcare system. The higher a person's income, the better their overall health. Despite the fact that social characteristics greatly affect quality of care and cost, the majority of MA payment adjustments are limited to medical characteristics rather than being inclusive of broader social factors. Only 12 of the 55 MA quality measures are adjusted for individual-level characteristics.		Quality Bonus Program Pg 22, Can Medicare Payment Account for Social Determinants?
6	Socioeconomic Characteristics Of Enrollees Appear To Influence Performance Scores For Medicare Part D Contractors	Young, G. <i>Health Affairs</i>	2012 data from CMS and the U.S. Census Bureau revealed that Medicare performance scores are influenced by the socioeconomic characteristics of the enrollee population. Contracts with a high proportion of enrollees who were minorities, who qualified for low-income subsidies, or who did not have a high school diploma, were more likely to receive lower medication adherence scores. Socioeconomic variables accounted for one-third of the variation in contract scores, demonstrating that the composition of the enrollee population has a significant influence on performance ratings.	01/2014	Pg 5, Characteristics Of Medicare Part D Contractors Studied
7	Medicare Advantage Special Needs Plans	MedPAC	Overall, D-SNPs have average to below-average performance on quality measures when compared to other SNPs and regular MA plans. Though some D-SNPs that are highly integrated with Medicaid perform well on the Star ratings, the majority of D-SNPs perform 5 to 12 percent lower than other SNPs and regular MA plans on nearly all quality measures. This is mainly attributed to coordinated care barriers and the characteristics of D-SNP enrollees, who have a higher rate of use of potentially harmful drugs and a higher prevalence of chronic conditions.	03/2013	Pg 314, Findings on D-SNPs Pg 325, Implication 14-2 D-SNPs
8	Assessing the Quality of California Dual Eligible Demonstration Health Plans	National Senior Citizens Law Center	The California Department of Healthcare Services (DHCS) conducted an analysis in 2012 that assessed the quality ratings for eight health plans operating both D-SNPs and Medi-Cal managed care plans. The analysis found that seven of the eight plans received an overall rating of 1 out of 5 stars, confirming fears that health plans are limited in their ability to effectively address the complex needs of dual populations.	2012	Pg 3, Medi-Cal and Medicare Plan Performance Overview
9	Key Attributes of High-Performing Integrated Health Plans for Medicare-Medicaid Enrollees	Feldman, P. Center for Healthcare Strategies, Inc. (CHCS)	Research shows that dual eligible individuals are more likely to have multiple chronic conditions and disabilities compared to those covered by Medicare alone. Because federal and state standards on quality measures are not aligned, health plans frequently struggle to provide high-quality, low-cost care to dual populations. Plans that have achieved high performance scores attribute their success to strong leadership, financial and nonfinancial incentives, and accessible networks. Plans that develop the capacity to serve multiple populations and better manage shared information systems are more likely to score higher.	08/2014	Pg 8, Best Practices in Quality
10	The SNP Alliance	The SNP	The current payment system penalizes SNPs for targeting frail beneficiaries with	02/2009	Pg 15, Eliminate

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	Strategy for Healthcare Reform: Don't Forget the Frail, Sick and Disabled	Alliance Strategy for Change	multiple chronic conditions. Payment is based upon a disease hierarchy of 70 conditions, which do not account for individual-level factors or for the majority of disease interactions. Almost all SNPs serve members who have multiple chronic conditions, and yet the payment structure does not recognize all conditions or adjust for illness severity and stage of illness. While most MA plans are overpaid relative to fee-for-service arrangements, SNPs that provide for a high percentage of patients with high-risk scores are underpaid 13 percent on average.		Payment Penalties for Specialization Pg 24, Report Analyses
11	Will Pay-For-Performance And Quality Reporting Affect Healthcare Disparities?	Casalino, L. <i>Health Affairs</i>	Evidence shows that providers are less likely to care for patients whom they perceive as being likely to lower their quality scores. Avoidance behaviors are even more common when quality measures are not adequately adjusted for health status and socioeconomic characteristics. Many studies have indicated that patient characteristics, including health status, SES, and primary language, are likely to affect quality scores. For instance, patients with lower SES are less likely to obtain a Pap smear, mammogram, and diabetic eye exam, and yet this is often not accounted for in performance ratings.	04/10/2007	Pg 408, Avoiding patients perceived as likely to lower quality scores
12	Risk Adjustment for Socioeconomic Status or Other Sociodemographic Factors	National Quality Forum (NQF)	NQF created an Expert Panel to examine if sociodemographic factors should be included in risk adjustment for performance measurements. Though NQF's current criteria do not adjust performance measures for sociodemographic factors, the majority of the panel concluded that not adjusting for sociodemographic factors could lead to greater disparities in care. Evidence clearly shows an association between sociodemographic variables (e.g., income, education, race/ethnicity, homelessness) and health outcomes. Overall, sociodemographic "disadvantage" (e.g., low income, low education, homelessness) is correlated with poor patient outcomes (e.g., higher morbidity, mortality, or readmissions). Furthermore, caring for sociodemographically "disadvantaged" populations is linked with poorer performance.	03/18/2014	Pg 11, Perspectives on Adjusting for SES Factors Pg 13, Unintended Consequences
Low-SES Characteristics: Education, Health					
13	Why Place Matters: Building a Movement for Healthy Communities	Bell, J. <i>The California Endowment</i>	Evidence shows that people with low-SES have worse overall health outcomes compared to people with higher-SES. Individuals with low-wage positions are more likely to experience depression and suffer from heart disease, arthritis, chronic pain, and tension headaches. People who do not have a high school diploma, college education, or graduate degree also tend to be sicker than their better-educated peers. The overall SES of neighborhoods even influences health behaviors, such as smoking, physical activity, and access to health resources.	2007	Pg 18, Socioeconomic Status (SES) and Health
14	Reaching for a Healthier Life: Facts on Socioeconomic Status and Health in the	Adler, N. <i>MacArthur Foundation</i>	The lower an individual's SES—the greater the prevalence of disease and lower educational attainment. In the U.S., the risk of dying before 65 years old is three times higher for those with low-SES compared to those with high-SES, and more	2007	Pg 8, The Relationship Between Health

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	United States		than a quarter of excess deaths is concentrated among the lowest wage-earners. Children whose families are of low-SES tend to experience a lower quality education, and are more susceptible to chronic conditions, ear infections, asthma, and physical inactivity compared to more affluent peers.		and Ladder Position
15	Socioeconomic Disparities In Health: Pathways And Policies	Adler, N. <i>Health Affairs</i>	SES has long been linked to health problems such as cardiovascular disease, hypertension, arthritis, low birth weight, diabetes, and cancer. Low-SES is associated with high mortality and significant health burdens, and researchers have estimated that low-SES may be responsible for 80 percent of premature mortality, largely due to behavior, lifestyle, environmental exposure, and healthcare. In the past, children in low-SES families have experienced a six-fold increase in blood lead levels, are more likely to have reading deficits, and severe asthma. Individuals with low education are more likely to smoke, be uninsured, sedentary, and have worse overall nutrition.	2002	Pg 66, SES and Environmental Exposures Pg 68, SES and Healthcare Pg 68, SES and Behavior
16	Socioeconomic Disparities in Health Behaviors	Pampel, F NIH	Low-SES is strongly associated with health harming behaviors such as tobacco use, poor diet, and lack of exercise. An analysis of socioeconomic factors found that education is by far the largest predictor of health and that individuals with low income experience more severe daily stressors, which negatively influence health. Knowledge of health harming behaviors and social capital are also less prevalent in low-SES neighborhoods.	08/2010	Pg 8, Lack of Knowledge and Access to Information about Health Risks
17	Work Stress & Health & Socioeconomic Status	American Psych. Association (APA)	Low-SES correlates significantly with lower education, poor health, and poverty. Inequalities in wealth and resources are growing in the U.S. and have a direct impact on individual health. People of low-SES have been shown to have higher blood pressure, greater psychological stressors, double the rates of smoking, and less access to employment-based sick days and health insurance.	2006	Fact Sheet
18	Why Place and Race Matters	Bell, J. The California Endowment	People with low-SES characteristics—income, education, occupation, social rank—are more likely to become sick, get diagnosed and treated later, and die sooner than individuals with higher-SES. People of color generally have worse health outcomes and race and ethnicity play a significant role in determining overall health.	2011	Pg 30, The Color Lines of Socioeconomic Status
19	Integrating Care for Dual Eligibles in New York: Issues and Options	NYS Health Foundation	Dual-eligible beneficiaries have a significantly greater prevalence of serious mental illness (SMI) and cognitive impairment compared to non-dual beneficiaries. On average, 40 percent of dual-eligibles have behavioral health and cognitive problems, and SMI has been shown to negatively impact quality of life, increase risk of hospitalization, and decrease life expectancy. Individuals with mental illness are less likely to seek preventive care and follow clinical guidelines.	02/2012	Pg 8, Dual Eligible Characteristics, Care Needs, and Costs
Low-SES and Hospital Readmissions					
20	Characteristics of Hospitals Receiving Penalties Under	Joynt, K. <i>JAMA</i>	A strong body of evidence shows that hospital readmissions are related to severity of illness and SES. Because the Hospital Readmissions Reduction Program	01/2013	Pg 1, Comment

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	the Hospital Readmissions Reduction Program		(HRRP) aims to cut Medicare reimbursement to hospitals with higher-than-predicted readmission rates, researchers at Harvard’s School of Public Health sought to determine the risk of penalties for hospitals that treat medically complex, socioeconomically vulnerable populations (large, teaching hospitals, safety-net hospitals (SNHs)). Researchers found that large, teaching hospitals and SNHs are in fact significantly more likely to receive payment cuts under HRRP. Findings confirm that case mix and patient SES influence the differences between hospitals, and that facilities treating vulnerable populations are most likely to be penalized.		
21	Higher Readmissions at Safety-Net Hospitals and Potential Policy Solutions	Berenson, J. The Commonwealth Fund	Based on publically reported data, safety-net hospitals are 30 percent more likely to have 30-day hospital readmission rates above the national average, compared to non-safety-net hospitals. Safety-net hospitals will therefore be disproportionately impacted by the HRRP. Hospitals that serve a greater proportion of low-income patients are most likely to have the lowest adjustment factor, and 12 percent of safety-net hospitals are estimated to receive the maximum penalty compared to 6 percent of hospitals serving the lowest number of low-income patients.	12/2012	Pg 4, Findings
22	Refining the Hospital Readmissions Reduction Program	MedPAC	Hospitals with high shares of low-income patients tend to have higher readmissions rates, which penalize facilities under the HRRP. Research shows that patients with low-SES have higher costs of care, and yet CMS does not adjust for this influence in its readmissions model. To determine the effect of SES on readmission rates, researchers assessed a range of factors that could impact hospital readmissions, including race, incomes, DSH percentage, etc. In the end, researchers found that a hospital’s share of low-income patients was the strongest predictor of readmissions and that the HRRP works contrary to its intent.	06/2013	Pg 106, Correlation between socioeconomic status and readmission rates
23	Socioeconomic Status And Readmissions: Evidence From An Urban Teaching Hospital	Hu, J. <i>Health Affairs</i>	Individual characteristics and neighborhood SES influence the likelihood of readmissions. Research shows that individuals living in a high-poverty neighborhood are 24 percent more likely to be readmitted compared to patients who live in areas of low-poverty. Readmissions are largely driven by individual circumstances after discharge. Patients living in neighborhoods with high poverty, low education, and low household incomes were at greater risk of being readmitted. Other studies also show that low education and income are associated with increased risk of readmissions.	05/2014	Pg 781, Combined Socioeconomic Variable Effects
24	Post-discharge Environmental and Socioeconomic Factors and the Likelihood of Early Hospital Readmission Among	Arbaje, A. <i>The Gerontologist</i>	Limited education is associated with higher sixty-day readmission rates among Medicare beneficiaries. After adjusting for health status and demographics, a pool of over 1,350 Medicare beneficiaries were found to have increased odds of early readmissions if they lived alone, had unmet medical needs, or had limited education. Other studies support the finding that lack of education and low-SES are associated with early readmissions.	2008	Pg 496, Previous Studies on Post-discharge Environmental and Socioeconomic

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	Community-Dwelling Medicare Beneficiaries				Factors
25	Encouraging Integrated Care for Dual Eligibles	The Commonwealth Fund	Dual-eligible beneficiaries stand to benefit from care coordination; and when properly managed, collaboration between plans and providers can ultimately lead to high quality care and improved health status which result in reduced health care costs, including those that are driven by hospital readmissions. Integrating care helps to lessen duplicative and/or missed services, align payment mechanisms, and ensure that the right care is received in the best setting. Integrated care also provides greater flexibility for the types of services that beneficiaries have access to, while simultaneously reducing confusion and simplifying interactions with the health care system.	07/2009	Pg 4, Integrated Care Overview

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