Is There a Relationship Between Part D Medication Adherence and Part C Intermediate Outcomes Star Ratings Measures?

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ABSTRACT

BACKGROUND: Improvements in the Centers for Medicare & Medicaid Services (CMS) star ratings Part D medication adherence measures may affect performance in Part C intermediate outcome measures for which the Part D targeted medication classes are prescribed.

OBJECTIVE: To determine if Part D medication adherence measures are associated with corresponding Part C intermediate outcome measures.

METHODS: This was a cross-sectional analysis using the CMS 2015 star ratings report (based on 2013 benefit year plan data) for Medicare contracts. The measures of interest included the Part D adherence measures for diabetes medications, antihypertensive agents, and statins and the Part C intermediate outcome measures for controlled blood sugar, blood pressure, and cholesterol. All Medicare Advantage Prescription Drug (MAPD) contracts with complete data for all Part C and D measures of interest were included. Contracts with $\geq 25\%$ of total enrollment with MA-only benefit were excluded. Linear and logistic regression models were used to assess the association between 2015 Part D adherence measures and Part C intermediate outcome measures ($n=366$). The regression models were adjusted for low-income subsidy (LIS) beneficiary enrollment and log-transformed (natural logarithm) total contract enrollment.

RESULTS: Bivariate linear regression models demonstrated moderate positive associations between each of the 2015 Part D adherence scores and related 2015 Part C measures that explained 27%-29% (R^2) of variance. Including LIS and total contract enrollment in the regression models increased the R^2 to 30%-36%. The multivariate logistic regression models showed that each percentage point of improvement in the 2015 Part D adherence measures was associated with a 4.13 to 4.69 greater odds of performing in the top quartile in corresponding 2015 Part C measures.

CONCLUSIONS: Moderate positive associations were observed between the Part D and Part C scores in the same benefit year. MAPD plans may observe improved Part C intermediate outcome measures with strategies that improve Part D medication adherence measures.

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What is already known about this subject

- Centers for Medicare & Medicaid Services (CMS) have placed an emphasis on several Part C and D measures related to medication therapy by weighting these measures 3 times as much as CMS's process measures.
- Randomized and observational studies to date have demonstrated the impact of interventions targeting medication adherence to diabetic medications, antihypertensive agents, and statins on improving blood sugar, blood pressure, and low-density lipoprotein cholesterol control.
- A recent analysis has demonstrated the association between health plan measures of adherence and outcomes.

What this study adds

- The results of this study indicate that high ratings in Part D adherence measures are associated with high ratings in related Part C measures.
- Health plans may be able to improve multiple star ratings measures and overall plan performance with strategies aimed at improving medication adherence rates.

In 2007, the Centers for Medicare & Medicaid Services (CMS) developed the star ratings system to measure health plan performance related to outcomes, patient experience and satisfaction with care, and patient access to health care services.^{1,2} The star ratings system is one of several industry programs aimed at defining quality health care, assessing plan performance in various quality measures, and rewarding positive outcomes. CMS star ratings measures are derived from measures developed and endorsed by various health care quality organizations, including the Pharmacy Quality Alliance (PQA) and the National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS).² CMS assigns numeric scores on individual performance measures (i.e., base-level measures) and assigns 1 to 5 stars to individual measures and groups of related measures to summarize overall performance, with 5 stars indicating excellent performance, 3 stars indicating average performance, and 1 star indicating poor performance.²

Plan performance on CMS star ratings measures is of considerable interest to Medicare plan sponsors for several reasons.

TABLE 1 2015 CMS Star Ratings Measures (2013 Benefit Year) Included in Analysis

Measure Label	Measure Description	Data Source	Weighting Value
Medication Adherence for Diabetes Medications	Percentage of beneficiaries aged 18 years or older with at least 2 prescription fills and a PDC $\geq$ 80% for any 1 of the diabetes medication classes ^a	PDE data, Medicare EDB file, CWF	3
Medication Adherence for Hypertension (RAS Antagonists)	Percentage of beneficiaries aged 18 years or older with at least 2 prescription fills and a PDC $\geq$ 80% for RAS antagonist medications ^b	PDE data, Medicare EDB file, CWF	3
Medication Adherence for Cholesterol (Statins)	Percentage of beneficiaries aged 18 years or older with at least 2 prescription fills and a PDC $\geq$ 80% for statin medications	PDE data, Medicare EDB file, CWF	3
Diabetes Care—Blood Sugar Controlled	Percentage of plan members aged 18-75 years with diabetes who had an A1c lab test that showed controlled blood sugar (A1c $\leq$ 9%)	HEDIS	3
Diabetes Care—Cholesterol Controlled	Percentage of plan members aged 18-75 years with diabetes whose most recent cholesterol test showed LDL-C $<$ 100 mg/dL	HEDIS	3
Controlling Blood Pressure	Percentage of plan members aged 18-85 years with hypertension whose blood pressure was adequately controlled ($<$ 140/90)	HEDIS	3

^aDiabetes medication classes include biguanides, sulfonylureas, thiazolidinediones, dipeptidyl peptidase-IV inhibitors, incretin mimetics, and meglitinides. Beneficiaries with 1 or more fills for insulin were excluded.

^bRAS antagonists include angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and direct renin inhibitor medications.

A1c = hemoglobin A1c; CMS = Centers for Medicare & Medicaid Services; CWF = Common Working File; EDB = Medicare Enrollment Database; HEDIS = Healthcare Effectiveness Data and Information Set; LDL-C = low-density lipoprotein cholesterol; PDC = proportion of days covered; PDE = prescription drug event; RAS = renin-angiotensin system.

First, the Affordable Care Act of 2010 entitles high-performing plans to quality bonus payments (QBPs);^{3,4} beginning with the 2015 star ratings, only plans with 4 or more stars were eligible for QBPs.⁴ Additionally, star ratings affect Medicare beneficiaries' choices in enrolling in insurance plans. Reid et al. (2013) found an increased likelihood for new Medicare beneficiaries to select plans with higher star ratings and continuing enrollees to switch to plans with higher star ratings.⁵ Medicare enrollment in higher-rated plans is increasing; in 2015, 61% of Medicare beneficiaries were enrolled in plans with 4 or more stars, a 25% increase from 2013.⁶ Revenue from QBPs, which are required by Medicare to be used only for providing additional benefits to members,^{1,3} may provide the means for plans to implement additional quality programs and further improve star ratings, which will likely attract more Medicare beneficiaries. Furthermore, contracts with consistently poor plan performance (i.e., rated below 3 stars for 3 consecutive years) receive the low-performing icon on the Medicare Plan Finder website and are subject to termination by CMS in 2016.⁷ Therefore, improvement of star ratings has a potentially significant material effect on plan revenue and market share in the Medicare insurance marketplace.

In 2012, CMS began weighting specific Part C and D measures related to outcomes, intermediate outcomes, and patient access, indicating CMS's greater emphasis on certain quality indicators.¹ Specifically, CMS's outcome and intermediate outcome measures are highly weighted measures that are weighted 3 times as much as CMS's process measures.^{1,2} For the 2015 star ratings, CMS's triple-weighted measures included Part D medication adherence measures for diabetes medications, renin-angiotensin system (RAS) antagonists, and statins

and Part C measures related to intermediate outcomes commonly associated with these classes of medications: Diabetes Care—Blood Sugar Controlled, Diabetes Care—Cholesterol Controlled, and Controlling Blood Pressure.² The greater contribution of these triple-weighted measures to a plan's Part C and Part D summary ratings and overall star rating creates additional incentives for plans to place emphasis on quality programs aimed at improving medication adherence.

Despite research supporting the association between medication adherence and improved clinical outcomes, there are limited data on the association between plan-level medication adherence and outcomes quality measures. Stakeholder discussions on CMS star ratings measures have suggested the importance of medication adherence in influencing Part C intermediate outcome measures and overall star ratings.¹ Because of the anticipated effect of medication adherence on achieving positive outcomes from prescribed drug therapy, health plan strategies to target Part D medication adherence measures may potentially affect performance across multiple related Part C intermediate outcomes measures. The purpose of this analysis was to determine if a relationship exists between triple-weighted Part D medication adherence measures and corresponding Part C measures.

Methods

Study Design and Data Source

This was a cross-sectional analysis using the CMS 2015 star ratings report that reflected contract performance data for the 2013 benefit year.

CMS publishes Medicare plan performance data each October before the annual open enrollment period on the CMS

FIGURE 1 2015 Star Ratings Report Medicare Contracts Included in Analysis

^aContracts were excluded if the following were indicated for any of the Part C and D measures of interest: "No data available," "Not enough data available," "Plan too new to be measured," "Plan too small to be measured," or "CMS identified issues with this plan's data."

CMS = Centers for Medicare & Medicaid Services; MA = Medicare Advantage.

website.⁸ The star ratings report is named for the upcoming benefit year and reflects plan data from the previous benefit year. For example, the 2015 star ratings report was released in late 2014 and reflects plan performance data for the 2013 benefit year. Performance data are reported at the contract level, and each contract receives a numeric score and a star rating (1 to 5 stars) for individual Part C and D star ratings measures. A star rating also is assigned to contracts for groups of related measures (i.e., domains) and for overall performance (i.e., overall star rating). For the 2015 star ratings report, there were 46 measures (33 Part C measures and 13 Part D measures) in 9 domains.² Medicare Advantage (MA) contracts and Prescription Drug Plans (PDPs) are rated based on performance in Part C or Part D measures, respectively, while Medicare Advantage Prescription Drug (MAPD) contracts are rated on all Part C and D measures.

The 2015 star ratings measures of interest for this analysis included the Part D medication adherence measures for diabetes medications, RAS antagonists, and statins and Part C Diabetes Care–Blood Sugar Controlled, Controlling Blood Pressure, and Diabetes Care–Cholesterol Controlled measures (Table 1). Each of the Part D medication adherence measures for the 2015 star ratings report is reported as the percentage of members with fills in the medication class who achieve 80% proportion of days covered (PDC), or in other words, the percentage of members who fill their prescriptions to cover 80% or more of the total days of directed medication use.² PDC is an adherence metric that has been developed by PQA and endorsed by the National Quality Forum.² The measure also is being used as a quality measure under the URAC PBM Accreditation and the Quality Rating System for Qualified

Health Plans.^{9,10} The Part C intermediate outcome measures for the 2015 star ratings report were adopted by CMS from the NCQA HEDIS 2014 Technical Specifications Manual as follows: Diabetes Care–Blood Sugar Controlled (percentage of plan members with diabetes whose most recent hemoglobin A1c [A1c] lab test results showed controlled blood sugar [$A1c \leq 9\%$]); Diabetes Care–Cholesterol Controlled (percentage of plan members with diabetes whose most recent low-density lipoprotein cholesterol [LDL-C] level during the measurement year was less than 100 mg/dL); Controlling Blood Pressure (percentage of plan members with a diagnosis of hypertension who achieved adequately controlled blood pressure [$<140/90$] during the measurement year).² Of the Part C and D measures of interest, the Part C Diabetes Care–Blood Sugar Controlled, Part C Diabetes Care–Cholesterol Controlled, and Part D Medication Adherence for Diabetes Medications measures include only beneficiaries with diabetes, while all other measures include beneficiaries regardless of diabetes diagnosis.

Inclusion Criteria

All MAPD contracts contained in the 2015 CMS star ratings report that had base-level numeric data for all the Part C and Part D measures of interest were included in this analysis. Contracts with "No data available," "Not enough data available," "Plan too new to be measured," "Plan too small to be measured," or "CMS identified issues with this plan's data" for any of the Part C and D measures of interest were excluded from this analysis. Additionally, since MA plans are not required to report performance in Part D measures, contracts with 25% or more of total contract enrollment with MA-only benefits were specified a priori to be excluded from the analysis (Figure 1).

Statistical Analysis

Bivariate linear regressions were performed using each 2015 star ratings Part D measure base-level score as the independent variable and each corresponding Part C base score as the dependent variable to assess the association between Part D and related Part C measures in the 2015 star ratings report (2013 benefit year). The 2015 star ratings measures of interest were collected by CMS in the same measurement period from January 1, 2013, to December 31, 2013.² Multivariate linear and logistic regressions using each Part D measure as the independent variable were used to model the probability of performing in the top quartile of the Part C measure. Independent variables included total contract size and low-income subsidy (LIS) beneficiary enrollment. Total contract size was transformed using the natural logarithm, which normalized the distribution of contract size. The regression models were performed using SAS version 9.4 (SAS Institute, Cary, NC), and a 2-sided *P* value of <0.05 was considered statistically significant.

TABLE 2 Characteristics of 2015 Star Ratings Medicare Advantage Prescription Drug Contracts Included in Analysis (N=366)

	n (%)	
Contract type		
Local CCP	348	(95.1)
Regional CCP	10	(2.7)
PFFS	5	(1.4)
1876 cost	3	(0.8)
Contract enrollment		
Large (≥ 50,000 enrollees)	64	(17.5)
Medium (≥10,000 and < 50,000 enrollees)	154	(42.1)
Small (<10,000 enrollees)	148	(40.4)
LIS beneficiary enrollment		
< 40%	264	(72.1)
≥ 40%	102	(27.9)

CCP=coordinated care plan; LIS=low-income subsidy; PFFS=private fee for service.

Results

A total of 366 Medicare contracts were included in the analysis, representing 53% of the 691 total Medicare contracts meeting criteria. Most contracts were local coordinated care plans (95.1%), mid-sized (≥10,000 and <50,000 enrollees, 42.1%), and had less than 40% of total enrollment with LIS beneficiaries (72.1%; Table 2). Mean (standard deviation [SD]) Part D medication adherence base scores for diabetes medications, RAS antagonists, and statins among the 366 contracts included in this analysis were 76% (5%), 78% (5%), and 73% (7%), respectively (Table 3). Mean (SD) base scores for the Part C Diabetes Care–Blood Sugar Controlled, Controlling Blood Pressure, and Diabetes Care–Cholesterol Controlled measures among these contracts were 76% (11%), 65% (11%), and 54% (9%), respectively (Table 3).

The bivariate linear regression models demonstrated moderate positive associations that accounted for 27%-29% of variance between each Part D medication adherence and related Part C measure (Table 4): Diabetes Care–Blood Sugar Controlled ($R^2=0.29$, $P<0.001$); Controlling Blood Pressure ($R^2=0.29$,

$P<0.001$); and Diabetes Care–Cholesterol Controlled ($R^2=0.27$, $P<0.001$). The multivariate regression models adjusted for LIS enrollment and total contract enrollment showed improved associations that accounted for 30%-36% of variance between the corresponding measures (Table 5): Diabetes Care–Blood Sugar Controlled ($R^2=0.36$, $P<0.001$); Controlling Blood Pressure ($R^2=0.30$, $P<0.001$); and Diabetes Care–Cholesterol Controlled ($R^2=0.35$, $P<0.001$).

The logistic regression models adjusted for LIS beneficiary enrollment and the natural logarithm of total contract enrollment showed that for each unit increase of medication adherence, the odds of performing in the top quartile of the corresponding Part C intermediate outcome measure increased by a factor of 4.63 (95% confidence interval [CI]=2.72-7.89), 4.13 (95% CI=2.44-6.98), and 4.69 (95% CI=2.79-7.91) for the Controlling Blood Pressure, Diabetes Care–Cholesterol Controlled, and Diabetes Care–Blood Sugar Controlled measures, respectively (Figure 2). High LIS beneficiary enrollment (≥40%) was associated with decreased odds of performing in the top quartile of the Part C Diabetes Care–Cholesterol Controlled (odds ratio [OR]=0.26, 95% CI=0.12-0.53) and Diabetes Care–Blood Sugar Controlled (OR=0.23, 95% CI=0.11-0.48) measures. Compared with smaller contracts (<10,000 enrollees), larger contracts (≥50,000 enrollees) had increased odds of achieving high base scores for the Part C Controlling Blood Pressure (OR=2.30, 95% CI=1.12-4.70) and Diabetes Care–Blood Sugar Controlled (OR=2.08, 95% CI=1.03-4.23) measures. Mid-size contracts (≥10,000 and <50,000 enrollees), compared with small contracts, did not have significantly greater odds of achieving a high Part C intermediate outcome measure score, except for the Part C Diabetes Care–Blood Sugar Controlled measure (OR=1.90, 95% CI=1.07-3.36).

Discussion

To our knowledge, this is the first study to examine the relationship between Part D medication adherence and Part C intermediate outcome star ratings measures. This analysis showed moderate positive associations between the 3 Part D

TABLE 3 Summary of 2015 CMS Star Ratings Part D Medication Adherence Measures and Corresponding Part C Intermediate Outcome Measures for MAPD Contracts that Report Complete Data for All Measures of Interest (N=366)

Measure Label	Data Time Frame	Base Data Range	Base Mean (SD)
Medication Adherence for Diabetes Medications	January 1, 2013-December 31, 2013	56%-89%	76% (5%)
Medication Adherence for Hypertension (RAS Antagonists)	January 1, 2013-December 31, 2013	62%-90%	78% (5%)
Medication Adherence for Cholesterol (Statins)	January 1, 2013-December 31, 2013	40%-86%	73% (7%)
Diabetes Care–Blood Sugar Controlled	January 1, 2013-December 31, 2013	27%-93%	76% (11%)
Diabetes Care–Cholesterol Controlled	January 1, 2013-December 31, 2013	23%-84%	54% (9%)
Controlling Blood Pressure	January 1, 2013-December 31, 2013	14%-92%	65% (11%)

CMS=Centers for Medicare & Medicaid Services; MAPD=Medicare Advantage Prescription Drug plan; RAS=renin-angiotensin system; SD=standard deviation.

TABLE 4 Bivariate Linear Regression for MAPD Contracts Reporting Complete Data for All 2015 Star Ratings Report Part C and D Measures of Interest (N=366)

2015 Part D Measure (Independent Variable)	2015 Part C Measure (Dependent Variable)	Beta Coefficient	Standard Error	R ²	P Value
Medication Adherence for Diabetes Medications	Diabetes Care–Blood Sugar Controlled	1.056	0.086	0.29	<0.001
Medication Adherence for Hypertension (RAS Antagonists)	Controlling Blood Pressure	1.156	0.095	0.29	<0.001
Medication Adherence for Cholesterol (Statins)	Diabetes Care–Cholesterol Controlled	0.709	0.061	0.27	<0.001

MAPD=Medicare Advantage Prescription Drug plan; RAS=renin-angiotensin system; R²=coefficient of determination.

TABLE 5 Multiple Linear Regression Models Adjusted for LIS Beneficiary Enrollment and Natural Logarithm of Total Contract Enrollment for MAPD Contracts Reporting Complete Data for All 2015 Star Ratings Report Part C and D Measures of Interest (N=366)

2015 Part D Measure (Independent Variable)	2015 Part C Measure (Dependent Variable)	Beta Coefficient	Standard Error	R ²	P Value
Medication Adherence for Diabetes Medications	Diabetes Care–Blood Sugar Controlled	0.894	0.086	0.36	<0.001
Medication Adherence for Hypertension (RAS Antagonists)	Controlling Blood Pressure	1.151	0.109	0.30	<0.001
Medication Adherence for Cholesterol (Statins)	Diabetes Care–Cholesterol Controlled	0.640	0.059	0.35	<0.001

LIS=low-income subsidy; MAPD=Medicare Advantage Prescription Drug plan; RAS=renin-angiotensin system; R²=coefficient of determination.

medication adherence measures and the corresponding Part C intermediate outcome measures in the 2015 star ratings report (2013 benefit year). The positive associations found between the Part D and Part C measures are consistent with literature findings that have demonstrated improved LDL-C, blood pressure, and blood sugar control with high levels of adherence (i.e., PDC≥80%) to each of the Part D medication classes.¹¹⁻¹⁴ While this analysis found positive associations between Part D adherence and Part C intermediate outcome measures in the same benefit year, this association does not indicate causality. Other factors, such as regular testing and access to better quality care, may contribute to improved performance in Part C intermediate outcome measures. The absence of strong associations between the Part D medication adherence and Part C intermediate outcome measures also may be accounted for in the differences in the specifications for the Part D and corresponding Part C measured populations.

The strongest association was observed between the Part D diabetes medication adherence and Part C Diabetes Care–Blood Sugar Controlled measures (R²=0.36, P<0.001). However, trends in blood sugar control reflected in the Part C measure are not fully explained, possibly because of the exclusion of individuals taking insulin in the Part D diabetes medication adherence measure. Excluding patients with diabetes taking insulin has been shown to eliminate a large number of beneficiaries in star ratings measures.¹⁵ In addition, insulin treatment is associated with improved glycemic control,¹⁶⁻¹⁸ and methods for measuring insulin adherence using the PDC calculation have recently been described.^{19,20} While measuring insulin adherence in patients concurrently receiving noninsulin therapies may introduce additional complexity to diabetes

medication adherence measurement in quality measures, unmeasured insulin adherence may confound the observed association between medication adherence for diabetic medications and blood sugar control measured in the Part D and C measures, respectively.

Similarly, the Part D Medication Adherence for Hypertension measure is limited to the measurement of adherence to angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and direct renin inhibitors, which likely excludes a large number of beneficiaries who receive other antihypertensive treatments. Published studies have noted an increasing use of thiazide-type diuretics (TZDs) and calcium channel blockers (CCBs).²¹⁻²³ Also, recently released guidelines by the Eighth Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 8) indicate TZDs and CCBs as first-line options for the treatment of hypertension.²⁴ In addition, combination regimens consisting of multiple antihypertensive drug classes are commonly required to achieve adequate blood pressure control. Gu et al. (2012) found that individuals in National Health and Nutrition Examination Surveys from 2001 to 2010 receiving multidrug antihypertensive regimens were 26%-55% more likely to achieve JNC 7 blood pressure goals compared with individuals receiving monotherapy.²¹ Therefore, the effect of unmeasured adherence to other antihypertensive agents may have a significant contribution to the Part C Controlling Blood Pressure measure performance.

The beneficiary population included in the Part C Diabetes Care–Cholesterol Controlled measure consists of patients with diabetes, while the Part D Medication Adherence for Cholesterol measure includes beneficiaries with 2 or more fills

FIGURE 2 Logistic Regression Models with Proportion of LIS Beneficiaries, Natural Logarithm of Enrollment Size, and Part D Adherence Measure Score as Predictor Variables

CI = confidence interval; LIS = low-income subsidy; RAS = renin-angiotensin system.

of statins, regardless of diabetes diagnosis. This subpopulation of beneficiaries with diabetes that is included in the Part C measure may have different characteristics compared with the entire population of statin users included in the Part D statins adherence measure. Statins are also standard of care treatment for patients aged 40-75 years with diabetes regardless of lipid levels.²⁵ Patients with diabetes using statins without history of dyslipidemias may confound the association between statin adherence and LDL-C levels.

Adjusting for LIS enrollment and total contract enrollment in the regression models improved the associations between each of the 2015 Part D and Part C measures, and both variables were associated with performance in the Part C measures. The observed association between LIS enrollment size with star ratings measures is consistent with preliminary analyses conducted by CMS, which have noted a statistically significant negative association between dual/LIS enrollment and performance in a subset of star ratings measures, including the Part C Diabetes Care–Blood Sugar Controlled and Part D adherence measures for diabetes medications, RAS antagonists, and statins.²⁶ For these measures, however, the association between dual/LIS enrollment and star ratings measure performance decreased after controlling for disability,²⁶ which suggests the potential contribution of additional patient-level factors and other plan demographics in driving the association between star ratings adherence and intermediate outcome measures. Additionally, our finding that larger contracts have an increased odds of achieving a higher Part C score is consistent with a previous report by Xu et al. (2015), which found that large contract size, maturity, and nonprofit status were associated with higher star ratings for MAPD contracts.²⁷

Despite CMS's emphasis on these triple-weighted Part D medication adherence and Part C intermediate outcome measures, improvement of these measures is typically challenging for health plans because of the need for greater member engagement in order to achieve positive outcomes.¹ Efforts to improve medication adherence likely require a multidimensional approach, innovative strategies, and high-touch interventions, such as clinician case management. Effective interventions have emerged from strategic partnerships between health plans, pharmacy benefit managers (PBMs), and pharmacies. A comprehensive pharmacy intervention using PBM pharmacy claims data, member outreaches by a health plan care management team, and mail order pharmacy delivery of medications led to significant improvements in performance in all Part D medication adherence measures for a dual-eligible Medicare Special Needs Plan.²⁸ Randomized and observational studies to date have demonstrated the impact of interventions, including personalized pharmacist consultations and patient education, targeting medication adherence to diabetes medications, antihypertensive agents, and statins on improving blood

sugar, blood pressure, and LDL-C control.^{29,30} Additionally, a recent analysis of private health plan claims data by Seabury et al. (2015) demonstrated the association between higher average adherence rates and lower hospitalization rates in plan-level quality measures.³¹ The cumulative evidence suggests that strategies in improving medication adherence are also likely to improve intermediate outcome quality measures.

Limitations

This analysis contains the following limitations. First, approximately 47% of Medicare contracts present in the 2015 CMS star ratings report were excluded from this analysis because of the incomplete reporting of base-level numeric data for all Part C and D measures of interest. New and low enrollment contracts—defined by CMS as contracts with less than 1,000 enrollees for 2015 star ratings measures that are derived from HEDIS²—did not report data for all the Part C and D measures of interest and were therefore excluded from this analysis. This lack of reporting may limit the applicability of the results if new or low enrollment contracts have different characteristics than those in our sample.

Second, the applicability of these results is limited by changes affecting the Part C and D measures of interest for the 2016 star ratings report (2014 benefit year). Following the release of the new American College of Cardiology/American Heart Association Guidelines on the Treatment of Blood Cholesterol, as well as the retirement of 3 NCQA measures related to LDL-C control for HEDIS 2015, CMS has retired the Part C Diabetes Care–Cholesterol Controlled measure for the 2016 star ratings.^{7,32} Also, in response to the release of the JNC 8 Guideline for the Management of High Blood Pressure,⁷ CMS has modified the methodology of the Part C Controlling Blood Pressure measure to reflect the percentage of beneficiaries aged 18-59 years and 60-85 years with diabetes who have a blood pressure reading of <140/90 and members aged 60-85 years without diabetes who have a blood pressure reading of <150/90 during the measurement year.³²

In relation to Part D measures, sodium glucose cotransporter 2 inhibitors will be included in the diabetes medication adherence measure, and beneficiaries with end-stage renal disease coverage will be excluded from the Part D adherence measures for diabetes and hypertension medications.³² These methodological changes may result in higher performance, on average, across contracts in these Part C and D measures for the 2016 star ratings. For HEDIS-derived Part C measures that include all the Part C intermediate outcome measures of interest, CMS has redefined low-enrollment contracts to include contracts with ≥500 enrollees,^{7,32} which would result in more contracts being eligible for inclusion in the 2016 star ratings Part C measures.

Also, the actual beneficiary date of death or disenrollment, instead of the last day of the month of disenrollment, will be used to define the end of the beneficiary's measurement period for the PDC adherence calculation, although this likely will have minimal impact on adherence rates and performance in the Part D measures.^{7,32} Future studies should assess the impact of these changes on the association between Part C and D measures in future star ratings reports.

Third, the PDC calculation used in the Part D adherence measures may not fully capture adherence to combination therapy. Limitations in the PDC methodology may be especially important for the Part D Medication Adherence for Diabetes Medications measure. Specifically, the PDC calculation may appear to artificially inflate adherence in the Part D Medication Adherence for Diabetes Medications measure, since this measure requires the supply of only 1 diabetes medication in the measurement period. Despite these limitations, PDC has been shown to be a reliable indicator of drug exposure and predictive of measurable clinical outcomes in diabetes, hypertension, and hyperlipidemia.^{12,14}

Fourth, this study used publicly available Medicare contract performance results that are reported at the contract level and do not include demographic or patient-level data. As a result, we were not able to control for socioeconomic differences in patient populations other than LIS beneficiary enrollment. More research is needed to understand the association between Part D and C measures in the context of an intervention where patient-level data are available.

Finally, this study focused on the Medicare-eligible elderly population. Therefore, the results of this analysis may not be generalizable to other plan populations, such as commercial plans on federal or state exchanges and Medicaid populations outside of dual-eligible plans.

Conclusions

In the context of national stakeholder discussions promoting the importance of medication adherence in influencing Part C intermediate outcome measures related to medication therapy,¹ the findings of this study indicate that MAPD plan sponsors may experience improved performance in Part C measures with strategies that improve performance in Part D medication adherence measures. This analysis suggests the potential added value of improving medication adherence in influencing Part C intermediate outcome measures and overall plan performance. Plan sponsors may use this information to guide strategies for achieving higher star ratings. The association between triple-weighted Part D medication adherence measures and Part C measures underscores the importance of innovative quality improvement strategies aimed at improving medication adherence.

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DISCLOSURES

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Ta, Erickson, and Patel were responsible for study concept and design and data interpretation, with assistance from Qiu. Qiu and Ta took the lead in data collection, assisted by Erickson. Ta wrote the manuscript, which was revised by Erickson and Patel.

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