

The Impact of Formulary Introduction in a Large Canadian Private Drug Plan

Running Head: Formulary Introduction in a Private Drug Plan

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3 **CONFLICTS OF INTEREST**
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6
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8
9 working to increase health literacy in the US workforce. Michael Law has consulted for
10
11 Health Canada, consulted for the Hospital Employees' Union, and acted as an expert
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13 witness for the Attorney General of Canada.
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ABSTRACT

Introduction

Most private drug plans in Canada do not use a formulary, leading to suboptimal drug use. This may result in part from a lack of understanding about their cost-saving potential. Therefore, we studied the impact of the adoption of the public formulary by a large public-sector union in British Columbia.

Methods

We studied the impact of a change by members of the BC Hospital Employees' Union to mirror the public formulary enacted in June 2013. With data from Pacific Blue Cross, we used interrupted time series analysis to study changes in covered drug costs, drug use, and grandfathered medications for 18 months preceding and following the change.

Results

Following the implementation of the formulary, the number of prescriptions covered by the plan declined by 0.46 prescriptions per member per month (95%CI: -0.50 to -0.42)—a decline of 23.8% at one year. This decreased plan spending by \$1.32 million over the following 18 months, a 49.7% decline. The use of grandfathered medicines dropped substantially as well.

Interpretation

We found that the adoption of the public formulary by a large private drug plan in BC substantially reduced expenditures and covered prescriptions. The largest declines

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were observed for non-benefit drugs, many of which have more cost-effective therapeutic alternatives available. Overall, these results suggest that carefully designed formulary changes could substantially reduce private sector drug plan spending.

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INTRODUCTION

In Canada, prescription drugs are covered through a mix of public and private insurance plans and out-of-pocket payments by patients.¹ The majority of these expenditures come from private sources, either through private benefits plans or out-of-pocket payments.² In 2014, public sources paid \$12.5 billion in drug expenditures, while private benefit plans and households paid \$10.4 billion and \$6.5 billion, respectively. Of these three categories, the amounts paid by private insurers has increased more quickly in recent years. This rapid growth is in part due to private insurers' failure to use major cost control mechanisms in their plan management.³ Industry estimates suggest this failure results in billions of dollars of excess spending every year.⁴

Formularies—positive lists that designate covered drugs—are one such cost control mechanism used by drug plans for three major purposes. The first is related to cost issues: to encourage the use of treatments that are more cost-effective compared to their comparators, and encourage physicians to initially prescribe less costly therapies before moving to higher-cost alternatives. Second, formularies provide leverage for drug plans in negotiating better prices with pharmaceutical companies through confidential rebates.⁵ Finally, formularies can act to discourage the use of medicines that lack a strong safety profile in comparison to alternative therapies.

Private drug plans in Canada use a comparatively narrow range of techniques to actively manage formularies.⁶ While every public drug plan uses a formulary to categorize the degree to which particular drugs are covered, prior research has

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3 suggested that at least 85% of private benefits plans did not in 2010. This means these
4 plans covered every approved drug that required a prescription. Of the remaining
5 benefits plans, 2% used a formulary that mimicked the public drug plan, 6% used a
6 proprietary plan developed by a benefits provider, and the remainder were of unknown
7 origin. In contrast, the use of formularies is nearly ubiquitous in private health insurance
8 plans in the United States.⁷
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19 Part of the reason for private drug plans avoiding formularies in Canada might stem
20 from a lack of understanding about their potential impacts. As very few plans have
21 adopted formularies, there is a dearth of data about how they can impact drug costs and
22 access. As such, when changes are proposed, plan sponsors, labour unions, and
23 employees have little guidance to foresee what those changes might mean to them.
24 Further, as many unions will not have access to the underlying data or the skills
25 necessary to analyze it, they have little basis on which to assess the trade-offs between
26 drug coverage and other aspects of compensation. This is an important point to address
27 given that about two-thirds of an employee's extended health coverage (excluding
28 dental coverage) is spent on pharmaceuticals.⁶ To address this gap in our knowledge,
29 we studied the impact of the adoption of a public formulary by a large private health
30 benefits plan in British Columbia.
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49 **METHODS**

50 ***Context and Policy Intervention***

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3 The Hospital Employees' Union is a large union based in British Columbia (BC) whose
4 membership includes health care workers across a range of settings. Most members of
5 the union receive private prescription drug benefits as part of their employment. On
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7 June 1, 2013, this private drug plan changed from covering all prescription drugs to only
8 covering those covered by the BC Fair PharmaCare plan. Plan members were also
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10 required to follow the rules for reference pricing and prior authorization of many
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12 medicines, known as obtaining Special Authority. Coverage for several popular drugs
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14 was indefinitely grandfathered for claimants who had a claim for those medicines within
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16 the six months preceding the change (including Duloxetine [Cymbalta], Pregabalin
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18 [Lyrica], Liraglutide [Victoza], methylphenidate [Ritalin]). Several other BC public sector
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20 bargaining associations also made a similar change at this time.
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31 The change was announced to Union members through a series of communications,
32 including written notices and announcements at staff meetings, and through an internet
33 site and communications from the insurance carrier. Other annual drug coverage terms
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35 remained the same before and after the formulary introduction, including: a \$100 annual
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37 deductible (shared with other benefit types), 80% coverage of drug expenditures under
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39 \$1,000 per family, and 100% coverage over \$1,000 per family. The plan would only
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41 reimburse the cost of generic equivalents, where available, and dispensing fees were
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43 capped at \$9.00 per prescription.
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51 ***Data Sources***

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3 We obtained anonymized drug benefits claims for all plan members and their
4 dependents from the carrier for the plan, Pacific Blue Cross, for 18 months preceding
5 and following the adoption of the formulary (December 2011 through November 2014).
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7 Our dataset included the name and dose of the drug, the cost to the plan of the
8 prescription, and whether the drug was grandfathered into plan coverage. It also
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10 contained information on the number of plan members and dependants enrolled in the
11 plan over the course of each month (this ranged between 62,291 and 71,669). We
12 merged this with data from the BC PharmaCare Formulary to ascertain whether the
13 drug was on the public formulary, and whether it required Special Authority approval.
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15 Finally, we also determined the drug class for each prescription record using the ATC
16 classifications contained in Health Canada's Drug Product Database.⁷
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30 ***Statistical Analysis***

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32 We examined longitudinal changes in drug use and costs by HEU members and their
33 dependants following the implementation of the Pharmacare Tie-in using an interrupted
34 time series analysis.⁸ This is a methodologically rigorous approach that controls for
35 pre-existing trends in drug use. We fit our segmented regression models using a
36 generalized least squares model, and incorporated appropriate autocorrelation
37 parameters for each model based on several diagnostic criteria.⁹ The models also
38 included an indicator variable for the month of January, as use and cost decline with the
39 rollover of deductibles in the public plan in that month. Our outcome variables included
40 (1) the number of prescriptions obtained per member per month, (2) differences in the
41 number of prescriptions based on formulary designation, (3) the number of
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3 grandfathered therapies obtained per month, and (4) the total per-member per-month
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5 expenditures.
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10 **RESULTS**

11 ***Overall Utilization and Cost***

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13 The total number of individuals covered by the plan (including dependants) averaged
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15 66,000 over the study period. Overall, drug spending during the 36-month period we
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17 examined totalled \$41.9 million, with 1.25 million prescriptions eligible for coverage by
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19 the benefits plan.
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26 ***Prescription Use***

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28 The total number of prescriptions paid for by the HEU benefits plan over the 36-month
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30 period was 1,252,383, of which 733,737 were filled before the formulary switch and
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32 518,646 after. As shown in Figure 1, we found an immediate decrease in the level of -
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34 0.46 prescriptions per member per month (95%CI: -0.50 to -0.42, $p < 0.001$). We also
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36 found an increase in the trend of 0.010 per member per month thereafter (95%: 0.007 to
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38 0.013, $p < 0.001$). Taken together, these represent a 23.8% reduction in the number of
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40 prescriptions paid for at one year after the coverage change.
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45 Table 1 shows the largest pre- to post-change reductions in the number of prescriptions
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47 for individual ingredients (defined at the ATC7 level). The largest declines were for
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49 zopiclone (anxiety and sleep), pantoprazole, rabeprazole, and esomeprazole
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51 (gastroesophageal reflux), bupropion (depression and smoking cessation), and
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53 mometasone (asthma and seasonal allergies). As shown in the table, many of the
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3 changes were substantial, with reimbursed drug use dropping by 80% or more for many
4 ingredients.
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9 The number of prescriptions per member per month for grandfathered medications is
10 shown in Figure 3. As shown in the Figure, the number of prescriptions for these
11 medicines paid for by the plan dropped substantially: we found a level decrease of
12 0.015 prescriptions per member per month (95%CI: -0.017 to -0.014, $p < 0.001$) and no
13 statistically significant increase in the trend thereafter. This represents an 83.8%
14 reduction in the coverage of these grandfathered medicines at one year following the
15 formulary change.
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29 ***Prescription Use by Formulary Designation***

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31 Unsurprisingly, our analysis showed substantially different impacts of the formulary
32 change, depending on whether the drugs affected were on or off the formulary. Figure
33 2 shows the interrupted time series results for each class separately. We found a small
34 reduction in the number of prescriptions for PharmaCare benefits of -0.03 per member
35 per month (95%CI: -0.057 to -0.004, $p = 0.03$), but this was offset by an increase in the
36 trend of 0.005 (95%CI: 0.003 to 0.007, $p < 0.001$) that led to an overall increase past the
37 6-month time point.
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48 In comparison, the level of both non-benefits and drugs requiring special authority
49 dropped substantially. The level of non-benefit treatments immediately dropped nearly
50 to zero, with a level change of -0.18 prescriptions per member per month (95%CI: -0.20
51 to -0.17, $p < 0.001$). We also found a very small yet statistically significant increase in the
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3 trend of 0.00071 prescriptions per member per month (95%CI: 0.000033 to 0.0014,
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5 p=0.048). Overall, this represents a predicted drop of 89.8% for non-benefit drugs at
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7 one year after the formulary change.
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11 Similarly, for drugs requiring special authority, we found an immediate level drop of -
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13 0.25 prescriptions per member per month (95%CI: -0.26 to -0.24, p<0.001). We also
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15 found an increase in the trend of 0.0039 prescriptions per member per month afterward
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17 (95%CI: 0.0032 to 0.0045, p<0.001). Despite this increase in trend, however, the overall
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19 predicted utilization of Special Authority products remained 65.0% lower at one year
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21 than would have been expected based on the pre-existing level and trend.
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29 ***Prescription Drug Expenditures***

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31 As shown in Figure 4, there was a decreased expenditure of \$33.11 per member per
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33 month after the adoption of the public formulary (95%CI: -38.78 to -27.44, p<0.001). The
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35 estimated change in trend was in the opposite direction at an estimated increase of
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37 \$0.60 per member per month (95%CI: 0.058 to 1.15, p=0.04). Considered together,
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39 these represent an overall \$1.32 million reduction in spending on the HEU drug benefit
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41 plan over the 18 months we studied—a 49.7% decrease in the predicted \$2.67 million in
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43 spending that was predicted over that time period.
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50 **DISCUSSION**

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52 For many years, private drug benefit plans in Canada have used limited cost control
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54 mechanisms, yet as year over year costs continue to show marked increases, interest in
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3 cost control measures has also grown. We found that a switch to a public drug
4 formulary, for a large union plan in BC resulted in substantial savings to that union's
5 drug benefit costs—on the order of a 50% reduction. We also found reductions in the
6 volume of prescriptions, including for listed drugs that required special authority.
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14 Our findings reinforce the use of formularies as an effective mechanism by which drug
15 plans can control costs. Beyond simply steering benefit plan members toward more
16 cost-effective medicines, their use could also form the foundation for private drug plans
17 negotiating lower prices with pharmaceutical companies.¹⁰ After all, for
18 manufacturers, getting their drug on a provincial formulary can boost profits and so they
19 have a strong incentive to negotiate to do so. They also suggest that formularies can be
20 used to steer benefit plan members toward more economical and more appropriate
21 medicines for various health conditions. Among the medicines that saw the largest
22 declines in use following the formulary change include those with the potential for
23 addiction (zopiclone, tramadol), those not therapeutically or economically superior to
24 alternatives (esomeprazole, duloxetine, liraglutide), and those not recommended by
25 guidelines for long-term continuous use (pantoprazole, rabeprazole).
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44 Many of these large reductions in use were for drugs that required special authority.
45 These drops could have resulted from either (1) plan members not meeting the special
46 authority criteria or, (2) from not understanding or being willing to go through the
47 process of obtaining special authority. The longer-term increase in the trend we
48 observed for drugs requiring special authority suggests that plan members who were
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3 affected by being prescribed special authority drugs were likely becoming quickly
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5 educated about how to navigate the new coverage rules. It is possible some members
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7 felt that they were being denied effective therapy when their drug was one of those that
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9 was only available under special authority or was deemed a non-benefit. A number of
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11 the treatments that were dramatically affected by the switch would have been
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13 prescribed because they were newer and not necessarily better, nor any safer than
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15 existing therapies. The grandfathering of people on existing therapies was intended to
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17 mitigate this, but we observed major declines in the reimbursement of these drugs as
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19 well.
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26 **Limitations**

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28 Our analysis has limitations that are worth noting. Unfortunately, our data did not enable
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30 us to ascertain precisely how plan members changed their behaviour after the formulary
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32 change. As we only had access to drug claims made to the plan, it was not possible to
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34 ascertain whether (1) members paid out of pocket, (2) used spousal drug plan
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36 coverage, or (3) stopped therapies altogether. Further, the generalizability of our
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38 findings might be limited and may not be applicable to other jurisdictions that don't have
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40 public income-based coverage schemes such as BC. However, as every other province
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42 has some type of widely available catastrophic coverage plan, we feel this is not a major
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44 concern. Finally, the degree of savings from such changes critically depends on the
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46 current level of drug use in the plan, so may differ for other employee groups.
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54 **Conclusion**

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3 Our analysis found that the adoption of the public formulary by a large private benefits
4 plan in Canada led to major reductions in expenditures. This provides further evidence
5 to Canadian employers about the potential inefficiencies in their current plans¹¹ , and to
6 unions about the expected magnitude of savings offered by drug plan modifications in
7 collective bargaining activities. It also provides a simple path to implementing such
8 changes, as public formularies are easily available and are more widely familiar to
9 practising physicians.¹² Our results also speak to the need for drug plan managers to
10 carefully anticipated potential changes, and communicate thoroughly with their
11 members. The large drops we saw in grandfathered therapies indicate some degree of
12 communications difficulties around the formulary change. While such changes have
13 proven controversial in some instances, the scope for savings and the potential to
14 optimize drug plan spending should be attractive to Canadian employers and their
15 employees who ultimately pay for such benefits.
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FIGURES

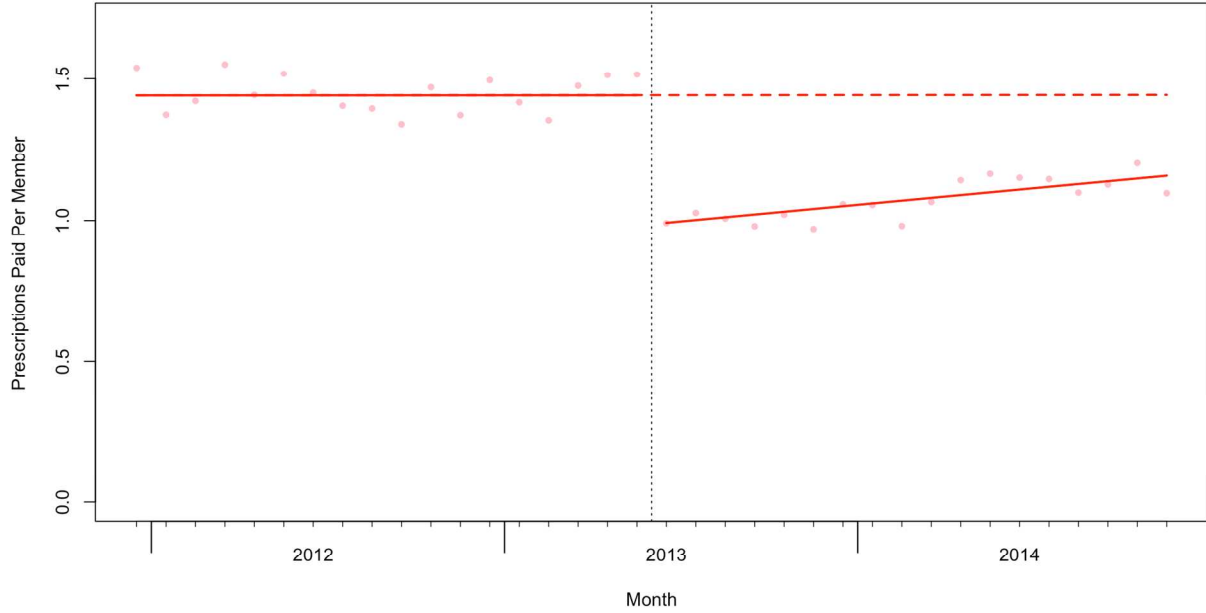


Figure 1. Average monthly number of prescriptions per member where at least a portion was paid by the benefits plan, before and after a change to mimic the Provincial formulary in June 2013.

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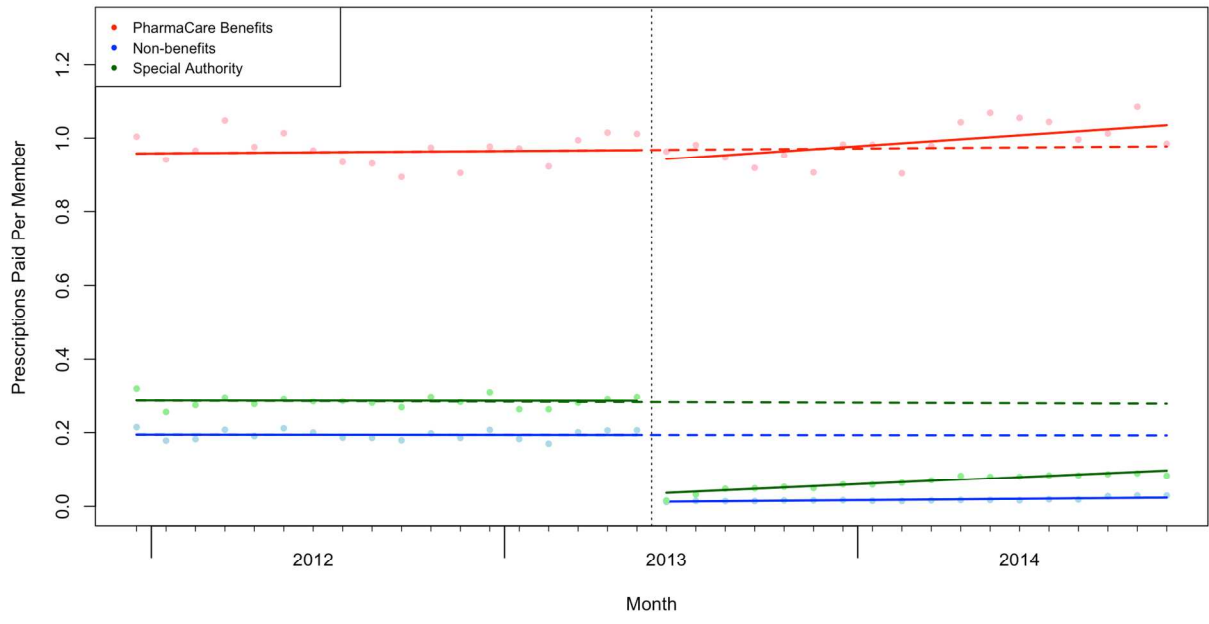


Figure 2. Average number of prescriptions paid for by member before and after the change to the PharmaCare formulary by HEU employees, by PharmaCare benefit type.

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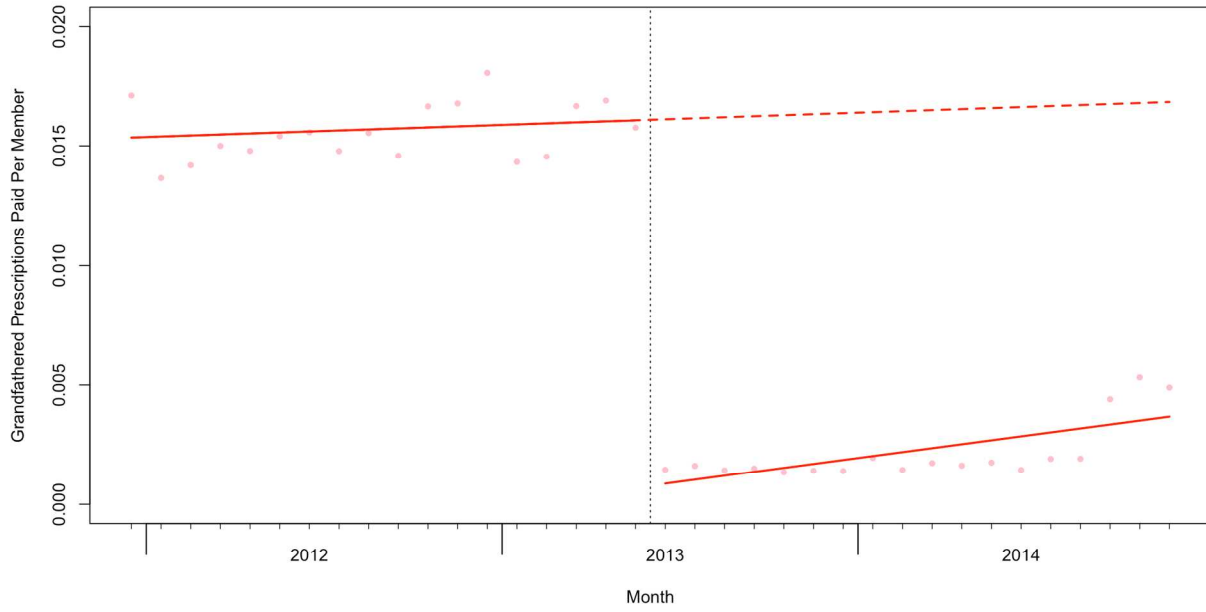


Figure 3. Interrupted time series analysis of the number of paid for prescriptions for grandfathered medications per member before and after the change to the public formulary.

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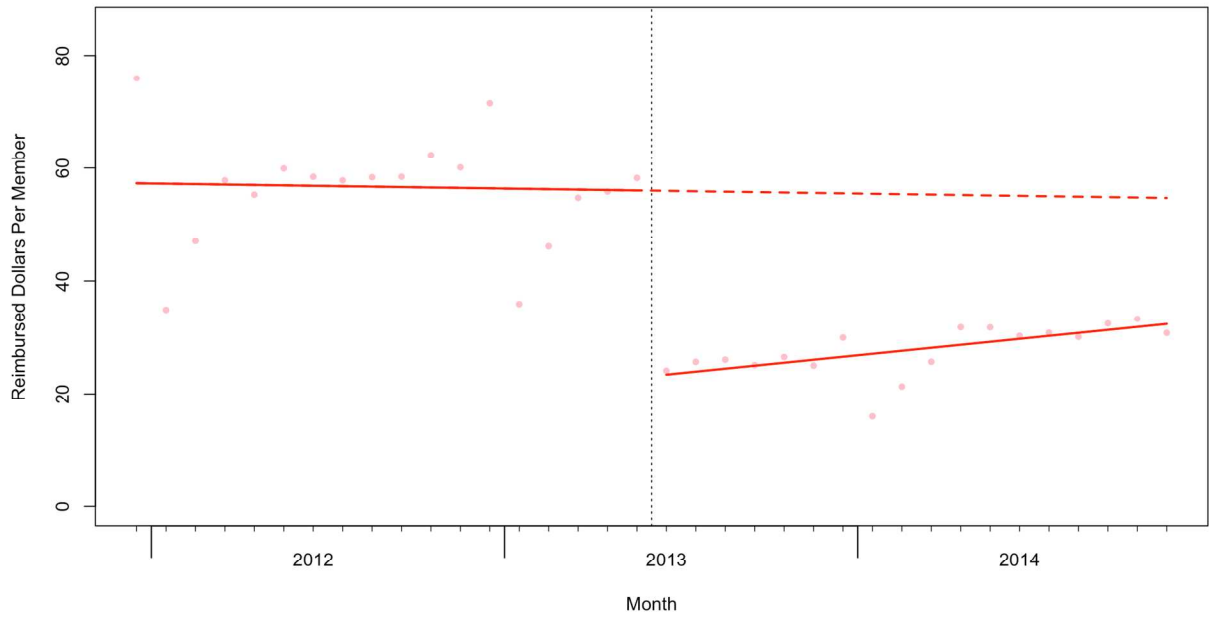


Figure 4. Interrupted time series analysis of reimbursed dollars per member before and after the change to the public formulary.

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3 **TABLES**
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Ingredient	Pre	Post	Difference	% Change
zopiclone	18912	1953	-16959	-89.7%
pantoprazole	10091	2655	-7436	-73.7%
rabeprazole	9116	1782	-7334	-80.5%
esomeprazole	8057	1312	-6745	-83.7%
bupropion	8133	2192	-5941	-73.0%
tramadol, combinations	6281	732	-5549	-88.3%
mometasone	7051	1613	-5438	-77.1%
celecoxib	4845	281	-4564	-94.2%
pregabalin	3928	534	-3394	-86.4%
gliclazide	4403	1067	-3336	-75.8%

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20 Table 1. Top 10 reductions in prescription volume following the adoption of the Fair
21 PharmaCare formulary by the Health Employees' Union drug benefit plan.
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