

CALCULATING PROPORTION OF DAYS COVERED (PDC) FOR ANTIHYPERTENSIVE AND ANTIDIABETIC MEDICATIONS: AN EVALUATION GUIDE FOR GRANTEES

August 31, 2015



ACKNOWLEDGEMENTS

Centers for Disease Control and Prevention Division for Heart Disease and Stroke Prevention

Division of Diabetes Translation

Translation, Health Education, and Evaluation Branch

Division for Heart Disease and Stroke Prevention

Applied Research and Evaluation Branch

Epidemiology and Surveillance Branch

Program Development and Services Branch

Division of Population Health

School Health Branch

ICF International

Rosemary Craft, MS Ed

Thearis Osuji, MPH

State Health Departments

Brooke Bardot, Colorado Department of Public Health and Environment

Leah Casanave, MPH, DrPH, Nebraska Department of Health and Human Services

Tara Cope, MS, New York State Department of Health

TABLE OF CONTENTS

Overview	1
Audience	1
Organization of this Evaluation Guide	1
Why Proportion of Days Covered (PDC)?	2
Before You Get Started	3
Step 1: Identify a Data Analyst	4
Step 2: Obtain Access to Data	5
Step 3: Prepare for Analysis	7
Obtain Statistical Analysis System (SAS) Code.....	7
Define a List of Antihypertensive and Antidiabetic Medications	7
Define the Measurement Period	7
Obtain Data on Key Variables	7
Define Your Population (Denominator).....	8
Step 4: Calculate PDC	10
Calculate the Numerator	10
Calculate PDC.....	10
Step 5: Report Results	11
Beneficiary Disposition Table by Data Source for Each Unique Population Segment	11
PDC Table	11
Next Steps	13
References	14
Appendix A: List of Acronyms and Glossary	

OVERVIEW

The Centers for Disease Control and Prevention’s (CDC), National Center for Chronic Disease Prevention and Health Promotion has adopted an integrated approach to chronic disease prevention and control, increasing opportunities for coordination across related diseases and risk factors so that public health programs can work synergistically to enhance program impact and efficiency. State Public Health Actions to Prevent and Control Diabetes, Heart Disease, Obesity and Associated Risk Factors and Promote School Health (hereafter referred to as SPHA 1305) and State and Local Public Health Actions to Prevent and Control Diabetes, Heart Disease and Associated

Relevant Performance Measures
SPHA 1305 – 3.1.07, 3.2.07, 4.3.05: Proportion of patients with high blood pressure in adherence to medication regimens
SPHA 1305 – 3.1.08, 3.2.08, 4.3.06: Proportion of patients with diabetes in adherence to medication regimens
SLPHA 1422 – 2.08.2: Proportion of adults with high blood pressure in adherence to medication regimens

Risk Factors (SLPHA) 1422 use this approach. SPHA 1305 and SLPHA 1422 grantees are required to report on specific performance measures associated with the strategies and interventions established by CDC. This guide focuses specifically on the Division for Heart Disease and Stroke Prevention and Division of Diabetes Translation performance measures associated with medication adherence. The intent of the medication adherence performance measure is twofold. The first intent is for CDC-funded grantees to work to increase the proportion of adult patients with high blood pressure and/or diabetes in adherence with their antihypertensive and/or antidiabetic medications regimens, such that the percent increase (from baseline) over the funding period can be reported. The second intent of the measure is for grantees to use this baseline information to help guide the development and execution of interventions that improve medication adherence within their target population.

The purpose of this evaluation guide is to provide a resource for evaluators and data analysts to assist with calculating the proportion of days covered (PDC) value for heart disease and diabetes performance measures related to medication adherence. While PDC is not the only method for calculating medication adherence, it is the leading method used to calculate medication adherence at a population level. It is also supported by the Pharmacy Quality Alliance (PQA) and a similar method is used by the Centers for Medicare and Medicaid Services in their Star Rating methodology, and is therefore considered the preferred method for assessing medication adherence, as specified in the relevant performance measures (for more information, see <http://www.pharmacytimes.com/contributor/michael-crowe-pharmd-mba-csp-fmpa/2015/07/do-you-know-the-difference-between-these-adherence-measures>).

Audience

This evaluation guide is intended for SPHA 1305 and SLPHA 1422 grantee staff involved in reporting on the CDC medication adherence performance measures. Steps 3, 4, and 5, in particular, are intended for data analysts who will calculate PDC.

Organization of this Evaluation Guide

This evaluation guide is organized into five steps that walk you through the process of accessing and calculating PDC data for medication adherence.

- **Step 1:** Identify a data analyst
- **Step 2:** Obtain access to data
- **Step 3:** Prepare for analyses
- **Step 4:** Calculate proportion of days covered (PDC)
- **Step 5:** Report results
- **Next Steps**
- **References**
- **Appendix A: Glossary**

When You Need Assistance

CDC evaluators are available to assist you with the process of obtaining data and calculating population-level performance measures related to medication adherence. Contact your primary project officer to help connect you with a CDC evaluator.

Why Proportion of Days Covered (PDC)?

While there are a number of medications that are effective for managing hypertension and diabetes, nonadherence with prescribed medications has long been an issue with getting these chronic conditions under control (1). Research studies indicate that a lack of adherence with prescribed medications is associated with increased morbidity and mortality and increased health care costs (2–7). It is important to measure and assess medication adherence in developing, implementing, and evaluating evidence-based strategies that promote chronic disease management. Because medication adherence is an important public health issue, it is also important to identify and implement standardized measures that will help build a common platform for assessing medication adherence. This will allow researchers, evaluators, epidemiologists, statisticians, and others to compare and combine these data to help develop and promote efficient and effective strategies designed to promote medication adherence among those with chronic diseases (1).

PDC is the leading method used to calculate medication adherence at a population level. The Pharmacy Quality Alliance (PQA) is a nonprofit alliance of over 100 member organizations that represents multiple stakeholders who collaborate to promote and implement performance measurement and promote appropriate medication use. PQA has tested, validated, and approved of PDC as a high quality measure of medication adherence (8-10).

While you are welcome to explore other tools or measures of medication adherence (e.g., point-of-care surveys), PDC is CDC's preferred method for calculating medication adherence at the population level. If you explore alternative ways to measure medication adherence, you should contact your CDC evaluation technical assistance provider and Project Officer to determine the appropriateness of the method.

Appendix A: List of Acronyms and Glossary

Appendix A contains a list of relevant acronyms and a glossary of key terms referenced in this guide. You may wish to review the glossary before reviewing the specific steps associated with calculating medication adherence.

Take some time to review the method before you get started. PQA’s Web site contains some detailed information on the measure: <http://www.pqaalliance.org/>. You can also access National Drug Codes (NDCs) for antihypertensive (AHM) and antidiabetic (ADM) drugs from the Senior Director of Performance Measurement at PQA (contact your CDC evaluator for more information). You can obtain the list of NDCs from PQA at no cost; however, you may be asked to sign a Memorandum of Understanding (MOU) between the health department and PQA which limits the use of these materials to grantees own use and prohibits their distribution for other purposes. For some health departments, multiple parties and steps may be necessary to establish an MOU; however, PQA is willing to work with grantees to make the process as smooth as possible. Your CDC evaluator may also be of assistance to you in addition to your guidance from PQA.

Before You Get Started

There are three key questions to consider in preparing to calculate the CDC performance measures related to medication adherence. Steps 1 and 2 of this document are intended to help you get to a “yes” response to all three questions. If your response is “yes” to each of the questions, you may wish to skip to Step 3.

	Yes	No
1. <i>Does your program have someone with the analytic capacity (quantitative data analysis and management skills and availability) to calculate PDC?</i>		 <i>(see Step 1)</i>
2. <i>Do you have relationships with key partners (e.g., Medicaid, a local college of pharmacy, representatives from All Payer Claims Databases), that will allow you to access data you need to calculate PDC?</i>		 <i>(see Step 2)</i>
3. <i>Do you have access to the data (e.g., pharmacy claims data) needed to calculate PDC?</i>		 <i>(see Step 2)</i>

STEP 1: IDENTIFY A DATA ANALYST

First and foremost, as the questions above suggest, it is critical that you identify a **data analyst** with the appropriate skills and availability to calculate the performance measures.

CDC recommends that you involve a data analyst with advanced skills in quantitative data management and analysis skills using large datasets.

Data analysts with experience working with health claims data (e.g., Medicaid, Medicare, and private payer claims data) are well-suited for this task. Finally, you will need to identify a person who is experienced using statistical packages, specifically Statistical Analysis System (SAS). SAS is preferred because CDC can help you access SAS code that can be used for calculating PDC. Ideally, your data analyst would have past experience calculating PDC. While this is desirable, CDC recognizes that grantees may experience challenges getting access to someone with this experience.

If you do not have an individual within your department with this specific skillset, you might consider connecting with a medication adherence researcher from the local College of Pharmacy or School of Public Health. You might also consider another department (e.g., Medicaid Services) and private vendors in your search for a data analyst.

As with much of the work associated with SPHA 1305 and SLPHA 1422, the process of calculating PDC may involve multiple individuals. The individual responsible for submitting your performance measures should understand the processes and data to report and communicate with CDC evaluators. In some cases, this individual may be the same individual who you identify as the primary data analyst for this task. In other cases, your evaluator will need to work closely with a data analyst throughout this effort.

Desired Qualifications in a Data Analyst

- Advanced quantitative data management and analysis skills using large data sets
- Experience working with claims data
- Experience using Statistical Analysis System (SAS)

STEP 2: OBTAIN ACCESS TO DATA

As noted in the medication adherence performance measure profiles, ultimately, CDC would like for your state to report on these performance measures at the highest level possible. Partners (e.g., health plans) may play a key role in helping you get access to the data needed. For your performance measures, you may submit PDC values calculated by and provided by partners, per the reporting format illustrated below. The data should be of sufficient quality and representative of a specific population to whom your (the grantee's) medication adherence interventions are being targeted. If you choose to report data provided by partners, consult with your CDC evaluator. This will help to, so that they can help to ensure the data will be appropriate, of quality and representative of your programmatic efforts.

Some states may have All Payer Claims Datasets (APCDs) that may be used to calculate PDC for multiple population segments (see text box to the right for more information). If your State has an APCD, consider this data source first before the other data sources referenced below.

All Payer Claims Datasets
Some states have established APCDs that combine claims data from multiple public and/or private payers. To find out if your state has an APCD and information on how to access your state's APCD, review the following Web site:
<http://www.apcdouncil.org/state/map>.

If your State does not have an APCD that reflects the entire State population (see text box), you should report on data across multiple segments and data sources in order to adequately capture your target population(s), as illustrated in Figure 1 below.

Figure 1. Segments to Consider in Population-Level Surveillance of Medication Adherence

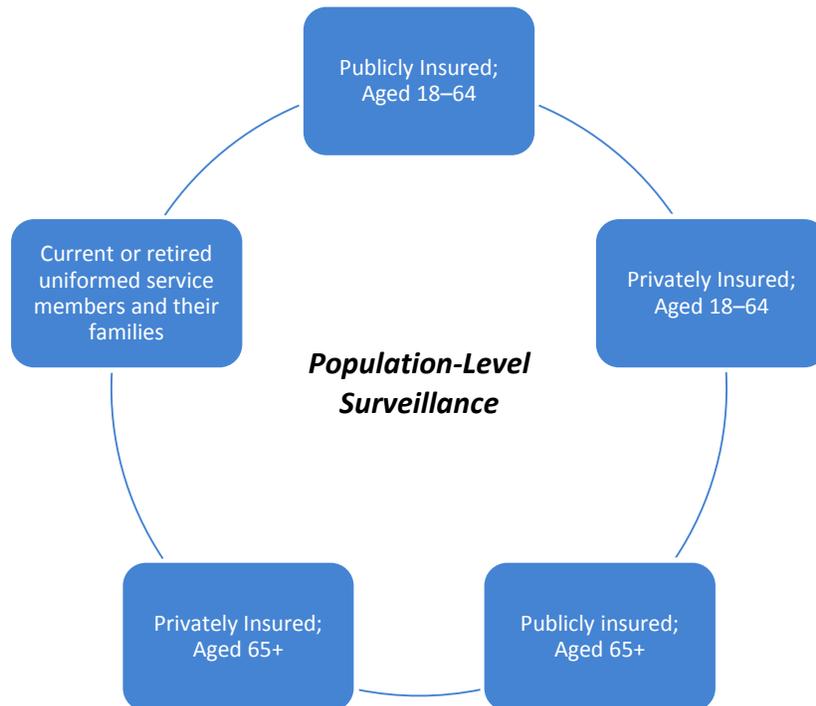


Table 1 below outlines the potential data sources for each of the population segments referenced in Figure 1. In accessing some of these data sources, you may need to use unfamiliar or new approaches to access the data (e.g., connecting with new partners). CDC understands that you may not be able to obtain data for all five population segments to report on the entire adult population. Therefore, it is appropriate to start with one population segment/data source, your intervention population, and consider adding to this as you have additional capacity, resources, or access to data on other population segments. Further, CDC understands that these data sources have limitations, as they likely contain only a portion of privately and publically insured adults and are not necessarily representative of all patients within a State.

Table 1. Data Sources by Target Population

Target Population	Data Sources	Accessing the Data Sources
Publicly insured; aged 18–64 years	Medicaid claims data	Contact the State Medicaid Program.
Privately insured; aged 18–64 years	Commercial claims data	Contact third party claim processors within the State, or third party data aggregators (e.g., IMS, Truven, CVS/Caremark, Walgreens). A cost may be associated with access to these databases or data.
Privately insured; aged 65+ years		
Publicly insured; aged 65+ years	Medicare claims data	Contact the Research Data Assistance Center (ResDAC) at http://www.resdac.org/cms-data/request/cms-data-request-center .
Current or retired uniformed service members and their families	Tricare claims data	Contact the DoD at http://www.tricare.mil/tma/privacy/hrpp/downloads/Guide%20for%20DoD%20Researchers%20on%20Using%20MHS%20Data.pdf , or contact the Defense Health Agency at http://www.tricare.mil/tma/privacy/hrpp/ , or contact local military base(s).

STEP 3: PREPARE FOR ANALYSIS

Now that you have addressed your capacity and obtained access to the data needed to calculate PDC, there are a few additional actions you should take to prepare for calculating PDC.

Obtain Statistical Analysis System (SAS) Code

You do not need to start from scratch and develop data management and analysis code for calculating PDC using statistical software packages. You can access “starter” SAS codes from the following Web site: <http://www2.sas.com/proceedings/forum2007/043-2007.pdf>.

Define a List of Antihypertensive and Antidiabetic Medications

To calculate PDC for AHMs and ADMs, you will need to define a list of drugs for inclusion in your calculation. As previously noted, you can obtain a list of AHMs and ADMs from the Senior Director of Performance Measurement at PQA (contact your CDC evaluator for more information). You may also decide to use your own list of AHMs and ADMs, or expand the list provided by PQA to include other classes of medications. If you plan to use your own drug list or a modified drug list, be sure to contact your CDC evaluator for more information on how to report this when you submit your CDC performance measures data for medication adherence.

Define the Measurement Period

Your CDC performance measures related to medication adherence should reflect a 12-month measurement period. This is defined as one calendar year, from January 1 through December 31. CDC understands that there is often a lag period between the end of the calendar year and when you are able to obtain the data to calculate PDC. The lag time may vary across States. Be sure to include the dates for the measurement period of the data when reporting to CDC. This ensures that the data can be interpreted and handled accordingly.

Obtain Data on Key Variables

Here is a list of key variables that you will need, at a minimum, in order to calculate PDC. The specific variable names and variable format may vary by the data source and/or data set that you use.

- Patient identification number (a masked patient identification number may need to be generated to ensure patient confidentiality and the analysis may need to be reviewed by an Institutional Review Board (IRB))
- National Drug Codes for AntiHypertensive Medications and AntiDiabetic Medications
- Date of prescription claim
- Days of supply for each prescription claim
- Regional identifier (to segment the population by State, county, city, or zip code)

- Date of disenrollment (if applicable)
- Date of death (if applicable)

Define Your Population (Denominator)

The following are criteria to use in defining your denominator.

- For calculating PDC for AHMs, adults are defined as persons aged 18–85 years of the last day of the measurement period. For calculating PDC for ADMs, adults are defined as persons aged 18 years and older as of the last day of the measurement period. For your CDC performance measures around medication adherence, use one calendar year, from January 1 through December 31, as your measurement period.
- Individuals must be continuously enrolled. Continuous enrollment is defined as enrollment of a beneficiary in the prescription drug benefit plan from the index prescription start date (IPSD) through the end of the measurement period, or until death or disenrollment.
- Treatment periods must be at least 90 days long, with the IPSD occurring at least 90 days before the end of the measurement period.
- **For AHMs:** Patients who filled at least two prescriptions for select AHMs on different dates of service during the treatment period. You might also consider hypertension-related diagnosis codes in your inclusion criteria (see text box for more information).
- **For ADMs:** Patients who filled at least two prescriptions for select ADMs. Patients with one or more prescriptions for insulin in the measurement period are excluded from the measure because insulin doses change frequently, making it difficult to accurately measure adherence using insulin prescription claims and the PDC method. You may also consider diabetes diagnosis codes in your inclusion criteria (see text box for more information).

Including Diagnosis Codes in Your Inclusion Criteria

Although it is not required, you may find it valuable to limit your study population/denominator to patients with specific International Classification of Diseases (ICD-9 or ICD-10) diagnosis codes. This may require you compare medical claims data (where diagnosis codes are typically included) with pharmacy claims data. The use of ADMs and AHMs like oral hypoglycemic agents and RASAs (an AHM therapeutic category that consists of angiotensin II receptor blockers [ARBs], angiotensin converting enzyme [ACE] inhibitors, and direct renin inhibitors) can generally be considered as a proxy for a diabetes or hypertension diagnosis. If you choose to include diagnosis codes in your inclusion criteria, contact your CDC evaluator for more information and resources.

Population needed to calculate PDC for AHMs

Prepare a data file containing the variables needed to calculate PDC (i.e. patient ID, NDC codes for AHMs, date of prescription claim, days of supply for prescription claim, region identifier, date of disenrollment, date of death) for all patients from the State aged 18 years or older and 85 or younger as of December 31, 20XX with at least two prescriptions for the AHM (contained within the PQA provided NDC files) on different dates between January 1, 20XX and December 31, 20XX. Exclude all patients: (1) with a gap in enrollment during this 12 month period, or (2) who did not have at least 90 days of continuous medication supply, or (3) with an IPSD

occurring after September 30, 20XX. Note: The presence of HTN diagnosis codes (i.e. ICD-9-CM codes 401–404) may be included as additional inclusion criteria.

Population needed to calculate PDC for ADMs

Prepare a data file containing the variables needed to calculate PDC (i.e. patient ID, NDC codes for ADMs, date of prescription claim, days of supply for prescription claim, region identifier, date of disenrollment, date of death) for all patients from the State aged 18 years or older of December 31, 20XX with at least two prescriptions for the ADM (contained within the PQA provided NDC files) on different dates between January 1, 20XX and December 31, 20XX.

Exclude all patients: (1) with a gap in enrollment during this 12 month period, or (2) who did not have at least 90 days of continuous medication supply, or (3) with an IPSD occurring after September 30, 20XX, or (4) with one or more prescriptions for insulin during the measurement period. Note: The presence of diabetes diagnosis codes (i.e. ICD-9-CM 250.xx) may be used as additional inclusion criteria.

STEP 4: CALCULATE PDC

Using your study population (denominator) as a base (see Step 3), calculate the number of individuals (or beneficiaries) who meet the PDC threshold for adherence (80% or greater) individually for AHMs (Renin Angiotensin System Antagonists (RASAs)) and ADMs during the 1-year measurement period by following the instructions below.

Calculate the Numerator

1. Determine the number of days in each individual's (or beneficiary's) treatment period.
2. Within the treatment period, count the days each individual (or beneficiary) was covered by at least one drug in the AHM or ADM class, based on the prescription fill dates and days of supply of each prescription.
 - If multiple prescriptions for different target medications within the RASA therapeutic category are dispensed on the same day, count the number of days covered using the prescription with the longest days of supply.
 - If multiple prescriptions for different target medications within the RASA therapeutic category are dispensed on different days with overlapping days of supply, count each day covered by a target medication only once within the treatment period. For example, if a prescription for drug A and a prescription for drug B are filled 5 days apart and each has a 30-day supply, then the total days covered are 35.
 - If multiple prescriptions for the same target medication are dispensed on the same day or different days where the days of supply overlap, adjust the prescription start date to be the day after the previous fill has ended. For example, if three prescriptions for the same target medication are dispensed on the same day, each with a 30-day supply, then a total of 90 days are covered.
 - Overlap adjustments should also occur when there is an overlap of a single target medication to a combination product (i.e., single pill that contains two [2] or more active ingredients) containing the single target medication, or when there is an overlap of one combination product with another combination product where at least one of the target medications is combined with another medication.
 - Any days of supply that extend beyond the end of the measurement period are not included when calculating the total number of days covered.

Using the NDC List

The NDC list, provided by PQA, includes flags for each target medication within the medication classes. The flags will help determine whether the prescription includes the same or different target medication.

Calculate PDC

3. Divide the number of covered days found in Step 2 by the number of days found in Step 1 of this list. Multiply this number by 100 to obtain the PDC (as a percentage) for each individual (or beneficiary).
4. Count the number of patients who had a PDC greater than or equal to 80%.

STEP 5: REPORT RESULTS

By completing the following tables you will have all of the information necessary to report on the CDC performance measures around medication adherence. Use these tables to organize your data. Only the “Total” row and the “CDC Results Statement,” highlighted in Table 3 below, should be reported. When you report the data in the CDC performance monitoring system, include a summary of noteworthy data comments (e.g., data source, time period, and deviations from procedures outlined in this document).

Beneficiary Disposition Table by Data Source for Each Unique Population Segment

Complete Table 2 for each population segment in your data (see Figure 1 on page 5 for more information on population segments).

Table 2: Beneficiary Disposition for [Insert Population Segment] (Month 1–Month 31, 20XX)

Eligibility Criteria	#
1. Total patient population during the 12-month measurement period who were enrolled in a prescription drug benefit plan.	
2. Patient population who meet age eligibility criteria (ages 18–85 years) for population on the last day of the treatment period. The treatment period is a period of time that starts at IPSD and ends when the measurement period ends. The treatment period must be at least 90 days long to be included in the measure (i.e., the IPSD was on or before September 30 of a calendar year).	
3. Patient population who meet the continuous enrollment criteria during treatment period.	†
4. Patient population with >90 day treatment period.	
5. Patient population with at least 2 prescription claims (fills) for <i>AHMs</i> on different dates of service during the treatment period. Or Patient population with at least 2 prescription claims (fills) for <i>ADMs</i> on different dates of service during the treatment period.	‡

†Equals the number of beneficiaries represented by the data source and can be used to demonstrate the coverage of the data source within the targeted community. This value is also reported in Table 3.

‡Equals the number of beneficiaries included in the PDC measure. *Note:* Each number in the table above is calculated from the number on the previous line. This final number (i.e., line 5) is used as the denominator for the PDC calculation in Table 2A2, and it represents the total population segment study population.

PDC Table

To complete the next set of tables, follow the guidance presented in Step 5.

Table 3: Proportion of Days Covered (Month 1–Month 31, 20XX)

Population Segment ^a	Data Source/Payer ^a (Examples shown below)	Beneficiaries represented by data source ^b	Beneficiaries included in PDC measure ^c	Beneficiaries with PDC \geq 80% ^d	Percent Adherent ^e
Ages 18–64; Public insurance	State Medicaid Program	†	‡		
	APCD				
Ages 18–64; Private insurance	APCD				
	Other				
Ages \geq 65; Medicare	Medicare Part D				
	APCD				
Ages \geq 65; Private insurance	APCD				
	Other				
Uniformed service members & families	TriCare				
	Other				
Other ^f	Other				
	Other				
Total	Combined		Report # to CDC ^g	Report # to CDC ^g	Weighted ^h
CDC Results Statement ⁱ	In the State of _____, CDC funded grantees worked to increase from ____% to ____% the proportion of adult patients in adherence to antihypertensive medication regimes. This represents an increase of ____% over the funding period.				

^aFor illustration purposes only; the actual number of population segments and databases used will depend on the number of unique population segments and the number of databases used to calculate PDC. Analysts should insert lines if additional population segments and/or data sources are available.

^bNumber of beneficiaries covered by data source during the reporting period.

^cNumber of beneficiaries included in the PDC calculation for this data source.

^dNumber of beneficiaries with a PDC \geq 80%.

^eBeneficiaries with a PDC \geq 80% divided by beneficiaries included in PDC measure.

^fIf you are using an APCD and are unable to determine values for individual population segments, you can insert the data in this category.

^gThese numbers must be reported to CDC per reporting expectations.

^hCDC will calculate the weighted adherence value by dividing the aggregate beneficiaries with a PDC \geq 80% by the aggregate beneficiaries included in the PDC measure.

ⁱThe result statement is provided for illustration only. CDC will complete this result statement based on data provided by each State. If the population the State is reporting on changes considerably over time, CDC may use the population segment values rather than the combined values to assess for trends in adherence.

NEXT STEPS

Calculating baseline medication adherence values (PDC) should assist you in achieving the goal of increasing the proportion of adult patients who are adherent to their medication regimens for your initial target population (while you expand the population to be representative of your State population over the course of the funding period). These values should also support your quality improvement efforts, as well as the development and implementation of interventions to improve medication adherence.

Now that you have a baseline medication adherence value (PDC), the next step is to develop an action plan that involves the implementation of quality improvement processes, team-based care, and increased engagement with community health workers and community pharmacists to encourage self-management and medication adherence. Contact your CDC project officer to discuss how you might use your baseline PDC value to take action to improve medication adherence at the population and individual patient levels.

REFERENCES

1. Adherence to Long Term Therapies: Evidence for Action. Geneva; World Health Organization; 2003.
2. Sokol MC, McGuigan KA, Verbrugge RR, Epstein RS. Impact of medication adherence on hospitalization risk and healthcare cost. *Med Care*. 2005; 43: 521-530.
3. Choudhry NK. The Epidemic of medication non-adherence and its implications for cardiovascular risk reduction. *JGIM*. 2008; 23:216-218.
4. Bosworth HB, et al. Medication Adherence: A Call for Action. *Am Heart J*. 2011; 162: 412-24.
5. Bitton A, Choudhry NK, Matlin OS, Swanton K, Shrank WH. The impact of medication adherence on coronary artery disease costs and outcomes. *Am J Med*. 2013; 126: 257.e7-357.e27.
6. Chisholm-Burns MA, Spivey CA. The 'cost' of medication nonadherence: consequences we cannot afford to accept. *J Am Pharm Assoc*. 2012; 52(6):823-6. doi: 10.1331/JAPhA.2012.11088.
7. Iuga AO, McGuire MJ. Adherence and health care costs. *Risk Manag Healthc Policy*. 2014; 7: 35–44.
8. Pharmacy Quality Alliance (PQA). www.pqaalliance.org. Accessed February 17, 2015.
9. Centers for Medicare and Medicaid Services (CMS). <http://www.cms.gov/Medicare/Prescription-Drug-coverage/PrescriptionDrugCovGenIn/PerformanceData.html>. Accessed February 17, 2015.
10. American Diabetic Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2014;37(Suppl 1):S81–90.

APPENDIX A: LIST OF ACRONYMS AND GLOSSARY

Relevant Acronyms

ACE	Angiotensin converting enzyme	IPSD	Index prescription start date
ADM	Antidiabetic medication	MA	Medicare Advantage
AHM	Antihypertensive medication	NDC	National Drug Code
APCD	All Payer Claims Dataset	PDC	Proportion of days covered
ARB	Angiotensin II receptor blocker	PQA	Pharmacy Quality Alliance
CMS	Centers for Medicare and Medicaid Services	NQF	National Quality Forum
DBP	Diastolic blood pressure	RASA	Renin Angiotensin System Antagonist
DoD	Department of Defense	ResDAC	Research Data Assistance Center
HD	Health Department	SAS	Statistical Analysis System
ICD	International Classification of Diseases	SBP	Systolic blood pressure

Glossary

Adherence Measure Adherence is defined for this performance measure using the PDC methodology, which has been endorsed by the Pharmacy Quality Alliance (PQA) and National Quality Forum.

Adults For calculating PDC for antihypertensive medications, adults are defined as persons aged 18–85 years. For calculating PDC for antidiabetic medications, adults are defined as persons aged 18 years and older.

Antidiabetic Medication (ADM) Use Patients who filled at least two prescriptions for select antidiabetic medications (ADMs). Patients with one or more prescriptions for insulin in the treatment period are excluded from the measure.

Antihypertensive Medication (AHM) Use	At least two (2) fills for either the same antihypertensive medication(s) in the same drug therapeutic category (e.g., RASA) on different dates of service during the one (1)-year measurement period. The initial fill should be made on or before September 30 for the patient to be included in the measure.
Beneficiary	A person enrolled in a prescription drug benefit plan.
Continuous Enrollment	Enrollment of a beneficiary in the prescription drug benefit plan from the index prescription start date through the end of the measurement period, or until death or disenrollment.
Covered Period	The number of days during the eligibility period that a patient had antihypertensive medication available to them.
Days of Supply	The number of days before a prescription would need to be refilled. Days of supply is a data element from the prescription claims file.
Diabetes	A disease in which blood glucose levels are above normal. If using administrative claims data, diabetes is defined as a patient having an <i>International Classification of Disease, Ninth Revision, Clinical Modification</i> (ICD-9-CM) code of 250.xx during one or more of their health system visits. This equates to <i>ICD, Tenth Revision</i> (ICD-10) codes of E11.xx.
Hypertension	A disease in which a person’s blood pressure is above normal. If using administrative claims data, hypertension is defined as a patient having an ICD-9-CM code of 401–404 during one or more of their health system visits. This equates to ICD-10 codes of I10–I13. The ICD-9-CM code of 405 (ICD-10: I15) is excluded, because it represents secondary hypertension.
Index Prescription Start Date (IPSD)	The earliest prescription dispensing date for the target medication from January 1 through September 30 of the measurement year.

International Classification of Diseases	<p>The International Classification of Diseases (ICD) is designed to promote international comparability in the collection, processing, classification, and presentation of mortality statistics.</p> <ul style="list-style-type: none"> • Additional information about the International Classification of Diseases, Ninth Revision (ICD-9) is available at: http://www.cdc.gov/nchs/icd/icd9.htm. • Additional information about the International Classification of Diseases, Tenth Revision (ICD-10) is available at: http://www.cdc.gov/nchs/icd/icd10.htm
Measurement Period	One calendar year, from January 1 through December 31.
Medication Adherence	Patients who take their medication as prescribed by their health care provider. Medication adherence can further be distinguished as primary adherence (i.e., prescription initially filled within a specified time period) and secondary adherence (i.e., prescription refilled within a specified time period). This performance measure is focused on secondary adherence.
National Drug Code (NDC)	A universal product identifier for drugs. The Federal Drug Administration (FDA) publishes the listed NDC numbers and the information submitted as part of the listing information in the NDC Directory, which is updated daily and available at: (http://www.fda.gov/Drugs/InformationOnDrugs/ucm142438.htm).
Prescription claims	Only paid, non-reversed prescription claims are included in the data set to calculate the measure.
Primary Adherence	Prescription is initially filled within a specified time period.
Proportion of Days Covered (PDC)	The proportion of days in the eligibility period “covered” by prescription claims for the same medication or another in its therapeutic category (e.g., RASA).
Proportion of Days Covered (PDC) Threshold	The PDC level above which the medication has a reasonable likelihood of achieving most of the potential clinical benefit (e.g., 80% for AHMs).
Renin Angiotensin System Antagonists (RASA)	This antihypertensive medication therapeutic category consists of angiotensin II receptor blockers (ARBs), angiotensin converting enzyme (ACE) inhibitors, and direct renin inhibitors.
Secondary Adherence	Prescription is refilled within a specified time period.

Statistical Analysis System (SAS)	A suite of software that can mine, alter, manage, and retrieve data from a variety of sources; the software can also perform statistical analyses on the data.
Target Medication	The medication (in the form of its generic ingredient used to treat hypertension or diabetes) being assessed using the PDC calculation.
Treatment Period	A period of time that starts at the index prescription start date (IPSD) and ends when the measurement period ends. The treatment period must be at least 90 days long to be included in the measure (i.e., the IPSD was on or before September 30 of a calendar year).