

Medicare Beneficiaries' Out-of-Pocket Costs for Commonly Used Generic Drugs, 2009-2017

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The 2003 Medicare Modernization Act established the Medicare Part D prescription drug benefit to improve access to and affordability of prescription medications for beneficiaries through government subsidies.¹ Under the benefit, private plans negotiate with drug manufacturers and compete to enroll Medicare beneficiaries. To control prescription costs, Part D plans steer consumers toward certain drugs through coverage decisions, tier structure (which determines co-payments or coinsurance), and utilization management tools. Since its inception, Part D has grown from offering prescription drug coverage to 27.9 million beneficiaries in 2006 to 43.9 million in 2018,^{2,3} and it achieved comparable levels of utilization of generic drugs by enrollees in state Medicaid programs.⁴ However, billions of dollars in savings could be realized through greater generic substitution of brand-name medications among Medicare beneficiaries.⁵⁻⁷

In 2006, the same year that the Part D benefit went into effect, large wholesale pharmacy chains, such as Walmart, began creating generic drug discount programs (GDDPs). These programs offer common generic medications for low out-of-pocket costs, usually \$4 for a 30-day supply and \$10 for a 90-day supply. This price can sometimes be lower than what patients would pay through their insurance coverage when purchasing the same medications and, therefore, leads to lower out-of-pocket costs. In 2007, 80% of beneficiaries filled prescriptions for generic medications available through GDDPs, but only 16.3% of those used the \$4 GDDP⁸; the estimated total savings if beneficiaries had used GDDPs instead of their insurance was more than \$5.7 billion, demonstrating the significant impact that GDDP utilization could have on prescription medication costs.⁹ A recent study of 2017 Medicare prescription drug plan (PDP) coverage of generic drugs used to treat cardiovascular disease (CVD) similarly demonstrated potential savings through GDDPs: 21% of PDPs required beneficiary out-of-pocket payments higher than Walmart's GDDP cash price for a 30-day supply of the same drug.¹⁰ However, whether the proportion of PDPs with higher prices than those offered by GDDPs varies across geography, across other medication classes, or over time remains unknown. Accordingly, we used Medicare PDP data to characterize trends in Medicare

ABSTRACT

OBJECTIVES: To examine differences in the out-of-pocket costs for common generic drugs used to treat chronic conditions when individuals used their Medicare prescription drug plan (PDP) or when purchased through Walmart's generic drug discount programs (GDDPs) from 2009 to 2017.

STUDY DESIGN: A retrospective analysis of Medicare PDP Formulary files and Walmart's GDDP retail drug lists from 2009 to 2017.

METHODS: We identified all generic drugs used to treat chronic conditions that were on Walmart's GDDP retail drug list from 2009 to 2017. We then determined the out-of-pocket costs for each drug for each Medicare PDP and compared those costs with Walmart's GDDP cash price.

RESULTS: There were 62 and 43 generic medications used to treat common chronic diseases available through Walmart's GDDP in 2009 and 2017, respectively. Across all PDPs, the median beneficiary out-of-pocket expenditure for a 30-day supply of the GDDP-available medications for chronic diseases decreased from \$5.70 (interquartile range [IQR], \$2.55-\$7.98) in 2009 to \$2.00 (IQR, \$0.00-\$4.00) in 2017 ($P < .001$). Approximately three-fifths (60.2%) of PDPs required beneficiaries to pay out-of-pocket costs higher than those of Walmart's GDDP in 2009, but only one-third (33.4%) did so in 2017.

CONCLUSIONS: Although Medicare beneficiary out-of-pocket costs for commonly used generic drug prescriptions generally decreased over time, Medicare beneficiaries may still be paying more for the same drugs than they would through Walmart's GDDP. Increased generic drug price transparency, including enforcing bans on gag clauses, is needed to ensure that Medicare beneficiaries obtain drugs using the most affordable options.

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beneficiary out-of-pocket expenditures for commonly used generic medications that treat any chronic disease and were available through Walmart's GDDP from 2009 to 2017. We expect our findings to offer important insights for future policy efforts intended to further reduce costs for Medicare beneficiaries and to better clarify the role that GDDPs are likely to play in insurance cost sharing and formulary structure.

TAKEAWAY POINTS

Retail generic drug discount programs (GDDPs) improve the affordability of generic medications, especially for individuals without pharmaceutical coverage. We characterized trends in the out-of-pocket costs required by Medicare prescription drug plans for generic drugs used for chronic diseases and compared them with the cash price of the drugs in Walmart's GDDP from 2009 to 2017.

- ▶ Out-of-pocket costs for these generic drugs have decreased over time.
- ▶ Formularies have increasingly classified these drugs into tiers other than preferred generic tiers.
- ▶ Opportunities to lower out-of-pocket costs still exist, as a substantial proportion of plans still require costs higher than GDDP cash prices for the same medications.

METHODS

Data Sources

We used data from the second quarters of 2009 through 2017 CMS PDP Formulary and Pricing files. These files provide information submitted by each Part D plan, including the associated formulary, tier assignment for all covered medications, co-payment type (eg, dollar co-payment vs percentage coinsurance), and co-payment amount. Because comprehensive Medicare PDP data to calculate out-of-pocket costs were not available until 2009 for 30-day supplies and 2014 for 90-day supplies, we limited our analysis to annual data from 2009 to 2017. We excluded Special Needs Plans, plans with incomplete or inaccurate data, and plans that operated in states for which Walmart did not guarantee its advertised cash price (generally \$4 for a 30-day supply and \$10 for a 90-day supply) for all of its GDDP medications through the entire time period of the analysis. Furthermore, we noted whether each plan was a Medicare Advantage (MA) plan, which covers Part A and Part B benefits in addition to prescription drug coverage, or a stand-alone Part D plan, which covers only prescription drugs.

Drug Sample

We obtained information on drugs offered through Walmart's GDDP from 2009 to 2017 directly from Walmart's pharmacy website.¹¹ We included all oral generic prescription medications used to treat chronic conditions that were not available over the counter. Because drugs could be added or removed from GDDP lists at any time, the drug sample varied from year to year.

Main Outcome Measures

Our primary outcome measure was the beneficiary out-of-pocket expenditure for generic prescription drugs for chronic conditions that were available through Walmart's GDDP from 2009 to 2017. When calculating the median out-of-pocket expenditures, we adjusted for inflation using June 2017 as the index month and year,¹² and we estimated the costs incurred by the beneficiary when filling a prescription with coverage for the first time in the year.

As a secondary outcome, we determined the proportion of plans requiring costs greater than Walmart's GDDP price. For this outcome, we did not adjust for inflation because the GDDP cash price has remained the same since the inception of Walmart's GDDP. Although nearly all included medications were offered by Walmart's GDDP at

\$4 for a 30-day supply and \$10 for a 90-day supply, for alendronate sodium, finasteride, and tamoxifen citrate, the 30-day supply cash price was \$9 and the 90-day supply cash price was \$24.

Key Variables of Interest

Other key variables of interest included presence of select care tier designations for certain drugs within plans, therapeutic classes, and geographic distribution of plans. In 2015, CMS increased the weight of adherence to some medications for hypertension, hyperlipidemia, and type 2 diabetes in calculating a plan's star rating.^{13,14} Consequently, these medications (and other common drugs used for chronic conditions) were increasingly allocated into a select care tier, which has low to no out-of-pocket costs, with the goal of improving beneficiary medication adherence and allowing plans to score higher on the star rating measure. We grouped any drug listed in a select care tier with those in tier 1, which typically includes low-cost generic medications. The drugs listed under Walmart's categorizations were classified into 3 therapeutic classes: cardiovascular, mental health, and endocrine. For geographic distribution, each state is assigned to 1 of 26 total MA regions and 1 of 34 stand-alone regions. All plans operating in MA or stand-alone regions composed of multiple states were assigned to all of those states; beneficiaries can enroll only in plans that operate in their state of residence.

Statistical Analysis

We used descriptive analyses to calculate median out-of-pocket costs across all GDDP-available medications (30- and 90-day supply) offered by all plans each year between 2009 and 2017. We also compared each plan's out-of-pocket cost for each drug with the Walmart GDDP cash price. Descriptive analyses were also applied to outcomes across geography.

Analyses were stratified by plan type (MA-PDP vs stand-alone PDP) and tier (tier 1 and select care tiers vs all other tiers). The Mann-Whitney *U* test was used to compare MA-PDPs and stand-alone PDPs within the same year. Because plan type and tier stratifications were independent of each other, we did not correct for multiple comparisons. We used the same test for comparing both outcomes in 2009 and 2017. We used the Wilcoxon signed-rank test to examine differences among the 3 therapeutic classes in a pairwise fashion with the Holm-Bonferroni method to correct for

POLICY

TABLE. Median Out-of-Pocket Costs and Proportion of Plans With Out-of-Pocket Costs Greater Than the GDDP Cash Price for Prescription Drugs Available Through Walmart's GDDP, 30-Day Supply, by Plan Type, 2009-2017

	2009	2010	2011	2012	2013	2014	2015	2016	2017
30-Day Supply: Median Out-of-Pocket Costs* in \$ (IQR) (YOY % change)									
All plans	5.70 (2.55-7.98) (—)	5.60 (4.48-7.84) (-1.8%)	5.45 (2.26-7.63) (-2.7%)	5.35 (2.14-7.49) (-1.8%)	5.25 (1.65-7.35) (-1.9%)	3.09 (1.03-7.21) (-41.1%)	3.09 (0.00-6.18) (0.0%)	3.06 (0.99-6.12) (-1.0%)	2.00 (0.00-4.00) (-34.6%)
MA-PDPs	5.70 (1.85-7.98) (—)	5.60 (4.48-7.84) (-1.8%)	6.54 (4.36-7.63) (16.8%)	5.35 (3.21-7.49) (-18.2%)	5.25 (3.15-8.40) (-1.9%)	5.15 (2.06-10.30) (-1.9%)	4.12 (2.06-10.30) (-20.0%)	4.08 (1.13-7.14) (-1.0%)	2.00 (0.00-4.00) (-51.0%)
Stand-alone PDPs	5.70 (2.64-7.98) (—)	5.60 (4.20-7.84) (-1.8%)	4.36 (2.18-6.00) (-22.1%)	3.21 (1.07-6.42) (-26.4%)	2.63 (1.05-5.25) (-18.2%)	2.06 (0.00-3.09) (-21.5%)	1.03 (0.00-3.09) (-50.0%)	1.02 (0.00-2.04) (-1.0%)	1.00 (0.69-2.39) (-2.0%)
30-Day Supply: Proportion [%] of Plans Requiring Out-of-Pocket Costs Greater Than GDDP Cash Prices (IQR) (YOY % change)									
All plans	60.2 (58.5-63.6) (—)	67.7 (63.9-69.1) (12.5%)	56.2 (52.4-59.8) (-17.0%)	51.2 (48.3-54.7) (-8.9%)	50.4 (43.2-53.5) (-1.6%)	39.1 (28.9-51.3) (-22.4%)	33.8 (26.2-52.1) (-13.6%)	38.2 (19.6-51.2) (13.0%)	33.4 (17.9-55.1) (-12.6%)
MA-PDPs	61.2 (60.1-62.9) (—)	72.1 (71.7-73.5) (17.8%)	68.2 (67.3-70.3) (-5.4%)	64.0 (62.1-68.2) (-6.2%)	58.8 (52.1-61.7) (-8.1%)	55.7 (41.6-65.6) (-5.3%)	51.2 (37.1-64.1) (-8.1%)	48.7 (27.9-69.4) (-4.9%)	41.0 (22.7-66.1) (-15.8%)
Stand-alone PDPs	60.1 (56.8-65.4) (—)	62.9 (55.5-63.3) (4.7%)	40.3 (34.0-46.8) (-35.9%)	33.5 (27.9-38.0) (-16.9%)	35.8 (28.1-40.8) (6.9%)	18.7 (9.5-32.0) (-47.8%)	12.2 (6.8-28.2) (-34.8%)	14.9 (5.6-28.2) (22.1%)	11.8 (3.3-28.2) (-20.8%)

GDDP indicates generic drug discount program; IQR, interquartile range; MA, Medicare Advantage; PDP, prescription drug plan; YOY, year-over-year.

*Co-payments were adjusted for inflation using June 2017 as the baseline for the median out-of-pocket cost outcome but not for the proportion of plans requiring co-payments greater than GDDP cash price outcome.

multiple comparisons, using a *P* value of .017 as the threshold for statistical significance.

As a sensitivity analysis, we used generalized estimating equations to examine whether within-plan clustering may be driving the results observed regarding median out-of-pocket expenses over time for 30-day supplies of GDDP chronic disease medications from 2009 to 2017. We included Medicaid region and Medicaid expansion status to account for factors that could influence out-of-pocket costs for generic drugs. Results of these analyses were consistent with our main analyses and are presented in the eAppendix material only (eAppendix Table 1 [eAppendix available at [ajmc.com](#)]).

Stata version 15.1 (StataCorp LLC; College Station, Texas) and RStudio version 1.1.423 (RStudio Inc; Boston, Massachusetts) were used for all analyses.

RESULTS

There were 3013 Medicare PDPs in 2009 and 2150 PDPs in 2017 included in our sample (eAppendix Figure 1). Over this period, the composition of Medicare PDP types shifted toward MA-PDPs (51.6% MA-PDPs and 48.4% stand-alone PDPs in 2009; 71.3% MA-PDPs and 28.7% stand-alone PDPs in 2017), primarily because of a reduction in the number of stand-alone PDPs.

Drug Sample

The number of medications available through Walmart's GDDP and eligible for inclusion in our study decreased from 62 generic

medications used to treat common chronic diseases in 2009 to 43 in 2017 (eAppendix Table 2). During this time period, Walmart added only 1 medication (finasteride) but removed 20. Our sample included medications for cardiovascular (32 and 20 medications in 2009 and 2017, respectively), psychiatric (17 and 12 medications in 2009 and 2017), and endocrine (13 and 11 medications in 2009 and 2017) disorders. By 2017, Walmart no longer offered digoxin, anticonvulsants, or selective serotonin reuptake inhibitors as part of the GDDP.

Tier Placement

The median proportion of GDDP drugs for common chronic conditions covered in Medicare plans in either tier 1 or a select care tier decreased from 94.8% in 2009 to 60.6% in 2015, and then rose to 75.2% in 2017. By plan type, the median proportion decreased from 96.1% in 2009 to 57.5% in 2015, and then increased to 77.4% in 2017 for MA-PDPs; a similar trend occurred for stand-alone PDPs, from 93.5% in 2009 to 65.4% in 2015 to 69.6% in 2017 (eAppendix Table 3).

Median Beneficiary Out-of-Pocket Costs

Across all plans, the median beneficiary out-of-pocket expenditure for a 30-day supply of these GDDP-available medications decreased 64.9%, from \$5.70 (interquartile range [IQR], \$2.55-\$7.98) in 2009 to \$2.00 (IQR, \$0.00-\$4.00) in 2017 (*P* < .001) (Table). By plan type, costs decreased 64.9% for MA-PDPs, from \$5.70 (IQR, \$1.85-\$7.98) in 2009 to \$2.00 (IQR, \$0.00-\$4.00) in 2017 (*P* < .001), and 82.5% for stand-alone PDPs, from \$5.70 (IQR, \$2.64-\$7.98) in 2009 to \$1.00 (IQR, \$0.69-\$2.39) in 2017 (*P* < .001) (Table).

Similar declines in median out-of-pocket costs were observed among both MA-PDPs and stand-alone PDPs for drugs in tier 1 or select care tiers and for drugs in all other tiers (*P* values < .001 for all) (Figure 1; eAppendix Table 4).

Proportion of Plans Requiring Beneficiary Out-of-Pocket Costs Greater Than GDDP Cash Prices

The median proportion of plans requiring beneficiary out-of-pocket costs greater than the GDDP cash price for a 30-day supply of medications was 60.2% (IQR, 58.5%-63.6%) in 2009 and 33.4% (IQR, 17.9%-55.1%) in 2017 (44.5% decrease; *P* < .001) (Table). By plan type, the proportion for MA-PDPs was 61.2% (IQR, 60.1%-62.9%) in 2009, which decreased to 41.0% (IQR, 22.7%-66.1%) in 2017 (33.0% decrease; *P* < .001). Similarly, the same proportions for stand-alone PDPs were 60.1% (IQR, 56.8%-65.4%) in 2009 and 11.8% (IQR, 3.3%-28.2%) in 2017 (80.4% decrease; *P* < .001) (Table).

Declines in proportion of plans requiring beneficiary co-payments more than the GDDP cash price were observed among drugs in tier 1 or select care tiers for both plan types (*P* < .001) and among drugs in other tiers for only stand-alone PDPs, not MA-PDPs (*P* < .001). (Figure 2; eAppendix Table 4).

Variation Across Geographic Areas

Across geographic areas, there was greater variation in out-of-pocket costs required by MA-PDPs than stand-alone PDPs and greater variation in 2009 than in 2017 (eAppendix Figures 2 and 3). In 2009, the IQRs for out-of-pocket costs across states were \$5.70 to \$6.84 (range, \$0-\$11.40) for MA-PDPs and \$5.70 to \$5.70 (range, \$5.70-\$6.84) for stand-alone PDPs. In 2017, the IQRs were \$2.00 to \$3.00 (range, \$0-\$6.00) for MA-PDPs and \$1.00 to \$2.00 (range, \$1.00-\$2.00) for stand-alone PDPs.

In 2009, the IQRs for proportions of plans requiring co-payments greater than the GDDP cash price for a 30-day supply across states were 61.9% to 81.0% (range, 19.2%-98.6%) for MA-PDPs and 60.2% to 62.6% (range, 55.1%-66.9%) for stand-alone PDPs. In 2017, the IQRs were 40.4% to 55.8% (range, 27.5%-74.3%) for MA-PDPs and 15.5% to 19.3% (range, 12.1%-22.8%) for stand-alone PDPs.

Variation by Therapeutic Class

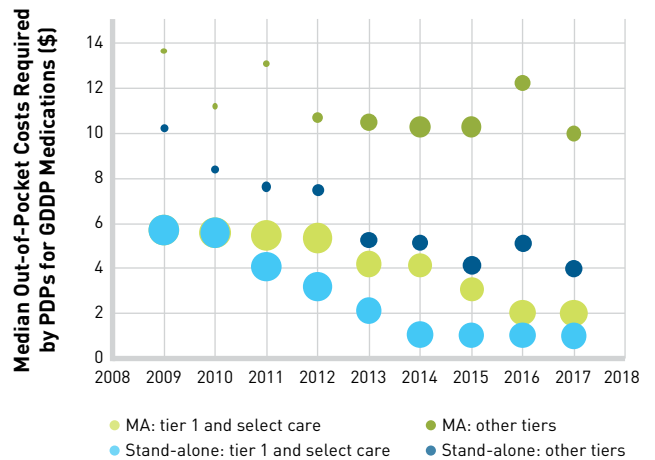
Across all plans, the differences among the proportions of plans requiring co-payments greater than the GDDP cash price for a 30-day supply were not significantly different by therapeutic class in 2009 (60.2%, 61.9%, and 58.8% for the cardiovascular, mental health, and endocrine classes, respectively; pairwise *P* values > .017) (eAppendix Figure 4).

In contrast, in 2017, there were differences by therapeutic class (20.6%, 52.7%, and 28.3% for cardiovascular, mental health, and endocrine classes, respectively; *P* < .017 for cardiovascular compared with mental health class; *P* > .017 for all other pairwise comparisons).

GDDP-Available Medications in 2009 Versus 2017

Twenty generic drugs were available through GDDPs in 2009 that were not available in 2017; the median out-of-pocket costs for these

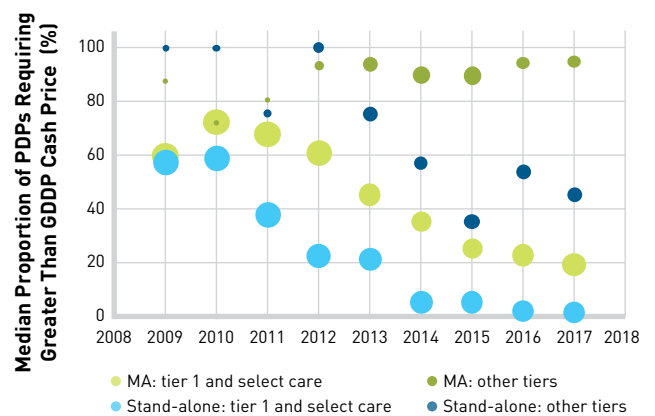
FIGURE 1. Median PDP Beneficiary Co-payments for 30-Day Supply of Select GDDP-Available Medications, by Plan Type and Tier, June 2009-June 2017



GDDP indicates generic drug discount program; MA, Medicare Advantage; PDP, prescription drug plan.

*Co-payments were adjusted for inflation using June 2017 as the baseline. Bubble size corresponds to the percentage of plans offering GDDP medications in the tier stratification, by plan type.

FIGURE 2. Proportion of PDPs Requiring Co-payments Greater Than GDDP Cash Price for 30-Day Supply of Select GDDP-Available Medications, by Plan Type and Tier, June 2009-June 2017



GDDP indicates generic drug discount program; MA, Medicare Advantage; PDP, prescription drug plan.

*Co-payments were not adjusted for inflation when comparing the plan co-payment with Walmart's cash price for a 30-day supply. Bubble size corresponds to the percentage of plans offering GDDP medications in the tier stratification, by plan type.

drugs, and the proportion of plans offering them for more than the GDDP cash price, were consistently higher when compared with the 43 generic drugs available through GDDPs only in 2017 (eAppendix Text; eAppendix Table 1).

Costs for 90-Day Supply of Medications

The trends in median out-of-pocket costs for a 90-day supply of GDDP-available medications were similar to those of a 30-day supply for both outcomes (eAppendix Table 4).

DISCUSSION

In the decade following the creation of the Medicare PDP benefit and GDDPs, there was a significant decrease in beneficiary out-of-pocket costs for generic medications treating common chronic conditions that were available through Walmart's GDDP. Similarly, a smaller proportion of plans required beneficiary out-of-pocket costs greater than the GDDP cash price for both a 30-day and a 90-day medication supply in 2017 than in 2009. Not only were these reductions more pronounced for stand-alone PDPs than for MA-PDPs, stand-alone PDPs also had less geographic variation across states compared with their MA-PDP counterparts. Despite reductions across all medication classes from 2009 to 2017, changes were uneven by therapeutic class: For example, in 2017, out-of-pocket costs for CVD medications were significantly less than those for mental health medications. Nevertheless, median beneficiary out-of-pocket costs and the proportion of plans requiring co-payments greater than the GDDP cash price decreased for all plan type and tier stratifications.

The availability of cheaper medications through GDDPs may have led plans to lower out-of-pocket costs for these drugs for beneficiaries, because a cheaper nonplan option is available. Despite this progress, it is still necessary to find opportunities to lower costs further, particularly given concerns about the ability of older adults to afford medications and the number of beneficiaries taking GDDP-available medications.^{15,16} In 2017, \$3.8 billion was spent by Medicare on the 43 medications included in our drug sample and available through the Walmart GDDP.¹⁷ Although the proportion of plans requiring out-of-pocket co-payments greater than GDDP cash prices decreased from three-fifths of plans in 2009 to one-third in 2017, alternative options, such as utilization of GDDPs, may be crucial for saving costs month after month if insurance plans remain more expensive for these medications.⁹ A 2014 study estimated that only one-third of adults 65 years or older utilized GDDPs, showing that significant room for potential savings remains.¹⁸ One reason that plans may continue to require higher out-of-pocket costs is the increasing use of mechanisms that steer consumers toward particular drugs. The proportion of PDPs listing generic drugs in tiers other than tier 1 or a select care tier grew over time from 2009 to 2017, a result consistent with others' findings that Part D plans have placed an increasing number of generic drugs in nonpreferred drug tiers over time.¹⁹ This means patients are incentivized to choose certain medications from preferred tiers (ie, tier 1 and select care

tier); this limits patient choice and is contingent on clinicians prescribing a generic medication listed in a preferred tier for patients' respective plans.²⁰ However, at the same time, Walmart's GDDP similarly narrowed the selection of drugs made available, from 62 to 43 medications for chronic diseases from 2009 to 2017.

Our finding of cost differences to beneficiaries, depending on whether the prescription is obtained using their pharmacy benefit plan or a GDDP, even if obtained from the same pharmacy, is a concern. Inconsistencies may result in instances when a drug's co-payment is higher than the cost to the insurance or pharmacy benefit manager (ie, "clawbacks"). These instances have garnered increasing national attention and are in part due to gag clauses, which are contractual terms that prevent pharmacists from disclosing list prices and informing patients about other potentially cheaper options for the same medication.²¹⁻²⁶ Although recent legislation has formally banned these clauses,²⁷ the enforcement and effects of these bans remain unknown. Ideally, all stakeholders would have readily available access to data and would be able to inform patients of the best way to lower out-of-pocket costs for individual medications and simultaneously minimize the inconvenience for patients who may achieve the lowest total cost for their medications by filling their generic medications using different modalities (eg, using a combination of insurance coverage and accessing GDDPs). Opportunities include informing clinicians at the time of ordering prescriptions, patients when choosing the pharmacy with the most affordable option(s), and pharmacists at the time of filling prescriptions.

Several strategies may additionally increase generic drug affordability for patients and encourage transparency. Plans should consider decreasing out-of-pocket costs to a level that matches or is lower than GDDP prices. Similarly, plans should incentivize patient procurement of 90-day medication supplies, which may limit distribution costs. Moreover, medication purchases made through GDDPs should generate Medicare claims, allowing for more accurate measurement of use and adherence while ideally allowing these purchases to count toward a patient's deductible or out-of-pocket maximum.²⁸ A multimodal solution is needed to help patients navigate the complexities of prescription drug coverage, reduce total medication costs, increase medication adherence, and promote better health outcomes among Medicare beneficiaries,²⁹⁻³¹ thereby fulfilling the mission of the Part D benefit.

Limitations

Our study should be considered in the context of several limitations. First, the numbers of beneficiaries enrolled in each plan and using drugs included in our sample are not known. As a result, we cannot determine how many patients could have been affected by differences in required expenditures for medications that treat chronic diseases and are available through Walmart's GDDP. Second, the calculated median out-of-pocket costs may not reflect the actual costs that low-income subsidy enrollees and dual-eligible beneficiaries are required to pay. Third, Walmart is just 1 wholesaler that offers

modestly priced generic medications to patients. Others include Walgreens, Rite Aid, Kroger, and Costco.³²⁻³⁵ We do not know if the same trends and observations apply to other generic medications for chronic disease available at these and other pharmacies. Finally, we do not know if these results represent the trends of the broader population of generic medications that have been experiencing price increases.

CONCLUSIONS

We found that beneficiary out-of-pocket costs have declined from 2009 to 2017 for medications that treat chronic conditions and were available at low costs through Walmart's GDDP. Further, although one-third of plans required 30-day costs higher than GDDP cash prices in 2017, this proportion has been declining. Enforcing greater transparency about beneficiary costs and matching co-payments to potentially cheaper options (eg, the drug's cash price or GDDP cash prices) may help decrease costs and increase medication adherence for Medicare beneficiaries. ■

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eAppendix Text. Median Out-of-Pocket Costs and Proportions of Plans Requiring Out-of-Pocket Costs Greater Than GDDP Cash Prices for Medications Available in GDDPs in 2009 but Not in 2017

The median out-of-pocket cost for the 20 medications that were available at GDDPs in 2009 but not in 2017 was \$9.00 (IQR, \$5.00-\$15.00) in 2017. By plan type, the out-of-pocket costs were \$10.00 (IQR, \$5.00-\$15.00) for MA-PDPs and \$7.00 (IQR, \$3.00-\$18.00) for stand-alone PDPs. By plan type and tier, the costs for medications in tier 1 or select care tiers were \$2.00 (IQR, \$0-\$4.00) for MA-PDPs and \$1.00 (IQR, \$0-\$2.00) for stand-alone PDPs; for medications in other tiers, the out-of-pocket costs were \$14.00 (IQR, \$9.00-\$20.00) for MA-PDPs and \$7.00 (IQR, \$3.00-\$26.87) for stand-alone PDPs. For all stratifications, the costs were at least equal to or higher than those of GDDP-available medications in 2017.

The proportion of plans requiring out-of-pocket costs greater than the GDDP cash prices in 2017 for these 20 medications was 66.1% (IQR, 60.3%-87.1%). By plan type, the proportions were 76.7% (IQR, 67.3%-87.9%) for MA-PDPs and 52.7% (IQR, 37.0%-82.8%) for stand-alone PDPs. By plan type and tier, the proportions for medications in tier 1 or select care tiers were 15.8% (IQR, 11.7%-19.1%) for MA-PDPs and 4.2% (IQR, 2.5%-3.3%) for stand-alone PDPs; for medications in other tiers, the proportions were 96.4% (IQR, 95.4%-97.5%) for MA-PDPs and 61.7% (IQR, 48.0%-83.1%) for stand-alone PDPs. Except for medications in tier 1 or select care tiers of MA-PDP plans, these proportions were higher than those of GDDP-available medications in 2017.

eAppendix Table 1. Results of a Generalized Estimating Equation Model for a Longitudinal Analysis of Median Out-of-Pocket Co-payments and Proportion of Plans Requiring Co-payments Greater Than GDDP Cash Prices, by Plan Type, 2009 vs 2017

		Medicare Advantage Plans			Stand-alone Plans		
		Coefficient	Standard Error	Z-Score	Coefficient	Standard Error	Z-Score
Median out-of-pocket cost	Year	-0.311 ^c	0.021	-14.569	-0.388 ^c	0.036	-10.743
	Medicaid Region	0.123 ^c	0.023	5.412	-0.025	0.029	-0.861
	Medicaid Expansion	0.414 ^a	0.209	1.975	0.032	0.382	0.085
	GDDP-available	-7.022 ^c	0.185	-38.058	-7.569 ^c	0.356	-21.240
Proportion of plans requiring out-of-pocket costs greater than GDDP cash price	Year	-0.022 ^c	0.002	-13.068	-0.055 ^c	0.002	-24.915
	Medicaid Region	0.012 ^c	0.002	6.239	-0.0005	0.002	-0.263
	Medicaid Expansion	0.017	0.011	1.571	-0.003	0.021	-0.160
	GDDP-available	-0.272 ^c	0.010	-26.320	-0.368 ^c	0.015	-25.340

^a *P* value < 0.05

^b *P* value < 0.01

^c *P* value < 0.001

Thioridazine	•	•	•	•					
Thiothixene	•	•	•	•					
Trazodone	•	•	•	•	•	•	•	•	•
Trihexyphenidyl	•	•	•	•	•	•	•	•	•
Thyroid Conditions									
Levothyroxine	•	•	•	•	•	•	•	•	•
Women's Health									
Estradiol	•	•	•	•	•	•	•	•	•
Alendronate Sodium	•	•	•	•	•	•	•	•	•
Tamoxifen	•	•	•	•	•	•			
Men's Health									
Finasteride			•	•	•	•	•	•	•
Total number of drugs offered on GDDP list	62	62	61	60	54	50	45	44	43

HCTZ indicates hydrochlorothiazide; ER, Extended Release.

eAppendix Table 3. Select Care Tier Status of Chronic Disease Medications Available at Walmart Generic Drug Discount Programs, 2009 – 2017

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Median proportion of all plans classifying GDDP-available drugs in tier 1 or select care tier (%)	94.8	94.5	93.1	86.7	69.7	63.9	60.6	72.8	75.2
Median proportion of MA-PDPs classifying GDDP-available drugs in tier 1 or select care tier (%)	96.1	96.4	95.6	87.7	68.9	58.1	57.5	74.5	77.4
Median proportion of stand-alone PDPs classifying GDDP-available drugs in tier 1 or select care tier (%)	93.5	92.4	90.2	85.3	71.1	71.7	65.4	69.8	69.6

GDDP indicates generic drug discount program; MA, Medicare Advantage; PDP, Prescription Drug Plan

eAppendix Table 4. Median Out-of-Pocket Costs and Proportion of Plans With Out-of-Pocket Costs Greater Than the GDDP Cash Price for Prescription Drugs Available Through Walmart’s GDDP, 30-Day and 90-Day Supplies, by Plan Type and Tier, 2009-2017

	2009	2010	2011	2012	2013	2014	2015	2016	2017
30-day supply, Median out-of-pocket costs^a									
Median out-of-pocket cost (\$), All plans [IQR] (YOY % change)	5.70 [2.55,7.98] (-)	5.60 [4.48,7.84] (-1.8%)	5.45 [2.26,7.63] (-2.7%)	5.35 [2.14,7.49] (-1.8%)	5.25 [1.65,7.35] (-1.9%)	3.09 [1.03,7.21] (-41.1%)	3.09 [0.00,6.18] (0.0%)	3.06 [0.99,6.12] (-1.0%)	2.00 [0.00,4.00] (-34.6%)
Median out-of-pocket cost (\$), MA-PDPs [IQR] (YOY % change)	5.70 [1.85,7.98] (-)	5.60 [4.48,7.84] (-1.8%)	6.54 [4.36,7.63] (16.8%)	5.35 [3.21,7.49] (-18.2%)	5.25 [3.15,8.40] (-1.9%)	5.15 [2.06,10.3] (-1.9%)	4.12 [2.06,10.30] (-20.0%)	4.08 [1.13,7.14] (-1.0%)	2.00 [0.00,4.00] (-51.0%)
Tier 1 and select care tier (\$) [IQR] (YOY % change)	5.70 [0.00,7.98] (-)	5.60 [4.48,7.84] (-1.8%)	5.45 [3.27,7.63] (-2.7%)	5.35 [3.21,7.49] (-1.8%)	4.20 [2.10,6.30] (-21.5%)	4.12 [1.03,5.15] (-1.9%)	3.09 [0.00,5.15] (-25.0%)	2.04 [0.00,5.10] (-34.0%)	2.00 [0.00,4.00] (-2.0%)
All other tiers (\$) [IQR] (YOY % change)	13.68 [8.55,66.12] (-)	11.20 [5.60,16.80] (-18.1%)	13.08 [6.54,38.15] (16.8%)	10.70 [6.42,13.91] (-18.2%)	10.50 [7.35,12.60] (-1.9%)	10.30 [7.21,15.45] (-1.9%)	10.30 [8.24,15.45] (0.0%)	12.24 [8.16,15.30] (18.8%)	10.00 [7.00,15.00] (-18.3%)
Median out-of-pocket cost (\$), Stand-alone PDPs [IQR] (YOY % change)	5.70 [2.64,7.98] (-)	5.60 [4.20,7.84] (-1.8%)	4.36 [2.18,6.00] (-22.1%)	3.21 [1.07,6.42] (-26.4%)	2.63 [1.05,5.25] (-18.2%)	2.06 [0.00,3.09] (-21.5%)	1.03 [0.0,3.09] (-50.0%)	1.02 [0.00,2.04] (-1.0%)	1.00 [0.69,2.39] (-2.0%)
Tier 1 and select care tier (\$) [IQR] (YOY % change)	5.70 [2.55,7.98] (-)	5.60 [2.80,7.84] (-1.8%)	4.09 [2.18, 5.45] (-27.0%)	3.21 [0.00,4.28] (-21.5%)	2.10 [1.05,3.15] (-34.6%)	1.03 [0.00,2.06] (-51.0%)	1.03 [0.00,1.03] (0.0%)	1.02 [0.00,1.02] (-1.0%)	1.00 [0.00,2.00] (-2.0%)
All other tiers (\$) [IQR] (YOY % change)	10.26 [8.55,11.40] (-)	8.40 [8.40,8.96] (-18.1%)	7.63 [4.22,15.37] (-9.2%)	7.49 [5.78,9.63] (-1.8%)	5.25 [3.61,8.40] (-29.9%)	5.15 [3.09,10.30] (-1.9%)	4.12 [3.09,6.18] (-20.0%)	5.10 [3.06,7.14] (23.8%)	4.00 [2.00,7.00] (-21.6%)
30-day supply, Proportion of plans requiring out-of-pocket costs greater than GDDP cash prices									
Proportion > GDDP cash price (%), All plans [IQR] (YOY % change)	60.2 [58.5,63.6] (-)	67.7 [63.9,69.1] (12.5%)	56.2 [52.4,59.8] (-17.0%)	51.2 [48.3,54.7] (-8.9%)	50.4 [43.2,53.5] (-1.6%)	39.1 [28.9,51.3] (-22.4%)	33.8 [26.2,52.1] (-13.6%)	38.2 [19.6,51.2] (13.0%)	33.4 [17.9,55.1] (-12.6%)

Proportion > GDDP cash price (%), MA-PDPs [IQR] (YOY % change)	61.2 [60.1,62.9] (-)	72.1 [71.7,73.5] (17.8%)	68.2 [67.3,70.3] (-5.4%)	64.0 [62.1,68.2] (-6.2%)	58.8 [52.1,61.7] (-8.1%)	55.7 [41.6,65.6] (-5.3%)	51.2 [37.1,64.1] (-8.1%)	48.7 [27.9,69.4] (-4.9%)	41.0 [22.7,66.1] (-15.8%)
Tier 1 and select care tier (%) [IQR] (YOY % change)	59.9 [59.1,60.9] (-)	72.4 [71.5,73.8] (20.9%)	67.9 [67.0,69.8] (-6.2%)	60.8 [58.2,62.7] (-10.5%)	45.4 [44.2,48.1] (-25.3%)	35.2 [32.2,39.2] (-22.5%)	25.5 [22.0,29.6] (-27.6%)	22.8 [15.6,25.9] (-10.6%)	19.2 [12.3,22.1] (-15.8%)
All other tiers (%) [IQR] (YOY % change)	87.8 [86.6,97.5] (-)	72.1 [65.8,79.3] (-17.9%)	80.7 [75.2,87.6] (11.9%)	93.5 [89.8,94.7] (15.9%)	93.9 [91.9,95.1] (0.4%)	89.9 [86.2,91.9] (-4.3%)	89.6 [84.8,91.8] (-0.3%)	94.4 [92.5,97.1] (5.4%)	94.9 [93.2,97.7] (0.5%)
Proportion > GDDP cash price (%), Stand-alone PDPs [IQR] (YOY % change)	60.1 [56.8,65.4] (-)	62.9 [55.5,63.3] (4.7%)	40.3 [34.0,46.8] (-35.9%)	33.5 [27.9,38.0] (-16.9%)	35.8 [28.1,40.8] (6.9%)	18.7 [9.5,32.0] (-47.8%)	12.2 [6.8,28.2] (-34.8%)	14.9 [5.6,28.2] (22.1%)	11.8 [3.3,28.2] (-20.8%)
Tier 1 and select care tier (%) [IQR] (YOY % change)	57.4 [54.9,62.4] (-)	58.9 [54.4,59.3] (2.6%)	37.6 [35.1,40.5] (-36.2%)	22.4 [20.9,23.9] (-40.4%)	21.2 [19.1,24.0] (-5.4%)	5.3 [3.8,8.1] (-75.0%)	5.3 [4.2,6.4] (0.0%)	2.0 [1.8,2.4] (-62.3%)	1.6 [1.0,2.1] (-20.0%)
All other tiers (%) [IQR] (YOY % change)	100.0 [100.0,100.0] (-)	100.0 [99.2,100.0] (0.0%)	75.8 [53.0,83.6] (-24.2%)	100.0 [100.0,100.0] (31.9%)	75.3 [69.5,80.4] (-24.7%)	57.1 [46.0,64.4] (-24.2%)	35.3 [20.6,46.6] (-38.2%)	54.0 [46.5,65.2] (53.0%)	45.4 [35.7,50.4] (-15.9%)
90-day supply, Median out-of-pocket costs^a									
Median cost-sharing (\$), All plans [IQR] (YOY % change)	-	-	-	-	-	7.73 [3.09,18.54] (-)	9.27 [0.77,18.03] (20.0%)	7.65 [2.46,18.36] (-17.5%)	6.00 [0.00,15.00] (-21.6%)
Median cost-sharing (\$), MA-PDPs [IQR] (YOY % change)	-	-	-	-	-	14.16 [5.15,30.90] (-)	15.45 [5.15,27.81] (9.1%)	12.24 [3.06,21.42] (-20.8%)	9.00 [0.00,15.00] (-26.5%)
Tier 1 and select care tier (\$) [IQR] (YOY % change)	-	-	-	-	-	10.30 [0.84,15.45] (-)	8.24 [0.00,15.45] (-20.0%)	6.12 [0.00,12.24] (-25.7%)	6.00 [0.00,12.00] (-2.0%)
All other tiers (\$) [IQR] (YOY % change)	-	-	-	-	-	30.90 [21.63,46.35] (-)	30.90 [21.63,46.35] (0.0%)	33.15 [24.48,45.90] (7.3%)	30.00 [21.00,45.00] (-9.5%)
Median cost-sharing (\$), Stand-alone PDPs	-	-	-	-	-	3.09 [0.00,9.27] (-)	3.09 [0.00,9.27] (0.0%)	3.06 [0.00,6.12] (-1.0%)	3.00 [0.00,6.00] (-2.0%)

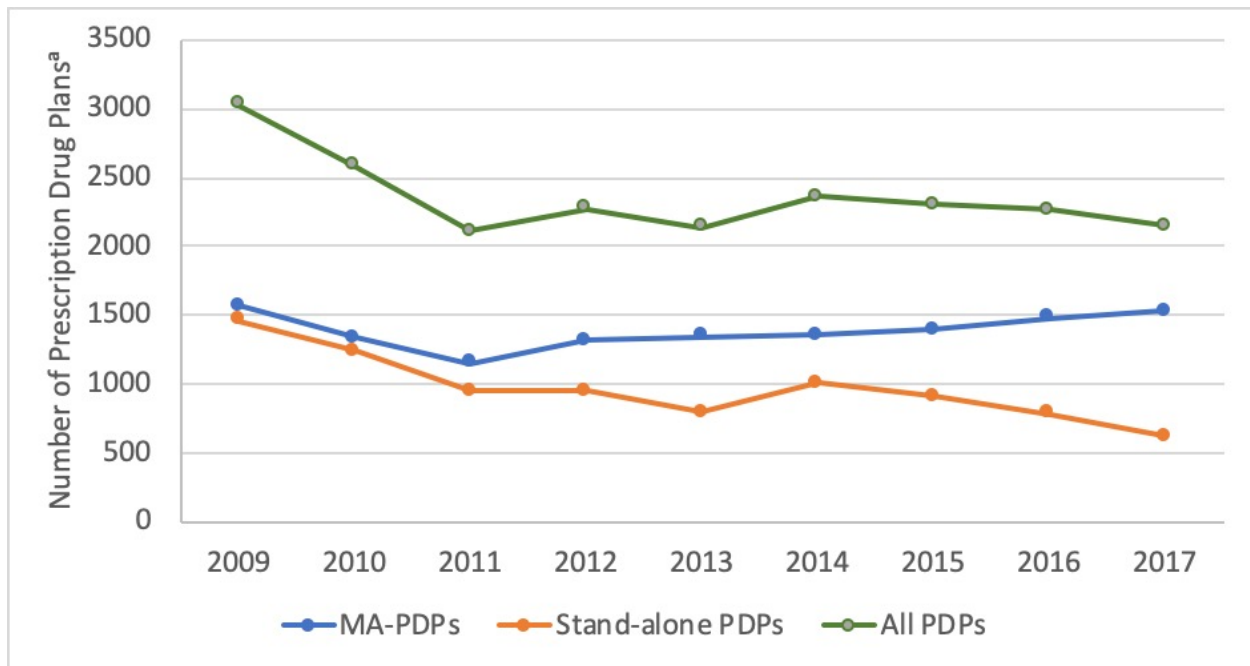
[IQR] (YOY % change)									
Tier 1 and select care tier (\$) [IQR] (YOY % change)	-	-	-	-	-	3.09 [0.00,6.18] (-)	3.09 [0.00,3.09] (0.0%)	3.06 [0.00,3.06] (-1.0%)	3.00 [0.00,6.00] (-2.0%)
All other tiers (\$) [IQR] (YOY % change)	-	-	-	-	-	15.45 [8.41,27.81] (-)	12.36 [9.27,18.54] (-20.0%)	15.30 [7.67,21.42] (23.8%)	10.00 [6.00,21.00] (-34.6%)
90-day supply, Proportion of plans requiring out-of-pocket costs >\$10									
Proportion >\$10 (%), All plans [IQR] (YOY % change)	-	-	-	-	-	43.9 [34.0,56.1] (-)	42.5 [33.8,59.2] (-3.2%)	42.1 [25.6,55.4] (-0.9%)	38.9 [22.9,58.2] (-7.6%)
Proportion >\$10 (%), MA-PDPs [IQR] (YOY % change)	-	-	-	-	-	61.3 [50.6,71.1] (-)	60.0 [48.3,71.1] (-2.1%)	53.8 [36.0,74.3] (-10.3%)	48.7 [29.9,70.7] (-9.5%)
Tier 1 and select care tier (%) [IQR] (YOY % change)	-	-	-	-	-	44.0 [41.9,49.1] (-)	37.2 [33.4,41.1] (-15.5%)	30.4 [26.0,36.0] (-18.3%)	27.1 [24.6,30.1] (-10.9%)
All other tiers (%) [IQR] (YOY % change)	-	-	-	-	-	90.9 [89.1,93.5] (-)	91.3 [88.5,93.2] (0.4%)	94.3 [92.1,96.2] (3.3%)	95.4 [93.9,98.3] (1.2%)
Proportion >\$10 (%), Stand-alone PDPs [IQR] (YOY % change)	-	-	-	-	-	22.4 [11.9,36.2] (-)	20.1 [8.6,38.3] (-10.3%)	15.9 [6.0,32.2] (-20.9%)	12.5 [4.0,28.6] (-21.4%)
Tier 1 and select care tier (%) [IQR] (YOY % change)	-	-	-	-	-	8.1 [5.3,10.9] (-)	6.7 [5.1,7.9] (-17.3%)	3.7 [2.9,4.1] (-44.8%)	1.4 [0.8,3.1] (-62.2%)
All other tiers (%) [IQR] (YOY % change)	-	-	-	-	-	64.8 [60.8,70.0] (-)	51.4 [33.6,59.2] (-20.7%)	56.7 [49.6,66.5] (10.3%)	47.7 [36.8,52.2] (-15.9%)

MA indicates Medicare Advantage; PDP, Prescription Drug Plan; GDDP, generic drug discount program; IQR, interquartile Range;

YOY, year-over-year.

^a Copayments were adjusted for inflation using June 2017 as the baseline for the median out-of-pocket cost outcome but not for the proportion of plans requiring copayments greater than GDDP cash price outcome.

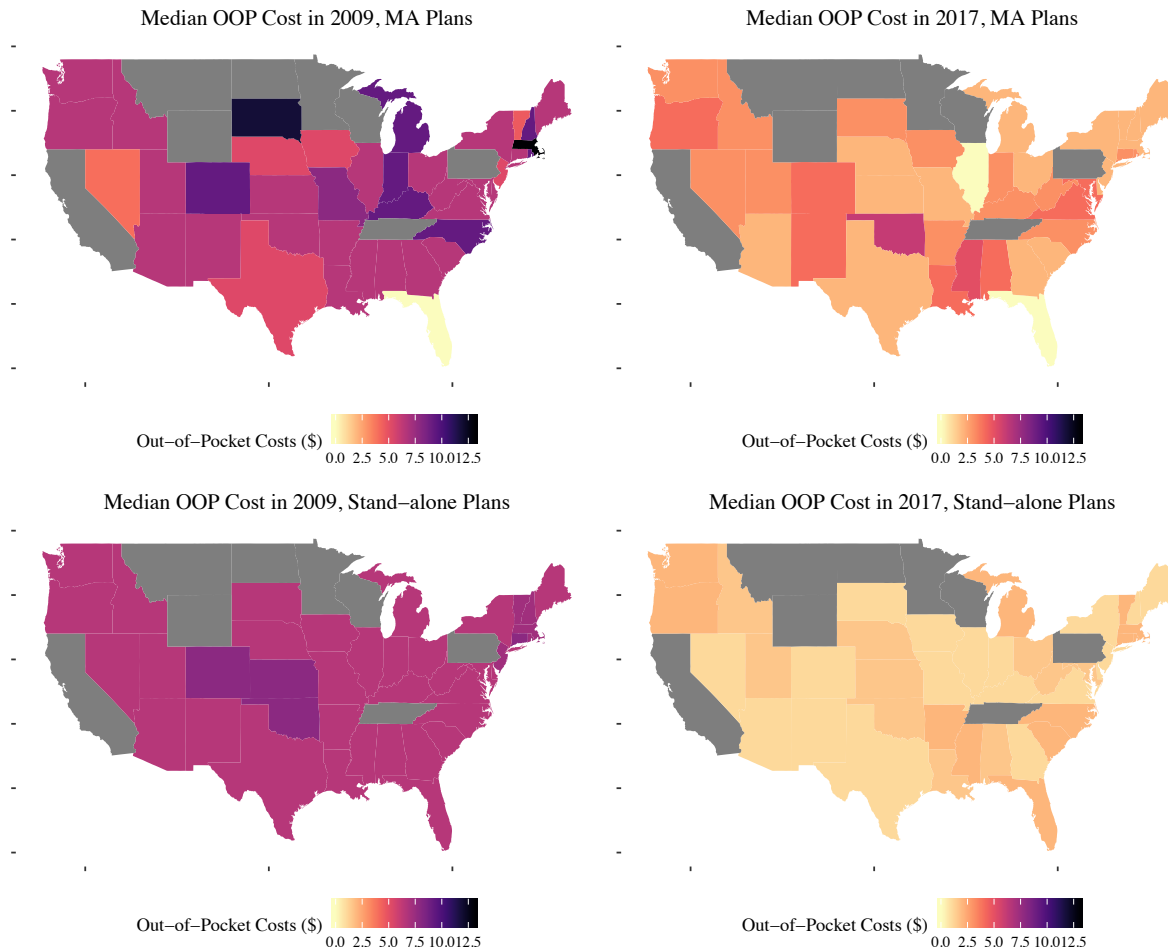
eAppendix Figure 1. Plan Characteristics, 2009 – 2017



MA indicates Medicare Advantage; PDP, Prescription Drug Plan

^a The number of PDPs is only for states in which Walmart guarantees its advertised cash prices for a 30-day supply

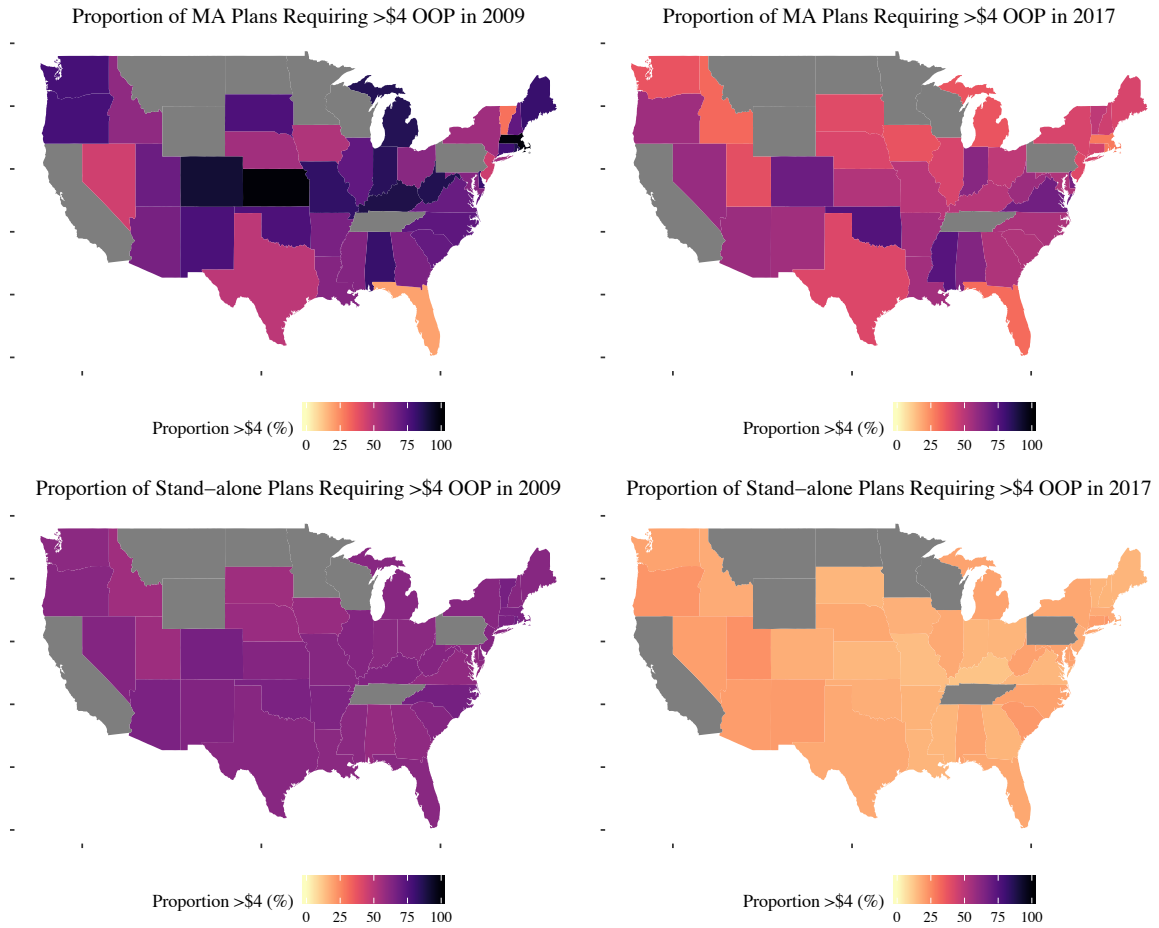
eAppendix Figure 2. Median Out-of-Pocket Costs Across U.S. States, by Plan Type, 2009 & 2017



OOP indicates out-of-pocket; MA, Medicare Advantage; GDDP, generic drug discount program; PDP, Prescription Drug Plan.

^a Grey states are those excluded from our analysis because Walmart does not guarantee its advertised cash price prices for a 30-day supply of GDDP-available medications in those states.

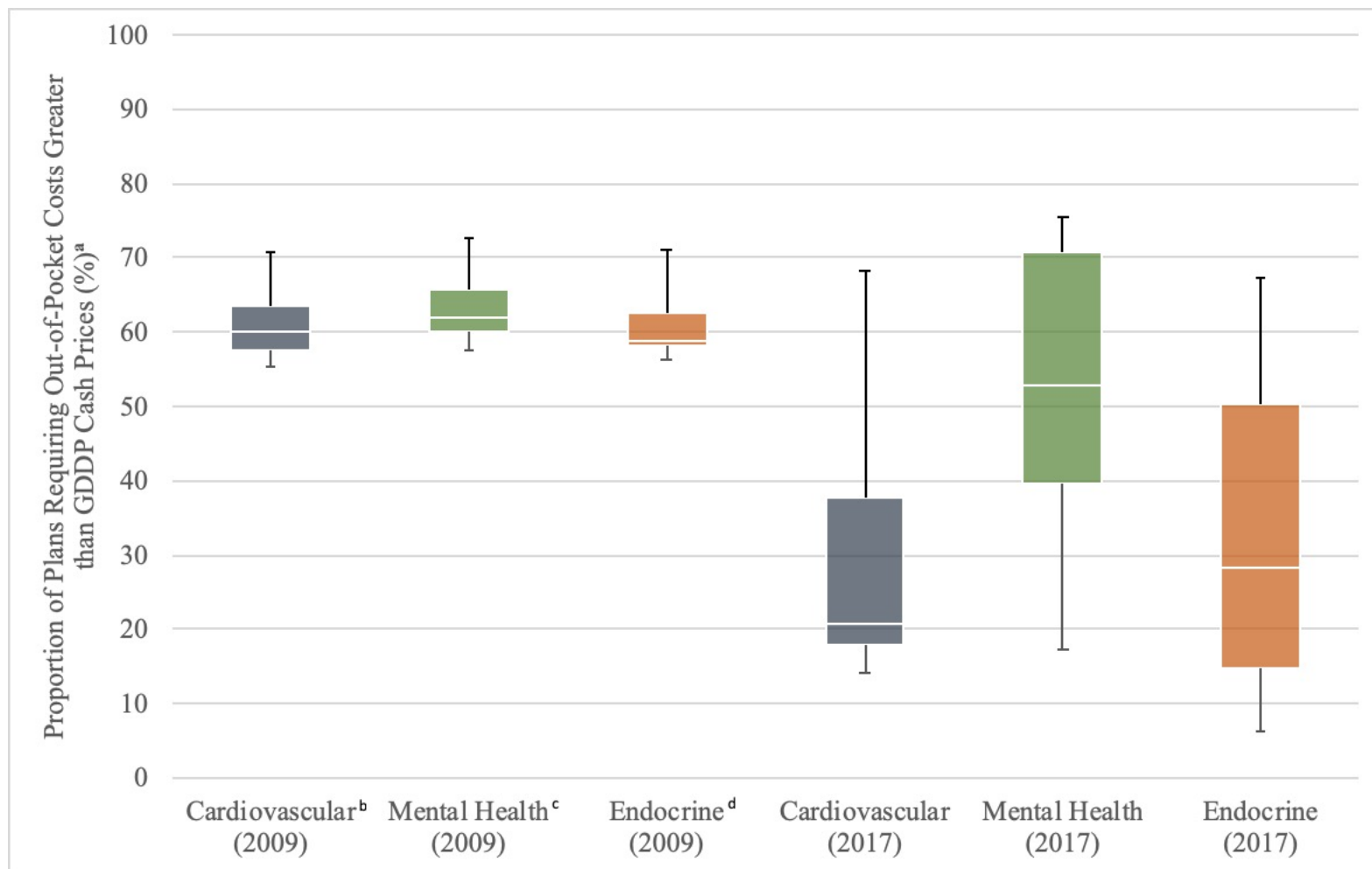
eAppendix Figure 3. Proportion of Plans Requiring Out-of-Pocket Costs Greater Than the GDDP Cash Price Across U.S. States, by Plan Type, 2009 & 2017



OOP indicates out-of-pocket; MA, Medicare Advantage; GDDP, generic drug discount program; PDP = Prescription Drug Plan.

^a Grey states are those excluded from our analysis because Walmart does not guarantee its advertised cash price for a 30-day supply of GDDP-available medications in those states.

eAppendix Figure 4. Proportion of Plans Requiring Out-of-Pocket Costs Greater Than the GDDP Cash Price for a 30-Day Supply of Generic Medications Used to Treat Chronic Diseases, by Therapeutic Classes, 2009 and 2017



^a Copayments were not adjusted for inflation when comparing the required plan copayment to Walmart's cash price for a 30-day supply.

^b Walmart's "Heart Health and Blood Pressure" and "Cholesterol" categories.

^c Walmart's "Mental Health" category.

^d Walmart's "Thyroid Conditions," "Diabetes," "Women's Health," and "Men's Health" categories.