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Prescription Drug Expenditures and 'Universal' Coverage: the Quebec Experience in Canada[*]

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Abstract

This paper examines the relationship between public expenditures on prescription drugs and public-insurance coverage in Canada over the period 1985 to 2012 using data from the Canadian Institute for Health Information and Statistics Canada. We pay particular attention to the introduction of universal prescription drug coverage in Quebec in 1997. Employing an OLS procedure with panel-corrected standard errors (PCSE) and correcting for AR(1) disturbances, we find that universal coverage in Quebec led to an increase in per capita public expenditures on prescription drugs. It also led to a reduction in spending for over-the-counter medications, suggesting some substitutability between prescription and non-prescription drugs.

Key words: prescription drug expenditures, catastrophic drug plans, non-spherical disturbances, panel-corrected standard errors, universal prescription drug coverage, Quebec.

JEL Classification: I113.

Introduction

In Canada, responsibility for health care is largely a provincial or territorial matter. All 13 health care jurisdictions – 10 provinces and three territories – must conform to the minimum requirements of the national health insurance program set out in the *Canada Health Act*.[1] Many differences exist across these jurisdictions when it comes to specific coverages; here, we focus on the treatment of prescription drugs.

Prescription drugs comprise about 16% of total health care expenditures in Canada, as compared to 29.5% for hospitals and 15.5% for physicians (CIHI, 2014). But unlike hospital and physician care which are publicly financed, prescription drugs are covered largely by the individual. About 60% of employed individuals have some prescription drug insurance benefits (Carter, 2011), others may purchase insurance privately. Public subsidies for drugs are typically available to seniors and those with very low incomes, and can vary across jurisdictions.

Some jurisdictions also provide public subsidies for prescription drugs to the non-elderly and more well-to-do residents. Six programs are notable: the Trillium Drug Program in Ontario, introduced in 1995[2]; the Pharmacare Plan in Manitoba in 1996[3]; the Public Prescription Drug Insurance Plan in Quebec (1997)[4]; the Fair PharmaCare Plan in British Columbia (2003)[5]; the Assurance Plan in Newfoundland and Labrador (2007)[6]; and the Family Pharmacare Program in Nova Scotia in 2008.[7] All but the Quebec plan targets

[1] See description in: http://hc-sc.gc.ca/hcs-sss/medi-assur/faq-eng.php.
[2] http://www.health.gov.on.ca/en/public/programs/drugs/programs/odb/opdp_trillium.aspx
[3] http://www.gov.mb.ca/health/pharmacare/index.html
[4] http://www.revenuquebec.ca/fr/default.aspx
[5] http://www2.gov.bc.ca/gov/content/health/health-drug-coverage/pharmacare-for-bc-residents/who-we-cover/fair-pharmacare-plan
[6] http://www.health.gov.nl.ca/health/prescription/nlpdp_plan_overview.html
[7] http://novascotia.ca/dhw/pharmacare/family-pharmacare.asp

prescription drug subsidies for individuals with high drug costs relative to their household income, summaries of which can be found in Phillips (2009). The Quebec 1997 plan is the most comprehensive of all, requiring that all residents hold prescription drug insurance. If they do not have access to a private plan, they must obtain coverage under the provincial plan administered by the RAMQ (Ministère du Revenu du Québec 2003).

The 1997 plan in Quebec embodied two large changes to prescription drug coverage in that province: an increase in the co-payment levied on seniors, and the requirement that everyone hold prescription drug insurance, with a Drug Insurance Fund established to provide public coverage for those without access to a private plan. The first change represents an increase in the amount of out-of-pocket expenses to seniors for prescription drugs and has the potential to reduce demand for these drugs leading to a reduction in the public costs of providing them. The second change, namely extending coverage to everyone without a private plan, is likely to have the opposite effect on the public purse.

A few papers have examined several aspects of the Quebec plan. Blais, et al., (2001) focus on the impact on the elderly population of the increase in co-payments, and found little effect on their use of medications. The use of medications for attention deficit disorders in children, by contrast, was found to have increased after the 1997 policy was put into place (Currie, et al., 2014). Contoyannis et al. (2005) exploited this change in co-payments to estimate the demand elasticity for prescription drugs (which they found to be very low). Wang et al., (2015) analyze the impact of universal access in Quebec on health care use (increased), resulting, mostly, in improved health outcomes.

Di Matteo and Grootendorst (2002) examine public expenditures on prescription drugs

using Canadian Institute for Health Information (CIHI) data across all provinces for the period 1975-2000. While examining the changes in Quebec was not the purpose of their study, they are able to pick up the impact of some of this 1997 policy with the use of a dummy variable. But only three data points after the introduction of the 1997 plan is a bit skimpy when it comes to tracking changes in expenditures. It is also notable that Di Matteo and Grootendorst (2002) employed provincial government expenditures on prescription drugs excluding the separately itemized expenditures of the Drug Insurance Fund in Quebec in their analyses, effectively capturing the impact of the increase in co-payments to seniors on government expenditures but not the impact of the expanded general coverage. They found that the Quebec 1997 policy *reduced* real per capita expenditures on prescription drugs by the province of about $11.

The purpose of our paper is to examine more broadly the impact on prescription drug expenditures of the 1997 policy in Quebec using annual data over the period 1985 to 2012, including public expenditures by the Drug Insurance Fund. We also examine expenditures on over-the-counter (OTC) drugs to see if substitution took place between prescription and OTC drugs following the 1997 policy change. Understanding the impact of universal prescription drug coverage on costs (and, indirectly, on individuals' behaviour) will help inform public discourse and policy on this important area.

The public policy debate regarding prescription drug coverage waxes and wanes in Canada, with it currently back on the table. Just recently, the Provincial health ministers, along with their Federal counterpart, met to discuss improving prescription drug access.[8] The question as

[8] See Globe & Mail article on January 20, 2016: http://www.theglobeandmail.com/news/national/health-ministers-to-begin-talks-on-prescription-drug-access/article28302974/

to whether prescription drugs should be publicly provided is raised regularly, particularly in light of the fact that the lack of universal coverage in all jurisdictions renders Canada anomalous when compared to other publicly-provided primary care regimes (e.g., Smith, 2010; Morgan, et al., 2015). One notable reason why prescription drug coverage is of policy concern is that it has been shown that lack of coverage reduces visits to primary-care physicians, which has potentially deleterious health effects (e.g., Devlin, et al., 2011; Wang, et al., 2015).

Our analyses lead to the conclusion that total public expenditures on prescription drugs *increased* in Quebec as a result of the 1997 universal access policy – by at least $10 per capita per year and as much as $45 (depending upon model estimated). Using this information, we estimate a cost increase of about $205 per insured individual. We also find evidence that individuals substituted away from over-the-counter medications towards prescription drugs after this policy was implemented.

2. Quebec's Universal Drug Coverage

In January 1997, Quebec implemented a mandatory, universal, drug coverage policy that required all residents to hold either private or public coverage – a "public-private partnership" (Pomey, et al., 2007). The myriad of private insurance programs operating in that province were obliged to meet certain requirements, including covering the drugs listed on the Drug Formulary and limiting the amount that individuals pay for coverage (including deductibles) (Pomey, et al., 2007). Individuals without private insurance are covered by the Régie de l'assurance maladie du Québec (RAMQ): those on social assistance and low-income seniors

receive coverage for free, otherwise, an annual fee (upwards of $660) is levied that depends upon income, plus the payment of a maximum monthly deductible of $18.85 (as of July 1, 2016), as well as a co-insurance payment. Overall, the total amount paid for prescription drugs covered under RAMQ cannot currently exceed $1,046 annually.[9]

From the RAMQ Annual Reports (1998-2012)[10] we collected information on the individuals covered by this public regime – which we sort into three distinct groups: those aged 65 or above (65+), those on Social Assistance (SA), and those who were not otherwise covered by a private insurer (NEW). Figure 1 presents the percentage of the Quebec population represented by these three groups (and in total). These percentages are reasonably stable over time. About 42% of the population is covered by RAMQ: 14% (65+), 6% (SA) and 22% (NEW).

These three groups are quite different when it comes to the amount of subsidy provided by RAMQ. In figure 2, we graph the percentage of the prescription drug costs covered by RAMQ by group. By far the lion's share of these costs, over 80%, is borne by the public insurer: 79% coverage for the 65+ group, 100% coverage for the SA group, and 75% coverage for the NEW subscribers.

Significant differences in the use of the drug plan are apparent. The percentage of each group that 'participated' in the program, i.e., purchased a prescription drug at least once in a given year, is graphed in figure 3. Not surprisingly, by far the highest participation rate is by

[9] http://www.ramq.gouv.qc.ca/SiteCollectionDocuments/citoyens/en/depliants/depl-assurance-medicaments-couts-en.pdf.
[10] The reports are for the fiscal years ending March 31st. When we refer to any given year, say 2012, we are referring to the fiscal year April 2012 – March 2013.

the 65+ group, with over 95% of them using the plan at least once a year. This is followed by the SA recipients at 76% and then the NEW insureds at 65%.

Two points from this short discussion should be borne in mind. First, the coverage was extended to only about 22% of the population (the NEW group) as the elderly (65+) and social assistance recipients (SA) were already covered under the pre-1997 plan. Second, the NEW group arguably consists of individuals of less-than-average health as they are without private insurance, which is usually obtained through full-time employment. Employed individuals are, on average, healthier than those who are un or under-employed (e.g., Wing Han Au et al., 2005; Webber et al., 2015), and, importantly, health is positively associated with socio-economic status (e.g., Adler and Newman, 2002). Our findings regarding the cost impact of Quebec's universal coverage must be interpreted in light of these two points.

3. Data

We use provincial data on health expenditures for the period 1985-2012 from Series B and G in the National Health Expenditure Trends databases maintained by the Canadian Institute for Health Information (CIHI).[11] These data are augmented with information from Statistics Canada's Canadian Socioeconomic Information Management System (CANSIM) on socioeconomic and demographic variables, including provincial gross domestic product, the proportion of the population in several age ranges as well as total population estimates, the employment rate and consumer price index. Some data, like employment rates, were missing for the territories; hence we omit them from the regression analysis. All data definitions and sources are summarized in table 1. Real per capita data are obtained by dividing provincial

[11]https://www.cihi.ca/en/spending-and-health-workforce/spending/health-spending-data/national-health-expenditure-database

data in current dollars by their populations and deflating by the regional consumer price index (1997=100).

Figure 4 graphs public prescription drug expenditures as a share of total public health care expenditures from 1985 to 2012. Notice the general upwards trend in the amount of public expenditures going to prescription drugs – although it has flattened out over the last five years or so – and the jump in the proportion of public expenditures on drugs seen in Quebec since 1997: until then, Quebec was part of the pack, thereafter, it is clearly an outlier. Another way of presenting this information is to look at per capita public expenditures on prescription drugs. Again, we can see clearly the impact of the 1997 policy on per capita expenses. Up to 1997, all of the provinces are bunched together; thereafter we see a significant spreading out of these per capita expenditures, with Quebec, again, clearly on the top.

Table 2 summarizes the descriptive statistics of three measures of drug expenditures as well as the independent variables used in the regressions, by province, over the 28 years of our sample. While many things are masked by averaging over the entire period, it is interesting to observe some broad strokes. Average real per capita spending on prescription drugs (*PublicDrug*) by the province over the 28 years of our sample is the highest in Quebec at $177 followed by Ontario at $164. Prince Edward Island spends the least ($105). Total per capita spending on drugs (*TotalDrug*) which also includes Federal Social Assistance payments for prescription drugs shows Quebec and Ontario as having the same per capita expenditures, followed reasonably closely by the Atlantic Provinces. In this case, it is the provinces west of Ontario that have the lowest per capita total spending. Finally, we note that per capita

spending on over-the-counter drugs is much less in Quebec ($45) than elsewhere – and is led by Prince Edward Island at $62.

Per capita GDP is highest in Alberta over the 28 years of the sample, followed by Ontario and then British Columbia. Quebec is in the middle of the pack, Prince Edward Island is at the bottom. Average per capita Federal transfer payments are significantly larger in Manitoba and Saskatchewan, than elsewhere; Quebec's payments are second last at $82 per capita as opposed to $70 in Newfoundland. Clearly, much is hidden by averaging over the whole period. Newfoundland and Labrador, for instance, had much larger transfers up until the oil boom which began around 2007. With increasing oil prices, Ontario's industrial output suffered, and it began to receive transfers around the end of the first decade of the new millennium. Average employment rates also vary significantly over the provinces, and again these averages mask a lot of cyclical interprovincial variation. The proportion of the population who are elderly varies a bit: about 7% of the population is aged 65-74 (our "young" retired group) – more in Nova Scotia (8%) and less in Alberta (6%); more variation is displayed in the proportion of the older 75+ group across provinces: much lower in Alberta (4%) and highest in Saskatchewan (7%). Finally, the share of the overall health budget going to hospitals varies from a low of 30% in Saskatchewan and a high of 40% in Newfoundland and Labrador.

4. Empirical Methodology

Public spending on drugs is dependent upon demand drivers. The presence of drug insurance and the proportion of the population covered by drug instance – for instance, the elderly, the poor, and the unemployed – will cause the demand for public expenditures on

prescription drugs to increase. Two variables are related to the ability of provincial governments to raise revenue: income, for which we use real, per capita, provincial gross domestic product (GDP), and the employment rate in the province. In addition, given that prescription drug coverage is provided to the less well off, these two variables are also likely to be determinants of demand for public drug assistance. Seniors are covered by provincial plans and hence we would expect expenditures on prescription drugs to be an increasing function of the relative size of the senior population.

The basic equation to be estimated can be expressed as:

$$PublicDrug_{it} = \alpha + \beta_1 Socio_{it} + \beta_2 Policies_{it} + \beta_3 F_i + \beta_5 F_t + \varepsilon_{it}$$

$$i = 1, \dots, 10; t = 1, \dots, 28 \qquad (1)$$

for province *i* and time *t* (1985 to 2012). Our main dependent variable is real per capita provincial public spending on prescription drugs (*PublicDrug*). Equation (1) is also modified to take account of two other dependent variables reflecting different measures of drug expenditures: *TotalDrug* which also includes all Federal government expenditures on prescription drugs mostly to Social Assistance recipients, and *OTCDrug* which captures per capita private spending on non-prescription drugs.

Table 3 details the 15 changes in provincial drug policies over the 1985-2012 period, for which we include dummy variables. Some were relatively minor, mostly to do with fee adjustments: for instance, a dispensing fee was introduced for seniors in British Columbia in 1987; co-payments were introduced in Nova Scotia in 1990; and co-payments were increased in New Brunswick in 1996 for low-income seniors on Guaranteed Income Supplements. Other policies were more significant: the Trillium Drug Program of Ontario in 1995

(*Ont1995*); the Pharmacare plan of Manitoba in 1996 (*Man1996*); the Fair PharmaCare Plan of British Columbia in 2003 (*BC03*); the Assurance Plan of Newfoundland and Labrador in 2007 (*NL2007*); and the Family Pharmacare Program of Nova Scotia in 2008 (*NS2008*). And, of course, we include the Quebec's Public Prescription Drug Insurance Plan (*Que1997*).

Three main socioeconomic and demographic variables are included in the model: real per capita provincial gross domestic product (*GDP*), the provincial employment rate (*Employrate*), the proportions of the provincial population aged 65 to 74 and aged 75 and above.

Provincial dummy variables capture unobserved, provincial-specific effects, not otherwise taken into account. Time fixed effects capture time-specific effects not otherwise accounted for, like, for instance, changes in the availability of prescription medications for certain conditions (or the de-listing of medications over time), or relevant technological advances. We are therefore estimating a two-way fixed effect model.

We have a panel data set across 10 provinces and 28 years. With panel data, the ordinary least squares regression technique (OLS) is appropriate only if there is no heteroscedasticity, no correlations between the errors across cross-sectional units (contemporaneous correlations) and no correlations across time (autocorrelation) (Greene 2012). However, in macro panels, these three assumptions are unlikely to hold: any or all of these assumptions may be violated leading to non-spherical disturbances which render invalid hypotheses tests about the coefficients.

Several residual diagnostic tests can detect heteroscedasticity, contemporaneous correlation and serial correlation. For the first problem, we employ the modified Wald test, whose null hypothesis is group-wise homoscedastic variances. At the bottom of table 4 we present these test results for our main model with all three dependent variables – the null cannot be accepted providing evidence of the presence of province-wise heteroscedasticity in all specifications. For cross-sectional correlations, the Breusch-Pagan Lagrange Multiplier (LM) test is used to test the null hypothesis of no contemporaneous correlations. Again, from the bottom of table 4, we cannot accept the null hypothesis of no cross-section dependence, concluding that there are contemporaneous correlations. Finally, looking at the Wooldridge test for autocorrelation in panel data, whose null hypothesis is no first order autocorrelation, it again cannot accept this hypothesis.

To correct the problems with the error structure in the data, we use the OLS approach with PCSE (which deals with heteroscedasticity and contemporaneous correlations) and include a first-order autocorrelation AR(1) correction to deal with the autocorrelation (Beck and Katz, 1995).[12] The standard errors reported in our tables reflect these corrections.

5. Empirical Results

Table 4 presents the least squares regression results with panel-corrected standard errors (PCSE), assuming first-order auto-correlated errors and that the coefficient of this AR(1) process is common to all the panels. Three regression models are reported, each corresponding to a different measure of drug expenditures as the dependent variable, with

[12] An alternative option for estimating the model is the feasible generalized least squares (FGLS) estimator. However, Beck and Katz (1995) show that the OLS estimators with PCSE often yield more accurate hypothesis test results, and hence we employ this approach.

appropriate modifications of the independent variables. Column (1) contains the results when the dependent variable is provincial public per capita expenditures on prescription drugs including the Drug Insurance Fund expenditures in Quebec. Column (2) presents the results when total public expenditures on prescription drugs is the dependent variable – this variable is the most exhaustive measure of such expenditures and includes federal social assistance related drug expenditures as well as those from Workers' Compensation Board payments. Finally, column (3) uses per capita expenditures on non-prescription (OTC) drugs.

We start by observing that the (adjusted) R-squared reported at the end of the table is quite high: ranging from 0.90 to 0.98 – so we are capturing a substantial portion of the variation in our dependent variables with the model as specified.

From the estimated coefficients reported in column (1) of table 4 we see that per capita GDP does not matter for per capita public spending on prescription drugs. However, per capita GDP is associated with a reduction in total per capita drug expenditures, column (2), which makes sense given that this latter measure includes Federal government social assistance transfers which are likely to fall as GDP rises. GDP is associated with an increase in non-prescription drug expenditures, as expected for normal goods.

The provincial employment rate does not have any statistically significant impact on drug expenditures, likely because this variable is correlated with per capita GDP. Looking at the impact of the age of the population, we can see that prescription drug costs are much higher for the older elderly group (75+) than for the younger (65-74) one. Unexpectedly, the proportion of individuals aged 65 to 74 is associated with a *ceteris paribus* decrease in per

capita public drug spending, with a one percent increase in this proportion, decreasing per capita spending by $7.88. But if the proportion of the older group increases by one percent, per capita spending increases by $15.38. Total drug expenditures (column (2)) increase for both of these age groups, but by much more for the older one. The same holds true for spending on non-prescription drugs (column (3) of table 4), which seems sensible.

Although the focus of this work is on the impact of the major policy change in Quebec in 1997, we turn first to a short discussion of the other policy changes for which we controlled. As mentioned, many of these changes are small and hence not expected to have much of an impact on our provincial per capita drug expenditures. A few points are worth noting. One interesting finding is the impact of policies that increase the out-of-pocket cost of prescription drugs on per capita spending on non-prescription, OTC, medications: we are finding a mostly positive effect on OTC expenditures of increased out-of-pocket prescription drug payments. Looking down the last column of table 4, we find that the increase in co-payments in Saskatchewan in 1993, in senior co-payments in Alberta in 1994 and in Ontario in 1996, are all associated with a statistically significant increase in expenditures on OTC drugs of between $3-$5 per year. The reduction from 365 days' worth to 100 days' worth of any given prescription dispensed in advance in Manitoba (1996),[13] is also associated with an increase in OTC expenditures by $3 per year per capita. These findings are consistent with some substitutability between OTC and prescription drugs, corroborating Stuart and Grana's (1995) study on elderly people, but at odds with an earlier study on working-aged individuals

[13] http://www.gov.mb.ca/chc/press/top/1996/10/1996-10-01-02.html

(Leibowitz, 1989) that actually found evidence of complementarity between prescription and OTC medications in the presence of insurance.

In three cases where co-payments to seniors for public coverage were either introduced or increased (Nova Scotia (1990), Saskatchewan (1993) and New Brunswick (1996)) we find a reduction in the per capita expenditures for public prescription drugs. Presumably, this increase in prices discouraged the use of prescription drugs (the introduction of senior co-payments in Canada's smallest province, Prince Edward Island, in 1987, had no statistical effect). The introduction of reference pricing in British Columbia in 1997 also had the expected reduction in public per capita spending on prescription drugs.

5.1 Quebec's Universal Access Policy

From table 4 we see that substantial changes that occurred in Quebec in 1997 led to a $39 increase in public per capita spending on prescription drugs (column (1)), by far the largest increase associated with the 15 policies controlled for in our analysis. Moreover, when we look at total drug expenditures, which include Federal transfers for this purpose, (table 4, column (2)), this increase becomes even larger at $57 per capita.

The increase in spending associated with the 1997 Quebec policy is robust to many specifications, although the amount by which per capita expenditure increases is not. For instance, we estimated an expanded model including Federal health-care transfers in general and the share of the health-care budget going to hospitals, which Di Matteo and Gootendorst (2002) argue may affect prescription drug expenditures. Table 5 reports these results, again using an OLS with panel-corrected standard errors and an AR(1) correction, and we find that

public per capita expenditures increase by even more, some $44.51 after the 1997 policy change (column (1)).

We also followed the specification reported by Di Matteo and Grootendorst (2002) by including real per capita provincial GDP, real per capita federal cash transfers, the proportions of the population aged 18-44, 45-64, 65-74, and over age 75, and hospital share of total health spending. We ran this model using the OLS with robust standard errors, and we excluded the additional expenditures on prescription drugs arising from the provincial Drug Expenditure Fund (the 1997 policy) as they did. Happily, our results (reported in table 6) are very similar to theirs: we now find a negative and statistically significant relationship between the Quebec 1997 variable and per capita expenditures on prescription drugs. In particular, the 1997 policy is associated with a reduction of $12.39 in per capita expenditures ($11.36 in Di Matteo and Grootendorst) – an amount that falls to $10.62 when we use the more appropriate panel-corrected standard errors approach. Excluding data from the Drug Expenditure Fund in Quebec allows us to capture the impact of the increase in out-of-pocket expenses levied on seniors in 1997, but not the impact from extending coverage. And indeed, excluding these data indicate that this increase in copayments and deductibles to seniors led to a measurable reduction in the use of prescription drugs by this group. However, including the Drug Expenditure Fund amounts, which reflect the expenditures arising from the extended public coverage to the general population, returns us to our conclusion that the Quebec policy has a positive impact on public drug costs per capita. In this case, using the much expanded model, per capita public costs for providing prescription drug coverage increase by $9.70, much

lower than the $39 found in the more parsimonious approach, and this estimated effect is less precisely measured, with a probability value of 0.129.

As a further robustness check, we ran regressions on the Quebec observations alone. Even though there were only 28 years of data, we ran the main (parsimonious) model and found that the estimated coefficient on the 1997 policy dummy variable was positive and statistically significant, at $11.63.

Finally, we examined if and how the Quebec policy affected per capita spending on OTC medications. While we found that policies in other provinces that increased out-of-pocket spending (largely to seniors) were associated with increased spending on OTC drugs, the Quebec policy led to the opposite effect. The Quebec policy, which embodies both an increase in costs to seniors and the important extension of coverage to hitherto uninsured individuals, is associated with a reduction in per capita spending on OTC medications of $5.19 (table 4, column (3)). This reduction points to some ability to substitute between OTC and prescription medications.

5.2 Universal at What Cost?

The purpose of our paper was to examine the factors associated with public per capita expenditures on prescription drugs, with particular focus on universal coverage in Quebec. Our finding that expenditures increased in Quebec with expanded coverage is not surprising. In many ways, what is surprising is that it changed by so little. The most that annual per capita expenditures increased by at the provincial level was $44.51 once we controlled for all

the variables in the expanded model of table 5. Using the preferred, more parsimonious model, this increase is $39.

To understand better what this increase means, we return to the two points highlighted earlier in the paper: that the 1997 policy represents extended coverage to about 22% of the population, and that this group is likely to be higher-than-average users of the plan because of lower-than-average health. For illustrative purposes, we will use the higher estimates of the impact of the policy on costs, namely $45 per capita. This amount represents an increase in costs of $45 multiplied by the Quebec population (approximately eight million people), or $360 million (assuming that the behaviour of the other two groups (65+ and SA), did not change). But this amount pertains only to 22% of the population (about 1.76 million people). Therefore, a simple estimate of the cost associated with extending coverage to individuals who were otherwise not insured, is $205 per person.

6. Conclusions and Discussion

Discourse on publicly-provided health care systems frequently surrounds the basket of services to be provided publicly. While prescription drugs are often included as part of primary care (Smith, 2010), Canadian jurisdictions have not typically followed this tradition except for the case of well-defined groups (the elderly, low-income) or situations (catastrophic drug requirements). Quebec is the exception, having implemented a private-public universal coverage program in 1997 in which public coverage is mandatory if private coverage is not available. Lessons can be learned from this experience.

It is important to look at the impact of universal coverage for many reasons, not the least of which is the fact that individuals are more likely to visit their family doctors if they have

prescription drug coverage and they are more likely to fill their prescriptions (Allin and Hurley, 2009; Devlin, et al., 2011). The health consequences of no or inadequate coverage can be dire.

We find clear and unambiguous evidence that public expenditures on prescription drugs increased in Quebec as a result of the 1997 policy – by at least $9.70 per capita, upwards of $45 per person. A simple back of the envelop calculation based on these results and some trends from the Quebec public insurer, RAMQ, suggest a cost of, at most, about $205 per person insured.

We are also able to say something about the substitution of OTC medications for prescription drugs, contributing to the small empirical literature on this subject. Our findings point to an increase in OTC medications arising from increasing the amount of out-of-pocket expenses from public drug coverage. But per capita OTC purchases fell significantly after the change in policy in Quebec, corroborating the findings of Stuart and Grana (1995) who analyzed directly the question of the substitution between prescription and OTC drugs and found persuasive evidence that insurance increased the use of the former instead of the latter for a population of elderly individuals.

More and better data would improve the analyses. It would be interesting to have individual-level data on prescription drug use with and without insurance. From a public finance perspective, we have not taken into account the costs of administration – although possibly lower for public systems than for a myriad of private ones. Nevertheless, the results of this paper suggest that the provision of universal prescription drug insurance may be well within the means of public systems to provide – further analyses is warranted.

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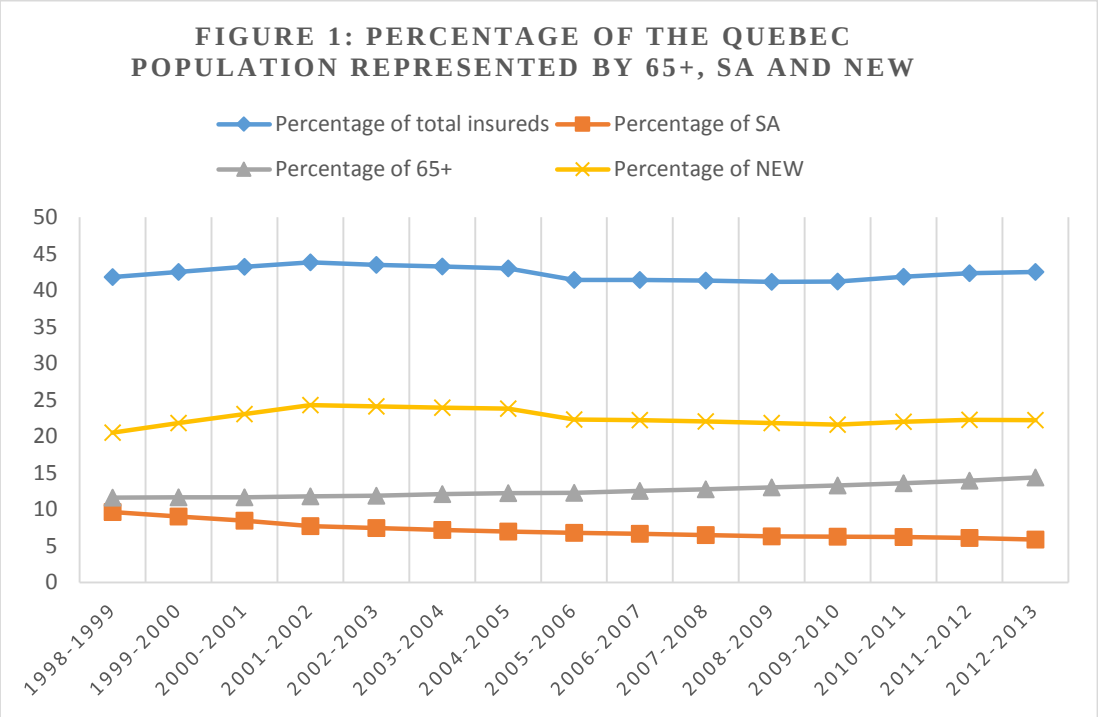

Data Source: RAMQ (1998-99 to 2012-13) Rapport Annuel de gestion.
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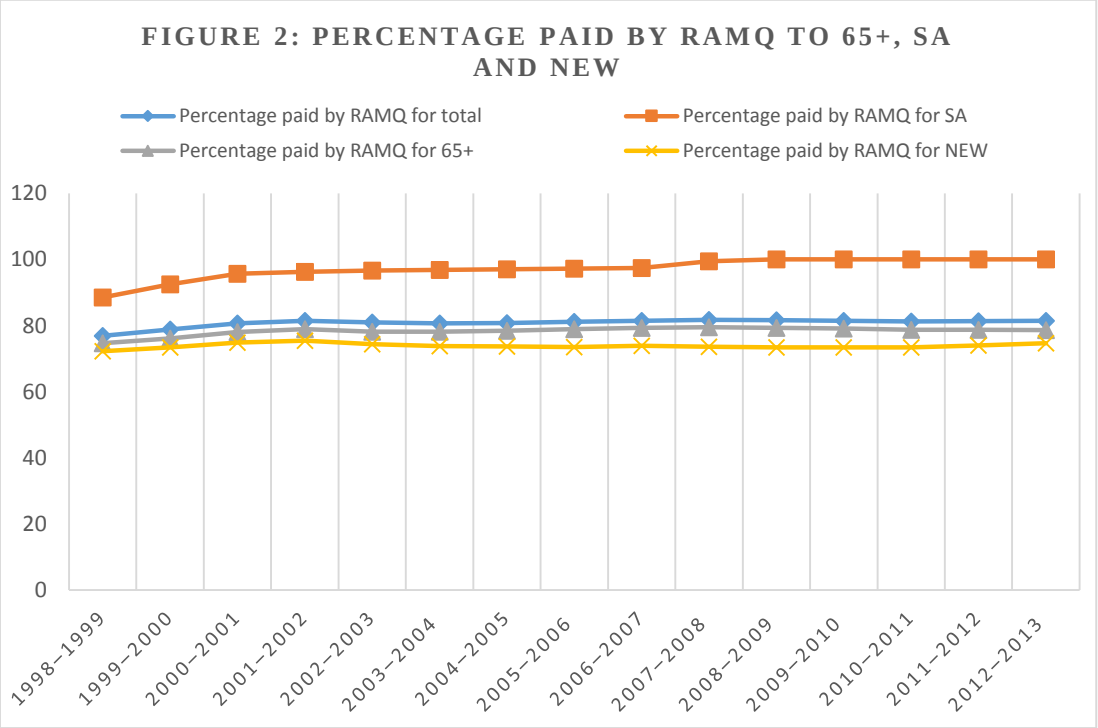

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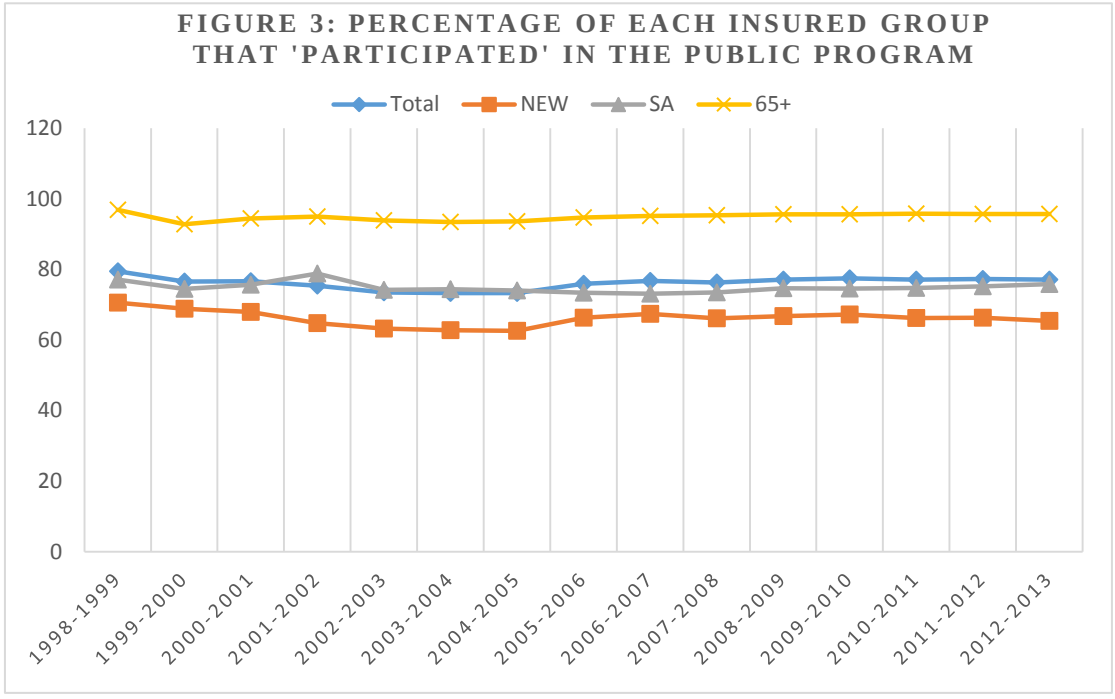

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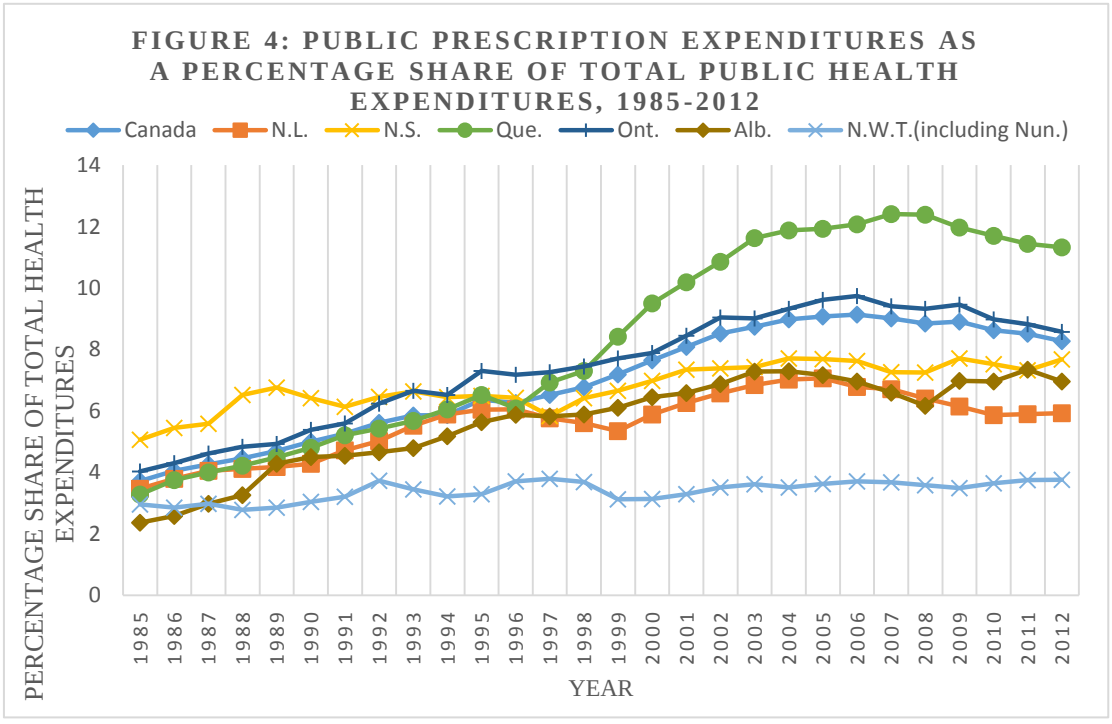
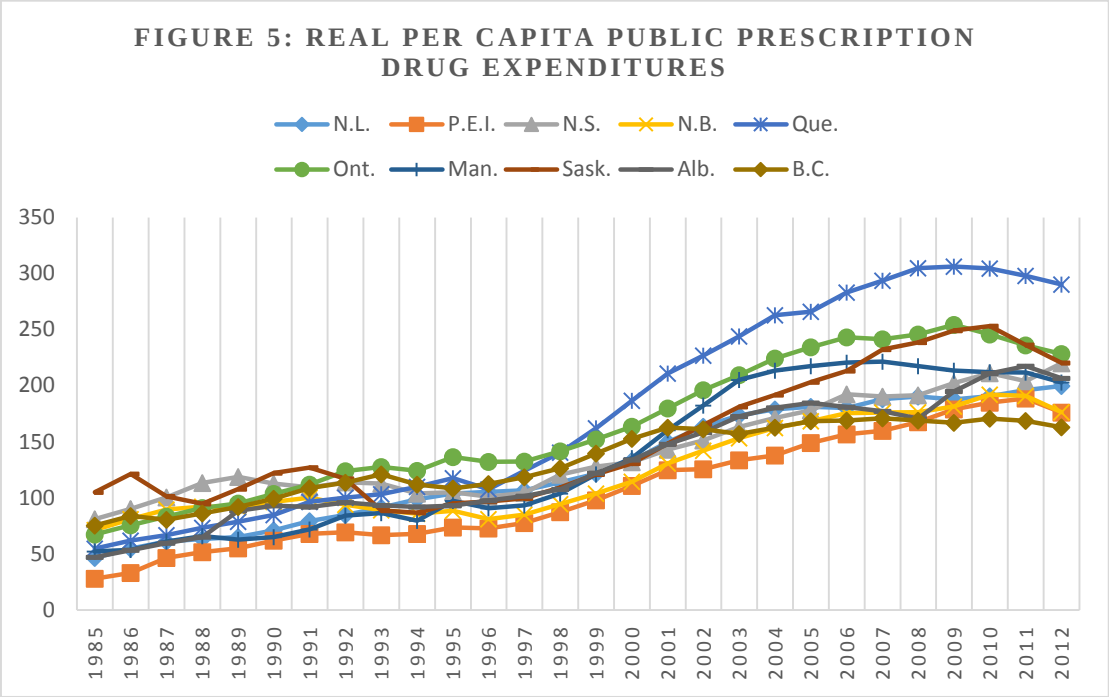


Data Source: Series G Expenditure on Drugs by Type, by Source of Finance, and as a Share of Public, Private and Total Health Expenditures, 1985–2014. Table B.3.1 Series B Public-sector Health Expenditure, by Province/Territory and Canada, 1975 to 2014—Current Dollars. National Health Expenditure Trends Database, 1975 to 2014. CIHI.



Data Source: Series G Expenditure on Drugs by Type, by Source of Finance, and as a Share of Public, Private and Total Health Expenditures, 1985–2014. National Health Expenditure Trends Database, 1975 to 2014. CIHI.

Table 1: Description of Variables and Sources of Data

Variable	Definition	Source
PublicDrug	Real per capita public prescription drug expenditures (1997 dollars)	Column F. Series G. Expenditure on Drugs by Type, by Source of Finance and as a Share of Public, Private and Total Health Expenditures, by Province/Territory and Canada. National Health Expenditure Trends 1975–2014. CIHI
ProvincialDrug	Real per capita provincial government prescription drug expenditures (1997 dollars)	Column B. Series G (above source)
TotalDrug	Real per capita total prescription drug expenditures (1997 dollars)	Column K. Series G (above source)
PrivateDrug	Real per capita private prescription drug expenditures (1997 dollars)	Column J. Series G (above source)
OTCDrug	Real per capita non-prescription drug expenditures (1997 dollars)	Column M. Series G (above source)
GDP	Real per capita provincial gross domestic product (1997 dollars)	Appendix A.1. Gross Domestic Product at Market Prices, 1975 to 2014— Current Dollars. National Health Expenditure Trends 1975–2014. CIHI
transfer	Real per capita provincial revenue from federal cash transfers (1997 dollars)	Table B.6.2. Federal Direct Health Expenditure, by Province/Territory and Canada, 1975 to 2014—Current Dollars. National Health Expenditure Trends 1975–2014. CIHI
employrate	Employment rate	Table 282-0002 Labor Force Survey Estimates. Statistics Canada

		CANSIM
age65to74	Proportion of provincial population aged 65 to 74	Table 051-0001 Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual. Statistics Canada CANSIM
age75above	Proportion of provincial population aged 75 and over	As above
hospitalshare	Hospital share of total health spending	Column B. Series D1. Total Health Expenditure, by Use of Funds, by Province/Territory. National Health Expenditure Trends 1975–2014. CIHI
CPI	Consumer price index (1997=100)	Appendix B.1 Government Current Expenditure Implicit Price Index, by Province/Territory and Canada, 1975 to 2014. National Health Expenditure Trends, 1975 to 2014. CIHI.
$Prov_i Year_t$	1 after the policy in Province i, and Year t (e.g., BC87, PEI87, and so on) for 15 policies described in table 3.	See table 3.

Table 2: Descriptive Statistics by Province

Variable	Provinces	Obs	Mean	Std.Dev.	Min	Max
PublicDrug	Newfoundland and Labrador	28	128	52	47	200
	Prince Edward Island	28	105	50	28	189
	Nova Scotia	28	142	42	81	220
	New Brunswick	28	124	42	71	192
	Quebec	28	177	92	55	306
	Ontario	28	164	62	67	254
	Manitoba	28	136	66	52	221
	Saskatchewan	28	152	57	87	253
	Alberta	28	130	52	47	217
	British Columbia	28	133	33	75	171
TotalDrug	Newfoundland and Labrador	28	343	138	171	556
	Prince Edward Island	28	336	120	150	532
	Nova Scotia	28	359	135	147	599
	New Brunswick	28	357	149	149	613
	Quebec	28	371	178	127	655
	Ontario	28	372	142	160	582
	Manitoba	28	296	126	132	497
	Saskatchewan	28	310	112	143	494
	Alberta	28	290	107	129	480
	British Columbia	28	282	107	139	480
OTCDrug	Newfoundland and Labrador	21	43	2	38	47
	Prince Edward Island	21	62	5	50	70
	Nova Scotia	21	58	3	53	63
	New Brunswick	21	55	5	43	63
	Quebec	21	45	3	39	50
	Ontario	21	62	4	52	68
	Manitoba	21	49	3	42	54
	Saskatchewan	21	49	3	46	55
	Alberta	21	53	5	44	59
	British Columbia	21	54	3	50	60
GDP	Newfoundland and Labrador	28	25,829	9,439	15,453	44,474
	Prince Edward Island	28	21,527	2,684	16,281	25,100
	Nova Scotia	28	24,188	1,786	21,761	26,586

	New Brunswick	28	23,949	2,301	19,533	27,246
	Quebec	28	27,455	2,418	23,123	30,345
	Ontario	28	33,292	2,234	28,859	35,994
	Manitoba	28	26,961	2,148	23,824	30,610
	Saskatchewan	28	31,195	6,613	24,291	46,052
	Alberta	28	41,423	6,920	32,299	54,965
	British Columbia	28	31,669	2,115	29,076	35,779
transfer	Newfoundland and Labrador	28	70	21	44	105
	Prince Edward Island	28	138	77	47	266
	Nova Scotia	28	141	29	102	186
	New Brunswick	28	112	34	55	166
	Quebec	28	82	20	46	113
	Ontario	28	89	21	58	128
	Manitoba	28	225	59	138	314
	Saskatchewan	28	207	60	103	284
	Alberta	28	103	25	63	139
	British Columbia	28	107	24	71	152
employrate	Newfoundland and Labrador	28	.47	.03	.43	.54
	Prince Edward Island	28	.58	.03	.53	.61
	Nova Scotia	28	.55	.03	.51	.59
	New Brunswick	28	.54	.03	.48	.59
	Quebec	28	.58	.02	.54	.61
	Ontario	28	.62	.02	.59	.67
	Manitoba	28	.63	.02	.60	.66
	Saskatchewan	28	.63	.02	.61	.67
	Alberta	28	.68	.02	.65	.72
	British Columbia	28	.60	.02	.56	.63
age65to74	Newfoundland and Labrador	28	.07	.01	.05	.10
	Prince Edward Island	28	.07	.01	.07	.09
	Nova Scotia	28	.08	.01	.07	.10
	New Brunswick	28	.07	.01	.07	.10
	Quebec	28	.07	.01	.06	.09
	Ontario	28	.07	.003	.06	.08
	Manitoba	28	.07	.003	.07	.07
	Saskatchewan	28	.07	.003	.07	.08
	Alberta	28	.06	.003	.05	.06
	British Columbia	28	.07	.004	.07	.09

age75above	Newfoundland and Labrador	28	.05	.01	.03	.06
	Prince Edward Island	28	.06	.005	.05	.07
	Nova Scotia	28	.06	.009	.04	.07
	New Brunswick	28	.06	.01	.04	.07
	Quebec	28	.05	.01	.04	.07
	Ontario	28	.05	.008	.04	.07
	Manitoba	28	.06	.006	.05	.07
	Saskatchewan	28	.07	.008	.05	.08
	Alberta	28	.04	.006	.03	.05
	British Columbia	28	.06	.008	.04	.07
hospitalshare	Newfoundland and Labrador	28	.40	.05	.35	.48
	Prince Edward Island	28	.34	.03	.29	.40
	Nova Scotia	28	.39	.06	.31	.49
	New Brunswick	28	.38	.04	.34	.44
	Quebec	28	.33	.07	.26	.48
	Ontario	28	.32	.04	.28	.39
	Manitoba	28	.34	.04	.29	.42
	Saskatchewan	28	.30	.03	.26	.36
	Alberta	28	.34	.04	.30	.40
	British Columbia	28	.31	.03	.26	.37

Table 3: Summary of Policy Changes

Province and date of introduction	**Description**
British Columbia (April 1987)	A 75% of dispensing fee was introduced for all seniors. http://www2.gov.bc.ca/assets/gov/health/ practitioner-pro/medical-services-plan/fpc-senior-info.pdf
Prince Edward Island (January 1987)	From free full coverage then January 1987, a $9.90 co-payment was introduced for all senior citizens. http://healthpei.ca/index.php3?number=1026303&lang=E
Nova Scotia (June 1990)	From free full coverage then June 1990, a $3/prescription co-payment was introduced. http://novascotia.ca/dhw/pharmacare/seniors-pharmacare.asp
Nova Scotia (January 1993)	For both Guaranteed Income Supplement (GIS) senior citizens and Non-GIS senior citizens, the co-payment was increased from $3 to maximum of 20% co-insurance or $3 co-payment to the total prescription cost.
Saskatchewan (March 1993)	Before 1993, the coinsurance was 35% then 10% on expenditures over $375 semi-annual deductible for seniors and general population. March 1993, the coinsurance was 35% for seniors on Saskatchewan income plan, seniors with some GIS income, seniors with no GIS income and general population. https://www.saskatchewan.ca/residents/health/ accessing-health-care-services/seniors-drug-plan
Alberta (July 1994)	Before 1994, there was a 20% coinsurance. In July 1994, a minimum of 30% co-insurance or $3 co-payment to the total prescription cost was introduced for all seniors. http://www.health.alberta.ca/services/drugs-seniors.html
Ontario (April 1995)	The Trillium Drug Program provides people with prescription drug subsidies based on their household income. People who are not covered under the Ontario Drug Benefit Program or who are uninsured or underinsured by a private health insurance can apply for it.
Manitoba (April 1996)	Pharmacare is a drug benefit program for people who have heavy prescription drug burdens. Its coverage is based on people's total family income and how much they pay for the eligible prescription drugs.
New Brunswick (April 1996)	For GIS senior citizens, low-income senior citizens and other senior citizens, the co-payment was increased from $7.05 to $9.05/prescription. http://www2.gnb.ca/content/gnb/en/services/ services_renderer.8875.

	New_Brunswick_Drug_Plans_for_Seniors.html
Ontario (July 1996)	Before July 1996, there was full coverage for seniors. Since July 1996, for senior citizen, single with household income over $16,081/year and senior citizen with partner with household income over $24,175/year, there was a $100 deductible and $6.11/prescription co-payment; for other seniors, there was no deductible and $2/prescription co-payment. http://www.health.gov.on.ca/en/public/programs/drugs/programs/odb/opdp_after65.aspx
Quebec (January 1997)	For general population, people are required to be insured by a private plan if this option is available to them. If they do not have access to a private plan, they must obtain coverage under the public prescription drug insurance plan administered by the RAMQ. For seniors, introduction of a $0 to $175 premium and $25 per quarter deductible http://www.ramq.gouv.qc.ca/en/life-events/turning-65/Pages/prescription-drug-insurance.aspx
British Column (May 2003)	The Fair PharmaCare Plan is an income based drug subsidy plan for all people, including seniors, who have Medical Services Plan (MSP) coverage. Family deductibles and family maximums depends on net annual family income.
Newfoundland and Labrador (2007)	The Assurance Plan provides prescription drug coverage to individuals or families where eligible drugs costs exceed 5%, 7.5% or 10% of different levels of net family income.
Nova Scotia (2008)	The Family Pharmacare Program in Nova Scotia is also an income-based provincial drug insurance plan. All Nova Scotians could be eligible for it as long as they can prove that they have no drug coverage or the costs of prescription drugs are a burden to them.

Table 4: OLS with Panel-corrected Standard Errors(PCSEs) and AR(1)

Variables	(1) PublicDrug	(2) TotalDrug	(3) OTCDrug
GDP	-0.000125	-0.00167***	0.000169*
	(0.000263)	(0.000532)	(9.70e-05)
employrate	9.037	190.4	-31.04
	(65.76)	(123.2)	(29.24)
age65to74	-787.8**	445.5	42.72
	(331.9)	(512.5)	(102.5)
age75above	1,538***	3,910***	351.9**
	(534.5)	(858.6)	(177.3)
BC87	-8.783	-8.070	
	(6.609)	(8.472)	
PEI87	6.517	-36.70*	
	(4.120)	(20.51)	
NS90	-17.04**	-1.073	
	(6.926)	(11.98)	
NS93	-12.91*	-6.582	-0.0833
	(6.615)	(11.87)	(2.859)
Sask93	-36.20***	-25.13***	5.124**
	(8.077)	(8.560)	(2.056)
Alb94	1.339	-14.12*	5.114**
	(6.017)	(8.534)	(2.137)
Ont95	11.34**	24.84**	3.784*
	(5.377)	(12.48)	(1.935)
Man96	1.476	10.72	2.973*
	(6.145)	(7.493)	(1.636)
NB96	-22.39***	2.090	2.352
	(5.075)	(9.756)	(3.265)

Ont96	-3.127	8.681	3.934**
	(5.405)	(12.24)	(1.894)
BC97	-5.626	-17.71**	-0.528
	(5.705)	(7.665)	(1.909)
Que97	39.39***	57.16***	-5.191***
	(7.830)	(9.883)	(1.660)
BC03	-36.42***	-31.85***	0.237
	(6.108)	(6.526)	(1.674)
NL07	1.172	9.968	-1.968
	(5.062)	(16.01)	(2.168)
NS08	0.413	6.719	-1.017
	(6.530)	(10.52)	(2.409)
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Constant	43.60	-62.36	46.63***
	(40.54)	(78.18)	(17.59)
Observations	280	280	210
R-squared	0.895	0.976	0.835
Number of Prov	10	10	10
Test for heteroscedasticity (the modified Wald test)			
Null hypothesis: there is no group-wise heteroscedasticity.			
Stat(Chi2)	381.84	229.53	55.89
d.f.	10	10	10
Prob.	0.0000	0.0000	0.0000
Note: Number of observations for all specifications are 280, except for OTC Drug, which is 210.			
Test for contemporaneous correlations (the Breusch-Pagan LM test)			
Null hypothesis: there is no cross-section correlation in the residuals.			
Stat(Chi2)	189.785	314.239	68.038
d.f.	45	45	45
Prob.	0.0000	0.0000	0.0149
Note: All tests are based on 28 complete observations over panel units (provinces), except tests for OTC Drug, which are based on 21 complete observations over panel units (provinces).			
Test for autocorrelation (the Wooldridge test)			

Null hypothesis: there is no first order autocorrelation.			
Stat(F)	740.984	64.995	17.444
d.f.	(1,9)	(1,9)	(1,9)
Prob.	0.0000	0.0000	0.0024
Note: Number of observations for all specifications are 280, except for OTC Drug, which is 210.			

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: OLS with PCSEs and AR(1), Including Transfer and Hospitalshare

Variables	(1) PublicDrug	(2) TotalDrug	(3) OTCDrug
GDP	-1.44e-05	-0.00146***	0.000220**
	(0.000258)	(0.000515)	(9.53e-05)
transfer	-0.331***	0.433*	
	(0.109)	(0.247)	
transfersquare	0.000904***	-0.00113**	
	(0.000286)	(0.000549)	
employrate		175.7	-43.23
		(124.5)	(28.77)
age65to74	-743.6**	-514.3	-43.15
	(298.3)	(563.4)	(101.6)
age75above	1,704***	3,618***	274.3*
	(546.8)	(810.2)	(166.4)
hospitalshare	-67.26	-251.2***	-55.13***
	(43.58)	(78.40)	(19.60)
BC87	-7.789	-8.335	
	(6.430)	(8.976)	
PEI87	9.689**	-41.04**	
	(4.171)	(20.23)	
NS90	-17.16**	2.920	
	(6.831)	(11.92)	
NS93	-18.11***	-13.33	-1.569
	(6.695)	(11.76)	(2.697)
Sask93	-39.58***	-25.45***	4.678**
	(8.086)	(9.475)	(2.020)
Alb94	2.597	-18.64**	4.623**
	(5.958)	(8.907)	(2.348)
Ont95	13.31**	24.74**	4.043**

	(5.456)	(12.55)	(1.999)
Man96	-2.966	8.952	1.493
	(6.362)	(7.855)	(1.550)
NB96	-23.34***	1.806	2.739
	(4.740)	(9.631)	(3.093)
Ont96	-2.544	5.283	3.921**
	(5.614)	(12.20)	(1.914)
BC97	-4.927	-19.07**	-0.164
	(5.446)	(8.214)	(1.910)
Que97	44.51***	51.39***	-4.374***
	(7.623)	(9.949)	(1.676)
BC03	-38.43***	-33.90***	0.183
	(5.741)	(6.925)	(1.664)
NL07	-0.571	16.23	-1.624
	(4.970)	(15.20)	(2.026)
NS08	-0.732	4.436	-1.806
	(6.533)	(10.27)	(2.197)
Province FE	YES	YES	YES
Year FE	YES	YES	YES
Constant	83.99***	73.93	81.72***
	(26.12)	(89.02)	(20.59)
Observations	280	280	210
R-squared	0.926	0.976	0.843
Number of Prov	10	10	10
Test for heteroscedasticity (the modified Wald test)			
Null hypothesis: there is no group-wise heteroscedasticity.			
Stat(Chi2)	108.45	76.83	66.40
d.f.	10	10	10
Prob.	0.0000	0.0000	0.0000
Note: Number of observations for all specifications are 280, except for OTC Drug, which is 210.			
Test for contemporaneous correlations (the Breusch-Pagan LM test)			

Null hypothesis: there is no cross-section correlation in the residuals.			
Stat(Chi2)	116.360	246.214	70.441
d.f.	45	45	45
Prob.	0.0000	0.0000	0.0090
Note: All tests are based on 28 complete observations over panel units (provinces), except tests for OTC Drug, which are based on 21 complete observations over panel units (provinces).			
Test for autocorrelation (the Wooldridge test)			
Null hypothesis: there is no first order autocorrelation.			
Stat(F)	957.387	76.305	21.045
d.f.	(1,9)	(1,9)	(1,9)
Prob.	0.0000	0.0000	0.0013
Note: Number of observations for all specifications are 280, except for OTC Drug, which is 210.			

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: OLS with Robust Standard Errors and PCSEs, with and without the Drug Insurance Fund Expenditures, Using Di Matteo and Grootendorst's Specification

Variables	(1) ProvincialDrug robust	(2) ProvincialDrug pcse	(3) PublicDrug robust	(4) PublicDrug pcse
Alb.GDP	-0.000775**	-0.000507	-0.00145***	-0.000908**
	(0.000370)	(0.000405)	(0.000437)	(0.000423)
B.C.GDP	-0.00151*	-0.00108	-0.00205**	-0.00142
	(0.000895)	(0.000975)	(0.000973)	(0.00109)
Man.GDP	0.00243*	0.00195	0.00331**	0.00286
	(0.00136)	(0.00218)	(0.00140)	(0.00206)
N.B.GDP	0.000328	-0.000815	0.000585	-0.000671
	(0.00135)	(0.00137)	(0.00133)	(0.00138)
N.L.GDP	-0.000236	7.52e-05	-0.000447	-0.000107
	(0.000278)	(0.000391)	(0.000275)	(0.000419)
N.S.GDP	-0.00244	-0.00160	-0.00232	-0.00195
	(0.00268)	(0.00232)	(0.00236)	(0.00248)
Ont.GDP	-0.000800	-0.000767	-0.00181*	-0.00160
	(0.00107)	(0.00109)	(0.00101)	(0.00113)
P.E.I.GDP	-0.00545**	-0.00324**	-0.00331	-0.00241*
	(0.00247)	(0.00140)	(0.00204)	(0.00143)
Que.GDP	0.000122	0.00143	0.00458	0.00467***
	(0.00242)	(0.00132)	(0.00290)	(0.00168)
Sask.GDP'	0.00230***	0.00115*	0.00280***	0.00148**
	(0.000754)	(0.000661)	(0.000629)	(0.000685)
Alb.transfer	0.0270	0.0528	0.0215	-0.00586
	(0.210)	(0.165)	(0.190)	(0.171)
B.C.transfer	-0.477***	-0.441***	-0.606***	-0.548***
	(0.126)	(0.136)	(0.133)	(0.150)
Man.transfer	-0.105	-0.0594	-0.0215	0.00608
	(0.0818)	(0.0825)	(0.0643)	(0.0793)

N.B.transfer	-0.430***	-0.262***	-0.411***	-0.254***
	(0.100)	(0.0968)	(0.101)	(0.0980)
N.L.transfer	-0.450	-0.164	-0.314	-0.0943
	(0.279)	(0.184)	(0.257)	(0.198)
N.S.transfer	-0.425***	-0.274*	-0.367**	-0.203
	(0.155)	(0.157)	(0.156)	(0.168)
Ont.transfer	0.282*	0.280**	-0.145	-0.00451
	(0.164)	(0.141)	(0.245)	(0.148)
P.E.I.transfer	0.0734	0.0734*	0.0155	0.0385
	(0.0521)	(0.0385)	(0.0487)	(0.0393)
Que.transfer	0.577***	0.584***	0.692***	0.699***
	(0.174)	(0.168)	(0.173)	(0.207)
Sask.transfer	-0.234*	-0.103	-0.171	-0.0360
	(0.125)	(0.0985)	(0.127)	(0.102)
age18to44	41.28	82.28	94.84	86.15
	(403.4)	(167.1)	(457.0)	(181.3)
age45to64	287.7	163.5	-35.85	-94.45
	(356.9)	(168.5)	(418.8)	(178.6)
age65to74	-8.094	-178.6	-197.4	-356.6
	(982.5)	(374.9)	(1,190)	(391.5)
age75above	218.6	70.60	1,627	1,190***
	(1,016)	(433.5)	(1,308)	(433.6)
hospitalshare	-12.65	-22.14	-40.27	-45.27
	(75.62)	(37.52)	(76.72)	(40.85)
BC87	4.029	-0.156	8.359	1.880
	(5.432)	(4.804)	(6.365)	(5.487)
PEI87	17.51**	11.54**	14.44*	11.36**
	(7.470)	(4.764)	(8.129)	(4.926)
NS90	-10.98**	-12.11*	-11.01**	-12.55*

	(5.046)	(6.385)	(4.872)	(6.836)
NS93	-18.92***	-13.09**	-19.72***	-14.10**
	(5.727)	(5.817)	(6.695)	(6.278)
Sask93	-43.86***	-43.64***	-50.10***	-45.95***
	(7.711)	(9.222)	(8.299)	(9.543)
Alb94	-0.836	2.007	1.077	3.077
	(4.326)	(7.258)	(4.750)	(7.526)
Ont95	16.50**	13.86**	20.74**	13.96**
	(7.582)	(5.710)	(9.020)	(6.141)
Man96	1.704	-1.075	-2.577	-2.791
	(7.020)	(7.736)	(7.521)	(7.346)
NB96	-24.18***	-15.85***	-24.65***	-16.14***
	(5.620)	(5.170)	(5.856)	(5.164)
Ont96	-5.163	1.153	-8.976**	-2.550
	(4.511)	(6.014)	(4.335)	(6.340)
BC97	1.784	3.916	-2.129	0.538
	(6.732)	(4.573)	(5.489)	(5.048)
Que97	-12.39***	-10.62**	1.996	9.701
	(4.583)	(4.866)	(6.498)	(6.369)
BC03	-27.10***	-22.59***	-30.08***	-25.99***
	(5.099)	(5.605)	(5.572)	(6.378)
NL07	-3.345	-0.938	-5.853	-2.685
	(6.408)	(5.058)	(6.320)	(5.507)
NS08	9.388**	7.848	7.382**	5.842
	(3.763)	(5.568)	(2.969)	(5.975)
Province FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Constant	5.878	12.90	42.95	62.30
	(179.1)	(85.35)	(196.1)	(92.30)

Observations	280	280	280	280
R-squared		0.954		0.966
Number of Prov	10	10	10	10
Test for heteroscedasticity (the modified Wald test)				
Null hypothesis: there is no group-wise heteroscedasticity.				
Stat(Chi2)		107.12		89.57
d.f.		10		10
Prob.		0.0000		0.0000
Note: Number of observations for all specifications are 280.				
Test for contemporaneous correlations (the Breusch-Pagan LM test)				
Null hypothesis: there is no cross-section correlation in the residuals.				
Stat(Chi2)		121.506		108.773
d.f.		45		45
Prob.		0.0000		0.0000
Note: All tests are based on 28 complete observations over panel units (provinces).				
Test for autocorrelation (the Wooldridge test)				
Null hypothesis: there is no first order autocorrelation.				
Stat(F)		229.521		256.866
d.f.		(1,9)		(1,9)
Prob.		0.0000		0.0000
Note: Number of observations for all specifications are 280.				

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1