PQS

sponsored by
Pharmacy Quality Solutions

2023 INDUSTRY TREND REPORT

in Pharmacy Quality

Table of Contents

Letter from the CEO

Healthcare-related quality measures are often developed to address gaps in observed care, gaps in the use of evidence-based guidelines, or substantial health outcome differences across populations. Once these quality measures and initial improvement efforts have been adopted, implemented, and tracked for several years, stakeholders involved with these efforts often want to dive deeper to understand what other factors may confound and influence performance results.

Our Trend Report in Pharmacy Quality (Trend Report) explores factors impacting healthcare quality and provides insights into where the industry is heading. This year's 2023 Trend Report is focused on factors that affect performance, including how demographics or medication-use behaviors may impact the results of quality performance scores. We observed a noticeable difference across populations when analyzing these factors. The insights may help those striving for continuous quality improvement to consider how patients in various categories may require different solutions, interventions, or education to help positively impact and empower them to embrace behavioral changes.

We also analyzed the impact of switching medications within a measure and the resulting impact on measure rates. Whether the need for the changes were due to drug shortages, formulary changes, changes in generic manufacturers, patient intolerance, or progression of disease states, understanding that these changes can impact performance on quality measures can be helpful context in designing patient support programs.

Additionally, we assessed the cross-measure impact of patients who qualify for more than one quality measure. As medication synchronization and other personalized services may be offered to a broad population, there is particular attention to those patients who have multiple medications. With our observed trends for 2023, data show significant increases in adherence scores among the populations who qualify for more than one quality measure. This trend may help to validate the success and efforts of community pharmacies providing these additional patient support services.

As advocates of quality, we all strive for continuous quality improvement and aim to quantify the impact we are collectively making to improve patient outcomes, one patient at a time. We hope you enjoy the latest release of our annual Trend Report and uncover insights to support your quality efforts. We look forward to hearing what insights we can deliver in a future year to help us all be better – together.

Todd Sega, PharmD
Chief Executive Officer
tsega@pharmacyquality.com

Introduction

IMPORTANCE OF MEDICATION ADHERENCE

Medication adherence (sometimes called compliance) is often defined as the extent to which a patient takes a medication regimen exactly as prescribed.[1] Decades of research on this topic have consistently demonstrated that many patients with chronic disease fail to maintain high levels of adherence over time.[1,2] Furthermore, the consequences of non-adherence to medications for chronic disease are profound.[3] Studies have shown higher risk of hospitalization and higher costs of care when patients are non-adherent to medications for hypertension, dyslipidemia, and diabetes.[4-8] Given the high prevalence of these conditions amongst Medicare enrollees, the cumulative costs of non-adherence to the Medicare program could be substantial.[9]

"Drugs don't work in patients who don't take them." - Former Surgeon General, C. Everett Koop[10]

Since various structural elements of the healthcare system have been shown to affect medication adherence, health plans and pharmacy benefit managers can affect adherence through the design of drug benefits and provision of services that have been shown to support adherence. Furthermore, measures of medication adherence are increasingly used within value-based payment models[3] as well as the Medicare Part D Star Ratings.[11]

MEASUREMENT OF MEDICATION ADHERENCE

Adherence to medications for chronic diseases can be calculated in several ways. Here we will focus on the method called proportion of days covered (PDC).[12] This measurement method identifies the proportion of days the patient has access to medication during a specific period of interest, often called the measurement period. PDC is calculated by tracking the "days covered" based on the refill dates and quantity supplied for each fill. Imagine a calendar covering the entire measurement period and using a marker to cross out the days on the calendar during that period when the patient had medication on hand. We then calculate the PDC by dividing the number of crossed out days by the total number of days and multiplying by 100. Higher PDC indicates better adherence. A patient with a PDC of 80% or higher is considered adherent for most adherence measures, including those we'll discuss in this report.

$$\text{PDC} = 100\% \times \frac{\text{Count of days 'covered' in measurement period}}{\text{Count of total days in measurement period}}$$

Several medication quality measures focus on adherence, each examining therapy for a particular disease state or sometimes only a medication class. The measure rate for a health plan or provider on any particular measure is calculated as the percentage of patients who qualified for the measure — based on eligibility and exclusion criteria specific to that measure — and who achieved the PDC threshold for that measure. The measure rate can also be expressed in the form of numerator divided by denominator, where the denominator is the total number of patients who met eligibility criteria and the numerator is the number of those patients who maintained the target PDC or higher.

The Pharmacy Quality Alliance (PQA) has developed and maintains several PDC measures. The Centers for Medicare & Medicaid Services (CMS) uses the PQA technical specifications to calculate and report the PDC measure rates for all Medicare plans with drug coverage. CMS uses the following three PDC measures from PQA within the Medicare Part D Star Ratings Program:

PROPORTION OF DAYS COVERED:		
Statins • Cholesterol PDC • This measure focuses on adherence for statins as a medication class	**Diabetes All Class** • Diabetes PDC • This measure includes non-insulin antihyperglycemic medications • Patients on insulin are excluded from this measure	**Renin Angiotensin System Antagonists** • RASA PDC • Includes drugs in the category of renin-angiotensin system antagonist

Of note, all three of these adherence measures require that a patient receive at least two dispenses of target medications on different dates of service within the measurement period. In the context of the adherence measures considered for this report, target medications are the medications included in the measure. For example, atorvastatin is a target medication for Cholesterol PDC, but it is not a target medication for Diabetes PDC.

Details on CMS calculations and reporting of PDC measure rates can be found at the CMS website for Part C and D Performance Data.[11] PQS calculates the measure rate for EQUIPP-participating health plans and the measure rate for pharmacies within each plan's network.

For more information on EQUIPP, see 'EQUIPP Dataset' section below. More information on the calculation of adherence can be found at https://www.pharmacyquality.com/resources/.

FACTORS RELATED TO MEDICATION ADHERENCE

Many questions arise regarding the factors that affect a patient's adherence to medications and the measure rate for a plan or provider. Thousands of studies have been published on medication adherence across numerous populations and medication categories;[1-3] however, many plans and providers are interested in knowing how the measure rates for Medicare plans are driven by factors related to patient demographics, plan and formulary design, medication distribution channels, or interventions for Medicare members. This report examines several of these potential factors that are of interest to plans and pharmacy providers, with an additional examination of the effects of Ozempic on Diabetes PDC measure rates.

EQUIPP® DATASET

PQS owns and manages EQUIPP, a digital platform for healthcare quality improvement. This platform is used by health plans, pharmacy benefit managers (PBMs), and pharmacies for shared tracking of performance across an extensive portfolio of medication-use quality measures. These data are provided to EQUIPP from health plans and PBMs and represent approximately 90% of Medicare lives. The data used in this trend report are from the 2022 calendar year, limited to Medicare lives, and based on the following number of Medicare Part D members for each PDC measure.

MEDICARE MEMBERS IN TREND ANALYSES

MEASURE	MEMBERS (N)
Cholesterol PDC	13,128,216
Diabetes PDC	4,057,960
RASA PDC	11,112,320

Note: This population represents a subset of the patient data in EQUIPP from calendar year 2022.

Chapter 1

Socio-Demographic Factors Related to Medication Adherence

Socio-demographic data include age, gender, and economic status. For Medicare Part D Star Ratings measures, the proxy for economic status is the enrollee's eligibility for low-income subsidy (LIS). Table 1 shows the average age of patients who are adherent versus those who are non-adherent. For each measure – Cholesterol PDC, Diabetes PDC, and RASA PDC – the average age for those who are non-adherent is very similar to those who are adherent.

TABLE 1. MEAN AGE AND ADHERENCE CATEGORY

	ADHERENT	PATIENT COUNT	MEAN AGE
Cholesterol PDC	No	1,765,698	73.0
	Yes	11,362,518	73.7
Diabetes PDC	No	596,607	71.4
	Yes	3,461,353	72.4
RASA PDC	No	1,374,787	73.0
	Yes	9,737,533	73.7

Table 2 shows measure rates by measure for three different age strata. Patients under the age of 65 years have lower adherence compared to those 65 years and older. The measure rate for each of the three measures is at least four percentage points lower amongst the patients under age 65 as compared to those 65–74 years. Keep in mind that the majority of Medicare beneficiaries under the age of 65 years are disabled and may have unique problems with access to care.[12]

TABLE 2. AGE STRATA AND MEASURE RATE

	AGE <65	AGE 65-74	AGE 75+
Cholesterol PDC	82.8% *n=1,241,827*	86.8% *n=6,053,543*	87.1% *n=5,832,834*
Diabetes PDC	81.1% *n=507,959*	85.9% *n=1,950,995*	85.9% *n=1,599,000*
RASA PDC	82.6% *n=1,031,954*	88.3% *n=5,125,376*	87.9% *n=4,954,973*

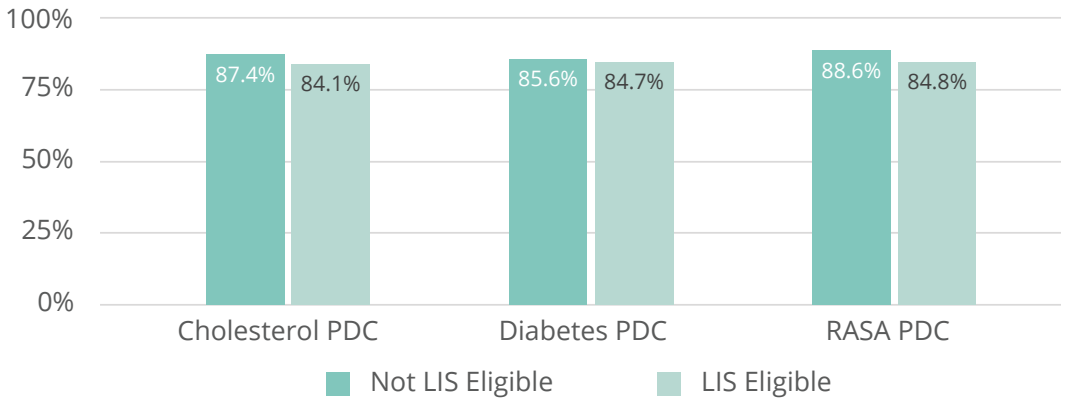
Table 3 shows measure rates by measure between males and females. For Cholesterol PDC and RASA PDC, the difference was 1% or less. However, for Diabetes PDC, male patients had a rate that was 1.5 percentage points higher than female.

TABLE 3. MEASURE RATE BY GENDER

	FEMALE	MALE	DIFFERENCE
Cholesterol PDC	86.1%	87.1%	1.0%
Diabetes PDC	84.6%	86.1%	1.5%
RASA PDC	87.8%	87.5%	-0.3%

Figure 1 shows measure rates by measure for patients who are eligible for low-income subsidy (LIS) versus those who are not. Measure rates are lower for LIS-eligible patients.

FIGURE 1. LOW-INCOME SUBSIDY (LIS) AND MEASURE RATE



DISCUSSION OF SOCIO-DEMOGRAPHICS AND ADHERENCE

The relationship of socio-demographic status (SDS) and PDC for Medicare patients has been described in peer-reviewed literature[13] and studied by CMS, PQA, and the National Quality Forum (NQF). In 2014–15, CMS collaborated with the RAND Corporation to more closely examine the relationships of Medicare Part C/D Star Ratings measures with dual-eligibility, LIS, and disability status for Medicare enrollees.[14] They found that the adherence measures were potential targets for SDS adjustment due to small, but statistically significant, within-contract differences in PDC based on LIS/DE or disability status. However, the small size of the differences in measure rates led to continued debate on the merits of adjusting the PDC measures for LIS/DE or disability status. NQF has generated numerous reports on potential SDS risk-adjustment methods for quality measures. In their most recent report (2022), NQF noted significant differences in opinions across stakeholders regarding the merits and risks of SDS adjustment of quality measures.[15] They recommended that measure developers assess the need for SDS adjustment and propose methods for adjustment of the measures. They strongly encourage the use of stratified reporting of performance rates to show the rates for each sub-population (i.e., strata).

CMS began stratified reporting of a subset of Medicare Part C/D measures with data from 2019; however, the stratified reports are only viewable by the Medicare contractor.[16] CMS has also begun use of the Categorical Adjustment Index (CAI) to adjust Star Ratings for significant within-contract variability related to LIS/DE status and this does include the PDC measures.[17] However, CMS stated its intent to move forward with a new model of SDS adjustment of the three PDC measures from PQA for the 2028 Star Ratings (using 2026 data).[18] In this new model, the PDC rates would be adjusted by a multivariable model including age, gender, LIS/DE status, and disability status. This model is based on PQA recommendations for SDS adjustment; however, the final CMS technical specifications for these SDS adjustments in the 2028 Star Ratings are not yet clear. The analyses reported by CMS within the proposed rule indicated that most Medicare contracts would not have a change in the measure-level star rating as a result of the adjustment. This is due to the finding by CMS that within-contract variation across LIS/DE or disability strata for each PDC measure was minimal.

Most Medicare contracts would not have a change in the measure-level Star Rating as a result of a multivariable model, including age, gender, LIS/DE status, and disability status.

Chapter 2

Utilization Factors Related to Adherence

SWITCHING DRUGS WITHIN A MEASURE

The PDC measures capture the patient's use of any product within the measure so that patients who switch between target medications are still counted as adherent. While most patients remain on the same product throughout the measurement period, there are patients who switch from one target medication to another. This can occur due to drug benefit changes that affect the cost-share for a patient, side effects from a particular product, changes in providers or other potential reasons. Prior research has indicated that patients who switch statin products have lower adherence than patients who remain on the same statin.[20] When a PBM is contemplating a shift in preferred products within a class, an important consideration is the potential disruption of adherence for patients whose product is switched.

To estimate the potential impact on adherence of switches, data for two of the PDC measures were analyzed. The selected PDC measures were RASA PDC and Cholesterol PDC. Diabetes PDC was not included in the analyses since persons with diabetes may concurrently use multiple non-insulin products. Analyses were conducted within each Medicare plan as well as with combined data. A comparison of mean measure rates was made between patients who received dispenses of only one target medication throughout the measurement period versus those who received two or more dispenses of different target medications during the same period.

Measure rates were lower when including only patients who switched target medications.

The results of the analyses indicate that measure rates were lower when including only patients who received two or more target medications within the applicable measure (i.e., those who switched medications). For RASA PDC, the difference was 5 percentage points and for Cholesterol PDC, 7 percentage points. However, only a small percentage of patients within each measure received two different active ingredients during the measurement period (3.9% for RASA PDC and 3.8% for Cholesterol PDC). The measure

rate for the entire population is approximately the same as the rate for patients who did not switch products in the measurement period. In sub-analyses, this also held true for individual Medicare plans. Removal of patients who used two or more unique medications during the measurement period would not significantly impact the measure rate for a Medicare plan. However, the presence of switching may be useful as an indicator to identify patients who are at risk for lower PDC.

TABLE 4. ADHERENCE MEASURE RATES AND SWITCHING

	DENOMINATOR	MEASURE RATE
RASA PDC	11,112,308	87.6%
1 Drug	10,700,652	87.8%
2+ Drugs	411,656	83.1%
Cholesterol PDC	13,128,196	86.5%
1 Drug	12,657,446	86.8%
2+ Drugs	470,750	79.6%

DISTRIBUTION CHANNEL

Patients may receive medications through retail pharmacies or mail-service pharmacies. Although the home delivery pharmacies are often referred to as "mail order" or "mail-service," the deliveries often occur through carriers other than the U.S. postal service. For simplicity, we refer to this channel as "mail."

The Medicare patients in our data set used the mail channel at a rate similar to the rate found for persons 65 years or older in prior research.[21] Mail was used by the following percentage of patients in each measure: Cholesterol PDC (23.7%), Diabetes PDC (21.2%), RASA PDC (22.3%).

The measure rates were higher for mail utilizers when compared to retail utilizers for all three PDC measures (see Table 5). The difference ranged from 5.1 percentage points for RASA to 6.7 percentage points for Diabetes. This finding is consistent with a 2016 review of adherence studies that compared mail vs retail channels.[22] In that systematic review, 14 of 15 studies found higher adherence rates for chronic-disease patients utilizing mail service. It was also noted that patients who chose to utilize the mail channel may have had higher adherence prior to a switch to mail. Adherence may be higher through the mail channel for several reasons, including lower copays and greater use of extended day supplies and auto-refill.

TABLE 5. ADHERENCE MEASURE RATE BY CHANNEL

PDC MEASURE	RETAIL			MAIL			DIFF.
	NUM.	DENOM.	RATE	NUM.	DENOM.	RATE	
Cholesterol	8,536,073	10,018,865	85.2%	2,823,291	3,109,351	90.8%	5.6%
Diabetes	2,684,079	3,199,140	83.9%	778,091	858,820	90.6%	6.7%
RASA	7,466,965	8.632,329	86.5%	2,271,672	2,479,991	91.6%	5.1%

Num. = Numerator; Denom. = Denominator; Diff. = Difference

EXTENDED FILLS

Medicare patients often receive fills of medications with quantities that will last for more than 30 days. A 90-day supply is common, but extended fills can sometimes cover a slightly smaller number of days. For this report, an extended fill was defined as a supply of at least 84 days. Within any specific measurement period, patients may also receive a mix of non-extended fills (e.g., 30 day supply) and extended fills. Consequently, patients were placed into one of three categories (extended fills only, both extended and non-extended fills, and non-extended fills only). Table 6 shows the adherence measure rates for patients in these three categories.

For every measure, the PDC rate was lowest for patients who did not receive any extended fills and highest for patients with only extended fills.

For every measure, the PDC rate was lowest for patients who did not receive any extended fills and highest for patients with only extended fills. This is most likely due to the fact that extended fills are associated with fewer opportunities for refill gaps within a measurement period. However, it is important to note that patients who were LIS-eligible were less likely to receive an extended fill (Table 7). As shown in Table 8, amongst the patients who received extended fills, the LIS patients had a lower PDC measure rate. For patients who only received non-extended fills, the LIS patients had a higher PDC measure rate (Table 8). **The complicated relationship of LIS status with the receipt of extended fills and the subsequent interactive effect of these factors on PDC measure rates deserves greater attention.**

TABLE 6. MEASURE RATE BY EXTENDED FILL STATUS

MEASURE	FILL STATUS	NUM.	DENOM.	RATE
Cholesterol PDC	Extended	9,226,813	10,417,991	88.6%
	Mix	1,400,546	1,731,470	80.9%
	Non-Extended	735,151	978,735	75.1%
Diabetes PDC	Extended	2,109,081	2,395,863	88.0%
	Mix	1,059,613	1,226,629	86.4%
	Non-extended	292,651	435,452	67.2%
RASA PDC	Extended	7,518,863	8,364,438	89.9%
	Mix	1,625,052	1,935,915	83.9%
	Non-extended	593,611	811,955	73.1%

Num. = Numerator; Denom. = Denominator

TABLE 7. PERCENT OF PATIENTS WITH EXTENDED FILLS BY LIS STATUS

	LIS ELIGIBLE		DIFFERENCE
	NO	YES	
Cholesterol PDC	95.8% *n=9,767,583*	83.1% *n=3,360,633*	-12.7%
Diabetes PDC	92.5% *n=2,783,966*	82.3% *n=1,273,994*	-10.2%
RASA PDC	95.5% *n=8,280,554*	84.5% *n=2,831,766*	-11.0%

Percentages in each cell reflect the percent who had ≥1 extended fill

TABLE 8. MEASURE RATES BY FILL STATUS AND LIS STATUS

	NOT LIS ELIGIBLE		LIS ELIGIBLE	
	EXTENDED	NON-EXTENDED	EXTENDED	NON-EXTENDED
Cholesterol PDC	88.3%	72.2%	85.5%	77.2%
Diabetes PDC	87.9%	60.9%	87.2%	73.1%
RASA PDC	89.4%	72.1%	86.7%	73.9%

MEMBER RETENTION

For Medicare Star Ratings, the performance measures are calculated for a calendar year which corresponds to the standard enrollment year (or plan year) for members. The members included in the calculation each year are a mixture of members who were new to the plan and members who re-enrolled from the prior year. One consideration when targeting members for intervention is whether the members who were new to the plan have a different pattern of adherence than those who were retained from the prior year.

Table 9 shows 2022 measure rates for members who were new to the plan in 2022 as compared to the 2022 measure rate for members who were retained from the prior year. **The PDC measure rate for new members differed by less than 0.4% for all measures when compared to retained members.**

TABLE 9. MEMBERSHIP STATUS AND MEASURE RATE

	NEW MEMBER		DIFFERENCE
	NO	YES	
Cholesterol PDC	86.6% *n=11,137,649*	86.5% *n=1,988,507*	-0.1%
Diabetes PDC	85.4% *n=3,388,128*	85.0% *n=669.062*	-0.4%
RASA PDC	87.7% *n=9,404,601*	87.4% *n=1,705,945*	-0.3%

Percentages represent the PDC measure rate for 2022

PATIENTS IN MULTIPLE PDC MEASURES

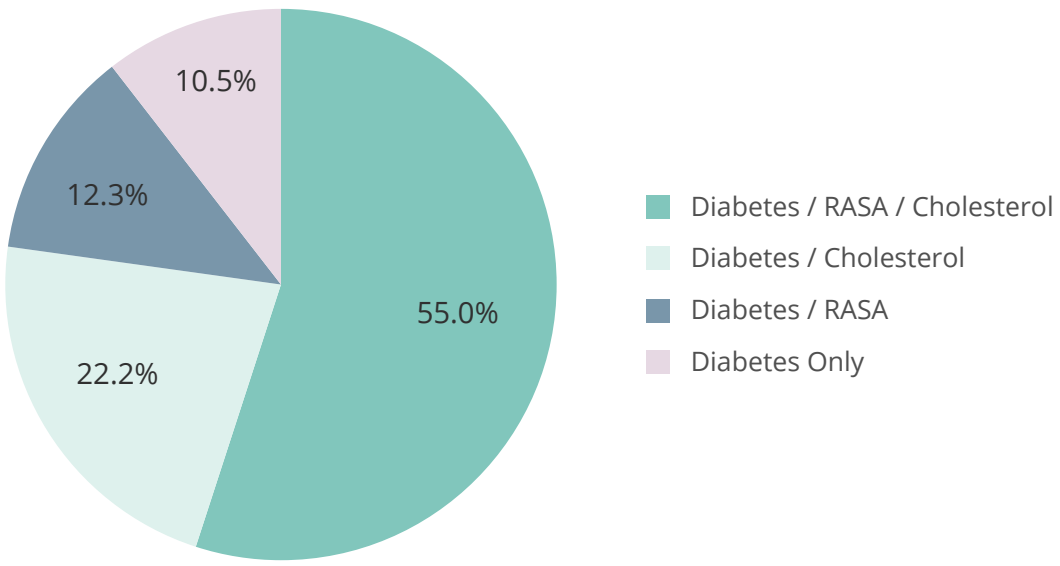
Medicare patients will often have multiple morbidities and will appear in the denominator for more than one PDC measure. This is especially true of persons with diabetes who may also have hypertension and dyslipidemia (i.e., metabolic syndrome). In Table 10, the PDC measure rate is displayed for groups of patients who appeared in the denominator for 1, 2, or 3 of the PDC measures. Only 10.5% of persons with diabetes were in the "diabetes only" group (Chart 2). That group had a diabetes PDC measure rate that was substantially lower than the diabetes patients who were also measured as part of the RASA PDC and/or Cholesterol PDC measures. There may be several reasons that the persons in the diabetes-only subgroup had lower adherence. The diabetes patients without statin or RASA drugs may be receiving care that is less

concordant with clinical guidelines and this may also reflect less interaction of patients with providers. An alternative explanation is that a greater proportion of patients who were included in the diabetes-only category were actually using their medications for indications other than diabetes (e.g., weight loss).

TABLE 10. PDC MEASURE RATE BY MEASURE COMBINATION

GROUP	PATIENT COUNT	DIABETES RATE	RASA RATE	CHOLESTEROL RATE
Diabetes Only	425,267	73.8%		
RASA Only	3,100,306		84.7%	
Cholesterol Only	4,712,772			84.8%
Diabetes, RASA and Cholesterol	2,233,759	88.6%	89.6%	88.3%
Diabetes and RASA Only	497,751	81.5%	84.9%	
Diabetes and Cholesterol Only	901,177	84.7%		85.5%
RASA and Cholesterol Only	5,280,498		88.7%	87.5%
Diabetes Total Population	4,057,954	85.3%		
RASA Total Population	11,112,314		87.6%	
Cholesterol Total Population	13,128,206			86.6%

FIGURE 2. DIABETES PATIENTS IN MULTIPLE MEASURES



DRUG CATEGORIES IN DIABETES PDC MEASURE

The Diabetes PDC measure includes patients who received at least two fills of any non-insulin diabetes medication on different dates of service. Some diabetic patients receive more than one non-insulin medication; however, the PDC calculation considers a calendar day to be covered when only one diabetes medication. An important consideration in targeting patients for intervention is whether patients on specific medications, or specific combinations of medications, have different adherence rates. Table 11 reports the number of patients who received a medication from each category of diabetes products. Over 80% of patients used metformin alone or with other diabetes medications.

TABLE 11. DRUG CATEGORIES IN DIABETES PDC MEASURE*

DRUG	PATIENT COUNT	% OF TOTAL
Metformin	3,264,836	80.5%
Sulfonylurea	1,273,525	31.4%
GLP-1	558,048	13.8%
DPP4	519,775	12.8%

Total Patient Count = 4,057,954
** A patient may be included in multiple categories*

In Table 12, the PDC measure rate for each category is reported. For further insights on potential targeting criteria, the PDC rate is also reported by LIS status of the patients within each category. The highest PDC rate was for patients taking sulfonylureas and the rate did not differ substantially by LIS status of patients. For the categories of GLP-1 and DPP4, patients in the LIS group had slightly higher PDC rates than patients who were not LIS eligible. The products in these categories will often have a higher cost-share than metformin or sulfonylureas; however, LIS patients are not subject to the same effect of cost-sharing. Thus, the effect of cost-share in these two categories may be countering the general trend towards lower adherence amongst non-LIS patients as reflected in Table 7 and 8.

For every drug or drug class, the measure rate for those patients who positively had a fill of the medication was higher, with the exception of GLP-1s.

TABLE 12. DIABETES PDC RATE BY DRUG COMPONENT AND LIS STATUS

DRUG / DRUG CLASS	FILL	PATIENT COUNT	MEASURE RATE	LIS	PATIENT COUNT	MEASURE RATE
Metformin	No	793,107	80%	No	510,008	79%
				Yes	283,099	82%
	Yes	3,264,836	87%	No	2,273,946	87%
				Yes	990,890	85%
Sulfonylurea	No	2,784,418	83%	No	1,876,840	83%
				Yes	907,578	83%
	Yes	1,273,525	91%	No	907,114	91%
				Yes	366,411	90%
GLP-1	No	3,499,895	85%	No	2,456,852	86%
				Yes	1,043,043	84%
	Yes	558,048	85%	No	327,102	83%
				Yes	230,946	87%
DPP4	No	3,538,168	85%	No	2,496,503	85%
				Yes	1,041,665	83%
	Yes	519,775	89%	No	287,451	88%
				Yes	232,324	90%

References

[1] DiMatteo MR. Variations in patients' adherence to medical recommendations: a quantitative review of 50 years of research. *Med Care* 2004;42:200-209.

[2] Bosworth HB, Granger BB, Mendys P, et al. Medication adherence: A call to action. *Am Heart J* 2011;162:412-424.

[3] Brewer S, Cree M, Hubbard T. Taking stock: Patient medication adherence and chronic disease management. NEHI White Paper; June 10, 2020

[4] Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS. Impact of medication adherence on hospitalization risk and health care cost. *Med Care* 2005;43:521-530.

[5] Heaton PC, Tundia NL, Luder HR. U.S. emergency department visits resulting from poor medication adherence: 2005-07. *J Am Pharm Assoc* 2013;53:513-519.

[6] Salas M, Hughes D, Zuluaga A, Vardeva A, Lebmeier M. Costs of medication non-adherence in persons with diabetes mellitus: A systematic review and critical analysis of the literature. *Value Health* 2009;12:915-922.

[7] Pittman DG, Tao Z, Chan W, Stettin GD. Antihypertensive medication adherence and subsequent hospitalization and costs. *Am J Manag Care* 2010;16:568-577.

[8] Aubert RE, Yao J, Xia F, Garavaglia SB. Is there a relationship between early statin compliance and a reduction in healthcare utilization? *Am J Manag Care* 2010;16:459-466.

[9] Centers for Medicare & Medicaid Services. Chronic conditions. Available at: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/CC_Main (last accessed Aug 24, 2023).

[10] Everett Koop, C. (1985). "Improving medication compliance," in *Proceedings of a symposium* (Reston, VA: National Pharmaceutical Council).

[11] Centers for Medicare & Medicaid Services. Part C and D Performance Data. Available at: https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PerformanceData

[12] Shah KK, Touchette DR, Marrs JC. Research and scholarly methods: Measuring medication adherence. *J Am Coll Clin Pharm* 2023;6:416-426.

[13] Koma JW, Biniek JF, Cubanski J, Neuman T. Access problems and cost concerns of younger Medicare beneficiaries exceeded those of older beneficiaries in 2019. *Health Aff (Millwood)* 2023;42:470-478.

[14] Young GJ, Rickles NM, Chou CH, Raver E. Socioeconomic characteristics of enrollees appear to influence performance scores for Medicare Part D contractors. *Health Aff (Millwood)* 2014;33:140-146.

[15] Centers for Medicare & Medicaid Services. Examining the potential effects of socioeconomic factors on Star Ratings. Presentation on Sept 8, 2015. Available at: https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/Downloads/Research-on-the-Impact-of-Socioeconomic-Status-on-Star-Ratingsv1-09082015.pdf

[16] NQF. Developing and Testing Risk Adjustment Models for Social and Functional Status-Related Risk Within Healthcare Performance Measurement. Final Technical Guidance – Phase 2. Dec 21, 2022. Available at: https://www.qualityforum.org/Publications/2022/12/Risk_Adjustment_Technical_Guidance_Final_Report_-_Phase_2.aspx

[17] Centers for Medicare & Medicaid Services. Technical Notes for Generating Stratified Reporting for Part C and D Star Ratings Measures. Available at: https://www.cms.gov/files/document/stratified-reporting-documentation-2022-2023-star-ratings.pdf

[18] Centers for Medicare & Medicaid Services. Medicare 2023 Part C & D Star Rating Technical Notes. Available at: https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovGenIn/PerformanceData

[19] Federal Register, Dec 27, 2022 [87 FR 79616-79617]. Medication Adherence for Diabetes Medication, Medication Adherence for Hypertension (RAS Antagonists), Medication Adherence for Cholesterol (Statins) (Part D)—Substantive Change

[20] Thiebaud P, Patel BV, Nichol MB, Berenbeim DM. The effect of switching on compliance and persistence: The case of statin treatment. *Am J Manag Care*. 2005;11:670-74.

[21] Do D, Geldsetzer P. Trends in mail-order pharmacy use in the U.S. from 1996 to 2018. An analysis of Medical Expenditure Panel Survey. *Am J Prev Med*. 2021;61:e63-e72.

[22] Fernandez EV, McDaniel JA, Carroll NV. Examination of the link between medication adherence and use of mail-order pharmacies in chronic disease states. *J Manag Care Spec Pharm*. 2016;22:1247-59.

About Pharmacy Quality Solutions, Inc. (PQS)

PQS aligns healthcare payers and pharmacies to achieve their shared goals of better patient outcomes and healthcare quality performance. As a neutral, trusted intermediary supporting the evolution of value-based care, PQS facilitates nationwide pharmacy-based care through our partners and the EQUIPP® platform.

Utilizing deep clinical pharmacy knowledge and over a decade of performance management experience, PQS helps clients develop strategies, implement quality improvement programs, and optimize the quality of healthcare for their Medicare, Medicaid, and commercial populations. For more information on how PQS can support you, please visit www.pharmacyquality.com.

WHAT WOULD YOU LIKE TO SEE IN NEXT YEAR'S REPORT?

If you have ideas or comments, we'd like to hear from you! If you'd like to participate and would be willing to serve as a resource for feedback on next year's report, please let us know. You can share your feedback or ideas at trendreport@pharmacyquality.com.

600 Park Offices Dr. Suite 300
Durham, NC 27709

PHONE: (919) 864-9756
EMAIL: info@pharmacyquality.com

WWW.PHARMACYQUALITY.COM