HHS Public Access

Author manuscript

Am J Manag Care. Author manuscript; available in PMC 2015 April 21.

Published in final edited form as:

Am J Manag Care. 2015 February ; 21(2): 119–128.

Did Medicare Part D Reduce Disparities?

Julie Zissimopoulos, Ph.D.[1], **Geoffrey F. Joyce, Ph.D.**[2], **Lauren M. Scarpati, M.A.**[3], and **Dana P. Goldman, Ph.D.**[4]

Julie Zissimopoulos: zissimop@usc.edu; Geoffrey F. Joyce: gjoyce@usc.edu; Lauren M. Scarpati: scarpati@usc.edu; Dana P. Goldman: dpgoldma@usc.edu

[1]Assistant Professor and Associate Director, Schaeffer Center for Health Policy and Economics, University of Southern California, Verna & Peter Dauterive Hall (VPD) 635 Downey Way Los Angeles, CA 90089-3333. Tel: 213-821-7947; Fax: 213-740-3460

[2]Associate Professor and Director of Health Policy, Schaeffer Center for Health Policy and Economics, University of Southern California, Verna & Peter Dauterive Hall (VPD) 635 Downey Way Los Angeles, CA 90089-3333

[3]Doctoral Student in Economics, Schaeffer Center for Health Policy and Economics, University of Southern California, Verna & Peter Dauterive Hall (VPD) 635 Downey Way Los Angeles, CA 90089-3333

[4]Schaeffer Chair and Director, Schaeffer Center for Health Policy and Economics, University of Southern California, Verna & Peter Dauterive Hall (VPD) 635 Downey Way Los Angeles, CA 90089-3333

Abstract

Objective—We assessed whether Medicare Part D reduced disparities in access to medication.

Study Design—Secondary data analysis of a twenty percent sample of Medicare beneficiaries, using Parts A and B medical claims from 2002–2008 and Part D drug claims from 2006–2008.

Methods—We analyzed medication use of Hispanics, blacks and whites beneficiaries with diabetes before and after reaching the Part D coverage gap, and compared it to race-specific reference groups not exposed to the loss in coverage. Unadjusted difference-indifference results were validated with multivariate regression models adjusted for demographics, comorbidities, and ZIP code-level household income used as a proxy for socioeconomic status.

Role of the Sponsors: The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript.

Conflicts of Interest: None of the authors have any relevant conflicts of interest.

Author Contributions: Drs. Joyce and Zissimopoulos had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Zissimopoulos, Joyce
Acquisition of data: Zissimopoulos, Joyce, Goldman
Analysis and interpretation of data: Zissimopoulos, Joyce, Scarpati, Goldman
Drafting of manuscript: Zissimopoulos, Joyce, Scarpati
Critical revision of the manuscript for important intellectual content: Zissimopoulos, Joyce, Scarpati
Statistical expertise: Zissimopoulos, Joyce, Scarpati
Obtained funding: Joyce, Goldman
Supervision: Zissimopoulos, Joyce, Goldman

Results—The rate at which Hispanics reduced use of diabetes-related medications in the coverage gap was twice as high as whites, while blacks decreased use of diabetes-related medications by thirty-three percent more than whites. The reduction in medication use was correlated with drug price. Hispanics and blacks were more likely than whites to discontinue a therapy after reaching the coverage gap but more likely to resume once coverage restarted. Hispanics without subsidies and living in low income areas reduced medication use more than similar blacks and whites in the coverage gap.

Conclusions—We find that the Part D coverage gap is particularly disruptive to minorities and those living in low-income areas. The implications of this work suggest that protecting the health of vulnerable groups requires more than premium subsidies. Patient education may be a first step, but more substantive improvements in adherence may require changes in health care delivery.

Keywords

Medicare Part D; minorities; coverage gap; prescription drugs; medication adherence

INTRODUCTION

The primary objective of the Medicare Prescription Drug, Improvement, and Modernization Act (MMA) was to provide seniors with affordable coverage for their prescription medications through the new Medicare Part D prescription drug benefit. This aim has largely been achieved, as more than 35 million Medicare beneficiaries are now enrolled in Part D plans, and approximately 9 out of 10 report being satisfied with their plan.[1] While Part D has reduced the financial burden of prescription drug spending for beneficiaries, particularly those with low incomes or extraordinarily high out-of-pocket drug expenses, its gap in coverage may have induced beneficiaries to change their use of medications or discontinue use of an effective therapy altogether.

The Part D benefit has a well-known gap in coverage commonly referred to as the "doughnut hole." Under the standard benefit, beneficiaries not receiving subsidies face a deductible, followed by a 25% co-insurance rate. But once they have spent up to a designated level on medications in a year ($2,850 in 2014), they must start paying the full price of their drugs. Only after a beneficiary reaches the "catastrophic" limit in out-of-pocket spending does coverage resume with minimal cost-sharing thereafter. This nonlinear design is more complicated than a simple increase in patient cost-sharing, for it alters both the current and future price of a drug. Once a non-subsidized beneficiary (non-LIS) reaches the coverage gap, each prescription he fills is likely to cost more. Yet at the same time, each fill increases the likelihood of reaching the catastrophic threshold, which lowers the expected price of future prescriptions that year. Further, any price change in the gap is temporary since benefits reset at the beginning of the next calendar year. How beneficiaries, particularly those with low levels of education and resources, respond to changes in coverage over the course of the year is largely unknown.

Recent work finds that the Part D coverage gap reduces beneficiaries use of essential medications,[2] but does not examine the differential responses of minorities and the near-poor who do not qualify for federal subsidies. Racial and ethnic minorities have higher rates

of chronic illness than non-minorities, and lower socioeconomic status (SES) groups are less able to manage complex treatment regimens often required in managing a disease.[3] Indeed, black and Hispanic enrollees report greater difficulty obtaining information and purchasing needed medications in Part D.[4]

In this paper, we examine the effects of cycling in and out of coverage on the prescription drug use of racial and ethnic minorities and other vulnerable subgroups of Medicare beneficiaries. We compare changes in prescription drug use of white, black and Hispanic beneficiaries before and after reaching the coverage gap for two different groups of beneficiaries: (1) those eligible for the full low-income subsidy (LIS) who face minimal cost sharing and thus unaffected by the coverage gap; and (2) non-subsidized beneficiaries who pay the full cost of medications in the coverage gap (non-LIS). We estimate changes in medication use after reaching the gap separately by race. We focus on beneficiaries with diabetes because it disproportionately affects ethnic minorities and is a major risk factor for a wide range of other health conditions. If the gap is prompting beneficiaries to use pharmaceuticals differently—especially if it leads them to discontinue an effective therapy —it should be evident in this sample.

STUDY DATA AND METHODS

Data

We used a twenty percent random sample of Medicare beneficiaries enrolled in Part D. This dataset links enrollment and Parts A and B claims for traditional fee-for-service Medicare enrollees (2002–2008) to Part D claims (2006–2008). The Part A data include information about inpatient hospital stays, including length of stay, diagnosis-related group (DRG), department-specific charges, and up to ten individual procedure codes and diagnostic codes. Part B information includes claims submitted by physicians, and other health care providers and facilities for services reimbursed by Part B. Each claim contains diagnostic (ICD-9-CM) and procedure (CPT-4) codes, dates of service, demographic information on beneficiaries, and a physician identification number.

The pharmacy data include all of the key elements related to prescription drug events (e.g., drug name; National Drug Code (NDC); dosage; supply; date of service). Each pharmacy claim includes the amount of the low-income subsidy; the true out-of-pocket amount; and a field that indicated in which benefit phase a claim was made: deductible, pre-coverage gap, coverage gap, or catastrophic phase (or whether the claim straddles two of these phases). The Part D data identify the exact date that non-LIS beneficiaries entered and exited the coverage gap, as well as when LIS beneficiaries -- not subject to the gap -- reach the same levels of prescription drug spending associated with entrance into and exit from the gap.

The denominator file contains demographic information about each beneficiary including date of birth, gender, beneficiary type (e.g., recipient of the low-income subsidy), and zip code of residence. We linked five-digit zip codes to the American Community Survey (ACS) to measure neighborhood socioeconomic status, including education (level of schooling attained) and median household income in the beneficiaries' ZIP code. The Medicare data also include externally validated measures of race/ethnicity. Self-reported

measures on race/ethnicity are refined using Research Triangle Institute estimates based on geography and first and last names.

Sample

The study sample consisted of Medicare beneficiaries aged 65 and older with diabetes. Persons with diabetes commonly take medications for glycemic control, hypertension, and dyslipidemia, and proper medication adherence is associated with large reductions in both macro and microvascular complications. Clinical trials consistently show that complications from this disease can be avoided or deferred with tight glycemic control.[3,5] We identified beneficiaries with diabetes based on at least one inpatient or skilled nursing facility diagnosis, or two or more outpatient diagnoses of diabetes. We also assumed that a beneficiary with a Part D claim for insulin has diabetes. Once identified, beneficiaries were assumed to have diabetes in subsequent years.

We restricted our analysis to those enrolled in traditional fee-for-service Medicare and a stand-alone Part D drug plan (PDP). Individuals were required to have the same Part D contract/plan for the entire year. Our sample included two groups of beneficiaries: those receiving the full low-income subsidy (LIS) and those not receiving any type of subsidy (non-LIS) and had no gap coverage. LIS beneficiaries do not pay Part D premiums and face minimal cost-sharing throughout the year. As a result, they are *not* subject to the coverage gap even when their level of drug spending reached the coverage gap threshold (e.g., $2,250 in 2006) and should not change their medication use before and after reaching the various (hypothetical) coverage thresholds. We used the LIS as controls and compared their medication use before and after reaching the gap to that of non-LIS beneficiaries, who face vastly different prices over the course of the year and spending distribution.

Given that 2006 was the initial year of the program and that beneficiaries could enroll up to May 15th, we restricted our analyses to 2007 and 2008. Nonetheless, we used the 2006 data for risk adjustment, categorization of beneficiaries, and to compute medication use in 2007 for medications initiated in 2006 or earlier. In 2007, the study sample included 557,756 beneficiaries: 416,495 whites, 69,947 blacks, and 71,314 Hispanics.

Statistical Analysis

Our strategy was to estimate the difference in medication use before and after the coverage gap for a treatment (non-LIS) and control group (LIS), by drug class and race/ethnicity. We estimated race-specific changes in medication use before and after reaching the coverage gap for the non-LIS, and benchmarked these changes to race-specific changes in the medication use of LIS beneficiaries at similar levels of drug spending, i.e. before and after reaching the “hypothetical” threshold of the coverage gap. We used multivariate regression to control for the variation in demographic and socioeconomic characteristics, and interacted binary indicators for each beneficiary group (LIS/non-LIS) with race/ethnicity. Standard errors were clustered at the individual level and computed using bootstrapping.

Our key outcome measure was medication adherence. We measured adherence using the Medication Possession Ratio (MPR), which is the fraction of days that a patient “possesses”

or has access to medication, as measured by prescription fills. For example, a patient who filled a thirty-day script on April 1st and refilled the prescription on May 10th would have an MPR of 75% for that period, since they possessed thirty pills over a forty-day span. For each drug class, we computed the total days' supply of medications before and after reaching the coverage gap to compute the percentage of compliant days for each individual in the sample. The remaining days' supply at the end of one year was carried over to the subsequent year. We estimated changes in the rate of medication use (MPR) overall and by therapeutic class, as well as the proportion of all prescriptions dispensed as generic (generic dispensing rate, GDR).

We also examined the fraction of white, black and Hispanic beneficiaries who stopped using a class of medication after reaching the gap, and the fraction that resumed use in the first 90 days of the next year. Discontinuation was measured by comparing medication use within a therapeutic class in the 90 days prior to a beneficiary's gap entry date and after reaching the gap. For example, a beneficiary observed taking an oral hypoglycemic, an antihypertensive, and a statin before reaching the gap, but only an oral hypoglycemic and an antihypertensive after entering the gap (for the remainder of the year) would be categorized as having discontinued one medication within the relevant classes. We also examined the extent to which beneficiaries switched medications after reaching the gap (from brand to generic), for classes that were neither brand- nor generic-dominated.

We measured changes in medication use for the nine most prevalent drug classes used to treat diabetes and its comorbidities (diabetes-related medications) and the nine most common classes used by these beneficiaries for other conditions (nondiabetes-related). Diabetes-related classes include: oral hypoglycemic agents, ACE inhibitors, calcium channel blockers, diuretics, beta blockers, angiotensin II receptor blockers (ARBs), statins, loop diuretics, digitalis glycosides, and combination antihypertensives. ACE inhibitors and ARBs are combined into a single class because they are commonly considered therapeutically interchangeable. The set of other drugs consists of the nine most prevalent nondiabetes-related classes used by this set of beneficiaries: antidepressants, antipsychotics, central nervous system (CNS) medications (the majority of which are Alzheimer's medications like Aricept, Namenda, and Razadyne, and Lyrica, which treats nerve and muscle pain), antiasthmatics, platelet aggregation inhibitors (e.g., Plavix), antiulcerants, anticonvulsants, opioid analgesics, and hormones/synthetics/modifiers. Using both diabetes-related and nondiabetes-related medications allowed us to examine whether beneficiaries with diabetes are more or less price sensitive for their disease-specific medications. In some analyses, we report the average price of a 30-day supply of the drugs in each class; these prices were derived empirically from the data.

We used estimates from multivariate regression models to predict the change in medication use by race/ethnicity, for diabetes and nondiabetes-related classes. The models controlled for health status using binary indicators for the most common comorbid conditions based on ICD-9 diagnostic codes in the medical claims. These included twenty conditions defined in the Chronic Conditions Warehouse (CCW), as well as hypertension, hyperlipidemia, asthma, gastro-intestinal disorders. We also adjusted for age, age-squared, gender, time indicators, and ZIP code-level measures of income.

Finally, we compared changes in medication use for LIS and non-LIS beneficiaries living in low-income areas to understand the relationship between changes in medication use and income effects proxied by the median household income in a beneficiary's zip code. We defined the "near-poor" as white, black and Hispanic beneficiaries who resided in zip codes with a median household income below $25,000 (the bottom income quartile of the sample of non-LIS beneficiaries).

STUDY RESULTS

Table 1 shows the characteristics of the study sample by race/ethnicity and beneficiary group. White beneficiaries were least likely and Hispanics were most likely to receive the full low-income subsidy: more than 80 percent of Hispanics and less than 30 percent of whites were categorized as LIS. White beneficiaries had more years of schooling and higher incomes than Hispanics and blacks. Regardless of race/ethnicity, the LIS were more likely to be female and have low SES compared to non-LIS.

Although prescription drug use differed widely by race/ethnicity, it did not differ by beneficiary group (Table 1) before the gap. For example, both LIS and non-LIS whites took their medications about 80% of the time before the coverage gap level of spending. More generally, pre-gap adherence was lowest among Hispanics and changed more dramatically after reaching the coverage gap. Adherence among non-LIS Hispanics declined by 10 percentage points (from 73% to 63%) before and after reaching the coverage gap compared to just 2 percentage points for whites (76% to 74%).

Because LIS beneficiaries are in worse health than the non-LIS and face minimal cost-sharing for their medications, they are much more likely to reach the coverage gap threshold and reach it earlier in the year than non-LIS beneficiaries. However, within beneficiary groups, white, black and Hispanics reached the coverage gap level of spending at about the same time (late August to early September). Thus average duration in the gap was about 4 months for those that did not reach the catastrophic threshold.

Multivariate Findings

Figure 1 displays the percentage point change in medication use of non-LIS relative to LIS before and after the coverage gap. We present results by race/ethnicity, adjusting for demographic, health and socioeconomic characteristics. The top panel displays changes in medication use across nine diabetes-related classes and the bottom panel for nondiabetes-related classes. Drug classes are ordered from lowest to highest average price to highlight the correlation between adherence and out-of-pocket costs during the coverage gap. For example, use of statins ($65/mo) declined by 9 percentage points (pp) during the coverage gap among non-LIS Hispanics (relative to LIS Hispanics). In practical terms, these changes imply that non-LIS Hispanics took their statins as prescribed 63% of the time after reaching the gap, compared to 72% prior to reaching the gap (tables available upon request). Corresponding figures for blacks and whites are 7pp and 5pp, respectively.

For the nine diabetes-related drug classes combined, medication use in the gap declined by 6pp for Hispanics, 4pp for blacks and 3pp for whites. We found a similar pattern in the use

of nondiabetes-related medications. Over these nine classes, use in the coverage gap declined by 9pp for Hispanics, 8pp for blacks and 6pp for whites. The differential changes in medication use were even larger in percentage terms (as opposed to percentage points) due to racial/ethnic differences in baseline levels of adherence (see Supplemental Figures).

In addition to racial differences, Figure 1 also highlights the correlation between adherence and price. Use of costly, brand-dominant classes such as antipsychotics ($213), antiplatelets ($123) and antiulcerants ($108) declined more sharply than use of less expensive medications such as beta blockers ($27) and diuretics ($8). For example, use of antipsychotics dropped by 8pp for whites, 10pp for blacks, and 9pp for Hispanics, while use of less costly diuretics decreased by 4pp for both whites and blacks and 2pp for Hispanics.

Reduced medication use can reflect different behavioral responses to the coverage gap, such as stretching a prescription over more days (e.g., pill-splitting) or stopping a medication altogether. Table 2 shows differential rates of stopping and later resuming drug therapies, by race/ethnicity. A higher percentage of non-LIS beneficiaries discontinued use of diabetes-related and nondiabetes-related medications after reaching the coverage gap compared to the LIS, and a larger fraction resumed use in the next year once coverage resumed. Discontinuing use was most common among Hispanics, who stopped and resumed at two to three times the rate of blacks and whites. For example, an additional 6.7% of non-LIS Hispanics discontinued a class of diabetes-related medication after reaching the coverage gap relative to LIS Hispanics (compared to 4.1% of blacks and 2.4% of whites). Among those who stopped, an additional 12.5% of the non-LIS Hispanics (relative to the LIS Hispanics) resumed use in the first quarter of the next year (versus 6.7% of whites and 5.9% of blacks).

While overall medication use declined in the coverage gap, the fraction of drugs dispensed as generic increased modestly. Figure 2 shows race-specific changes in the use of generic drugs after reaching the coverage gap for diabetes-related and nondiabetes-related classes, relative to the LIS. Among the nine diabetes-related classes, generic use increased 2 to 3 percentage points in the coverage gap for each race/ethnicity. We found similar effects among the nondiabetes-related classes, but the difference was only statistically significant for whites.

Given that race/ethnicity is correlated with income, we re-estimated the models including median household income in the beneficiary’s zip code, and then predicted medication use in the coverage gap by race/ethnicity, holding household income constant at $25,000. For the nine diabetes-related classes combined, low-income Hispanics decreased medication use by 9 percentage points in the gap relative to Hispanics receiving the low-income subsidy, a larger effect than that of Hispanics overall (6pp, Figure 1). Further, the effects were larger in more expensive classes. By contrast, the reduction in medication use among lower income blacks (5pp) and whites (3pp) was similar to that of blacks (4pp) and whites (3pp) overall (Figure 1).

DISCUSSION

Our findings suggest that the Part D coverage gap is disruptive to drug therapy, particularly for minorities and those who live in lower-income areas but do not receive subsidies. Older, unsubsidized Hispanics with diabetes reduced their use of diabetes-related medications by 6 percentage points during the coverage gap, compared to 4 percentage points for blacks and 3 percentage points for whites. The reduction in medication use reflected higher rates of medication discontinuation and only a fraction of patients who discontinued use in the coverage gap re-initiated therapy once coverage resumed the next year.

A large body of literature has demonstrated that out-of-pocket costs affect adherence.[6–9] Yet, since most claims-based datasets do not contain information on race or ethnicity, this research has been silent as to whether minorities are more sensitive to the cost of prescription drugs than non-minorities. Our research begins to fill that gap. What remains unclear however, is *why* Hispanic and black beneficiaries have a stronger response to changes in the price of medication. Older minorities may perceive drug therapies as less efficacious or essential in the treatment of chronic disease[10] and thus may be more likely to discontinue use when out-of-pocket costs increase suddenly or exceed some threshold.[11] We found a strong relationship between the price of the drug and the response to the coverage gap. Declines in medication use were larger in drug classes costing more than $60 per month. Other studies have shown that racial/ethnic minorities are more adversely affected by cost-related non-adherence and have poorer overall adherence to medication in Medicare Part D.[12–16] Unlike a change in copayment, the coverage gap is temporary and two-fold: it increases the current out-of-pocket cost of medication, while simultaneously lowering the expected future out-of-pocket cost of a drug if the beneficiary reaches the catastrophic threshold.

Changes in drug benefits have been associated with substantial morbidity and mortality in certain high-risk populations.[18–22] Reductions in medication use as a result of the Part D coverage gap raise concerns about deleterious health effects that may manifest over time. Mitigating some of this concern is the relatively short length of time most beneficiaries spend in the coverage gap. The median beneficiary is only subject to the gap for 3–4 months. Behavioral responses to the coverage gap may also mitigate potential health effects. Black, white and Hispanic beneficiaries increased their use of generic medications after reaching the coverage gap, and switched to more generous plans the next year (see Supplemental Materials). While minorities were more likely to stop taking a medication after reaching the gap than white beneficiaries, they were also more likely to resume therapy once coverage restarted in January.

Our study has several limitations. First, our proxy for socioeconomic status did not fully account for the variation by race and ethnicity in adherence in the coverage gap. While near-poor Hispanics decreased medication use in the gap more than higher income Hispanics, income had little impact on the response of white and blacks to the coverage gap. Since our income measure is at the zip code level we are unable to perfectly disentangle the effect of socioeconomic status from race. Previous work using similar SES data found that

individuals living in lower-income areas were more price sensitive than their higher-income counterparts.[23]

Second, beneficiaries receiving the full low-income subsidy (LIS) were obviously poorer, and more likely to be female, non-white, and sicker on average than the non-LIS. Our results may be biased if the LIS also differ in unobserved ways that make them an inappropriate control group. Two points mitigate these concerns. First, the LIS had a constant level of prescription drug use before and after the coverage gap, which is consistent with them being unaffected by the gap. Further, our empirical approach compared medication use before and after the coverage gap within beneficiary group and race/ethnicity, thereby using each group as its own control.

Third, we identified the chronically ill from claims data. The main concern with this approach is false positives if “rule-out” diagnoses are recorded on the claims. We tried to minimize this error by restricting our analysis to users of disease-specific drugs, requiring multiple physician visits or hospitalizations for the condition, and exploiting a long panel of Parts A and B claims (2002–2008). The use of claims data also obscures the level of disease severity, but this potential bias is also minimized by the difference-indifferences strategy.

Lastly, our results may overstate the impact of the coverage gap on prescription drug use if beneficiaries obtained free samples from their providers or paid for medications in cash at discount outlets after reaching the gap. [24] An increasing number of retail pharmacies (e.g., Wal-Mart, Target) sell a broad range of generic drugs for $4 per prescription. While there is little empirical data on the extent of this behavior, a pre-Part D study found that 6% of enrollees in a Kaiser Permanente Medicare Advantage plan purchased prescriptions outside of their plan after reaching the annual benefit limit.[25] We observed a substantial and rapidly increasing number of $4 claims in the Part D data, thus the extent of bias from uncaptured claims is likely to be small. Further, since entry into the catastrophic phase was based on accumulating out-of-pocket expenses, beneficiaries had an incentive to purchase all of their medications -- even $4 scripts -- through the Part D program.

Although the coverage gap is being phased out under the Affordable Care Act (ACA), beneficiaries will continue to face a break in coverage until 2020. In addition, like Part D, the ACA continues the trend toward “consumer-directed” health care. While compelling patients to take a more active role in choosing a plan and managing their health care is generally positive, protecting vulnerable groups in the health care marketplace requires more than just premium subsidies. Patient education is a first step, but more substantive improvements in adherence will require changes in health care delivery. The shift from a fee-for-service model to bundled payments under the ACA will reward providers for better patient outcomes, of which medication adherence is critical. Similarly, new investments in health information technology will allow more providers and health plans to contact patients who do not fill or refill a prescription on a timely basis and discuss with them the reasons behind their decision, and allow them intervene when applicable. While the success of these types of changes have not been demonstrated, it is difficult to imagine that targeted interventions would not be cost-beneficial given the clinical and financial consequences of poor adherence among older beneficiaries with chronic diseases.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Funding/Support: This research was supported by the National Institutes of Health and National Institute on Aging (NIH/NIA R01-AG-29514, NIH/NIA P01 AG33559-01A1, NIH 1 RC4 AG039036-01, and RCMAR Grant P30AG043073).

References

1. KRC Research. KRC Research. KRC Research. Seniors' Opinions About Medicare Rx: Sixth Year Update. Washington, DC: KRC Research; 2011.
2. Joyce GF, Zissimopoulos J, Goldman DP. Digesting the doughnut hole. J Health Econ. 2013
3. Goldman DP, Smith JP. Can patient self-management help explain the SES health gradient? Proc Natl Acad Sci U S A. 2002; 99(16):10929–10934. [PubMed: 12140364]
4. Haviland AM, Elliott MN, Weech-Maldonado R, Hambarsoomian K, Orr N, Hays RD. Racial/ethnic disparities in Medicare Part D experiences. Med Care. 2012; 50:S40–S47. [PubMed: 23064276]
5. Group TDCaCTR. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. New Engl J Med. 1993; 329(14): 977–986. [PubMed: 8366922]
6. Joyce GF, Escarce JJ, Solomon MD, Goldman DP. Employer drug benefit plans and spending on prescription drugs. JAMA. 2002; 288(14):1733–1739. [PubMed: 12365957]
7. Goldman DP, Joyce GF, Escarce JJ, et al. Pharmacy benefits and the use of drugs by the chronically ill. JAMA. 2004; 291(19):2344–2350. [PubMed: 15150206]
8. Goldman DP, Joyce GF, Zheng Y. Prescription drug cost sharing. JAMA. 2007; 298(1):61–69. [PubMed: 17609491]
9. Huskamp HA, Deverka PA, Epstein AM, Epstein RS, McGuigan KA, Frank RG. The effect of incentive-based formularies on prescription-drug utilization and spending. New Engl J Med. 2003; 349(23):2224–2232. [PubMed: 14657430]
10. Le TT, Bilderback A, Bender B, et al. Do asthma medication beliefs mediate the relationship between minority status and adherence to therapy? J Asthma. 2008; 45(1):33–37. [PubMed: 18259993]
11. Mann DM, Ponieman D, Leventhal H, Halm EA. Predictors of adherence to diabetes medications: the role of disease and medication beliefs. J Behav Med. 2009; 32(3):278–284. [PubMed: 19184390]
12. Gellad WF, Haas JS, Safran DG. Race/ethnicity and nonadherence to prescription medications among seniors: results of a national study. J Gen Intern Med. 2007; 22(11):1572–1578. [PubMed: 17882499]
13. Zhang Y, Baik SH. Race/ethnicity, disability, and medication adherence among Medicare beneficiaries with heart failure. J Gen Intern Med. 2013:1–6. [PubMed: 23242866]
14. Ngo-Metzger Q, Sorkin DH, Billimek J, Greenfield S, Kaplan SH. The effects of financial pressures on adherence and glucose control among racial/ethnically diverse patients with diabetes. J Gen Intern Med. 2012; 27(4):432–437. [PubMed: 22005941]
15. Tseng C-W, Tierney EF, Gerzoff RB, et al. Race/Ethnicity and Economic Differences in Cost-Related Medication Underuse Among Insured Adults With Diabetes The Translating Research Into Action for Diabetes Study. Diabetes Care. 2008; 31(2):261–266. [PubMed: 18000177]
16. Lauffenburger JC, Robinson JG, Oramasionwu C, Fang G. Racial/Ethnic and Gender Gaps in the Use and Adherence of Evidence-Based Preventive Therapies among Elderly Medicare Part D Beneficiaries after Acute Myocardial Infarction. Circulation. 2013 CIRCULATIONAHA. 113.002658.

17. Madden JM, Graves AJ, Zhang F, et al. Cost-related medication nonadherence and spending on basic needs following implementation of Medicare Part D. JAMA. 2008; 299(16):1922–1928. [PubMed: 18430911]
18. Johnson RE, Goodman MJ, Hornbrook MC, Eldredge MB. The impact of increasing patient prescription drug cost sharing on therapeutic classes of drugs received and on the health status of elderly HMO members. Health Serv Res. 1997; 32(1):103. [PubMed: 9108807]
19. Tamblyn R, Laprise R, Hanley JA, et al. Adverse events associated with prescription drug cost-sharing among poor and elderly persons. JAMA. 2001; 285(4):421–429. [PubMed: 11242426]
20. Gaynor M, Li J, Vogt WB. Substitution, Spending Offsets, and Prescription Drug Benefit Design. Forum Health Econ Policy. 2007; 10(2)
21. Chandra A, Gruber J, McKnight R. Patient cost-sharing and hospitalization offsets in the elderly. Am Econ Rev. 2010; 100(1):193. [PubMed: 21103385]
22. Lurie N, Ward NB, Shapiro MF, Gallego C, Vaghaiwalla R, Brook RH. Termination of Medi-Cal benefits. New Engl J Med. 1986; 314(19):1266–1268. [PubMed: 3517642]
23. Chernew M, Gibson TB, Yu-Isenberg K, Sokol MC, Rosen AB, Fendrick AM. Effects of increased patient cost sharing on socioeconomic disparities in health care. J Gen Intern Med. 2008; 23(8): 1131–1136. [PubMed: 18443882]
24. Tseng CW, Brook RH, Keeler E, Steers WN, Mangione CM. Cost-lowering strategies used by medicare beneficiaries who exceed drug benefit caps and have a gap in drug coverage. JAMA. 2004; 292(8):952–960. [PubMed: 15328327]
25. Hsu J, Price M, Huang J, et al. Unintended consequences of caps on Medicare drug benefits. New Engl J Med. 2006; 354(22):2349–2359. [PubMed: 16738271]

Take away points

We examined the impact of the Medicare Part D coverage gap on medication use by Hispanics, blacks, and whites with diabetes. These findings suggest that the Part D coverage gap was particularly disruptive to medication use of minorities and those of low socioeconomic status.

- Hispanics, especially those residing in poorer areas, reduced medication use more than White and Blacks when they were required to bear the full costs of their medications.
- Hispanics and blacks were more likely than whites to discontinue a therapy after reaching the coverage gap but more likely to resume once coverage restarted.
- Improving medication adherence and the health of vulnerable groups requires more than premium subsidies.

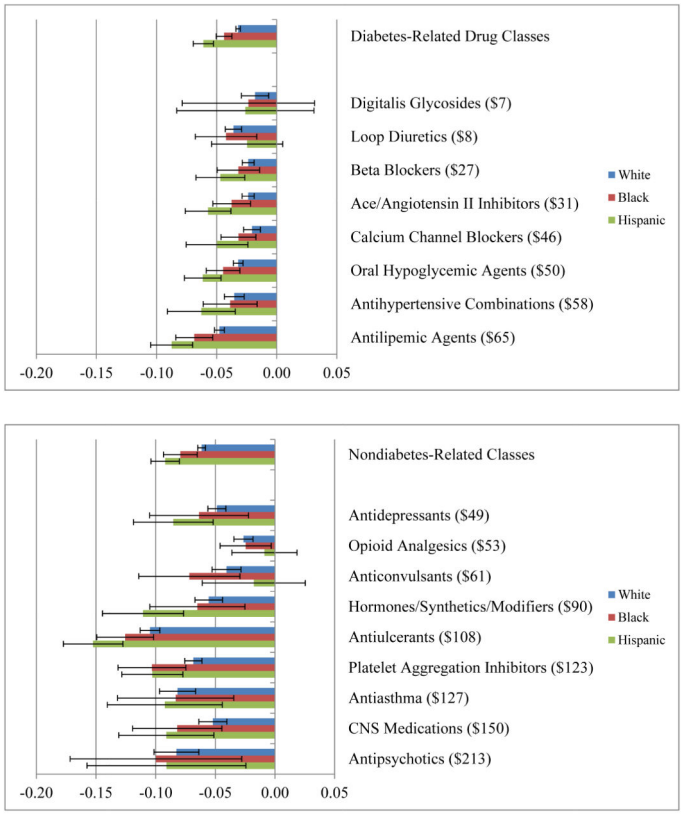

Figure 1.

Regression Adjusted Difference-in-Difference in Medication Use (MPR), by Therapeutic Class and Race (percentage point)

MPR refers to the Medication Possession Ratio, which is the fraction of days that a patient "possesses" or has access to medication, as measured by prescription fills. "CNS medications" refers to central nervous system medications. Changes are based on results from multivariate models which control for age, age-squared, gender, comorbid conditions, and socioeconomic status. Prices shown reflect the average price paid in the sample for a 30-day supply of medication in the therapeutic class. Diabetes-related drug classes: Whites who received the low-income subsidy (LIS): n=74,452; Whites who did not receive the low-income subsidy (non-LIS): n=115,333; LIS blacks: n=26,140; Non-LIS blacks: n=6,131; LIS Hispanics: n=29,113; Non-LIS Hispanics: n=4,311. Nondiabetes-related drug classes: LIS whites: n=65,062; Non-LIS whites: n=89,927; LIS blacks: n=21,337; Non-LIS blacks: n=4,373; LIS Hispanics: n=25,083; Non-LIS Hispanics: n=3,464.

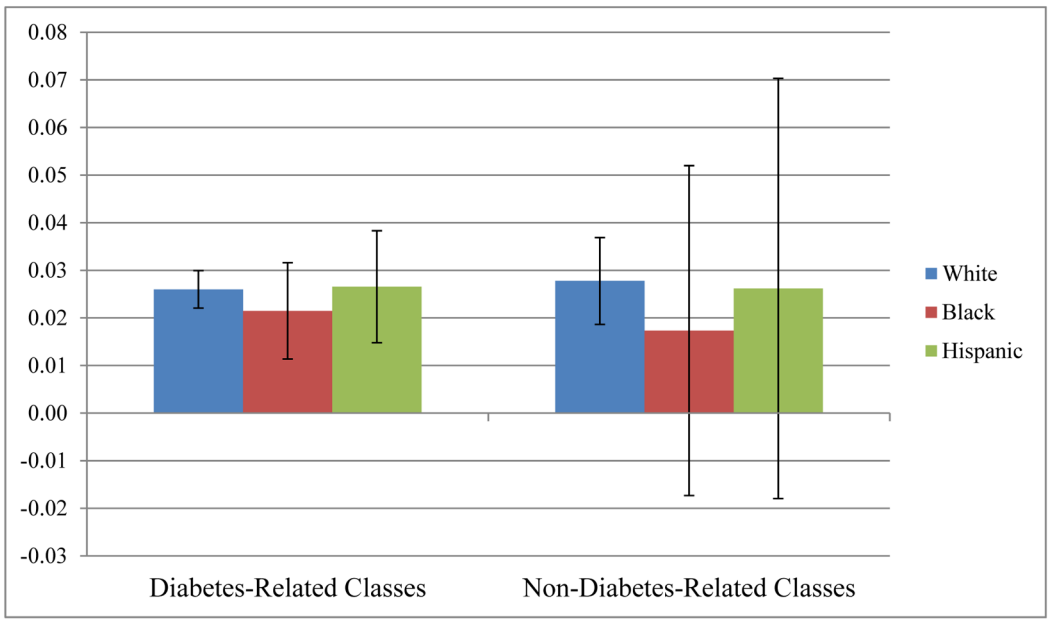

Figure 2.

Regression Adjusted Difference-in-Difference in Use of Generic Substitutes (GDR), by Race (percentage point)

GDR refers to the Generic Dispensing Rate. Changes are based on results from multivariate models which control for age, age-squared, gender, comorbid conditions, and socioeconomic status. GDR for ACE/ARB class is for ACE Inhibitors only since ARB class is brand-dominated. This analysis is limited to therapeutic classes which are neither brand nor generic-dominated. Diabetes-related classes include: oral hypoglycemic agents, ACE inhibitors, calcium channel blockers, diuretics, beta blockers, angiotensin II receptor blockers (ARBs), statins, digitalis glycosides, and combination antihypertensives. ACE inhibitors and ARBs are combined into a single class because they are commonly considered therapeutically interchangeable. The set of other drugs consists of the nine most prevalent nondiabetes-related classes used by this set of beneficiaries: platelet aggregation inhibitors and antiulcerants. Diabetes-related drug classes: Whites who received the low-income subsidy (LIS): n=70,284; Whites who did not receive the low-income subsidy (non-LIS): n=104,784; LIS blacks: n=24,412; Non-LIS blacks: n=5,475; LIS Hispanics: n=27,159; Non-LIS Hispanics: n=3,736. Nondiabetes-related drug classes: LIS whites: n=61,860; Non-LIS whites: n=76,652; LIS blacks: n=19,054; Non-LIS blacks: n=3,339; LIS Hispanics: n=22,485; Non-LIS Hispanics: n=2,668.

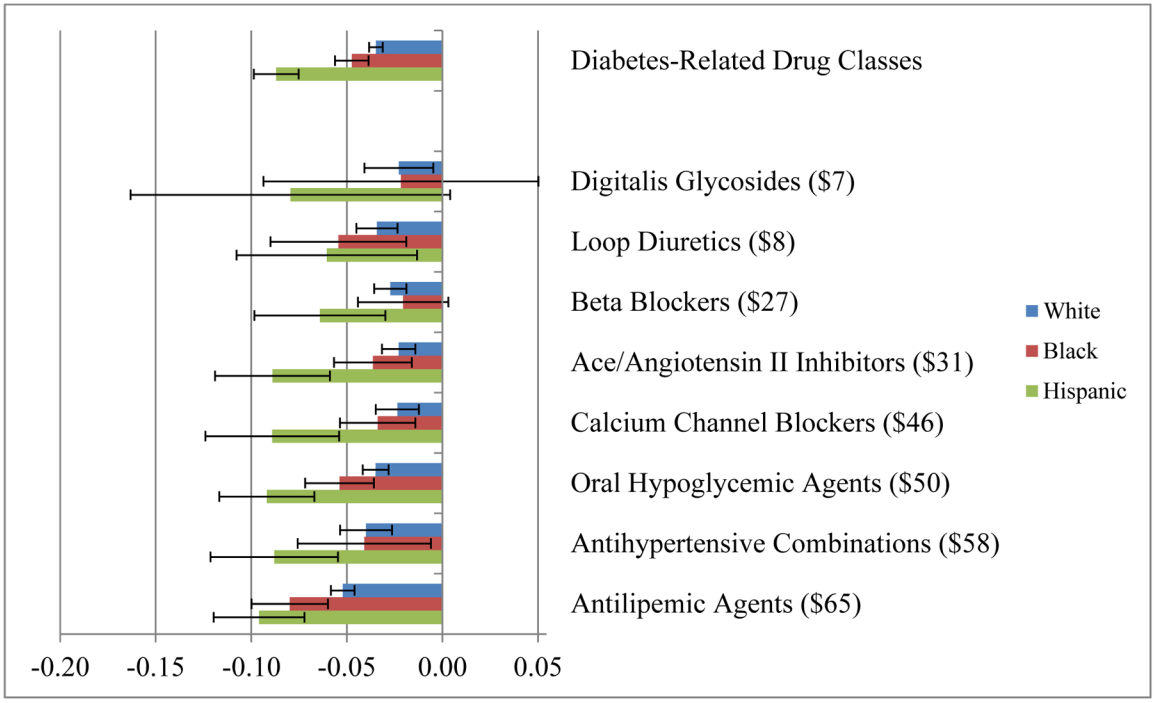

Figure 3.

Regression Adjusted Difference-in-Difference in Medication Use (MPR), by Therapeutic Class and Race for the Near-Poor Population

MPR refers to the Medication Possession Ratio, which is the fraction of days that a patient "possesses" or has access to medication, as measured by prescription fills. Changes are based on results from multivariate models which control for age, age-squared, gender, comorbid conditions, and socioeconomic status. Prices shown reflect the average price paid in the sample for a 30-day supply of medication in the therapeutic class. ACE inhibitors and ARBs are combined into a single class because they are commonly considered therapeutically interchangeable. We defined the "near-poor" as white, black and Hispanics beneficiaries residing in zip codes with a median household income below $25,000 (the bottom quartile of the sample's income distribution). Whites who received the low-income subsidy (LIS): n=74,452; Whites who did not receive the low-income subsidy (non-LIS): n=115,333; LIS blacks: n=26,140; Non-LIS blacks: n=6,131; LIS Hispanics: n=29,113; Non-LIS Hispanics: n=4,311

Am J Manag Care. Author manuscript; available in PMC 2015 April 21.

Table 1

Beneficiary Characteristics, by Coverage Group and Race

	White		Black		Hispanic	
	LIS (n=123,033)	**Non-LIS (n=293,462)**	**LIS (n=50,440)**	**Non-LIS (n=19,507)**	**LIS (n=57,283)**	**Non-LIS (n=14,031)**
Demographics						
Age in years (mean)	75.0*	75.8	74.6*	73.9	74.5*	74.2
Male (%)	28.8*	42.4	22.9*	38.0	34.2*	44.4
Socioeconomic Status[a]						
Median income ($)	48,697*	57,926	40,984*	46,660	45,561*	48,256
Years of education	13.3*	13.7	12.9*	13.2	12.5*	13.2
Rx Utilization Measures (mean)[b]						
Pre-gap MPR	0.80*	0.80	0.76*	0.75	0.74*	0.73
Post-gap MPR	0.78*	0.73	0.74*	0.67	0.72*	0.63
Pre-gap GDR	0.49*	0.48	0.50*	0.48	0.43	0.43
Post-gap GDR	0.54*	0.55	0.56*	0.57	0.48*	0.52
Median month of coverage gap entry	7.10*	8.70	7.80*	9.00	7.60*	8.90

	White		Black		Hispanic	
Parts A and B utilization (mean) 2005[c]	**LIS (n=109,143)**	**Non-LIS (n=268,680)**	**LIS (n=43,930)**	**Non-LIS (n=17,151)**	**LIS (n=44,455)**	**Non-LIS (n=12,492)**
No. of office visits	9.0*	9.0	7.5*	7.7	9.2*	9.4
No. of emergency department visits	7.7*	6.3	8.7*	6.3	7.5*	4.6
No. of inpatient stays	0.5*	0.3	0.5*	0.3	0.4*	0.3
No. of inpatient days	2.6*	1.7	2.8*	2.0	2.2*	1.5
Parts A and B spending (mean $) 2005[c]						
Total	9,698*	7,869	10,260*	8,160	10,581*	6,917
Inpatient	4,251*	3,152	4,265*	3,200	3,909*	2,438

	White		Black		Hispanic	
Parts A and B utilization (mean) 2005[c]	**LIS (n=109,143)**	**Non-LIS (n=268,680)**	**LIS (n=43,930)**	**Non-LIS (n=17,151)**	**LIS (n=44,455)**	**Non-LIS (n=12,492)**
Outpatient	1,455*	1,196	2,227*	1,724	1,839*	1,033
Other	3,992*	3,521	3,768*	3,236	4,833*	3,446

Notes:

Sample is individuals with diabetes and ages 65 and older. Demographics, socioeconomic status, medication possession ration and generic dispensing ratio are measured in year 2007. Spending and utilization measured in 2005 to demonstrate pre-Part D differences across groups.

*Indicates low-income subsidy (LIS) and non-low-income subsidy (non-LIS) values are significantly different at 1%

[a]Socioeconomic status is measured at zip code level.

[b]Medication Possession Ratio (MPR) and Generic Dispensing Ratio (GDR) are measured before spending reaches the coverage gap level (“pre”) and after spending reaches coverage gap levels (“post”) in 2007.

[c]Utilization and spending for beneficiaries covered by fee-for-service Medicare Part A & B for all 12 months of 2005.

Table 2

Differential Stopping and Conditional Resumption Rates of Non-LIS Group Relative to LIS Group

Stops Drug (% difference non-LIS and LIS)[a]	**White (n=196,178)**[c]	**Black (n=33,061)**	**Hispanic (n=34,472)**
Diabetes Drug Classes	2.4	4.1	6.7
Non-Diabetes Drug Classes	2.6	3.2	4.2
Resumes Conditional on Stopping (% difference non-LIS and LIS) [b]	White (n=97,589)[d]	Black (n=18,257)	Hispanic (n=20,291)
Diabetes Drug Classes	6.7	5.9	12.5
Non-Diabetes Drug Classes	4.7	4.1	11.4

Notes:

Sample is individuals with diabetes and ages 65 and older that reached the coverage gap in 2007. Individuals had to stay in coverage gap for at least 40 days. Resumption is defined as stopping a drug in the coverage gap in 2007 and resuming in the first quarter of 2008. The difference between non-low-income subsidy (non-LIS) and low-income subsidy (LIS) rates is significantly different at 1% for all cells.

[a] Percent of Non-LIS stoppers less percent of LIS stoppers, in the coverage gap in 2007

[b] Among stoppers, the difference in percent of Non-LIS who resume and percent of LIS who resumed in the first quarter of 2008

[c] The number of observations for stoppers is the number of individuals of the particular race who spent at least forty days in the coverage gap in 2007.

[d] The number of observations for those who resumed refers to the number of individuals of the particular race who spent at least forty days in the coverage gap in 2007 and stopped medications in at least one drug class.