The Impact of Aging and Provincial Health Policy on Household Prescription Expenditures in Canada

by
Craig Galbraith

A master's essay submitted to the Department of Economics in partial fulfillment with the requirements for the degree of Master of Arts.

Queen's University
Kingston, Ontario, Canada
August, 2008

Abstract

Prescription drug costs represent the fastest growing sub-sector of medical expenditures in Canada. This essay focuses on the extent to which rising prescription drug costs can be attributed to population aging. Consideration for differences in provincial prescription drug policies is taken into account while examining results between the provinces. The results indicate that significant heterogeneity exists between provinces with similar age structures in terms of the relationship between age and household prescription expenditures. The results reveal public and private prescription drug policies have a significant impact on an individual's and household's prescription drug expenditure.

Acknowledgements

I would like to thank my supervisor Chris Ferrall for his insights and guidance. I would like to thank Jeff Moon for his help in attaining data for the project. I would also like to thank Casey Warman’s Economics 882: Research Problems and Methodology course for providing practical insights into undertaking empirical research.

Table of Contents

List of Tables

Section 1: Tobit Model Marginal Effects

List of Figures

Appendix B: Figures

Section 1: Introduction

Currently, prescription drug expenditures in Canada comprise the second largest and fastest increasing category of health expenditures. Despite the national growth in health expenditures, the level of expenditure growth for households differs markedly between the provinces. This is due to the fact that outpatient prescription drug reimbursement policies, unlike hospital stays, are a provincial responsibility.[1] As a consequence, any attempt to analyze the causes of prescription expenditure growth in Canada requires an examination of each province separately. Within the literature, there are thought to be two primary factors driving the health expenditure increase. The first cause is the recent introduction of many new, costly drugs. The second factor is attributed to a greater proportion the population entering into the high cost, prescription expenditure age cohorts.[2] The focus of this paper will be on the latter issue.

Recent literature on the subject has focused on the relationship between age and medical expenditure, controlling for an individuals remaining life expectancy. Several studies document that when time to death is factored in, the impact of old age on medical expenditure is negated. That is, the cost of medical expenditures for a sixty-year-old individual is no more expensive than for a ninety-year-old. For my study, I will examine the same relationship between age and prescription drug expenditures, controlling for estimated remaining life expectancy.

Where my paper differs from previous work is with the incorporation of provincial health policies into the analysis. Heterogeneity in public policy is influential in explaining potential differences between provinces in terms of the relationship between prescription drug expenditure relative to an individuals age. To my knowledge, no prior study has attempted to assess the link between household prescription expenditure in Canada and age between provinces, controlling for differences in provincial policies. Results from this study could be beneficial towards implementing future provincial policy that effectively contains prescription drug costs, without making medically

[1] See Appendix for overview of current provincial public drug plans.

necessary treatments prohibitively expensive.

The remainder of the paper is organized as follows: Section 2 provides a literature review, Section 3 reviews the data set, Section 4 outlines the methodology, Section 5 discusses the results, Section 6 concludes.

Section 2: Literature Review

Section 2.1 Population Aging and Healthcare Expenditure

Recent economics literature analyzing the link between population aging and health care expenditure has focused on disentangling the relationship between proximity to death and age at death in determining per-capita health expenditure. The implications of failing to account for time to death can be viewed as an omitted variable problem, resulting in upward bias of the age variables. Bias is due to the fact that the age coefficient does not account for technology and social factors prolonging life today and in the future. As a consequence, future expenditures are overestimated for groups with greater longevity; with bias increasing over time if population longevity is rising.[3]

A seminal paper by Zweifel et al. (1999) found that among individuals aged sixty-five or older, health care expenditure (HCE) was independent of age provided proximity to death was adequately controlled for. For the study, the authors employed a Heckman sample selection model. In the first part of the model, a probit regression was run to examine the likelihood of positive quarterly cost observations. From the probit model, the inverse of the Mills ratio was calculated using maximum likelihood estimation. The second part of the model examined the level of health care costs conditional on being hospitalized. The regressors from the first step, along with the Mills ratio variable were included in the second step. The purpose of inclusion of the Mills ratio was to control for bias originating from excluding variables with zero cost. The dependent variable in the

---

[2] Most studies point to the age group of forty-five to sixty-five as having the highest prescription drug costs.
[3] See Norton and Stearns 2004.

second step was log transformed to account for skewness in the cost data. The data set contained United States health insurance records for the years 1981-1994 for individual health care costs five years before death.

Zweifel et al. (1999) results indicated that the terminal phase of life is costly irregardless of whether occurring at age sixty-five or ninety years of age. This result implies that expected changes in population composition due to declining fertility rates and increased life expectancy (for countries like Canada), are unlikely to drive future increases in per capita HCE. Rather, future HCE cost surges will be primarily driven by a greater proportion of the population nearing their terminal year of life, with the high cost of dying causing per capita HCE to rise with age.

Following Zweifel et al. (1999), several studies were published confirming the finding of age neutrality after controlling for time to death. O'neill et al. (2000) studied whether the hypothesis that per capita HCE is driven by individual proximity to death was generalizable to a range of General Practitioner services provided to nursing home patients in their last year of life. Their findings indicated that all elements of costs for care were cheaper among survivors than among patients who died within the course of study, supporting the results of Zweifel et al. (1999).

In addition, Kildemoes et al. (2006) estimated the impact of an aging Danish population on future yearly expenditure on out-of-hospital prescription drug use, controlling for proximity to death and holding drug expenditure by age, gender and survival constant. A secondary aim of the paper was to compare drug expenditures between survivors and decedents based on age. Their results suggested that future Danish drug expenditures would be driven by drug consumption of middle age and elderly individuals. Mean yearly drug expenditures for survivors increased with age until the age of eighty-five, slightly decreasing thereafter. Mean drug expenditure for the last year of life peaked at the age group of sixty to seventy years old. Both drug utilization and mean yearly drug expenditure were higher for decedents than survivors, but the difference narrowed as the age groups increased. As opposed to hospital expenditures, age-specific increases in expenditures on prescription drugs are less attributable to the cost of dying. The explanation put forth by the authors is that most out-of-hospital prescription drugs target more chronic conditions and have a more long-term treatment goal.

Felder et al. (2000), were also concerned with examining the demand for health services in the last months of life, but did so based on a life-cycle model which formalized the trade-off between utility of living and utility of consumption. The authors examined whether HCE in the last months of life increased with closeness to death, if HCE in last months of life for individuals sixty-five years and older differed from those sixty-four and younger, and whether HCE in the last months of life decreases with age for the age group sixty-five and older. In addition, Felder et al. (2000) compared willingness to pay of high and low-income individuals in the terminal months of life and whether supplementary health insurance resulted in higher HCE in the final months of life.

Their results revealed that closeness to death was the determining factor for HCE. Older individuals were found to have a higher cost of dying and in the subsample of individuals aged sixty-five and older, there was a significant drop in cost as age increased for end of life expenditures. Low-income households were found to spend less than high-income households and the degree of insurance coverage had a significant impact on HCE for the last two years of life. The latter finding is particularly important, as the authors suggest it hints at an alternative to rationing health care services based on patient age due to the high cost of dying. Implementation of a coinsurance rate increasing with age based on risk of death could provide a buffer against rising HCE.

Hoover et al. (2002) use United States Medicare and non-Medicare expenditure data between the years 1992-1996. The authors analyzed expenditures between the two groups according to service and by person's age. Expenditures were subdivided into the following categories: inpatient hospital, outpatient hospital, prescription drugs and home health care. End of life Medicare expenditures decline with age at death, while non-Medicare end of life expenditures have been shown to increase. Part of the difference was attributed to non-Medicare end-of-life expenditures directed towards management of chronic conditions preceding death. Costs for outpatient prescription drugs are less for the terminally ill than for the elderly. As the population ages, the authors contend average inflation adjusted end-of-life medical expenses will stay roughly the same, but the portion paid by non-Medicare sources treating chronic conditions will likely rise.

While the results put forth by Zweifel et al. (1999) have been largely validated in a number of studies mentioned above, the result of age neutrality in HCE, once proximity to death is controlled, has been challenged based on methodology issues. Salas and Raftery (2001) do not dispute the fact that dying patients generate disproportionately large HCE. However, they argue that because of problems of endogeneity of closeness to death and sample selectivity bias, the results with regards to age effects are questionable. One assumption Zweifel et al. (1999) made was that HCE in a particular quarter was independent of closeness to death in that quarter. Salas and Raftery (2001) believe this assumption is unrealistic, arguing this oversimplification leads to OLS estimates being biased and inconsistent. Zweifel et al. (1999) controlled for sample selectivity using a Heckit model. The procedure involved an initial probit for positive health care utilization to compute the variable for the hazard rate of the standard normal distribution, used in the second regression equation where the dependent variable was the log of HCE to measure sample selectivity. Salas and Raftery (2001) reveal that since the sample selectivity variable is an approximately linear function, there is the potential for multicollinearity between the age variables and the sample selectivity variable in the second part of the model. As a consequence, the age coefficients appear less significant and have opposite signs.

Seshamani and Gray (2004) also provided a critique of Zweifel et al. (1999). They addressed the methodological concerns by replicating the study using a panel data set from the Oxford Record Linkage Study. Demographic variables included patient date of birth, date at death, gender, marital status and cause of death, as well as detailed information of each hospital episode. The authors compared their findings of the effects of age and time to death on health-care costs relative to Zweifel et al. (1999) study. In addition to the issue of multicollinearity in the second step of the model mentioned previously, Seshamani and Gray (2004) also address issues with data treatment by Zweifel et al. (1999). They argue the sample selection model is only appropriate when the selection is not observed. This was not the case in Zweifel et al. (1999), where all zero cost observations were observed. Therefore, the Zweifel et al. (1999) model treats zero cost observations as missing data, implying their model provides information on potential rather than actual health expenditures. Seshamani and Gray (2004) propose a two-part model as a more optimal methodology based on the data. Finally, Seshamani and Gray (2004) point out Zweifel et al. (1999) did not account for correlation between cost observations for the same patient. They incorporated Huber-White standard errors to enable clustering by patient to provide more accurate standard errors.

Seshamani and Gray's (2004) two-part model included a regular probit in the first part of the model, which examined the likelihood of being in hospital in a particular quarter based on patient age, sex, time to death, cause of death and social class. The second part of the model examined cost level for the positive cost observations using variables from step one as well as: diagnosis, source of admission, place of discharge and marital status. The cost variable in the second part of the model underwent a log transformation due to the skewness of the cost variable. The general linear model was then fitted with a Poisson error distribution.

The results of Seshamani and Gray's (2004) replication of the Zweifel et al. (1999) study initially showed a non significant relationship between proximity to death and hospital costs, as well as between age and hospital costs. Once the methodological weaknesses were corrected for, time to death was a significant explanatory variable in terms of quarterly hospital costs, with particular significance in the last years of life. The relationship between hospital cost and age diverged from the results of Zweifel et al. (1999). In the last quarter of life, hospital costs rose significantly for individuals aged sixty-five to eighty-five for males and approached significance levels for females. This final result is in contrast to the principle finding of age neutrality of HCE for this age group in Zweifel et al. (1999).

Using the same data set as Seshamani and Gray (2004a), Seshamani and Gray (2004b) examine another issue with the Zweifel et al. (1999) study. They wanted to observe whether age-neutrality of expenditure holds further from death, where age-related chronic illnesses may play more of a factor. Interaction terms between age and proximity to death were also included in the model, to examine whether the effects of proximity to death on cost vary with patient age. Using the two-part model stated previously, Seshamani and Gray (2004b) calculated all probabilities and cost values for each year prior to death, holding all other covariates constant. Two separate models were run: one for patients one to five years from death, and one for patients six to ten years from death. Average costs one year from death were found to increase 37% for women and 30% for men from age sixty-five to eighty, but decreasing by 20% to 16% by age ninety-five for men and women respectfully. Concerning the interaction term between age and proximity to death, from six to two years prior to death, costs rose with age. Costs were found to rise gradually as death approached, with less of an increase at the end of life compared to the results of Zweifel et al. (2004).

Zweifel et al. (2004) responded to the criticisms of their original paper and corrected for methodological issues. First, a two-part model was employed along with a Heckman model to correct for multicollinearity. Second, the authors used a different data set that included deceased individuals and survivors, to test for the relative importance of time to death and age. Their results with the corrected model still largely supported their previous findings, reaffirming that proximity to death drives the relationship between the age and average HCE, reflecting the high costs of dying and the high mortality in old age. Based on these findings, Zweifel et al. (2007) then questioned if there findings were simply limited to acute care services or whether the results were applicable to all components of HCE. Components of HCE now included in the analysis were: ambulatory care, nursing home care, hospital inpatient and outpatient care, home care and prescription drugs. Using the same methodology from Zweifel et al. (2004), the results showed that age had a negligible effect on aggregate HCE for survivors and deceased, once proximity to death was controlled for. The one exception was acute care provided to long-term patients, regardless of survival.

Finally, another strand of the literature focuses on the age effect of HCE while controlling for health status. Dormont et al. (2006) use data with information including: HCE, insurance coverage, socio-economic characteristics and demographic characteristics. Their methodology makes it possible to separately identify changes due to morbidity compared to changes due to practices. A vector of chronic illnesses, allowing for changes in prevalence by age, measures morbidity. Their microsimulation captures changes in practices through changes in the coefficients measuring the influence of morbidity on health care use. This method incorporates changes in patient's preferences, physician's behavior, as well as the impact of technological progress. The author's incorporated a general two-part model discussed previously. Their results indicate a strong impact of morbidity on participation and conditional consumption. Several of the morbidity indicators had large, positive impacts on the use of health care services and pharmaceutical consumption was also strongly influenced by morbidity indicated.

Section 2.2 Population Aging and Healthcare Expenditure: A Canadian Context

Within the Canadian literature, research has examined the link between HCE and population aging, as well as the impact provincial policies have had on the cost and accessibility of prescription medications. McGrail et al. (2000) used British Columbia Linked Health Data to examine the relationship between age and proximity to death in explaining acute and long-term care expenditures for survivors and deceased aged sixty-five plus. Their findings indicate that the pattern for medical care shows costs for survivors rising with age, while costs for those deceased fall with age. Social and nursing costs, however, were shown to rise with age, with these costs increasing with closeness to death. Little difference was found in health care cost for those who died at age sixty-five versus aged seventy-five. The results generally support the finding that the growing costs of HCE from aging will be modest, with the rise of social care costs expected to comprise a larger part of the increase.

In a similar study examining all provinces, DiMatteo and Grootendorst (2002) identified age groups with independent explanatory power for per-capita spending in provincial drug benefit plans. Their findings indicated that the higher proportion of the population between forty-five and seventy-five years of age drove up health costs, while the age group seventy-five and older did not drive up per-capita expenditures. This study highlights the importance of Canadian provincial population structure in determining the strain that prescription expenditures have on households and provincial governments, regardless of the policies in place.

Aside from research solely examining HCE and aging, another branch of Canadian research has focused on comparing the cost and coverage of provincially funded drug programs.[4] Demers and Melo (2008) compare provincially funded drug reimbursement plans in terms of cost and coverage for prescription drugs for seniors, non-seniors and social assistance recipients. Prescription expenditure burden was based on annual household income, marital status and number of children. The authors found that despite every Canadian senior having some form of coverage from a provincial plan, the extent of coverage varied significantly.

Overall, the research by Demers and Melo indicated that coverage for seniors was the most comprehensive in New Brunswick and Prince Edward Island. Seniors in Ontario and Nova Scotia were offered somewhat comprehensive plans; reimbursement being proportional to prescription drug costs and inversely proportional to income level. Quebec seniors generally pay more for prescription drug coverage due to premiums excluding low-income individuals and those with high prescription burden. Saskatchewan, Manitoba and Newfoundland seniors only received coverage if they were considered low-income.

The issue of cost inequities between provinces highlighted in Demers and Melo et al. (2008) illustrates a difficult trade-off provincial drug plans are forced to wrestle with. By transferring more of the cost burden onto individuals, the provinces risk making costs so severe that individuals are unable to adhere to medical advice. In the long run, this could end up costing the province more money in other areas like increased and extended hospital stays, as well as longer duration and use of long-term care facilities. In fact, Angus and Karpetz (1998) argue that any provincial co-payment scheme for pharmaceutical drugs should be predicated on ensuring access and affordability of essential medications, and higher co-payment for those drugs deemed non-essential. Ideally, a provincial drug plan should provide incentives for treatment that help to take the pressure off of other publicly provided medical services.

[4] Provincial plans normally target seniors, as well as people with special needs. Examining private drug plans on a provincial scale would be extremely complicated, given the variation in coverage between employers.

Graham and Tabler (2005), attempt to quantify the strength and weaknesses of the provincial prescription drug policies. They attempted to measure the length of time for approval of new drugs into a provincial formulary,[5] as well as the breadth of coverage (partial of full-status), in terms of cost by provincial pharmacare plan. Graham and Tabler (2005) found significant provincial differences in the listing of new drugs. For instance, Saskatchewan and British Columbia favoured partially listing new drugs, while Alberta and Manitoba favour granting full status to new drugs. Provinces also differed in terms of time to listing of new drugs. Newfoundland performed well listing full-time, but poorly in partial listing time. British Columbia had fast partial access and moderate time for full access drug listings.

A major finding of the Graham and Tabler study was that high volume, low cost drugs were approved in substantially less time than high cost and low volume drugs. This implies that the medications that are truly unaffordable are largely unavailable. As mentioned previously, lack of coverage or delayed listing of medically necessary drugs has a detrimental impact on other areas of public medical expenditures.

An example of this scenario is Ontario, which performed very poorly in the Graham and Tabler study. The province has a fixed co-payment system per prescription filled that makes per-capita expenditure relatively inexpensive for the household.[6] However, the lack of incentives for Ontario public plan users to control consumption of current approved drugs, limits the ability of the plan to be able to afford listing important new drugs with high efficacy that would prevent catastrophic costs for some seniors. In contrast, Quebec has a more incentive based co-payment system that has allowed the provincial program to list more high cost drugs in their formulary. It is clear all provinces face a challenge moving forward in balancing cost effectiveness and access to prescription medications.

For my research, analysis will also be performed focusing on publicly funded provincial plans.

[5] Provincial formulary is the list of drugs that qualify for coverage as defined within a provinces drug plan. Formularies were created to help control drug expenditures by limiting the number of drugs available for coverage, particularly within a given therapeutic class.

Section 3: Data and Sample Issues

The data set utilized for this study is the Canadian Survey of Household Spending (SHS), for the years 1998 to 2004. The SHS is a cross-sectional data set tracking private expenditures across households, with provincial data solely utilized for the study.[7] SHS contains information on the direct costs to households for prescription pharmaceutical expenditures. In other words, SHS asked respondents to report only household medical expenditures that will not be reimbursed by a public or private drug plan. Additionally, SHS provides information regarding household expenditures on public and private health insurance. An umbrella measure of health insurance, which includes payments to both private and public health plans, was incorporated. The umbrella measure used was based on the SHS Guidelines, which note that the separate public and private health insurance variables suffer from inaccuracies due to the confusion of respondents in distinguishing between public and private health insurance payments.

For my study, analysis of the regression results by province will be based on the public provincial policies that were in place during the years under study. A limitation of my research is the inability to separate households and individuals with public and private insurance, due to the issue mentioned above.[8] The prescription expenditure and health insurance variables were also deflated using the CPI index for medical expenditures and the standard CPI measure respectively.

In addition to the medical expenditure information, relevant demographic information available from SHS includes information on age, gender, province, marital status, income and housing status for the reference person and spouse where applicable. The reference person in a cohabiting couple is defined as the individual primarily responsible for major financial payments made by the household. The interviewer chose the reference person arbitrarily in the event that both individuals estimated payments to be equal. Two of the most appropriate measures of socio-economics status available in SHS were housing status and income of the reference person and

---

[6] See Appendix for provincial policy overview.
[7] The Maritime Provinces were also excluded due to small sample issues.
[8] In most provinces, seniors receive coverage under the public health plans, if they do not have private coverage upon retirement.

spouse. Consideration was given to using housing status as a proxy measure of socio-economic status due to the fact that the income variables in SHS are censored from above. For instance, the income variables are rounded upwards to the nearest $1000, $10 000 or $100 000 depending on the income level. [9] However, the income variables were ultimately used in the analysis, primarily due to the fact that most provincial policies tie the level of coverage to income.[10] The reference and spouse income variables were deflated according to the standard CPI measure. A low-income dummy variable was then created by province for the reference person. The variable measured whether the individual or cohabiting couple would be eligible for more inexpensive coverage based on income for the relevant province in question.

While the SHS data set has relevant information for most necessary demographic characteristics, there is no direct measure of time to death found in other studies utilizing panel data tracking patients medical expenditures over a period of time. As mentioned in Section 2, failure to account for time to death will almost certainly result in an upward bias in estimating the effect of age on health care utilization and expenditure. While SHS does not provide information directly pertaining to potential chronic conditions of an individual in the sample, there is information available for yearly tobacco expenditure. To roughly estimate remaining life expectancy, a measure of remaining life expectancy by province was used in combination with the tobacco expenditure variable to create a proxy measure estimating remaining life expectancy.[11] A smoker was defined to be an individual with at least $100 expenditure on tobacco products per year. A recent Statistics Canada study found that the difference in life expectancy between smokers and non-smokers was approximately six years. Consequently, for those individuals deemed to be smokers, their remaining life expectancy variable was reduced by six years.

From the information mentioned above, the following changes were made to the SHS data set to reach the final sample. First, the Territories and the Maritimes were excluded to leave the six

[9] The income variable measures income of seniors as their pension received for the year, where applicable.
[10] Regressions were run with housing status and with income variables separately, with very similar outcomes.
[11] The source for estimated remaining life expectancy was the Canadian Human Mortality Database.by age group in SHS for each province.

provinces. Second, the sample was restricted to those individuals aged forty-five and older, given that middle-aged and elderly citizens are expected to drive future medical expenditure increases in developed countries (Kildemoes et al. 2006). Additionally, medical expenditures of age groups below middle age fluctuate without a discernable pattern. Since medical expenditures were reported at the household level, families with children, teenagers and young adults still considered living at home were excluded from the sample, along with any other dependents. This exclusion was done primarily to try to restrict prescription expenditures to the specific individual paying for health insurance. In turn, this resulted in a sample comprising singles and cohabiting couples without dependents. The final sample was then split between those paying and not paying health insurance. The sample was than further divided provincially to account for provincial heterogeneity in terms of public prescription drug coverage.

Section 4: Methodology

Medical expenditure data is appropriately categorized within a censored regression model, since the dependent variable is only observed if prescription expenditure is positive. Prescription expenditure data is censored at zero due to the fact that some people, if it were possible, would spend a negative amount on prescription drugs. If Ordinary Least Squares were used as the method of analysis to estimate a relationship between medical expenditures and demographic characteristics without accounting for the censoring at zero, OLS would tend to underestimate the magnitude of the slope of the line. In turn, this inaccuracy would lead to the parameter estimates being biased downwards. To correct for this problem, a Tobit Model was run to address the issue of the case of censored dependent variable, a common problem when dealing with expenditure data.

The model expresses the actually observed dependent variable in terms of the underlying latent variable:

$$y_i^* = x_i\beta + \varepsilon_i, \varepsilon \mid x \sim Normal\ (0, \sigma^2)$$

Where :

$$y_i = x_i\beta + \varepsilon_i \_if \_y_i^* > 0$$

and

$$y_i = 0 \_if \_y_i^* \leq 0$$

The Tobit model uses Maximum Likelihood Estimation to estimate the coefficients and residuals for the model. In addition, x is a matrix of regressors that includes: estimated remaining life expectancy variables and their squares for the reference person and spouse, age groups of the reference person and spouse and their squares, a dummy variable equal to one if the reference person is female and a dummy variable equal to one if the reference person qualifies as a low income claimant for health coverage depending on applicable province. Ramsey's omitted-variable regression specification error test was implemented to test the validity of the model. When the squared age group and remaining life expectancy variables were included, the null hypothesis of no omitted variables was accepted at a higher level of confidence. It also makes intuitive sense to include squared variables relating to age. Additionally, prior research has shown that medical expenditure increases for the ages of forty-five to sixty-five, and then begins to fall off as old age continues to increase, depending on proximity to death. Thus, adding the squared term enables the model to account for this age-related trend.

It is important to point out that estimates of the coefficient of the regressors estimate the marginal effect of x on y*, not on the actual variable y. In other words, unless the latent variable is of interest, the coefficients should not be interpreted from this regression. As a result, marginal effects were also calculated to measure the marginal effect of x on y.

In addition, there are two critical assumptions of the Tobit model: homoskedasticity and normality of the residuals with respect to the regressors. Prior research has shown that for those with positive HCE, the distribution of expenditure is highly skewed to the right with non-constant variance (Blough et al. 1999). This implies there tends to be more variability between individuals at the high-end of medical expenditures relative to those at the low end. To account for this skewness, the Breusch-Pagan test for heteroskedasticity was performed for each province. For some of the provinces, heteroskedasticity was present in the data. As a result, the robust standard errors option to correct for heteroskedasticity while using a Tobit model was incorporated. In addition, for each regression the residuals were tested for normality by creating a normal probability plot to test whether the residuals from the regression are normally distributed. In almost all the cases, the residuals became approximately more normal the larger the sample size.

Section 5: Results and Policy Implications

For each province, the Tobit model was run for four cases: single individuals with and without prescription drug insurance and cohabiting couples with and without prescription drug insurance. These regressions, along with marginal effects, were calculated for each case with and without the remaining life expectancy variables. Exclusion of the remaining life expectancy variables provides the opportunity for a comparison with previous literature on aging and medical expenditure, primarily to see if exclusion of the remaining life expectancy variables leads to the age group variables becoming more significant.

It is expected, based on previous research, that the variables for age groups and remaining life expectancy variables will be positive, with the square being negative. Inclusion of both age and remaining life expectancy should reduce the significance of the age variables. It is anticipated that the impact of age on prescription drug expenditures should differ between provinces due to provincial policy differences. It also needs to be pointed out, however, that the remaining life expectancy life variable is a rough proxy that lacks the accuracy of other measures in previous studies. It is unclear how gender should impact medical expenditures; perhaps given the propensity for females to outlive males, one would expect the coefficient to be negative. The low-income dummy variable is also difficult to predict, as provincial policies differ markedly in their definitions of low-income. Hence, the strain put on low-income households in terms of their share of prescription expenditures in cases where individuals and households have coverage differ, leading to varying incentive effects. Finally, since the primary concern is the impact of the regressors on the actual value of household prescription expenditures, the focus of the analysis will be on the results from the marginal effects of the independent variables on actual prescription expenditures, not on the latent dependent variable.[12]

5.1 Ontario

Ontario public prescription drug policy has remained unchanged for over a decade. The program is targeted towards seniors, individuals with special needs and those individuals whose prescription expenditures are a disproportionately high share of their income. In addition, Ontario provides simple market segmentation of public prescription drug policy between high and low-income individuals and families. Those qualifying for the high-income category pay a deductible and a higher fixed co-payment per prescription filled compared to those qualifying for the low-income category. Those in the low-income grouping do not have to pay a deductible.[13] Previous studies have shown that a fixed co-payment system, at a relatively small fee for the individual, provides little incentive for seniors to contain their prescription drug consumption. [14]

The results for singles and cohabiting couples indicating no insurance payments reveals differences in the impact of the age and remaining life expectancy between single

[12] For output results using the latent variable, see Appendix C
[13] See Provincial Policy Table for more detail.
[14] See Graham and Tabler

and co-habitats.[15] In both cases, the remaining life expectancy variables are insignificant. However, for co-habiting couples, the reference person's age group variables are significant, showing a positive marginal effect on medical expenditures that declines with increasing age. When the remaining life expectancy variables are removed, the reference persons age variables become more significant, in accordance with previous results in the literature. Singles, however, see no change; the age variables remain non significant even when the remaining life expectancy variables are removed. This surprising result can in part be explained by the characteristics of the singles senior group not paying health insurance in the Ontario sample.[16] This group is primarily comprised of those over the age of sixty-five, with a high proportion of these in the low-income group. Low-income, single seniors pay a negligible amount of the total cost to get a prescription filled, and in some cases even see their fee waived (Graham and Tabler 2001). In contrast, the sample of co-habitants not paying is primary filled with those still of working age that do not qualify for public prescription drug coverage. As a result, the proportion of cost of filling prescriptions borne on the household is much greater. For cohabiting couples compared to single individuals, the age variables show a much higher marginal effect given the cost faced by these groups. In contrast to the reference person for cohabiting couples, the spouse's age and remaining life expectancy variables had no significant effect. Finally, gender had a significant effect in a number of cases. In the case of couples, the marginal effect of gender on prescription expenditure is negative; for singles, the marginal effect is strongly positive. These results point again to the differences in the respective sub samples, with more seniors in the single group predominantly comprised of females. With the known low, fixed co-payment system, the lack of cost borne by the individual in the public plan appears

[15] See Appendix A for Regression Results by Province.
[16] See Sample Province Characteristics Table for Singles and Cohabitors

to make consumption more likely.

Turning now to single individuals and cohabiting couples recorded as paying health insurance, the results indicate that the age cohort variables and the remaining life expectancy variables were not significant, even when the remaining life expectancy variables were excluded. The sample characteristics show that over half of cohabiting couple respondents in this group are of working age, the single individual group contains a slightly higher proportion relative to working age seniors. It is puzzling that the age variables have little impact, given a large portion of the sample does not qualify for the public plan; hence, are required in the private system to pay a percentage of the actual drug cost in the private system.

The somewhat unexpected results for Ontario only seem to agree with previous research findings for the case where the sample was predominantly seniors with a small, fixed co-payment of the drug cost. The results indicate that policy plays an important role in determining the relationship between age and prescription expenditures. The fact that in Ontario, the public health plan does not place a large share of the drug cost on households has translated into a smaller impact of age on prescription drug expenditure. It is important to note that this result is only at the household level. Examination of provincial expenditure figures would likely render different results.

5.2 Quebec

Quebec's public prescription plan differs substantially in structure and scope relative to Ontario, with the plan available to all age groups. If enrolled in the public program, a premium is paid ranging from $0 to $570, depending on income. For those with private coverage, the public premium is not paid. For those in the public plan receiving over ninety percent of the Guaranteed Income Supplement, the public premium is waived. All those within the public plan must also pay a monthly deductible and co-payment, indexed to age and income level. The difference between Ontario and Quebec in terms of per-capita cost for the household is striking.[17] There is a substantial difference not only in cost, but also in pattern of cost between the age cohorts. In Ontario, costs peak in the sixty-five to seventy-five age grouping, while for Quebec household prescription expenditures continue to increase for the household up to the seventy-five to eighty-five year old cohort.

It is also important to point out that in Quebec, the goal of the prescription drug program is to have everyone in the province with some form of prescription drug coverage. As a result, those identified, as not paying for health coverage should be the group with full coverage entitled to full coverage without cost within a private plan. This can help to explain the results for single individuals and cohabiting couples not paying health insurance. For both singles and couples, the results for non-payers show a non-significant effect for the age variables. Based on the above assumption, this can be attributed to the lack of incentive to control prescription expenditures, given that prescription expenditure is almost entirely borne by the insurer. In such a case, there is unlikely to be any relationship with household cost and age given that the household prescription expenditure burden is minimal.

The results for those paying for health insurance in Quebec, however, or diverge greatly from the non-pay group, as well as for both singles and couples. First, the impact of the remaining life expectancy variables on the age cohort variables is substantial. Among Quebec cohabiting couples that pay health insurance, only the reference age cohort variables are significant. The sign of the coefficients indicate a positive marginal effect of age on prescription expenditure up to age sixty-five, followed by a declining effect with the advent of old age. Once the remaining life expectancy variables are excluded, however, both the reference and spouse age cohort's variables become strongly significant, with a positive marginal effect of age on prescription expenditure, declining with very old age. The primary justification for the spouse variables having a significant impact may have to do with the structure of the plan. In Quebec, premiums, deductibles and co-

---

[17] See figure B.1

payments are based on household income for couples. In the case of the co-payments, the value of the co-payment, in contrast to Ontario, is a percentage of the prescription drugs actual cost. Given that prescription expenditures rise for males and females from age forty-five until old age, it is not surprising that age of the spouse has an impact on household prescription expenditures.

The results for single individuals paying for health insurance also follows a similar pattern to the results of couples paying for insurance. Once the remaining life expectancy variables are excluded, the age cohort variables show a positive marginal effect on expenditure, and a declining marginal effect with the onset of old age. In contrast to the couple payers, the gender variable resulted in a positive, marginal effect of single female individuals having higher prescription expenditures than males. This result is also in contrast to Ontario, where there was no impact of gender on prescription expenditure for singles with health insurance. It is unclear why there would be a noticeable difference in gender effects between the provinces.

The results for Quebec reveal that the effect of age on prescription expenditure hinges on the individual or household's prescription drug coverage being impacted by the actual cost of drugs purchased. When this impact is present, the age variables have a much more clear effect on prescription expenditure. This difference can be clearly shown when comparing Quebec and Ontario, which differ in their co-payment policies.

5.3 Manitoba

Similar to Quebec, the Manitoba public prescription drug plan is available to all age groups for those without private coverage. All age groups pay a deductible rate that is a percentage of income depending on the income level.[18] For all groups, once the maximum deductible is covered, the individual receives full-coverage. This program implies that for the vast majority of households, they will be required to pay the full-amount for their drug costs. Only in the cases where individuals or couples face catastrophic costs, would they eclipse the deductible limit. In addition, there is no

[18] See Provincial Policy Table for more detail.

co-payment for people enrolled in Manitoba's prescription drug program.

The regression results for individuals who do not pay health insurance contrast the results of Ontario and Quebec. Among non-paying cohabiting couples, none of the independent variables were found to have a significant effect. When the remaining life expectancy variables are excluded, the age cohort variables have a positive marginal effect for the reference person and the spouse; the squared terms, however, remain non significant. This result opposes the majority of previous findings in the literature. Given the structure of the Manitoba public plan, this result would seem plausible only if this group was paying for insurance, given that the Manitoba policy does not provide seniors with a break on medical expenditures relative to other age cohorts. Looking at Figure B.1, it is clear that there is a drastic jump in prescription expenditures between the forty-five to fifty-four and fifty-five to sixty-four age groupings, with cost becoming stable for those sixty-five plus afterwards. For singles not paying health insurance, the remaining life expectancy variables are of correct sign and significant. However, when the remaining life expectancy variables are removed, the marginal impact of the age cohorts on prescription expenditure remains non significant. This result reflects the fact that two thirds of the observations in this group are seniors, who are likely covered under the public plan but have seen their fees waived or dramatically reduced. As a consequence, they were responsible for a smaller fraction of the cost, reducing the relationship between age and prescription expenditure.

Similar to the results for the non-payer group, the results for single individuals and cohabiting couples paying health insurance contradict the literature. The age cohorts seem to have little effect on prescription expenditure, regardless if remaining life expectancy variables are included or not. This lack of an effect is potentially explained by the structure of Manitoba's public plan. In Manitoba, the program is designed such that the cost paid by each household is approximately proportionally equivalent, regardless of the age cohort the single or cohabiting couples fall into. Therefore, drugs should not become more or less expensive as a person ages if they consume the same amount of drugs. Typically, individuals will consume proportionately more medications as they age. A possible scenario is that as people move into retirement age and largely switch from private to public health insurance, the public plan forces them to be much more cost conscious. Under the Manitoba public health plan, households are responsible for almost the entire portion of the drug cost.

Another difference between singles and couples in Manitoba is that among individuals, the low-income indicator variable has a negative marginal effect on prescription expenditure. This could be due to the fact that while the Manitoba government tried to design policy to equalize relative payments for all groups, low-income groups still feel a disproportionate effect of the cost.

5.4 British Columbia

British Columbia's public drug plan is available to all age groups, with people able to join the plan while also having private prescription drug coverage. In contrast to Manitoba, British Columbia's program cost-discriminates between age groups in a straightforward manner. For individuals born before 1939, the requirement is a twenty-five percent co-payment per prescription filled with no deductible required. For those born after 1939, a deductible is required along with a thirty percent co-payment. Looking at Figure B.1, British Columbia has low annual prescription expenditure per household, which rises up to the sixty-five year old threshold, than stays basically flat afterwards.

Observing the sample characteristics of singles and couples reported as not paying insurance, a noticeable difference is present between the two groups. From Table A.8, it is clear that the majority of those not paying for insurance are those born after 1939. This means either this group has extensive coverage or it is choosing not to join the public plan. For the no-pay cohabiting couple group, the results support the previous literature, with the age cohort variables having a marginal effect on expenditure, once the estimated remaining life expectancy variables were removed. If this group were primarily composed of those without private coverage, one would expect this group to be more responsive to prescription expenditure over time. What is unclear is why age variables were non significant for non-paying single individuals, even when estimated remaining life expectancy variables were excluded. This could be due to a higher portion of singles having lower income and seeing their fees waived. As a consequence, they would be unlikely to see the same incentive effects as couples, most of which would not qualify for the low income relief program.

Compared to the non-paying groups in British Columbia, both singles and couples who pay health insurance are more likely to be born after 1939. As a result, most of these individuals are of working age that would either be covered under a private plan or with the public plan where they pay a deductible and co-payment for each prescription filled. Given most plans in British Columbia involve a co-payment as a percentage of the drug cost, it is expected that age cohorts would have a relationship with prescription expenditures. However, as can be seen by both the single and cohabiting couples, the age cohort variables have no marginal effect on prescription expenditures, regardless of whether estimated remaining life expectancy variables are included. This is a surprising result, given that a substantial portion of the drug cost is borne by the household. However, from Figure B.1, it is clear British Columbia ranks near the lowest in yearly household prescription drug expenditures among provinces. Thus, the results found for British Columbia may reflect that its residents are cost conscious, given the incentive to manage their prescription expenditures brought on by the provincial plan policy.

5.5 Alberta

Alberta provides prescription drug coverage to all age groups, regardless of whether individuals have private coverage. Individuals under the age of sixty-five without private drug coverage, they are required to pay a quarterly premium at regular or subsidized rates, depending on income level. This group is also required to pay twenty-five percent co-payment on each prescription filled, up to a maximum of twenty-five dollars. Individuals over the age of sixty-five are exempt from the premium, and pay thirty percent co-payment up to a maximum of twenty-five dollars.

In Alberta, those not paying for health insurance are predominantly aged sixty-five years and over, with most applying for low-income status where they see their fees waived. The tesults for those reported to pay health insurance indicate that the age cohort variables for both singles and couples have an no significant marginal effect, with and without the remaining life expectancy variables included. This is logical, given that most of the sample for this sub-group is seniors and likely not reporting any health insurance expenditure due to special coverage under low-income status.

In contrast to the group in Alberta not paying health insurance, those primarily under sixty-five years of age make up the sample group. Among cohabiting couples reported to be paying health insurance, the age variables having an insignificant effect even when estimated remaining life expectancy variables were excluded. Singles saw similar results, with one exception. The age cohort variable was significant and but became non significant once the estimated remaining life expectancy variables were removed. These results are surprising, given Albertan households share a significant portion of the drug cost, and their costs are relatively high compared with the rest of the country. The expectation was that there would have been much more of an impact of the age variables on prescription drug expenditure in Alberta.

5.6 Saskatchewan

Saskatchewan's public drug plan is available to all individuals regardless of age. If an individual receives a Guaranteed Income Supplement, they are required to pay a two hundred dollar semi-annual deductible and afterwards pay thirty-five percent co-payment. Those individuals over the age of sixty-five pay fifteen dollars per prescription filled. Low-income, working families pay a one hundred dollar semi-annual deductible and then pay thirty-five percent deductible. A divergent sample characteristic of individuals in Saskatchewan is that the majority paying are sixty-five and older, while those not paying insurance are primarily reported as the younger group. Compared to the other provinces, Saskatchewan has a much higher yearly expenditure per capita on prescription drugs is relative to other provinces.

The results indicate that for both singles and cohabiting couples who pay insurance, the age cohort variables fail to have a significant marginal effect on prescription expenditure, even when estimated remaining life expectancy is excluded. This result is surprising, considering the dramatic rise in expenditure borne by households over time in Saskatchewan from Figure B.1; particularly for those within the cohorts age sixty-five to eighty-five year old age groups. The only logical explanation is that individuals reporting public insurance have extensive coverage in the private sector; thus, those who primarily use the public plan are accounting for the high cost.

Examining singles and couples paying health insurance, surprising results also emerge. Among paying cohabiting couples, the age cohort variables for both the reference person and spouse have a positive marginal effect on prescription expenditure only when estimated life expectancy variables were excluded, with the squares non insignificant. Among paying individuals, the age variables remain non significant even after the remaining life expectancy variables were excluded. Given that the majority of those paying are over sixty-five, it is surprising there is no effect of age given the cost borne by the household, especially the drastic increase in cost found for those sixty-five and older. Finally, the low-income variable corresponding to couples paying health insurance has a significant, positive, marginal effect. This result reflects the nature of Saskatchewan's policy, which allows a lower premium and co-payment plan for those that qualify.

Section 6: Conclusion

Prescription drugs constitute the fastest growing branch of medical expenditures in Canada. One of the primary reasons for this growth is the demographic shift currently underway that is shifting the majority of the population in Canada into the age groups generally associated with the highest cost of prescription drug expenditures. From the results of this study, it is clear that any examination of the relationship between age and medical expenditures must also take into account how public policy influences household behavior surrounding prescription drug consumption. It is also clear that even within a country like Canada, with a public health plan designed to provide equal access to health services province-wide, there are substantial differences in the level of coverage between provinces. While the findings in this study did not necessarily disagree with the literature linking age to prescription medical expenditures, there were many instances found across provinces where the link between age and prescription expenditures was not significant. These results emphasize the important incentive effects created by provincial plans, and how that incentive effect can blur the relationship between age and medical expenditure found in previous studies.

Additionally, aside from comparison of cost for the household when comparing the effectiveness of a plan in terms of the cost borne by the household, other consideration must be given for the breadth of coverage, as well as the ability of a health plan to list new, high efficacy drugs in the formulary. If an individual cannot undertake necessary therapy simply as a result of cost, the province could see this costs re-enter later on in other areas of medical expenditure on a much higher magnitude, for instance extended hospital stays. Furthermore, even if a public drug expenditure plan seems excellent in terms of low cost in yearly per-capita expenditures, the cost to the government running the program may become so great that costly drugs with high efficacy cannot be covered. Examining these avenues could be a future extension of this study.

References

Angus, D and Karpetz, H. 1998. Pharmaceutical Policies in Canada: Issues and Challenges, *Pharmacoeconomics*, 14(July), 81-96.

Baum, C. 2006. *An Introduction to Modern Econometrics Using Stata*, Stata Press, College Station, Texas.

Blough, D., Madden, C., and Hornbrook, M. 1999. Modeling Risk Using Generalized Linear Models, *Journal of Health Economics*, 18, 153-171

Canadian Human Mortality Database: http://www.bdlc.umontreal.ca/CHMD/index.htm

Consumer Price Index, Health and Personal Care (Health Care Goods), National, 2002 Base Year: http://www40.statcan.ca/l01/cst01/cpis13a.htm heatlh

Consumer Price Index, All Items, National, 2002 Base Year: http://www40.statcan.ca/l01/cst01/econ46a.htm

Demers, V., Jackevicious C,, and Melo, M. 2008. Comparison of Prescription Drug Plans and the Impact on Patients Annual Drug Expenditures, *Canadian Medical Association Journal*, 178, 405-409.

DiMatteo, L., and Grootendorst, P. 2002. Federal Patent Extension, Provincial Policies and Drug Expenditures, *Canadian Tax Journal*, 50(6), 1-36.

Dormont, B., Grignon, M., and Huber, H. 2006. Health Expenditure Growth: Reassessing the Threat of Aging, *Health Economics*, 15, 947-963.

Felder, S., Meier, M., and Schmitt, H. 2000. Health Care Expenditure in the Last Months of Life, *Journal of Health Economics*, 19, 679-695.

Graham, J., and Tabler, T. March 2005. Canadian Pharmacare: Performance, Incentives and Insurance, *Fraser Institute Digital Publication*, 1-45.

Madigan, D. 2008. Logistic and Tobit Regression: http://www.stat.rutgers.edu/~madigan/COLUMBIA/logisticRegressionColumbia.pdf

McDonald, J., and Moffitt, R. 1982. The Uses of Tobit Analysis, *The Review of Economics and*

Statistics, 62(2), 318-321.

McGrail, K., Green, B., Barer, M., Evans, R., Hertzman, C. 2000. Age, Costs of Acute and Long-Term Care and Proximity to Death: Evidence for 1987-88 and 1994-95 in British Columbia, *Age and Aging*, 29, 249-253.

O'Neill, C., Groom, L., Avery, A., Boot, D., and Thornhill., K. 2000. Age and Proximity to Death as Predictors of GP Care Costs: Results from a Study of Nursing Home Patients, *Health Economics,* 9, 733-738.

Salas, C., and Ratery, J. 2001. Econometric Issues in Testing the Age Neturality of Health Care Expenditure, *Health Economics Letters*, 10, 669-671.

Seshamani, M., and Gray, A. 2004. A Longitudinal Study of the Effects of Age and Time to Death on Hospital Costs, *Journal of Health Economics*, 217-235.

Seshamani, M., and Gray, A. 2004. Aging and Health-Care Expenditure: the Red Herring Argument Revisited, *Health Economics,* 13, 303-314.

Stearns, S., and Norton, E. 2004. Time to Include Time to Death? The Future of Health Care Expenditure Predictions, *Health Economics,* 13, 315-327.

Werblow, A., Felder., S, and Zweifel, P. 2007. Population Aging and Health Care Expenditure: A School of Red Herrings?, *Health Economics*, 16, 1109-1126.

Werblow, A., Felder., S, and Zweifel, P. 1999. Aging of Population and Health Care Expenditure: A Red Herring?, *Health Economics*, 8, 485-496.

Werblow, A., Felder., S, and Zweifel, P. 2004. Population Aging and Health Care Expenditure: New Evidence on the Red Herring, *The Geneva Papers on Risk and Insurance*, 29(4), 652-666.

Appendix A. Tables

A.1 Ontario

Single and Cohabiting Couples, Ontario, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Est. Life Exp Ref	0.0546	0.0618	-0.0248	-0.13
	0.0679	**0.0918**	**0.109**	**0.171**
Est. Life Exp Ref_Sq	-0.00077	-0.0021	0.00037	0.00376
	0.0016	**0.0021**	**0.0024**	**0.0037**
Ref Age Cohort	1.66	0.106	0.687	0.0908
	0.598**	**0.798**	**0.79**	**1.31**
Ref Age Cohort _Sq	-0.0687	0.00271	-0.0304	-0.0002
	0.0294*	**0.0408**	**0.0369**	**0.0637**
Est. Life Exp Spouse	0.0203	0.0191		
	0.0272	**0.034**		
Est. Life Exp Spouse_Sq	-0.00162	-0.00133		
	9.60E-04	**0.0013**		
Spouse Age Cohort	-0.154	-0.0377		
	0.14	**0.185**		
Spouse Age Cohort _Sq	0.00136	0.00023		
	0.0013	**0.0017**		
Female	-0.674	0.144	1.23	0.751
	0.275*	**0.34**	**0.356*****	**0.512**
Low Income	0.308	0.563	-0.275	0.87
	0.211	**0.285***	**0.282**	**0.498**
constant	-5.35	2.11	-2.26	1.72
	3.01	**3.73**	**4.34**	**6.75**
Observations	1601	958	843	282
Pseudo r2	0.00855	0.00691	0.00869	0.00753
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, Ontario, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Ref Age Cohort	1.85	0.784	0.677	-0.976
	0.424***	**0.599**	**0.489**	**0.831**
Ref Age Cohort _Sq	-0.0832	-0.0304	-0.028	0.0502
	0.0216***	**0.0312**	**0.0244**	**0.043**
Spouse Age Cohort	0.0187	0.102		
	0.108	**0.143**		
Spouse Age Cohort _Sq	-0.00021	-0.00105		
	0.001	**0.0013**		
Female	-0.457	0.16	1.2***	0.883
	0.222*	**0.279**	**0.307**	**0.455**
Low Income	0.315	0.541	-0.268	0.796
	0.211	**0.283**	**0.28**	**0.489**
constant	-6.95***	-2.33	-2.69	6.16
	2	**2.75**	**2.32**	**3.86**
Observations	1601	958	843	282
Pseudo r2	0.00794	0.0059	0.00867	0.00657
legend:	Standard errors in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

A.2 Quebec

Single and Cohabiting Couples, Quebec, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Est. Life Exp Ref	-0.0489	0.0405	-0.145	-0.0109
	0.109	**0.047**	**0.206**	**0.0823**
Est. Life Exp Ref_Sq	0.00108	-0.00114	0.00355	0.00012
	0.0024	**0.0011***	**0.0042**	**0.0018**
Ref Age Cohort	0.889	1.08	1.94	1.24
	0.93	**0.42***	**1.09**	**0.64**
Ref Age Cohort _Sq	-0.0278	-0.0422	-0.072	-0.0422
	0.047	**0.0204**	**0.0558**	**0.031**
Est. Life Exp Spouse	-0.0758	0.0086		
	0.0577	**0.0263**		
Est. Life Exp Spouse_Sq	0.00125	-0.00066		
	0.0016	**7.40E-04**		
Spouse Age Cohort	0.0699	0.126		
	0.27	**0.129**		
Spouse Age Cohort _Sq	-0.00097	-0.00128		
	0.0025	**0.0012**		
Female	-0.0815	0.134	0.558	1.28***
	0.466	**0.231**	**0.59**	**0.29**
Low Income	-0.233	-0.0846	0.0881	-0.00755
	0.312	**0.139**	**0.499**	**0.23**
constant	-0.519	-2.64	-8.19	-4.89
	4.39	**1.99**	**5.75**	**3.35**
Observations	568	2090	370	821
Pseudo r2	0.0216	0.018	0.0267	0.0344
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, Quebec, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Ref Age Cohort	0.525	1.45	1.33	1.25
	0.665	**0.289*****	**0.829**	**0.411****
Ref Age Cohort _Sq	-0.0072	-0.0616	-0.0405	-0.0415
	0.035	**0.0148*****	**0.0431**	**0.021***
Spouse Age Cohort	0.182	0.2		
	0.174	**0.0767****		
Spouse Age Cohort _Sq	-0.00189	-0.00195		
	0.0016	**7.10E-04****		
Female	-0.0175	0.185	0.639	1.26
	0.339	**0.166**	**0.484**	**0.25*****
Low Income	-0.243	-0.0825	0.0373	-0.004
	0.309	**0.138**	**0.495**	**0.228**
constant	-1.33	-4.85	-6.68	-5.18
	3.03	**1.35*****	**3.83**	**1.92****
Observations	568	2090	370	821
Pseudo r2	0.0205	0.0177	0.0262	0.0344
legend:	Standard errors in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

A3. Manitoba

Single and Cohabiting Couples, Manitoba, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Est. Life Exp Ref	-0.0347	0.36	0.266	0.244
	0.235	**0.202**	**0.113***	**0.119***
Est. Life Exp Ref_Sq	-0.00044	-0.00383	-0.00673	-0.00011
	0.0022	**0.0018**	**0.0026***	**0.0027***
Ref Age Cohort	0.591	1.32	-0.982	2.19
	1.7	**1.35**	**0.826**	**0.95**
Ref Age Cohort _Sq	-0.0255	-0.0133	0.0632	-0.0571
	0.0583	**0.0464**	**0.0383**	**0.0436**
Est. Life Exp Spouse	0.056	-0.379		
	0.231	**0.203**		
Est. Life Exp Spouse_Sq	0.00109	0.00471**		
	0.0021	**0.0018**		
Spouse Age Cohort	2.23	0.835		
	1.55	**1.34**		
Spouse Age Cohort _Sq	-0.086	-0.0719		
	0.0513	**0.0469**		
Female	0.691	-1.43	1.69	0.0107
	1.37	**1.18**	**0.415***	**0.449**
Low Income	0.00578	-0.101	-0.48	-0.762
	0.254	**0.199**	**0.332**	**0.354***
constant	-12.5	-6.84	3.61	-16.2
	3.7*	**3.11***	**4.7**	**5.3****
Observations	686	957	505	403
Pseudo r2	0.0267	0.0242	0.0243	0.0208
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, Manitoba, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Ref Age Cohort	1.26	0.952	0.212	0.553
	0.632*	**0.534**	**0.577**	**0.595**
Ref Age Cohort _Sq	-0.0501	-0.0383	0.00099	-0.0178
	0.0318	**0.0276**	**0.0285**	**0.0292**
Spouse Age Cohort	1.16	0.775		
	0.584*	**0.545**		
Spouse Age Cohort _Sq	-0.0494	-0.0277		
	0.0291	**0.0284**		
Female	0.128	-0.0797	1.72	1.01
	0.287	**0.225**	**0.352***	**0.389****
Low Income	0.0112	-0.0807	-0.477	-0.97
	0.253	**0.199**	**0.332**	**0.358****
constant	-8.86	-5.23	0.311	-0.257
	2.45*	**2.02****	**2.78**	**2.89**
Observations	686	957	505	403
Pseudo r2	0.0258	0.0223	0.0213	0.0116
legend:	Standard erros in normal font			
	* p<0.05	** p<0.01	*** p<0.001	

A4. British Columbia

Single and Cohabiting Couples, British Columbia, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
RLE_Ref	-0.0623	-0.1180	-0.2300	-0.0004
	0.3140	**0.1310**	**0.1540**	**0.1040**
RLE_Ref_sq	0.0005	0.0037	0.0033	-0.0003
	0.0028	**0.0029**	**0.0014**	**0.0022**
rpagegrp	1.6200	1.3600	0.5880	-0.4770
	1.9400	**1.0000**	**1.0200**	**0.6910**
rpagegrp_sq	-0.0772	-0.0461	-0.0457	0.0225
	0.0658	**0.0469**	**0.0351**	**0.0339**
RLE_Sp	-0.0008		0.0426	
	0.3190		**0.1520**	
RLE_Sp_sq	0.0013		0.0005	
	0.0026		**0.0013**	
spagegrp	0.5490		1.3700	
	1.8700		**1.0000**	
spagegrp_sq	-0.0103		-0.0495	
	0.0619		**0.0340**	
ref_female	0.1690	2.1400	0.5760	1.2100
	1.8500	**0.48*** **	**0.8900**	**0.33*** **
low_income_ref	-0.2050	-1.0700	0.1490	-0.2960
	0.3120	**0.407** **	**0.1600**	**0.2770**
_cons	-8.2900	-7.5000	-3.4900	5.1200
	4.6100	**5.6500**	**2.4800**	**3.6100**
Obs	623	545	1636	616
r2_p	0.0181	0.0372	0.0105	0.0074
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, British Columbia, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
rpagegrp	1.8900	0.5830	0.4300	-0.3540
	0.788*	**0.3990**	**0.6870**	**0.4520**
rpagegrp_sq	-0.0825	-0.0244	-0.0033	0.0182
	0.0414*	**0.0205**	**0.0344**	**0.0230**
spagegrp	0.1350	0.8520		
	0.7540	**0.382***		
spagegrp_sq	0.0157	-0.0357		
	0.0399	**0.0197**		
ref_female	-0.1900	0.0830	2.2900	1.1600
	0.3420	**0.1820**	**0.413*** **	**0.273*** **
low_income_ref	-0.2120	0.1190	-1.1500	-0.2880
	0.3090	**0.1610**	**0.399** **	**0.2740**
_cons	-6.6200	-3.5000	-3.4100	4.2800
	3.08*	**1.67***	**3.2700**	**2.11***
Obs	623	1636	545	616
r2_p	0.0179	0.0089	0.0364	0.0074
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

A.5 Alberta

Single and Cohabiting Couples, Alberta, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Est. Life Exp Ref	-0.322	-0.0455	-0.00215	0.0994
	0.303	**0.24**	**0.0903**	**0.131**
Est. Life Exp Ref_Sq	0.00507	-0.00064	0.00283	0.00061
	0.0029	**0.0018**	**0.0023**	**0.0027**
Ref Age Cohort	0.0792	-0.663	2.75	1.75
	2.09	**1.55**	**0.92****	**0.8***
Ref Age Cohort _Sq	-0.0305	0.042	-0.0945	-0.0539
	0.0692	**0.0506**	**0.0408***	**0.0404**
Est. Life Exp Spouse	0.315	0.0478		
	0.305	**0.246**		
Est. Life Exp Spouse_Sq	-0.00538	-0.00021		
	0.0029	**0.0018**		
Spouse Age Cohort	0.52	1.15		
	2.1	**1.45**		
Spouse Age Cohort _Sq	0.024	-0.0495		
	0.0685	**0.046**		
Female	1.16	0.532	0.195	0.369
	1.62	**1.52**	**0.398**	**0.39**
Low Income	0.178	0.378	-0.231	0.494
	0.332	**0.203**	**0.328**	**0.349**
constant	-1.55	0.414	-15.3	-10.9
	4.76	**2.81**	**5.32****	**4.11****
Observations	459	1297	357	498
Pseudo r2	0.0358	0.0156	0.04	0.0172
legend:	Standard erros in normal font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, Alberta, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Ref Age Cohort	-0.439	0.029	1.36	0.863
	0.787	**0.533**	**0.57***	**0.552**
Ref Age Cohort _Sq	0.0218	0.0193	-0.0438	-0.0312
	0.038	**0.029**	**0.0278**	**0.0286**
Spouse Age Cohort	1.21	0.845		
	0.787	**0.537**		
Spouse Age Cohort _Sq	-0.0332	-0.0415		
	0.0375	**0.0293**		
Female	0.341	0.115	0.536	0.875
	0.366	**0.224**	**0.358**	**0.339***
Low Income	0.123	0.38	-0.277	0.424
	0.331	**0.203**	**0.328**	**0.35**
constant	-2.53	-1.94	-5.86	-2.64
	3.02	**2.1**	**2.82***	**2.5**
Observations	459	1297	357	498
Pseudo r2	0.0337	0.0152	0.0373	0.0143
legend:	Standard erros in normal font			
	* p<0.05	** p<0.01	*** p<0.001	

A.6 Saskatchewan

Single and Cohabiting Couples, Saskatchewan, Marginal Effects				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Est. Life Exp Ref	0.415	-0.108	-0.00066	-0.0428
	0.346	**0.152**	**0.192**	**0.106**
Est. Life Exp Ref_Sq	-0.00152	0.00189	0.00119	0.00104
	0.003	**0.0014**	**0.0043**	**0.0025**
Ref Age Cohort	1.86	1.12	0.566	0.73
	2.26	**1.11**	**1.45**	**0.852**
Ref Age Cohort _Sq	-0.0144	-0.056	-0.00681	-0.0249
	0.076	**0.0376**	**0.068**	**0.0382**
Est. Life Exp Spouse	-0.474	0.0719		
	0.363	**0.154**		
Est. Life Exp Spouse_Sq	0.00316	-0.00106		
	0.003	**0.0014**		
Spouse Age Cohort	-0.123	0.821		
	2.19	**1.05**		
Spouse Age Cohort _Sq	-0.058	-0.0192		
	0.0739	**0.0347**		
Female	-3.86	-0.111	0.908	0.535
	2.11	**0.866**	**0.641**	**0.345**
Low Income	0.66	0.423	0.792	-0.169
	0.345	**0.158**	**0.605**	**0.268**
constant	-3.46	-5.88	-4.3	-0.0526
	4.7	**2.47**	**8.03**	**4.85**
Observations	531	1357	292	496
Pseudo r2	0.0174	0.0324	0.0114	0.00995
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

Single and Cohabiting Couples, Saskatchewan, Marginal Effects, RLE Excluded				
	Cohabiting		Single	
	No Ins	Ins	No Ins	Ins
Ref Age Cohort	-0.405	0.848	-0.0541	0.519
	0.841	**0.412**	**0.962**	**0.502**
Ref Age Cohort _Sq	0.031	-0.0342	0.0166	-0.014
	0.0446	**0.02**	**0.0485**	**0.0241**
Spouse Age Cohort	1.62	0.954		
	0.835	**0.408**		
Spouse Age Cohort _Sq	-0.0762	-0.0326		
	0.0444	**0.0197**		
Female	-1.37	-0.312	1.08	0.519
	0.409	**0.192**	**0.572**	**0.307**
Low Income	0.694	0.42	0.737	-0.167
	0.343	**0.158**	**0.597**	**0.267**
constant	-2.83	-5.56	-0.203	0.556
	3.23	**1.58**	**4.59**	**2.52**
Observations	531	1357	292	496
Pseudo r2	0.0166	0.0321	0.011	0.00987
legend:	Standard erros in bold font			
	* p<0.05	** p<0.01	*** p<0.001	

A.7 Variable Descriptions

Variable	Description
Est. Life Exp Ref	Equal to the estimated remaining life expectancy of the reference person, based on the corresponding estimated remaining life expectancy of that age cohort from the Canandian Mortality Database. If the individual is a smoker, six years were deducted.
Est. Life Exp Spouse	See Est, Life Exp Ref
Ref Age Cohort	Age cohort of the reference person, ranging from 45-54, 55-64 and so on up to 85 years and older
Spouse Age Cohort	See Ref Age Cohort
Female	Dummy variable equal to one if the reference person is female
Low Income	Dummy variable equal to one if the individuals income falls below a threshold level chosen by the relevant public prescription drug program as a cut-off for reduced prescription drug fees.

A.8 Summary Statistics

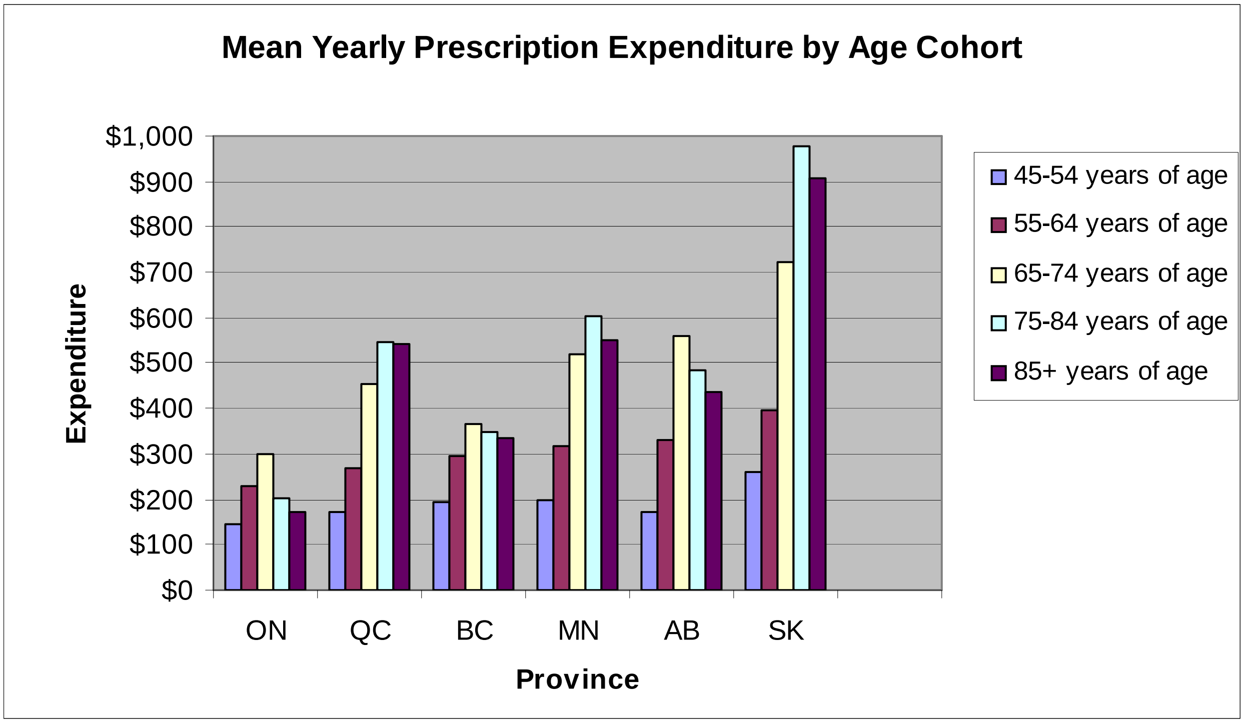
	Ontario			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs>65	493	150	1186	524
Obs 45-64	350	132	1198	714
Obs<65 & Ref Full-time (exclusive)	146	65	299	205
Obs>65 & Income<$16,018(only singles)	264	41		
Obs<65 & Ref & Sp Full-time			202	137
Obs<65 & Ref+Sp Income<$24,175			399	63
	Alberta			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs>65	260	211	479	572
Obs<65	97	287	291	1124
Obs<65 & Ref Full-time (exclusive)	57	174	187	512
Obs<65 & Ref & Sp Full-time			77	244
	British Columbia			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs<70	220	250	382	770
Obs>70	325	366	786	1460
Obs<65 & Ref & Sp Full-time	70	148	184	311
Obs<65 & Ref Full-time (exclusive)			83	213
	Quebec			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs>65	227	371	737	1746
Obs<65	143	450	421	1434
Obs<65 & Ref Full-time (exclusive)	57	174	187	512
Obs<65 & Ref & Sp Full-time			77	244
	Manitoba			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs>65	315	271	674	710
Obs<65	190	132	616	662
Obs<65 & Ref Full-time (exclusive)	68	74	156	189
Obs<65 & Ref & Sp Full-time			89	123
<15000	171	82	127	349
15000-40000	108	138	324	349
40000-75000	8	20	62	169
	Saskatchewan			
	Singles		Couples	
	No Health Ins	Health Ins	No Health Ins	Health Ins
Obs>65	140	382	351	1195
Obs<65	152	114	566	799
Obs<65 & Ref Full-time (exclusive)	48	58	161	216
Obs<65 & Ref & Sp Full-time			103	204

A.9 Provincial Policy Overview

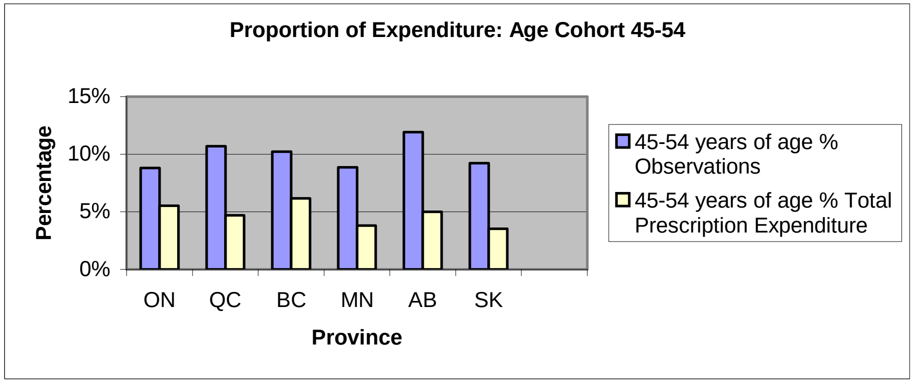
Province	Public Prescription Drug Policy Overview
Ontario	Low Income or those covered under high drug cost relative to income category pay $2 dispensing fee Qualify if age over 65 and if single income less than $16,018 or dual income less than $24,175 High income pay $100 deductible and $6.11 dispensing fee Trillium program for those with medical expenditures exceeding 4% of yearly income
Quebec	Program available for all age groups Pay premium ranging from $0 to $570 depending on income level Exempt from premium if 65+ and receive over 90% of Guaranteed Income Suppliment If 65+ and have private plan coverage for entire year do not pay public premium If 65+ and have partial private plan coverage pay public premium for time not on private plan 18-64 years old pay monthly deductible $14 and 30% co-payment 65+ with less 95% of GIS received pay $14 deductible and 30% co-payment If receive more 95% of GIS exempt from any form of payment
Manitoba	All age groups pay deductible rate indexed to income groups <$15,000 Deductible rate 2.69% $15,000 to $40,000 deductible rate 4.02% $40,000 to $75,000 deductible rate 4.63% >$75,000 deductible rate 5.79% Once hit max deductible receive full coverage
British Columbia	Program available for all age groups, can join while also having private coverage 100% prescription drug coverage of palliative drugs for people categorized as in palliative care If born before 1939, do not pay a deductible, pay 25% co-payment If born after 1939, pay deductible indexed to income, also pay 30% co-payment
Alberta	For those under 65 without private coverage, also pay quarterly premium at regular or subsidized rates based on income Also pay 25% co-payment with max $25 per prescription 65+ exempt from premium, pay 30% co-payment with $25 limit Palliative care patients pay 30% co-payment with $25 limit per prescription, if reach $1000 additional drug cost fully covered
Saskatchewan	If on GIS pay $200 semi-annual deductible, afterwards 35% co-oay 65+ pay $15 per prescription drug No charge for palliative care patients Low income working families pay $100 semi-annual deductible then pay 35% co-pay

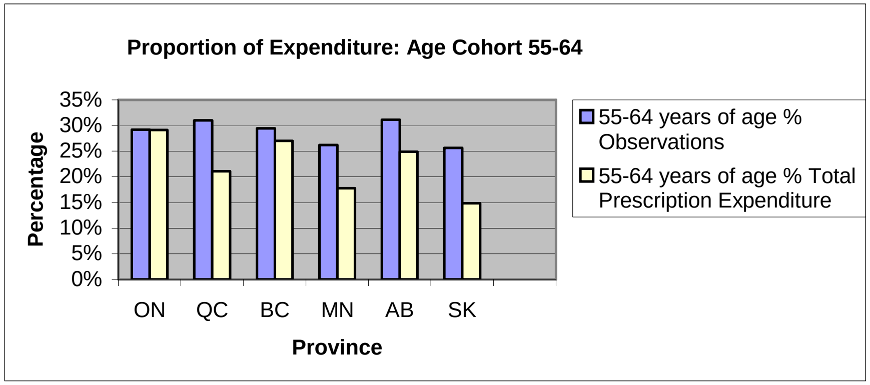
Appendix B

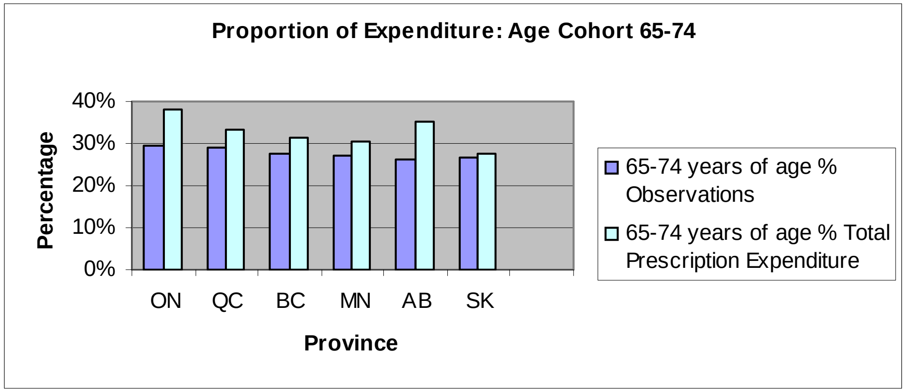
B.1 Mean Yearly Prescription Expenditure by Age Cohort: Provincial Comparison

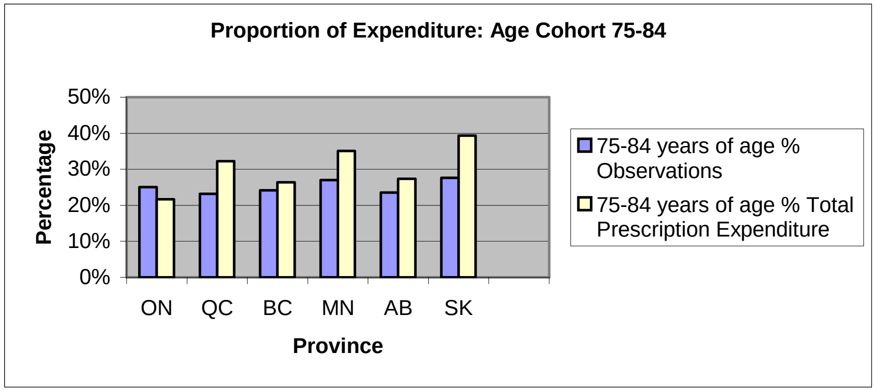


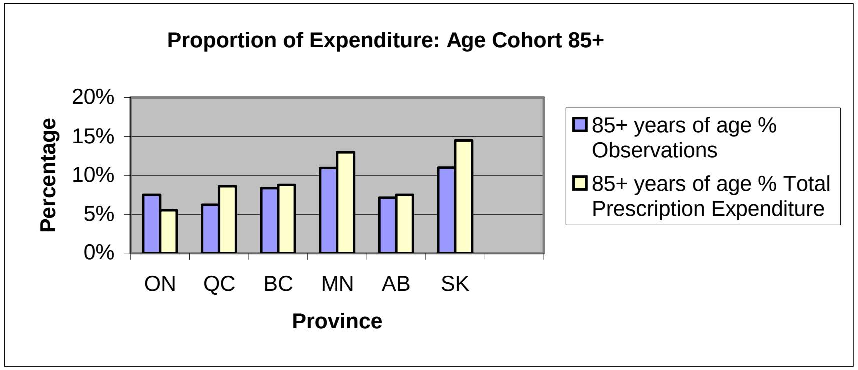
B.2 Proportion of Expenditure by Age Cohort: Provincial Comparison











Appendix C: Additional Output

C.1 Ontario

Single and Cohabiting Couples Ontario				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	0.0546	0.0618	-0.0248	-0.13
RLE_Ref_sq	-0.00077	-0.0021	0.00037	0.00376
rpagegrp	1.66**	0.106	0.687	0.0908
rpagegrp_sq	-.0687*	0.00271	-0.0304	-0.0002
RLE_Sp	0.0203	0.0191		
RLE_Sp_sq	-0.00162	-0.00133		
spagegrp	-0.154	-0.0377		
spagegrp_sq	0.00136	0.00023		
ref_female	-.674*	0.144	1.23***	0.751
low_income~f	0.308	.563*	-0.275	0.87
_cons	-5.35	2.11	-2.26	1.72
Obs	1601	958	843	282
r2_p	0.00855	0.00691	0.00869	0.00753
legend:	*p<0.05	**p<0.01	***p<0.001	

Single and Cohabiting Couples Ontario, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	1.85***	0.784	0.677	-0.976
rpagegrp_sq	-.0832***	-0.0304	-0.028	0.0502
spagegrp	0.0187	0.102		
spagegrp_sq	-0.00021	-0.00105		
ref_female	-.457*	0.164	1.2***	0.883
low_income~f	0.315	0.541	-0.268	0.796
_cons	-6.95***	-2.33	-2.69	6.16
Obs	1601	958	843	282
r2_p	0.00794	0.0059	0.00867	0.00657
legend:	*p<0.05	**p<0.01	***p<0.001	

C.2 Quebec

Single and Cohabiting Couples Quebec				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	-0.0489	0.0405	-0.145	-0.0109
RLE_Ref_sq	0.00108	-0.00114	0.00355	0.00012
rpagegrp	0.889	1.08*	1.94	1.24
rpagegrp_sq	-0.0278	-.0422*	-0.072	-0.0422
RLE_Sp	-0.0758	0.0086		
RLE_Sp_sq	0.00125	-0.00066		
spagegrp	0.0699	0.126		
spagegrp_sq	-0.00097	-0.00128		
ref_female	-0.0815	0.134	0.558	1.28***
low_income~f	-0.233	-0.0846	0.0881	-0.00755
_cons	-0.519	-2.64	-8.19	-4.89
Obs	568	2090	370	821
r2_p	0.0216	0.018	0.0267	0.0344
legend:	*p<0.05	**p<0.01	***p<0.001	

Single and Cohabiting Couples Ontario, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	0.525	1.45***	1.33	1.25**
rpagegrp_sq	-0.0072	-.0616***	-0.0405	-.0415*
spagegrp	0.182	.2**		
spagegrp_sq	-0.00189	-.00195**		
ref_female	-0.0175	0.185	0.639	1.26***
low_income~f	-0.243	-0.0825	0.0373	-0.004
_cons	-1.33	-4.85***	-6.68	-5.18**
Obs	568	2090	370	821
r2_p	0.0205	0.0177	0.0262	0.0344
legend:	*p<0.05	**p<0.01	***p<0.001	

C.3 Manitoba

Single and Cohabiting Couples Manitoba				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	-0.0347	0.36	.266*	.244*
RLE_Ref_sq	-0.00044	-.00383*	-.00673*	-0.00011
rpagegrp	0.591	1.32	-0.982	2.19*
rpagegrp_sq	-0.0255	-0.0133	0.0632	-0.0571
RLE_Sp	0.056	-0.379		
RLE_Sp_sq	0.00109	.00471**		
spagegrp	2.23	0.835		
spagegrp_sq	-0.086	-0.0719		
ref_female	0.691	-1.43	1.69***	0.0107
low_income~f	0.00578	-0.101	-0.48	-.762*
_cons	-12.5***	-6.84*	3.61	-16.2**
Obs	686	957	505	403
r2_p	0.0267	0.0242	0.0243	0.0208
legend:	*p<0.05	**p<0.01	***p<0.001	

Single and Cohabiting Couples Manitoba, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	1.26*	0.952	0.212	0.553
rpagegrp_sq	-0.0501	-0.0383	0.00099	-0.0178
spagegrp	1.16*	0.775		
spagegrp_sq	-0.0494	-0.0277		
ref_female	0.128	-0.0797	1.72***	1.01**
low_income~f	0.0112	-0.0807	-0.477	-.97**
_cons	-8.86***	-5.23**	0.311	-0.257
Obs	686	957	505	403
r2_p	0.0258	0.0223	0.0213	0.0116
legend:	*p<0.05	**p<0.01	***p<0.001	

C.4 British Columbia

Single and Cohabiting Couples British Columbia				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	-0.0623	-0.23	-0.118	-0.00042
RLE_Ref_sq	0.00045	.00332*	0.00366	-0.00025
rpagegrp	1.62	0.588	1.36	-0.477
rpagegrp_sq	-0.0772	-0.0457	-0.0461	0.0225
RLE_Sp	-0.00078	0.0426		
RLE_Sp_sq	0.00126	0.00046		
spagegrp	0.549	1.37		
spagegrp_sq	-0.0103	-0.0495		
ref_female	0.169	0.576	2.14***	1.21***
low_income~f	-0.205	0.149	-1.07**	-0.296
_cons	-8.29	-3.49	-7.5	5.12
Obs	623	1636	545	616
r2_p	0.0181	0.0105	0.0372	0.00743
legend:	*p<0.05	**p<0.01	***p<0.001	

Single and Cohabiting Couples British Columbia, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	1.89*	0.583	0.43	-0.354
rpagegrp_sq	-.0825*	-0.0244	-0.0033	0.0182
spagegrp	-0.135	.852*		
spagegrp_sq	0.0157	-0.0357		
ref_female	-0.19	0.083	2.29***	1.16***
low_income~f	-0.212	0.119	-1.15**	-0.288
_cons	-6.62*	-3.5*	-3.41	4.28*
Obs	623	1636	545	616
r2_p	0.0179	0.00891	0.0364	0.00739
legend:	*p<0.05	**p<0.01	***p<0.001	

C.5 Alberta

Single and Cohabiting Couples Alberta				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	-0.32	-0.05	0.00	0.10
RLE_Ref_sq	0.01	0.00	0.00	0.00
rpagegrp	0.08	-0.66	2.75**	1.75*
rpagegrp_sq	-0.03	0.04	-.0945*	-0.05
RLE_Sp	0.32	0.05		
RLE_Sp_sq	-0.01	0.00		
spagegrp	0.52	1.15		
spagegrp_sq	0.02	-0.05		
ref_female	1.16	0.53	0.20	0.37
low_income~f	0.18	0.38	-0.23	0.49
_cons	-1.55	0.41	-15.3**	-10.9**
Obs	459.00	1297.00	357.00	498.00
r2_p	0.04	0.02	0.04	0.02
legend:	*p<0.05	**p<0.01	***p<0.001	

Single and Cohabiting Couples Alberta, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	-0.439	0.029	1.36*	0.863
rpagegrp_sq	0.0218	0.0193	-0.0438	-0.0312
spagegrp	1.21	0.845		
spagegrp_sq	-0.0332	-0.0415		
ref_female	0.341	0.115	0.536	.875*
low_income~f	0.123	0.38	-0.277	0.424
_cons	-2.53	-1.94	-5.86*	-2.64
Obs	459	1297	357	498
r2_p	0.0337	0.0152	0.0373	0.0143
legend:	*p<0.05	**p<0.01	***p<0.001	

C.6 Saskatchewan

Single and Cohabiting Couples Saskatchewan				
	cohab_no	cohab_pay	single_no	single_pay
RLE_Ref	0.415	-0.108	-0.00066	-0.0428
RLE_Ref_sq	-0.00152	0.00189	0.00119	0.00104
rpagegrp	1.86	1.12	0.566	0.73
rpagegrp_sq	-0.0144	-0.056	-0.00681	-0.0249
RLE_Sp	-0.474	0.0719		
RLE_Sp_sq	0.00316	-0.00106		
spagegrp	-0.123	0.821		
spagegrp_sq	-0.058	-0.0192		
ref_female	-3.86	-0.111	0.908	0.535
low_income~f	0.66	.423**	0.792	-0.169
_cons	-3.46	-5.88*	-4.3	-0.0526
Obs	531	1357	292	496
r2_p	0.0174	0.0324	0.0114	0.00995
*p<0.05	**p<0.01	***p<0.001		

Single and Cohabiting Couples Saskatchewan, RLE Excluded				
	cohab_no	cohab_pay	single_no	single_pay
rpagegrp	-0.405	.848*	-0.0541	0.519
rpagegrp_sq	0.031	-0.0342	0.0166	-0.014
spagegrp	1.62	.954*		
spagegrp_sq	-0.0762	-0.0326		
ref_female	-1.37***	-0.312	1.08	0.519
low_income~f	.694*	.42**	0.737	-0.167
_cons	-2.83	-5.56***	-0.203	0.556
Obs	531	1357	292	496
r2_p	0.0166	0.0321	0.011	0.00987
*p<0.05	**p<0.01	***p<0.001		