



Prescribed Drug Spending in Canada, 2018

A Focus on Public Drug Programs



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

About CIHI

The Canadian Institute for Health Information (CIHI) is an independent, not-for-profit organization that provides essential information on Canada's health systems and the health of Canadians.

We provide comparable and actionable data and information that are used to accelerate improvements in health care, health system performance and population health across Canada. Our stakeholders use our broad range of health system databases, measurements and standards, together with our evidence-based reports and analyses, in their decision-making processes. We protect the privacy of Canadians by ensuring the confidentiality and integrity of the health care information we provide.

Highlights

Public drug program spending accounts for 41.8% of prescribed drug spending in Canada. This report provides an in-depth look at public drug program spending in Canada, using CIHI's National Prescription Drug Utilization Information System (NPDUIS). Public drug program spending does not include spending on drugs dispensed in hospitals or on those funded through cancer agencies and other special programs.

Public drug program spending increased by 4.6% in 2017, similar to the increase observed in 2016.

- Antivirals for treatment of hepatitis C and antineovascularization agents for treatment of macular degeneration were the top 2 contributors to growth.
- 2 new drugs contributed to the majority of the growth in hepatitis C drugs.
- Savings from generic entries and pricing policies continued to offset some of the growth. Drug classes with significant declines in spending included statins, proton pump inhibitors and “other antidepressants.”

Anti-TNF drugs, to treat conditions such as rheumatoid arthritis and Crohn's disease, accounted for the highest proportion of drug spending for the sixth consecutive year.

- Anti-TNF drugs accounted for 8.2% of public drug program spending. Antivirals for treatment of hepatitis C accounted for the next highest proportion (5.0%).
- To date, for the 2 anti-TNFs that have available biosimilars, the biosimilars account for only 1.4% of spending, but it will be important to monitor their uptake.

About 1 in 4 Canadians (22.7%) received benefits from a public drug program in 2017.

- Individuals living in low-income and rural/remote neighbourhoods were more likely to have received benefits from a public drug program.
- Public drug program spending per paid beneficiary was also higher among those in low-income neighbourhoods but was lower among those living in rural/remote neighbourhoods.

The proportion of public drug program spending on high-cost individuals continues to rise.

- In 2017, the 2.3% of individuals for whom a drug program paid \$10,000 or more accounted for more than one-third of spending (36.6%).
- Chemicals with an average cost of \$10,000 or more per individual accounted for roughly one-quarter of spending.

About this report

Prescribed Drug Spending in Canada, 2018 provides an in-depth look at public drug program spending in Canada in 2017. It looks at the types of drugs accounting for the majority of spending, broken down by sex, age and neighbourhood income. It also examines how different drug classes contribute to observed trends in public drug program spending. For more detailed methodological notes and for information on the terms used in this report, see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#).

Supplementary data tables, including the top drug classes in terms of spending and use, are available on the Canadian Institute for Health Information (CIHI) website: [Prescribed Drug Spending in Canada, 2018 — Data Tables](#).

Please note that, throughout the report (including data tables and figures), numbers may not add up to the total due to rounding.

Please send feedback and questions to the National Prescription Drug Utilization Information System (NPDUIS) team at drugs@cihi.ca.

Introduction

Spending on prescribed drugs is forecast to reach \$33.7 billion in 2018, an increase of 4.2% over the previous year. Multiple payers are involved in the financing of prescribed drugs. In the public sector, these payers include provincial/territorial and federal drug subsidy programs and social security funds (such as workers' compensation boards). In the private sector, payers include private insurers and households or individuals paying out of pocket.

This report provides an in-depth look at public drug program spending in 2017 using drug claims data submitted to CIHI's NPDUIS by all provinces and Yukon, plus 1 federal program administered by the First Nations and Inuit Health Branch (FNIHB) at Indigenous Services Canada. For the first time, the report includes data from Quebec.

Public drug program spending accounts for 41.8% of prescribed drug spending, as reported in CIHI's [National Health Expenditure Trends, 1975 to 2018](#).¹ Public drug program spending does not include spending on drugs dispensed in hospitals or on those funded through cancer agencies and other special programs.

In 2018, \$14.4 billion (42.7%) of prescribed drug spending is expected to have been financed by the public sector. This reflects an annual increase of 5.0%, compared with 3.6% growth in private-sector spending. The public share of prescribed drug spending varied among provinces, ranging from 30.3% in New Brunswick and 33.2% in Nova Scotia to 45.4% in Alberta and 47.6% in Saskatchewan. In the private sector, prescribed drug spending financed by private insurers was \$12.3 billion (36.6%), with the remaining \$7.0 billion (20.7%) financed by Canadian households.

Public drug program spending by broad therapeutic category

Spending by broad therapeutic category provides a high-level overview of the types of conditions that account for the majority of drug spending. Broad therapeutic categories are regarded as groups of different chemicals that act on the same organ or system (see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#)).

Among 14 broad therapeutic categories, antineoplastic and immunomodulating agents accounted for the highest proportion of public drug program spending (19.3%), despite the fact that a large portion of public spending on these drugs comes from cancer agency and hospital budgets and is therefore not included in drug program spending. Nervous system drugs, which accounted for the highest proportion of spending in 2016, accounted for the second-highest proportion (17.2%).

A total of \$465.5 million (3.4% of public drug program spending) was spent on non-drug products. Diabetic supplies accounted for the highest proportion of non-drug spending at 65.6%. Pharmaceutical services, such as medication reviews and immunizations, were second, accounting for 17.3% of non-drug spending, despite the decrease in spending from 2016 to 2017 (\$93.3 million to \$80.6 million, respectively). Public drug program spending on blood glucose test strips also declined by 4.5%, reaching \$256.6 million in 2017. The decrease may be partly due to changes in formulary coverage that limit the number of blood glucose test strips that could be claimed per person in a given year.^{2, 3}

Table 1 Percentage of public drug program spending and rate of use, by broad therapeutic category,* 2017

Broad therapeutic category	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)
Antineoplastic and immunomodulating agents	2,614.9	19.3	3.4
Nervous system	2,328.1	17.2	47.3
Alimentary tract and metabolism	1,727.4	12.8	40.1
Cardiovascular system	1,615.5	12.0	48.3
Antiinfectives for systemic use	1,211.1	9.0	47.7
Respiratory system	807.3	6.0	22.9
Sensory organs	787.0	5.8	12.0
Blood and blood-forming organs	682.2	5.0	14.0
Musculoskeletal system	365.6	2.7	24.4
Genitourinary system and sex hormones	286.2	2.1	16.4
Systemic hormonal preparations	226.5	1.7	19.9
Dermatologicals	125.0	0.9	21.0
Various	111.4	0.8	0.8
Antiparasitic products, insecticides and repellents	22.0	0.2	4.2
Unassigned [†]	139.8	1.0	2.5
Non-drug products	465.5	3.4	21.5
Total	13,515.4	100.0	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† This category includes products without an assigned Anatomical Therapeutic Chemical (ATC) code.

TPS: Total program spending.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

In general, the distribution of spending across broad therapeutic categories was similar across jurisdictions, with antineoplastic and immunomodulating agents and nervous system drugs accounting for the 2 highest proportions of spending in 8 of the 12 jurisdictions and appearing in the top 4 broad therapeutic categories in all jurisdictions except FNIHB (see Table A1 in Appendix A). Many factors can influence the distribution of spending, including the drug program design, the health and demographics of the population covered, formulary coverage and prescribing patterns. For a more comprehensive list of factors, see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#).

Drug classes that contributed to spending and growth

This section looks at drug classes that accounted for the highest proportion of public drug program spending (Table 2) in 2017, as well as those that contributed the most to spending growth that year (Table 3). Spending by drug class provides more detail on the conditions being treated. Drug classes are regarded as groups of different chemicals that act in the same way to treat similar medical conditions.

Public drug programs spent \$13.5 billion in 2017, up 4.6% from 2016.ⁱ This is similar to the growth rate observed for 2016 (see Table A2 in Appendix A). The top 10 drug classes accounted for a third of drug program spending in 2017. For the sixth consecutive year, anti-TNF drugs (used to treat conditions such as rheumatoid arthritis and Crohn's disease) accounted for the highest proportion of spending. They were followed by antivirals for treatment of hepatitis C. 2 drug classes were new to the top 10 in 2017: direct factor Xa inhibitors (used for the treatment or prevention of stroke and for venous thromboembolic events) and selective immunosuppressants (used to treat various forms of arthritis, organ transplant and various other conditions). Soliris (eculizumab), used to treat certain rare blood disorders, accounted for 21.3% of spending on the latter drug class. These 2 drug classes were also among the top contributors to growth in both 2017 and 2016.

Table 2 Top 10 drug classes by public drug program spending,* 2017

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)	TPS per paid beneficiary (\$)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	1,105.3	8.2	0.5	19,341
Antivirals for treatment of hepatitis C infections[†]	Hepatitis C	673.7	5.0	0.1	56,069
Antineovascularization agents[‡]	Age-related macular degeneration, secondary and diabetic macular edema	615.2	4.6	0.5	9,225
HMG-CoA reductase inhibitors (statins)	High cholesterol	380.7	2.8	28.3	128

i. This amount may not reflect the impact of any rebates from drug manufacturers.

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)	TPS per paid beneficiary (\$)
Other antipsychotics	Schizophrenia, bipolar disorder	328.8	2.4	2.2	1,300
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	Asthma, emphysema, chronic bronchitis	311.7	2.3	4.5	609
Oral protein kinase inhibitors	Various types of cancer	305.8	2.3	0.1	30,506
Selective immunosuppressants	Various forms of arthritis, organ transplant, various other conditions	298.6	2.2	0.4	7,007
Proton pump inhibitors (PPIs)	Gastroesophageal reflux disease, peptic ulcer disease	288.3	2.1	21.0	124
Direct factor Xa inhibitors	Venous thromboembolism, stroke prevention, deep vein thrombosis prevention	272.3	2.0	3.0	768
Combined top 10		4,580.4	33.9	n/a	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

‡ Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

TPS: Total program spending.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table 3 Top 10 drug classes by contribution to public drug program spending growth,* 2017

Drug class	Common uses	Increase in TPS (\$ millions)	Contribution to TPS growth (%)	Annual rate of growth (%)
Antivirals for treatment of hepatitis C infections [†]	Hepatitis C	96.8	16.3	16.8
Antineovascularization agents [‡]	Age-related macular degeneration, secondary and diabetic macular edema	72.4	12.2	13.3
Oral protein kinase inhibitors	Various types of cancer	67.5	11.3	28.3
Selective immunosuppressants	Various forms of arthritis, organ transplant, various other conditions	63.0	10.6	26.8
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	58.5	9.8	5.6
Direct factor Xa inhibitors	Venous thromboembolism, stroke prevention, deep vein thrombosis prevention	57.6	9.7	26.8
Sodium–glucose co-transporter 2 (SGLT2) inhibitors	Type 2 diabetes mellitus	56.5	9.5	114.3
Other immunosuppressants	Rheumatoid arthritis, renal transplant, multiple myeloma	53.0	8.9	26.3
Interleukin inhibitors	Various forms of arthritis, psoriasis	31.9	5.4	36.1
Oral blood glucose–lowering drugs, combinations	Type 2 diabetes mellitus	30.9	5.2	21.3
All drug classes		594.8	100	4.6

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

‡ Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

TPS: Total program spending.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Single-ingredient angiotensin-converting enzyme (ACE) inhibitors and other antidepressants moved out of the top 10 in terms of total program spending in 2017, to 12th and 17th, respectively. Spending on other antidepressants decreased from \$235.9 million in 2016 to \$196.4 million in 2017, due in large part to the introduction of a generic version of duloxetine in 2016.

Spending for the 2 commonly used top 10 drug classes — PPIs (commonly used to treat gastroesophageal reflux disease) and statins (used to treat high cholesterol) — decreased at a rate of 7.9% and 3.2%, respectively, in 2017 (see Table A3 in Appendix A). These decreases were likely due, in part, to decreases in prices for certain chemicals in these classes negotiated through the pan-Canadian Pharmaceutical Alliance (pCPA) price reduction initiative.⁴ The negotiated price for pantoprazole (a PPI), statins (atorvastatin and simvastatin) and 3 other chemicals were further reduced from 18% to 15% of their brand counterparts as of April 1, 2017.

Biologics

Spending on biologics increased slightly, accounting for 21.6% of total spending in 2017, a proportion similar to those for 2016 and 2015. 3 of the top 10 classes are biologic drugs: anti-TNF drugs, antineovascularization agents (used to treat age-related macular degeneration) and selective immunosuppressants.

Anti-TNF drugs accounted for the highest proportion of public drug program spending, at 8.2%, and were the fifth-highest contributor to spending growth. Antineovascularization agents accounted for 4.6% of spending and were the second-highest contributor to spending growth. These classes were used by a small proportion of beneficiaries (0.5%) but have a high cost per patient (roughly \$19,341 and \$9,225 per paid beneficiary for anti-TNFs and antineovascularization agents, respectively).

Anti-TNF drugs accounted for the largest share of drug program spending in every province except Ontario, where they accounted for the third-largest share after antineovascularization agents and antivirals for treatment of hepatitis C infections (see [Prescribed Drug Spending in Canada, 2018 — Data Tables](#)). Almost all (99.9%) program spending on antineovascularization agents was for Lucentis (ranibizumab) and Eylea (aflibercept) in 2017. Public spending on ranibizumab and aflibercept in Nova Scotia, Manitoba and B.C., and the majority of this spending in Alberta, is through special programs that are not included in NPDUIS.

Selective immunosuppressants ranked eighth in terms of spending and were the fourth-highest contributor to spending growth in 2017. Several drugs in this class experienced significant growth in 2017, including tofacitinib (used to treat rheumatoid arthritis), vedolizumab (used to treat ulcerative colitis and Crohn's disease), eculizumab and alemtuzumab (used to treat multiple sclerosis). Eculizumab was first listed by public drug programs in 2011, while the other chemicals were first listed in either 2016 or 2017, although not all chemicals are listed in all jurisdictions.

Hepatitis C drugs

Hepatitis C drugs, introduced in 2014, accounted for the second-highest proportion (5.0%) of drug program spending and were the largest contributor to spending growth, accounting for 16.3% of overall growth in 2017. This may in part be due to some jurisdictions expanding coverage of these drugs to all eligible individuals who were diagnosed with chronic hepatitis C, regardless of the type and severity of their disease. They were the eighth-highest contributor in 2016. The mix of chemicals contributing to spending and growth within the class changed significantly in 2017.

Spending on Sovaldi (sofosbuvir) and Harvoni (ledipasvir/sofosbuvir), which accounted for 88.7% of spending on the drug class in 2016, decreased by \$330.4 million in 2017. Also in 2017, spending on 2 new chemicals — Zepatier (elbasvir and grazoprevir) and Epclusa (sofosbuvir and velpatasvir), first marketed in 2016 — increased by \$472.2 million, accounting for 70.4% of drug program spending on this drug class. Epclusa is the first product approved to treat all genotypes of the hepatitis C virus.⁵ These new drugs were similar in price to their predecessors, with all 4 chemicals costing between \$51,000 and \$57,000 per person. Public drug programs spent an average of \$51,652, \$53,347, \$54,772 and \$57,037 per paid beneficiary on Zepatier, Sovaldi, Harvoni and Epclusa, respectively, in 2017. The uptake of the new chemicals was almost entirely among new users of hepatitis C drugs, with only 1.8% of people taking Zepatier or Epclusa having had a previous claim for another hepatitis C drug.

Like the 3 biologic drug classes, hepatitis C drugs have a low rate of use (0.1% of beneficiaries). However, these drugs had the highest average cost to public drug programs of any class in the top 10, at \$56,069 per paid beneficiary. They appeared in the top 5 in terms of public drug program spending in 2017 in all jurisdictions except Newfoundland and Labrador, Nova Scotia and Quebec (see [Prescribed Drug Spending in Canada, 2018 — Data Tables](#)).ⁱⁱ Among all provinces, Newfoundland and Labrador and Quebec have the 2 lowest rates of reported hepatitis C infection in Canada; however, the rate in Nova Scotia is just above the Canadian average, suggesting that other factors are responsible for the lower spending in that province.⁶

ii. Spending on antivirals for treatment of hepatitis C infections in P.E.I. is not included in NPDUIS. P.E.I. spent \$1.7 million on its hepatitis C program in 2017; if this spending had been included, it would have ranked second among drug classes in terms of program spending.

Sodium–glucose co-transporter 2 inhibitors

Sodium–glucose co-transporter-2 (SGLT2) inhibitors, used to treat type 2 diabetes, continued to be among the highest contributors to spending growth. Public drug program spending on SGLT2 inhibitors, including Forxiga (dapagliflozin), Invokana (canagliflozin) and Jardiance (empagliflozin), increased from \$49.4 million in 2016 to \$105.9 million in 2017, a growth rate of 114.3% (Table 3). SGLT2 inhibitors are among several second-line agents recommended to be added when glycemic targets are not adequately controlled by metformin, which is the first therapeutic agent of choice.^{7,8} Among existing individuals with type 2 diabetes who started using SGLT 2 inhibitors in 2016, 93.1% of them used metformin within 6 months prior to or after the use of SGLT 2 inhibitors.

Variation by age

As expected, the drug classes accounting for the majority of spending differed significantly between seniors (those age 65 and older) and non-seniors. Only 1 drug class — anti-TNF drugs — appeared in the top 10 drug classes for both seniors (Table 4) and non-seniors (Table 5). Seniors accounted for 57.4% of total program spending in the 12 jurisdictions but for only 45.3% of active beneficiaries (see Table B1 in Appendix B).

Antineovascularization agents accounted for the highest proportion of public drug program spending for seniors (7.5%). Seniors accounted for 94.3% of spending on this drug class, which reflects the difference in the prevalence of age-related macular degeneration between the 2 age groups.

Statins — the most commonly used drug class among seniors⁹ — ranked third, accounting for 4.0% of total spending. DPP-4 inhibitors (used to treat type 2 diabetes) were new to the top 10 list for seniors in 2017, while dihydropyridine derivatives (used to treat high blood pressure) were off the list (ranked 11th in 2017).

Table 4 Top 10 drug classes by public drug program spending on seniors,* 2017

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)
Antineovascularization agents[†]	Age-related macular degeneration, secondary and diabetic macular edema	580.2	7.5	1.1
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	340.2	4.4	0.3
HMG-CoA reductase inhibitors (statins)	High cholesterol	309.6	4.0	48.7
Direct factor Xa inhibitors	Venous thromboembolism, stroke prevention, deep vein thrombosis prevention	254.9	3.3	6.0
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	Asthma, emphysema, chronic bronchitis	234.6	3.0	6.9
Oral protein kinase inhibitors	Various types of cancer	224.8	2.9	0.1
Proton pump inhibitors (PPIs)	Gastroesophageal reflux disease, peptic ulcer disease	207.8	2.7	31.5
Angiotensin-converting enzyme (ACE) inhibitors, plain	Congestive heart failure, high blood pressure	202.4	2.6	24.2
Other immunosuppressants	Rheumatoid arthritis, renal transplant, multiple myeloma	201.3	2.6	0.3
Dipeptidyl peptidase 4 (DPP-4) inhibitors	Type 2 diabetes mellitus	166.8	2.2	3.7
Combined top 10		2,722.7	35.2	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

TPS: Total program spending.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table 5 Top 10 drug classes by public drug program spending on non-seniors,* 2017

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	765.1	13.3	0.6
Antivirals for treatment of hepatitis C infections[†]	Hepatitis C	543.2	9.4	0.1
Other antipsychotics	Schizophrenia, bipolar disorder	274.9	4.8	2.6
Selective immunosuppressants	Various forms of arthritis, organ transplant, various other conditions	203.5	3.5	0.4
Drugs used in opioid dependence	Drug addiction	174.7	3.0	1.4
Antivirals for treatment of HIV infections, combinations	HIV	168.5	2.9	0.3
Diazepines, oxazepines, thiazepines and oxepines	Schizophrenia, bipolar disorder	165.8	2.9	4.9
Other antiepileptics	Epilepsy, neuropathic pain	119.1	2.1	5.7
Centrally acting sympathomimetics	ADHD	107.2	1.9	3.2
Natural opium alkaloids	Management of moderate to severe pain	105.1	1.8	4.9
Combined top 10		2,627.0	45.6	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

TPS: Total program spending.

HIV: Human immunodeficiency virus.

ADHD: Attention deficit hyperactivity disorder.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Anti-TNF drugs accounted for the highest proportion of public drug program spending for non-seniors (13.3 %), followed by antivirals for treatment of hepatitis C infections and other antipsychotics (accounting for 9.4% and 4.8% of spending, respectively). By contrast, hepatitis C drugs ranked 14th among seniors, accounting for 1.7% of program spending. Centrally acting sympathomimetics, used to treat attention deficit hyperactivity disorder (ADHD), were new to the top 10 list for non-seniors, while other antidepressants moved off the list.

Opioids and drugs used in opioid dependence

Opioids are a class of medication used mainly for pain management. While they have important therapeutic benefits, opioids also have abuse potential and can lead to severe harm or even death if not used properly.^{10, 11} Canada is one of the world's largest per capita consumers of opioids. The high level of dispensing not only costs health care systems in terms of drug expenditures but is also a public health and safety concern due to the potential harm associated with opioid use.¹⁰

Natural opium alkaloids, such as morphine and codeine, ranked 20th among the top drug classes in terms of public drug program spending in 2017. Spending on this class was \$186.7 million, which accounted for 1.4% of total program spending and 66.8% of program spending on all opioids. This class ranked 10th among non-seniors, with public spending at \$105.1 million or 1.8% of total program spending. It should be noted that these figures do not include spending by private insurers or out-of-pocket spending, which, combined, are likely higher for non-seniors than for seniors.

Spending on natural opium alkaloids decreased from \$195.7 million in 2016 to \$186.7 million in 2017. Including all opioids, spending decreased from \$301.2 million in 2014 to \$279.3 million in 2017. This is consistent with a recent CIHI study finding that the overall quantity of opioids dispensed in Canada declined by 10.1% between 2016 and 2017.¹² A number of factors may have contributed to this decrease, including the implementation of new treatment guidelines and the delisting of high-strength opioids in several jurisdictions.^{13–15}

Drugs used in opioid dependence ranked fifth among the top 10 drug classes for spending on non-seniors. These drugs are most often used to treat dependence on illicit opioids, such as heroin, but can also be used to manage pain.^{16, 17} In 2017, \$174.7 million was spent on drugs used in opioid dependence among non-seniors, accounting for 96.9% of drug program spending in that class. The majority (74.0% in 2017) of spending in this class is for methadone (sold under the brand names Metadol and Methadose), although the proportion of spending on buprenorphine in combination with naloxone (Suboxone) increased from 15.8% in 2014 to 26.0% in 2017. Although there are advantages and disadvantages to both treatments, new clinical guidelines released in 2018 strongly recommend the buprenorphine–naloxone combination (rather than methadone) as the first-line treatment where possible because of a lower risk of side effects, including overdose, and the potential for more flexible dosing options.^{18–20}

Variation by sex

Females accounted for 51.3% of total program spending and 55.4% of active beneficiaries in the 12 jurisdictions in 2017 (see [Prescribed Drug Spending in Canada, 2018 — Data Tables](#)). 8 of the top 10 drug classes were the same for both sexes (see Appendix A, and tables A4 and A5).

Anti-TNF drugs accounted for the highest proportion of public drug program spending among both males and females, while antineovascularization agents and antivirals for treatment of hepatitis C infections were also on the top 3 list for both. PPIs ranked 7th among women but 13th among men. Antivirals for HIV infections ranked 8th among men but 34th among women.

Although spending for statins was similar among both men and women, there was a notable difference in the rate of use between males (34.0%) and females (23.8%). This suggests that for women, spending per beneficiary was higher for this drug class than it was for men.

Variation by neighbourhood income

Table 6 looks further into spending among the top 10 drug classes by neighbourhood quintile. In the 7 jurisdictions where the neighbourhood could be identified, 5 of the 10 classes appeared in the top 10 for all income neighbourhoods. Anti-TNF drugs and hepatitis C antivirals accounted for the highest program spending in all neighbourhood income levels, although anti-TNFs accounted for a much higher proportion of spending among individuals living in the highest income neighbourhoods. 2 classes of antipsychotics and drugs for opioid dependence all ranked much higher in terms of spending among those living in lower-income neighbourhoods, while selective immunosuppressants, interleukin inhibitors and direct factor Xa inhibitors ranked much higher among those living in higher-income neighbourhoods (see [Prescribed Drug Spending in Canada, 2018 — Data Tables](#)).

Table 6 Top 10 drug classes by public drug program spending, by neighbourhood income quintile, selected jurisdictions,* 2017

Drug class	1: Lowest income	2	3	4	5: Highest income
	Percentage of total program spending				
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	11.8%	15.9%	19.1%	21.6%	22.6%
Antivirals for treatment of hepatitis C infections [†]	10.1%	7.9%	7.1%	6.1%	4.9%
Selective immunosuppressants	1.8%	2.6%	2.8%	3.4%	3.6%
Other antipsychotics	3.9%	2.6%	2.1%	1.8%	1.6%
HMG-CoA reductase inhibitors (statins)	2.5%	2.5%	2.4%	2.2%	2.3%
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	2.4%	2.5%	2.3%	2.1%	2.1%
Diazepines, oxazepines, thiazepines and oxepines	3.3%	2.2%	1.8%	1.6%	1.4%
Drugs used in opioid dependence	3.2%	1.9%	1.5%	1.2%	1.1%
Angiotensin-converting enzyme (ACE) inhibitors, plain	1.9%	1.9%	1.8%	1.7%	1.7%
Natural opium alkaloids	2.0%	1.8%	1.6%	1.5%	1.5%

Notes

* As of July 2018, there were 7 jurisdictions submitting claims data to NPDUIS where patient postal code could be identified:

Newfoundland and Labrador, Prince Edward Island, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

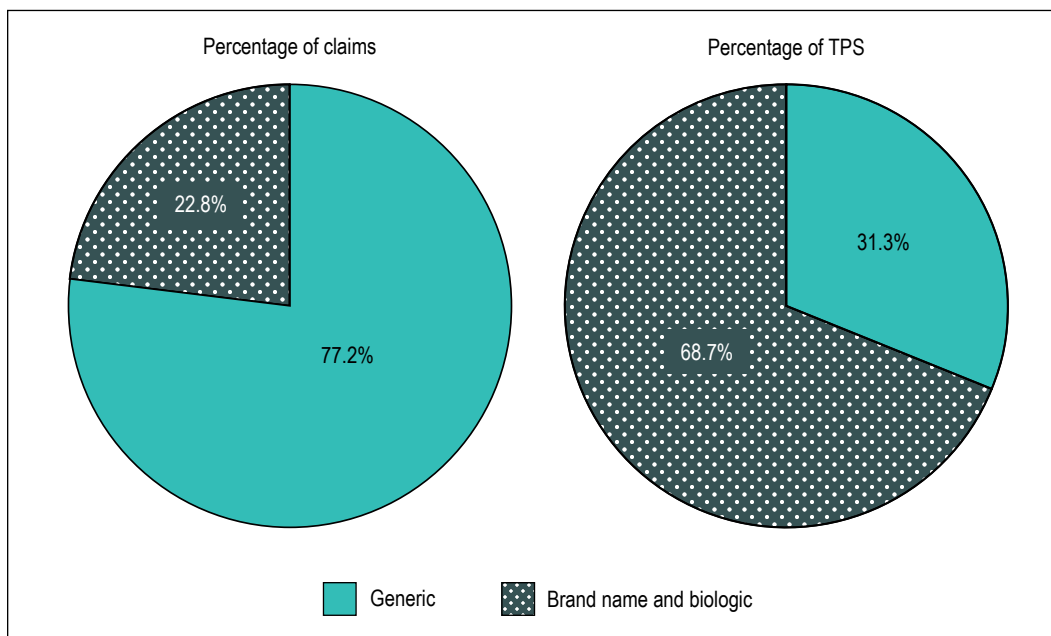
Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Postal Code Conversion File Plus, version 6D, Statistics Canada.

Generic drugs and biosimilars

In 2017, generic products accounted for 31.3% of public drug program spending (Figure 1) — down from 33.3% in 2015 and 32.9% in 2016. Although the share of generic spending varies by jurisdiction, spending on generic products decreased as a proportion of drug program spending over the past 4 years in all jurisdictions (see Table A6 in Appendix A). Generic products' share of utilization during this time period was relatively stable, accounting for 77.2% of accepted claims in 2017, up from 75.7% in 2015 and 77.2% in 2016.

Figure 1 Percentage share of public drug program spending and of accepted claims, by type of drug,* 2017



Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

The share of spending on generic products does not necessarily reflect the extent of use of generic products in place of brand-name products, as generic alternatives are not available in all cases (most often when the brand-name product is still under patent). For cases where generic products were available, generics accounted for 82.3% of spending and 91.7% of claims in 2017.

A biosimilar biologic drug, or biosimilar, is a drug demonstrated to be highly similar to a biologic drug that is already authorized for sale. Due to the size, complexity and natural variability of biologic drugs, and because biologic drugs are made in living cells rather than with chemicals, a biosimilar and its reference biologic drug can be shown to be similar but not identical.²¹ Owing to the relative complexities in manufacturing biosimilar products, savings from their use may not be as great as those seen with generic drugs. However, the market entry of biosimilars still offers the potential for cost savings.²² As of September 2018, there are 7 biosimilars available in Canada, and their uptake has been modest.²³ For example, for the 2 anti-TNFs that have available biosimilars — infliximab (biosimilar was first marketed in 2014) and etanercept (biosimilar first marketed in 2016) — biosimilars accounted for 2.4% of claims and 1.4% of spending in 2017. Although biosimilars have not had a significant impact to date, this may change over time, and their use will be important to monitor going forward.

High-cost users of drugs

The majority of public drug spending in 2017 was for a relatively small number of individuals. Public drug programs paid \$2,500 or more toward drug costs for 13.8% of beneficiaries, accounting for 69.7% of public drug spending. Conversely, the programs paid less than \$500 toward drug costs for more than half (54.5%) of beneficiaries, accounting for only 5.6% of program spending (Table 7).

Table 7 Percentage of paid beneficiaries and public drug program spending, by program spending per paid beneficiary,* 2017

Program spending per paid beneficiary	Proportion of paid beneficiaries (%)	Proportion of TPS (%)
<\$500	54.5	5.6
\$500–\$1,499	22.7	13.3
\$1,500–\$2,499	9.0	11.4
\$2,500–\$4,999	8.3	18.8
\$5,000–\$9,999	3.2	14.3
\$10,000+	2.3	36.6

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

Sources

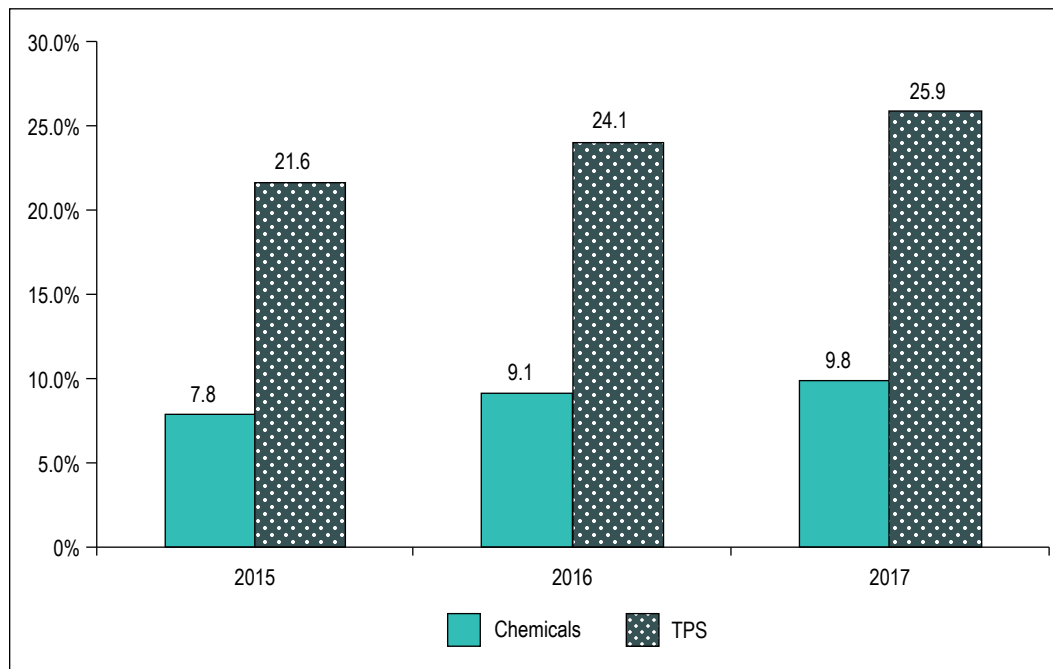
National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

The proportion of drug program spending on beneficiaries for whom the drug program paid \$10,000 or more in drug spending increased from 34.5 % in 2016 to 36.6% in 2017, while the proportion of beneficiaries they accounted for increased marginally, from 2.1% to 2.3%.

The distribution of cost varied across jurisdictions (see Table A7 in Appendix A). The proportion of individuals for whom the drug program covered less than \$500 in drug costs ranged from 79.5% for P.E.I. and 76.9% for Saskatchewan to 34.1% for Yukon and 42.0% for New Brunswick. In contrast, the proportion of individuals for whom the drug program paid \$2,500 or more toward drug costs was significantly smaller, ranging from 18.4% for Yukon and 17.6% for Manitoba to 4.0% for P.E.I. and 6.6% for Saskatchewan. Variation in spending across jurisdictions can be influenced by many factors, such as drug program design, formulary coverage, and the health and demographics of the population covered (see Appendix B).

The proportion of spending on high-cost drugs also continued to rise. In 2017, chemicals with an average cost of \$10,000 or more per beneficiary accounted for 25.9% of the spending, compared with 24.1% in 2016 (Figure 2) and 16.1% in 2014 (see Table A8 in Appendix A). Anti-TNFs and hepatitis C drugs accounted for 53.1% of this spending.

Figure 2 Proportion of public drug program spending on chemicals that cost on average \$10,000 or more per paid beneficiary, and the proportion of total chemicals paid,* 2015 to 2017



Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

Drug products without an ATC code assigned by Health Canada and products assigned as pseudo-drug identification numbers are excluded.

Sources

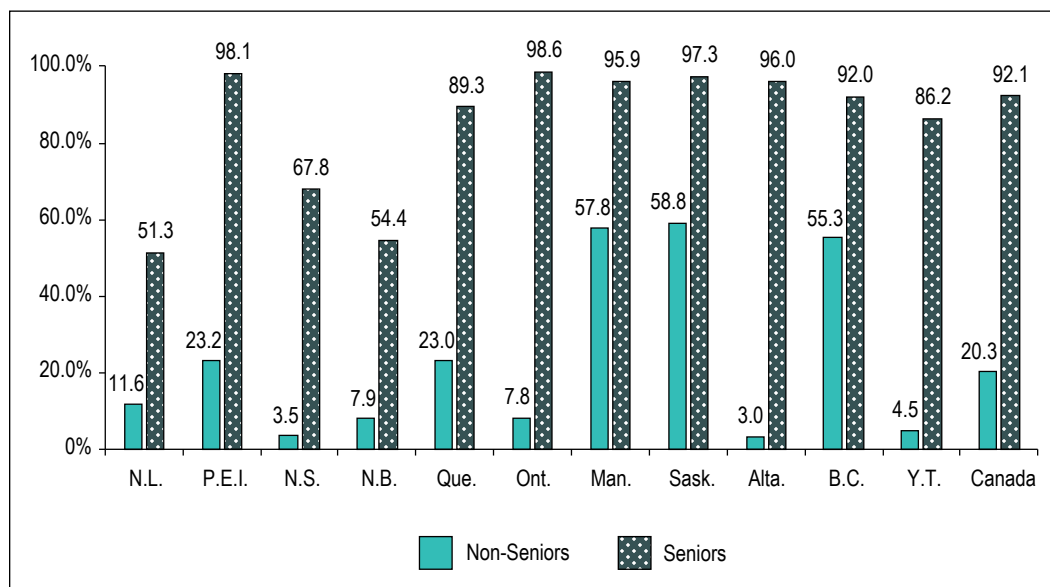
National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Among chemicals costing more than \$10,000 per paid beneficiary, anti-TNFs and hepatitis C drugs accounted for 5 of the top 6 chemicals, with infliximab, an anti-TNF, accounting for the highest proportion (3.7%) of spending (see Table A9 in Appendix A). 2 hepatitis C drugs — Zepatier (elbasvir and grazoprevir) and Epclusa (sofosbuvir and velpatasvir) — as well as Imbruvica (ibrutinib) — first marketed in 2014 and used to treat chronic lymphocytic leukemia related conditions — were new to the top 10 in 2017.

Differences in public drug program coverage

Public drug coverage is available across Canada, but the design of public drug programs varies widely across jurisdictions. Drug coverage for the seniors population is fairly similar across most jurisdictions; however, there is less consistency in the coverage for non-seniors (see Appendix B for more details). Owing to the more comprehensive public coverage, and the fact that seniors use more drugs than younger age groups, it is not surprising that, in 2017, 92.1% of seniors had at least one claim accepted by a public drug program, either for reimbursement or toward a deductible; the corresponding percentage for non-seniors is 20.3%. The proportion of the population receiving benefits from a public drug program was much smaller, with 81.2% of seniors and 11.1% of non-seniors — one-quarter (22.7%) of the population overall — receiving benefits in 2017. The proportion of seniors who made at least one claim varied from 98.6% in Ontario to 51.3% in Newfoundland and Labrador (Figure 3). The smaller proportions of seniors in Newfoundland and Labrador, Nova Scotia and New Brunswick are likely due, in part, to the larger role of private insurance among seniors in those provinces (see Appendix B). For non-seniors, the proportion of the population with public claims ranged from 58.8% in Saskatchewan to 3.0% in Alberta (Figure 3). It should be noted that the lower proportion of non-seniors in Nova Scotia and Alberta is due, in large part, to the fact that drug claims for programs for income assistance recipients younger than 65 in those provinces are not submitted to NPDUIS.

Figure 3 Active beneficiaries as a percentage of population, seniors and non-seniors, by jurisdiction,* 2017



Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS. FNIHB is not included in this analysis as the population is unknown.

Drug claims for income assistance recipients younger than 65 in Nova Scotia and Alberta are not submitted to NPDUIS. Therefore, the proportion of the non-senior population with claims is underestimated in those provinces.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; Banque médicaments, Régie de l'assurance maladie du Québec; and Statistics Canada population estimates, July 2017.

Individuals living in the lowest-income neighbourhoods were the most likely to have received benefits from a public drug program in 2017, with 18.4% of people having at least one paid claim (i.e., a claim where the cost was at least partially reimbursed), compared with 13.6% of people living in the highest-income neighbourhoods. Public drug program spending per paid beneficiary varied similarly with income, at \$1,524 for those living in the lowest-income neighbourhoods and \$1,342 for those living in the highest-income neighbourhoods (Table 8). This is likely due, in part, to public drug program design and the fact that there is generally less out-of-pocket spending for lower-income residents. The elevated drug spending among those in the lowest-income neighbourhoods may also be related to differences in health status by income.

Table 8 Public drug program spending, by neighbourhood income quintile,* 2017

Income quintiles	Percentage of population with accepted claims	Percentage of population with paid claims	Proportion of TPS (%)	TPS per paid beneficiary (\$)
Q1: Lowest income	38.3	18.4	24.7	1,524
Q2	40.6	16.4	21.1	1,458
Q3	41.7	15.8	19.7	1,415
Q4	43.3	14.9	18.5	1,407
Q5: Highest income	40.2	13.6	16.0	1,342
Urban	42.0	15.3	78.7	1,481
Rural	38.0	18.4	21.3	1,289

Notes

* As of July 2018, there were 7 jurisdictions submitting claims data to NPDUIS where patient postal code could be identified: Newfoundland and Labrador, Prince Edward Island, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

TPS: Total program spending.

Drug claims for income assistance recipients younger than 65 in Alberta are not submitted to NPDUIS. Therefore, the proportion of the population with claims may be underestimated, particularly in lower-income neighbourhoods.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; Population estimates and Postal Code Conversion File Plus, version 6D, Statistics Canada; and Statistics Canada, Demography Division, customized data.

Individuals living in rural/remote neighbourhoods were more likely to have received benefits from a public drug program (18.4% of individuals had at least one paid claim) than those living in urban neighbourhoods (15.3%); however, the amount paid per beneficiary by public drug programs was lower for those in rural/remote neighbourhoods (\$1,289) than for those in urban neighbourhoods (\$1,481).

Cancer drug spending in hospitals and by public drug programs

There are differences in the way cancer drug programs are funded and administered across jurisdictions. Public drug program spending does not include spending on drugs dispensed in hospitals or on those funded through cancer agencies and other special programs. However, some public drug programs cover cancer medications used in outpatient settings (i.e., outside of the hospital). Claims paid through the public drug programs submitting to NPDUIS are included in this analysis, while claims from the Alberta Outpatient Cancer Drug Program, BC Cancer Agency and the Saskatchewan Cancer Agency are not submitted to NPDUIS (see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#) for more details).

Spending on cancer drugs accounted for 7.9% of total public drug program spending in the 7 provinces where data was available in 2017. In 2016, the most recent year for which hospital spending data was available, \$2.2 billion was spent on drugs dispensed in hospitals (excluding Quebec). In provinces that report hospital drug spending by type of drug, roughly one-third (33.5%) of hospital drug spending was on cancer drugs (Table 9).

Table 9 Hospital and public drug program spending on cancer drugs, by province, 2016 and 2017

Province	2016			2017	
	Drug spending in hospitals* (\$ millions)	Drugs as a share of total hospital spending (%)	Cancer drug spending† in hospitals (\$ millions)	Cancer drug‡ spending by public drug program (\$ millions)	Cancer drug spending as a share of total public drug program spending§ (%)
N.L.	50.9	3.7	17.5	11.6	8.0
P.E.I.	9.3	3.2	3.4	2.7	8.8
N.S.	101.2	4.8	35.6	20.8	10.0
N.B.	70.6	4.5	30.9	21.4	9.0
Que.	n/a	n/a	n/a	286.7	7.4
Ont.	1,227.4	5.5	388.7	457.4	8.0
Man.	81.8	2.9	n/a	35.8	10.2
Sask.	54.3	2.6	n/a	n/a	n/a
Alta.	239.3	3.0	86.9	n/a	n/a
B.C.	328.1	4.6	162.5	n/a	n/a
Total	2,162.9	4.6	725.4	836.3	7.9

Notes

* Includes only drug spending borne by hospitals. Spending on drugs used in hospitals but funded through other agencies, such as provincial cancer agencies, is excluded. As a result, Manitoba and Saskatchewan cancer drug spending data is not available. Quebec cancer drug spending data is not available.

† Drugs classified as antineoplastics according to the MIS Standards in Canadian MIS Database data are considered to be cancer drugs in this analysis.

‡ Drugs identified by their World Health Organization Anatomical Therapeutic Chemical (ATC) as antineoplastics and immunomodulating agents with an approved indication of cancer (see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#) for more detail).

§ Spending on cancer drugs in Saskatchewan, Alberta and British Columbia is funded through cancer agencies and is not included in NPDUIS.

n/a: Not available.

Sources

Canadian MIS Database and National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Conclusion

This report looks at public drug program spending in 2017 in all provinces, Yukon and 1 federal program administered by Indigenous Services Canada. Spending in these jurisdictions reached \$13.5 billion in 2017. Anti-TNF drugs continued to account for the highest proportion of spending (8.2%) in 2017, followed by antivirals for treatment of hepatitis C (5.0%) and antineovascularization agents (4.6%).

Spending in the jurisdictions studied increased by 4.6% in 2017, similar to the growth rate observed in 2016. Hepatitis C drugs were the biggest contributors to growth, as they were in 2015. However, it was 2 new drugs that contributed to growth in that class.

Significant decreases in spending in several classes — including 3 that appeared in the top 10 in terms of spending in 2016 — partially offset the growth in other classes. Drug classes with significant declines in spending included statins and proton pump inhibitors (where pCPA negotiations had decreased prices for atorvastatin, simvastatin and pantoprazole) and “other antidepressants” (where the introduction of a generic version of duloxetine led to significant savings).

The proportion of spending on high-cost users continues to rise. The proportion of drug program spending on beneficiaries for whom the drug program paid \$10,000 or more toward drugs increased from 34.5 % in 2016 to 36.6% in 2017, while the proportion of corresponding beneficiaries increased from 2.1% to 2.3%. A large part of this spending relates to high-cost drugs (e.g., anti-TNFs, hepatitis C drugs), which accounted for one-quarter of drug program spending. Trends for high-cost users and high cost drugs will continue to be important to monitor going forward.

Individuals living in the lowest-income neighbourhoods were the most likely to have received benefits from a public drug program in 2017, with 18.4% of people having at least one paid claim; in comparison, 13.6% of people living in the highest-income neighbourhoods received benefits from a public drug program in 2017. Public drug program spending per paid beneficiary varied similarly with income, from a high of \$1,524 for those living in the lowest-income neighbourhoods to a low of \$1,342 among those living in the highest-income neighbourhoods.

Appendix A: Data tables

Table A1 Percentage of public drug program spending, by broad therapeutic category and jurisdiction, * 2017

Broad therapeutic category	Public drug program spending by jurisdiction (%)											
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	FNIHB
Antineoplastic and immunomodulating agents	20.2	27.5	26.1	23.6	18.7	16.8	38.0	27.6	27.3	23.4	18.2	8.6
Nervous system	21.3	21.0	12.7	22.9	17.5	15.3	17.7	17.3	11.3	26.5	10.1	22.6
Alimentary tract and metabolism	12.4	10.7	12.8	10.9	14.1	13.5	9.0	9.5	11.7	7.6	6.7	14.3
Cardiovascular system	16.0	13.8	17.5	12.6	13.2	11.5	8.0	10.6	15.2	8.9	7.9	9.0
Antiinfectives for systemic use	4.4	2.5	3.2	6.7	6.3	9.6	9.3	10.1	6.3	14.7	13.5	15.8
Respiratory system	6.6	6.5	7.7	7.2	6.5	5.7	4.6	5.7	7.6	4.2	8.5	5.7
Sensory organs	2.9	3.6	2.1	4.4	5.5	8.7	0.7	2.4	2.7	0.8	1.4	1.4
Blood and blood-forming organs	2.3	2.4	3.8	4.3	5.7	5.2	3.5	4.4	6.5	3.8	2.4	2.9
Musculoskeletal system	2.2	1.0	2.2	1.8	2.6	3.2	1.3	1.4	3.2	1.7	1.5	2.2
Genitourinary system and sex hormones	1.9	1.5	1.7	1.9	2.6	2.1	1.3	1.4	2.6	1.1	1.1	2.5
Systemic hormonal preparations, excluding sex hormones and insulins	1.9	1.0	2.4	1.5	2.1	1.5	2.0	1.0	2.1	1.4	1.0	1.0
Dermatologicals	1.4	0.9	1.1	0.7	0.7	1.0	0.6	0.9	0.8	0.6	0.5	1.9
Various	0.3	0.2	0.2	0.3	0.9	1.1	0.2	0.4	0.3	0.5	0.2	0.8
Antiparasitic products, insecticides and repellents	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.6
Unassigned [†]	0.3	0.0	0.6	0.7	0.1	1.9	1.1	1.0	0.7	0.2	16.7	2.0
Non-drug products	5.7	7.4	5.9	0.2	3.3	2.8	2.6	6.2	1.5	4.6	10.1	8.8

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† This category includes products without an assigned ATC code.

FNIHB: First Nations and Inuit Health Branch.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A2 Annual growth rate of active beneficiaries and public drug program spending, by jurisdiction, * 2013 to 2017

Jurisdiction [†]	Annual growth rate (%)									
	Active beneficiaries					Total program spending				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
N.L.	-1.7	-3.1	-0.3	-0.6	-1.0	-6.7	-2.8	4.8	3.7	-1.7
P.E.I.	2.8	4.7	11.3	13.2	30.3	-5.8	-12.1	-1.9	15.3	6.0
N.S.	2.2	1.7	2.0	2.2	2.4	0.0	0.1	4.2	3.2	6.2
N.B.	0.2	1.8	2.9	1.4	2.1	-6.4	1.2	13.1	5.7	5.5
Que.[‡]	n/a	n/a	1.5	2.0	1.4	n/a	n/a	3.7	3.9	4.6
Ont.	3.0	2.9	2.0	2.7	2.6	7.2	5.1	8.3	5.0	4.8
Man.	0.2	2.6	1.6	1.0	0.6	-4.2	0.3	9.0	5.4	1.3
Sask.	2.2	1.9	2.1	2.8	1.4	1.3	6.4	5.1	2.9	6.9
Alta.	2.8	2.9	3.0	3.5	3.5	-2.5	1.8	10.0	0.8	6.8
B.C.	0.5	0.2	1.1	1.9	1.1	-1.4	-0.6	15.9	3.1	1.5
Y.T.	1.6	3.9	4.3	5.1	5.2	-8.9	0.2	27.5	-6.4	7.3
FNIHB	1.3	1.8	1.7	2.2	0.4	0.5	6.0	12.4	9.9	6.9
Total	n/a	n/a	1.7	2.2	1.7	n/a	n/a	7.7	4.4	4.6

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Differences in jurisdictional growth rates should be interpreted with caution as they can be influenced by data limitations.

For example, spending on hepatitis C drugs is not included in NPDUIS in all jurisdictions.

‡ Quebec data was not available prior to 2014.

FNIHB: First Nations and Inuit Health Branch.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System Database, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A3 Annual growth rate of public drug program spending for top 10 drug classes (in total program spending),* 2015 to 2017

Top 10 drug classes (in TPS)	Annual growth rate of public drug program spending (%)		
	2015	2016	2017
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	10.3	12.2	5.6
Antivirals for treatment of hepatitis C infections [†]	817.9	7.0	16.8
Antineovascularization agents [‡]	12.1	-1.4	13.3
HMG-CoA reductase inhibitors (statins)	-3.2	0.4	-3.2
Other antipsychotics	13.4	16.0	8.5
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	1.8	0.1	-0.8
Oral protein kinase inhibitors	17.1	36.6	28.3
Selective immunosuppressants	28.1	30.2	26.8
Proton pump inhibitors (PPIs)	0.4	-16.0	-7.9
Direct factor Xa inhibitors	66.3	39.4	26.8
All drug classes	7.7	4.4	4.6

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

‡ Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

TPS: Total program spending.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A4 Top 10 drug classes by public drug program spending on females,* 2017

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	570.4	8.2	0.5
Antineovascularization agents[†]	Age-related macular degeneration, secondary and diabetic macular edema	355.3	5.1	0.6
Antivirals for treatment of hepatitis C infections[‡]	Hepatitis C	243.0	3.5	0.1
Selective immunosuppressants	Various forms of arthritis, organ transplant, various other conditions	199.3	2.9	0.4
HMG-CoA reductase inhibitors (statins)	High cholesterol	187.7	2.7	23.8
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	Asthma, emphysema, chronic bronchitis	174.6	2.5	4.7
Proton pump inhibitors (PPIs)	Gastroesophageal reflux disease, peptic ulcer disease	172.9	2.5	22.1
Direct factor Xa inhibitors	Venous thromboembolism, stroke prevention, deep vein thrombosis prevention	135.3	2.0	2.7
Other antipsychotics	Schizophrenia, bipolar disorder	134.7	1.9	2.0
Oral protein kinase inhibitors	Various types of cancer	132.6	1.9	0.1
Combined top 10		2,305.9	33.3	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

‡ Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

TPS: Total program spending.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A5 Top 10 drug classes by public drug program spending on males,* 2017

Drug class	Common uses	TPS (\$ millions)	Proportion of TPS (%)	Rate of use (%)
Tumour necrosis factor alpha inhibitors (anti-TNF drugs)	Rheumatoid arthritis, inflammatory bowel disease, Crohn's disease	534.8	8.1	0.5
Antivirals for treatment of hepatitis C infections[†]	Hepatitis C	430.0	6.5	0.1
Antineovascularization agents[‡]	Age-related macular degeneration, secondary and diabetic macular edema	259.9	3.9	0.5
Other antipsychotics	Schizophrenia, bipolar disorder	193.8	2.9	2.4
HMG-CoA reductase inhibitors (statins)	High cholesterol	192.8	2.9	34.0
Oral protein kinase inhibitors	Various types of cancer	173.2	2.6	0.1
Other immunosuppressants	Rheumatoid arthritis, renal transplant, multiple myeloma	150.6	2.3	0.3
Antivirals for treatment of HIV infections, combinations	HIV	145.8	2.2	0.3
Adrenergics in combination with corticosteroids or other drugs, excluding anticholinergics	Asthma, emphysema, chronic bronchitis	137.0	2.1	4.3
Direct factor Xa inhibitors	Venous thromboembolism, stroke prevention, deep vein thrombosis prevention	136.9	2.1	3.4
Combined top 10		2,354.8	35.8	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Spending on antivirals for treatment of hepatitis C infections in Prince Edward Island is not included in NPDUIS.

‡ Spending on ranibizumab and aflibercept (which accounted for 99.9% of spending on antineovascularization agents) in Nova Scotia, Manitoba and British Columbia, and the majority of this spending in Alberta, is funded through special programs and is not included in NPDUIS.

TPS: Total program spending.

HIV: Human immunodeficiency virus.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A6 Generic drugs as a percentage of public drug program spending and of accepted claims, by jurisdiction,* 2014 to 2017

Jurisdiction	Percentage of TPS				Percentage of accepted claims			
	2014	2015	2016	2017	2014	2015	2016	2017
N.L.	48.4	49.3	47.2	47.1	78.2	82.1	83.3	83.8
P.E.I.	44.8	45.6	43.1	42.6	77.4	78.7	80.0	80.1
N.S.	45.3	40.5	40.6	38.5	74.9	75.8	77.2	77.2
N.B.	37.6	36.5	37.7	36.8	74.7	77.7	82.6	82.8
Que.	36.6	36.8	36.7	34.9	73.6	75.5	76.5	76.5
Ont.	30.6	30.2	29.3	27.7	72.4	75.6	77.3	77.1
Man.	36.2	32.7	31.1	30.1	78.6	80.0	80.6	80.4
Sask.	31.5	29.6	28.5	25.9	70.1	73.1	75.9	76.2
Alta.	31.4	29.9	31.8	30.0	73.5	74.7	76.2	76.5
B.C.	37.6	32.6	32.6	31.6	71.5	74.7	77.8	78.4
Y.T.	36.9	27.9	32.4	31.6	78.5	79.8	80.7	80.7
FNIHB	47.6	44.6	43.6	40.6	75.1	77.3	78.1	77.2
Total	34.4	33.3	32.9	31.3	73.2	75.7	77.2	77.2

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

FNIHB: First Nations and Inuit Health Branch.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A7 Program spending per paid beneficiary, by percentage of paid beneficiaries and of public drug program spending, and by jurisdiction,* 2014 and 2017

Jurisdiction		Program spending per paid beneficiary											
		<\$500		\$500–\$1,499		\$1,500–\$2,499		\$2,500–\$4,999		\$5,000–\$9,999		\$10,000+	
		2014	2017	2014	2017	2014	2017	2014	2017	2014	2017	2014	2017
N.L.	PB (%)	46.9	45.8	30.0	31.6	10.6	10.1	8.5	8.1	2.7	2.9	1.3	1.6
	TPS (%)	6.8	6.5	20.8	19.8	15.7	13.7	22.4	19.8	13.6	13.2	20.8	27.0
P.E.I.	PB (%)	66.1	79.5	23.4	13.2	4.9	3.4	3.6	2.5	1.3	0.8	0.8	0.7
	TPS (%)	15.3	14.9	26.5	20.2	12.4	11.6	16.2	15.1	11.1	10.3	18.4	27.9
N.S.	PB (%)	41.5	44.7	34.3	32.7	11.3	10.1	9.2	8.4	2.4	2.2	1.2	1.7
	TPS (%)	7.0	7.1	21.9	19.1	15.9	13.3	22.8	19.5	11.3	9.9	21.1	31.1
N.B.	PB (%)	41.8	42.0	31.9	30.7	11.6	11.7	9.4	9.3	3.3	3.4	2.0	2.9
	TPS (%)	5.3	4.7	18.5	14.9	14.4	12.3	20.8	17.2	14.0	12.5	26.9	38.4
Que.	PB (%)	57.4	58.0	22.3	21.3	7.8	7.6	7.7	7.7	3.1	3.3	1.7	2.1
	TPS (%)	6.5	6.1	15.6	13.7	11.9	10.6	21.1	19.4	16.5	16.3	28.4	33.9
Ont.	PB (%)	44.1	46.2	27.0	25.2	12.0	11.5	10.7	10.5	4.1	3.9	2.2	2.7
	TPS (%)	4.5	4.3	15.0	12.5	14.2	12.2	22.3	19.8	16.5	14.6	27.5	36.6
Man.	PB (%)	47.8	48.5	25.5	24.5	10.1	9.4	9.1	8.7	3.9	4.3	3.6	4.6
	TPS (%)	4.2	3.6	11.6	9.1	9.8	7.7	15.9	12.7	13.3	12.2	45.3	54.7
Sask.	PB (%)	70.8	76.9	16.2	11.9	5.7	4.6	4.6	3.8	1.5	1.4	1.2	1.4
	TPS (%)	8.2	7.3	17.4	13.1	13.3	10.9	18.8	15.9	12.1	11.3	30.3	41.5

Jurisdiction		Program spending per paid beneficiary											
		<\$500		\$500–\$1,499		\$1,500–\$2,499		\$2,500–\$4,999		\$5,000–\$9,999		\$10,000+	
		2014	2017	2014	2017	2014	2017	2014	2017	2014	2017	2014	2017
Alta.	PB (%)	49.3	50.8	31.0	29.2	9.7	9.9	6.1	6.4	1.9	1.7	2.0	2.0
	TPS (%)	8.1	7.8	21.1	18.5	14.4	13.8	15.9	15.6	10.3	8.0	30.2	36.4
B.C.	PB (%)	58.0	59.5	21.9	19.8	7.8	7.4	7.4	7.3	2.9	3.1	2.0	2.9
	TPS (%)	7.6	6.3	15.1	11.0	11.8	8.9	19.9	15.9	15.4	13.3	30.3	44.6
Y.T.	PB (%)	35.1	34.1	33.5	33.6	13.1	13.9	10.5	10.6	5.0	4.2	2.9	3.6
	TPS (%)	3.8	3.5	15.0	13.4	12.0	11.5	17.3	15.6	16.2	12.5	35.6	43.6
FNIHB	PB (%)	70.9	69.1	16.2	16.3	5.7	5.8	4.9	5.6	1.7	2.2	0.7	1.1
	TPS (%)	12.9	10.1	18.5	14.7	14.5	11.6	21.9	19.9	14.6	15.1	17.6	28.6
Total	PB (%)	53.1	54.5	24.2	22.7	9.3	9.0	8.3	8.3	3.2	3.2	1.8	2.3
	TPS (%)	6.1	5.6	15.9	13.3	13.2	11.4	21.0	18.8	15.6	14.3	28.1	36.6

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

PB: Paid beneficiaries.

TPS: Total program spending.

FNIHB: First Nations and Inuit Health Branch.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A8 Proportion of public drug program spending per paid beneficiary per chemical,* 2014, 2016 and 2017

Program spending per paid beneficiary per chemical	2014		2016		2017	
	Proportion of TPS (%)	Proportion of number of chemicals (%)	Proportion of TPS (%)	Proportion of number of chemicals (%)	Proportion of TPS (%)	Proportion of number of chemicals (%)
<\$500	50.2	69.4	45.2	67.5	43.6	67.2
\$500–\$1,499	19.5	12.0	17.0	12.2	16.4	11.9
\$1,500–\$4,999	5.7	7.1	6.5	7.1	7.1	7.1
\$5,000–\$9,999	8.5	3.7	7.2	3.6	6.9	3.3
\$10,000+	16.1	7.1	24.1	9.1	25.9	9.9

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

Drug products without an ATC code assigned by Health Canada and products assigned as pseudo-drug identification numbers are excluded.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Table A9 Top 10 chemicals that cost on average \$10,000 or more per paid beneficiary, by public drug program spending, * 2017

Chemical	Common uses	TPS (\$ millions)	Proportion of TPS (%)	TPS per paid beneficiary (\$)
Infliximab	Rheumatoid arthritis, Crohn's disease	498.1	3.7	28,947
Sofosbuvir and velpatasvir	Hepatitis C	406.8	3.0	57,037
Adalimumab	Rheumatoid arthritis, Crohn's disease	335.8	2.5	15,403
Lenalidomide	Various blood cancers	194.4	1.4	63,286
Etanercept	Rheumatoid arthritis, ankylosing spondylitis	187.8	1.4	14,481
Sofosbuvir and ledipasvir	Hepatitis C	160.8	1.2	54,772
Ibrutinib	Chronic lymphocytic leukemia	75.9	0.6	61,941
Ustekinumab	Plaque psoriasis, Crohn's disease, psoriatic arthritis	70.0	0.5	17,493
Elbasvir and grazoprevir	Hepatitis C	67.4	0.5	51,652
Golimumab	Rheumatoid arthritis, psoriatic arthritis, ulcerative colitis, ankylosing spondylitis	64.5	0.5	13,618
Combined top 10		2,061.5	15.3	n/a

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

TPS: Total program spending.

n/a: Not applicable.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Appendix B: Overview of drug program design and formulary

Overview of drug plan design

Although public drug coverage is available in the 12 jurisdictions included in this analysis, the design of public drug programs varies widely across jurisdictions. One major difference is that drug programs in Manitoba and B.C., as well as FNIHB's drug program, offer similar coverage to people of all ages, while the other jurisdictions have a separate plan designed specifically for seniors.

There is less consistency in the coverage of non-seniors across jurisdictions. In Manitoba, Saskatchewan and B.C., drug costs are reimbursed if they exceed a certain percentage of an individual's income. In most other jurisdictions, similar plans are available but only to those without private insurance. In all jurisdictions, coverage is available to individuals receiving income assistance. Coverage is also available for selected drugs to treat particular conditions in all provinces, though the drugs and conditions vary.

The differences in coverage of non-seniors across jurisdictions, along with population demographics, greatly impact the age distribution of the active beneficiary population, and in turn how drug program spending is distributed across age groups. In jurisdictions offering similar coverage to both non-seniors and seniors, non-seniors account for the vast majority of active beneficiaries, and the majority, albeit a lower proportion, of total drug program spending (Table B1). In these jurisdictions, the proportion of non-senior beneficiaries ranges from 73.4% in B.C. to 91.2% for FNIHB beneficiaries, where the large proportion is due to both plan design and the relatively lower average age of the population it covers. Non-seniors accounted for a proportion of drug program spending ranging from 64.1% in Manitoba to 82.3% for FNIHB.

Table B1 Public drug program spending on seniors and non-seniors, by jurisdiction, * 2017

Jurisdiction	Non-seniors (< 65)		Seniors (65+)	
	Percentage of active beneficiaries (%)	Percentage of TPS (%)	Percentage of active beneficiaries (%)	Percentage of TPS (%)
N.L.	48.9	49.5	51.1	50.5
P.E.I.	50.6	45.9	49.4	54.1
N.S.†	17.9	20.1	82.1	79.9
N.B.	37.5	47.3	62.5	52.7
Que.	54.0	39.3	46.0	60.7
Ont.	28.8	35.4	71.2	64.6
Man.	77.3	64.1	22.7	35.9
Sask.	77.6	59.6	22.4	40.4
Alta.†	18.4	34.0	81.6	66.0
B.C.	73.4	64.9	26.6	35.1
Y.T.	28.4	42.3	71.6	57.7
FNIHB	91.2	82.3	8.8	17.7
Total	54.7	42.6	45.3	57.4

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

† Claims data for community services drug programs in Nova Scotia and Alberta is not submitted to NPDUIS, so beneficiaries younger than 65 are underrepresented in those provinces.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec

In Saskatchewan, the proportion of non-senior beneficiaries (77.6%) is similar to the proportion in Manitoba and B.C.; however, the proportion of total program spending for non-seniors (59.6%) is slightly lower due to differences in cost sharing.

Among the remaining provinces, seniors accounted for the majority of both active beneficiaries and total program spending. The seniors' proportion of beneficiaries ranged from 46.0% in Quebec to 82.1% in Nova Scotia, and the proportion of program spending for seniors ranged from 50.5% in Newfoundland and Labrador to 79.9% in Nova Scotia. It should be noted that drug claims from drug programs for income assistance recipients in Nova Scotia and Alberta are not submitted to NPDUIS. This results in a lower proportion of non-seniors appearing in the data for these provinces, as these programs provide coverage to non-seniors only.

Another important difference between drug programs is the cost-sharing mechanism employed, such as a deductible or copayment (or a combination of the 2), which will affect the amount that individuals and drug programs pay for each drug claim. For example, even for consistently covered populations like seniors, cost-sharing mechanisms vary. In Nova Scotia and New Brunswick, some seniors must pay premiums to enrol in the program, and then there are copayments for each claim. Newfoundland and Labrador, P.E.I., Ontario and Alberta also have copayments for each claim but do not charge premiums. In Manitoba, deductibles are used whereby seniors pay for their drug costs up to a certain percentage of their income and the drug program pays for their drug costs once the deductible has been reached. In Saskatchewan, some seniors have copayments, while others have deductibles, depending on income level; in B.C., deductibles are used, but there are also copayments for each claim once the deductible has been reached. FNIHB covers all eligible costs for those enrolled in its drug program, regardless of age or income.

Common to all provinces included in the analysis, individuals 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

- Correctional Service of Canada;
- First Nations and Inuit Health Branch;ⁱⁱⁱ 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*,²⁴ available at cihi.ca, or on the websites of the public drug programs (see [Prescribed Drug Spending in Canada, 2018 — Methodology Notes](#)).

iii. This excludes seniors living in Ontario who also have coverage through FNIHB. These seniors first have their drug claims covered by the Ontario Drug Benefit program; any remaining drug costs are covered by FNIHB.

Formulary overview

Variation in the number and types of drugs covered by jurisdictional 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.

In 2017, drug classes common in all 12 public drug programs made up 92.4% of drug claims and 74.5% of drug program spending on seniors. For drug classes covered in at least 11 jurisdictions, the rates increased to 95.9% of drug claims and 86.3% of total program payments on seniors.^{iv} Because such a large portion of program expenditures relates to drug classes that are listed in most jurisdictions, differences in formulary coverage are not expected to play a large role in any jurisdictional differences in overall utilization and expenditure. However, differences in formulary coverage may have a significant impact on the utilization of specific drugs or drug classes across jurisdictions. Given this potential impact, it is important to consider differences in formulary listings when comparing jurisdictional drug utilization or expenditure for specific drugs or drug classes.

iv. Drug products without an ATC code assigned by Health Canada and products assigned as pseudo-drug identification numbers are excluded.

Appendix C: Text alternatives for images

Text alternative data tables for Figure 1:

Percentage share of public drug program spending and of accepted claims, by type of drug,* 2017

Type of drug	Percentage of total program spending
Generic	31.3%
Brand name and biologic	68.7%

Type of drug	Percentage of claims
Generic	77.2%
Brand name and biologic	22.8%

Note

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Text alternative data table for Figure 2: Proportion of public drug program spending on chemicals that cost on average \$10,000 or more per paid beneficiary, and the proportion of total chemicals paid,* 2015 to 2017

Proportion of . . .	2015	2016	2017
Total program spending on chemicals that cost on average \$10,000 or more per paid beneficiary	21.6%	24.1%	25.9%
Chemicals paid that cost on average \$10,000 or more per paid beneficiary	7.8%	9.1%	9.8%

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS.

Drug products without an ATC code assigned by Health Canada and products assigned as pseudo-drug identification numbers are excluded.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; and Banque médicaments, Régie de l'assurance maladie du Québec.

Text alternative data table for Figure 3: Active beneficiaries as a percentage of population, by seniors and non-seniors,* by jurisdiction, 2017

Jurisdiction	Proportion of non-seniors active beneficiaries as a percentage of population	Proportion of seniors active beneficiaries as a percentage of population
N.L.	11.6%	51.3%
P.E.I.	23.2%	98.1%
N.S.	3.5%	67.8%
N.B.	7.9%	54.4%
Que.	23.0%	89.3%
Ont.	7.8%	98.6%
Man.	57.8%	95.9%
Sask.	58.8%	97.3%
Alta.	3.0%	96.0%
B.C.	55.3%	92.0%
Y.T.	4.5%	86.2%
CA	20.3%	92.1%

Notes

* Currently, the Northwest Territories and Nunavut do not submit data to NPDUIS. FNIHB is not included in this analysis as the population is unknown.

Drug claims for income assistance recipients younger than 65 in Nova Scotia and Alberta are not submitted to NPDUIS. Therefore, the proportion of the non-seniors population with claims is underestimated in those provinces.

Sources

National Prescription Drug Utilization Information System, Canadian Institute for Health Information; Banque médicaments, Régie de l'assurance maladie du Québec; and Statistics Canada population estimates, July 2017.

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