

Value-Based Insurance Design in Louisiana: Blue Cross Blue Shield's Zero Dollar Co-pay Program

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Nonadherence to prescription medications is a significant factor contributing to the high clinical and economic costs of chronic disease. For example, only about 50% of patients with hypertension have the disease controlled, despite the efficacy of taking antihypertensive medication as prescribed.¹ Similarly, about 50% of patients prescribed antidepressants, one of the most commonly prescribed medication classes, become nonadherent within 6 months after treatment initiation.^{2,3} More broadly, as many as 50% of patients do not take their prescriptions for the recommended duration and about 20% to 30% of patients do not fill their prescriptions.⁴

Nonadherence may be due to financial barriers or patients misperceiving the importance or value of their prescription medication. Numerous insurers and employers have turned to value-based insurance designs (VBIDs) that reduce or eliminate co-pays for relevant chronic disease medications to increase medication adherence. There is also hope that these programs will ultimately decrease total spending.

A large amount of evidence demonstrates that medication adherence increases following the reduction or complete removal of patient cost sharing for chronic disease prescriptions.^{5,6} However, there is limited evidence that reducing cost sharing reduces total spending.^{7,8} A recent literature review on VBIDs for chronic disease medications found 9 studies that examined VBID's effect on total spending and spending on prescription medication.⁹ Results of 7 studies showed an increase in prescription drug spending, and just 1 study, by Kim et al, showed a reduction in total spending relative to a control group.⁸ Other study findings revealed no statistically significant difference in total spending. (Findings of a second study by Hirth et al evaluating Connecticut state employees' 2011 VBID plan showed a statistically significant increase in total spending relative to employees in neighboring states.¹⁰ However, the authors did not draw strong conclusions from this secondary outcome because the control group's spending was significantly different from the treatment group's spending prior to the introduction of the VBID program.) Typically, these programs focus on a small set of medications or a handful of disease categories, perhaps

ABSTRACT

OBJECTIVES: To determine whether a program that eliminated pharmacy co-pays, the Blue Cross Blue Shield of Louisiana (BCBSLA) Zero Dollar Co-pay (ZDC) program, decreased health care spending. Previous studies have found that value-based insurance designs like the ZDC program have little or no impact on total health care spending. ZDC included an expansive set of medications related to 4 chronic diseases rather than a limited set of medications for 1 or 2 chronic diseases. Additionally, ZDC focused on the most at-risk patients.

STUDY DESIGN: ZDC began in 2014 and enrolled patients over time based on (1) when a patient answered a call from a nurse care manager and (2) when a patient or their employer changed the benefit structure to meet the program criteria. During 2015 and 2016, 265 patients with at least 1 chronic condition (asthma, diabetes, hypertension, mental illness) enrolled in ZDC.

METHODS: Observational study using within-patient variation and variation in patient enrollment month to identify the impact of the ZDC program on health spending measures. We used 100% BCBSLA claims data from January 2015 to June 2018. Monthly level event studies were used to test for differential spending patterns prior to ZDC enrollment.

RESULTS: We found that total spending decreased by \$205.9 ($P = .049$) per member per month, or approximately 18%. We saw a decrease in medical spending (\$195.0; $P = .023$) but did not detect a change in pharmacy spending (\$7.59; $P = .752$). We found no evidence of changes in spending patterns prior to ZDC enrollment.

CONCLUSIONS: The ZDC program provides evidence that value-based insurance designs that incorporate a comprehensive set of medications and focus on populations with chronic disease can reduce spending.

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TAKEAWAY POINTS

Patient enrollment in Blue Cross Blue Shield of Louisiana's Zero Dollar Co-pay (ZDC) program, a new value-based insurance design (VBID), was associated with an 18% decrease in total spending.

- ▶ Previous evidence indicated that eliminating pharmacy co-pays led to medication adherence but no change in total spending.
- ▶ ZDC eliminated co-pays for a large set of medication classes related to 4 chronic disease categories, including mental illness, for members with chronic disease.
- ▶ VBID programs that include a more comprehensive set of medication classes and focus on populations with chronic disease can lead to significant changes in total health care spending.

limiting the effectiveness of the programs. Importantly, patients with chronic disease typically have multiple comorbidities and have a higher rate of mental illness relative to the US population as a whole.¹¹ The VBID programs studied thus far have generally not supported a wide range of medications that take into account a patient's full medical complexity.

In 2014, Blue Cross Blue Shield of Louisiana (BCBSLA) implemented a Zero Dollar Co-pay (ZDC) program, which removed the co-pay for a large set of medications related to 7 chronic diseases. This program included a larger range of drug classes relative to most other VBID programs examined in the literature. In particular, it included medications related to mental illness. Importantly, antidepressants were not included in any previously studied program. Additionally, the program reduced the co-pay for a subset of medications in each drug class rather than reducing all co-pays in a drug class, which most VBID programs in the literature have done. Overall, the ZDC program relative to many previous VBID programs included a more comprehensive set of medications and had a stronger incentive for patients to substitute different and often less expensive prescription medications. This study evaluated whether the ZDC program changed total member spending.

Setting

Beginning in August 2014, BCBSLA rolled out its ZDC program in conjunction with its new disease management (DM) program. Although both programs served members with chronic illnesses, the ZDC program was intended for patients with chronic disease who engaged with nurse care managers (the member had to answer at least 1 call from a nurse care manager from the DM program). A member was automatically enrolled in the DM program once they were identified as having at least 1 of the following chronic diseases: asthma, chronic obstructive pulmonary disease, congestive heart failure, hypertension, diabetes, prediabetes, end-stage renal disease, and chronic kidney disease. The DM program provided members with motivational interviewing, health coaching, care plan development, long-term support, and an assessment of their health status. (The individual member health assessment was provided at the beginning of DM enrollment and included a comprehensive medical and pharmacy claim, biometric data, and personal health record review.)

Once a member was enrolled in the DM program, they were eligible for the ZDC program if they were fully insured commercial with BCBSLA's pharmacy benefit manager. Furthermore, patients had to actively engage with a nurse care manager and take medications for at least 1 of 4 chronic conditions: asthma, diabetes, hypertension, and mental illness. BCBSLA identified a set of high-volume, low-cost medications for each relevant drug class and reduced those co-pays to \$0. The majority of selected drugs were generic

medications. When no generic medication was available, a branded medication was selected for inclusion in the ZDC program. Members learned about their ZDC enrollment when filling a ZDC prescription at a pharmacy. Switching from a non-ZDC to a ZDC medication requires that a provider switch a member's prescription.

Although both the DM and ZDC programs began in August 2014, patients enrolled in the ZDC program at different times due to 2 factors: when a patient actively engaged with a nurse care manager (answered a nurse call) and when a patient or their employer changed the benefit structure to meet the ZDC program criteria. A variety of factors could have led a member to change their engagement with the DM nurse care manager or their benefit structure. In particular, ZDC enrollment could be associated with a negative health event (eg, emergency department visit, inpatient admission). If, instead, ZDC enrollment occurred due to an employer changing its benefit structure, the timing of enrollment was plausibly unrelated to member characteristics that could affect a member's response to the ZDC program.

METHODS

Study Data and Sample

We had BCBSLA claims data from January 2015 through May 2018, which included all physician, inpatient, outpatient, and pharmacy services for individuals who participated in the ZDC program. The study population included all BCBSLA members who actively engaged in the DM program between January 1, 2015, and December 31, 2017, and who subsequently joined the ZDC program. We only included months in which members were actively engaged in the DM program. Additional inclusion factors required that members (1) be part of the DM program and actively engaged for at least 6 months, (2) be part of the DM program and actively engaged for at least 1 month prior to joining the ZDC program, (3) have at least 1 month of claims following ZDC enrollment, (4) take ZDC program-related drugs during the study period, and (5) be at least 18 years old. These requirements ensured that members had claims data prior to and after ZDC enrollment.

The main outcome of interest was total spending and included the allowed amount paid by BCBSLA and any cost sharing paid by

the member. Spending was measured at the member-month level (per member per month [PMPM]). Additionally, total spending was decomposed into medical and pharmacy spending.

Statistical Analysis

We used a quasiexperimental observational design to estimate the effect of the ZDC program on spending outcomes. BCBSLA rolled out the program to all members with the relevant chronic conditions and prescription medications; therefore, we cannot use a traditional difference-in-differences approach with a single treatment group and a single control group. We used the variation in timing of when a member joined the ZDC program to create control groups. When a member joined in a certain month, the control members were those who had yet to join or had already joined.

We ran all regressions with time fixed effects, member fixed effects, and an indicator for ZDC participation (the indicator switches on the first month the member was eligible to receive a ZDC medication). Additional control variables included a member's age group, concurrent risk score (based on a rolling 12-month lookback of member health care data), an indicator for whether a member's provider participated in BCBSLA's patient-centered medical home initiative, and the number of calls from a nurse care manager. The inclusion of member fixed effects conservatively forced a member's overall performance to act as a control for their own performance change in the ZDC program. The inclusion of time fixed effects captured temporal trends. Importantly, the indicator for ZDC participation was the average effect of the ZDC program if the timing of a member joining was not related to other factors that were related to the outcomes of interest.

In the study population, ZDC enrollment timing was due to member- and employer-level decisions. Enrollment timing was plausibly exogenous if a member enrolled due to an employer changing its benefit structure. Alternatively, our estimate of the ZDC program effect would be biased upward if enrollment was due to a negative health shock because higher spending would be captured prior to ZDC enrollment. Importantly, we explored using event studies whether members had enhanced or depressed spending around ZDC enrollment, which would suggest a health shock. Specifically, we plotted the average monthly member spending relative to the member's month of ZDC enrollment.

One final factor associated with ZDC enrollment was DM enrollment, as members typically joined the ZDC program soon after enrolling in the DM program. To uniquely identify the effect of ZDC, we required patients to have at least 1 month of actively engaging with DM prior to ZDC enrollment. In our sample, members joined the ZDC program, on average, 6 months after DM engagement.

All models were run at the monthly member level and used ordinary least squares. We ran sensitivity analyses using a general linear model (GLM) with log link Poisson distribution. Additional sensitivity analyses used various sets of control variables adding age group polynomials, as well as dropping age groups and intervention calls. SEs were clustered to account for repeated

TABLE 1. Baseline Characteristics of Study Population^a (N = 265)

| | |
|---|-----------|
| Age group, in years | |
| 18-24 | 0.4% |
| 25-44 | 11.7% |
| 45-64 | 77.4% |
| ≥65 | 10.6% |
| Risk score, based on previous rolling 12 months | |
| Mean | 6.51 |
| Interquartile range | 1.72-6.53 |
| PCMH provider ^b | 54% |
| Female sex | 62.6% |
| Chronic condition | |
| Asthma | 4.9% |
| Diabetes | 51.7% |
| Hypertension | 85.3% |
| Mental illness | 39.6% |
| Total spending (per member per month) | \$1169.9 |

PCMH, patient-centered medical home.

^aAll variables represent values for the first month in the data except for total spending, which represents the average spending prior to Zero Dollar Co-pay enrollment.

^bIndicator of whether member's attributed primary care provider was part of Blue Cross Blue Shield of Louisiana's PCMH program, also known as Quality Blue.

measures at the member level and used the Huber-White correction. All *P* values were 2-sided. Analyses were conducted using Stata 15.1 (StataCorp).

RESULTS

Sample Characteristics

There were 265 patients who met sample inclusion criteria (Table 1). The patient sample was more likely to be female (62.6%) and older, with almost 90% of the population 45 years or older. More than one-third of patients had multiple chronic conditions, with the most prevalent conditions being hypertension (85.3%), diabetes (51.7%), and mental illness (39.6%). The study sample had high costs relative to other BCBSLA members, with 193% higher total spending during 2015 (\$1170 vs \$463 PMPM; total spending of all other members not shown in Table 1).

Spending

Adjusted results demonstrated that the ZDC program decreased member total spending by \$205.9 PMPM (*P* = .049), or approximately 18% of total spending, relative to members who had yet to enroll and members who had already enrolled (Table 2). When decomposing total spending into medical and pharmacy spending, enrollment in the ZDC program was associated with a decrease in medical spending of \$195.0 (*P* = .023), or approximately 25% relative to baseline spending. No statistically significant change was estimated for pharmacy spending. Results were similar in significance and

TABLE 2. Average Effect of ZDC Enrollment on PMPM Spending*

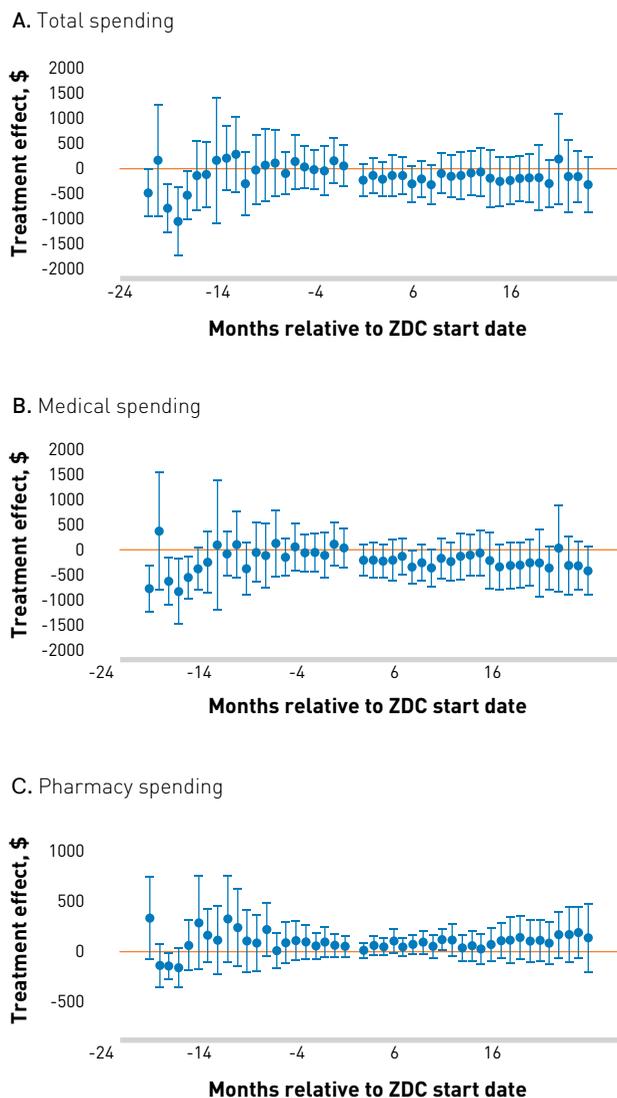
| | Baseline spending | Adjusted ZDC effect (SE) |
|----------------|-------------------|--------------------------|
| Total spending | \$1169.9 | -\$205.9* (104.3) |
| Medical | \$798.7 | -\$195.0* (85.3) |
| Pharmacy | \$371.1 | -\$7.59 (61.8) |

PMPM, per-member per-month; ZDC, Zero Dollar Co-pay.

* $P < .05$.

*N = 4970 for all regressions. Other controls include number of nurse calls, concurrent risk score, member age group, indicator for patient-centered medical home-associated provider, member fixed effects, and month fixed effects.

FIGURE. Event Studies for Main PMPM Spending Outcomes



PMPM, per-member per-month; ZDC, Zero Dollar Co-pay.

slightly smaller in magnitude using the GLMs (see [eAppendix Table 1](#) [eAppendix available at [ajmc.com](#)]).

Additional analyses decomposed medical spending into inpatient, outpatient, and professional spending; pharmacy spending into branded and generic; and total spending by members with specific chronic diseases including diabetes, mental illness, and hypertension (too few patients had asthma to run further analysis). No further significant results were detected (see [eAppendix Tables 2 and 3](#)). All results were similar for sensitivity analyses with various sets of controls (adding age group polynomials, dropping age groups, and dropping intervention calls).

The event studies in the [Figure](#) demonstrate that members did not have higher or lower average monthly spending immediately prior to or following ZDC enrollment.

DISCUSSION

We found evidence that total member health care spending decreased significantly after enrollment in the ZDC program, with a \$205.9 PMPM, or approximately 18%, decrease ($P = .049$). The decrease was primarily due to changes in medical spending rather than pharmacy spending (medical spending decrease of \$195.0; $P = .023$; no statistically significant change in pharmacy spending). Results suggest that BCBSLA's ZDC program accomplished something unusual in health care—enhanced patient access to medication and reduced total spending—through the elimination of co-pays for a subset of primarily generic medications in various chronic condition drug classes.

Ample evidence has demonstrated that a decrease in patient cost sharing increases medical care use.^{12,13} However, when faced with lower cost sharing, patients increase their use of high- and low-value care or medications rather than increase their use of solely services or drugs deemed high value.^{13,14} This fact suggests that patients misperceive the medical benefit of specific types of medical services or medications. VBID products were developed based on the premise that incorporating a patient's misperceptions in patient cost sharing could decrease the use of wasteful services (by increasing patient cost sharing for these services) and, alternatively, increase the use of beneficial services (by decreasing patient cost sharing).¹⁴

The majority of VBID products focus on decreasing or eliminating co-pays for prescription medications for a relatively narrow set of drug classes. As noted earlier, a growing body of literature has found that these VBIDs increased medication adherence; however, these products generally did not decrease overall spending.⁹

We found evidence for a decrease in total spending with the introduction of BCBSLA's VBID program, ZDC. We postulate 2 reasons for the significant and large decrease in total spending. First, this program eliminated co-pays for a small set of primarily generic medications in each drug class. Many other VBID programs reduced co-pays for all drugs in a class. The reduction was frequently largest for generic or tier 1 medications and smallest for branded or higher

tiers of medications. BCBSLA's ZDC program therefore had a larger incentive for patients to switch from branded to generic medications because co-pays for branded medications were generally not reduced. Our analysis of branded and generic medication spending changes did not detect significant differences; however, our results were imprecise, and we could not detect a difference below 30% (see eAppendix Table 2).

Second, we postulate that the inclusion of antidepressants as a drug class increased the effectiveness of the program. ZDC was the first VBID to our knowledge to include antidepressants as a drug class. Increased medication adherence for antidepressants could improve downstream patient outcomes that affect other health care service use, and more than one-third of our sample had an antidepressant prescription. Subset analysis for only enrollees receiving antidepressant medications did not detect differences in total spending relative to other populations, but we could not detect a difference below 37% (see eAppendix Table 3).

In March 2018, BCBSLA expanded the ZDC program to members who are enrolled in the DM program but do not actively engage with a nurse care manager. The change in program requirements increased ZDC enrollment by 20-fold. Future work should evaluate whether total spending reductions hold for the expanded population, as well as explore whether patients substituted branded for generic medications and whether patient savings were concentrated in certain patient types, such as members taking antidepressants.

Limitations

Our study has several limitations. First, we relied on the timing of a patient's enrollment in the ZDC program to identify the effect of the program. This approach assumed that the timing of enrollment was not related to the outcomes of interest. Automatic enrollment occurred when a member's employer changed its pharmacy benefits, making ZDC enrollment plausibly unrelated to the outcomes of interest. Alternatively, enrollment occurred when a patient changed their pharmacy benefits or began accepting calls from a nurse care manager. The timing of a patient changing their pharmacy benefits or accepting phone calls could be associated with a negative health shock and would bias our results upward. Importantly, the event study analysis demonstrated that no significant changes in spending occurred directly around ZDC enrollment (Figure), suggesting that no health event or change in health care behavior was associated with ZDC enrollment.

Second, our limited sample size prevented precise estimates for subset analysis that could provide insight into potential mechanisms for the total spending results. Finally, results were limited to those who enrolled in the ZDC program and may not generalize to similar programs for a broader patient population. However, the ZDC program was geared toward patients at highest risk who would be likely to benefit most from the program.

CONCLUSIONS

In this study evaluating the impact of BCBSLA's ZDC program, we found that patient overall spending decreased almost 18% after enrollment. This was among the first studies to demonstrate health spending savings in a VBID program. Unique features of the ZDC program included the incorporation of numerous drug classes covering 4 chronic diseases, including mental health disorders, and the reduction of cost sharing for a subset rather than all medications in a single drug class. Other insurers and employers may find it useful to apply ZDC program features to new and current VBID programs. ■

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eAppendix Table 1. Average effect of ZDC enrollment on spending using GLM log link, poisson distribution

| | Adjusted ZDC effect |
|----------------|---------------------|
| Total Spending | -142.2* (63.9) |
| Medical | -90.1 (48.7) |
| Pharmacy | -21.2 (14.9) |

Notes: Standard errors in parentheses; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. N is 4,969 for all regressions. Other controls include: number of nurse calls, concurrent risk score, member age group, indicator for Patient Centered Medical Home associated provider, member fixed-effects and month fixed-effects.

eAppendix Table 2. Adjusted effect of ZDC enrollment on spending for spending on inpatient, outpatient, professional services, and branded and generic medications

| | Inpatient | Outpatient | Professional | Rx: Branded | Rx: Generic |
|---------------------|------------------|-------------------|-------------------|--------------------|------------------|
| Adjusted ZDC effect | 6.492 (28.94) | -144.8 (77.19) | -41.52 (26.98) | -7.591 (-61.84) | -0.88 (-9.95) |
| N | 4,969 | 4,969 | 4,969 | 4,969 | 4,969 |

Notes: Standard errors in parentheses; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Other controls include: number of nurse calls, concurrent risk score, member age group, indicator for Patient Centered Medical Home associated provider, member fixed-effects and month fixed-effects.

eAppendix Table 3. Adjusted effect of ZDC enrollment on spending for beneficiaries by chronic condition

| | Diabetes | Mental Health | Hypertension |
|----------------|-----------------|-------------------|-----------------|
| Total Spending | -88 (97.9) | -274.6 (218.4) | -102 (65.4) |
| Medical | -34.1 (72.6) | -78.1 (144.7) | -55.2 (46.1) |
| Pharmacy | -24 (20.3) | -193.9 (157.2) | -21.5 (19.2) |
| N | 2,513 | 1,810 | 4,261 |

Notes: N in final column represents N for all regressions in column. Standard errors in parentheses; * p<0.05; ** p<0.01; *** p<0.001. Other controls include: number of nurse calls, concurrent risk score, member age group, indicator for Patient Centered Medical Home associated provider, member fixed-effects and month fixed-effects.