



# Pharmaceutical Data Tool

## Methodology Notes



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# Table of contents

Data .....	4
National Prescription Drug Utilization Information System .....	4
Claims data sources .....	5
All jurisdictions .....	5
Newfoundland and Labrador .....	5
Prince Edward Island .....	6
Nova Scotia .....	7
New Brunswick .....	7
Quebec .....	8
Ontario .....	9
Manitoba .....	9
Saskatchewan .....	10
Alberta .....	10
British Columbia .....	11
Yukon .....	11
Indigenous Services Canada .....	12
Terms and definitions .....	13
General methods .....	16
Brand-name, generic, reference biologic and biosimilar products .....	16
Drug classification systems .....	16
Calculation methods .....	18
Drug groups .....	18
Spending .....	19
Utilization .....	19

# Data

## National Prescription Drug Utilization Information System

The drug claims and formulary data used in this analysis comes from the National Prescription Drug Utilization Information System (NPDUIS) at the Canadian Institute for Health Information (CIHI), as submitted by provincial/territorial public drug programs in Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and the Yukon, as well as 1 federal public drug program administered by the First Nations and Inuit Health Branch (FNIHB) at Indigenous Services Canada. NPDUIS 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 analytical and reporting requirements for the establishment of sound pharmaceutical policies and the effective management of Canada's public drug benefit programs.

NPDUIS includes claims accepted by public drug programs, either for reimbursement or to be applied toward a deductible.<sup>i</sup> Claims are included regardless of whether the individual used the drugs. Public drug program spending does not include spending on drugs dispensed in hospitals or on drugs funded through cancer agencies and other special programs.

NPDUIS also collects claims data on all drugs dispensed in community pharmacies — regardless of payer — in Manitoba, Saskatchewan and British Columbia.

As claims data indicates only that a drug was dispensed, and not that a drug was used, it may not always reflect utilization. A patient may take all, some or none of a dispensed prescription.

NPDUIS does not contain information regarding diagnoses or the conditions for which prescriptions were written. Therefore, 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.

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i. 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

## All jurisdictions

### Jurisdiction notes

Claims for drugs administered outside of the public drug plan/program (e.g., through hospital-based programs or cancer agencies) and covered by jurisdictions are not submitted to NPDUIS.

## Newfoundland and Labrador

### Plans/programs

- 65Plus Plan
- Access Plan
- Assurance Plan
- Foundation Plan
- Pandemic Plan
- Select Needs/Cystic Fibrosis Plan
- Select Needs/Growth Hormone Plan

### Jurisdiction notes

Not applicable.

### Additional information

More information on public drug plans/programs is available from the following web page:

- [Newfoundland and Labrador Prescription Drug Program](#)

# Prince Edward Island

## Plans/programs

- Catastrophic Drug Program
- Children in Care Drug Program
- Diabetes Drug Program
- Family Health Benefit Drug Program
- Financial Assistance Drug Program
- Generic Drug Program
- High Cost Drug Program
- Immunization Program
- Nursing Home Drug Program
- Opioid Replacement Therapy Program
- Seniors' Drug Program
- Sexually Transmitted Disease (STD) Drug Program
- Smoking Cessation Program

## Jurisdiction notes

Claims dispensed through the Children in Care Drug Program, Financial Assistance Drug Program, Catastrophic Drug Program, Seniors' Drug Program, Diabetes Drug Program, Family Health Benefit Drug Program, Generic Drug Program, High Cost Drug Program, Nursing Home Drug Program, Opioid Replacement Therapy Program, Immunization Program, Smoking Cessation Program and Sexually Transmitted Disease (STD) Drug Program are included in NPDUIS. Claims for all other plans and programs are not submitted.

Residents of privately owned nursing homes whose care is publicly subsidized are eligible for drug coverage through the Nursing Home Drug Program. Residents of privately owned nursing homes whose care is not publicly subsidized are not covered through the Nursing Home Drug Program, but they may be eligible for coverage through another plan (e.g., Seniors Cost Assistance Program). Residents of government long-term care nursing homes or manors are covered through the Institutional Pharmacy Program; claims for these residents are not submitted to NPDUIS.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [Prince Edward Island Pharmacare](#)

## Nova Scotia

### Plans/programs

- Diabetes Assistance Program
- Drug Assistance for Cancer Patients
- Family Pharmacare Program
- Palliative Care Drug Program
- Seniors' Pharmacare Program
- Under 65 — Long-Term Care (LTC) Pharmacare Plan

### Jurisdiction notes

Not applicable.

### Additional information

More information on public drug plans/programs is available from the following web page:

- [Nova Scotia Pharmacare](#)

## New Brunswick

### Plans/programs

- New Brunswick Drug Plan
- New Brunswick Prescription Drug Program
  - Seniors
  - Nursing Home Residents
  - Social Development Clients
  - Individuals in Licensed Residential Facilities
  - Children in Care of the Minister of Social Development and Special Needs Children
  - Multiple Sclerosis
  - HIV/AIDS
  - Cystic Fibrosis
  - Organ Transplant Recipients
  - Growth Hormone Deficiency

- Medical Abortion Program
- Extra-Mural Program
- Tuberculosis Drug Plan
- Pharmacist Administered Publicly Funded Seasonal Influenza Vaccine

## Jurisdiction notes

Not applicable.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [New Brunswick Prescription Drug Program](#)

## Quebec

### Plans/programs

- Public Prescription Drug Insurance Plan

## Jurisdiction notes

Not applicable.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [Quebec Prescription Drug Insurance](#)



# Ontario

## Plans/programs

- Ministry of Children, Community and Social Services (MCCSS)
- Ontario Drug Benefit Program (ODB)

## Jurisdiction notes

As of January 1, 2020, the Ministry of Health implemented a fee-per-bed capitation model for long-term care (LTC) pharmacy professional services, which replaced its fee-for-service model. This change should be noted when examining trends in public drug spending for LTC facilities.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [Ontario Drug Benefit Program](#)

# Manitoba

## Plans/programs

- Employment and Income Assistance Program
- Palliative Care Drug Access Program
- Personal Care Home Drug Program
- Pharmacare

## Jurisdiction notes

Not applicable.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [Manitoba Pharmacare Program](#)

## Saskatchewan

### Plans/programs

- Universal Program

### Jurisdiction notes

Not applicable.

### Additional information

More information on public drug plans/programs is available from the following web page:

- [Saskatchewan Drug Plan](#)

## Alberta

### Plans/programs

- Non-Group
- Palliative
- Seniors

### Jurisdiction notes

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 to NPDUIS. Claims dispensed to residents of long-term care facilities are not submitted to NPDUIS.

### Additional information

More information on public drug plans/programs is available from the following web page:

- [Alberta Health Coverage and Benefits](#)

# British Columbia

## Plans/programs

- Assurance Program
- Children in the At Home Program
- Cystic Fibrosis
- Fair PharmaCare
- Nicotine Replacement Therapies
- Palliative Care
- Psychiatric Medication Program
- Recipients of B.C. Income Assistance
- Residential Care

## Jurisdiction notes

A portion of the spending on drugs used in opioid dependence treatment — specifically, the interaction fee for witnessed ingestion for the Methadone Maintenance Payment Program in British Columbia — is not submitted to NPDUIS. The public drug program spending for this drug class is underestimated.

## Additional information

More information on public drug plans/programs is available from the following web page:

- [British Columbia PharmaCare](#)

# Yukon

## Plans/programs

- Children's Drug and Optical Plan
- Chronic Disease Program
- Pharmacare

## Jurisdiction notes

Not applicable.

## **Additional information**

More information on public drug plans/programs is available from the following web page:

- [Yukon Pharmacare](#)

## **Indigenous Services Canada**

### **Plans/programs**

- Non-Insured Health Benefits

### **Jurisdiction notes**

As of October 2017, claims processed on behalf of the First Nations Health Authority in British Columbia are not submitted to NPDUIS.

## **Additional information**

More information on public drug plans/programs is available from the following web page:

- [Indigenous Services Canada Non-Insured Health Benefits Program](#)

# Terms and definitions

Please note that some of the terms below may have alternate definitions. The stated definitions are meant only to reflect how these terms have been used in the context of this analysis.

**active beneficiary:** An individual with at least one claim accepted by a public drug program, either for reimbursement or for application toward a deductible. In Manitoba and Saskatchewan, active beneficiaries are also individuals 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.

**active ingredient:** Any component that has medicinal properties and that supplies pharmacological activity or other direct effect in the diagnosis, cure, mitigation, treatment or prevention of disease, or that affects the structure or any function of the body. The active ingredient is as reported in Health Canada's Drug Product Database.

**age group:** The age of the beneficiary as of January 1 of the calendar year. Beneficiaries are grouped as 0 to 24 years, 25 to 44 years, 45 to 64 years, and 65 years and older. Claims with an unknown or invalid age are excluded.

**ATC4 code/ATC5 code:** A type of Anatomical Therapeutic Chemical (ATC) code defined by the World Health Organization. The ATC classification system divides the active substances in drugs into different groups according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties. Health Canada assigns ATC codes to products. ATC level 4 codes represent chemical/pharmacological/therapeutic subgroups, while ATC level 5 codes represent chemical substances.

**benefit status:** Identifies the type of drug benefit coverage:

- **benefit:** Drugs included as regular benefits in a program that doesn't require patient-specific justification to receive reimbursement.
- **limited:** Drugs included in a program that requires regular (automated) adjudication processes against a set of specific published criteria (coded by either the prescriber or the pharmacy/service provider).
- **restricted:** Drugs included in a program that requires the prescriber to complete a formal request for coverage for a patient. The program reviews and then approves or denies the request against a set of specific published criteria.

**biologic:** A drug made from living organisms or their cells. Biologic drug molecules are generally larger and more complex than chemically produced pharmaceutical drugs.

**biosimilar:** A biologic drug that is highly similar to the reference biologic drug.

**brand name:** Commercial name of a drug.

**chemical:** Chemical substances classified by the World Health Organization at the fifth level of the Anatomical Therapeutic Chemical (ATC) classification system. Each unique code represents a distinct chemical or biological entity within its respective drug class.

**chronic drug use:** A beneficiary having at least 2 claims and 180 days' supply for a given drug class.

**claim:** 1 or more transactions, with the final result indicating that a prescription has been filled and dispensed in exchange for payment.

**claimant:** Refer to *active beneficiary*.

**coverage end date:** The date on which a program's given combination of coverage attributes was removed for a drug identification number/pseudo-drug identification number (DIN/PDIN). If the field is blank, the coverage remains effective as of the start date.

**coverage start date:** The date on which a program's given combination of coverage attributes became effective for a drug identification number/pseudo-drug identification number (DIN/PDIN).

**DIN:** A drug identification number (DIN) that Health Canada assigns to uniquely identify drug products sold in a dosage form in Canada. It's specific to a manufacturer, product name, active ingredient(s), strength(s) of active ingredient(s) and pharmaceutical form.

**DIN market date:** The date when a drug product first entered the Canadian market.

**drug:** Refer to *chemical*.

**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 (e.g., the chemical subgroup statins includes chemicals such as atorvastatin, rosuvastatin and simvastatin).

**drug plan/program:** A plan/program that provides coverage for drugs for a set population; it has defined rules for eligibility, payment and the drugs it covers.

**drug plan/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.

**drug plan/program spending:** The amount paid by a drug plan/program toward an individual's prescription costs, including the drug cost, professional fees paid to the pharmacy and markup charged by the pharmacy. This amount may not reflect the impact of any rebates from drug manufacturers. Any portion of the prescription cost paid by the individual or a third-party private insurer is not captured in this amount.

**drug type:** Identifies whether a drug information number (DIN) is for a brand-name, generic or biologic drug.

**geographic location (neighbourhood):** Summary of Statistical Area Classification (SAC) type as defined in the Postal Code Conversion File Plus (PCCF+) reference guide. Defined as urban (SACtype 1, 2 and 3) and rural/remote (SACtype 4, 5, 6, 7 and 8). A patient's postal code is used for this measure.

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

**neighbourhood income quintile:** As defined in the Postal Code Conversion File Plus (PCCF+) reference guide, neighbourhood income per person equivalent is a household size-adjusted measure of household income. A patient's postal code is used for this measure.

**paid beneficiary:** An individual who has had at least part of one claim paid by a plan/program as a benefit.

**PDIN flag:** A flag to identify the pseudo-drug identification number (PDIN) that plans/programs assign to a drug or product they cover when Health Canada has not assigned it a DIN. Programs typically do this to identify non-drug benefits (e.g., diabetes supplies) and to differentiate benefits based on package size or covered indication (e.g., methadone for substance use disorder treatment versus for pain management).

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

**public drug coverage:** Drug coverage offered to individuals by federal/provincial/territorial jurisdictions.

**reference biologic:** The biologic drug to which a proposed biosimilar is compared. Generally, it is the first version of the drug approved for sale in Canada.

**seniors:** People age 65 and older.

**sex:** The sex of the patient (the person for whom the prescription was filled). Patient sex will be reported as Female or Male. Claims with unknown or invalid data reported will be excluded.

**total drug program spending:** Refer to *drug program spending*.

**year:** The calendar year during which a claim was dispensed.

# General methods

## Brand-name, generic, reference biologic and biosimilar products

Identification of brand-name, generic, reference biologic and biosimilar products is based on the methodology developed by CIHI using data sources such as the Health Canada Drug Product Database (HC-DPD), the Health Canada Notice of Compliance (HC-NOC) and the Health Canada Patent Register. Products may be categorized in one of the following categories:

- 1. Brand-name products:** Products submitted as new drug submission/active ingredient(s) to Health Canada as reported by the HC-NOC database, associated with a patent number as reported by the Health Canada Patent Register database or manufactured by a pharmaceutical research company.
- 2. Generic products:** Products with a description that contains the main active ingredient as reported by Health Canada and/or a prefix of a generic company name (e.g., NOVO, APO, PMS, RATIO, SANDOZ); products not otherwise defined as brand-name, reference biologic or biosimilar products.
- 3. Reference biologic products:** Products assigned with Schedule D (Biological products) as reported by the HC-DPD and submitted as new drug submission/active ingredient(s) to Health Canada as reported by the HC-NOC database.
- 4. Biosimilar products:** Products assigned with Schedule D (Biological products) and identified as biosimilar to a reference biologic product in the product monograph as reported by the HC-DPD.

## Drug classification systems

Drugs can be analyzed using many different classification systems. For the purposes of the Pharmaceutical Data Tool, 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 the 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 (e.g., a glucose test strip); when it is a compound consisting of multiple drug products, each with its own DIN; or when it is a pharmacy service (e.g., medication review).



- The 2023 version of the World Health Organization ATC classification system, as reported in the HC-DPD:<sup>ii</sup>
  - 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 (e.g., inhaled corticosteroid).
  - Drugs are classified in groups at 5 different levels:
    - The drugs are divided into 14 main groups (first level), with 1 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 they are 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, in this analysis, classified under the ATC classification “unassigned.”
- Benefits assigned a PDIN are automatically classified, in this analysis, under the ATC classification “not applicable.”
- Where appropriate, CIHI may assign DINs or PDINs to other ATC classifications. Some of the non-drug CIHI classifications are Diabetic (Z99A), Wound Care (Z99D), Ostomy (Z99G), Other Medical Supplies (Z99M), Respiratory (Z99R) and Pharmaceutical Services (Z99P).

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, to any top 10 lists (i.e., they are not included in any top 10 lists, even if their utilization or spending level puts them in the top 10) and to chemical-level analyses (e.g., high-cost drugs, chemicals).

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ii. 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.

# Calculation methods

This tool uses claims from 2019 to 2023 from 11 jurisdictions submitting claims data to NPDUIS (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and the Yukon). Selected plans/programs were excluded from the analyses, including Newfoundland and Labrador Provincial/Pandemic Plan, Prince Edward Island Immunization Program, New Brunswick Pharmacist Administered Publicly Funded Seasonal Influenza Vaccine and Ontario non-ODB MedsCheck Program.

Data from Indigenous Services Canada was excluded from this analysis because data was not available after 2019.

## Drug groups

### Antidepressants

Antidepressant drug products are identified by ATC code N06A Antidepressants. Rate of use is calculated by dividing the number of active beneficiaries who had at least one claim for antidepressants by the total number of active beneficiaries.

### Antipsychotics

Antipsychotic drug products are identified by ATC code N05A Antipsychotics (excluding lithium). Rate of use is calculated by dividing the number of active beneficiaries who had at least one claim for antipsychotics by the total number of active beneficiaries.

### Benzodiazepines

Benzodiazepine drug products are identified by the following ATC codes: N05BA Benzodiazepine derivatives (excluding clobazam); N05CD Benzodiazepine derivatives; and N05CF Benzodiazepine related drugs. Rate of use is calculated by dividing the number of active beneficiaries who had at least one claim for benzodiazepines by the total number of active beneficiaries.

### Opioids

Opioid drug products are identified by ATC code N02A Opioids. Rate of use is calculated by dividing the number of active beneficiaries who had at least one claim for opioids by the total number of active beneficiaries.

## Spending

### Total drug program spending

Calculated by summing the amount that the drug program paid for each accepted claim.

### Total drug program spending per paid beneficiary

Calculated by dividing the total amount paid by the public drug program by the total number of paid beneficiaries.

### Total drug program spending per paid beneficiary per chemical

Calculated by dividing the total amount paid by the public drug program per chemical by the number of paid beneficiaries per chemical.

## Utilization

### Chronic rate of use

Calculated by dividing the number of active beneficiaries who had chronic use of the drug class by the total number of active beneficiaries. For definition of chronic drug use, refer to the [Terms and definitions](#) section.

### Number of chemicals

The number of distinct chemical substances in the drugs that an individual was dispensed during the reporting period.

### Number of drug classes dispensed

The number of distinct classes of drug that an individual was dispensed during the reporting period.

### Number of drug classes dispensed chronically

The number of distinct classes of drug that an individual was dispensed chronically during the reporting period. For definition of chronic drug use, refer to the [Terms and definitions](#) section.

### Rate of use

Calculated by dividing the number of active beneficiaries who had at least one claim for the group (e.g., drug class) by the total number of active beneficiaries.



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