

Reduced Medical Spending Associated With Integrated Pharmacy Benefits

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An employer considering the structure of its employee health insurance plan must make several consequential decisions about benefit design. One key choice is whether to exclude (ie, “carve out”) benefits for certain services or patient populations from core medical benefits or to offer an integrated benefits package from a single vendor (ie, to “carve in” these services). Extensive debate about the relative merits of these 2 approaches followed the emergence of pharmacy benefits managers (PBMs) in the 1980s¹ and mental health and substance abuse (MH/SA) carve-out plans in the 1990s.²

Carve-outs are generally promoted as a mechanism for cost containment while also attempting to preserve a high standard of quality of care.^{3,4} In both the PBM and MH/SA contexts, carve-outs rely on specialization as a component of cost reductions.^{5,6} In the case of PBMs, this can take the form of utilization review and formulary management, which are used to identify cost-effective drugs and promote their utilization through physician and beneficiary education or tiered co-pays.^{4,7} Carve-out plans can also leverage greater scale to negotiate discounts more effectively. In 2017, PBMs directed prescription drug coverage for roughly 266 million Americans. Furthermore, consolidation of PBMs ensured that about 80% of American lives, in 2014, were covered by the top 3 PBMs.⁸

In the MH/SA case, prior research has shown that carving out benefits can lead to reductions in costs in a variety of settings,⁹⁻¹¹ although the evidence regarding the impact of carve-outs on quality is mixed.⁵ When comparing the performance of pharmaceutical carve-outs and integrated benefits, the picture is much murkier, owing in part to the opacity of negotiations between PBMs and drug manufacturers.⁸ Given this uncertainty, it is important to consider areas where pharmacy benefit carve-outs may not deliver savings—especially given recent commentary, which has highlighted that PBMs are not necessarily organized or incentivized to generate the most value for patients.^{7,12} Indeed, some industry reports have pointed to potential savings from the provision of an integrated pharmacy benefit.^{13,14} Moreover, several states have made sweeping changes to their Medicaid PBM contracts, ranging from imposing new disclosure requirements to terminating them

ABSTRACT

OBJECTIVES: Although pharmacy benefit carve-outs are promoted as a cost-containment tool, their impact on medical spending is not well understood. We compare the health care spending of Blue Cross and Blue Shield of Louisiana (BCBSLA) members covered by an integrated (“carved-in”) pharmacy benefit with that of members covered under a pharmacy benefit carve-out.

STUDY DESIGN: Matched, longitudinal cohort study.

METHODS: We identified members with coverage through an employer contracting for administrative services only (ie, self-insured) and determined whether they received a pharmacy benefit through BCBSLA. We matched members with and without integrated benefits using a baseline year and compared their medical spending trajectories in 3 subsequent years. These comparisons were repeated in the subset of patients with chronic comorbidities.

RESULTS: Among patients with chronic illnesses, relative growth in per-member per-month (PMPM) medical spending was significantly lower in the integrated benefit group by the second and third follow-up years. Neither the level nor the growth of PMPM medical spending significantly differed in the full population sample, although point estimates suggest that the integrated benefit members may be on a lower cost growth trajectory over time.

CONCLUSIONS: Members with chronic illnesses receiving an integrated pharmacy benefit experienced slower medical cost growth compared with members covered by a pharmacy carve-out. Group leaders and brokers should consider the additional cost savings achieved by integrated pharmacy benefits when comparing the total costs of carve-in vs carve-out prescription drug programs.

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entirely, indicating concerns about whether these arrangements are delivering value.¹⁵

For example, one aspect of MH/SA carve-outs highlighted in evaluation is the contribution of utilization review and care coordination. Although selective contracting with specialty providers or PBMs might drive efficiencies in health care consumption *within* a given category of spending, it could also increase fragmentation across health care settings for the *patient as a whole*. Therefore, providing integrated pharmacy or other benefits could allow for improved care coordination. One important component of integrated benefits is the availability of prescription drug utilization data to health plans because prior work has shown that pharmacy data can be a reliable predictor of a patient's total health care spending.¹⁶

These considerations are particularly pressing given the massive contribution of prescription drug spending to health care costs and cost growth. Retail drugs account for 21% of spending by employer-sponsored health plans.¹⁷ Although expenditure growth slowed in 2016 and 2017, the previous 2 years saw 12.4% and 8.9% growth in retail drug spending, pointing to high uncertainty in these costs as well.¹⁸ High prescription drug costs will continue to exert pressure on employers to seek savings in pharmacy costs.

This study used claims data from Blue Cross and Blue Shield of Louisiana (BCBSLA) members to evaluate the association between coverage under integrated pharmacy benefits and medical spending, which may guide the choices of employers considering the design of employee benefits. We followed a matched cohort of patients with and without integrated pharmacy benefits over 3 years and assessed the potential impact of integrated pharmacy benefits on spending for the entire population and a select cohort of members with chronic conditions.

METHODS

We conducted a longitudinal, matched case-control study to assess whether the provision of integrated pharmacy benefits was associated with lower levels of growth of health care spending. Our analysis used member-level medical claims data (excluding pharmacy claims) from BCBSLA covering the period from October 1, 2014, through September 30, 2018, and included members covered through employers who contracted for administrative services only (self-insured firms). Our outcome of interest was total combined inpatient and outpatient medical costs, which excluded spending on prescription drugs because these records were unavailable for members covered by a prescription drug program carved out to a PBM. Using administrative data, we partitioned our sample into 2 mutually exclusive groups: (1) members with integrated pharmacy coverage and (2) those covered by a pharmacy benefit carve-out. We then conducted a 1:1 match of integrated benefit and carve-out members on attributes in the baseline year of the data (2014-2015)

TAKEAWAY POINTS

Members with chronic illnesses receiving an integrated pharmacy benefit experienced slower medical cost growth compared with members covered by a pharmacy carve-out.

- ▶ Integrated pharmacy benefits are associated with reduced medical expenditures over the long term, resulting in annual per-member per-month savings compared with a carve-out.
- ▶ These savings are observable in the population as a whole but are more pronounced for patients with chronic illnesses.
- ▶ Any potential savings on drug spending promised by a pharmacy benefits carve-out should be weighed against potential increases in medical spending.

and followed these members for comparison in the 3 following years (2015-2018). The details of the sample selection, matching, and comparisons follow.

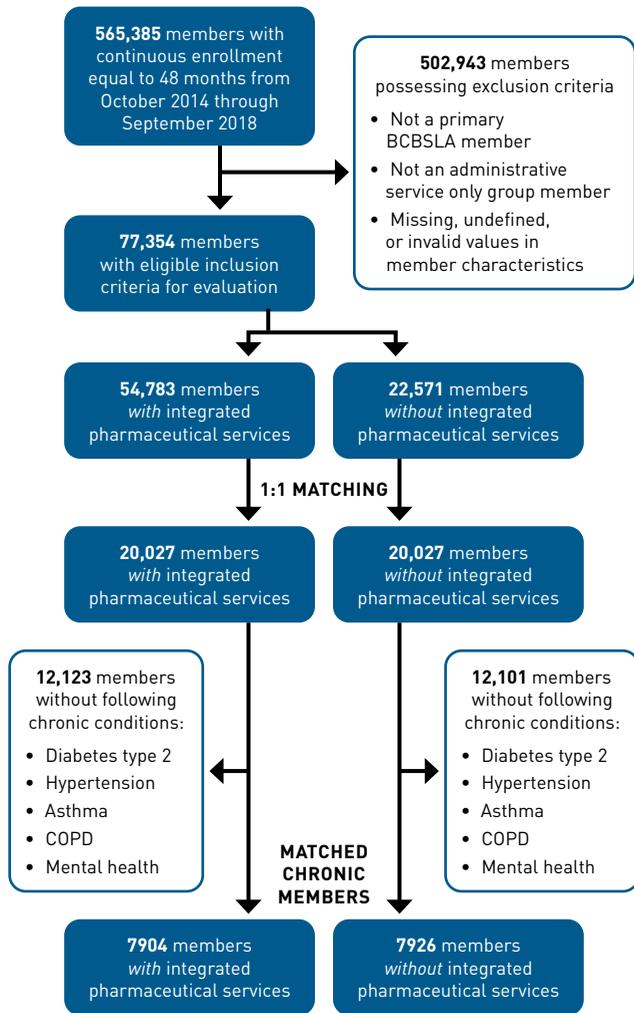
Sample Selection

Members had to have 48 months of continuous enrollment during the study period (October 1, 2014, through September 30, 2018) to be considered for inclusion in the analytic sample. All members were then required to have their primary coverage through BCBSLA, and their coverage had to be provided through a self-insured employer during all 4 years of the study. Additionally, we excluded members with missing data for key characteristics and members with extreme outlier medical spending values (the top 1%). Of the 565,385 members who met the initial criterion, a total of 77,354 (13.7%) members met the additional inclusion criteria (54,783 integrated members and 22,571 carve-out members). An attrition diagram detailing these steps appears in [Figure 1](#).

It is important to note that employers do not randomly choose to carve out pharmacy benefits; they may consider factors like recent spending and utilization trends among their employees when evaluating competing benefit designs. As a result, a naive comparison of integrated benefit and carve-out members may result in biased estimates of the effect of carving out pharmacy benefits. To account for this possibility, we used exact matching to create a matched cohort of integrated benefit and pharmacy carve-out members and followed them for 3 years post matching to compare both level and trend differences in medical spending. The matching procedure used member values for key variables during the first year (baseline year) of the study period, from October 1, 2014, through September 30, 2015. The matching criteria were selected to account for factors most likely to impact the need for medical care.

Regarding demographics and health status, we matched on sex, clinical diagnoses for chronic diseases that had the largest distributions in our study group (eg, diabetes, asthma, hypertension, and mental health conditions), and narrow bins of DxCG concurrent risk score. The DxCG risk score uses health care data to assign individual risk scores to patients for both concurrent and prospective diagnoses and estimates both retrospective and future expected health care payments for a commercially insured population. To account for the potential impact of other aspects of members' health insurance coverage, we also included the type

FIGURE 1. Attrition Diagram for the Selection of BCBSLA Members



BCBSLA, Blue Cross and Blue Shield of Louisiana; COPD, chronic obstructive pulmonary disease.

of insurance plan (health maintenance organization vs preferred provider organization) and insurance market region in the match. We combined all large urban areas into a single category for purposes of the matching procedure. Other parishes and out-of-state addresses remained as separate categories.

Additionally, we matched on indicators for member or provider enrollment in 1 or more of BCBSLA’s care coordination and management programs intended to reduce costs and utilization. These include Quality Blue Primary Care, a provider program similar to the patient-centered medical home concept, emphasizing population health measures and quality improvement^{19,20}; Quality Blue Value Partnership, a shared savings program that builds on the primary care program²¹; and/or the BCBSLA care management program. Overall, the matching approach was chosen to reduce the risk of bias from baseline differences between members with

integrated benefits and pharmacy carve-outs, while minimizing the loss of sample in achieving common support. This procedure yielded exact matches for 20,027 of the members with integrated pharmacy benefits. Within the matched sample, we repeated our comparisons using only members with selected chronic illnesses, which yielded samples of 7904 members in the integrated benefit group and 7926 members with pharmacy carve-outs. All analyses were conducted in SAS Enterprise Guide version 7.1 (SAS Institute).

RESULTS

The **Table** provides descriptive statistics on the integrated benefit and pharmacy carve-out cohorts before and after matching. Before matching, we saw qualitatively large and statistically significant differences across all categories. The carve-out group was older, more likely to be female, more likely to live in a large urban region, and in better health. These members were also more likely to be enrolled in the Quality Blue programs and less likely to be enrolled in care management programs. After matching, however, we saw that these differences were no longer significant except for age, which was not explicitly included in the matching.

We considered 2 features of costs to assess the relationship between medical costs and the provision of an integrated benefit or pharmacy carve-out. First, in the figures and tables that follow, we plotted the average *level* of per-member per-month (PMPM) medical spending in our matched cohort. Second, we compared the difference in the *growth* of spending during the study years to assess whether the use of either benefit design was associated with bending the cost curve.

The numbers plotted alongside the medical spending curves reflect the average medical PMPM spending. In the tables below **Figure 2** and **Figure 3**, the first 2 columns express the difference between the pharmacy carve-out and integrated benefit groups and *P* values resulting from *t* tests that compared the level of spending. In the following columns, we present the change in spending compared with the baseline year for the 2 groups, as well as a third column (Δ trend) that expresses the relative difference between the 2 groups, compared with the gap between them at baseline.

The results for the entire matched cohort are presented in Figure 2. In the baseline year, we saw a small, statistically insignificant difference in average medical spending: only \$1.90 PMPM. This is to be expected, as our matching approach exactly matches on small bins of health risk, as well as selected chronic illnesses and geographic region, and this result suggests that our matching strategy was successful in accounting for important drivers of spending. In the first follow-up year, we found that both groups had experienced an average PMPM increase in medical spending of approximately 22% compared with the baseline year, but it was not statistically significant. In the second and third follow-up years, however, we observed some divergence between the 2 groups. Neither the level of medical spending nor the trend in spending growth was significantly different in any year, although the integrated benefit members did

experience lower levels of spending and slower growth by the end of the study period.

The results presented in Figure 2 convey the average differences in spending across the full matched cohort. Although the overall association between pharmacy benefit structure and medical spending was not significant, different relationships may exist among important subpopulations within this group. In particular, it is essential to consider the effects of benefits design on patients with chronic illnesses. Although roughly half of American adults have a chronic condition, this group accounts for 86% of health care costs.²² Additionally, these costs may be modifiable with improved coordination and other delivery system improvements.²³ With these facts in mind, we also considered the growth of PMPM medical spending among patients with selected chronic illnesses. These results are presented in Figure 3.

In the baseline year, the integrated benefit group had slightly higher spending, although it was not significantly different from the pharmacy carve-out group. Additionally, spending levels were not significantly different in any of the follow-up years. Turning to spending trends, as we observed in the full-cohort comparisons, the growth rate of spending was not significantly different moving to the first year of follow-up. However, the spending gap between the 2 groups narrowed by the first follow-up year, and we saw significant differences in the relative rate of growth in PMPM costs by the second and third follow-up years. By the last year of the study, the pharmacy carve-out members had experienced an additional \$64.20 in PMPM medical spending growth—a difference of nearly 17% of the baseline spending level. By the final year of the study, average medical PMPM spending was \$588 in the carve-out group, compared with \$537 in the integrated benefit group.

DISCUSSION

Since their introduction in the 1980s, pharmacy benefit carve-outs have been the subject of vigorous debate. Most recently, these controversies have typically focused on the impact of PBMs on drug spending, such as the pricing models used by PBMs and the kinds of data transparency that employers might need to negotiate with them effectively.²⁴ Our analysis took a different approach to evaluating the impact of pharmacy carve-outs relative to integrated benefits. Here, we considered whether outside contracting for a

TABLE. Sample Descriptive Statistics, Before and After Matching

	Before matching			After matching		
	Integrated	Carve-out	P	Integrated	Carve-out	P
Total members	54,783	22,571		20,027	20,027	
Average age in years	37	38	<.0001	35	37	<.0001
Female	52.04%	59.53%	<.0001	57.76%	57.76%	1.00
Marketing region						
Alexandria	3.84%	0.69%	<.0001	0.72%	0.72%	1.00
Lafayette	5.49%	2.17%	<.0001	2.16%	2.16%	1.00
Lake Charles	15.17%	2.46%	<.0001	2.63%	2.63%	1.00
Monroe	6.66%	0.16%	<.0001	0.13%	0.13%	1.00
Out of state	8.39%	7.30%	<.0001	7.31%	7.31%	1.00
Large urban	60.46%	87.21%	<.0001	87.05%	87.05%	1.00
Risk severity group			<.0001			1.00
Healthy	41.33%	44.57%		44.46%	44.46%	
Stable	19.15%	18.44%		19.60%	19.60%	
At risk	22.58%	21.24%		21.82%	21.82%	
Struggling	13.92%	13.18%		12.51%	12.51%	
In crisis	3.02%	2.66%		1.61%	1.61%	
Conditions						
Asthma	3.73%	4.45%	<.0001	2.75%	2.75%	1.00
Diabetes	11.99%	11.16%	.0012	9.32%	9.32%	1.00
Mental health	18.76%	20.68%	<.0001	18.62%	18.62%	1.00
Hypertension	23.84%	24.24%	.2429	21.24%	21.24%	1.00
COPD	3.48%	3.71%	.1091	2.91%	3.18%	.1232
Program participation						
Quality Blue Primary Care	24.33%	31.39%	<.0001	27.40%	27.40%	1.00
Quality Blue Value Partnership	21.90%	32.37%	<.0001	28.91%	28.91%	1.00
Care management	6.87%	4.06%	<.0001	3.10%	3.10%	1.00
Insurance plan type						
Health maintenance organization	16.45%	26.92%	<.0001	24.35%	24.35%	1.00

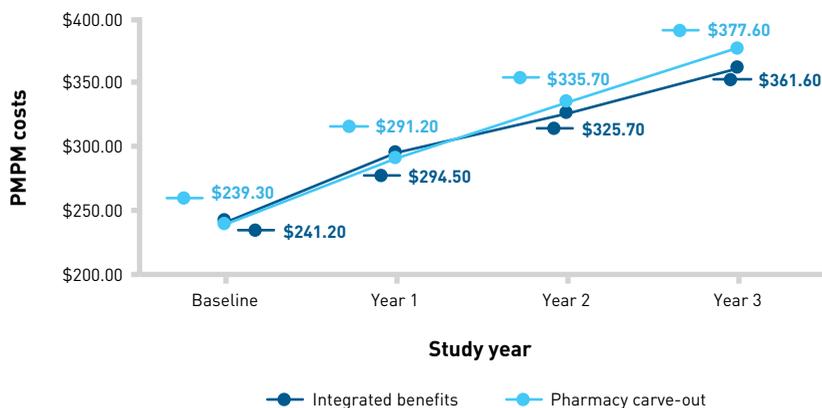
COPD, chronic obstructive pulmonary disease.

*P < .05; **P < .01; ***P < .001.

subset of health care services would lead to an inefficient provision of care and, consequently, increased costs outside prescription drug expenditures.

After matching patients on demographics, health status, and a variety of health insurance benefit characteristics, we found that overall, BCBSLA members covered by an integrated pharmacy benefit did not experience significantly different levels of medical spending or trends in spending growth compared with members covered by a pharmacy benefit carve-out. However, when we restricted our analysis to members with selected chronic illnesses, we found significant reductions in medical spending growth among those with an integrated pharmacy benefit. These benefits appeared to materialize over time, with no significant differences in the first comparison year but significant differences in the second and third

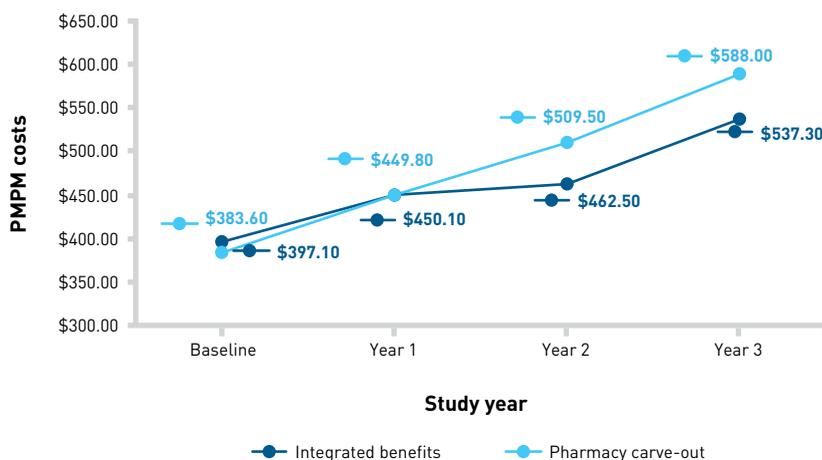
FIGURE 2. Matched Cohort PMPM Costs by Study Year, Full Study Cohort



	Δ mean	P	Δ integrated	Δ carve-out	Δ trend	P
Baseline	\$1.90	.7530	-	-	-	-
Year 1	\$3.30	.7256	\$53.30	\$48.90	\$1.40	.3990
Year 2	-\$10.00	.3958	\$84.50	\$93.20	-\$11.90	.8915
Year 3	-\$16.00	.2303	\$120.40	\$134.30	-\$17.90	.3860

PMPM, per member per month.

FIGURE 3. Matched Cohort PMPM Medical Costs by Study Year, Chronic Illness Subgroup



	Δ mean	P	Δ integrated	Δ carve-out	Δ trend	P
Baseline	\$13.50	.2918	-	-	-	-
Year 1	\$0.30	.9875	\$53.00	\$66.20	-\$13.20	.2955
Year 2	-\$47.00	.4789	\$65.40	\$125.90	-\$60.50	.0401
Year 3	-\$50.70	.0689	\$140.20	\$204.40	-\$64.20	.0001

PMPM, per member per month.

P* < .05; *P* < .01; ****P* < .001.

year of postmatch follow-up. These results suggest that, although the cost of contracting for prescription drug benefits is an important topic for employers, brokers, government leaders, policy makers, and other stakeholders, the effect of benefit design on “whole-person” care, not just the services delegated to a carve-out, must also be considered—particularly for patients with chronic medical conditions.

Several possible mechanisms could explain the results presented here. For example, the employer or health plan with integrated pharmacy benefits, armed with new access to data on prescription drug utilization, could have observed certain physician prescribing behaviors or trends in member medication adherence and responded with increased engagement or education campaigns. Pharmacy data could have also informed risk stratification and led to better targeting of disease management programs and other programs. For example, New York state switched from a carve-out to a carve-in approach in 2011, and its costs since implementing the policy change showed a 21.4% savings on managed care organization–paid prescriptions compared with the rest of the nation during federal fiscal year 2019 by using a pharmacy carve-in model.²⁵ We do observe significantly larger increases in care management program enrollment among members with an integrated benefit. Although both cohorts began at 3.1% enrollment, this figure had risen to 20.2% in the integrated benefit group, but only 19.4% in the carve-out group, by the third follow-up year. However, definitively resolving the question of what drove the reduction in medical spending growth is beyond the scope of this paper. Recent findings by Parekh et al showed a similar increase in health management program enrollment and decrease in PMPM spending among carve-in members, breaking down utilization and cost differences in further detail.²⁶ More research attempting to explain the mechanisms by which the provision of an integrated benefit or carve-out can affect health care utilization across the spectrum of services is needed.

Limitations

These analyses have several limitations. Our work considered only impacts on medical spending and lacked access to prescription

drug claims. In many ways, this limitation is indicative of one of the challenges posed by pharmacy benefit carve-outs: Data on the outcome of interest (prescription drug spending) were not available for half of our matched cohort. As a result, our analyses should be interpreted as presenting an important caveat to any assertions that carve-outs reduce spending, as changes in spending on prescription drugs may tell only part of the story.

Another point to consider is the potential generalizability of the findings. Although we included members employed in a variety of industries and regions, Louisiana is our sample, so our results reflect only 1 state. The study population is also young, with low rates of comorbidities. Additionally, our analyses considered only self-insured employers—firms facing different financial risks in their insurance contracts may have approached these benefit design decisions differently. Finally, our results should be interpreted as describing an association between integrated benefits and medical spending growth rather than making strong causal claims. It is important to point out that unobserved heterogeneity in contracting for carve-in vs carve-out at the employer level may affect our results. Therefore, we are careful not to make causal statements. Although our matched longitudinal study was able to account for the effects of a variety of observable member and health plan attributes, we could not account for potential unobserved differences at baseline (like smoking status) or endogenous choice of benefit design by the employers.

CONCLUSIONS

The design of an employer-sponsored health insurance benefit can have significant impacts on the cost and quality of care that covered individuals receive. One particularly important decision is whether to offer a comprehensive, integrated benefit or to carve out certain aspects of coverage like pharmacy benefits. Our results show that members with selected chronic illnesses covered by integrated pharmacy benefits experience slower medical expenditure growth over the long term, resulting in annual PMPM savings compared with members covered by a pharmacy carve-out. We also see that the integrated benefit and carve-out groups appear to be on gradually diverging trends with respect to rising PMPM medical spending, with the integrated benefit group on a slower trajectory. Although neither the level nor trend differences were significant by the end of our study, the gap does appear to be growing over time. As noted earlier, these analyses consider only medical spending and exclude the costs of prescription drugs, so we cannot definitively say that the integrated benefit approach reduces net spending. However, the results do suggest that any potential savings resulting from reduced drug spending promised by a pharmacy benefit carve-out should be weighed against potential increases in medical spending. ■

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