UNIVERSAL PHARMACARE RISK ANALYSIS REPORT

Prepared by RSM Canada on behalf of the
Canadian Taxpayers Federation

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Executive Summary

Background

In 2016, the House of Commons Standing Committee on Health (**HESA**) undertook a study to explore solutions to mitigate the accessibility gap in out-of-hospital prescription drug coverage across Canada. The accessibility gap refers to the portion of the Canadian population that currently has little to no coverage and face cost-related deterrents to purchasing or renewing prescription drugs. However, the actual impact of this gap in coverage is unknown. Studies suggest the number of Canadians facing accessibility issues could be between 5.2 per cent and 23 per cent depending on how the accessibility gap is defined.

HESA recognized universal pharmacare as one potential solution to address the challenges associated with prescription drug accessibility across Canada. Universal pharmacare is defined as a single-payer system of public insurance coverage for prescription drugs under which all Canadians will have equal access to a list of eligible drugs.

In its 2018 budget, the Federal government announced the creation of the Advisory Council on the Implementation of National Pharmacare (**the Advisory Council**). The Advisory Council was mandated to advise the government on the implications of universal pharmacare on Canadians. The Advisory Council's findings were published in a final report entitled, *A prescription for Canada: Achieving pharmacare for all*. As part of their report, the Advisory Council builds on estimate of the financial cost of a universal pharmacare program published by the Parliamentary Budget Officer (**PBO**).

The Advisory Council estimated that without universal pharmacare the total spending on drugs would rise to $51.6 billion by 2027. They suggest implementing universal pharmacare will reduce the overall spending on drugs to $46.8 billion in 2027, resulting in a savings of $4.8 billion. Of the $46.8 billion, $40.0 billion will be eligible under universal pharmacare per Quebec's formulary list. The remaining $6.8 billion will be borne by other public plans covering drugs, private insurance and out-of-pocket by individuals.

However, there are considerable uncertainties associated with this cost estimate, partly due to the variability in some of the key variables. Their model for estimating costs does not fully reflect the risks associated with a universal pharmacare program. Indeed, guidelines for economic evaluation of health technology provided by Canadian Agency for Drugs and Technologies in Health (**CADTH**) suggest defining uncertainties and expected values of costs probabilistically to allow for a risk-adjusted assessment.

Study Objectives

This study builds on both the PBO's and the Advisory Council's report by employing a risk-based approach to assess the fiscal impact of universal pharmacare that takes into consideration the uncertainties associated with some of the underlying inputs, as is the recommendation by CADTH. Our approach to fiscal impact assessments is based on the following guiding principles:

- **Transparency** – we believe that it is vital to be clear regarding the methodology employed, data and underlying assumptions and to make this information as accessible as possible.
- **Directly consider risk** – all fiscal impact models are based on data assumptions and projections that may or may not materialize. We have developed a probabilistic model to more explicitly and directly consider the inherent risk associated with key input variables based on our review of the relevant literature.

- **Be conservative and cautious** – we think it is important to "plan for the worst and hope for the best". As currently structured, universal pharmacare represents one of the largest expansions to Canada's social programs in a generation and accordingly we believe any assessment of the program requires a cautious approach.

Key Findings

In conducting this assessment, we built on the PBO's and the Advisory Council's model by overlaying a risk-based simulation model, which reflects the uncertainty associated with key inputs based on our review of the relevant underlying literature. In order to compare the PBO's and the Advisory Council's cost estimates with our findings, we ran our analysis on two scenarios:

- **Scenario 1 –** the PBO's expenditure on total drugs (base year: 2015) and
- **Scenario 2 –** the Advisory Council's estimated expenditure on total drugs (base year: 2017),

Our results find that the expected value for the gross cost of universal pharmacare is $52.5 billion in scenario 1 and 48.3 billion in scenario 2. This estimate is roughly $10 billion more than the Advisory Council's estimate of $40 billion cost for universal pharmacare for eligible drugs.

This suggests that there is only a 50.0 per cent chance that universal pharmacare will lead to gross savings. The table below summarizes our findings.

		5th Percentile	50th Percentile	95th Percentile
The Advisory Council	Cost of drugs under universal pharmacare program (eligible drugs)		$40.0	
	Saving/cost under universal pharmacare		$4.8	
RSM Scenario 1	Cost of drugs under universal pharmacare program	$48.62	$52.46	$56.61
	Saving/cost under universal pharmacare	($4.24)	($0.17)	$3.61
RSM Scenario 2	Cost of drugs under universal pharmacare program	$44.78	$48.30	$52.12
	Saving/cost under universal pharmacare	($3.88)	($0.11)	$3.39

Table E1 – Financial cost estimates of universal pharmacare ($ billion), Advisory Council vs. RSM, 2027

Conclusion

Universal pharmacare is one of several potential solutions to addressing the accessibility gap associated with prescription drugs. This study strictly looked at the potential fiscal impact associated with universal pharmacare leveraging a risk-based model. We have not investigated the broader potential socioeconomic benefits and costs as a result of universal pharmacare. As such, the results of our analysis do not suggest whether universal pharmacare should or should not be

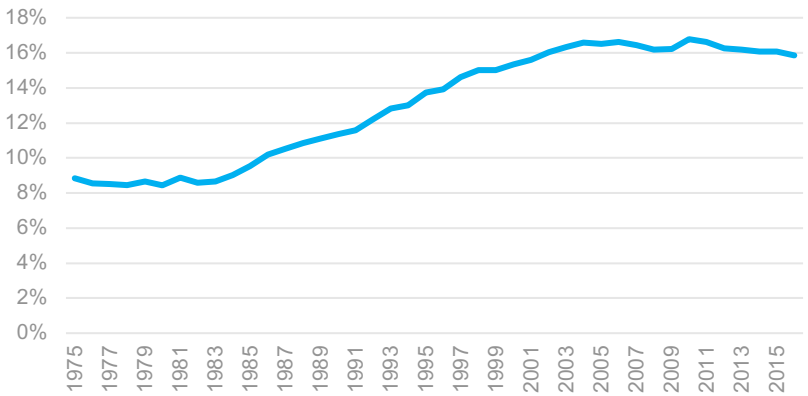
pursued. A more comprehensive cost-benefit analysis and value-for-money assessment that adequately considers other scenarios and alternatives is required to make that determination.

Introduction

Background

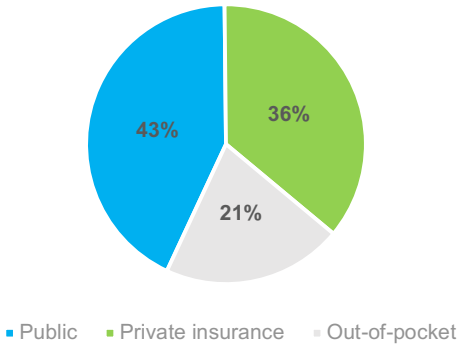
According to the Canadian Institution for Health Information (**CIHI**)[i], drug (prescribed and non-prescribed) spending accounted for 15.8 per cent of the share of overall health spending in 2016 (Figure 1). Even though the annual percentage change in drug spending has stabilized over the recent years, the share of drug spending as a percentage of overall healthcare spending has increased over the last several decades. As such, pharmaceuticals are becoming an increasingly important part of Canada's healthcare system and accordingly, healthcare expenditures.

Figure 1 – Share of healthcare spending by drugs, Canada, 1975 to 2016



According to CIHI's drug expenditure database[ii], in 2016, the public sector funded 43 per cent of the total out-of-hospital prescription drug expenses in Canada (Figure 2). The remainder is borne by the private sector through private insurance plans (36 per cent) or paid out-of-pocket directly by individuals (21 per cent).

Figure 2 - Share of prescription drug spending by type of financing, Canada, 2016



Out-of-pocket expenditures could represent the full cost of drugs for those individuals that do not have public or private insurance or a portion of the cost of drugs representing deductibles, co-payments or co-insurance, and/or premiums:

- **Deductibles –** a fixed dollar value individuals must pay initially before their coverage begins;
- **Co-payment or co-insurance –** a fixed dollar value or a fixed percentage, respectively, of the prescription drug cost that individuals must pay; and
- **Premium –** an amount an individual must pay to enroll into a drug program.

Provincial and federal programs

Provinces and territories administer their own prescription drug benefit programs and represent the vast majority of public drug expenditures. The eligibility criteria for publicly funded provincial plans vary considerably across Canada.

Eligible residents under a provincial drug plan are typically subject to a fixed or means-tested out-of-pocket share of the drug cost. Most provinces generally provide coverage for low-income populations and seniors and many have established catastrophic drug plans. Catastrophic drug plans are means-tested programs designed to protect individuals from drug costs that threaten their financial security.

Manitoba's Pharmacare Program is an example of a catastrophic drug plan that covers residents with high drug costs. The plan is subject to a deductible of 3 per cent to 7 per cent of an individual's adjusted household income. Ontario's Trillium Drug Program (**TDP**) is a similar program. Individuals enrolled in the TDP face a deductible of 3 per cent to 4 per cent of their net household income and a co-payment of $2 per prescription.

In addition to provincial drug plans, the Federal Government is responsible for providing full coverage to certain groups (e.g., indigenous Canadians, veterans, etc.). The Federal Government also provides subsidies to individuals facing catastrophic health costs through a non-refundable federal income credit program: the Medical Expense Tax Credit (**METC**). The METC is applicable to all medical costs including prescription drugs and health insurance premiums. In 2018, an individual could claim 15 per cent of their medical expenses in excess of $2,302 or 3 per cent of their net income. The Federal Government also provides a supplemental refundable medical tax credit up to $1,222.

Accessibility gap

Despite the existence of numerous federal and provincial public drug programs and subsidies/tax credits, there is still a gap in the current system of prescription drug coverage. However, estimates about the size of this gap vary considerably and depend in part on how the accessibility gap is defined.

A report by the Conference Board of Canada in 2018[iii] estimated that 5.2 per cent of Canadians do not have drug coverage from either public or private plans. The bulk of this uninsured population is in Ontario and Newfoundland and Labrador. Moreover, lack of information on publicly available coverage appears to impact utilization of the program. The report finds that 54 per cent of respondents did not take prescribed drugs due to unawareness of publicly-funded programs.

Another deterrent faced by individuals is the cost of prescription drugs and associated cost-sharing mechanisms. Even those currently enrolled in public plans face cost-related deterrents due to high deductibles or co-payments. Given the variability of provincial drug plans, the amount of out-of-pocket expenses that individuals face depend on their province of residence.

A report by the Angus Reid Institute in 2015[iv] found 23 per cent of Canadians did not fill or renew their prescription or skipped doses due to cost. Another report by the Commonwealth Fund in 2016[v] estimates this number to be 10.2 per cent. Yet another study (Law et al., 2018)[vi] using 2016 Statistics Canada Canadian Community Health Survey data estimate this figure to be 8.2 per cent. The exact impact of cost on adherence to prescriptions accessibility is highly uncertain and estimates vary considerably.

Universal pharmacare

Universal pharmacare is one of several potential solutions to the problem of accessibility of prescription drugs. Universal pharmacare is a single-payer system of public insurance coverage for prescription drugs under which all Canadians will have equal access to a list of eligible drugs and accordingly, it is similar in nature to how *Medicare* is structured.

Under Medicare, provinces receive funding for hospital and physician services from the Federal Government through the Canada Health Transfer (**CHT**) under the *Canada Health Act, 1984*. Historically, the Federal government funded 50 per cent of the provincial governments' eligible health expenditures. In recent years, the Federal Government component of the CHT represents only about 20 per cent to 25 per cent of the provincial government's healthcare cost. In 2017, the Government of Québec reported a 23.3 per cent share of federal funding in provincial health spending[vii].

In March 2016, the House of Commons Standing Committee on Health (**HESA**) undertook a study to explore the option of expanding the *Canada Health Act* to include prescription drug coverage[viii]. In addition to administering the public hearing on the topic, in September 2016, the Parliamentary Budget Officer (**PBO**) was mandated by HESA to estimate the financial cost of a universal pharmacare program in Canada. In response, in September 2017, PBO presented the findings of its report entitled, *Federal Cost of a Universal pharmacare Program,* to the committee[ix].

The Federal government announced the creation of the Advisory Council on the Implementation of National Pharmacare (**the Advisory Council**) in its 2018 budget. In June 2019, the Advisory Council released its final report of its findings regarding the implementation of universal pharmacare entitled, *A prescription for Canada: Achieving pharmacare for all*[x]. As part of their report, the Advisory Council released their projections of total prescription drug spending with and without universal pharmacare in Canada.

Purpose of the study

This study builds on the PBO's and the Advisory Council's cost estimates and employs a risk-based approach to assessing the fiscal impact of universal pharmacare based on our review of the underlying literature.

We have strived to be as transparent as possible in this study. Our methodology and data assumptions are explained within the report. We encourage other commentators to do the same to enable an open and transparent conversation about universal pharmacare and other alternatives.

This study is in no way an evaluation or cost-benefit assessment of universal pharmacare. The potential socioeconomic benefits of universal pharmacare have not been considered. To our knowledge, a comprehensive cost-benefit assessment has not been conducted on universal pharmacare and alternatives. We have only assessed the cost side of the equation based on our review of the PBO report, the Advisory Council report and other relevant literature. This study was funded by the Canadian Taxpayers Federation based on a proposal submitted by RSM Canada (**RSM**).

Guiding principles

Our fiscal impact analysis of the cost of universal pharmacare was guided by the following key principles:

- **Transparency** – it is worth mentioning again that we think it is vital to be very clear regarding the methodology employed, data and underlying assumptions and to make this information as accessible as possible. Being fully transparent allows readers of this report to assess the voracity of our key findings. We welcome this scrutiny.
- **Directly consider risk** – all fiscal impact models are based on data assumptions and projections that may or may not materialize. We have developed a probabilistic model to more explicitly and directly consider the inherent risk associated with key input variables. A model that defines expected values of costs and uncertainties probabilistically is consistent with the guidelines for economic evaluation of health technology as provided by Canadian Agency for Drugs and Technologies in Health (**CADTH**)[xi].
- **Be conservative and cautious** – we think it is important to "plan for the worst and hope for the best". As currently structured, universal pharmacare represents one of the largest expansions to Canada's social programs in a generation and accordingly we believe any assessment of the program requires a cautious approach.

This report is strictly focused on our findings regarding the fiscal impact of universal pharmacare. It is important to note that RSM is not providing any recommendation regarding whether universal pharmacare is a good use of taxpayer dollars. As noted above, we believe that a comprehensive cost-benefit analysis that looks at all the socioeconomic and financial benefits and costs and alternatives to universal pharmacare is required to make this determination.

Scope

Approach

We started by conducting a review of the PBO's universal pharmacare report and HESA's recommendations based on the PBO report. This initial phase of work also included reviewing other existing studies and reports on universal pharmacare and alternatives to universal pharmacare. Next, we reverse-engineered the PBO's model to better understand how the PBO developed their cost estimates, which also helped us to determine the critical model inputs. Additionally, we reviewed the Advisory Council's report to understand their methodology for estimating the cost of universal pharmacare. We then developed a model based on the PBO's and the Advisory Council's model that would directly assess the risk associated with the fiscal impact of universal pharmacare. To be more specific, we developed a Monte Carlo simulation model as an overlay to the model. After identifying the critical inputs, we conducted a detailed review of these assumptions based on a literature review of a number of studies and assessments. Lastly, we re-estimated the cost of universal pharmacare based on the Monte Carlo simulation model developed where we sought to reflect the inherent uncertainty associated with key inputs.

Limitations

RSM relied upon the completeness, accuracy and fair presentation of all the information, data and representations obtained from various sources which were not audited or otherwise verified by RSM. These sources include:

- The PBO's report;
- The Advisory Council's report;
- CIHI's National Prescription Drug Utilization Information System (**NPDUIS**) database; and
- Published and peer-reviewed economic literature.

RSM reserves the right at its discretion to withdraw or make revisions to this report should we be made aware of facts existing at the date of the report that were not known to us when we prepared this report.

The findings are as of the date hereof and RSM is under no obligation to advise any person of any change or matter brought to its attention after such date, which would affect the findings and RSM reserves the right to change or withdraw this report. This information has been prepared solely for the use and benefit of, and pursuant to a buyer relationship exclusively with the Canadian Taxpayers Federation. RSM disclaims any contractual or other responsibility to others based on its use. Any use that a third party makes of this report or reliance thereon, or any decision made based on it, is the responsibility of such third party.

Note to reader

This report has been prepared by RSM based on the PBO's report, the Advisory Council's report and from other sources as referenced throughout. Our assessment is based on our professional interpretation of the information. In preparing this report, we have strived to be as transparent as possible in terms of the methodology employed, data sources used and any assumptions made to ensure users of the report can properly critique and assess this report's conclusions.

Review of the Advisory Council Report

Introduction

Our analysis begins with a review of the fiscal cost estimates as outlined in the Advisory Council's report, *A prescription for Canada: Achieving pharmacare for all*. In this section of our report, we provide a brief overview of the Advisory Council's key findings and their calculations to estimate the cost associated with universal pharmacare.

The Advisory Council builds on the PBO's methodology for fiscal cost estimates of universal pharmacare. As per HESA's recommendation, the PBO assumed that universal pharmacare would be based on the Régie de l'assurance maladie du Québec (**RAMQ**) formulary. The Advisory Council recommended a stepwise implementation of universal pharmacare starting with an initial formulary covering only essential medicines for major conditions in 2022 and transitioning to a more comprehensive formulary by 2027. Same as the PBO, the Advisory Council assumed RAMQ as the adopted formulary in 2027. Quebec's formulary represents the most generous list of eligible drugs in Canada and consists of over 8,000 drugs.

Overview of the Advisory Council's estimates

Table 1 below outlines at a high level the Advisory Council's calculations regarding the fiscal impact of universal pharmacare. The Advisory Council projected base year 2017 non-aggregated prescription drug expenditures data from IQVIA to 2027 expenditures and used this data to estimate expenditures on total prescription drugs.

The Advisory Council estimates that without universal pharmacare, total spending on prescription drugs will be $51.6 billion in 2027 (Line 1). Of this, $23.0 billion was estimated to be funded by the public sector (Line 1a) under status quo, $19.8 billion by private insurance companies (Line 1b) and $8.8 billion directly by individuals (i.e., out-of-pocket expenditures) (Line 1c). It is important to note that these figures are not actual expenditures. Rather, the Advisory Council allocated the share of public, private and out-of-pocket spending on drugs using a primary payer methodology. The implications of utilizing this approach are discussed in the next section of this report.

The primary payer refers to the entity (public, private or out-of-pocket) that paid for the largest share of the drug cost. For example, if an individual incurred a drug expense of $100, $70 of which was covered by a public drug program and $30 by the individual as a co-payment, the full $100 amount will be allotted to the public sector. The $30 paid by the individual is therefore not counted in the out-of-pocket expenditures.

Under a universal pharmacare scenario, the Advisory Council estimates the total spending on drugs in 2027 to be $46.8 billion (Line 2). Of this $46.8 billion, $40.0 billion will be eligible under universal pharmacare per the RAMQ formulary (Line 2a). The remaining $6.8 billion will be borne by other public plans covering drugs not included in the RAMQ formulary (Line 2b), private plans (Line 2c) and out-of-pocket by individuals (Line 2d).

The Advisory Council suggests that universal pharmacare will save $4.8 billion in aggregate in 2027 (Line 3) based on a cost of $46.8 billion. As the public sector is estimated to fund $23.0 billion in prescription drugs without universal pharmacare (Line 1a), the additional cost of universal pharmacare to the public sector net of revenue from co-payment (Line 4) and ancillary public savings (Line 5) is estimated at $15.4 billion (Line 6).

Description	2027
(1) Total spending on drugs (without universal pharmacare)	**$51.6**
(1a) spending by public plans	$23.0
(1b) spending by private plans	$19.8
(1c) spending out-of-pocket	$8.8
(2) Total spending on drugs (under universal pharmacare)	**$46.8**
(2a) spending on eligible drugs	$40.0
(2b) spending by other public plans (non-eligible drugs)	$1.9
(2c) spending by private plans	$2.8
(2d) spending out-of-pocket	$2.1
(3) Total estimated savings under universal pharmacare [(2) – (1)]	**$4.8**
(4) Revenue from co-payment	**$0.7**
(5) Ancillary public savings	**$2.8**
(6) Net cost of universal pharmacare to public sector [(2a) + (2b)] – [(1a) + (4) + (5)]	**$15.4**

Table 1 - The Advisory Council's estimated costs and savings under universal pharmacare (in $ billions), 2027

A similar table outlining the cost estimate calculations in the PBO model is detailed in Appendix C. Our model suggests that the fiscal impact of universal pharmacare is highly sensitive to a number of assumptions. The PBO and the Advisory Council conducted a sensitivity analysis on some of these key assumptions to determine a high and low estimate of total spending on drugs. Although the Advisory Council has considered possible alternate scenarios, our analysis builds on the PBO's and the Advisory Council's report by conducting a more comprehensive risk analysis to explicitly consider and model uncertainty.

We begin by describing the key components of the PBO and the Advisory Council's calculations.

Key components of the cost estimation

We believe the following are the key drivers of the PBO and the Advisory Council's cost estimates for universal pharmacare:

- **Behavioural effect –** an increase in overall consumption on prescription drugs under a universal pharmacare program. This is a consequence of decreased out-of-pocket expenditures and improved access. The Advisory Council assumed a 1 per cent reduction in out of pocket spending will lead to a 0.1 – 0.2 per cent increase in total drug consumption. The PBO assumed a 0.14 per cent increase in total drug consumption.

- **Price discount effect –** a further reduction will apply to drug prices achieved through improved negotiation position of the government with drug companies. The Advisory Council assumed a 20 per cent rebate on current public plan spending for brand name drugs and discount between 25 and 40 per cent on new brand name drugs entering the market. The PBO assumed a 25 per cent price discount.

- **Growth Rate** – the Advisory Council projected the total spending on drugs on a growth rate of 6.3 per cent including confidential rebate and a growth rate of 6.7 per cent excluding confidential rebate, on average. The PBO assumed a growth rate of 3.1 per cent on universal pharmacare drugs.

Our model indicates that the cost estimates are highly sensitive to the assumptions made under the behavioural effect and the price discount effect. The following sub-sections are focused on reviewing these two impacts.

Behavioural effect of universal pharmacare

As defined in the previous section, the behavioural effect is the increase in utilization of prescription drugs due to greater access and lower out-of-pocket expenditures borne by individuals. The Advisory Council assumes for every 1 per cent reduction in out of pocket spending will lead to a 0.1 – 0.2 per cent increase in total drug consumption.

Price elasticity of demand and expenditures

The behavioural effect is calculated using price elasticity estimates to monetize the increase in consumption of prescription drugs due to universal pharmacare. The price elasticity of demand measures the responsiveness of the quantity demanded for a good or service to a change in its price (holding everything else constant). It is the percentage change in the quantity demanded, or consumed, due to a one per cent change in price.

The PBO, and by extension the Advisory Council, utilized estimates of the price elasticity of *expenditure* for prescription drugs. This is the percentage change in total prescription drug expenditures that is associated with a one per cent change in out-of-pocket expenditures on prescription drugs. The PBO assumed that the behavioural effect does not apply to exceptional drugs. These are drugs with strict eligibility requirements and many are subject to various expenditure caps (i.e., subject to some fixed price per patient per year). We understand that non-exceptional drugs, however, are generally not subject to an expenditure cap. Accordingly, the price elasticity of demand (in other words, price elasticity of utilization) and price elasticity of expenditure of prescription drugs are broadly comparable and we have treated them as such in our review of the relevant literature.

The PBO report assumes an elasticity of -0.14 per cent, which is the average elasticity based on a study (Contoyannis et al., 2005)[xii] that estimates the range to be between -0.12 per cent and -0.16 per cent. The -0.14 per cent elasticity means that for a one per cent *decrease* in the out-of-pocket cost of prescription drugs, expenditures on prescription drugs will *increase* by 0.14 per cent. The Advisory Council assumes a range between 0.1 and 0.2. However, this does not capture the full range of variation in elasticity estimates.

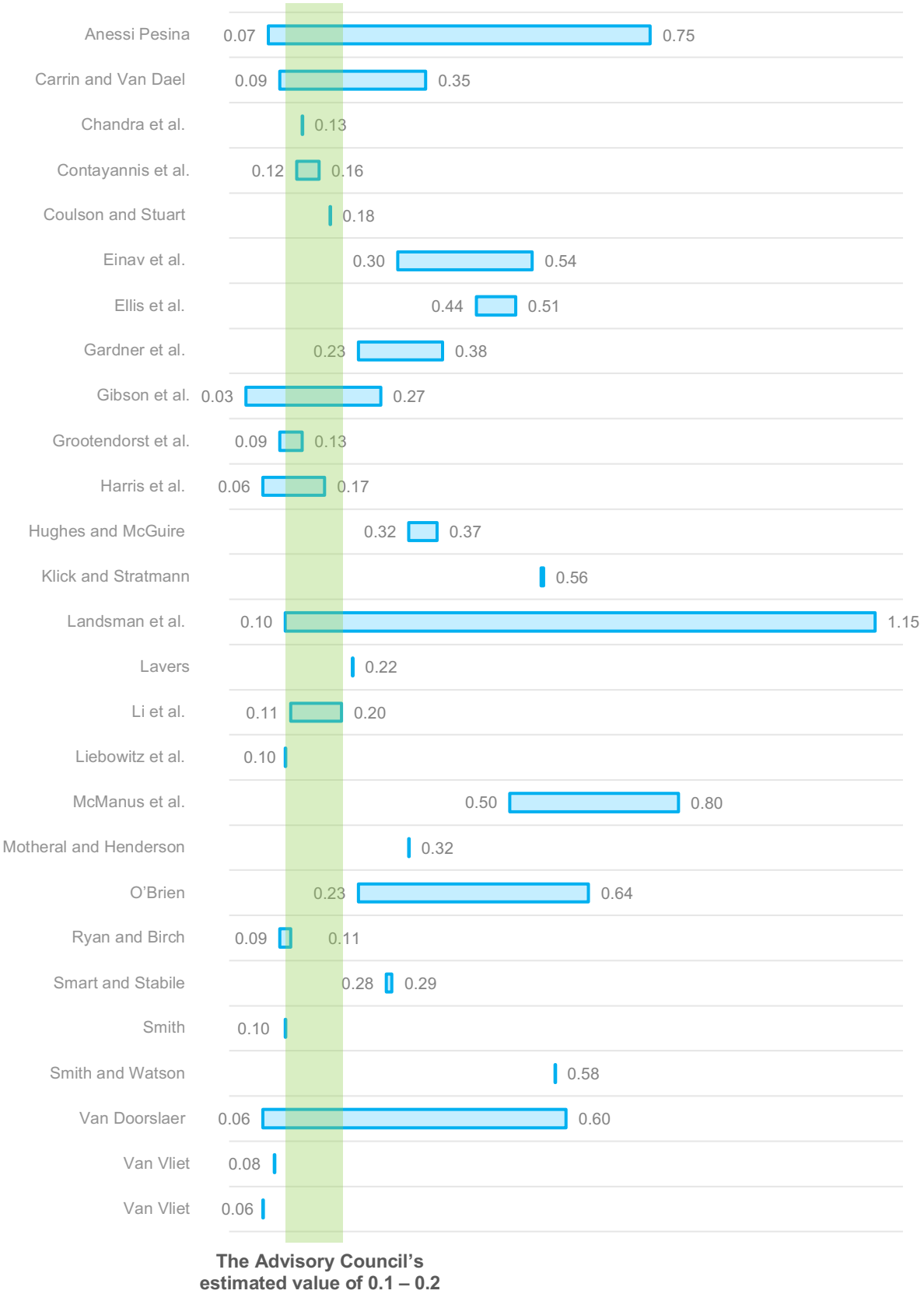
Figure 3 illustrates the range of elasticity of demand/expenditure for prescription drugs (values in the figure shown in absolute terms for simplicity) found in the literature we reviewed. Table B1 in Appendix B includes further details of each study (i.e. country and sub-group analyzed, type of cost measured and methodology utilized). Our review indicates the following:

- Nearly all of the studies we reviewed based their estimates on some sort of natural experiment where a change in government policy and/or regulations led to an increase or decrease in out-of-pocket expenditures. For example, the study used by the PBO (Contoyannis et al., 2005) is based on a relatively minor increase in co-payments

associated with prescription drugs due to a change in government policy. While relevant to the present discussion, the implementation of universal pharmacare is substantially different in scale and scope.

- The demand for prescription drugs is generally inelastic. Nearly all of the studies we reviewed indicated elasticity estimates that are less than one in magnitude. That being said, there is considerable variation. As shown in the figure, elasticity estimates we found in the literature range from 0.06 to 1.15 (absolute value). The elasticity estimate used by the PBO is at the lower end of this range. Of the 27 studies we reviewed, 18 had more sensitive average elasticity estimates and 8 had less than the PBO's estimate (see Figure 3 below and Table B1 in Appendix B for details).
- The studies we looked at also ranged in terms of the sub-groups they were investigating. For instance, many studies focused on estimating elasticity estimates for seniors, non-elderly and/or lower income groups. The study (Contoyannis et al., 2005) that informed the PBO's elasticity estimate looked at seniors in Québec. Other studies, however, did not explicitly focus on a particular sub-group. Demographic differences across provinces will most likely produce a varying elasticity estimates. Additionally, as Canadian provinces currently have different publicly-funded drug programs in place, this difference in policy framework will also add to the variability.
- Many of the studies focused on Canada were particularly dated and based on data from the 1990s. During this period, the utilization of pharmaceuticals in Canada increased quite significantly as measured by the share of pharmaceutical expenditures in total healthcare expenditures (Figure 1).

Figure 3 - Ranges of price elasticity in literature (in absolute values)



Although the studies referenced in Figure 3 provide a framework for an estimation of elasticity, we cannot say for certain how the utilization of prescription drugs will change due to the implementation of universal pharmacare. As shown above, there is considerable variation in elasticity estimates. Accordingly, we recommend that broad ranges should be utilized to estimate the behavioural impact associated with universal pharmacare.

Percent decrease in out-of-pocket expenditures

Another important aspect of estimating the behavioural impact associated with universal pharmacare is the percentage decrease in out-of-pocket expenditures. Under universal pharmacare, the Advisory Council assumed a $2 co-payment for essential medications and a $5 co-payment for all other eligible drugs, subject to exceptions with a max of $100 per person. Therefore, the introduction of universal pharmacare will decrease the cost of out-of-pocket to individuals while increasing the spending on covered drugs under the program, per the behavioural effect. The percentage decrease in out-of-pocket expenditures multiplied by the price elasticity yields the behavioural effect.

The PBO assumes that the behavioural effect only applies to non-exceptional drugs and accordingly does not consider out-of-pocket expenditures associated with exceptional drugs from the calculation of the percentage decrease in out-of-pocket expenditures.

Furthermore and as mentioned in the previous section of this report, the Advisory Council allocated the share of public, private and out-of-pocket drug spending on a primary payer methodology. Under this approach, out-of-pocket expenditures only include instances where the largest share of the drug cost was paid out-of-pocket by the individual. The use of this methodology overestimates public sector expenditures and underestimates out-of-pocket expenditures. Recall that total expenditures on prescription drugs was $51.6 billion in 2027, $8.8 billion of which was estimated to be paid through out-of-pocket expenditures. In reality, out-of-pocket expenditures on prescription drugs should be $15.1 billion, as reported by CIHI (actual figure 2015 forecasted to 2027). Adjusting out-of-pocket expenditures to the CIHI value, while holding everything else constant, resulted in a slightly higher behavioural effect.

Price discount under universal pharmacare

Another factor that is key in assessing the fiscal impact of universal pharmacare is the price discount effect. This discount is said to be achieved due to the joint negotiation power of the Federal Government and provincial governments under a single-buyer universal pharmacare program. The Advisory Council indicated that a 20 per cent rebate is achievable on current public plan spending for brand name drugs under the formulary and a rebate between 25 and 40 per cent on new brand name drugs entering the market. Rebates are a form of price concession paid by a drug manufacturer to the plan provider. Rebate negotiations are generally confidential.

Joint purchasing of prescription drugs already exists in Canada through the Pan-Canadian Pharmaceutical Alliance (**pCPA**)[xiii]. Established in 2010, pCPA is mandated to negotiate lower drug prices through a joint public sector alliance. All ten provinces are members of the alliance, along with the Federal Government. Since its establishment, pCPA has been very successful in negotiating down prices for prescription drugs. For example, pCPA announced a 25 to 40 per cent price reduction in about 70 of the most commonly prescribed generic drugs[xiv].

It appears that pCPA has played an important role in negotiating down drug prices. From 1975 to 2010, drug expenditures as a percentage of total healthcare expenditures increased from 8.8 per cent to 16.8 per cent (Figure 1). Drug expenditures as a share of total healthcare expenditures decreased to 15.8 per cent in 2016. The 2017 annual report published by Patented Medicine Prices Review Board (**PMPRB**)[xv], an independent body, showed that Canadian list prices of patented drugs have fallen quite a bit since 2010. In the recent years, inflation (measured by Consumer Price Index) has outpaced the rise in patented drug prices. Furthermore, when confidential rebates are taken into consideration, the net patented price of drugs (which is the transaction price) is much lower than the list price.

The report also found Canadian patented drug prices to be in the middle ranges when ranked internationally among seven comparator countries (**PMPRB7**). Based on the median-international-price (**MIP**) to Canadian price ratio, in 2017, Canadian drug prices were about 26 per cent lower than PMPRB comparator prices when confidential rebates are included. Excluding confidential rebates, Canadian prices were about 8 per cent lower than comparators.

Canadian drug prices are already lower in comparison to other comparable countries. Prices are further driven down by confidential rebates. Accordingly, we are not sure if universal pharmacare will generate additional savings for prescription drugs. Any reduction in price from stronger negotiation power would likely only apply to drugs that are currently purchased by the private sector.

Similar to the 40 per cent reduction in generic drug prices through the pCPA, the government may be able to negotiate a price discount of up to 40 per cent for all prescription drugs under universal pharmacare. However, the bulk of the price discount will be applied on drugs that are currently purchased through private plans or out-of-pocket expenditures. Excluding confidential rebates, this 40 per cent discount would translate to about 25 per cent list price discount assuming a 15 per cent existing confidential rebate. In reality, confidential rebates may be higher as indicated by the difference between Canadian transaction drug prices and the list prices reported by PMPRB.

The public sector will face no further discount given pCPA's establishment. The 25 per cent discount rate will be applied to the private insurance, which makes up 36 per cent of the drug expenditures. Out-of-pocket expenditure, accounting for 21 per cent of the expenditure, will also receive a 25 per cent list price discount. On a weighted average basis, this would represent about a 14 per cent discount on total expenditures on drugs (i.e., public, private and out-of-pocket). Even this 14 per cent discount on total drug expenditures is at the higher end of achievable discount. The Advisory Council's estimate of an additional discount between 20 and 40 per cent is therefore a best-case estimate.

Like the price elasticity estimate, the price discount effect is very difficult to forecast with a high degree of accuracy. There are a lot of factors at play. For example, what happens if one or more provinces decide to opt-out of universal pharmacare?

Given the existence of joint negotiation bodies such as the pCPA and the risk associated with estimating the discount rate achievable, we think it is prudent to take a conservative and cautious approach that reflects this uncertainty.

Key findings

We found that the fiscal impact of universal pharmacare as estimated by the Advisory Council is highly sensitive to a few key assumptions, particularly the behavioural effect and the price discount. We conducted a critical review of these assumptions based on a review of the underlying literature. Key findings from this review are listed below:

- The behavioural impact is driven by two factors: the elasticity of demand for prescription drugs and per cent decrease in out-of-pocket expenditures due to universal pharmacare. It appears that the PBO and the Advisory Council likely underestimated the elasticity parameter based on our review of the relevant literature and did not reflect the uncertainty found in the literature. Utilizing primary payer data also underestimates the per cent decrease in out-of-pocket expenditures. Accordingly, this leads us to believe that the PBO as well as the Advisory Council has underestimated the behavioural effect associated with universal pharmacare.

- The Advisory Council assumed that universal pharmacare would result in an additional price discount due to improved negotiation position under a single-buyer program. Our analysis suggests that this appears to be on the high end of what is likely achievable.

- While the Advisory Council conducted some sensitivity analysis, a more comprehensive risk analysis that looks at a range of factors and reflects the inherent uncertainty associated with key inputs was not conducted.

Adhering to our guiding principles, we believe that risk needs to be more explicitly considered in estimating the fiscal impact. We have tried to address this gap and build on the work conducted by the PBO and the Advisory Council by overlaying a Monte Carlo simulation on the model, which reflects the inherent risk and uncertainty associated with critical inputs. Utilizing a probabilistic model such as the Monte Carlo simulation model is consistent with the CADTH guidelines for economic evaluation of health technology. The following section of this report outlines the results of this analysis.

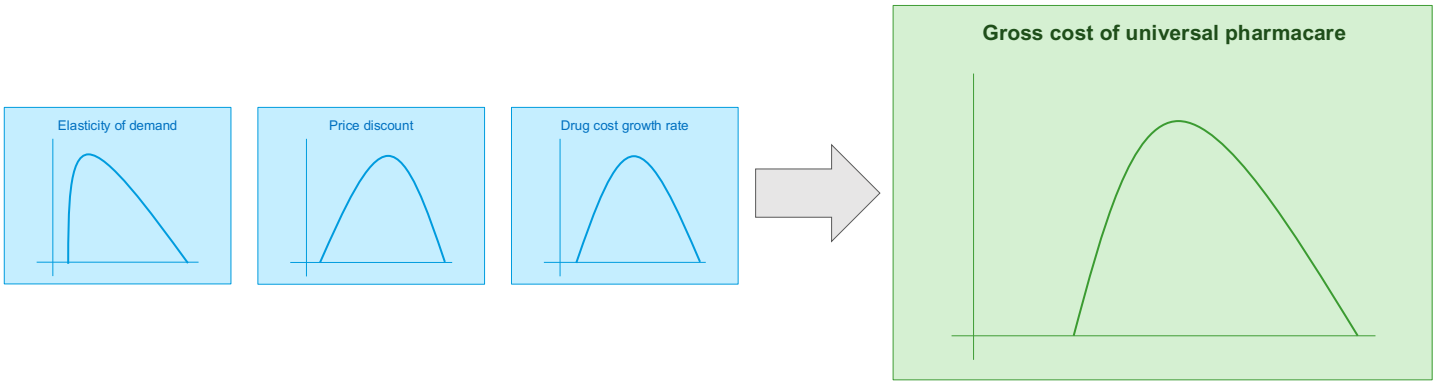
Risk Analysis Results

Our review of the PBO and the Advisory Council's report found that the Advisory Council did not explicitly consider risk associated with the implementation of a universal pharmacare program. In order to assess the fulsome impact of risks associated with this program, we utilized a probabilistic approach to estimate the fiscal impact. More specifically, we developed a Monte Carlo simulation model as an overlay to the PBO's model.

Monte Carlo simulation

A Monte Carlo simulation allows us to define model inputs on a probabilistic as opposed to deterministic basis. Since model inputs are defined on a probabilistic basis then model outputs will be defined as such.

Figure 4 - Monte Carlo simulation



This approach allows us to reflect the uncertainty associated with key model inputs and to determine how this impacts model outputs. Monte Carlo simulation is superior to sensitivity analysis as it enables us to assess a range of possible outcomes and to consider a wider set of factors.

Key assumptions

Based on our review of the PBO and the Advisory Council's report and the key components of the cost calculation, we have defined the following variable on a probabilistic basis:

- **Price elasticity estimate** – a minimum possible value of 0.1 per cent, a mean of 0.3 per cent and a maximum possible value of 0.9 per cent using a pert distribution (a pert distribution is a non-continuous distribution that resembles a normal distribution, but with increased likelihood for obtaining values away from the mean). We applied this figure on a provincial basis, which allows for divergent price elasticities across provinces.

- **Price discount estimate** – a minimum possible price reduction of 10 per cent, a mean of 17.5 per cent and a maximum possible discount of 25 per cent using a pert distribution.

  Growth rate estimate – a minimum possible growth rate of 6.3 per cent, a mean of 6.5 per cent and a maximum possible rate of 6.7 per cent using a pert distribution.

Our Monte Carlo model builds on the PBO's model while adjusting for some of the changes in estimates by the Advisory Council, as mentioned above. Other assumptions to calculate the cost estimate in our model are based on the PBO's model, given the limited availability of data on the Advisory Council's report for cost estimates. A summary comparing the assumptions made under the PBO, the Advisory Council and our model can be found in Appendix D.

Recall that the Advisory Council used 2017 expenditures on total drugs as the base year. The PBO's model used 2015 expenditure on total drugs as the base year. In order to compare the PBO's and the Advisory Council's cost estimates with our findings, we ran our analysis on two scenarios:

- **Scenario 1 –** the PBO's expenditure on total drugs (base year: 2015) and
- **Scenario 2 –** the Advisory Council's estimated expenditure on total drugs (base year: 2017),

Both the PBO and the Advisory Council's expenditures were projected to the implementation year, 2027, figures using the growth rate estimates mentioned above.

Note that similar to the PBO's model, our estimate of the cost of universal pharmacare only includes eligible drugs under the RAMQ formulary. Our analysis does not take into account spending by public plans on non-eligible drugs, spending by private sector under a universal pharmacare scenario or decreased spending on government employee drug plans. As such, the results outlined in the next sub-section are estimates of gross cost and savings under universal pharmacare.

Results

Savings under universal pharmacare

The gross savings under universal pharmacare based on our Monte Carlo model are shown in figure 5 and 6 for scenario 1 and 2 respectively. Our results suggest that there is just under a 50 per cent chance that universal pharmacare will result in net savings.

In both scenarios, there is just over a 50 per cent chance that universal pharmacare will lead to increased costs. Based on the literature we reviewed, it appears that the Advisory Council underestimated the behavioural effect and did not reflect the significant variation associated with this parameter.

Figure 5 – Scenario 1 probability distribution of savings under universal pharmacare ($ billion), 2027

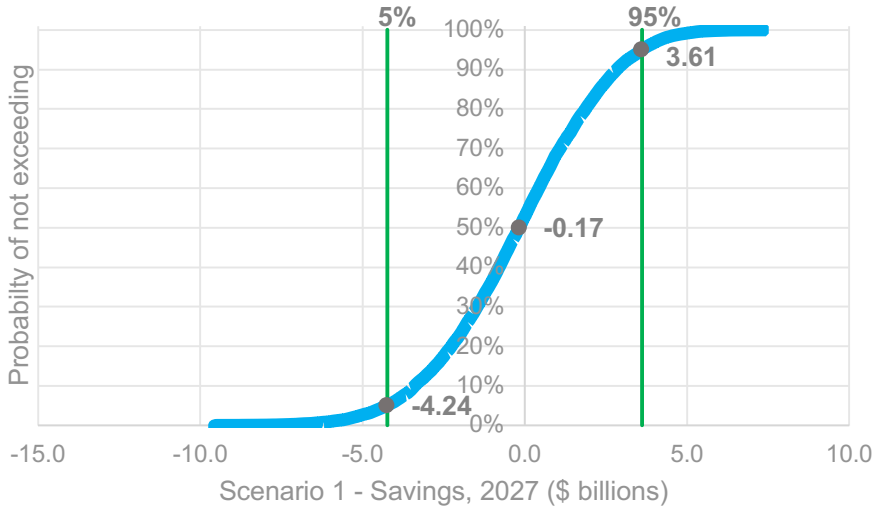
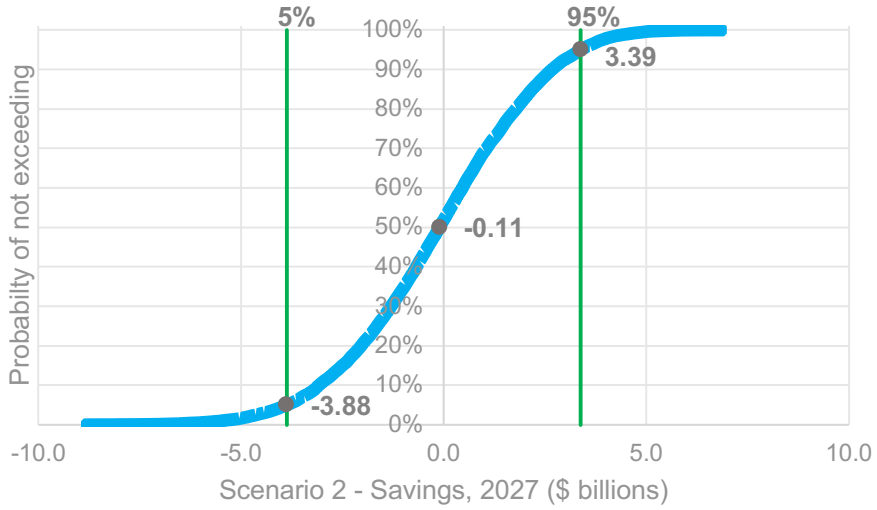


Figure 6 – Scenario 2 probability distribution of savings under universal pharmacare ($ billion), 2027



Gross cost under universal pharmacare

Looking at total expenditures under scenario 1, the expected value for the gross cost for universal pharmacare is estimated at $52.5 billion in 2027. Under scenario 2, the expected value is estimated at $48.3 billion in 2027.

However, there is significant variation in this estimate as shown in the probability distribution shown in figure 7 and 8. Our analysis suggests that there is a 90 per cent probability that universal pharmacare will cost between $48.6 billion and $56.6 billion in scenario 1 and between $44.8 billion and $52.2 billion in scenario 2.

Figure 7 – Scenario 1 probability distribution of gross cost under universal pharmacare ($ billion), 2027

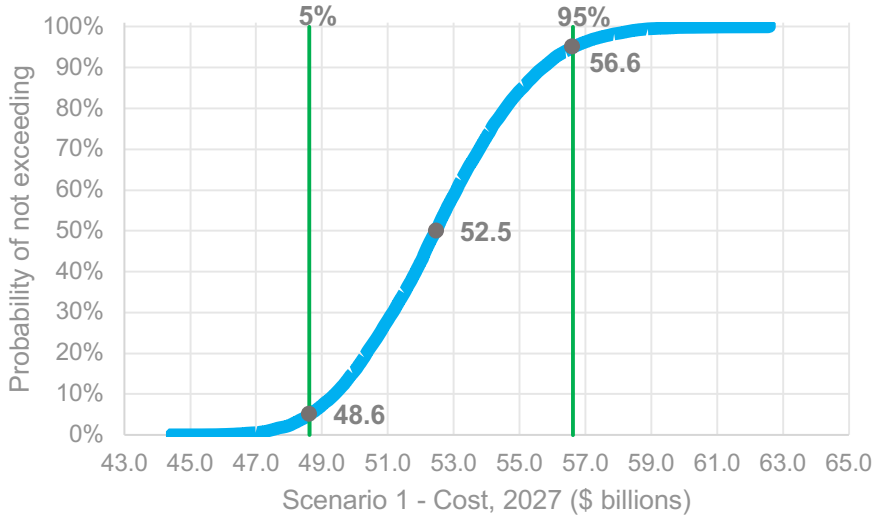
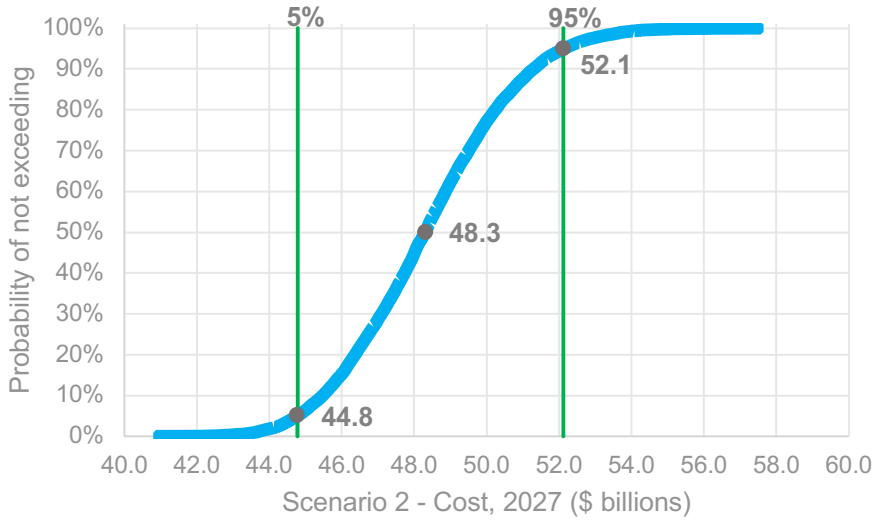


Figure 8 – Scenario 2 probability distribution of gross cost under universal pharmacare ($ billion), 2027



Key findings

Our results find that the expected value for the gross cost of universal pharmacare is $52.5 billion in scenario 1 and 48.3 billion in scenario 2. This estimate is roughly $10 billion more than the Advisory Council's estimate of $40 billion cost for universal pharmacare for eligible drugs.

This suggests that there is only a 50.0 per cent chance that universal pharmacare will lead to gross savings. At its most likely value universal pharmacare will cost an additional $0.17 billion (scenario 1) or $0.11 billion (scenario 2). Table 2 summarizes the Advisory Council's estimates vs. our estimates for 2027. Recall that scenario 1 uses the PBO's estimated expenditure on total drugs (base year: 2015), and Scenario 2 uses the Advisory Council's estimated expenditure on total drugs (base year: 2017).

		5th Percentile	50th Percentile	95th Percentile
The Advisory Council	Cost of drugs under universal pharmacare program (eligible drugs)		$40.0	
	Saving/cost under universal pharmacare		$4.8	
RSM Scenario 1	Cost of drugs under universal pharmacare program	$48.6	$52.5	$56.6
	Saving/cost under universal pharmacare	($4.2)	($0.2)	$3.6
RSM Scenario 2	Cost of drugs under universal pharmacare program	$44.8	$48.3	$52.1
	Saving/cost under universal pharmacare	($3.8)	($0.1)	$3.4

Table 2 - Financial cost estimates of universal pharmacare ($ billion), the Advisory Council and RSM, 2027

It is important to stress that these results in themselves do not suggest that universal pharmacare should not be pursued. A more comprehensive cost-benefit analysis and value-for-money assessment that looks at alternatives is required to make this determination. We recommend that similar risk-based techniques are utilized in any forward-looking evaluation of universal pharmacare and alternatives.

Conclusion

Unlike physician services and in-hospital drugs, expenditure on pharmaceutical drugs incurred outside of hospitals are not included under the *Canada Health Act*. As a result, the pharmaceutical market in Canada is represented by a mix of public and private insurance. A large portion of the expenditure is borne by the public sector (43 per cent), through a series of federal and provincial programs that tend to be targeted towards seniors, low-income Canadians and other in-need groups.

Although there are several of these publicly funded drug programs across Canada, a portion of the Canadian population currently has little to no coverage and face cost-related deterrents to purchasing or renewing prescription drugs. The actual impact of this gap in coverage is unknown. Studies suggest the number of Canadians facing accessibility or cost-related deterrents to consuming prescription drugs could be between 5.2 per cent and 23 per cent depending on how the accessibility gap is defined.

Universal pharmacare is one solution to addressing this gap. HESA is exploring the possibility of extending the *Canada Health Act* to include prescription drugs. The Advisory Council published a final report building on the PBO's costing analysis of implementing a universal pharmacare program based on the RAMQ formulary. The Advisory Council estimated that without universal pharmacare the total spending on drugs would rise to $51.6 billion by 2027. They estimated that a universal pharmacare program will reduce total drug spending to $46.8 billion in 2027, resulting in a savings of $4.8 billion.

This study builds on the PBO's and the Advisory Council's report by utilizing a probabilistic approach to estimating the fiscal impact of universal pharmacare that takes into consideration the significant risk associated with some of the underlying inputs in the their projections. Our analysis suggests that the costs of universal pharmacare are likely to be greater than what the Advisory Council estimated. The expected value for the gross cost of universal pharmacare is between $44.8 billion and $56.6 billion, suggesting significant variation in this estimate. There is just over a 50 per cent chance that universal pharmacare will lead to increased costs and not savings as suggested by the PBO and the Advisory Council. As a result, there is considerable risk associated with the cost savings estimated by the PBO.

These results in themselves do not suggest that universal pharmacare should or should not be pursued. A more comprehensive cost-benefit analysis and value-for-money assessment that looks at alternatives is required to make this determination. For example, the Conference Board of Canada found that lack of information on publicly available coverage appears to be a significant deterrent; over half of respondents indicated that they did not take prescribed drugs due to unawareness of publicly-funded programs. Addressing the information gap may be a more cost-effective way of addressing the accessibility gap. Moreover, this study strictly looked at the potential fiscal impact associated with universal pharmacare. We have not investigated the broader potential socioeconomic benefits and costs as a result of universal pharmacare.

That being said, universal pharmacare would represent one of the largest expansions of social programs in Canada in a generation. This does not mean that universal pharmacare should not be pursued. Given the cost of this program, a cautious and conservative approach in assessing the costs and benefits of the program is required. Alternatives should be seriously considered.

Appendices

Appendix A: Glossary of terms and abbreviations

Advisory Council – Advisory Council on the Implementation of National Pharmacare

Brand-name drug – the first version of a new innovative drug released in the market.

CIHI – Canadian Institution for Health Information

Co-insurance – a fixed percentage of the prescription drug cost individuals must pay. E.g. the insurance may cover 70 per cent of the drug cost, in which case the individual would need to pay 30 per cent out-of-pocket.

Co-payment – a fixed dollar value individuals must pay each time they make a claim.

Deductible – a fixed dollar value that constitutes the initial amount of the drug costs that individuals must pay when obtaining drugs. Before the deductible is met, the individual typically must pay 100 per cent of the drug expenditure out-of-pocket.

Exceptional drugs – drugs with eligibility requirements, e.g. documentation prior to drug purchase

Formulary – a list of drugs that is covered by a certain drug coverage program.

Generic drug – an alternative to a brand-name drug that enters the market once the patent of a brand-name drug expires. Brand-name and generic drugs have the same form and strength.

Generic substitution effect – an increase in the consumption of generic drugs among individuals with private or no insurance. Universal pharmacare would mandate brand name drugs to be substituted with their generic counterpart.

HESA – House of Commons Standing Committee on Health

Lowest price per unit effect – a stronger negotiation position from universal pharmacare is expected to allow the government to establish drug prices at the lowest price currently obtained by public and private insurance plans in Canada. All drug prices will converge to the current lowest observed price.

PBO – Parliamentary Budget Officer

Premium – an amount individuals must pay to enroll in the drug program.

Price Elasticity of Demand – the percentage change in the quantity demanded, or consumed, due to one per cent change in price.

RAMQ – Régie de l'assurance maladie du Québec (Quebec's formulary; assumed to be the national formulary under universal pharmacare)

Appendix B: Price elasticity of prescription drugs

Study	Country	Population	Type of cost	Methodology	Elasticity estimate
Anessi Pesina (1997)[xvi]	Italy	All	Co-payment	Utilization	-0.75 to -0.07
Carrin and Van Dael (1991)[xvii]	Belgium	All	Mixed system	Utilization	-0.35 to -0.09
Chandra et al. (2014)[xviii]	US	Low-income, non-elderly	Co-payment	Expenditure	-0.13
Contoyannis et al. (2005)	Canada (Quebec)	Seniors	Co-payment; Co-insurance	Expenditure	-0.16 to -0.12
Coulson and Stuart (1995)[xix]	US	Seniors	Primary insurance (vs. none)	Utilization	-0.18
Einav et al. (2015)[xx]	US	Seniors	Co-insurance	Expenditure	-0.54 to -0.30
Ellis et al. (2017)[xxi]	US	Non-elderly	Myopic spot-prices	Expenditure	-0.51 to -0.44
Gardner et al. (1997)[xxii]	US	Seniors	Co-payment	Utilization	-0.38 to -0.23
Gibson et al. (2005)[xxiii]	US	All	Multi-tier formulary (vs. 1 or 2-tiers)	Utilization	-0.27 to -0.03
Grootendorst et al. (1997)[xxiv]	Canada (Ontario)	Seniors	Supplementary insurance (vs. none)	Utilization	-0.13 to -0.09
Harris et al. (1990)[xxv]	US	Non-elderly	Co-payment	Utilization	-0.17 to -0.06
Hughes and McGuire (1995)[xxvi]	UK	All	Co-payment	Utilization	-0.37 to -0.32
Klick and Stratmann (2005)[xxvii]	US	Seniors	Mixed system	Utilization	-0.56
Landsman et al. (2005)[xxviii]	US	All	Multi-tier formulary (vs. 1-or 2-tiers)	Utilization	-1.15 to -0.10
Lavers (1989)[xxix]	UK	All	Co-payment	Utilization	-0.22
Li et al. (2007)[xxx]	Canada	Seniors	Mixed system	Utilization	-0.20 to -0.11

Study	Country	Population	Type of cost	Methodology	Elasticity estimate
Liebowitz et al. (1985)[xxxi]	US	Non-elderly	Co-insurance	Utilization	-0.10
McManus et al. (1996)[xxxii]	Australia	Seniors	Co-payment	Utilization	-0.80 to -0.50
Motheral and Henderson (1999)[xxxiii]	US	All	Multi-tier formulary (vs. 1-or 2-tiers)	Utilization	-0.32
O'Brien (1989)[xxxiv]	UK	All	Co-payment	Utilization	-0.64 to -0.23
Ryan and Birch (1991)[xxxv]	UK	All	Co-payment	Utilization	-0.11 to -0.09
Smart and Stabile (2005)[xxxvi]	Canada	All	Tax rate (for tax credit on drugs)	Expenditure	-0.29 to -0.28
Smith (1993)[xxxvii]	US	All	Mixed system	Utilization	-0.10
Smith and Watson (1990)[xxxviii]	UK	All	Co-payment	Utilization	-0.58
Van Doorslaer (1984)[xxxix]	Belgium	All	Co-payment to co-insurance	Utilization	-0.60 to -0.06
Van Vliet (2004)[xl]	Netherlands	All	Deductible	Expenditure	-0.08
Van Vliet (2001)	Netherlands	All	Deductible	Expenditure	-0.06

Table B1 – Literature on price elasticity across multiple high-income countries

Note: Elasticity estimates in some of this studies may have been reported differently in the paper. This report utilizes re-calculated estimates by Gemmill et al. (2008)[xli] to reflect the standard definition of elasticity.

Appendix C: Overview of the PBO's cost estimates

Table C1 below outlines at a high level the PBO's calculations regarding the fiscal impact of universal pharmacare. The PBO sourced 2015-2016 (2016) non-aggregated prescription drug expenditures data from IQVIA and used this data to estimate expenditures on eligible drugs (i.e., based on the RAMQ formulary).

The PBO estimates total spending of $28.5 billion on prescription drugs in 2016 (Line 1). Of this, $13.1 billion was estimated to be funded by the public sector (Line 2), $10.7 billion by private insurance companies and $4.7 billion directly by individuals (i.e., out-of-pocket expenditures). The PBO allocated the share of public, private and out-of-pocket spending on drugs using a primary payer methodology.

Of the $28.5 billion expenditure on prescription drugs, $24.6 billion is estimated to be eligible under universal pharmacare (Line 5). The remaining $3.9 billion will not be reimbursed by the program envisioned by the PBO and will continue to be paid for either through private insurance or out-of-pocket. The impact of universal pharmacare on these expenditures was not considered by the PBO.

After considering changes in consumption behaviour and drug prices under universal pharmacare, the PBO estimates a gross expenditure of $20.4 billion under universal pharmacare (Line 6), which represents a savings of $4.2 billion.

As the public sector already funds $13.1 billion in prescription drugs, the additional cost of universal pharmacare to the public sector would be $7.3 billion (Line 6 less Line 2).

Line	Description	Amount
1	Overall expenditure on drugs (based on data from IQVIA):	$28.5
2	*Estimated public sector expenditures on drugs*	*$13.1*
3	*Estimated private insurance expenditures on drugs*	*$10.7*
4	*Estimated out-of-pocket expenditures on drugs*	*$4.7*
5	Total expenditure on eligible drugs based on the RAMQ formulary	$24.6
6	Total spending on eligible drugs under universal pharmacare as estimated by the PBO	$20.4
7	Total estimated savings under universal pharmacare	$4.2
8	Net cost of universal pharmacare to public sector	$7.3

Table C1 – The PBO's estimated cost and savings under universal pharmacare (in $ billions), 2016

Appendix D: Key assumptions under the PBO, the Advisory Council and RSM model

Assumptions	PBO	Advisory Council	RSM
Base year of total drug spending	2015	2017	Scenario 1: 2015 Scenario 2: 2017
Implementation year of universal pharmacare	2015	2022 partial implementation covering essential medication only; 2027 full implementation plan covering comprehensive list of drugs	2027 comprehensive implementation covering comprehensive list of drugs
Coverage	Universal, single-payer public plan across all provinces (territories not included in analysis)	Same as the PBO	Same as the PBO
Formulary	Adaptation of Quebec's RAMQ formulary as the national formulary	2022: Essential meds per the CLEAN meds list; 2027: RAMQ formulary is assumed to be the comprehensive list; same as the PBO	RAMQ formulary
Model type	Deterministic model with some sensitivity analysis	Deterministic model with high and low analysis for projected drug spending	Monte Carlo simulation (probabilistic model, per CADTH's recommendation)
Growth rate	3.1 per cent under universal pharmacare	6.3 per cent average annual increase in spending including confidential rebate; 6.7 per cent average annual increase in spending excluding confidential rebate	a minimum of 6.3 per cent, a mean of 6.5 per cent and a maximum of 6.7 per cent
Co-payment	$0 co-payment on generic drugs;	$2 on essential meds, subject to exemptions;	Same as the Advisory Council; Assumed revenue from co-payment based on the Advisory Council's report

Assumptions	PBO	Advisory Council	RSM
	$5 co-payment on brand-name drugs, subject to exemptions	$5 for all other covered drugs, subject to exemptions; maximum co-payment is capped at $100	
Price elasticity	0.14	0.1 to 0.2 per cent; increase in spending is capped at 5 per cent and 10 per cent	a minimum of 0.1 per cent, a mean of 0.3 per cent and a maximum 0.9 per cent
Behavioural effect	Calculated using the percentage decrease in out-of-pocket expenditures multiplied by the price elasticity Out-of-pocket expenditure based on primary payer methodology	Same as the PBO	Calculated using the percentage decrease in out-of-pocket expenditures multiplied by the price elasticity Out-of-pocket expenditure based on CIHI's estimate of actual spending
Price discount effect	Price discount of 25 per cent applied on medicinal cost net of markups and fees	20 per cent discount on current public plan spending on brand drugs; 25 per cent to 40 per cent price discount on new brand name drugs;	a minimum of 10 per cent, a mean of 17.5 per cent and a maximum of 25 per cent applied on total cost, including markups and fees
Generic substitution effect	Brand-name drugs substituted with their generic counterpart where available	Converges to a target generic substitution rate based on existing public plan substitution rate	Same as the PBO
Biologics and biosimilars	Biologics not included under generic substitution effect	Biologics lose 60 per cent of market share of biosimilars over 10 years ; biosimilars discount for biologics coming off patent is assumed to be 30 per cent	Same as the PBO
Lowest price per unit effect	All drug prices converge to the lowest observed price in Canada	All drug prices are set to the national average price	Same as the PBO

Assumptions	PBO	Advisory Council	RSM
Therapeutic substitution	Not included	Converges to a target therapeutic substitution rate based on existing public plan substitution rate	Same as the PBO
Ancillary public savings	Not included	Savings from decreased spending on employee drug benefit for government employees and increased in tax revenue to calculate net cost under universal pharmacare	Same as the PBO

Table D1 – Summary of assumptions under the PBO, Advisory Council and RSM model

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