



Drug Use Among Seniors on Public Drug Programs in Canada, 2002 to 2008

National Prescription Drug Utilization Information System Database



Canadian Institute
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Please note that the analyses and conclusions in this document do not necessarily reflect those of the individuals or organizations mentioned above.

About CIHI

The Canadian Institute for Health Information (CIHI) collects and analyzes information on health and health care in Canada and makes it publicly available. Canada's federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI's goal: to provide timely, accurate and comparable information. CIHI's data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health.

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Executive Summary

Total expenditures on prescription drugs in Canada are expected to reach \$25.4 billion in 2009. Public-sector expenditures are expected to make up almost half of this total, at \$11.4 billion. While the share of seniors' drug costs paid by Canadian public drug programs is unknown, it accounts for a significant percentage of drug program expenditures. In 2007, per capita spending on prescription drugs by seniors (people age 65 and older) was estimated to be three times the Canadian average, accounting for about 40% of all retail spending on prescription drugs.

Between 2001 and 2006, the Canadian senior population grew to almost 14% of the total population. With this growth projected to continue, there will be an ongoing need for information regarding seniors' drug use and expenditures to support the overall management of public drug programs.

Using data from the National Prescription Drug Utilization Information System (NPDUIS) Database, as submitted by six provincial public drug programs (Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island), this report looks at several key questions regarding seniors' drug use and expenditures, including

- How much do public drug programs spend on seniors?
- Which drugs account for the highest drug program spending on seniors?
- Which drugs showed the most change in drug program spending on seniors?
- How is public drug program spending on seniors distributed?
- How many drugs are seniors using?
- What drugs are being used by younger versus older seniors?

How Much Do Public Drug Programs Spend on Seniors?

- In 2008, public drug programs in the six provinces spent just more than \$1.0 billion on claims for seniors, increasing at an average annual rate of 8.6% (from \$603.5 million in 2002).ⁱ
- In 2008, average drug program spending per paid senior beneficiary among the six provinces varied from \$875 in P.E.I. to \$1,632 in Manitoba.
- In 2008, average drug program spending per paid beneficiary age 65 to 74, 75 to 84 and 85 and older was \$1,279, \$1,485 and \$1,403, respectively.

i. Drug program spending in P.E.I. was excluded from the growth rate calculation, as data is not available prior to 2004.

Which Drugs Account for the Highest Drug Program Spending on Seniors?

- In 2008, the top 10 drug classes, in terms of drug program spending, accounted for almost half (48.3%) of public drug program spending on seniors in the six provinces, at \$486.1 million. Of the top 10 drug classes, 5 were used for cardiovascular conditions.
- HMG-CoA reductase inhibitors (statins)—a drug class used to lower cholesterol levels—accounted for the highest proportion of drug program spending on seniors in 2002 and 2008. Expenditures on this class more than doubled between 2002 and 2008, increasing to 13.8% of public drug program spending on seniors in 2008.
- The four classes new to the top 10 list in 2008 were anticholinesterases (used for Alzheimer’s disease), tumour necrosis factor alpha inhibitors (used for rheumatoid arthritis and Crohn’s disease), angiotensin II antagonists combined with diuretics (used for high blood pressure) and inhaled adrenergics and other drugs for obstructive airway diseases (used for asthma, emphysema and chronic bronchitis).

Which Drugs Showed the Most Change in Drug Program Spending on Seniors?

- In terms of public drug program spending, the fastest growing drug class between 2002 and 2008 was tumour necrosis factor alpha inhibitors (anti-TNF drugs), which are used to treat conditions such as rheumatoid arthritis and Crohn’s disease. Spending on this class grew at an average annual rate of 58.4% between 2002 and 2008. The rapid increase in spending is due in large part to the significant uptake of chemicals that were either relatively new at the start of the study period or not available in Canada until after the start of the study period.
- Seven of the top 10 fastest growing drug classes between 2002 and 2008 were also in the top 10 list in terms of total drug program spending on seniors in 2008. Four of the seven classes were used for cardiovascular conditions.
- The fastest decreasing drug class, in terms of drug program spending, was coxibs, used for pain management in conditions such as arthritis. New safety information around some of the products in this class led to a large decline in use.
- Several factors may have influenced changes in spending on drug classes, including the introduction of new drugs, the approval of new indications for existing drugs, the emergence of new safety information, changes in prescribing patterns, changes to formulary coverage and changes in the health status of the population.

How Is Public Drug Program Spending on Seniors Distributed?

- In 2008, almost half of total drug program spending (45.5%) in the six provinces was for a small group of seniors (14.7%), where the drug program paid \$2,500 or more of their annual drug costs.
- In 2008, 5.0% of drug program spending in the six provinces was for almost a third of seniors (31.2%), where the drug program paid less than \$500 of their annual drug costs.
- The distribution of drug program spending on seniors was similar among the six provinces.

How Many Drugs Are Seniors Using?

- In 2008, seniors on public drug programs had claims for an average of 6.5 drug classes and 6.7 chemicals.
- In 2008, 62.0% of seniors on public drug programs had claims for 5 or more drug classes, a slight increase from 2002 (57.7%); 21.4% had claims for 10 or more drug classes; and 5.5% of seniors had claims for 15 or more drug classes.
- There was wide variation in utilization among some of the top 10 drug classes most commonly used by all three groups (those who had claims for fewer than 5, 5 to 14 and 15 or more drug classes). For example, proton pump inhibitors (PPIs), a drug class commonly used to treat gastro-esophageal reflux disease, were used by only 8.3% of seniors with claims for fewer than 5 drug classes, compared with 60.8% of seniors with claims for 15 or more drug classes.
- The number of drug classes used by seniors increased with age: 28.6% of seniors age 85 and older had claims for 10 or more drug classes, compared with 16.8% of seniors between age 65 and 74.

What Drugs Are Being Used by Younger Versus Older Seniors?

- Seven of the top 10 most commonly used drug classes were common to seniors of all age groups.
- Statins were the most commonly used drug class among senior claimants between age 65 and 74 and age 75 and 84, with a utilization rate of 39.7% for both groups. Though still quite common among those 85 and older, statin use dropped to 24.3% among claimants in this age group.
- The utilization of plain sulfonamide diuretics, which treat heart failure and high blood pressure, was significantly higher among older seniors.

Introduction

Pharmaceuticals have become an increasingly significant component of the Canadian health care system. Drug expenditures have increased at a faster rate than total health expenditures and make up the second-largest component of health spending, after hospital expenditures.^{1, 2} Total drug expenditures in Canada increased from \$3.8 billion in 1985 to a forecast \$30.0 billion in 2009.² Spending on prescription drugs makes up the majority of total drug expenditures and is expected to reach \$25.4 billion in 2009.² These expenditures are shared by governments, private insurers and individuals who pay out of pocket.

Public-sector expenditures on prescribed drugs are expected to reach \$11.4 billion in 2009.² Public-sector payers include provincial/territorial and federal drug subsidy programs and social security funds, such as workers' compensation boards. While the share of seniors' drug costs paid by Canadian drug programs is unknown, it is expected that the senior population accounts for a significant percentage of these expenditures. It is estimated that, in 2007, per capita spending on prescription drugs by Canadian seniors (those age 65 and older) was three times the Canadian average and that seniors accounted for about 40% of all Canadian retail spending on prescription drugs.³

The Canadian senior population grew by 12% between 2001 and 2006, up to almost 14% of the total population.⁴ As this growth is expected to continue, there will be an ongoing need for detailed information regarding seniors' drug use and expenditure to support the overall management of public drug programs.

While several reports have examined trends in drug use and expenditures in Canada, there has been limited focus on seniors.^{2, 3, 5} As a result, several questions regarding seniors' drug use and expenditures remain largely unanswered, including

- How much are public drug programs spending on seniors?
- How is public drug program spending distributed across the senior population?
- What types of drugs account for public drug program expenditures for seniors?
- How many drugs are seniors using?
- How do drug utilization patterns change as seniors age?

Drug Use Among Seniors on Public Drug Programs in Canada, 2002 to 2008 will look further at these questions. Using drug claims and formulary data from the National Prescription Drug Utilization Information System (NPDUIS) Database, this report will provide an in-depth look at drug use of and expenditures on seniors, based on public drug program information from six Canadian provinces: Alberta, Saskatchewan, Manitoba, Nova Scotia, New Brunswick and Prince Edward Island.

This report is organized into three main sections. The first focuses on the drug coverage available to seniors in each of the six provinces, including important plan design differences that impact coverage, drug use and expenditure. The second examines the commonality of the public drug formularies of the six provinces, providing insight into the comparability of coverage. These two sections support interpretation of the drug utilization and expenditure data contained in the third section of this report, which looks at the distribution of public drug program expenditures across the senior population, as well as the drugs that account for the highest expenditure and the fastest growth in expenditure. This section also examines the mix and number of drugs that seniors are using and compares usage patterns as seniors age.

Public Drug Coverage Available to Seniors

This section provides an overview of public drug plan design differences that may impact seniors' drug coverage in the six provinces. It also summarizes the drug coverage available to seniors in the provinces under study. This information supports interpretation of the drug utilization and expenditure data presented later in this report. A glossary (Appendix A) provides definitions of key terms used in this report.

Overview of Drug Plan Design

Public drug coverage is available to seniors (people age 65 and older) in all six provinces included in the analysis; however, each drug program is designed differently. One of the major differences is that Alberta, Saskatchewan, New Brunswick, Nova Scotia and P.E.I. have drug plans designed specifically for seniors, whereas seniors in Manitoba are covered under a universal drug plan offered to residents of all ages. Prior to July 1, 2007, seniors in Saskatchewan were also covered under a drug plan offered to residents of all ages. Another important difference relates to the cost-sharing mechanisms used in the drug programs. These mechanisms, including premiums, deductibles and copayments, affect the amount that seniors are required to pay for their drugs.

Differences in plan design may impact drug utilization within the plans and, in turn, the claims submitted to the NPDUIS Database. For example, in provinces where plan members must pay premiums, a smaller number of seniors may choose public coverage, thereby reducing the percentage of seniors with claims accepted and paid for by the drug program. Seniors may choose private coverage, when available, particularly if it offers more affordable coverage. They may also choose to pay out of pocket if they expect their drug costs to be low. Premiums differ from deductibles and copayments in that they must be paid regardless of whether or not any drug expenses are incurred.

Deductibles and copayments (or a combination of the two) are also used to share costs between seniors and public drug programs. A deductible is an amount paid by the beneficiary toward eligible drug costs before any part of the drug costs will be paid by the drug program. Incurred drug costs that exceed the deductible may either be paid entirely by the drug program or shared between the beneficiary and the drug program through copayments. The latter allows costs to be spread out over time and limits the amount that a senior will have to pay out of pocket for a single prescription. In some cases, drug programs set a maximum contribution, which limits the amount a beneficiary can pay through copayments in a given time period. It is expected that drug programs with deductibles will have a lower proportion of seniors with paid claims than those who pay a portion of every claim.

It should be noted that several factors, aside from differences in plan design, may lead to variations in seniors' drug utilization and expenditure, both over time and among provinces. Factors include the health, age and sex of the population, prescribing trends, formulary listings and the availability of non-drug therapies.

Common to all six provinces, seniors covered by provincial workers' compensation boards or federal drug programs are not eligible for coverage under provincial drug programs. Federal drug programs include those delivered by

- The Canadian Forces;
- The Correctional Service of Canada;
- First Nations and Inuit Health Branch;
- The Royal Canadian Mounted Police; and
- Veterans Affairs Canada.

In addition to the overview presented here, further information about public drug programs in Canada can be found in the *NPDUIS Plan Information Document*, available at www.cihi.ca, or on the websites of the public drug programs (Appendix B).

Provincial Summaries of Seniors' Drug Coverage

The following summaries provide a high-level overview of the drug coverage available to seniors in each of the six provinces under analysis, as of December 31, 2008, the end of the study period. Some of the drug plans described are available to people of all ages, not only seniors. For more information on plan eligibility, please see the *NPDUIS Plan Information Document*.

Unless noted, there were no major changes to seniors' coverage or plan design (eligibility, cost-sharing mechanisms, etc.) from 2002 to 2008.

It is important to acknowledge that seniors not covered by publicly funded drug plans may have private drug plan coverage or pay out of pocket.

Claims data for seniors covered in the plans described below is included in the NPDUIS Database, unless otherwise noted.

Alberta

Drug coverage for seniors in Alberta is available through two publicly funded drug plans: Alberta Blue Cross Coverage for Seniors and Palliative Care Drug Coverage. The Alberta Blue Cross Coverage for Seniors plan applies to all Albertans age 65 or older and their dependants, as well as recipients of the province's Widows' Pensionⁱⁱ and their dependants. To qualify for coverage, the senior must be a resident of Alberta and be registered with the Alberta Health Care Insurance Plan.

Palliative Care Drug Coverage covers people receiving palliative care at home. To qualify for drug coverage under this plan, the person must be a resident of Alberta, be registered with the Alberta Health Care Insurance Plan, have been diagnosed by a physician as palliative and be receiving treatments at home.

ii. The Widows' Pension was created to provide assistance to residents of Alberta who lost their spouse, are age 55 to 65, have a low income and are not old enough to receive federal assistance.

Seniors covered under either of these programs are required to pay 30% of their drug costs, up to a maximum of \$25 for each drug prescribed. With Alberta Blue Cross Coverage for Seniors, the maximum amount the drug program will cover in a given year is \$25,000.ⁱⁱⁱ Under the Palliative Care Drug Coverage plan, there is no maximum for the drug program, but the maximum a senior is required to pay out of pocket is \$1,000 in total; the maximum does not apply only to expenditures in a given year.

Alberta's health region provides all medically required drugs at no direct cost to seniors residing in long-term care facilities, including nursing homes. The Alberta Cancer Board covers the cost of select medically required cancer drugs as specified in the Alberta Cancer Board Outpatient Cancer Drug Benefit Program for eligible cancer patients. Prescription drugs used to treat sexually transmitted diseases or tuberculosis are provided free of charge by Disease Control and Prevention. Provincewide Services provides coverage for high-cost drugs that treat conditions such as HIV or cystic fibrosis. Claims paid under any of these programs are not included in the NPDUIS Database.

Drug Program Formularies

Seniors in Alberta are eligible for medications listed in the Alberta Health and Wellness Drug Benefit List, subject to the criteria noted on that list. Under Palliative Care Drug Coverage, seniors are also entitled to drugs covered by the Palliative Care Drug Benefit Supplement.

Saskatchewan

Most seniors in Saskatchewan are covered under the Seniors' Drug Plan and/or the Special Support Program, which is available to residents of all ages. Seniors may also qualify for the Palliative Care Drug Plan, the Saskatchewan Aids to Independent Living (SAIL) program or Plan Three Supplementary Health benefits, all of which are also available to residents of all ages.

The Seniors' Drug Plan was introduced on July 1, 2007. Between July 1, 2007 and July 1, 2008, seniors were automatically enrolled in the plan. As of July 1, 2008, they must provide income information to be approved for coverage under the plan. A person may apply for coverage with automatic renewal or choose to re-enrol each year. Seniors with an income below a certain level (that is, seniors eligible for the federal age credit) qualify for coverage under this drug plan. Seniors pay a maximum copayment of \$15 for each eligible prescription (low-cost alternative policies apply). Those who receive certain federal/provincial income supplements are eligible for coverage with lower copayments, after their out-of-pocket expenditures reach a certain level.^{iv}

Seniors with anticipated drug costs in excess of 3.4% of their household income can also apply to the Special Support Program. Benefits are determined based on drug costs and income. Coverage may result in reduced copayments for seniors who are already covered by the Seniors' Drug Plan, or it may be a source of benefits for seniors who are not eligible for the Seniors' Drug Plan.

iii. On an exception basis, this amount can be modified by Alberta Health and Wellness.

iv. For more information on how these copayments are determined and Saskatchewan's drug program in general, see the *NPDUIS Plan Information Document*.

If a senior is approved for the Palliative Care Drug Plan, the SAIL plan (which provides benefits for people with certain long-term disabilities or illnesses) or Plan Three Supplementary Health benefits (available to seniors receiving the Saskatchewan Income Plan and residing in a special-care home), eligible prescriptions are covered at no cost. Claims for seniors covered under the SAIL or Plan Three programs are included in the NPDUIS Database only if the medication claimed is listed in the Saskatchewan Health Drug Plan Formulary.

Prescription drugs covered by the Saskatchewan Cancer Agency are provided free of charge to registered cancer patients. These claims are not included in the NPDUIS Database.

Drug Program Formularies

Seniors in Saskatchewan are eligible to receive medications listed in the Saskatchewan Health Drug Plan Formulary, subject to the criteria noted in the formulary. All plans use the same formulary, though additional benefits are available under the SAIL, Plan Three and Palliative Care programs.

Manitoba

Seniors in Manitoba are eligible for drug coverage through four programs: Pharmacare; Employment and Income Assistance; Home and Nursing Care; and Palliative Care.

The Pharmacare program provides coverage to the majority of Manitoba seniors, although it is designed to cover residents of all ages. For seniors to be eligible for coverage, they must provide income information so that any applicable deductible can be calculated.^v A person may enrol indefinitely or choose to re-enrol each year. Unlike plans with age-based eligibility rules, Manitoba's plan maintains the same eligibility criteria for drug coverage regardless of age. Once the deductible amount has been reached, all of the costs are covered for any drug listed on the formulary.

If a senior is receiving Employment and Income Assistance (EIA), lives in a personal care home, is undergoing in-home cancer treatment that requires drugs or is receiving palliative care at home, 100% of the costs of any drug listed on the formulary of the applicable drug program will be covered, with no deductible.

Drug Program Formularies

Seniors covered under the public drug programs are eligible to receive medications listed on the plan formulary, subject to the criteria noted in the formulary. The core drugs listed on the formularies of the four plans are the same, although there are additional drugs listed on the formularies of the EIA, Home and Nursing Care and Palliative Care programs.

v. For more information on the calculation of the deductible and Manitoba's drug program in general, see the *NPDUIS Plan Information Document*.

New Brunswick

Drug coverage in New Brunswick is available to eligible seniors through the New Brunswick Prescription Drug Program (NBPDP). The NBPDP provides coverage to all eligible residents of the province who are older than 65 and who either receive the federal Guaranteed Income Supplement (GIS) or qualify based on income.^{vi} To be eligible, seniors must be registered with New Brunswick Medicare.

Seniors who do not qualify for the NBPDP may apply to purchase equivalent prescription drug coverage through the Medavie Blue Cross Seniors' Drug Program. They will be granted coverage under this plan if they apply within 60 days following their 65th birthday or within 60 days following the cancellation of other drug coverage after their 65th birthday. Coverage of late applicants (that is, those who apply after 60 days) is dependent on a review of their medical history. Seniors who wish to enrol in the Medavie Blue Cross Seniors' Drug Program are required to pay a monthly premium of \$89.^{vii} There is no premium for coverage through the NBPDP.

Once enrolled in either of these programs, seniors must pay a part of each prescription. Those receiving the GIS are required to pay a maximum of \$9.05 for each prescription, to a yearly maximum of \$250. Seniors who qualify for the NBPDP based on their annual income, or who are enrolled in the Medavie Blue Cross Seniors' Drug Program, are required to pay up to \$15 per prescription, with no maximum contribution.

All New Brunswick seniors who reside in licensed adult residential facilities or nursing homes are also eligible for prescription drug coverage through the NBPDP. Those residing in adult residential facilities must pay \$4 per prescription, to a maximum of \$250 per year, while seniors in nursing homes are not required to pay any copayments or fees. Seniors with cystic fibrosis or HIV and those who have had an organ transplant are required to pay a copayment of 20%, to a maximum of \$20 per prescription. The maximum copayment amount per fiscal year is \$500 per family unit.

Seniors with multiple sclerosis are required to pay an annual registration fee and an income-based copayment ranging from 0% to 100% of the prescription drug cost. Both the NBPDP and the Medavie Blue Cross Seniors' Drug Program provide coverage to eligible seniors for a select group of drugs used to treat cancer and its symptoms.

Drug Program Formularies

Seniors enrolled in the NBPDP and the Medavie Blue Cross Seniors' Drug Program are eligible for prescription drugs listed on the NBPDP formulary, subject to the criteria noted in the formulary. Seniors who are enrolled in one of the supplementary plans are entitled to additional drugs covered by the respective plans.

vi. For more information on income requirements and the New Brunswick Prescription Drug Program in general, see the *NPDUIS Plan Information Document*.

vii. As of August 1, 2009, the monthly premium is \$105.

Nova Scotia

Seniors in Nova Scotia are eligible for coverage under three programs: Seniors' Pharmacare, Family Pharmacare and Drug Assistance for Cancer Patients.

For seniors to be eligible for coverage under any program, they must provide income information so any applicable premium or deductible can be calculated. A person must renew his or her application every year.

Seniors must pay a premium to join the Seniors' Pharmacare program. This premium is based on income and may be waived entirely for seniors below a certain income threshold. Once enrolled in the plan, seniors pay 33% of each claim, up to an annual maximum of \$382.^{viii} Once the maximum contribution has been reached, the drug program pays 100% of eligible drug costs.

As of March 1, 2008, seniors may choose to be covered under Family Pharmacare. Under this program, there is no premium; however, deductibles and copayments are applied. Prior to reaching their deductible, seniors pay the full cost of all eligible prescriptions. The majority (80%) of the cost of each prescription is counted toward an income-based deductible, and the remainder (20%) is paid as a copayment. Once the deductible has been reached, a copayment of 20% is applied until the maximum out-of-pocket drug costs are reached. The maximum contribution is also income based. The drug program covers 100% of eligible drug costs exceeding the maximum contribution. Seniors may be enrolled in both the Drug Assistance for Cancer Patients and Family Pharmacare programs.

Drug Assistance for Cancer Patients offers coverage to seniors with a family income below a certain threshold. This program covers 100% of drug costs for a select group of drugs used to treat cancer and its symptoms. These drugs are also covered under Seniors' Pharmacare, as are prescription drugs for seniors residing in a long-term care facility.

Drug Program Formularies

Seniors covered under the public drug programs are eligible to receive medications listed on the plan formularies, subject to the criteria noted in the formularies. The Seniors' Pharmacare and Family Pharmacare programs use the same formulary. Drug Assistance for Cancer Patients provides coverage for a select group of drugs used to treat cancer and its symptoms.

Prince Edward Island

Drug coverage in P.E.I. is available to eligible recipients through the Prince Edward Island Drug Programs. Seniors are eligible for the following programs: the Seniors' Drug Cost Assistance Program (DCAP); the Diabetes Control Program; the Financial Assistance Program; the Family Health Benefits Program; the High Cost Drugs Program (which covers drugs required to treat cancer, multiple sclerosis, severe rheumatoid arthritis and severe Crohn's disease); the Nursing Home Program; the Sexually Transmitted Diseases Program; and the Quit Smoking Program.

viii. Prior to April 1, 2008, there was a \$30 maximum copayment per prescription. As of April 1, 2009, the copayment is reduced to 30%.

P.E.I. residents age 65 or older who qualify for P.E.I. Medicare are automatically enrolled in the DCAP.

Seniors covered by the DCAP are required to pay a copayment of \$11 for each prescription, plus the cost of the professional fee, with no maximum contribution. Seniors eligible for coverage under the Financial Assistance Program and the Nursing Home Program (that is, seniors eligible for coverage under the *Welfare Assistance Act*) are not required to pay any copayments or fees for eligible prescriptions.

Seniors who meet certain income requirements, who have children younger than 18 (or younger than 25 if they are full-time students) living at home, are required to pay only the professional fee for each eligible prescription.

Seniors are also eligible for supplemental drug coverage if they require drugs to treat certain conditions. Those eligible for the Diabetes Control Program pay a fixed copayment (the amount depends on the drug or supply) plus the professional fee, with no maximum contribution. Seniors eligible for the High Cost Drugs Program pay an income-based copayment, plus the professional fee. Seniors covered under the Sexually Transmitted Disease Program are not required to pay any copayments or fees. Under the Quit Smoking Program, the first \$75 of eligible drug costs are covered, and the senior must pay any additional costs. Drugs for certain other conditions are also provided to eligible seniors at no cost.^{ix} The additional coverage provided by these supplementary plans applies only to prescriptions for drugs used to treat the conditions specified by each plan. Other prescriptions for seniors covered by a supplementary plan must be paid for as specified by the DCAP.

Claims for seniors covered under the Multiple Sclerosis Program (part of the High Cost Drugs Program), or any supplementary plan not specifically mentioned above, are not included in the NPDUIS Database. Claims for seniors in government manors (that is, publicly owned nursing homes) are not included in the NPDUIS Database.

Drug Program Formularies

Seniors covered under the Seniors' Drug Cost Assistance Program are eligible to receive medications, subject to any criteria listed in the P.E.I. Drug Programs Formulary. As well, seniors who are enrolled in one of the supplementary plans are entitled to additional drugs covered by the respective plans, as noted in the formularies.

ix. For more information on eligibility for these plans and on the Prince Edward Island Drug Programs in general, see the *NPDUIS Plan Information Document*.

Formulary Overview

Variation in the number and types of drugs covered by provincial formularies is one of many factors that can lead to differences in drug utilization and expenditure. Other factors include the health, age and sex of the population, prescribing trends and the availability of non-drug therapies.

This section assesses the commonality of the public drug formularies of the six provinces as of December 31, 2008 (that is, the degree to which the formularies of the six provinces are the same). The main objective of this section is to explore whether differences in formulary coverage significantly affect the comparability of drug utilization and expenditure in the six provinces. These findings will provide important contextual information to support the interpretation of the analyses performed in later sections of this report. A secondary objective is to examine the commonality of the formularies themselves.

It is important to note that the analysis in this section will not assess all aspects of formulary listings; it is intended to provide some insight into, but not a complete picture of, formulary commonality. This analysis does not consider the level of restriction, or “openness,” of individual formulary listings, which may vary by province. Formulary listings may be open to anyone covered by the respective drug program who is prescribed the medication, or they may be restricted to those on select drug plans (for example, palliative care or cancer care). Listings may also be restricted by such requirements as an approved application and assessment (based on a predetermined set of criteria). In addition, some drug products, such as cancer medicines, might be paid for by a government agency outside of the drug program and may not appear on the drug program formulary, even though they are covered.

For this analysis, drugs were grouped using the World Health Organization (WHO) Anatomical Therapeutic Chemical (ATC) classification system, which divides drugs into groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties (Appendix C). There are five levels in the ATC system, ranging from a very broad anatomical grouping (Level 1) to pharmacologic and therapeutic subgroups (levels 2, 3 and 4) and chemical substances (Level 5). The majority of analyses in this report are presented at the chemical subgroup level (ATC Level 4). At this level, subgroups are, in theory, regarded as groups of different chemicals that work in the same way to treat similar medical conditions. For example, the chemical subgroup bisphosphonates includes chemicals such as etidronate, alendronate and risedronate. The term “drug class” will be used to refer to subgroups of chemicals classified by the WHO at the fourth level of the ATC classification system.

Formulary Comparison

Drug program formularies were most similar when listed drug classes were weighted by their contribution to total drug program spending. The drug classes that were listed in all six provinces accounted for 88.3% of all public drug program spending, and drug classes that were listed in at least five provinces accounted for 97.0% of all program spending. These results are similar to those from a recently published study that looked at the commonality of public drug formularies across Canada.⁶ Although payments for drugs

not listed on any formulary were negligible, there are cases where drug programs will reimburse beneficiaries for drug products not listed on their formularies. When considering spending on seniors only, commonality is even higher, with drug classes that were listed in all six provinces accounting for 91.9% of all drug program spending on seniors.

Because such a large portion of program expenditures is for drug classes that are listed in all six provinces, differences in formulary coverage are not expected to play a large role in any provincial differences in overall expenditures. However, differences in formulary coverage may have a significant impact on the utilization of specific drugs or drug classes across provinces. Given this potential impact, it is important to consider differences in formulary listings when interpreting provincial differences in drug utilization or expenditure for specific drugs or drug classes.

The commonality of formulary listings was lower when drug classes were not weighted by their contribution to overall drug program spending. Of the drug classes that were listed on a public drug program formulary in at least one province, 43.7% were listed in all six provinces. This result is similar to those of previous studies that have also found variation in public drug formulary listings across Canada.⁷⁻¹⁰ Two studies—one comparing listings in 6 Canadian provinces and another comparing listings in 10 Canadian provinces—found commonality among all provinces studied for 40.7% and 41.5% of drug classes, respectively.^{8,9} Again, it is important to note that these types of comparisons do not consider the level of restriction, or “openness,” of individual formulary listings, which may vary by province.

Drug Expenditure and Utilization Analysis

The analysis in this section will address the following questions:

- What is the size of the senior claimant population in each province?
- How much do public drug programs spend on seniors?
- Which drugs account for the highest drug program spending on seniors?
- Which drugs showed the most change in drug program spending on seniors?
- How is public drug program spending on seniors distributed?
- Which drugs account for drug program spending on seniors with low, medium and high drug costs?
- How many drugs are seniors using?
- What drugs are used by younger versus older seniors?

Background information on drug claims accepted and paid by the public drug programs provides insight into the size of the senior claimant population in each province. The term “drug class” will be used to refer to subgroups of chemicals classified by the WHO at the fourth level of the ATC classification system. The common uses of the drug classes will not always include all of the approved indications in Canada. Appendix D summarizes the calculation methods used in this section.

What Is the Size of the Senior Claimant Population in Each Province?

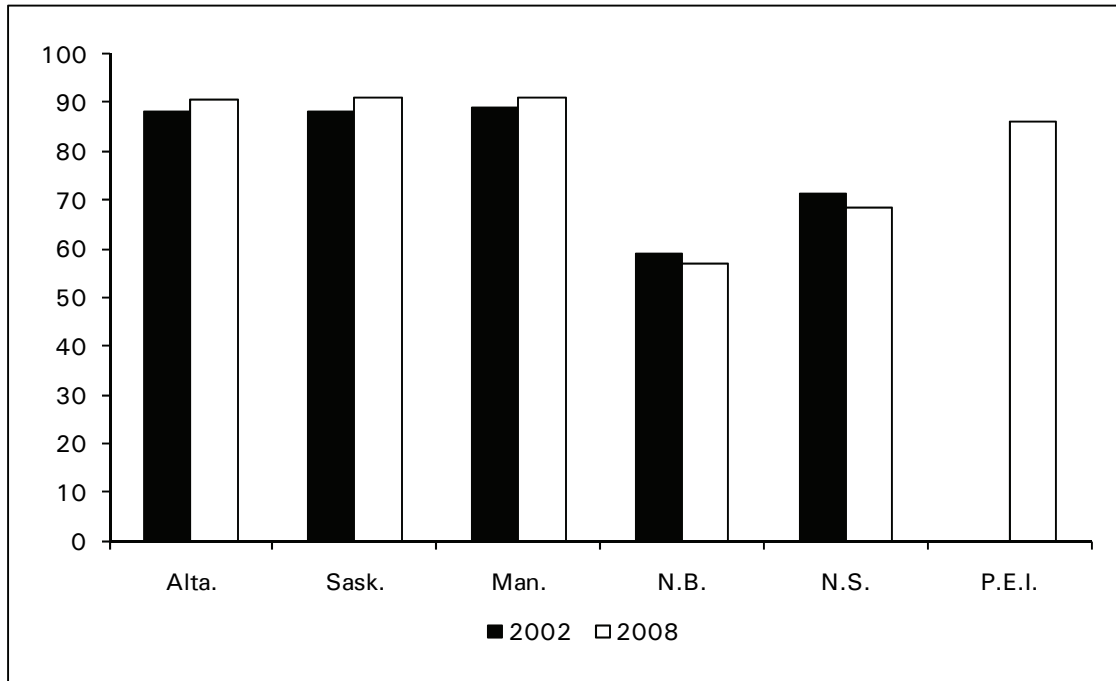
In 2008, there were 374,248 seniors (people age 65 or older) living in Alberta; 151,566 in Saskatchewan; 166,455 in Manitoba; 113,599 in New Brunswick; 144,446 in Nova Scotia; and 21,130 in P.E.I.¹¹

There was variation in the age distribution of senior claimant populations of the six provinces. Saskatchewan had the highest proportion of claimants older than 85, at 16.3%, while Alberta had the smallest proportion, at 12.7% (Appendix F).

The proportion of seniors who had drug claims accepted by the public drug programs in the six provinces in 2008 varied from 57.0% in New Brunswick to 91.1% in Manitoba (Figure 1).^x The lower percentages in New Brunswick (57.0%) and Nova Scotia (68.5%) were likely related to plan design (see Public Drug Coverage Available to Seniors). The proportion of seniors who had drug claims accepted by the public drug programs remained relatively stable in all provinces between 2002 and 2008.

x. Population data comes from Statistics Canada, *Demographic Estimates Compendium 2009*. The population estimates for 2002 are considered final, while interim population estimates were used for 2008.

Figure 1 Percentage of Seniors on Public Drug Programs With Accepted Claims, Select Provinces,* 2002 and 2008



Note

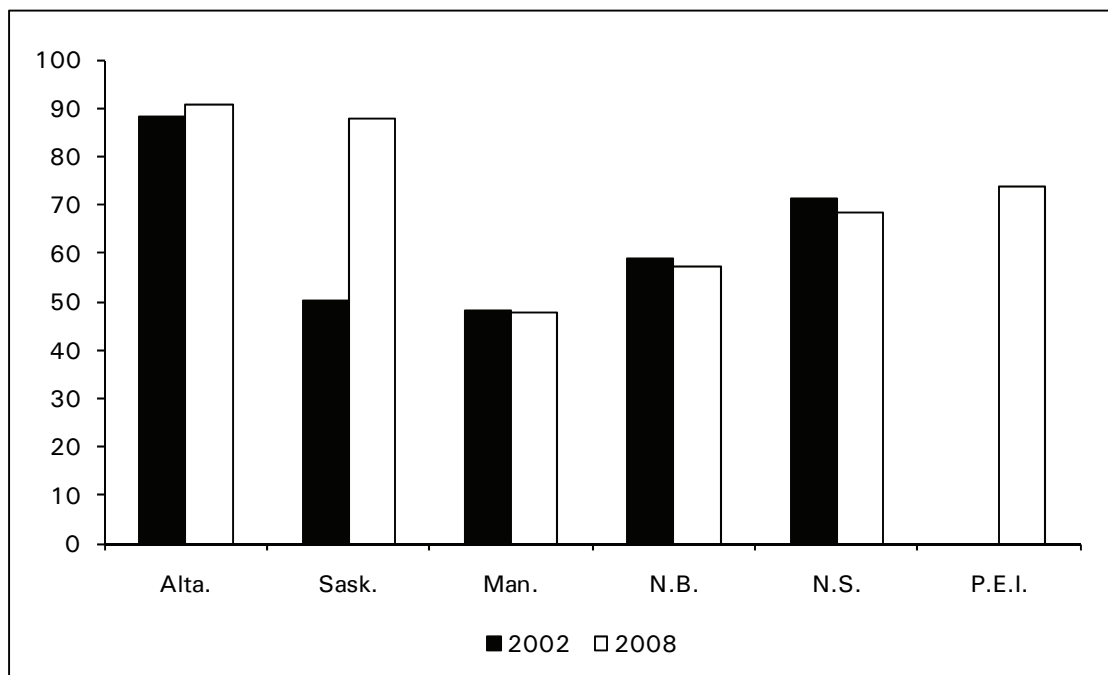
* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island. P.E.I. data is included in 2008, but not in 2002, as data is not available prior to 2004.

Sources

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information; Population, Statistics Canada.

The proportion of seniors who had drug claims paid by the public drug programs in the six provinces in 2008 varied from 47.6% in Manitoba to 90.6% in Alberta (Figure 2). In provinces where the public drug program pays a portion of every claim (Alberta and New Brunswick), the number of seniors with paid claims will be identical to the proportion with accepted claims. In provinces with either fixed copayments or deductibles, the number of seniors with paid claims will be lower than the number with accepted claims. The difference is likely to be greatest in Manitoba, which applies a deductible for a large portion of beneficiaries. Also, by definition, a claim must be accepted to be paid; the number of seniors with paid claims cannot be higher than the number with accepted claims. The proportion of seniors who had drug claims paid by public drug programs remained relatively stable in all provinces between 2002 and 2008, with the exception of Saskatchewan, whose proportion increased significantly when a maximum copayment was introduced for a large number of seniors on July 1, 2007.

Figure 2 Percentage of Seniors on Public Drug Programs With Paid Claims, Select Provinces,* 2002 and 2008



Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island. P.E.I. data is included in 2008, but not in 2002, as data is not available prior to 2004.

Sources

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information; Population, Statistics Canada.

It should be noted that the denominators used in the calculations in figures 1 and 2 include seniors who are not eligible for provincial drug coverage because they receive drug coverage from another source (for example, federal drug programs or private drug insurance) or who were eligible for public drug coverage but did not apply to have their deductibles calculated. The percentages of patients with accepted and paid claims would be higher if only the eligible and enrolled population was considered. It should also be noted that, as the numerator is a cumulative count of claimants throughout the year and the denominator is measured at a given point in time (that is, July 1 of each year), it is possible for the percentage to be greater than 100%.

How Much Do Public Drug Programs Spend on Seniors?

“Public drug program spending on seniors” refers to only the amount paid by the drug program toward a senior’s prescription costs. Any portion of the prescription cost paid by either the senior or a third-party private insurer is not captured in this amount. The costs included are the drug cost (the actual cost of the drug product being dispensed), as well as any pharmacy professional fees or pharmacy markup, if applicable. For simplicity, “prescription costs” will be referred to in this report as drug costs, although other costs associated with the prescription may also be included.

Drug programs in the six provinces spent just more than \$1.0 billion on claims for seniors in 2008, increasing at an average annual rate of 8.6%, from \$603.5 million in 2002 (Table 1).^{xi} As expected, due to relative population size, spending in Alberta made up the highest proportion of overall program spending for seniors in the six provinces, at 45.6%, and P.E.I. made up the smallest proportion, at 1.5%. The trends observed in the following analysis will be influenced by trends in Alberta, because it makes up the largest proportion of the total. However, in general, trends in drug spending and utilization were found to be similar among the six provinces.

In 2008, average drug program spending per paid senior beneficiary among the six provinces varied from \$875 in P.E.I. to \$1,632 in Manitoba (Table 1). The amount paid per senior beneficiary is influenced by many factors, including the quantity and mix of drugs claimed, variations in drug prices, plan eligibility rules and the cost-sharing mechanisms in place in each province. Program spending per paid senior beneficiary increased in every province between 2002 and 2008. The lower amount in P.E.I. may be partly due to its copayment system, which requires seniors to pay the full amount for many low-cost prescriptions.

Table 1 Public Drug Program Spending on Seniors, Select Provinces,* 2008

Province	Drug Program Spending on Seniors (\$ Millions)	Drug Program Spending per Paid Senior Beneficiary (\$)
Alta.	458.5	1,352
Sask.	151.2	1,136
Man.	129.2	1,632
N.B.	102.0	1,574
N.S.	149.5	1,515
P.E.I.	15.5	875
Total	1,005.9	1,373

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

xi. Drug program spending in P.E.I. was excluded from the growth rate calculation, as data is not available prior to 2004.

In 2008, among all six provinces, average drug program spending per paid beneficiary age 65 to 74, age 75 to 84 and age 85 and older was \$1,279, \$1,485 and \$1,403, respectively (Table 2). The highest average program spending per paid senior beneficiary was on seniors age 75 to 84 in all provinces except Manitoba, where the highest average spending was on paid beneficiaries age 65 to 74 (although the amount was similar to average spending on seniors age 75 to 84). In all six provinces, average program spending on seniors age 85 and older was lower than average spending on seniors age 75 to 84.

Table 2 Public Drug Program Spending on Seniors, by Age Group, Select Provinces,* 2008

Age Group	Drug Program Spending (\$ Millions)	Proportion of Total Drug Program Spending (%)	Proportion of Total Senior Claimant Population (%)	Drug Program Spending per Paid Beneficiary (\$)
65–74	452.1	44.9	49.1	1,279
75–84	392.2	39.0	35.6	1,485
85+	161.6	16.1	15.3	1,403
Total	1,005.9	100.0	100.0	1,373

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Which Drugs Account for the Highest Drug Program Spending on Seniors?

As previously mentioned, total drug program spending on seniors among the six provinces was just more than \$1.0 billion in 2008. Spending was spread among 440 drug classes; the top 10 drug classes, in terms of drug program spending for 2008 and 2002, are presented in tables 3 and 4. During this time period, expenditures on the top 10 drug classes increased by 65.8%, from \$287.7 million in 2002, to \$486.1 million in 2008.^{xii} In both years, these drug classes accounted for almost half of drug program spending on seniors.

There were six classes on the 2008 top 10 list that also appeared on the 2002 list. Five of the six drug classes common to both years were cardiovascular-related. Proton pump inhibitors (PPIs), commonly used in the treatment of gastro-esophageal reflux disease, was the other drug class. The top drug class in both years was HMG-CoA reductase inhibitors, commonly referred to as statins, which are used to lower cholesterol levels. Expenditures on this class more than doubled between 2002 and 2008, increasing to 13.8% of all program spending on seniors in 2008, from 10.6% in 2002. PPIs accounted for the second-highest proportion of drug program spending in 2008 (at 6.9%), up from third highest in 2002. The five cardiovascular drug classes in the top 10 accounted for 31.6% of drug program spending on seniors in 2008.

There were four classes in the 2008 top 10 list that did not appear in the 2002 list: anticholinesterases, tumour necrosis factor alpha inhibitors (anti-TNF drugs), angiotensin II antagonists combined with diuretics, and inhaled adrenergics and other drugs for obstructive airway diseases. The four classes in the 2002 top 10 list that were not in the 2008 list were coxibs, selective serotonin reuptake inhibitors (SSRIs), beta blockers and inhaled glucocorticoids. Changes between 2002 and 2008 are explained in part by drug classes with significant growth or decline in expenditure. These areas will be examined in more detail in the next section of this report.

Although drug claims data from British Columbia, Ontario and Quebec is not currently submitted to the NPDUIS Database, each province reports on the top 10 drugs or drug classes based on drug program expenditures.¹²⁻¹⁴ It is important to note that the comparability of these lists to the top 10 list in this report (Table 3) is limited, due to the inclusion of non-seniors and the use of slightly differing time periods in B.C. and Ontario, and the use of different drug classifications in all three provinces. With these caveats in mind, there are similarities between the lists. Drugs from each of the top four drug classes among the NPDUIS Database provinces appear among the top 10 in each of the three non-submitting provinces, with statins (or a statin) being at the top of each list.¹²⁻¹⁴ For Ontario (where seniors account for roughly 70% of Ontario Drug Program beneficiaries), 8 of the top 10 drugs were from classes appearing in the top 10 among NPDUIS Database provinces.¹³

xii. Drug program spending in P.E.I. was excluded from the growth rate calculation, as data is not available prior to 2004.

Table 3 Top 10 Drug Classes, by Total Public Drug Program Spending on Seniors, Select Provinces,* 2008

Drug Class	Common Uses	Total Program Spending (\$ Millions)	Proportion of Total Program Spending (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	138.7	13.8
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	69.0	6.9
Dihydropyridine calcium channel blockers	High blood pressure	65.9	6.5
ACE inhibitors, plain	Heart failure, high blood pressure	51.3	5.1
Angiotensin II antagonists, plain	High blood pressure, heart failure	40.6	4.0
Platelet aggregation inhibitors, excluding heparin	Heart attack and stroke prevention	29.0	2.9
Adrenergics and other drugs for obstructive airway diseases, inhaled	Asthma, emphysema, chronic bronchitis	28.2	2.8
Angiotensin II antagonists and diuretics	High blood pressure	21.7	2.2
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, Crohn's disease	21.2	2.1
Anticholinesterases	Alzheimer's disease	20.5	2.0
Combined Top 10		486.1	48.3

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 4 Top 10 Drug Classes, by Total Public Drug Program Spending on Seniors, Select Provinces,* 2002

Drug Class	Common Uses	Total Program Spending (\$ Millions)	Proportion of Total Program Spending (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	64.1	10.6
ACE inhibitors, plain	Heart failure, high blood pressure	51.3	8.5
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	47.9	7.9
Dihydropyridine calcium channel blockers	High blood pressure	33.6	5.6
Coxibs	Management of pain in rheumatoid arthritis and osteoarthritis, and of acute pain in adults	26.1	4.3
Angiotensin II antagonists, plain	High blood pressure, heart failure	16.3	2.7
Selective serotonin reuptake inhibitors	Depression	15.1	2.5
Platelet aggregation inhibitors, excluding heparin	Heart attack and stroke prevention	11.6	1.9
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	10.9	1.8
Glucocorticoids, inhaled	Prevention of asthma attacks	10.9	1.8
Combined Top 10		287.7	47.7

Note

* Five provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick and Nova Scotia.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Which Drugs Showed the Most Change in Drug Program Spending on Seniors?

The previous section looked at the types of drug classes that accounted for the highest spending among seniors in 2002 and 2008. This section will look further into changes between the two years. Tables 5 and 6 present the top 10 fastest growing and fastest declining drug classes, in terms of average annual growth in drug program spending between 2002 and 2008. As noted previously, total drug program spending on seniors among the five provinces grew at an average annual rate of 8.6% during this period. (It should be noted that P.E.I. data was excluded from the 2008 total when calculating growth rates in order to compare with 2002, when data for P.E.I. was not available.)

Fastest Growing Drug Classes

The fastest growing drug class between 2002 and 2008 was tumour necrosis factor alpha inhibitors (anti-TNF drugs), used to treat conditions such as rheumatoid arthritis and Crohn's disease (Table 5). Drug program spending on these drugs increased by an average of 58.4% per year during the study period and accounted for 2.1% of total program spending for seniors in 2008. Seven of the top 10 fastest growing drug classes were also in the top 10 in terms of total program spending in 2008. Four of the top 10 fastest growing drug classes are used to treat cardiovascular conditions and two are used to treat pulmonary conditions.

Table 5 Top 10 Fastest Growing Drug Classes, by Average Annual Growth (AAG) in Total Public Drug Program Spending on Seniors (TPS), Select Provinces,* 2002 to 2008

Drug Class	Common Uses	AAG (%) in TPS	Proportion of TPS in 2008 (%)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, Crohn's disease	58.4	2.1
Angiotensin II antagonists and diuretics	High blood pressure	30.6	2.2
Anticholinergics, inhaled	Emphysema, chronic bronchitis	24.2	1.6
Anticholinesterases	Alzheimer's disease	19.6	2.0
Adrenergics and other drugs for obstructive airway diseases, inhaled	Asthma, emphysema, chronic bronchitis	18.5	2.8
Thiazolidinediones	Diabetes	18.0	1.4
Platelet aggregation inhibitors, excluding heparin	Heart attack and stroke prevention	16.2	2.9
Angiotensin II antagonists, plain	High blood pressure, heart failure	15.9	4.0
HMG-CoA reductase inhibitors (statins)	High cholesterol	13.3	13.7
Bisphosphonates	Osteoporosis	13.1	2.0
Total Program Spending		8.6	100.0

Note

* Five provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick and Nova Scotia.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Increases in spending on drug products can occur for several reasons, including the introduction of new drugs, the approval of new indications for existing drugs, changes in prescribing patterns, changes to formulary coverage or changes in the health status of the population. (For a more comprehensive list, see Appendix E.)

The increase in drug program spending on anti-TNF drugs is due in large part to the fact that the class as a whole was relatively new at the start of the study period. Etanercept and infliximab were marketed in Canada in 2001, and both had significant uptake during the study period. The third chemical, adalimumab was not introduced until 2004, and accounted for a quarter (25.0%) of drug program spending on anti-TNF drugs in 2008.

Spending on angiotensin II inhibitors, both alone and in combination with thiazide diuretics, increased at an average annual rate of 15.9% and 30.6%, respectively, between 2002 and 2008. These increases are similar to those found in a previous study that looked at long-term trends in the use of and expenditure for cardiovascular medications in Canada.¹⁵ This study cited two major factors that influenced the increased use of these and other antihypertensive drugs: an increase in the prevalence of hypertension in Canada (from 8.2% in 1994, to 14.6% in 2005); and changes in treatment guidelines for hypertension. Hypertension guidelines now often include newer drug classes, including angiotensin II inhibitors, as possible first-line therapies.¹⁵

The increase in drug program spending on combination products containing inhaled adrenergics and other products for obstructive airway diseases appears to be due in part to switching from older, single-ingredient products. Of those patients using an inhaled single-ingredient adrenergic product in 2002 who were still using an adrenergic (either as a single-ingredient or combination product) in 2008, 38.8% had switched to a combination product by 2008. The switch to combination products also contributed to a decline in drug program spending on inhaled single-ingredient glucocorticoids, a class often combined with adrenergics in combination products.

It should be noted that although thiazolidinediones—a newer class of drugs used to treat diabetes—experienced high growth in drug program spending during the study period overall, there was a significant (28.3%) drop in spending on these drugs between 2007 and 2008, most likely in response to new safety information that emerged about the drug class.¹⁶

Fastest Declining Drug Classes

The fastest declining drug class, in terms of drug program spending, was coxibs, used to manage pain in conditions such as arthritis (Table 6). Drug program spending on these drugs decreased by an average of 17.2% per year during the study period and accounted for 0.8% of total plan spending on seniors in 2008.

Table 6 Top 10 Fastest Declining Drug Classes, by Average Annual Growth (AAG) in Total Public Drug Program Spending on Seniors (TPS), Select Provinces,* 2002 to 2008

Drug Class	Common Uses	AAG (%) in TPS	Proportion of TPS in 2008 (%)
Coxibs	Management of pain in rheumatoid arthritis and osteoarthritis, and of acute pain in adults	-17.2	0.8
H2-receptor antagonists (H2RAs)	Gastro-esophageal reflux disease, peptic ulcer disease	-7.4	0.6
Phenylalkylamine calcium channel blockers	Abnormal heart rhythm, high blood pressure, angina (chest pain)	-5.7	0.3
Bisphosphonates, combinations	Osteoporosis	-4.4	0.3
Glucocorticoids, inhaled	Prevention of asthma attacks	-2.3	1.0
Natural and semi-synthetic estrogens, plain	Menopause symptoms, osteoporosis prevention	-2.1	0.3
Other antipsychotics (for example, risperidone)	Schizophrenia, bipolar disorder	-1.8	0.3
Beta-blocking agents, non-selective	High blood pressure, heart failure, angina (chest pain)	-1.7	0.3
Organic nitrates	Prevention and treatment of angina (chest pain)	-1.4	0.8
ACE inhibitors, plain	Heart failure, high blood pressure	-0.4	5.1
Total Program Spending		8.6	100.0

Note

* Five provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick and Nova Scotia.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Decreases in the use of a drug product or class of drugs can occur for several reasons, including the introduction of new drugs, the emergence of new safety information, changes in prescribing patterns or changes to formulary coverage. (For a more comprehensive list, see Appendix E.) In the example of coxibs, the emergence of new safety information about some of the products in this class led to a large decline in use.¹⁷ Safety concerns also had a role in the decline of estrogens.¹⁸

In the case of bisphosphonate combinations, there has been significant uptake of newer, single-ingredient products, which fall into a different drug class. This has led to switching away from older products.¹⁹ The decrease in drug program spending on histamine-2 receptor antagonists (H2RAs) also appears to be due in part to patients switching therapies. A previous CIHI study found that, of H2RA users in 2002–2003 who were still using a prescription drug for an acid-related disorder in 2007–2008, 51.8% had switched

to a PPI. A much smaller percentage of PPI users (8.3%) switched to an H2RA during the same time period.²⁰ As noted previously, PPIs were the second-highest class in total drug program spending in 2008 (Table 3).

How Is Public Drug Program Spending on Seniors Distributed?

This section will examine the distribution of public drug program spending on seniors based on the amount the public drug programs paid toward their annual drug costs. As previously mentioned, in this report, “drug costs” refers to all costs associated with a prescription.

In general, the majority of drug program spending on seniors is for a relatively small number of high-cost beneficiaries. In 2008, the six drug programs paid \$2,500 or more towards drug costs for 14.7% of seniors who had at least one paid claim; however, these seniors accounted for 45.5% of total program spending. Conversely, the six drug programs paid less than \$500 on drug costs for about one-third (31.2%) of seniors, accounting for only 5.0% of total drug program spending on seniors.

Table 7 shows both the percentage of paid beneficiaries and the total amount paid by the public drug programs across per beneficiary program spending ranges in the six provinces. In general, the distribution of costs among the provinces is similar. The proportion of seniors for whom the drug program covered less than \$500 in drug costs ranged from 26.3% in New Brunswick to 44.0% in P.E.I. The higher proportion in P.E.I. may be partly due to its copayment system, which requires seniors to pay the full cost for many low-cost prescriptions. Although New Brunswick has the lowest proportion of paid beneficiaries for whom the drug program paid less than \$500, its rate is similar to that found in Alberta, Manitoba and Nova Scotia. The proportion of seniors for whom the drug program paid \$5,000 or more toward drug costs varied from 1.0% in P.E.I. to 4.5% in Manitoba.

The proportion of drug program costs associated with seniors for whom the drug program covered less than \$500 in drug costs ranged from 3.7% in New Brunswick to 10.4% in P.E.I. Again, the high proportion in P.E.I. may be related to its copayment system. The proportion of costs associated with seniors with \$5,000 or more in drug costs paid by the drug program varied from 9.1% in P.E.I. to 24.3% in Manitoba.

Table 7 Percentage of Paid Senior Beneficiaries (PB) and Percentage of Total Drug Program Spending on Seniors (TPS), by Program Spending per Beneficiary, Select Provinces,* 2008

Program Spending	Alta.		Sask.		Man.		N.B.		N.S.		P.E.I.		Total	
	% PB	% TPS	% PB	% TPS	% PB	% TPS	% PB	% TPS	% PB	% TPS	% PB	% TPS	% PB	% TPS
< \$500	29.9	4.7	38.6	7.0	29.2	4.3	26.3	3.7	28.6	4.6	44.0	10.4	31.2	5.0
\$500– \$1,499	37.3	26.3	36.3	29.6	34.3	19.7	36.0	21.8	36.7	22.1	39.7	41.2	36.7	25.1
\$1,500– \$2,499	18.6	26.6	14.5	24.6	17.2	20.4	19.3	23.8	16.6	21.3	11.1	24.0	17.3	24.4
\$2,500– \$4,999	12.2	29.8	8.8	26.0	14.9	31.3	14.9	31.8	14.5	32.8	4.2	15.4	12.2	29.9
\$5,000– \$9,999	1.7	7.7	1.4	8.0	3.7	14.7	3.0	12.4	3.2	13.4	0.9	6.3	2.1	9.9
\$10,000+	0.4	4.7	0.3	4.8	0.8	9.6	0.6	6.5	0.4	5.8	0.1	2.8	0.4	5.7

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

What Drugs Account for Drug Program Spending on Seniors With Low, Medium and High Drug Costs?

The previous section examined the overall distribution of drug program expenditures for senior claimants. This section looks at expenditures by drug class for different levels of drug program spending on senior claimants. This information may provide insight into the types of drugs being used by seniors and the types of conditions being treated in seniors with different levels of drug costs. To better illustrate any differences that may exist, which may appear gradually as drug costs change, this section examines seniors with three distinct levels of drug program spending: those with low drug costs (less than \$500 in drug costs paid for by public drug programs), medium costs (between \$2,500 and \$4,999) and high costs (\$10,000 or more). It is important to note that these categories do not encompass all seniors, as results for seniors with drug costs between \$500 and \$2,499 and between \$5,000 and \$9,999 are not presented in this section.

Tables 8, 9 and 10 show the top 10 drug classes (which made up the highest percentages paid by public drug programs in 2008) among seniors with low, medium and high drug costs. It should be noted that all figures in this section relate to drug program spending on a drug class within each group of seniors, not to total drug program spending on the drug class.

As is the case when looking at all seniors, the top 10 drug classes accounted for roughly half of drug program spending on seniors with low and medium drug costs (49.7% and 50.5%, respectively). The picture is somewhat different for seniors with high drug costs, where the top 10 drug classes made up 72.0% of total program spending. The top two classes alone made up almost half (46.7%) of drug program spending on seniors with high drug costs.

Many of the same drugs accounted for the majority of drug program spending on seniors with low and medium drug costs. Five drug classes were common to the top 10 for both groups. HMG-CoA reductase inhibitors (statins) accounted for the highest proportion of total drug program spending among both groups: 10.2% among seniors with low costs and 12.0% among seniors with medium drug costs.

The differences between the top 10 drug classes for seniors with low and medium costs may have contributed in part to the variation in drug program spending between the two groups. Some of the classes that made up higher proportions of drug program spending in the medium drug cost group are drug classes that do not have generic alternatives, such as anticholinesterases, used for Alzheimer's disease. Conversely, some of the drug classes making up a higher proportion of drug program spending in the low-cost group are drugs with one or more generics, such as beta blockers, commonly used for various cardiovascular conditions.

The drug classes making up the majority of drug program spending on seniors with high drug costs differed from those for seniors with low and medium drug costs. Proton pump inhibitors was the only drug class in the top 10 for seniors with high costs that also appeared among the top 10 for seniors with low and medium costs. The drug classes accounting for high proportions of drug spending for seniors with high costs generally included therapies used for conditions such as cancer, chronic renal failure, multiple sclerosis, neutropenia, rheumatoid arthritis and Crohn's disease.

Among seniors with high drug costs, the highest proportion of drug program costs (35.5%) was spent on tumour necrosis factor alpha inhibitors (anti-TNF drugs), a class of drugs used to treat conditions such as rheumatoid arthritis and Crohn's disease. Anti-anemic preparations, used to treat anemia associated with kidney failure, accounted for the next-highest proportion of spending on seniors in this group (11.2%).

It is important to note the impact of the price of a drug and the cost of treatment on the observed trends. Particularly among seniors with high costs, a drug class may account for one of the 10 highest proportions of drug program spending, even though it is not widely used. For example, tumour necrosis factor alpha inhibitors (anti-TNF drugs), a drug class with a high cost for a course of treatment, made up a high portion of drug program spending, even though its rate of use was much lower than that of statins, which did not appear in the top 10 for seniors with high costs.

The source of the data used in this analysis may also impact the results. As noted earlier, data related both to drugs covered by public agencies other than the public drug programs and to drugs dispensed in hospitals is not submitted to the NPDUIS Database. Due to this limitation, data for some high-cost drugs (for example, some drugs used to treat cancer) may not be available.

Table 8 Top 10 Drug Classes, by Total Public Drug Program Spending on Seniors With Less Than \$500 in Drug Costs Paid for by Public Drug Programs (Low Drug Costs), Select Provinces,* 2008

Drug Class	Common Uses	Total Program Spending Within Beneficiary Group (\$ Millions)	Total Program Spending for Seniors With Low Drug Costs (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	5.1	10.2
ACE inhibitors, plain	Heart failure, high blood pressure	4.7	9.3
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	2.9	5.8
Angiotensin II antagonists, plain	High blood pressure, heart failure	2.5	5.0
Bisphosphonates	Osteoporosis	2.2	4.4
Angiotensin II antagonists and diuretics	High blood pressure	2.2	4.3
Dihydropyridine calcium channel blockers	High blood pressure	2.1	4.1
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	1.3	2.7
Alpha-adrenoreceptor antagonists	Benign prostatic hyperplasia	1.0	2.0
Selective serotonin reuptake inhibitors	Depression, anxiety, panic disorder	1.0	2.0
Combined Top 10		24.9	49.7

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 9 Top 10 Drug Classes, by Total Public Drug Program Spending on Seniors With Between \$2,500 and \$5,000 in Drug Costs Paid for by Public Drug Programs (Medium Drug Costs), Select Provinces,* 2008

Drug Class	Common Uses	Total Program Spending Within Beneficiary Group (\$ Millions)	Total Program Spending for Seniors With Medium Drug Costs (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	35.9	12.0
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	22.1	7.4
Dihydropyridine calcium channel blockers	High blood pressure	19.0	6.3
Platelet aggregation inhibitors, excluding heparin	Heart attack and stroke prevention	13.3	4.4
Adrenergics and other drugs for obstructive airway diseases, inhaled	Asthma, emphysema, chronic bronchitis	13.0	4.3
ACE inhibitors, plain	Heart failure, high blood pressure	12.6	4.2
Anticholinesterases	Alzheimer's disease	10.7	3.5
Angiotensin II antagonists, plain	High blood pressure, heart failure	10.6	3.5
Anticholinergics, inhaled	Emphysema, chronic bronchitis	7.3	2.4
Thiazolidinediones	Diabetes	7.3	2.4
Combined Top 10		151.8	50.5

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 10 Top 10 Drug Classes, by Total Public Drug Program Spending on Seniors With \$10,000 or More in Drug Costs Paid for by Public Drug Programs (High Drug Costs), Select Provinces,* 2008

Drug Class	Common Uses	Total Program Spending Within Beneficiary Group (\$ Millions)	Total Program Spending for Seniors With High Drug Costs (%)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, Crohn's disease	20.3	35.5
Other anti-anemic preparations (for example, erythropoietin)	Anemia of chronic renal failure	6.4	11.2
Protein kinase inhibitors (for example, imatinib)	Certain types of cancer	3.3	5.8
Antigrowth hormones (for example, octreotide)	Acromegaly	2.7	4.7
Colony stimulating factors (for example, filgrastim)	Treatment and prevention of neutropenia	2.0	3.4
Other antihypertensives (for example, bosentan)	Pulmonary arterial hypertension	1.9	3.3
Natural opium alkaloids	Management of moderate to severe pain	1.5	2.6
Interferons	Multiple sclerosis, chronic hepatitis C	1.3	2.2
Selective immunosuppressants	Rheumatoid arthritis, organ rejection in transplants	0.9	1.6
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	0.9	1.6
Combined Top 10		41.1	72.0

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

As might be expected, the amount of drug costs the drug program paid for a senior was also related in part to the number of drug classes he or she claimed (Table 11). Seniors with a lower number of claimed drug classes had, on average, lower amounts paid by the drug program, while those with a higher number of claimed classes had a higher average amount paid by the drug program. A study that looked at high-cost users of pharmaceuticals in Manitoba reported a similar result, that claimants with high drug costs were more likely than those with lower costs to be on a high number of drugs.²¹

Of senior claimants with claims for fewer than five drug classes, 70.6% had less than \$500 in drug costs paid for by the drug program, and less than 1% of them received more than \$2,500 in drug costs paid for by the drug program (Table 11). Conversely, of seniors with claims for 15 or more drug classes, only 1.6% of them had less than \$500 in drug costs paid for by the drug program, and roughly two-thirds (67.3%) of them had more than \$2,500 paid for by the drug program. It should be noted that patients who had no drug costs paid for by a drug program but who had claims accepted toward their deductible were included in the less-than-\$500 category.

Table 11 Percentage of Seniors on Public Drug Programs, by Number of Drug Classes Claimed and Drug Program Spending, Select Provinces,* 2008

Number of Drug Classes Claimed	< \$500	\$500–\$2,499	\$2,500–\$4,999	\$5,000 +
< 5	70.6	28.7	0.5	0.1
5–9	24.5	66.4	8.3	0.9
10–14	6.4	57.8	30.9	4.9
15 +	1.6	31.1	46.8	20.5

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

How Many Drugs Are Seniors Using?

This section switches the focus away from drug spending and examines trends in the use of drugs by seniors. The following analyses look at the number of drug classes being claimed by seniors, the mix of drugs being used by seniors on different numbers of drugs and how the number and mix of drug classes change with age.

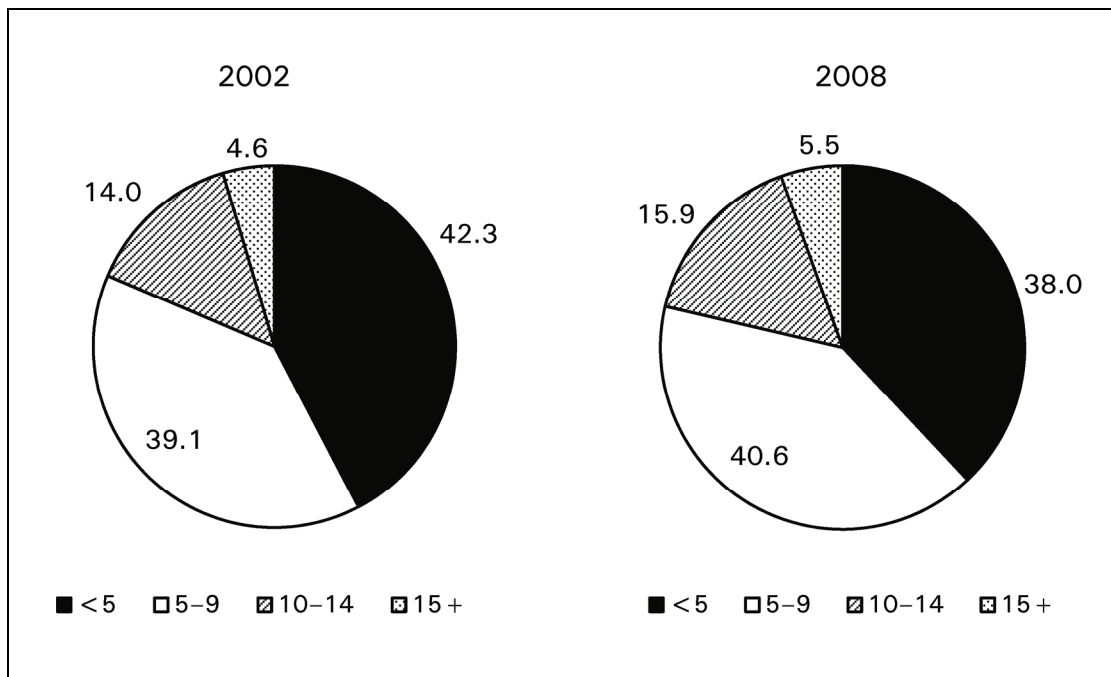
Previous studies have shown that the use of multiple medications can increase the risk of adverse effects, drug interactions and non-compliance with drug therapy, all of which may result in less-than-optimal health outcomes. Although in some cases it may be appropriate for a patient to be taking a high number of medications, the additional risks are an important factor to consider when monitoring the patient’s medication therapy.

Figure 3 compares the number of drug classes claimed by seniors in 2008 and 2002. In 2008, 62.0% of seniors on public drug programs had claims for 5 or more drug classes, while 21.4% had claims for 10 or more and 5.5% of seniors had claims for 15 or more. In 2002, 57.7% of senior claimants were taking 5 or more drug classes, 18.6% were taking 10 or more and 4.6% were taking 15 or more. These changes suggest that, on average, seniors were using more drugs in 2008 than in 2002.^{xiii}

xiii. It should be noted that P.E.I. data is included in 2008, but not in 2002, as data is not available prior to 2004. Although this does slightly impact the reported numbers for 2008, the overall effect is small, as the average number of chemicals claimed by seniors in 2008 was 6.7, both including and excluding P.E.I. data.

The number of drug classes a senior is taking in one year does not necessarily reflect the number of drugs he or she is taking at one time. Some drugs are taken chronically (that is, taken consistently over a period of months or longer), while others, such as anti-infectives, are typically taken for a defined short course of treatment (for example, seven days). Also, this measure does not consider whether the patient was taking a drug from each class from the beginning of the year, or whether he or she started partway through. In addition, while looking at the number of drug classes rather than the number of drugs controls for switching between drugs within a class, it can also understate the number of drugs a senior is taking if he or she is taking multiple drugs within a single class at the same time. Overall, it does not appear that these factors significantly impacted the analysis, as the average number of claimed drug classes and claimed chemicals were similar for all age groups. In 2008, seniors on public drug programs had claims for an average of 6.5 drug classes and 6.7 chemicals.

Figure 3 Percentage of Seniors on Public Drug Programs, by Number of Drug Classes Claimed, Select Provinces,* 2002 and 2008



Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island. P.E.I. data is included in 2008, but not in 2002, as data is not available prior to 2004.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

The mix of drugs taken by seniors also varied by the number of drug classes they were taking. Tables 12, 13 and 14 examine the most commonly used drug classes among three groups of seniors: those with claims for fewer than 5 drug classes during 2008, those with claims for between 5 and 14 classes and those with claims for 15 or more drug classes. These groups are referred to in this analysis as low-, medium- and high-use seniors, respectively. It should be noted that all figures in the analysis refer to rates of use among beneficiaries within each group of seniors and not rates of use among all senior beneficiaries.

Cardiovascular medications were frequently used among all seniors, with four classes—statins, single-ingredient ACE inhibitors, selective beta blockers and dihydropyridine calcium channel blockers—appearing in the top 10 for all three utilization categories. The only other drug class common to the top 10 lists for all three groups was PPIs.

The types of drugs used by low-use seniors seemed to vary widely and, as result, few single chemicals had high rates of use among this class. The most commonly used drug class among this group of seniors was statins, with 21.3% of low-use seniors having at least one claim for this class (Table 12). This rate of use was relatively low, compared with medium- and high-use seniors, who had rates of 44.5% and 56.9%, respectively. Seven of the 10 most commonly used drug classes among low-use seniors were used to treat cardiovascular conditions, including 6 for high blood pressure.

Among medium-use seniors, statins were the most commonly used drug class (Table 13). Eight of the 10 most commonly used drug classes among medium-use seniors were also in the top 10 classes for low-use seniors. The two other drug classes that appeared in the medium-use category were opium alkaloids, used for pain management, and biguanides, used to treat diabetes.

PPIs were the most commonly used drug class among high-use seniors (Table 14). The use of PPIs increased substantially with the number of drug classes being taken by a senior. Among low-use seniors, only 8.3% had at least one claim for a PPI, compared with 60.8% among high-use seniors. Statins were the second most commonly used class among high-use seniors, with 56.9% of seniors in the group having at least one claim for this class.

Several other classes of drugs were much more commonly used among high-use than low-use seniors. One of the most notable was plain sulphonamide diuretics, which treat heart failure and high blood pressure, used by only 1.9% of low-use seniors but 53.6% of high-use seniors.

Many factors may contribute to the differences in the mix of drug classes used by the three groups of seniors, such as differences in health status and age. A higher prevalence of certain conditions may also exist in high-use seniors, some of which may require therapy with multiple drugs. High-use seniors may also have multiple chronic conditions, such as diabetes, high blood pressure, rheumatoid arthritis and chronic obstructive pulmonary disease, many of which may require treatment with multiple drugs. However, without further analysis, it is difficult to draw any conclusions about the types of conditions being treated in seniors in each use category.

Table 12 Top 10 Drug Classes by Rate of Use Among Seniors on Public Drug Programs With Claims for Fewer Than Five Drug Classes (Low-Use Seniors), Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among Low-Use Seniors (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	21.3
ACE inhibitors, plain	Heart failure, high blood pressure	15.1
Thyroid hormones	Hypothyroidism	11.8
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	9.7
Thiazides, plain	High blood pressure	9.4
Dihydropyridine calcium channel blockers	High blood pressure	8.9
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	8.3
Angiotensin II antagonists, plain	High blood pressure, heart failure	7.3
Angiotensin II antagonists and diuretics	High blood pressure	6.6
Bisphosphonates	Osteoporosis	5.9

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 13 Top 10 Drug Classes by Rate of Use Among Seniors on Public Drug Programs With Claims for 5 to 14 Drug Classes (Medium-Use Seniors), Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among Medium-Use Seniors (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	44.5
ACE inhibitors, plain	Heart failure, high blood pressure	35.4
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	29.9
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	27.1
Dihydropyridine calcium channel blockers	High blood pressure	23.8
Thyroid hormones	Hypothyroidism	21.5
Thiazides, plain	High blood pressure	18.8
Natural opium alkaloids	Management of moderate to severe pain	17.7
Angiotensin II antagonists, plain	High blood pressure, heart failure	17.4
Biguanides	Diabetes	16.1

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 14 Top 10 Drug Classes by Rate of Use Among Seniors on Public Drug Programs With Claims for 15 or More Drug Classes (High-Use Seniors), Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among High-Use Seniors (%)
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	60.8
HMG-CoA reductase inhibitors (statins)	High cholesterol	56.9
Sulfonamide diuretics, plain	Heart failure, high blood pressure	53.6
ACE inhibitors, plain	Heart failure, high blood pressure	49.1
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	46.7
Natural opium alkaloids	Management of moderate to severe pain	44.8
Fluoroquinolones	Bacterial infections	42.8
Selective beta-2-adrenoreceptor agonists	Acute prevention of asthma, emphysema, chronic bronchitis	39.6
Benzodiazepine derivatives	Anxiety disorders	36.1
Dihydropyridine calcium channel blockers	High blood pressure	35.9

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 15 shows that the number of drug classes used by seniors increased with age. In 2008, among seniors age 65 to 74, 44.9% had claims for fewer than 5 drug classes and 16.8% had claims for 10 or more. Among seniors age 85 and older, only 27.6% had claims for fewer than 5 drug classes, while 28.6% had claims for 10 or more, including 7.5% with claims for 15 or more classes.

Table 15 Percentage of Seniors on Public Drug Programs, by Number of Different Drug Classes and Age Group, Select Provinces,* 2008

Number of Drug Classes Claimed	Age Group		
	65–74	75–84	85+
<5	44.9	32.8	27.6
5–9	38.3	42.6	43.8
10–14	12.6	18.2	21.1
15+	4.2	6.4	7.5

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

What Drugs Are Used by Younger Versus Older Seniors?

Tables 16, 17 and 18 examine the most commonly used drug classes among seniors by age group. It should be noted that all figures in the analysis refer to rates of use among beneficiaries within each group of seniors and not rates of use among all senior beneficiaries.

The high-use drug classes were quite similar across age groups, with 7 drug classes appearing in the top 10 among all three age groups. PPIs (commonly used to treat gastro-esophageal reflux disease), statins, single-ingredient ACE inhibitors and selective beta-blocking agents (all used to treat cardiovascular conditions) were among the top 5 most commonly used drug classes among seniors in all age groups.

There were some notable differences in the top 10 drug classes for all age groups. Statins were the most commonly used drug class among senior claimants age 65 to 74 and age 75 to 84, with a usage rate of 39.7% among both groups. Though still quite common among those 85 and older, the rate of statin use dropped to 24.3% among claimants in this age group. The use of biguanides, used to treat diabetes, also declined with age. Among claimants age 65 to 74, 14.0% had claims for biguanides, compared with 8.2% of those age 85 and older. This may be related to the prevalence of diabetes, which has been reported to decline among people after age 85.²²

Plain sulphonamide diuretics showed a particularly large increase in use among older seniors. Used to treat heart failure and high blood pressure, this drug class was used by 1.8% of seniors age 65 to 74, compared with 27.6% of those age 85 and older. Fluoroquinolones, a drug class used to treat bacterial infections, appeared in the top 10 most commonly used drugs only among seniors age 85 and older, although the increase in use across age groups was much smaller.

Table 16 Top 10 Drug Classes by Rate of Use, Seniors Age 65 to 74 on Public Drug Programs, Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among Seniors Age 65–74 (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	39.7
ACE inhibitors, plain	Heart failure, high blood pressure	27.0
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	20.9
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	20.7
Thyroid hormones	Hypothyroidism	16.4
Dihydropyridine calcium channel blockers	High blood pressure	16.1
Natural opium alkaloids	Management of moderate to severe pain	15.2
Thiazides, plain	High blood pressure	14.6
Biguanides	Diabetes	14.0
Angiotensin II antagonists, plain	High blood pressure, heart failure	13.8

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 17 Top 10 Drug Classes by Rate of Use, Seniors Age 75 to 84 on Public Drug Programs, Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among Seniors Age 75–84 (%)
HMG-CoA reductase inhibitors (statins)	High cholesterol	39.7
ACE inhibitors, plain	Heart failure, high blood pressure	31.6
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	26.8
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	24.1
Dihydropyridine calcium channel blockers	High blood pressure	21.9
Thyroid hormones	Hypothyroidism	20.4
Thiazides, plain	High blood pressure	16.9
Angiotensin II antagonists, plain	High blood pressure, heart failure	16.0
Natural opium alkaloids	Management of moderate to severe pain	15.3
Sulfonamide diuretics, plain	Heart failure, high blood pressure	14.9

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Table 18 Top 10 Drug Classes by Rate of Use, Seniors Age 85 and Older on Public Drug Programs, Select Provinces,* 2008

Drug Class	Common Uses	Rate of Use Among Seniors Age 85+ (%)
ACE inhibitors, plain	Heart failure, high blood pressure	31.7
Sulfonamide diuretics, plain	Heart failure, high blood pressure	27.6
Beta-blocking agents, selective	High blood pressure, heart failure, angina (chest pain)	27.6
Proton pump inhibitors (PPIs)	Gastro-esophageal reflux disease, peptic ulcer disease	25.7
HMG-CoA reductase inhibitors (statins)	High cholesterol	24.3
Thyroid hormones	Hypothyroidism	24.3
Dihydropyridine calcium channel blockers	High blood pressure	24.2
Thiazides, plain	High blood pressure	16.5
Fluoroquinolones	Bacterial infections	16.0
Organic nitrates	Prevention and treatment of angina (chest pain)	15.3

Note

* The six provinces submitting claims data to the NPDUIS Database as of March 2009: Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island.

Source

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information.

Appendix A: Glossary of Terms

Please note that some of the terms in this glossary may have alternate definitions. The stated definitions are meant only to reflect how these terms were used in the context of this report and are not necessarily the sole definitions of these terms.

Accepted claim: A claim where the drug program accepts at least a portion of the cost, either toward a deductible or for reimbursement.

Adverse drug reaction: A harmful and unintended response to a drug, which occurs at doses normally used or tested to diagnose, treat or prevent a disease or to modify an organic function.

Amount paid per paid beneficiary: The average amount paid by the plan/program per person, for whom the public plan/program paid at least part of one claim.

Anatomical Therapeutic Chemical (ATC) level: A classification system that divides drugs into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties.

Average annual growth rate: The constant annual rate necessary for a value at the beginning of a period to grow to a value at the end of a period over the number of compounding years in the period. (See Appendix D for more detail.)

Claim: One or more transactions, with the final result indicating that a prescription had been filled and dispensed in exchange for payment.

Claimant: A senior (age 65 and older) with at least one claim accepted by a public drug program, either for reimbursement or applied toward a deductible. In Manitoba and Saskatchewan, claimants are also seniors with accepted claims who are eligible for coverage under a provincial drug program but who have not submitted an application and, therefore, do not have a defined deductible.

Copayment: The portion of the claim cost that patients must pay each time they make a claim. This may be a fixed amount or a percentage of the total claim cost. When calculated as a percentage of the total cost, this is also known as "co-insurance."

Cost sharing: The amount of the total prescription cost accepted by the plan/program that is not paid by the plan/program (that is, the amount of the total prescription cost accepted that is paid out of pocket by the beneficiary or through another plan/program/insurer).

Cost-sharing mechanisms: The ways through which prescription costs can be shared between drug programs and their beneficiaries (for example, copayments, deductibles and premiums).

Deductible: The amount of total drug spending a patient must pay in a given year (or other defined time period) before any part of his or her drug costs will be paid by the drug program. A deductible may be a fixed amount or a percentage of income (income-based deductible).

Drug class: Subgroups of chemicals classified by the World Health Organization at the fourth level of the Anatomical Therapeutic Chemical (ATC) classification system. At this level, subgroups are, in theory, regarded as groups of different chemicals that work in the same way to treat similar medical conditions (for example, the chemical subgroup bisphosphonates includes chemicals such as etidronate, alendronate and risedronate).

Drug interaction: The alteration of the effect of a particular drug when it is taken with another drug.

Drug program: A program that provides coverage for drugs for a set population. Programs have defined rules for eligibility, payment, etc.

Drug program formulary: A formal listing of the benefits eligible for reimbursement under a specific drug benefit plan/program and the conditions under which coverage is provided. For the purpose of the National Prescription Drug Utilization Information System (NPDUIS) Database, a “benefit” means a drug, product, medical supply, equipment item or service covered under a drug benefit plan or program.

Drug program spending: The amount paid by the drug program toward a senior’s prescription costs. Any portion of the prescription cost paid by the senior or a third-party private insurer is not captured in this amount, including the drug cost, professional fees paid to the pharmacy or markup charged by the pharmacy. (See Appendix D for more detail.)

Indication: Refers to the use of a drug for treating a particular disease. For example gastro-esophageal reflux disease is an indication for proton pump inhibitors.

Jurisdiction: The federal/provincial/territorial jurisdiction responsible for the drug program formulary and for financing the paid amount of accepted claims.

Maximum contribution: The maximum amount of drug spending a patient is required to pay in a given year (or other defined time period). Once the maximum contribution has been reached, the drug program will pay 100% of eligible drug costs for the remainder of the year.

Maximum copayment: The maximum amount a patient is required to pay per claim.

Paid beneficiary: A senior claimant who has had at least part of at least one claim paid by a plan/program as a benefit.

Paid claim: A claim for which the drug program paid at least a portion of the cost.

Palliative: Patients who have been diagnosed by a physician or nurse practitioner as being in the end stage of a terminal illness or disease, who are aware of their diagnosis and have made a voluntary informed decision related to resuscitation, and for whom the focus of care is palliation and not treatment aimed at a cure.

Premium: The amount a patient must pay to enrol in the drug program.

Public drug coverage: Drug coverage offered to seniors (people 65 and older) by the federal/provincial/territorial jurisdictions.

Total drug program spending: See *drug program spending*.

Appendix B: Provincial and Territorial Drug Programs

More information on public drug programs is available from the following websites:

British Columbia Pharmacare

www.health.gov.bc.ca/pharmacare/

Alberta Prescription Drug Program

www.health.alberta.ca/AHCIP/prescription-program.html

Saskatchewan Drug Plan

www.health.gov.sk.ca/drug-plan-benefits

Manitoba Pharmacare Program

www.gov.mb.ca/health/pharmacare/index.html

Ontario Drug Benefits

www.health.gov.on.ca/english/public/program/drugs/funded_drug/funded_drug.html

Régime général d'assurance médicaments du Québec (RGAM)

www.ramq.gouv.qc.ca/en/citoyens/assurancemedicaments/index.shtml

New Brunswick Prescription Drug Program

www.gnb.ca/0212/intro-e.asp

Nova Scotia Pharmacare

www.gov.ns.ca/health/pharmacare/

Prince Edward Island Pharmacy Services

www.gov.pe.ca/infopei/index.php3?number=1019960&lang=E

Newfoundland and Labrador Prescription Drug Program

www.health.gov.nl.ca/health/nlpdp/newoverview.htm

Yukon Pharmacare

www.hss.gov.yk.ca/pharmacare.php

Northwest Territories

www.hlthss.gov.nt.ca/english/services/health_care_plan/default.htm

Nunavut

www.drugcoverage.ca/p_benefit_nu.asp

Appendix C: Drug Classification Systems

Drugs can be analyzed using many different classification systems. For the purposes of this analysis, the following systems were used:

- The drug identification number (DIN) as assigned by Health Canada. A DIN is specific to manufacturer, trade name, active ingredient(s), strength(s) of active ingredient(s) and pharmaceutical form. In this analysis, references to drug products are implied to be specific to DIN level.
- The pseudo-drug identification number (PDIN) as assigned by a drug program, in cases where a benefit has not been assigned a DIN by Health Canada. This may occur when a benefit is not a drug product (for example, a glucose test strip) or when it is a compound consisting of multiple drug products, each with its own DIN.
- World Health Organization Anatomical Therapeutic Chemical (ATC) classification system as reported in the Health Canada Drug Product Database.^{xiv}
 - In the ATC classification system, drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties.
 - The ATC does not distinguish between strength, dosage, route or form of drug, except as implied by the ATC (for example, inhaled corticosteroid).
 - Drugs are classified in groups at five different levels:
 - The drugs are divided into 14 main groups (first level), with one pharmacological/therapeutic subgroup (second level).
 - The third and fourth levels are chemical/pharmacological/therapeutic subgroups.
 - The second, third and fourth levels are often used to identify pharmacological subgroups when that is considered more appropriate than therapeutic or chemical subgroups.
 - The fifth level is the chemical substance.
 - Drug products assigned a DIN but not assigned to an ATC classification by Health Canada are automatically classified under the ATC classification “unassigned.”
 - Benefits assigned a PDIN are automatically classified under the ATC classification “not applicable.”
 - Where appropriate, CIHI may assign DINs or PDINs to other ATC classifications.

Drug program spending on and use of DINs and PDINs not assigned to ATC classifications are included in total amounts, but the default drug classes “unassigned” and “not applicable” are not counted as drug classes. This applies to any count of drug classes and to any top 10 lists (that is, they are not included in any top 10 lists, even if their utilization or spending level puts them in the top 10).

xiv. Although Health Canada typically assigns drug products to a fifth-level ATC, in some cases it may assign an ATC at the fourth or even the third level.

Appendix D: Methodological Notes

Data Sources

NPDUIS Database

The drug claims and formulary data used in this analysis comes from the National Prescription Drug Utilization Information System (NPDUIS) Database, as submitted by the Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia and Prince Edward Island provincial public drug programs. The NPDUIS Database houses pan-Canadian information related to public program formularies, drug claims, policies and population statistics. It was designed to provide information that supports accurate, timely and comparative analytic and reporting requirements for the establishment of sound pharmaceutical policies and the effective management of Canada's public drug benefit programs.

The NPDUIS Database includes claims accepted by public drug programs, either for reimbursement or to be applied toward a deductible.^{xv} Claims are included regardless of whether the patient actually used the drugs.

The NPDUIS Database does not include information regarding the following:

- Prescriptions that were written but never dispensed;
- Prescriptions that were dispensed but for which the associated drug costs were not submitted to or not accepted by the public drug programs; or
- Diagnoses or conditions for which prescriptions were written.

Drug claims data from Alberta, Saskatchewan, Manitoba, New Brunswick and Nova Scotia was available for 2002 through 2008; for Prince Edward Island, it was available from 2005 through 2008. Analyses that include drug claims data prior to 2005 do not include data from Prince Edward Island.

xv. In Manitoba and Saskatchewan, this includes accepted claims for people who are eligible for coverage under a provincial drug program but have not submitted an application and, therefore, do not have a defined deductible.

Claims Data Sources From the Public Drug Programs of the Six Provinces

Jurisdiction	Plan/Program Description
Alberta	Blue Cross Coverage for Seniors
	Palliative Care Drug Coverage
Saskatchewan	Seniors' Drug Plan
	Saskatchewan Aids to Independent Living (SAIL)
	Palliative Care Drug Plan
	Special Support Program
	Plan Three Supplementary Health
Manitoba	Employment and Income Assistance Program
	Palliative Care Program
	Pharmacare Program
	Home and Nursing Care Program
New Brunswick	Seniors
	Individuals in Licensed Residential Facilities
	Family and Community Services
	Multiple Sclerosis
	Organ Transplant
	HIV
	Nursing Home
	Extra Mural Hospital
Nova Scotia	Drug Assistance for Cancer Patients
	Family Pharmacare Program
	Seniors' Pharmacare Program
Prince Edward Island	Diabetes Control Program
	Family Health Benefits Program
	High Cost Drugs Program
	Nursing Home Program
	Seniors' Drug Cost Assistance Program
	Financial Assistance Program
	Quit Smoking Program

Provincial Notes

Alberta

Claims dispensed through the Income Support, Alberta Adult Health Benefit, Assured Income for the Severely Handicapped and Alberta Child Health Benefit programs are not submitted. Claims dispensed to residents of long-term care facilities are not submitted to the NPDUIS Database.

Saskatchewan

Claims for non-published DINs (that is, DINs not listed on the Saskatchewan Health Drug Plan Formulary) and claims dispensed through special programs, such as the Saskatchewan Cancer Agency, are not submitted to the NPDUIS Database.

Claims dispensed through SAIL and Supplementary Health are included in the NPDUIS Database only if they are for DINs published on the Saskatchewan Health Drug Plan Formulary.

Manitoba

Formulary information for products available through Part III of the Manitoba formulary is not submitted to the NPDUIS Database.

Prince Edward Island

Claims dispensed through the Child in Care/Financial Assistance, Seniors Drug Cost Assistance, Diabetes Control, Family Health Benefits, High Cost Drugs, Nursing Home, Quit Smoking and Sexually Transmitted Diseases programs are included in the NPDUIS Database. Claims for all other plans are not submitted.^{xvi}

Calculation Methods

Average Annual Growth Rate

The average annual growth rate is the constant annual rate necessary for a value at the beginning of a period to grow to a value at the end of a period over the number of compounding years in the period. The formula used to calculate the average annual rate of growth is as follows:

$$(e^{(\ln(\text{value at end of period}) - \ln(\text{value at beginning of period})) / (T - 1)} - 1)$$

Where the constant “e” equals 2.718, which is the base of the natural logarithm, and “T” equals the number of years in the period.

xvi. For a list of all P.E.I. drug plans, please see the *NPDUIS Plan Information Document*, available at http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=GR_1302_E.

Average Amount Paid per Paid Senior Claimant

Calculated as the total amount paid by the drug program toward drug claims for seniors in a given year, divided by the number of seniors with paid claims in that year.

Drug Program Spending

“Drug program spending on drug claims for seniors” refers only to the amount paid by the drug program toward a senior’s prescription costs. Any portion of the prescription cost paid by either the senior or a third-party private insurer is not captured in this amount. The costs included are the drug cost (the actual cost of the drug product being dispensed), as well as pharmacy professional fees or pharmacy markup, if applicable. The policies determining the fees and markups that pharmacies are allowed to charge vary by jurisdiction. Although these differences will impact cost comparisons across jurisdictions, all costs are included in order to reflect the total cost of drug claims by seniors to public drug programs. For more information on drug program policies, including those regarding professional fees and markup, please see the *NPDUIS Plan Information Document*.

Percentage of Seniors With Accepted and Paid Claims

Percentage of seniors with accepted claims is calculated by dividing the number of senior claimants in a given year by the senior population reported for that province as of July 1 of that year.

Percentage of seniors with paid claims is calculated by dividing the number of seniors with paid claims in a given year by the senior population reported for that province as of July 1 of that year.

It should be noted that the denominators in the above two calculations include seniors who are not eligible for provincial drug coverage, either because they receive drug coverage from another source (for example, federal drug programs or private drug insurance) or because they were eligible for public drug coverage but did not apply to have their deductible calculated. The proportions of patients with accepted and paid claims would be larger if only the eligible and enrolled population was considered. It should also be noted that, as the numerator is a cumulative count of claimants throughout the year and the denominator is measured at a given point in time, it is possible for the percentage to be greater than 100%.

Top 10 Drug Classes Exhibiting Greatest Increase and Decline in Growth

Minimum levels of total drug program spending were set for drugs when preparing these lists. For a drug class to be considered among the top 10 fastest growing drug classes (Table 5), it had to account for at least 1.0% of total drug program spending in 2008. For a drug class to be considered among the top 10 fastest declining drug classes (Table 6), it had to account for at least 0.2% of total drug program spending in 2008.

Limitations

Since the NPDUIS Database does not contain information regarding diagnoses or the conditions for which prescriptions were written, the conditions that contribute to drug program spending cannot be identified with certainty. However, identifying the most common indications for the drug classes that account for the majority of spending gives an idea of which conditions are the main contributors.

Pan-Canadian claims-level data for those younger than 65 was unavailable for this study; the focus of this analysis is therefore on seniors. Using NPDUIS Database data from Saskatchewan and Manitoba, it is estimated that seniors account for roughly 20% of all claimants and 40% of total accepted costs, which include both drug program spending and any cost sharing.

Appendix E: Factors That May Influence Drug Use and Expenditure in Canada

Prices

- Changes in the unit prices of drugs (both patented and non-patented)
- Changes in retail and wholesale markups and professional fees
- Availability of generics
- International prices
- Inflation

Entry of New Drug Chemicals

Volume of Drug Use

- Population related
 - Changes in population size
 - Changes in population structure/distribution
 - Age, sex and ethnicity
 - Changes in health status of a population
 - Emergence of new diseases
 - Epidemics
 - Prevalence and severity of disease
- System related
 - Changes and transition associated with health system reform
 - Availability and access to third-party insurance coverage
 - Changes in policies and programs
 - Extent of formulary listings
 - Eligibility and copayments
- Research and technology related
 - New treatment approaches
 - Drugs replacing surgery
 - Drug therapy for previously untreatable or undertreated diseases
 - Availability of more and/or improved diagnostic technology
 - Outcomes research, evidence-based preventive or curative approaches in diagnosis or treatment
 - Use of programs and technology in monitoring patients

Factors That May Influence Drug Expenditure in Canada (cont'd)

- Pharmaceutical Industry
 - Development of new drug products (for example, new strengths, new drug forms and presentations)
 - Promotion of drugs to physicians
 - Drug sampling
 - Direct-to-consumer advertising
- Practice and People Related (health care providers and consumers)
 - Changes in prescribing and dispensing practices
 - Number and mix of prescribers (specialists, general practitioners, nurse practitioners and others)
 - Multiple doctoring
 - Consumers' expectations and behaviours
 - Adherence to treatment

Appendix F: Distribution of Total Senior Population^{xvii} and Senior Claimants on Public Drug Programs, by Sex and Age Group, Select Provinces and Canada,^{xviii} 2008

Alberta

Sex/Age Group	Senior Population (n = 374,248)	Senior Claimants (n = 339,306)
Male	45.0%	44.5%
Female	55.0%	55.5%
65–74	53.3%	52.2%
75–84	33.9%	35.2%
85 +	12.7%	12.6%

Saskatchewan

Sex/Age Group	Senior Population (n = 151,566)	Senior Claimants (n = 137,909)
Male	43.8%	42.5%
Female	56.2%	57.5%
65–74	47.7%	45.2%
75–84	36.0%	36.7%
85 +	16.3%	18.1%

Manitoba

Sex/Age Group	Senior Population (n = 166,455)	Senior Claimants (n = 151,641)
Male	43.1%	42.0%
Female	56.9%	58.0%
65–74	49.1%	47.2%
75–84	35.2%	35.7%
85 +	15.7%	17.1%

xvii. Population data comes from Statistics Canada, Demography Division, *Special Tabulation*, June 2009.

xviii. The six provinces submitting claims data to the NPDUIS Database as of March 2009.

New Brunswick

Sex/Age Group	Senior Population (n = 113,599)	Senior Claimants (n = 64,793)
Male	43.8%	38.6%
Female	56.2%	61.4%
65–74	53.2%	46.0%
75–84	33.1%	36.2%
85 +	13.8%	17.8%

Nova Scotia

Sex/Age Group	Senior Population (n = 144,446)	Senior Claimants (n = 98,923)
Male	43.6%	38.9%
Female	56.4%	61.1%
65–74	53.6%	48.8%
75–84	32.6%	34.9%
85 +	13.8%	16.4%

Prince Edward Island

Sex/Age Group	Senior Population (n = 21,130)	Senior Claimants (n = 18,206)
Male	44.0%	42.5%
Female	56.0%	57.5%
65–74	53.8%	51.4%
75–84	32.5%	34.8%
85 +	13.7%	13.9%

Canada

Sex/Age Group	Senior Population (n = 4,563,119)	Senior Claimants (N/A)
Male	44.0%	N/A
Female	56.0%	N/A
65–74	52.7%	N/A
75–84	34.4%	N/A
85 +	12.8%	N/A

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