LCERPA

Laurier Centre for Economic Research & Policy Analysis

LCERPA Working Paper No. 2014-3

August 2014

The Burden of Prescription Drugs on Seniors: Reducing Out-of-Pocket Expenditures Through Lower Co-Payments

Nicholas Corvari, Department of Economics, Wilfrid Laurier University
Logan McLeod, Department of Economics, Wilfrid Laurier University

The Burden of Prescription Drugs on Seniors: Reducing Out-of-Pocket Expenditures Through Lower Co-payments

Nicholas Corvari*

Logan McLeod†

August 25, 2014

Abstract

The elderly are the most intensive users of healthcare including prescription drugs. Canadian provinces have responded to this need with varying levels of support through senior drug plans with cost-sharing measures such as co-payments in an attempt to find a sustainable balance between meeting health care needs of seniors and budgetary constraints of government. While provincial co-payments have tended to migrate upwards over time resulting in a greater financial burden for seniors, Saskatchewan deviated from this trend in 2007 by capping its co-payment level. In an effort to provide evidence-based research to the ongoing policy discussion on best-practice approaches for this relatively vulnerable population group, this paper employs a Difference-in-Difference method within a Generalized Linear Model (GLM) to examine the impacts of the Saskatchewan policy change on out-of-pocket expenditure for senior household with a focus on impacts for differing segments of expenditure. The findings suggest Saskatchewan's policy change resulted in a decrease in out-of-pocket expenditures thereby lowering the financial burden for seniors. The results also suggest the expenditure savings largely accrued to seniors at the higher level of expenditure distribution; with no significant change for households in the middle and lower quintiles.

*Wilfrid Laurier University

†Corresponding author; Wilfrid Laurier University, Department of Economics; Email: lmcleod@wlu.ca

1 Introduction

The Canadian Institute for Health Information (CIHI) reported total prescription drug expenditures in Canada reached $27.7 billion in 2012 (CIHI, 2012). While the average annual growth rate for prescription drug expenditures has slowed over the last decade, prescription drugs represent the second largest component of total health care costs in Canada (CIHI, 2012). While governments are responsible for financing prescription drugs in hospital, financing out-patient prescription drugs is usually through private sources such as private health insurance or out-of-pocket payments. The gap in coverage, between public and private sources, has prompted a debate on proposals for a pan-Canadian drug plan which adds another dimension to the already complex debate on the efficiency, effectiveness, and sustainability of Canada's healthcare system.

Canada's senior population represents a special component of the debate. Given the absence of private prescription drug insurance among seniors, and concerns about financial barriers to accessing needed prescription drugs, provincial governments provide varying levels of public coverage for the most vulnerable population groups such as those on social assistance and seniors. Canada's senior population is expected to double from five million to ten million by 2036.[1] Canadian seniors pay, on average, a larger percentage of their household budget in out-of-pocket expenses for prescription drugs compared to other household groups, including those on social assistance (McLeod et. al, 2011). The larger share of senior's household budget spent on prescription drugs come from two main sources. First, seniors are more intense users of prescription drugs, which are often required to manage chronic health conditions. In addition, chronic conditions often become more numerous and complex with age (McPherson, et. al, 2012). Second, seniors are more likely to live on fixed incomes. Given the more significant burden that seniors carry both in health and economic terms, provincial policy makers need to ensure that seniors have equitable and affordable access to medicines that can support good health for as long as possible. While this is an important moral issue, it is also an economic issue. Recent research shows that increased costs to seniors for prescription drugs through cost-sharing measures can lead to lower levels of drug utilization resulting in increased use of hospitalization or physician services, leading to greater overall costs to the health care system caused by negative externalities (Chandra et. al, 2010).

[1] Human Resources and Skills Development Canada "Canadians in Context – Aging Population", `www.4.hrsdc.gc.ca`

In Canada, all provinces currently provide public drug insurance plans for seniors with a cost-sharing mechanism. The cost-sharing mechanisms normally take the form of a co-payment (equal to a flat fee for each prescription filled) or co-insurance (equal to a percentage of the price of the drug) paid out-of-pocket. Efforts to contain costs of prescription drugs expenditures have prompted many provinces to increase co-payments or co-insurance rates. An increase in cost-sharing may lead to either an increase in total out-of-pocket expenditures or a decrease in prescription drug use to offset the higher cost.

This paper seeks to contribute to our understanding of how co-payment levels impact out-of-pocket expenditures by seniors. We exploit plausible exogenous variation provided by a natural experiment from a recent change to the Senior's Drug Plan in Saskatchewan. This change, implemented in 2007, reduced the 35% co-payment to a maximum of $15 per prescription for drugs listed in the Saskatchewan drug formulary (CIHI, 2010). Saskatchewan's drug formulary has a low-cost substitution policy meaning that reimbursement under the Drug Plan is determined based on the price of the lowest cost alternative drug as listed in the formulary.[2] The Saskatchewan case is interesting for two reasons. First, unlike the trend in other provinces, where co-payments have increased overtime to help contain provincial costs, the change in Saskatchewan was largely aimed at reducing out-of-pocket expenditure for seniors by putting a cap on co-payments when using the lowest cost alternative (Daw and Morgan, 2012). Saskatchewan is also of particular interest due to evidence it has the highest provincial median drug budget share for senior households at 3.6% (McLeod et al., 2011).

We expect the 2007 policy change will, on average, reduce out-of-pocket expenditure for senior households. Households that could not previously afford to fill all prescriptions are expected to respond by increasing prescription drug use, possibly resulting in smaller decreases or increases in their expenditure. To test the impact of this policy change on prescription drug out-of-pocket expenditure for seniors, the time period before and after the policy change will be examined using data from 2005 to 2009 from Statistics Canada's Survey of Household Spending (SHS). In order to control for possible underlying time trends, provinces without any significant changes to their public drug plans for seniors will be used as a control group.

[2]Saskatchewan Institute of Public Policy (2007), *Health Care in Saskatchewan*, Houghton Boston, Saskatoon, Saskatchewan, Canada, p. 113.

2 Literature Review

There is recent Canadian research that provides context to the growing issue of senior prescription drug expenditure. The federal Patented Medicine Prices Review Board (PMPRB) undertook an analysis to isolate the impact of Canada's aging population on the growth in prescription expenditure using data from five provincial drug plans. They projected that these demographic changes alone will contribute between 2.7% to 4.4% to the average annual growth rate by 2016, depending on the province (PMPRB, 2010).[3] McPherson et al. (2012) use NPDUIS data[4] to look at drug utilization by seniors. They show that average annual claims to the public drug programs amounted to $1,526 per patient for the 65–75 age group, rising significantly to $2,005 for 74–84, and $2,249 for 85 plus. This paper also notes that over 75% of seniors reported having at least one chronic condition and 25% reported having more than three such conditions demonstrating the growing number and complexity of health problems that accompany aging.[5]

Using Statistics Canada's 2006 Survey of Household Spending (SHS), McLeod et al. (2011) gives us more direct information in respects to the financial burden of prescription drugs on senior household budgets across provinces. They use budget share Engel curves to examine how the proportion of the household budget on out-of-pocket prescription drugs expenses varies with income. An Engel curve is used to show how spending on a particular good may change with income.[6]

The results find that the median budget share was more than ten times higher for seniors at 1.1%, than for households on social assistance and the general population, which were both at 0.1% (ranging from 0.4% for Ontario to 3.6% for Saskatchewan for seniors). While this reveals a relatively larger financial burden for seniors, it is still a small portion of total household budget. This paper undertook further analysis to look at the portion of households in each income group that faced catastrophic drug expenditures (i.e. greater than 10% of household budget). The results showed that 2.5% of senior households faced such catastrophic costs, compared to 0.3% for the general population with quite a variance among the provinces. For senior households the range was 0.5% for Ontario to 10.4% for Saskatchewan. While the authors caution that only a small number

[3]The five provinces were: Alberta, Saskatchewan, Manitoba, New Brunswick and Nova Scotia.

[4]The National Prescription Drug Utilizaiton Information System (NPDUIS) includes data on seniors under provincial drug plans for seven provinces.

[5]Chronic drug use is defined in this paper as a patient needing a minimum of a 180-day supply of medication.

[6]An Engel curve also reflects the income elasticity and may indicate whether the good is an inferior, normal or luxury good.

of households in the survey data had catastrophic drug expenses, they feel that the variance is plausible given the differences in drug plan coverage across provinces (McLeod et al., 2011).

2.1 Economic Theory

Co-payments are a type of co-insurance and are one of many forms of cost-sharing mechanisms widely used for all types of health insurance. Cutler and Zeckhauser (2000) discuss the theory behind co-insurance, or what they refer to as indemnity policies, and the optimal use of these mechanisms. The authors identify a trade-off in the subsidization of any health care service where moral hazard exists. Moral hazard occurs when a party demands more than the "optimal" amount of a good or service regardless of risk because it will not have to assume the costs of the additional risk (Pauly, 1968). In the case of co-payments, this suggests that if drug co-payments for seniors are set too low seniors may seek more medications than necessary for health reasons, resulting in an increase in claims and costs to drug plans. This leads to a dynamic optimization problem where co-insurance/co-payment rates must be set at a level that deters unnecessary claims while at the same time allowing access to drugs that are necessary to maintain health and maximize welfare. While this makes sense in theory, it is difficult to solve for this optimal rate in practice due to the wide variation in individual health and income factors across the senior population.

2.2 Canadian Empirical Literature

Between 1970 and 1986, all Canadian provinces implemented policies to provide seniors with some level of coverage for prescription drugs through a public drug plan. Alan et. al (2002) look at how these various policies have impacted out-of-pocket expenditures for seniors in high and low-income households. Using Family Expenditure Survey for Canada between 1970 and 1986, they examine out-of-pocket expenditure and household budget shares as the dependent variables and look at changes before and after the implementation of the provincial policies, while controlling for high versus low income households. To estimate the changes, a difference-in-difference method was used for the regression. The findings showed a decline in out-of-pocket expenditure for seniors in all regions. This work provides evidence that public drug plans were having the intended effect of easing the financial burden on seniors and that income distribution concerns should not be a primary factor in supporting prescription drug subsidies. Unfortunately, because only certain years

of the Survey contained the necessary prescription drug data, it was not possible for the authors to examine changes in out-of-pocket expenditure as closely before and after plan implementation as would be desired. This could have resulted in other factors influencing the results in cases where larger periods of time elapsed between observations. Complimenting this work on seniors, these same authors used improved data to expand their analysis to look at budget share and distributional impacts for the non-senior population (Alan et. al, 2005). Engel curves were used to measure the effects of the subsidy as an increase in income on drug budget share. It is noteworthy that the results for the non-senior population differed from the seniors in that they find a much greater reduction in prescription drug budget shares in low-income households suggesting drug subsidies have a re-distributional impact.

Using data from the National Population Health Survey (1994–97) for all provinces, Grootendorst and Levine (2002) test to see if differing provincial coverage affects the health of patients or the levels of drug utilization for seniors and those on social assistance. The paper estimated the effect of drug plans on ten different outcomes, including measures of prescription drug utilization, and controlled for income, health status, education and occupation. Utilization outcomes were measured in two ways, one measuring the number and the other measuring the probability. For number measurements, negative binomial regression was used as, unlike basic linear regression models such as OLS, it does not allow for negative values. This was considered important as expenditure cannot be a negative value. For the probability measure, a logit regression was used as a standard method when the outcome is a categorical variable. The results for seniors were somewhat contrary to theory. It was found that seniors were generally price insensitive with respect to the varying costs of drugs resulting in little effect on utilization. It was found, however, that household income had a significant impact on drug utilization suggesting that if the analysis were to examine price elasticity among only low-income seniors the results may be different. As Alan et al. (2005) showed, low-income households were more sensitive to changes in drug subsidy levels. In general though, these results indicate that the moral hazard outlined in the theory may not be as large a concern for prescription drugs as for other health services.

Tamblyn et al. (2001) focus on the health implications of cost control measures by testing the effect of cost-sharing on essential and non-essential prescription drugs use by the elderly and welfare recipients in Quebec between 1995–1997. This time period allowed for an examination of a policy

change in Quebec in 1996 that introduced a co-insurance policy for these groups which had, prior to this change, received free services, or paid relatively minor amounts of co-insurance.[7] Contrary to the findings of Grootendorst et al. (2002), the results indicated significant price sensitivity with a decrease in utilization for both essential and non-essential drugs by the elderly after the policy change. This difference may relate to the fact that Grootendorst examined variations in levels of co-insurance, whereas Tamblyn looked at single policy shift of significant magnitude – i.e., from free care to cost-sharing. Tamblyn et al. (2001) also provide insights into the externalities associated with cost-containment strategies of public health plans through their access to the Quebec integrated health database. They found an increase in the rate of serious adverse health events as well as an increase in the hospital emergency visits after the policy change, suggesting that cost savings associated with increased co-insurance for essential drugs may be offset by higher downstream treatment costs as well as poorer health outcomes.

Adding to our understanding of price sensitivity among the senior population, Li et. al (2007) looked at how increases in co-payments implemented by British Columbia (BC) in 2002, impacted the use of prescription drugs and physician visits for seniors with rheumatoid arthritis. Using the BC Ministry of Health database from January 1996 to December 2002, the model tested the demand for drugs and physician visits before and after the policy change. Price was included in the model and due to endogeneity issues with utilization an instrumental variable was used. This endogeneity issue between price and utilization is common as consumers and suppliers change their behaviour given a change in either one. To account for endogeneity, a two-stage least squares model was used. A 2SLS model first estimates the instrumental variable and then includes the first stage estimate in the second stage full regression. It was found that for higher co-payments there was a decrease in utilization for prescription drugs and an increase in physician visits, supporting economic theory and the findings in Tamblyn et al. (2001), as well as the evidence that cost-containment strategies by public drug plans may be offset by an overutilization of other costly health care services.

Fassbender and Pickard (2000) look at cost-containment policies in terms of their effectiveness in reducing the overall societal costs of prescription drugs. The study examined changes to Alberta's

[7]Prior to August 1996 low-income elderly were fully coverage for prescription drugs, whereas all other elderly paid $2 per prescription with a maximum of $100 per year. The policy change required a 25% coinsurance fee with an annual maximum that varied with income levels with low-income groups paying $200 raising to $500 and $700 for higher income elderly.

senior drug plan in 1993 and 1994 which included a requirement to use the least cost alternative (LCA policy) form of a drug, followed by an increase in the co-payment from 20% to 30% – with a cap at a maximum of $25 per prescription. Using aggregate monthly data July 1992–September 1999, the paper examined the effect of the policy on a number of outcomes the most relevant being the average cost per prescription, the number of prescriptions and average co-payment for the senior population. A basic Ordinary Least Squares (OLS) regression model was used which included policy dummies for the two changes and interaction variables between policy and time. To control for time trends, year dummies were included. It was found that the LCA reduced societal costs overall by reducing out-of-pocket expenditures for seniors as well as lowering costs for the public plan. Whereas the increase in the co-payment did not reduce total drug expenditures, but rather had the effect of shifting the financial burden from the drug plan to seniors in terms of increased out-of-pocket expenditures. This suggests that seniors did not cut back on prescription drug use as a result of the co-payment increase which may relate to the fact that the 10% increase was not of sufficient magnitude to alter purchasing behaviour.

2.3 Empirical Literature in the United States

The health care system in the United States is heavily reliant on private insurance which differs greatly from the more universal coverage found in Canada. For seniors, health insurance is provided publicly through the Medicare program which did not include coverage for prescription medication until 2006 (Multack, 2012). This makes it more difficult to draw inferences from the U.S. empirical literature and apply them to the Canadian situation. That said, there are many important U.S. studies that examine the implications of cost-sharing measures on the utilization of health services. One of the most notable experiments in the field of health economics is the RAND Health Insurance Experiment (RAND HIE) conducted from 1974 to 1982, the results of which are summarized by Keeler (1992). This large-scale experiment selected a random group of 5809 people and assigned them each a different level of cost-sharing including free care, 25%, 50% and 95% co-insurance with a maximum out-of-pocket payment of $1000 annually. It was found that cost-sharing had a very significant impact on spending for health services with those individuals facing the highest costs spending two-thirds less than those that received free care. In addition, those with the free care were found to be in significantly better health at the end of the experiment compared to

those with cost-sharing. This experiment gave researchers insight into patient behavior. While it demonstrated cost-sharing may be effective in lowering costs it also showed that those with financial constraints may reduce spending resulting in negative health impacts. This is a major concern when considering public plans for the elderly, a high percentage of which operate on fixed budgets. The experiment was the closest thing to a truly randomized study in the field and motivated much of the literature that followed.

More recently Chandra et al. (2010) performed an extensive study examining the effects of co-payments on utilization for both prescription drugs and hospital care for seniors using data from the California Public Employees Retirement System. Monthly health data from January 2000 through September 2003 was used for a difference-in-difference model to estimate the effect of a change in co-payments on utilization, measured by out-of-pocket expenditure. Instead of OLS the study uses Generalized Least Squares (GLS) method to perform the regression. This method can be used when it is thought that there is heteroscedasticity among the data or if correlation between observations may occur. In this case it allowed for the researchers to correct for auto-correlation in utilization that resulted from the observations containing a number of different drug plans with the assumption there would be auto-correlation within health insurance plans. This is an important step to ensure that estimates of the standard errors for the model are unbiased. The model also included controls for month and plan fixed effects. The results for prescription drugs showed that the large increase in co-payments seen for the test period resulted in a decrease in drug utilization. These results support earlier research and estimated elasticities for drug expenditure were found to be very close to those in the RAND HIE experiment. The main drawback of this paper was the absence of any external controls for effects outside those of the fixed effects for plans and month such as socio economic characteristics or health status. The paper goes one step further by using the same difference-in-difference model to examine the impact of the policy change in prescription drug co-payments for the elderly on hospital utilization. The results did show there was a statistically significant positive relationship between the higher co-payments and hospital utilization. These papers further support findings in Canada which indicate patients may forego necessary drugs at the cost of health.

2.4 Closing Comments

The literature generally supports the established economic theory and indicates that for seniors, especially those in low-income households, there is an inverse relationship between prescription drug utilization and levels of co-payments. There is also evidence that while higher co-payments can be an effective cost-containment measure for provincial drug plans, if they are set too high, seniors may substitute drug purchases for physician or hospital services offsetting cost savings and leading to poorer health outcomes. In addition, there appear to be other methods that can reduce these out-of-pocket costs for seniors as well as costs for public programs as seen in Alberta through the implementation of the LCA. In the case of Alberta the LCA was accompanied by increases in co-payments which offset the savings for seniors. For the policy change in Saskatchewan examined in this paper the formulary requirements are similar to the LCA policy and are not accompanied by a co-payment increase. This supports the expectations that the results show a decrease in out-of-pocket expenditure for seniors. Through the examination of the Saskatchewan policy change, this paper will be able to use more recent data to see if the economic theory and results in previous studies hold for this policy change. This is important to know as the concerns discussed regarding Canada's demographic shift will likely necessitate future changes in policies impacting cost-sharing arrangements such as co-payment levels. In addition, the data being used will allow for several other provinces to be used as control groups, which was not done in most of the previous literature. Finally, the analysis is taken one step further with the sample being broken down into various groups in order determine if hetereogeneous effects exist between them.

3 Methodology

A difference-in-differences (DID) method within a Generalized linear model (GLM) (McCullagh and Nelder, 1989) is used to examine the policy change. The DID method is a common way to analyze the effects of a policy change by looking at how the policy impacts the outcome variable in the periods following the change while using a control group to take into account common time trends. The key assumption is that before and after the policy change the treatment and control group would be following a common trend in the outcome variable. This allows for a more accurate assessment of the impact of a policy change. As a first pass, the linear representation of the DID model is given by:

$$Y_{it} = \alpha + \beta X_{it} + \delta(POST1_t * SASK_t) + \Omega(POST2_t * SASK_t) + \varepsilon_{it} \tag{1}$$

Y_{it} represents the measure of prescription drug expenditure for each observation over time. The model will include two policy variables, one for the policy change in 2007 ($POST1_t$) which represents the year 2008 and a second for the policy change in 2008 ($POST2_t$) which represents the year 2009. The main explanatory variables will be two separate interaction terms between the post policy dummies and a dummy for Saskatchewan. These interaction terms will represent those in the sample that were affected by the policies. X_{it} represents the various control variables and ε_{it} represents the error term.

The DID will be estimated using a non-linear Generalized Linear Model (GLM) which is considered to be more flexible than a standard Ordinary Least Squares (OLS) model. The GLM can be applied to various types of dependent variables, this includes continuous variables such as prescription drug expenditure examined as the dependent variable in this paper. The benefit of using a GLM compared to OLS is the GLM allows the choice of a number of possible distributions for the outcome variable to be drawn from while OLS requires the outcome variable be drawn from a normal distribution. In addition, the GLM allows a generated function to interact with the explanatory variables linearly. The link function can then interact with the explanatory variable in a non-linear functional form instead of assuming that the outcome variable must have a linear relationship to the explanatory variables. This is done through the two key assumptions of the

GLM which are the family function and link function.

$$g\big(E[y_i \mid x_i]\big) = x_i\beta,\ y \sim F \tag{2}$$

Equation (2) represents the general form of the GLM model where $g(\ )$ represents the link function and F represents the family function. The family function assumes the outcome variable can have a non-normal distribution and allows for the specification of various distribution types.[8] The correct distribution can be found by performing a Box-Cox test. The second assumption, the link function, assumes the functional form linking the outcome variable y_i to a linear combination of the explanatory variables, x_i, and their coefficients, β. The link function then uses the specified functional form to estimate the mean of the dependent variable using the linear predictor. The link function can use a number of specified functional forms which can be one of various linear or non-linear relationships.[9]

To find the correct functional form a Wald test is needed. The results of these tests can be found in Appendix Appendix 1 which determined that a gamma distribution with a log link function best fit the data. Equation (3) represents the form of the GLM used in this analysis.

$$E[y_i \mid x_i] = e^{x_i\beta},\ y \sim \Gamma \tag{3}$$

With the use of a log link function the specific values for the coefficients cannot be interpreted directly. For clarity the coefficients are instead reported as marginal effects at the mean when not specified otherwise. Thus, the reported values show the change in prescription drug expenditure for a one unit change in the explanatory variable while holding all other variables at their mean values. It should also be noted that clustered standard errors were used in all regressions. This is often done for where there may be correlation between errors within specific groups due to unknown factors. In this case the clustering was done at the provincial level as all households within a province are covered by the same plan and impacted by the same provincial characteristics which may have an unknown effect. For this type of data the clustering method can produce more accurate estimates

[8]The family function can be specified as Poisson, Gaussian, inverse Gaussian, binomial, negative binomial, or Gamma distributions.

[9]The link function can be specified as identity, log, logit, probit, C. log-log, power, odds power, negative binomial, log-log or log comp. functional forms.

for standard errors if there are a suitable number of clusters which the various provinces should satisfy (Angrist and Pischke (2008).

4 Survey of Household Spending (SHS)

The data comes from the Survey of Household Spending (SHS). The SHS is collected by Statistics Canada and, until 2010, a Public-use Microdata Files (PUMFs) was made available at the household level. Data from 2005 to 2009 will be used. The SHS collects detailed expenditure data from Canadian households, as well as information regarding characteristics of household members such as age, income, marital status and sex. The survey is conducted annually, except in the territories where it is done every other year. Data collection from participating households is done throughout the calendar year on monthly cycles. Participants keep an expenditure diary following the initial interview and data is collected on each expenditure at different frequencies depending on the type of good. Data on frequently purchased goods is collected more often than on durable goods. Data collection periods are adjusted to accommodate households to better ensure more accurate information.

4.1 Sample Restrictions

A number of restrictions were imposed on the data to better address the specified research question. Households from the three territories are excluded due to their less frequent collection of data. Nova Scotia is also excluded because of a provincial policy change to its senior drug plan, disqualifying it as a candidate for the control group. This exclusion resulted in the narrowing of the original sample size from 64,252 observations to 55,900. Since the analysis focuses on seniors, the sample is further narrowed to senior households, defined as any household where the age of the reference person was 65 or older. During the first interview each household is required to select the reference person given a specific definition that requires the chosen individual be the one most responsible for the household's finances. In view of this, it was considered reasonable to assume these to be senior households. This resulted in further narrowing the sample by excluding 43,389 observations bringing the sample down to 12,511. There were also a small number of observations with masked records that did not indicate which province they belonged to. These missing observations were

excluded as it was impossible to determine if they belonged to the treatment or control group which resulted in eliminating 47 observations. The final sample consists of 12,464 observations in total with 1,533 observations in the treatment group of Saskatchewan.

4.2 Sample Weights

The survey includes a weight variable for the household level reflecting the number of actual households that each sample household represents. The weight was used in the calculation of the descriptive statistics and regressions. The weights were generated for the SHS by Statistics Canada given the probability a household would be selected and adjusted to meet population and household characteristic estimates.

4.3 Variables

The SHS contains expenditure information on a wide range of goods but only those variables that could impact prescription drug expenditure were used in the analysis. The dependent variable is the reported expenditure by each household on prescription drugs. The main explanatory variable is an interaction term between a dummy representing Saskatchewan and the post-policy years, one for each policy. A number of the household characteristics are included as control variables and include sex, marital status, age, education, whether the household is in an urban area and household income. It should be noted that all dollar values have been converted to real dollars using the CPI from Statistics Canada. The CPI was adjusted to make 2005 the base year so all dollar values are in 2005 dollars and the index used a 2009 basket of goods defined by Statistics Canada. While a number of CPI indexes are available, this paper adopts the Bank of Canada definition, which excludes the most volatile components.

4.3.1 Prescription Drug Spending

The dependent variable is the household's reported out-of-pocket expenditure on prescription drugs. Out-of-pocket expenditure measures the amount paid by the household directly and does not include the amount paid by insurance (including the public drug insurance plans). Prescription medications are considered to be any doctor-prescribed drug or pharmaceutical product.

4.3.2 Independent Variables

Six independent variables are used: sex, marital status, age, education, whether the household is in an urban area, and household income.

The survey requires the respondent to indicate whether they are male or female which is recorded as a categorical variable. For the analysis, a dummy variable was created to control for gender where a one indicates the respondent is male and zero indicates female. Gender was included to capture possible gender-specific health issues. Moreover, given that females have, on average, longer life expectancies, males may be expected to be more prone to health issues and therefore will have higher drug expenditure.

Marital status is recorded as a categorical variable indicating whether the respondent is married, single and never married, or single due to other circumstances such as widowed or divorced. The categorical variable was converted into a dummy variable with one representing a respondent who is married and zero a respondent who is single. It was thought this could potentially impact prescription medication expenditure as there is some literature that suggests married individuals, both male and female, may react to symptoms differently and alter the frequency with which they consult physicians (Verbrugge, 1983). The frequency of doctor visits would affect the use of prescription medications and therefore expenditure.

Age is recorded as a categorical variable indicating which age group the respondent belongs to. The SHS defines age groups in five year intervals in order to make it more difficult to identify individuals. The five senior age groups are included: 65–69, 70–74, 75–79, 80–84, 85 plus. Age is relevant given that the number and complexity of health issues tend to increase along with health care costs as an individual ages (McPherson et al., 2012).

Education is defined as the highest level of education attained by the respondent. This is a categorical variable including eight possible choices of education level.[10] For the analysis this was separated into three dummy variables: (1) No high school is a dummy variable equal to one if the respondent had no high school diploma, zero otherwise; (2) High school is a dummy variable equal to one if the respondent has a high school diploma; and (3) Post-secondary is a binary variable

[10]The respondent can indicate whether they have: 1) No high school diploma 2) High school diploma 3) Trade or vocation certificate 4) Apprenticeship certificate 5) Community college or nursing school diploma 6) University certificate or diploma below bachelor's 7) Bachelor's degree 8) Above Bachelor's degree.

equal to one if the respondent has any type of post-secondary degree, zero otherwise. There are two ways education might impact prescription drug expenditure. First, a higher level of education could result in an individual being better informed on how to take care of themselves and maintain better health. Second, those with higher education are more likely to have lived their life before retirement with a higher income and therefore more capable of maintaining health during that period. This would likely result in those with higher education having less expenditure than those with lower education.

The SHS recorded the urban area where each household was located which was a categorical variable that designated whether in an urban or rural area. A third option indicated the location was masked in order to ensure it was not possible to determine the identity of the household for the public use file. Unfortunately there were 729 observations, representing 5.8% of the sample, with masked records which was judged to be too large to simply exclude from the sample. For these observations, a dummy variable indicating unknown urban area was created in addition to dummies for urban or rural areas. Urban areas were considered to be significant as those in rural area would have more limited access to physicians and pharmacies. This could result in less frequent use of physicians and therefore fewer prescriptions.

Household income was constructed using several variables from the SHS. While the survey does include its own income measurement this is only available as before tax income which was not considered to be an accurate representation of true income not only due to differing tax policies across provinces, but mainly due to Canada's progressive tax system. The SHS includes a total measurement for each broad expenditure category. For example, expenditures on prescription medications are included as part of the broad health care expenditure category. An income measurement was constructed by summing up all of broad expenditure categories,[11] minus a couple specific expenditures considered unnecessary due to the durability of these goods.[12]

We follow Alan et al. (2005) which made use of the SHS. Measuring income in this fashion was considered superior to before tax income as it implicitly takes into account both savings and taxes. An income variable was included as prescription medication is considered a normal good so utilization, and therefore expenditure, should increase with income.

[11] These expenditure categories include food, shelter, household operation, household furnishings and equipment, clothing, transportation, health care, personal care, recreation, reading materials, education and tobacco and alcohol.

[12] Expenditure on carpets and recreational vehicles were excluded due to their durability and high cost.

4.4 Descriptive Statistics

The analysis examines Saskatchewan as the treatment group and uses all other provinces, excluding Nova Scotia, as the control group. Table 1 shows the prescription medication expenditure by year and pooled for Saskatchewan, the control group and the overall sample. All values are reported in Canadian dollars with the standard errors in brackets underneath. Column one indicates the group and column two indicates the variable. For the control group, prescription medication expenditure is relatively constant over the sample period ranging between $455 and $529. Income for the control group increases from $26,150 in 2005 to $27,877 in 2006 and then remains relatively constant in the remaining years until a decrease in 2009 to $25,969. For the treatment group there are more obvious trends with prescription medication expenditure decreasing over 2006 through 2008 from $1,096 to $691 before rising again in 2009 to $898. Income remains relatively constant until 2008 where it trends upwards. This trend for prescription medication expenditure can be represented graphically as shown in 1. As can be seen in Table 1, the maximum value of prescription medication expenditure is high at $25,000. It should be noted that of the total sample size of 12,464, only 6 observations exceed $10,000 so these extremely high values are those households likely suffering from catastrophic prescription medication expenditures. The maximum household income is also high and only a small percentage, 66 observations, have a high household income exceeding $100,000. In 2008 the second policy change in Saskatchewan restricted access to the public drug plan to those with an individual net income below that of $64,404. It was found that 15 out of 227, or 6.6%, observations for Saskatchewan in 2009 exceeded this limit. While this is not small enough to be irrelevant it is unlikely it is the main driver behind the large prescription medication expenditure increase from 2008 to 2009 in Saskatchewan.

[Insert Table 1 here]

1 shows the trend in prescription drug expenditure for senior households between the years 2005 through 2009. Looking at this trend there appears to be other drivers behind changes in expenditure that are not included in the SHS. Following the policy changes observed in Saskatchewan in 2007 and 2008 we expected to see a decrease in expenditure in 2008 and an increase in 2009. While these are observed, there also appears to be a downward trend prior to the policy change.

Further investigation is required but it is known that one of the major drivers of changes in these expenditures is blockbuster drugs going off patent and new expensive patented medications entering the market. Differences between provincial formularies regarding what new patented drugs are included and how quickly generic drugs are added when a patent expires may account for some this.

[Insert Figure 1 here]

[Insert Table 2 here]

[Insert Table 3 here]

In Tables 2 and 3, the characteristics for the treatment and control group are shown year by year as well as the pooled average over the sample period. The values indicate the percentage of the sample that falls under the specified characteristic. For the control group there does not appear to be any consistent trends in the demographics as all remain fairly constant over the sample period. For the treatment group, however, there appears to be a downward trend for the households in rural areas. Unfortunately, it is hard to determine if this is the case as there are a large shifts in some variables that were expected to remain relatively constant. This is thought to be due to limitations of the data which has a limited number of observations for each individual province. The sample size for each year for the treatment group is approximately 200–300 observations and so it may be that these swings are due to sample variation. When comparing the treatment to the control group there are a few significant differences. The most notable of which is the larger proportion of the population residing in rural area for the treatment group compared to the control group. The control group also, on average, has a more educated population. While these differences may help explain why prescription medication expenditure is higher in the treatment group compared to the control group, by controlling for these characteristics they should not affect the analysis of the policy impact on changes in expenditure.

4.5 Group Analysis

This paper goes beyond the basic regression by looking at different segments of the prescription medication expenditure distribution as well as different groups to see if heterogeneous effects exist between them. The groups were identified as those for which the policy may have a different impact on one compared to the other. Table 4 lists the group breakdown and shows the difference in expenditure between the two to see how they generally may differ. This comparison will be done by running two separate regressions where the sample is narrowed to each subgroup and will then compare the impact of the policy on expenditure between the groups.

Expenditure Distribution

The main part of this analysis into the heterogeneous effects of the policy between groups will be the examination of different segments of the distribution of prescription drug expenditure. This was done by breaking down the distribution of expenditure into five equal parts, or quintiles, with the first quintile representing the bottom 20% of expenditure and the fifth the top 20%. This was done separately for each province as the distribution varies with each. The thinking behind this assumes that those in the higher end of the distribution would experience a larger impact from the co-payment cap than those at the lower end.

Subgroups

Table 4 presents a breakdown of the average prescription medication expenditure for each subgroup in the overall sample, Saskatchewan and the control group. The values are reported in Canadian dollars with the standard errors in brackets.

[Insert Table 4 here]

Income

The income subgroup was created by separating income into quartiles. Those in the lowest 25% were defined as households with low income. Table 4 presents a breakdown of each subgroup which shows that prescription medication expenditure appears to behave as a normal good with

expenditure being higher for the high-income group. In this case, it is thought the policy may affect these groups differently as high income households are less likely to face financial barriers and therefore the co-payment cap should decrease expenditure. For low-income households there may be financial barriers preventing them from purchasing the desired level of prescription medications. In this case, the expected expenditure decrease may not be as significant as substitution effects cancel out income effects as the lower costs increase utilization for this group.

Education

The education subgroup was separated into two groups with the lower education group having a no high school or high school diploma and the higher education group having any post-secondary degree. As discussed earlier, there may be differences between the two groups due to access to resources and better general knowledge for those with higher education.

Age

Age was separated into those between 65–74 and those above the age of 75. As previously described, health problems and costs continue to rise for each age group. This makes age group a good indicator of health status. Given this, it is more likely that the 75 and older age group face financial barriers due to higher prescription medication expenditure. They are also more likely to have a higher demand and willingness to pay for prescription drugs. Thus, they may react differently to the policy change than the 65–74 age group.

Urban Area

Here the urban area was used to compare the policy effect to those in rural areas. For this analysis it will be necessary to exclude those observations where the urban area is unknown making the sample slightly smaller than for any of the previous regressions. As noted, the more difficult access to physicians and pharmacies in rural areas may have an impact on household response to the policy change.

4.6 Alternative Analysis

An alternative analysis was conducted which replaces the dependent variable measuring prescription drug expenditure with a dummy variable which represents positive drug expenditure. The purpose of this analysis is to examine the impact of the two policies on consumer behaviour by looking at households which have changed from no expenditure to positive expenditure or vice versa.

5 Results

5.1 Results - Expenditure Amount

Table 5 presents the regression results for the initial analysis which used the GLM model to estimate the impact of the policy changes on the full sample of senior households. The analysis used three different model specifications in which control variables were introduced in steps. This was done to see how the introduction of the control variables changed the effects of the policy variables in order to examine the stability of the estimates. The regression results are reported as the marginal effects at the mean for easier interpretation. Column one lists the variable and columns two, three and four list the coefficients for the three models. As seen in Table 5, the introduction of control variables for models 2 and 3 do not cause a change in the sign or significance of the explanatory variables indicating stable estimates. The following analysis and discussion will focus on model 3 which reports the AIC closest to zero indicating it has the most explanatory power. The two main coefficients of interest are those for the post-policy interaction variables. For the 2007 policy change the coefficient implies that the introduction of this policy caused approximately a $182 decrease in the mean prescription drug expenditure for senior households in Saskatchewan. The variable was found to be statistically significant at the 1% level. The variable measuring the effect of the 2008 policy change also had a negative relationship with expenditure significant at the 1% level which showed an $82 decrease in the mean expenditure for senior households in Saskatchewan. The control variables were all statistically significant except for gender. There were no surprises in the relationships between the dependent variable and the control variables and so the analysis and discussion will focus on the main test variables.

[Insert Table 5 here]

Table 6 presents the original regression results as well as those for each quintile of prescription drug expenditure. The control variables used in model 3 for Table 5 were included but only the estimates for the variables of interest are reported (see Appendix Appendix 2 for the full results). When the sample was narrowed to the quintiles of expenditure it became clear households in the top 20% of expenditure were driving the overall results of a reduction in expenditure. For this group, the 2007 policy variable remained statistically significant at the 1% level, indicating the policy decreased the mean prescription medication expenditure by $321. Similarly, the magnitude of the 2008 policy variable for this quintile is also larger than for the original regression, but is no longer statistically significant. For all other quintiles the results were either small or not statistically significant, i.e., too close to zero to be measurable at a statistically significant level.

[Insert Table 6 here]

Table 7 presents the regression results reported as marginal effects for the various subgroups identified in the data section. The control variables used in model 3 for Table 5 were included but only the estimates for the variables of interest are reported (see Appendix Appendix 3 and Appendix 4 for the full results). The results show that for the majority of subgroups there are no changes in the sign or significance level of the main test variables. There are a few exceptions however as the 2008 post-policy variable was no longer statistically significant for rural, low education or age group of 75 and older. Also of note is the large difference in magnitude between the low and high-income groups for the 2007 policy change with the impact for low income being approximately 10% of that for high income.

[Insert Table 7 here]

5.2 Results - Expenditure Change

5.3 Robustness Checks

In order to help support the validity of the above results a number of robustness checks were performed to examine estimate stability. These checks were performed in addition to the three model

specifications reported in Table 5. For the entire sample, approximately 18% of senior households had zero prescription medication expenditure. Due to the policy being unable to reduce expenditure below zero it was thought these households could skew results for the lower quintiles. In order to check this assumption the sample was narrowed to only households with positive expenditure where it was once again broken down by expenditure distribution into quintiles. The results were similar to those reported in Table 6 indicating the zero expenditure households were not having a large impact on the results (see Appendix Appendix 5 for the results).

Another robustness check included testing the results with different provinces specified as the control group. This check was needed given the much larger household sample from the more populated provinces of Ontario and Quebec, which may not be as comparable to Saskatchewan as the other smaller provinces. The new control group was specified as Alberta and Manitoba. The results increased in magnitude but not enough to draw any definitive conclusions and there was no change in sign or statistical significance indicating that the original control group was not having an unintended impact on the results (see Appendix Appendix 6 for the results).

5.4 Discussion

For the 2007 policy change, which saw the introduction of the co-payment cap, the results for the original regression reported in Table 5 are in line with the predictions and the trend seen in Figure 1. This indicates that the co-payment cap was set low enough to have a significant impact on out-of-pocket expenditures for senior households, with the full sample seeing nearly a 20% decrease in the mean household expenditure in the year following the policy change. This would imply that a substantial portion of prescription medications exceeded 15$ per prescription. What was unexpected was the continued decrease in expenditure that occurred in 2009 captured by the 2008 policy variable for Saskatchewan. This decrease is a lower magnitude and one reason for this could be a continued affect from the 2007 policy change. This would occur if some households are slow to change their prescriptions over to medications included on the Saskatchewan drug formulary. Given that only approximately 5% of the sample fell into the income range that was excluded by the 2008 policy change, this is a plausible scenario. Another more interesting possibility to explain the continued decrease is a change in consumer behaviour caused by anticipation of a price increase for the high-income households. If these households, or their physicians, had advanced knowledge

of the upcoming policy change it is possible they increased their demand for prescription drugs in anticipation of the price increase. This would be in line with the established economic theory in regards to inter-temporal budget constraints. If it is assumed these households anticipate the price drop and prefer consumption in period two, or to smooth out consumption between periods, they would shift their demand to the current period. This would not only result in a decrease in expenditure for these households following the 2008 policy change, but also an increase before the change meaning the results for 2007 policy change would be underestimating the magnitude of the effect.

When we examine different segments of the distribution for prescription drug expenditure it was clear that households in the top 20% of expenditure were driving the results. The reason for this is likely due to the fact that they are filling more prescriptions and therefore more likely benefiting from the $15 cap on their purchases. It is interesting to note that none of the other segments of the distribution show effects close to the original regression. A couple of results for these segments are statistically significant with small magnitudes which suggests for each of these there may be an impact but it would be close to zero and, due to the small sample size, it cannot be measured accurately. There could be a number of reasons for these results regarding the lower expenditure segments. For one, it is possible these groups are more likely to be purchasing less expensive medications and therefore receiving less benefit from the 15$ co-payment cap. If this is the case it would indicate that high cost prescription medications are a larger factor in driving high expenditure than the quantity of prescriptions. Another possibility would assume these segments are more price sensitive and are increasing their quantity purchased following the price drop resulting in an income and substitution effect off-setting one another.

For the breakdown into socio-economic, income and age groups, generally there were no heterogeneous effects large enough to draw any solid conclusions. The most noteworthy difference was between the low and high-income groups which saw a large difference in the magnitude of the decrease following the 2007 policy change. This is not surprising as those in the high-income group are more likely to fall into the higher end of expenditure distribution resulting in a larger impact. Furthermore, low-income households are more likely to be budget constrained and face financial barriers making them more likely to increase quantity following the price drop. There is a similar difference in magnitude to a lesser extent between high and low-education groups but the reasoning

for this would be similar to that for income groups assuming low education are more likely to have low income and high education to have high income.

There were some data limitations that made accurate measurement of smaller changes difficult. This was a result of sample sizes being too small to measure changes closer to zero. The survey itself also had some limitations which prevented the examination of some of the possible causes for the decreases seen in the original regression, particularly for prescription medication where there is only information collected on the costs to the household and no information on the quantity of prescriptions which makes it impossible to investigate if indeed some households are increasing their quantity of prescriptions due to the price drop. Also, while the survey allowed for the control of some important characteristics, there is no measurement of the health status for individuals which prevents us from controlling for changes in the health of household members. Taking these limitations into account, the results clearly validate that the intent of Saskatchewan's policy change aimed at reducing out-of-pocket expenditures for seniors was successful. Specifically, the $15 cap reduced expenditure for those households at the higher end of the expenditure distribution. This is an encouraging result for policy makers as these households would be facing the largest financial burden. This implies that co-payment caps when set low enough can be an effective tool for relieving some of the financial burden for prescription medications faced by aging seniors.

6 Conclusion

Given policy changes to public drug plans are common and have important implications there has not been nearly as much empirical research examining these policy changes as might be expected. In recent years this is especially true in Canada where there has been relatively few papers examining specific policy changes impacting seniors. With the baby boomer generation beginning to retire one might think if anything this area would be a far more common research topic. This paper has built on previous literature by examining the policy changes in the province of Saskatchewan in 2007 and provides more recent evidence that effective use of co-payment policies can have an impact on the out-of-pocket expenditure for seniors. Generally the results are in line with previous literature which found decreases in co-payments can lead to a decrease in out-of-pocket expenditure. More specifically, evidence was offered that a reasonably low co-payment cap has a significant impact in reducing expenditures for senior households at the higher end of the expenditure distribution. This is an important result as those facing catastrophic drug costs would be among those most impacted. The findings also show that the policy change did not result in any significant change in expenditures for households at the middle to lower end of the expenditure distribution. This suggests the co-payment cap may not have significantly changed senior drug-purchasing behaviour for this group. These findings provide evidence to support health policy makers as they look for more cost-effective solutions to help ease the financial burden on the most vulnerable and fast-growing segment of the population.

Figure 1: Prescription Drug Expenditure for Seniors

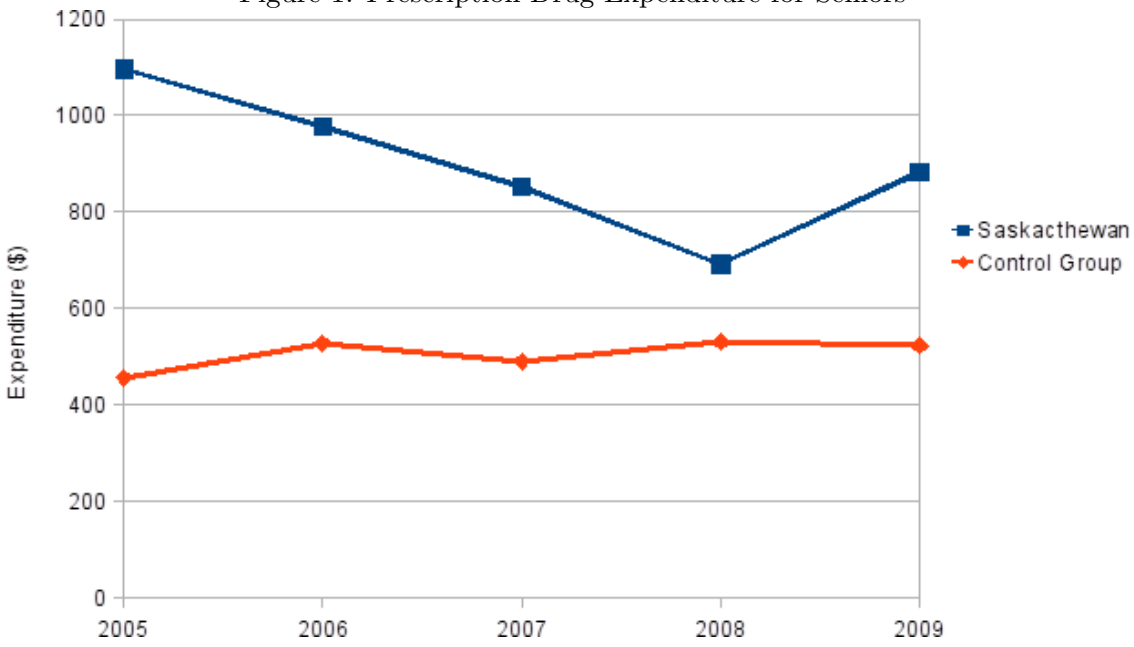

Table 1: Household Prescription Drug Expenditure and Income (in Canadian Dollars) for Saskatchewan and Control Group, by Year and Pooled

		Mean (Canadian $)					
Year		2005	2006	2007	2008	2009	Pooled
Saskatchewan	Prescription Expenditure	1,096 (1,744)	976 (1,177)	851 (1,042)	691 (764)	881 (1,002)	898 (1,194)
	Income	21,447 (11,071)	22,471 (11,742)	22,438 (10,696)	23,990 (11,871)	26,024 (12,678)	26,150 (11,729)
Control Group	Prescription Expenditure	455 (671)	527 (876)	489 (698)	529 (767)	522 (852)	505 (778)
	Income	26,150 (15,174)	27,877 (17,861)	28,881 (17,464)	29,151 (16,715)	28,740 (16,131)	25,969 (16,741)

		Mean	Minimum	Maximum
Overall	Prescription Expenditure	634 (945)	0	25,000
	Income	26,273 (15,396)	1,037	251,505

*Standard Errors are reported in brackets.

Table 2: Control Variables by Year and Pooled for Saskatchewan

Saskatchewan Characteristics (in percentages)

Year		2005	2006	2007	2008	2009	Pooled
	Male	41.5	46.2	44.1	40.7	47.4	44.0
	Married	44.3	38.2	44.8	44.5	45.3	43.4
	Rural	33.4	35.3	31.6	25.4	27.2	30.6
Age Group	65–69	20.7	25.9	21.5	25.2	27.4	24.2
	70–74	24.4	18.1	23.0	21.5	22.5	21.9
	75–79	21.7	20.3	17.9	20.2	20.5	20.1
	80–84	17.2	21.5	22.2	16.8	16.8	18.9
	85+	16.0	14.1	15.5	16.3	12.8	14.9
Education Level	No High School	52.5	54.4	58.9	51.9	44.1	52.3
	High School	21.3	16.6	17.7	18.5	20.3	18.9
	Postsecondary	26.1	29.1	22.9	29.6	35.6	28.7
Percentage of Total Sample		13.6	12.4	11.5	12.9	10.9	12.3

Table 3: Control Variables by Year and Pooled for Control Group

Control Group Characteristics (in percentages)

Year		2005	2006	2007	2008	2009	Pooled
	Male	46.5	47.8	49.0	48.5	48.2	48.1
	Married	47.4	47.7	49.4	45.6	47.4	47.5
	Rural	12.5	12.9	13.6	12.9	12.2	12.8
Age Group	65–69	27.3	30.8	28.3	29.8	32.6	29.8
	70–74	26.4	25.4	23.4	27.0	24.0	25.2
	75–79	20.8	20.2	21.5	19.5	19.0	20.2
	80–84	16.3	14.4	15.2	14.7	14.3	14.9
	85+	9.2	9.2	11.6	9.0	10.2	9.9
Education Level	No High School	44.6	41.4	45.4	42.6	43.2	43.5
	High School	24.7	24.7	23.1	22.4	22.8	23.1
	Postsecondary	34.0	34.0	31.2	35.0	33.9	33.4
Province	Newfoundland	10.1	10.2	10.9	11.2	11.2	10.7
	P.E.I.	5.4	5.2	5.3	6.4	6.7	5.7
	New Brunswick	9.0	10.7	11.5	11.7	11.0	10.7
	Quebec	13.8	13.6	14.0	14.7	15.0	14.1
	Ontario	13.5	15.6	14.3	13.7	16.0	14.6
	Manitoba	11.6	11.6	11.5	10.0	9.1	10.9
	Alberta	9.2	7.5	8.6	7.3	7.8	8.1
	British Columbia	13.8	13.2	12.3	12.1	12.4	12.8

Table 4: Mean Total Prescription Drug Expenditure (Canadian $) by Subgroups Used for Narrowed Samples

Subgroup	Saskatchewan	Control Group	Overall
Low Income	582	336	374
	(579)	(458)	(487)
High Income	1077	676	720
	(1411)	(975)	(1040)
Low Education	885	602	642
	(1041)	(888)	(917)
High Education	958	587	627
	(1414)	(893)	(969)
Age 65–74	912	580	615
	(1440)	(890)	(968)
Age 75	925	610	656
	(1031)	(891)	(919)
Rural	911	656	693
	(1109)	(891)	(930)
Urban	924	574	615
	(1279)	(890)	(950)

*Standard errors are reported in brackets

Table 5: GLM Regression Results for Full Sample

Variables	**Model 1**	**Model 2**	**Model 3**
Post Policy – 2007 * Saskatchewan	-208.383*** (27.805)	-180.954*** (33.408)	-182.188*** (35.462)
Post Policy – 2008 * Saskatchewan	-81.775*** (20.178)	-75.645*** (11.866)	-82.687*** (16.541)
Post Policy – 2007	19.378 (17.993)	24.186* (13.735)	28.234** (11.418)
Post Policy – 2008	4.995 (16.377)	18.123 (13.826)	21.020* (12.351)
Saskatchewan	340.967*** (45.260)	337.798*** (38.608)	326.235*** (40.538)
Income		0.005*** (0.002)	0.006*** (0.002)
Married		217.125*** (61.138)	231.305*** (67.299)
Rural		55.875 (34.279)	70.857** (29.758)
Male		-6.142 (18.932)	1.322 (17.138)
High School Diploma		-66.316*** (25.259)	-54.271*** (18.803)
Post-secondary Degree		-74.586* (45.207)	-57.712* (34.387)
Age 70–74			82.863** (37.682)
Age 75–79			113.781** (45.963)
Age 80–84			163.048** (74.891)
Age 85+			200.992** (78.454)
# Observations	12,464	12,464	12,464
AIC	14.412	14.309	14.290

- Standard errors are reported in brackets.

* represents statistical significance at the 10%.

** represents statistical significance at the 5%.

*** represents statistical significance at the 1%.

Table 6: Marginal Effects for Full Sample Compared to Expenditure Broken Into Quintiles

Variables	**Original Regression**	**0–20% Expenditure**	**20–40% Regression**	**40–60% Expenditure**	**60–80% Expenditure**	**80–100% Expenditure**
Post Policy – 2007	-182.188***	-4.174	1.640	-7.460	23.742	-321.345***
* Saskatchewan	(35.462)	(3.416)	(7.300)	(14.401)	(17.163)	(46.318)
Post Policy – 2008	-82.687***	2.943**	-7.720	-15.447**	17.978	-153.468
* Saskatchewan	(16.541)	(1.263)	(6.331)	(6.827)	(29.478)	(99.675)
# Observations	12 464	2597	2403	2461	2488	2515

- Standard errors are reported in brackets.

* represents statistical significance at the 10%.

** represents statistical significance at the 5%.

*** represents statistical significance at the 1%.

Table 7: Marginal Effects for Narrowed Samples by Subgroup

GLM Regression Results for Socio Economic, Age and Income Groups

	Urban Area Subgroup		**Education Subgroup**	
Variables	**Rural**	**Urban**	**Low Education**	**High Education**
Post Policy – 2007 * Saskatchewan	-162.555*** (36.013)	-190.364*** (40.545)	-127.542*** (32.555)	-213.879*** (36.601)
Post Policy – 2008 * Saskatchewan	7.862 (51.789)	-127.835*** (28.593)	-38.437 (29.850)	-127.062*** (20.433)
# Observations	3,068	9,396	5,695	6,769
	Income Subgroup		**Age Subgroup**	
Variables	**Low Income**	**High Income**	**Age 65–74**	**Age 75+**
Post Policy – 2007 * Saskatchewan	-27.480* (15.020)	-265.845*** (54.679)	-170.284*** (45.245)	-194.073*** (22.642)
Post Policy – 2008 * Saskatchewan	-57.512*** (20.855)	-104.627*** (27.218)	-154.641*** (53.310)	-30.870 (37.846)
# Observations	3,116	9,348	6,606	5,858

- Standard errors are reported in brackets with percentage increase over mean in square brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

References

Alan, S., Crossley, T. F., Grootendorst, P., & Veall, M. R. (2002). The effects of drug subsidies on out-of-pocket prescription drug expenditures by seniors: regional evidence from Canada. *Journal of Health Economics, 21*(5), 805–826.

Alan, S., Crossley, T. F., Grootendorst, P., & Veall, M. R. (2005). Distributional effects of 'general population' prescription drug programs in Canada. *Canadian Journal of Economics, 38*(1), 128–148.

Angrist, J. D., & Pischke, J. S. (2008). *Mostly harmless econometrics: An empiricist's companion.* Princeton University Press.

Canadian Institute of Health Information (2005–2009). *National Prescription Drug Utilization Information System Plan Information Document* (NPDUIS Database Series) `https://secure.cihi.ca/estore/productSeries.htm?pc=PCC294`

Canadian Institute of Health Information (2010). *Drug Use Among Seniors on Public Drug Programs in Canada, 2002 to 2009.* (NPDUIS Database)

Canadian Institute of Health Information (2012). *National Health Expenditure Trends, 1975 to 2012.* October 20, 2012.

Chandra, A., Gruber, J., & McKnight, R. (2010). Patient cost-sharing and hospitalization offsets in the elderly. *The American Economic Review, 100*(1), 193.

Cutler, D. M., & Zeckhauser, R. J. (2000). The anatomy of health insurance. *Handbook of Health Economics, 1*, 563–643.

Daw, J. R., & Morgan, S. G. (2012). Stitching the gaps in the Canadian public drug coverage patchwork? A review of provincial pharmacare policy changes from 2000 to 2010, *Health Policy 104*(1), 19–26.

Fassbender, K., & Pickard, S. A. (2000). *A Policy Impact Analysis of Pharmaceutical Cost Containment Strategies in Alberta.* Institute of Health Economics, Edmonton, AB, Canada.

Grootendorst, P., & Levine, M. A. (2002). *Do Drug Plans Matter?: Effects of Drug Plan Eligibility on Drug Use Among the Elderly, Social Assistance Recipients and the General Population.* Research Institute for Quantitative Studies in Economics and Population, McMaster University.

Keeler, E. B. (1992). *Effects of cost sharing on use of medical services and health.* Retrieved from RAND Health website: `http://www.rand.org/content/dam/rand/pubs/reprints/2005/RP1114.pdf`

Li, X., Guh, D., Lacaille, D., Esdaile, J., & Anis, A. H. (2007). The impact of cost sharing of prescription drug expenditures on health care utilization by the elderly: Own- and cross-price elasticities. *Health Policy, 82*, 300–347. doi:10.1016/j.healthpol.2006.11.002

McCullagh, P., & Nelder, J. A. (1989). *Generalized linear models* (Monographs on statistics and applied probability 37). Chapman Hall, London.

McLeod, L., Bereza, B. G., Shim, M., & Grootendorst, P. (2011) Financial burden of household out-of-pocket expenditures for prescription drugs: Cross-sectional analysis based on national survey data. *Open Medicine, 5*(1), e1.

McPherson, M., Ji, H., Hunt, J., Ranger, R., & Gula, C. (2012). Medication Use among Canadian Seniors. *Healthcare Quarterly, 15*(4), 15–18.

Multack, M. (2012). *The Medicare Program: A Brief Overview*. Retrieved from AARP Public Policy Institute website: `http://www.aarp.org/content/dam/aarp/research/public_policy_institute/health/medicareprogram-brief-overview-fs-AARP-ppi-health.pdf`

National Prescription Drug Utilization System (NPDUIS) (2010). *Baby-Boomer Effects on Prescription Expenditures and Claims*. Patented Medicine Prices Review Board (PMPRB), Ottawa, Ontario.

Pauly, M. V. (1968). The economics of moral hazard: comment. *The American Economic Review, 58*(3), 531–537.

Saskatchewan Institute of Public Policy (2007). *Health Care in Saskatchewan*. Houghton Boston, Saskatoon, Saskatchewan, Canada.

Skinner, B., & Rovere, M. (2011). *Canada's Medicare Bubble, Is Government Health Spending Sustainable without User-based Funding?* Fraser Institute.

Tamblyn, R., Laprise, R., Hanley, J. A., Abrahamowicz, M., Scott, S., Mayo, N., Hurley, J., Grad, R., Latimer, E., Perreault, R., McLeod, P., Huang, A., Larochelle, P., & Mallet, L. (2001). Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *The Journal of the American Medical Association, 285*(4), 421–429.

Verbrugge, L. M. (1983). Multiple roles and physical health of women and men. *Journal of Health and Social Behavior, 24*, 16–30.

Appendix 1

GLM Function Test Results

Family Function (Wald Test)			Link Function (Box-Cox Test)		
	Estimated value	**Standard error**		**Estimated value**	**Standard error**
θ	1.892	0.139	Δ	0.147	0.006
				Chi-Squared Test	
				Null Hypothesis	P-Value
			Δ	$= 0$	0.000
			Δ	$= 1$	0.000

*θ near 2 indicates a gamma distribution is best fit for family function.
*Δ near 0 indicates log functional form best fit for link function.

Appendix 2

	GLM Regression Results for Narrowed Samples					
Variables	**Original Regression**	**0–20% Expenditure**	**20–40% Regression**	**40–60% Expenditure**	**60–80% Expenditure**	**80–100% Expenditure**
Post Policy – 2007 * Saskatchewan	-182.188*** (35.462)	-4.174 (3.416)	1.640 (7.300)	-7.460 (14.401)	23.742 (17.163)	-321.345*** (46.318)
Post Policy – 2008 * Saskatchewan	-82.687*** (16.541)	2.943** (1.263)	-7.720 (6.331)	-15.447** (6.827)	17.978 (29.478)	-153.468 (99.675)
Post Policy – 2007	28.234** (11.418)	1.623 (1.204)	-4.129 (8.158)	12.464 (10.978)	-49.014*** (11.768)	31.609 (36.467)
Post Policy – 2008	21.020* (12.351)	0.587 (0.579)	-2.273 (3.360)	21.756*** (8.076)	-3.960 (25.755)	33.389 (95.402)
Saskatchewan	326.235*** (40.538)	8.538*** (1.444)	96.481*** (18.460)	197.917*** (36.107)	333.296*** (56.346)	801.496*** (113.883)
Income	0.006*** (0.002)	-0.000 (0.000)	-0.001** (0.000)	-0.001** (0.001)	-0.002* (0.001)	0.008*** (0.003)
Married	231.305*** (67.299)	1.158 (1.619)	7.857** (3.834)	-26.129* (15.281)	-17.386 (15.918)	35.853 (26.673)
Rural	70.857** (29.758)	4.112 (2.586)	16.170 (16.890)	26.344* (15.953)	61.788* (32.595)	170.849* (90.892)
Male	1.322 (17.138)	-0.755 (1.423)	8.067** (3.500)	30.232*** (9.675)	21.188 (16.284)	31.171 (35.180)
High School Diploma	-54.271*** (18.803)	-0.020 (0.614)	-9.508 (7.701)	-49.551** (20.039)	-56.186*** (16.754)	-48.972 (70.531)
Post-secondary Degree	-57.712* (34.387)	0.896 (1.059)	6.642 (14.181)	-25.077** (11.291)	-97.490*** (33.398)	-122.110*** (44.173)
Age 70–74	82.863** (37.682)	3.278 (3.145)	-3.738 (8.384)	20.944* (12.528)	13.454 (13.230)	49.326 (73.905)
Age 75–79	113.781** (45.963)	0.037 (1.267)	-4.542 (8.563)	-1.946 (13.594)	12.723 (10.294)	253.171*** (64.485)
Age 80–84	163.048** (74.891)	-3.959 (2.828)	-19.155 (11.938)	-6.183 (8.509)	-34.887 (29.749)	178.864** (89.345)
Age 85+	200.992** (78.454)	-0.943 (1.156)	-9.122* (5.477)	-3.360 (12.744)	-27.594 (17.374)	338.775*** (106.506)
# Observations	12 464	2597	2403	2461	2488	2515

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 3

GLM Regression Results for Narrowed Samples

	Income Subgroup		Age Subgroup	
Variables	**Low Income**	**High Income**	**Age 65–74**	**Age 75+**
Post Policy – 2007 * Saskatchewan	-27.480* (15.020)	-265.845*** (54.679)	-170.284*** (45.245)	-194.073*** (22.642)
Post Policy – 2008 * Saskatchewan	-57.512*** (20.855)	-104.627*** (27.218)	-154.641*** (53.310)	-30.870 (37.846)
Post Policy – 2007	-11.456 (23.382)	35.210*** (9.934)	22.673** (11.561)	29.261 (36.650)
Post Policy – 2008	42.051*** (12.739)	0.730 (20.895)	5.318 (24.501)	45.750 (30.506)
Saskatchewan	177.466*** (29.285)	391.165*** (39.111)	327.197*** (23.968)	342.543*** (57.572)
Income	0.019*** (0.007)	0.004*** (0.001)	0.004*** (0.001)	0.011*** (0.003)
Married	89.749*** (20.352)	229.275*** (77.651)	208.527*** (74.793)	265.693*** (61.423)
Rural	100.051*** (19.928)	63.637* (33.660)	72.910*** (19.962)	72.675* (43.959)
Male	-11.356 (19.352)	2.157 (26.212)	18.416 (14.406)	-42.942 (26.749)
High School Diploma	-49.404*** (10.933)	-77.293*** (27.949)	-50.401*** (11.144)	-64.213** (32.562)
Post-secondary Degree	-24.333 (30.003)	-85.570** (38.359)	-48.859* (25.304)	-88.822* (53.952)
Age 70–74	71.408 (58.416)	80.220** (37.072)	75.837** (37.354)	
Age 75–79	78.137 (50.864)	121.645** (54.910)		
Age 80–84	112.996* (67.389)	177.642** (76.434)		64.414** (32.234)
Age 85+	142.749** (60.986)	236.595*** (82.629)		105.286*** (36.067)
# Observations	3116	9348	6606	5858

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 4

GLM Regression Results for Narrowed Samples

	Urban Area Subgroup		Education Subgroup	
Variables	**Rural**	**Urban**	**Low Education**	**High Education**
Post Policy – 2007 * Saskatchewan	-162.555*** (36.013)	-190.364*** (40.545)	-127.542*** (32.555)	-213.879*** (36.601)
Post Policy – 2008 * Saskatchewan	7.862 (51.789)	-127.835*** (28.593)	-38.437 (29.850)	-127.062*** (20.433)
Post Policy – 2007	-51.058 (34.310)	36.791*** (9.415)	11.727 (25.064)	33.603* (17.781)
Post Policy – 2008	14.133 (43.803)	22.261 (13.727)	17.509 (26.278)	21.843 (25.170)
Saskatchewan	250.555*** (62.569)	358.554*** (34.132)	277.557*** (51.699)	377.049*** (31.178)
Income	0.003 (0.005)	0.006*** (0.002)	0.011*** (0.004)	0.004*** (0.001)
Married	352.096*** (89.406)	210.627*** (66.186)	240.188*** (79.255)	213.426*** (63.115)
Rural			101.490*** (38.538)	41.798 (27.734)
Male	-48.469 (42.491)	10.036 (16.113)	-14.651 (28.563)	7.360 (22.703)
High School Diploma	-73.297* (42.176)	-50.996* (27.576)		
Post-secondary Degree	-109.873** (51.621)	-50.664 (37.593)		
Age 70–74	99.202 (88.323)	82.280** (32.566)	134.815** (53.713)	43.107 (46.209)
Age 75–79	136.631 (95.706)	111.049*** (42.750)	135.252** (62.858)	109.694** (50.615)
Age 80–84	150.649 (103.804)	165.283** (74.508)	230.406** (107.486)	102.602* (59.037)
Age 85+	66.567 (106.447)	210.807** (82.150)	224.578* (115.157)	201.011*** (57.171)
# Observations	3068	9396	5695	6769

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 5

GLM Regression Results for Narrowed Samples

Variables	Original Regression	0–20% Expenditure	20–40% Regression	40–60% Expenditure	60–80% Expenditure	80–100% Expenditure
Post Policy – 2007 * Saskatchewan	-206.632*** (44.176)	6.691* (3.448)	19.952*** (6.812)	44.573*** (11.996)	-29.951* (18.150)	-358.468*** (74.333)
Post Policy – 2008 * Saskatchewan	-130.224*** (27.455)	5.853*** (1.926)	-7.169 (5.313)	24.582** (10.839)	2.872 (8.283)	-142.590 (90.158)
Post Policy – 2007	12.236 (9.091)	5.809** (2.621)	-18.628*** (6.001)	-15.539 (13.215)	40.673** (19.403)	94.669** (37.574)
Post Policy – 2008	23.772 (17.689)	-3.831** (1.527)	10.928* (5.917)	-7.926 (8.163)	36.687*** (12.354)	71.384 (91.559)
Saskatchewan	372.538*** (49.358)	43.647*** (15.484)	125.016*** (36.832)	207.915*** (47.698)	360.912*** (65.539)	799.083*** (101.133)
Income	0.007*** (0.002)	-0.000 (0.000)	-0.001** (0.000)	-0.001* (0.001)	-0.002 (0.001)	0.008** (0.003)
Married	219.470*** (59.603)	-4.849 (5.244)	-23.822** (11.194)	-14.851* (8.298)	-41.025 (25.224)	66.389 (45.349)
Rural	46.096* (24.044)	14.671* (7.802)	9.388 (10.458)	14.772 (29.455)	64.019 (49.034)	158.426* (85.304)
Male	21.900 (15.364)	12.769* (7.359)	15.282*** (4.415)	10.294 (12.377)	27.959*** (10.402)	-27.386 (32.487)
High School Diploma	-75.058*** (21.873)	9.182** (3.937)	-32.875*** (10.999)	-42.226** (17.291)	-61.887*** (22.882)	-44.013 (80.736)
Post-secondary Degree	-83.932** (34.853)	8.700 (5.523)	-8.071 (9.372)	-46.921*** (16.435)	-78.213*** (27.746)	-117.316** (46.191)
Age 70–74	56.292** (23.747)	-13.793** (6.115)	9.383** (3.659)	0.782 (8.043)	-9.059 (16.277)	100.801 (65.475)
Age 75–79	102.805*** (31.754)	-4.552 (5.917)	-10.832 (8.848)	3.062 (4.254)	-6.487 (8.918)	310.949*** (75.994)
Age 80–84	139.047** (63.531)	-3.368 (3.588)	-20.927 (16.429)	-28.918* (15.818)	-8.924 (31.468)	255.041*** (83.105)
Age 85+	189.589*** (64.085)	-14.410 (12.861)	-20.882* (12.427)	-3.249 (8.808)	-32.101 (25.015)	500.300*** (124.324)
# Observations	10453	2113	2073	2087	2071	2109

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 6

Variables	Model 1	Model 2	Model 3
Post Policy – 2007 * Saskatchewan	-215.384*** (50.784)	-165.734*** (46.742)	-165.079*** (43.126)
Post Policy – 2008 * Saskatchewan	-229.288*** (60.536)	-162.128** (75.929)	-178.667** (83.442)
Post Policy – 2007	-35.829* (20.142)	-50.969*** (17.722)	-41.860** (18.624)
Post Policy – 2008	127.239*** (48.088)	85.832 (63.716)	96.842 (67.583)
Saskatchewan	317.637*** (54.207)	312.720*** (53.862)	305.567*** (52.975)
Income		0.012*** (0.001)	0.013*** (0.002)
Married		205.334*** (74.587)	209.932*** (80.925)
Rural		-13.657 (20.762)	0.836 (21.143)
Male		-63.883** (28.291)	-52.337* (28.645)
High School Diploma		-116.370** (45.746)	-93.939** (47.719)
Post-secondary Degree		-109.593*** (28.417)	-82.252** (37.737)
Age 70–74			110.658 (88.736)
Age 75–79			155.465* (88.943)
Age 80–84			229.390** (91.426)
Age 85+			168.229* (87.930)
# Observations	12 464	12 464	12 464
AIC	14.412	14.309	14.290

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 7

Variables	Model 1	Model 2	Model 3
Post Policy – 2007 * Saskatchewan	-0.034 (0.023)	-0.036* (0.021)	-0.035 (0.022)
Post Policy – 2008 * Saskatchewan	0.045*** (0.012)	0.044*** (0.012)	0.044*** (0.011)
Post Policy – 2007	0.025 (0.023)	0.028 (0.023)	0.029 (0.023)
Post Policy – 2008	-0.002 (0.012)	-0.001 (0.012)	0.002 (0.011)
Saskatchewan	0.061* (0.034)	0.058* (0.032)	0.053 (0.034)
Income		0.000** (0.000)	0.000*** (0.000)
Married		0.100*** (0.005)	0.106*** (0.005)
Rural		0.053* (0.031)	0.059** (0.029)
Male		-0.035*** (0.007)	-0.032*** (0.008)
High School Diploma		0.002 (0.006)	0.007 (0.006)
Post-secondary Degree		0.004 (0.016)	0.011 (0.014)
Age 70–74			0.063*** (0.021)
Age 75–79			0.060*** (0.023)
Age 80–84			0.089*** (0.019)
Age 85+			0.085*** (0.021)
# Observations	12 464	12 464	12 464
AIC	14.412	14.309	14.290

- Standard errors are reported in brackets.
* represents statistical significance at the 10%.
** represents statistical significance at the 5%.
*** represents statistical significance at the 1%.

Appendix 8

GLM Regression Results for Narrowed Samples

	Income Subgroup		Age Subgroup	
Variables	**Low Income**	**High Income**	**Age 65–74**	**Age 75+**
Post Policy – 2007 * Saskatchewan	-0.010 (0.074)	-0.052*** (0.015)	-0.061** (0.026)	-0.009 (0.015)
Post Policy – 2008 * Saskatchewan	0.078*** (0.008)	0.036*** (0.012)	0.049*** (0.016)	0.039*** (0.011)
Post Policy – 2007	0.048 (0.080)	0.022 (0.016)	0.024 (0.028)	0.033* (0.017)
Post Policy – 2008	0.015** (0.007)	-0.006 (0.011)	-0.008 (0.016)	0.016 (0.013)
Saskatchewan	0.066 (0.046)	0.051* (0.027)	0.054* (0.030)	0.055 (0.039)
Income	0.000*** (0.000)	-0.000 (0.000)	0.000** (0.000)	0.000*** (0.000)
Married	0.082* (0.042)	0.081*** (0.011)	0.099*** (0.015)	0.121*** (0.013)
Rural	0.145** (0.066)	0.037 (0.023)	0.063*** (0.021)	0.054 (0.042)
Male	-0.073*** (0.017)	-0.022** (0.010)	-0.015 (0.010)	-0.063*** (0.015)
High School Diploma	0.014 (0.021)	-0.006 (0.010)	-0.001 (0.011)	0.015 (0.012)
Post-secondary Degree	0.006 (0.031)	0.000 (0.015)	0.025* (0.015)	-0.012 (0.024)
Age 70–74	0.106*** (0.040)	0.052*** (0.017)	0.064*** (0.022)	
Age 75–79	0.101*** (0.038)	0.047* (0.025)		
Age 80–84	0.121*** (0.039)	0.083*** (0.014)		0.032*** (0.011)
Age 85+	0.170*** (0.023)	0.060** (0.025)		0.029* (0.017)
# Observations	3116	9348	6606	5858

- Standard errors are reported in brackets with percentage increase over mean in square brackets.
* represents statistical significance to the 90%.
** represents statistical significance to the 95%.
*** represents statistical significance to the 99%.

Appendix 9

GLM Regression Results for Narrowed Samples

	Urban Area Subgroup		Education Subgroup	
Variables	**Rural**	**Urban**	**Low Education**	**High Education**
Post Policy – 2007 * Saskatchewan	0.026 (0.044)	-0.069*** (0.023)	-0.036 (0.033)	-0.036** (0.017)
Post Policy – 2008 * Saskatchewan	0.066 (0.041)	0.027** (0.013)	0.014** (0.007)	0.061*** (0.012)
Post Policy – 2007	0.036 (0.046)	0.028 (0.023)	0.035 (0.036)	0.022 (0.018)
Post Policy – 2008	0.001 (0.037)	0.003 (0.011)	0.010 (0.010)	-0.004 (0.012)
Saskatchewan	-0.022 (0.015)	0.089** (0.041)	0.048 (0.043)	0.062** (0.027)
Income	-0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Married	0.137*** (0.020)	0.101*** (0.007)	0.117*** (0.020)	0.091*** (0.010)
Rural			0.061* (0.033)	0.055** (0.027)
Male	-0.023 (0.027)	-0.034** (0.013)	-0.030 (0.021)	-0.034*** (0.012)
High School Diploma	0.048** (0.021)	0.003 (0.006)		
Post-secondary Degree	0.001 (0.020)	0.013 (0.014)		
Age 70–74	0.046 (0.047)	0.067*** (0.018)	0.119*** (0.026)	0.026 (0.024)
Age 75–79	0.047* (0.027)	0.063*** (0.024)	0.102*** (0.031)	0.037 (0.025)
Age 80–84	0.085*** (0.025)	0.090*** (0.021)	0.126*** (0.040)	0.068*** (0.016)
Age 85+	0.017 (0.084)	0.095*** (0.016)	0.130*** (0.047)	0.061*** (0.012)
# Observations	3068	9396	5695	6769

- Standard errors are reported in brackets with percentage increase over mean in square brackets.
* represents statistical significance to the 90%.
** represents statistical significance to the 95%.
*** represents statistical significance to the 99%.