Pharmacists in Canada, 2023

Methodology Notes

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About CIHI's pharmacist data

Collecting and reporting health workforce data assists decision-makers in the planning and distribution of health care professionals. Since 2006, the Canadian Institute for Health Information (CIHI) has collected data on the supply, distribution and practice characteristics of pharmacists in Canada.

The following pharmacist companion products are available on [CIHI's website](#):

- *Pharmacists in Canada, 2023 — Data Tables* (XLSX)
- *Health Workforce in Canada, 2022 — Quick Stats* (XLSX)

Other health workforce products are also available on [CIHI's website](#):

- *Occupational Therapists in Canada, 2023 — Data Tables* (XLSX)
- *Occupational Therapists in Canada, 2023 — Methodology Notes* (PDF)
- *Physiotherapists in Canada, 2023 — Data Tables* (XLSX)
- *Physiotherapists in Canada, 2023 — Methodology Notes* (PDF)
- *Nursing in Canada, 2023 — Data Tables* (XLSX)
- *Nursing in Canada, 2023 — Methodology Notes* (PDF)
- *Personal Support Workers in Alberta, 2023 — Data Tables* (XLSX)
- *Personal Support Workers in Alberta, 2022 — Methodology Notes* (PDF)
- *Health Workforce in Canada: Overview, 2017 to 2021 — Data Tables* (XLSX)
- *Health Workforce in Canada: Overview, 2017 to 2021 — Methodology Notes* (PDF)
- *A profile of physicians in Canada, 2023* (infographic)
- *Supply, Distribution and Migration of Physicians in Canada, 2023* (data tables, historical data, methodology notes, Quick Stats)
- *National Physician Database, 2022–2023* (payments and utilization data tables, historical payments and utilization data tables, methodology notes)

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About this document

This document summarizes the basic concepts, underlying methodologies, strengths and limitations of the data. It provides a better understanding of the health workforce information presented in our analytical products and the ways in which it can be effectively used. This information is particularly important when making comparisons with other data sources and when looking at trends over time.

Data availability

Pharmacists are regarded as the medication management experts of the health care team and collaborate with patients, their families and other health care professionals to benefit the health of Canadians.[1]

To practise as a pharmacist in Canada, annual registration with the appropriate provincial regulatory authority or territorial government is mandatory, requiring the completion of a registration form.

Data collection

The annual registration form that an applicant completes is the property of the provincial regulatory authority or territorial government. Through an agreement with CIHI, most provincial regulatory authorities and the territorial governments submit a set of standardized data to CIHI, collected using the registration forms. The information collected pertains to demographic, education, training and employment characteristics.

CIHI and the organizations submitting data jointly review and scrutinize the submitted data. Once CIHI and the data providers approve the final data, it is ready for analysis and reporting.

Please note that data from the National Association of Pharmacy Regulatory Authorities (NAPRA) is used for jurisdictions whose supply data is not available. NAPRA data is as of January 1 of the data year. For more information, please refer to the [Data limitations and considerations](#) section below.

Statistics reported by CIHI may differ from those reported by others, even though the source of the data (i.e., annual registration forms) is the same. Variances may be attributed to differences in the population of reference; they may also be attributed to the collection period and/or CIHI's data exclusion criteria, as well as to CIHI's editing and processing methodologies.

Population of interest

The population of interest includes all pharmacists who submit an active registration form in a Canadian province or territory.

To better ensure timeliness, CIHI collects data prior to the end of the registration period, which varies among jurisdictions. For pharmacists, a cut-off date for data collection was established through consultation with the data providers and reflects a point in time when the majority of the registrations have been received for the registration period. Data is collected at the cut-off date to maintain annual consistency.

Defining the workforce

It is important to note the difference between the terms "supply" and "workforce." *Supply* refers to all registrants who were eligible to practise in the given year (including those employed and those not employed at the time of registration). Note that inactive registrants and secondary registrants are excluded from the supply. *Workforce* refers to only those registrants who were employed in the profession at the time of annual registration and who submit an active registration.

The figure below helps to illustrate how we define the pharmacist workforce.

Figure   Tracking regulatory authority data to CIHI: The pharmacist workforce
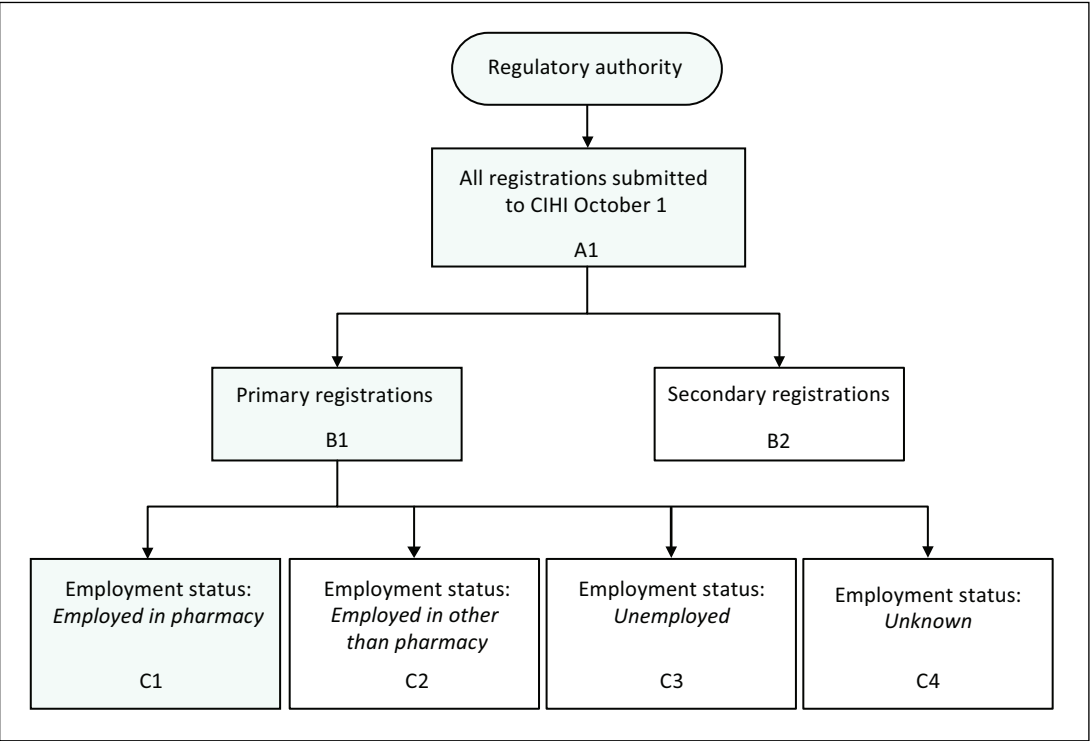
The total number of registrations submitted to a pharmacy regulatory authority or territorial government is composed of both active and inactive registration types. Of all the registrations received by the provincial regulatory authorities and territorial governments, only those that are active as of October 1 in the registration year are submitted to CIHI (Box A1 in the figure above).

There are 2 types of active registrations:

- Primary registrations (Box B1) are those where the province or territory of registration reflects the registrant's primary jurisdiction of practice.
- Secondary registrations (Box B2) represent pharmacists who work in more than one jurisdiction concurrently and are registered by the proper authorities. These secondary registrations are excluded from the supply, with exceptions based on jurisdiction-specific requests. For more information, refer to the Data quality section of this report.

CIHI workforce statistics include only primary registrations where registrants explicitly state their employment status in pharmacy via the data element value *employed in pharmacy* (Box C1). Pharmacists who are employed outside of pharmacy, who are unemployed or whose employment status is unknown are excluded from workforce statistics (the corresponding data element values are *employed in other than pharmacy*, Box C2; *unemployed*, Box C3; and *unknown*, Box C4.

Data quality

Under- and over-coverage

There are a few potential sources of under-coverage:

- **Registration period versus data collection period:** While setting cut-off dates enables CIHI to release more timely data, pharmacists who register between the cut-off date and the end of the registration period are not included in the Health Workforce Database (HWDB).
- **First-time registrants:** These include new graduates as well as pharmacists who are registering in a province or territory for the first time. Information on first-time registrants has varied across provinces and territories and over time, which has resulted in cases of under-coverage.
- **Voluntary registration data:** For jurisdictions whose supply data is not available for a certain year, membership registration data is acquired from the National Association of Pharmacy Regulatory Authorities (NAPRA). Membership registration with a national association is often voluntary; data acquired from NAPRA is therefore under-covered.

Potential sources of over-coverage include the following:

- **Secondary registrations:** Pharmacists can choose to register simultaneously in multiple provinces and territories. In order to avoid double-counting these pharmacists, CIHI identifies registrations that do not reflect the primary province or territory of practice and excludes them when reporting supply or workforce information. These are known as secondary registrations. However, pharmacists who register in multiple provinces or territories and also work in more than one province or territory are included more than once in "Provinces/territories with available data" totals.

Terminology and general methodology

Throughout the HWDB products,

- *Health Workforce Database* (HWDB) refers to the database that stores both record-level and aggregate-level data collected on more than 30 groups of health care professionals in Canada, including pharmacists.

- The term *primary employment* refers to employment with an employer or in a self-employed arrangement that is associated with the highest number of usual weekly hours of work. All workforce data and analyses represent primary employment statistics for the respective health care professionals.

- The term *renewal* refers to the number of registrants who renewed their registration in the same province or territory as the one they were registered in the year before.

Average age

The average age of pharmacists in a given province or territory and/or in Canada is calculated based on the age of the individual pharmacist, which is derived from the data elements Year of Birth and the Current Data Year for each record. Records with missing age are excluded from the calculation.

$$\text{Average age} = \frac{1}{n} \sum_{i=1}^{n} Age_i$$

Where

- i = Individual health care professional
- n = Total number of health care professionals in a province or territory or Canada

Pharmacists employed in direct care

The term *employed in direct care* refers to only those registrants who provided services directly to clients. Direct care includes those whose Primary Position is *staff pharmacist*, *pharmacy owner/manager*, *pharmacy manager* or *institutional leader/coordinator*. Those whose Primary Position is *pharmacy owner/manager* or *pharmacy manager* may spend less of their time providing direct care.

Health regions

Health regions are defined by the provincial and territorial governments and represent administrative bodies or areas of interest to health authorities.

The health region data presented in the *Pharmacists in Canada, 2023* analyses and products includes pharmacists who work in direct patient care and whose postal code is within the province or territory of analysis. Those employed in administration, education or research are excluded from the health region totals. The postal code data and Statistics Canada's Postal Code^{OM} Conversion File (PCCF) are used to assign health care professionals to health regions. The Postal Code of Primary Employment is used to conduct this analysis. If the postal code is unknown or invalid, the health region cannot be determined.

Starting in 2021, the methodology for mapping health regions has been enhanced to align with CIHI's data standards; this update has been applied to the reporting period (i.e., 2014 to 2023).

Note that Newfoundland and Labrador and Ontario changed their health region reporting structures in 2023. Regional reporting based on the new structures has not yet been implemented, as 2023 population estimates by new health regions were unavailable at time of publication.

Inflow and outflow

Changes in the pharmacist supply reflect the number of registrants entering their profession (inflows) and the number leaving (outflows). Analyzing inflows and outflows provides better information about how the pharmacist supply changes over time.

The term *inflow* refers to the number of registrants entering the profession. Inflow occurs when a pharmacist registers to practise in a province or territory in which the pharmacist did not register the previous year. Inflow can include new graduates, pharmacists who migrate in from other Canadian provinces or territories or foreign countries and those who return to the workforce after extended leave (such as for family responsibilities or further education).

The term *outflow* refers to the number of registrants leaving a specific province or territory. Outflow occurs when a pharmacist fails to renew their annual registration in a province or territory the following year. Outflow is influenced by a number of factors, and these factors can change over time. For those pharmacists who are late in their careers, not renewing their registration may be a signal that they have retired. For pharmacists who are in the early stages of their careers, reasons for not renewing registration could include, but are not limited to, choosing an employment opportunity in another province, territory or country, leaving the profession, taking parental leave, or returning to school for additional education.

It should be noted that inflow and outflow are not available at the national level because a national unique identifier is not currently in place to allow tracking a registrant across provinces and territories.

Population estimates and per 100,000 population counts

Using population estimates from Statistics Canada, rates per population can be calculated for health care professionals. *Pharmacists in Canada, 2023 — Data Tables* includes Statistics Canada's population estimates by province and territory for 2014 to 2023.[2]

Urban and rural/remote

A postal code analysis is performed to determine whether a health care professional is practising in an urban or a rural/remote setting. For pharmacists, the Postal Code of Primary Employment is used to conduct this analysis. If the postal code is unknown or invalid, the urban or rural/remote setting cannot be determined.

Using Statistics Canada's PCCF, postal codes are assigned a statistical area classification (SAC) type value based on the 2021 census. The SAC groups census subdivisions (CSDs) according to whether they are a component of a census metropolitan area (CMA), a census agglomeration (CA), or census metropolitan influenced zone (MIZ). At CIHI, we use the following categorization of SACtype as a standard methodology to define urban and rural/remote in our reporting products:

- Urban: SACtype = 1, 2, 3 (i.e. within a CMA/CA)
- Rural/remote: SACtype = 4, 5, 6, 7, 8 (i.e. strong/moderate/weak/no MIZ/territories areas outside of Whitehorse and Yellowknife)

Comparability

As part of the data submission process, the provincial regulatory bodies and territorial governments submit to CIHI the changes that have been made to their data for inclusion in this publication. A review of this information is helpful when looking at trends over time and comparing provinces and territories.

Table 1 highlights the data submitted to CIHI in 2023 by province and territory for pharmacists.

Table 1   Pharmacist data submitted to CIHI, by province and territory, 2023

Jurisdiction	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nun.
Pharmacist data	D	D	D	D	*	D	D	D	D	D	†	D	†

Notes

* Supply data is acquired from the National Association of Pharmacy Regulatory Authorities.

† Record-level data from Yukon and Nunavut is not currently collected in the Health Workforce Database. Only aggregate counts are available.

D: Data was submitted to CIHI.

International comparability

To improve the usability of Canada's health workforce statistics for international stakeholders, CIHI has developed a series of health workforce indicators grounded in the work of the World Health Organization's *National Health Workforce Accounts: A Handbook* (2016),[3] which has now been removed from the organization's National Health Workforce Accounts (NHWA) website. CIHI's release is focused on indicators identified in Module 1: Active health workforce stock.

Table 2 highlights the pharmacist component of the 8 indicators included in CIHI's *Pharmacists in Canada, 2023* release, as well as variations in terminology for the data presented by CIHI. Please see CIHI's Indicator library for the detailed methodology for each health workforce indicator.

Table 2   CIHI-reported World Health Organization indicators

WHO indicator	Corresponding table in *Pharmacists in Canada, 2023 — Data Tables*
1 – 02: Density of active health workers per 1000 population, by cadre **1 – 03:** Density of active health workers per 1000 population by cadre and at subnational level	**Table 5:** Pharmacist workforce employed in direct care per 100,000 population, by jurisdiction, provinces/territories with available data, 2014 to 2023
1 – 04: Density of health workers per 1000 population, by cadre, by activity level (practising, professionally active, licensed to practice)	**Table 6:** Pharmacist supply, by employment status per 100,000 population, provinces/territories with available data, 2014 to 2023
1 – 05: Ratio between active and registered health workers, by cadre	**Table 7:** Ratio of pharmacist workforce employed in direct care to supply, provinces/territories with available data, 2014 to 2023
1 – 07: Percentage of active health workers in different age groups, by cadre and sex	**Table 8:** Pharmacist workforce employed in direct care, by age group, provinces/territories with available data, 2014 to 2023
1 – 09: Percentage of active foreign-trained health workers by place of birth (domestic/foreign) and by country of training	**Table 9:** Pharmacist workforce employed in direct care, by top 10 countries of graduation, provinces/territories with available data, 2014 to 2023
1 – 11: Percentage of active health workers employed by facility type, by cadre	**Table 10:** Pharmacist workforce employed in direct care, by place of employment, provinces/territories with available data, 2014 to 2023 **Table 10a:** Pharmacist workforce employed in direct care, by place of employment and jurisdiction, 2014 to 2023
1 – 12: Density of active health workers in different regions (by regional typology, by cadre)	**Table 11:** Pharmacist workforce employed in direct care, by health region and jurisdiction, provinces/territories with available data, 2014 to 2023
1 – 12: Density of active health workers in different regions (by regional typology, by cadre)	**Table 12:** Pharmacist workforce employed in direct care per 100,000 population, by health region and jurisdiction, 2014 to 2023

Source
World Health Organization. *National Health Workforce Accounts: A Handbook*. 2016.

Data limitations and considerations

Methodological and historical changes to the data have the potential to make it difficult to compare data across time. CIHI, in collaboration with the regulatory authorities, is continually striving to improve data quality; therefore, the following information should be considered when making historical comparisons and consulting previous CIHI publications. In all cases, comparisons should be made with caution and in consideration of the methodological and historical changes made. For a complete list of data elements, please review the Health Workforce Database metadata page on CIHI's website.

The section below provides information on the data elements that had data quality improvements or changes in data years 2014 to 2023 that may have an impact on comparability.

If more than 30% of records in a province/territory have a *not stated* value (i.e., *unknown*, *not applicable* or *not collected*) for a data element, statistics based on that element are not reported. When the population of provinces/territories for which the data is unavailable exceeds 35% of the total Canadian population, no overall result is reported for "Provinces/ territories with available data."

Statistics on *not stated* values for each reporting data element are available in *Pharmacists in Canada, 2023 — Data Tables*. Caution should be used when comparing data within this time period.

HHR data standards update, 2022

In response to evolving health information needs of stakeholders, CIHI updated the Health Human Resources Minimum Data Set (HHR MDS) data standard (including current data elements and values, and their associated definitions).

The updated 2022 HHR MDS data standard allows for comparable, high-quality, linkable health workforce data across health care provider groups to support pan-Canadian health workforce planning, policy development and research. It evolves the standardized approach to data collection, streamlines current processes and reduces data collection burden. For more information about the 2022 HHR MDS data standard, please refer to the Health Workforce Database metadata page on CIHI's website.

The implementation of the 2022 HHR MDS data standard will be staggered across professions, jurisdictions and data years; therefore, trending results should be interpreted with caution when comparing data submitted using the 2022 HHR MDS standard with data submitted using the previous standard (the latter is outlined in CIHI's *Pharmacist Database Manual, Version 3.0*).

Pharmacist data, 2014 to 2023

Supply and workforce

Province or territory	Data limitation
Newfoundland and Labrador	Due to the absence of a 2021 graduating class from the Memorial University of Newfoundland, the supply of Newfoundland and Labrador pharmacists was impacted in 2021. In 2023, the Newfoundland & Labrador Pharmacy Board (NLPB) submitted data based on the 2022 HHR MDS data standard; therefore, trending results should be interpreted with caution.
Prince Edward Island	In 2020, Prince Edward Island supply data was acquired from the National Association of Pharmacy Regulatory Authorities (NAPRA), as data was not provided by the Prince Edward Island College of Pharmacy due to a database transition.
New Brunswick	In 2014, New Brunswick supply data was acquired from NAPRA. Due to COVID-19, the May 2020 Pharmacy Examining Board national examinations were cancelled, thereby preventing some new applicants from becoming licensed in 2020. This could account for decreased inflow numbers in 2020. Fluctuations in Inflow, Outflow and Renewal of pharmacists in New Brunswick between 2021 and 2022 can be attributed to the New Brunswick College of Pharmacists (NBCP) implementing a new database resulting in data quality improvements. Data for 2022 was submitted after the cut-off date (March 2023). Comparisons with data for previous years should be made with caution.
Quebec	From 2014 to 2023, Quebec supply data was acquired from NAPRA.
Ontario	In 2019, Inflow, Outflow and Renewal data for pharmacists in Ontario was unavailable. Due to COVID-19, the May 2020 Pharmacy Examining Board national examinations were cancelled, thereby preventing some new applicants from becoming licensed in 2020. This could account for decreased inflow numbers in 2020. In 2022, the Ontario College of Pharmacists adopted a new methodology to improve the quality of employment-related data and direct care. Comparisons with previous years should be made with caution.
Saskatchewan	Due to COVID-19, the May 2020 Pharmacy Examining Board national examinations were cancelled, thereby preventing some new applicants from becoming licensed in 2020. This could account for decreased inflow numbers in 2020.
Manitoba	The decrease in inflow in Manitoba in 2021 and 2022 can be attributed to the following: a reduced number of new applicants due to COVID-19–related travel restrictions; postponement of the 2020 Pharmacy Examining Board of Canada (PEBC) Qualifying Examinations and the sequent seating capacity limitation in the 2022 PEBC Objective Structured Clinical Examination (OSCE); and there having been no graduates from the College of Pharmacy, University of Manitoba in 2022 due to the transition to a new PharmD Program.
Alberta	Due to COVID-19, the May 2020 Pharmacy Examining Board of Canada's national examinations were cancelled, thereby preventing some new applicants from becoming licensed in 2020. This could account for decreased inflow numbers in 2020.

Province or territory	Data limitation
British Columbia	Due to COVID-19, the May 2020 Pharmacy Examining Board of Canada's national examinations were cancelled, preventing some new applicants from becoming licensed in 2020. This could account for increased inflow numbers in 2021.
Yukon	In 2014, 2016 and 2017, Yukon supply data was acquired from NAPRA. The Department of Community Services, Government of Yukon submitted record-level data in 2015. From 2018 to 2023, aggregate-level supply data was submitted for pharmacists. In 2023, Yukon data underwent an enhancement procedure. Data from 2014 to 2022 should be used with caution.
Nunavut	Between 2014 and 2016, Nunavut supply data was acquired from NAPRA. From 2017 to 2023, the Department of Health, Government of Nunavut, submitted aggregate-level supply data for pharmacists.

Demographic

Province or territory	Data limitation
Manitoba	Gender and Year of Birth are not directly provided to CIHI by the College of Pharmacists of Manitoba. For reporting, CIHI uses aggregated age and gender information provided by Manitoba Health. In 2015, Inflow and Renewal by Age Group were not available. From 2014 to 2022, Outflow by Age Group was not reported due to a high proportion of missing values.
Yukon	In 2014, 2016 and 2017, Yukon supply data was acquired from NAPRA and demographic data was not available. From 2018 to 2023, the Yukon Department of Community Services, Government of Yukon submitted aggregate-level supply data. In 2018 and 2021, Gender, Age Group and Average Age were available, and in 2019 and 2020, only Average Age was available. In 2022 and 2023, Gender data was not collected by the Yukon Department of Community Services, Government of Yukon and Age data was not available.
Northwest Territories	After 2020, Gender and Age data was not collected by the Government of the Northwest Territories Department of Health and Social Services.

Education

Province or territory	Data limitation
Newfoundland and Labrador	In 2023, **Education** data was not reported due to data quality issues resulting from the adoption and implementation of CIHI's 2022 HHR MDS data standard. Refer to the HHR data standards update, 2022 section for more details.
Northwest Territories	In 2014, Years Since Graduation was not reported due to a high proportion of missing values.

Employment

Province or territory	Data limitation
Newfoundland and Labrador	In 2023, **Employment** data was not reported due to data quality issues resulting from the adoption and implementation of CIHI's 2022 HHR MDS data standard. Refer to the HHR data standards update, 2022 section for more details.
New Brunswick	Fluctuations in the Employment Category for pharmacists in New Brunswick between 2021 and 2022 can be attributed to the NBCP implementing a new database, resulting in data quality improvements. Comparisons with data for previous years should be made with caution.
Prince Edward Island	In 2023, information pertaining to **Workforce Geography** and **Health Region** data was not reported due to database quality issues. Modifications are being made to enable the collection of this information in future years.
Ontario	In 2014, the Ontario College of Pharmacists coded all pharmacists as *permanent employee* for the data element Employment Category**.** Prior to 2017, the Ontario College of Pharmacists was unable to accurately identify Employment Status categories. As such, all pharmacists were coded as *employed in the profession of pharmacy* or *not employed and seeking employment in the profession of pharmacy*. Since 2017, data for **Employment Status** has been accurately submitted. In 2022, the Ontario College of Pharmacists adopted a new methodology to improve the quality of employment-related data and direct care. Comparisons with previous years should be made with caution.
British Columbia	In 2018, due to the change of the data collection method and the optional status of the **Employment** and **Geography** fields, some registrants may have omitted this information, causing a significant increase in *not stated* values.
Yukon	In 2015, workforce geography (urban and rural/remote) was not reported due to a high proportion of missing values.

Privacy and confidentiality

The protection of individual privacy, the confidentiality of records and the security of information are essential to CIHI's operations. In support of this position, CIHI established a comprehensive privacy, confidentiality and security program. A key element of the program is the statement of principles and policies set out in the document *Privacy Policy on the Collection, Use, Disclosure and Retention of Health Workforce Personal Information and De-identified Data, 2011* (in short, the Health Workforce Privacy Policy, 2011). A copy of this document can be downloaded free from [CIHI's website](#).

CIHI is a prescribed entity in Ontario, which means that health information custodians in Ontario can provide personal health data to us without the consent of individuals.

The HWDB does not collect, use or disclose personal information. The data collected may contain small cell sizes. However, in keeping with Section 32 of the Health Workforce Privacy Policy, 2011, CIHI makes statistical information publicly available only in a manner designed to minimize any risk of identifiability and residual disclosure of personal information about individuals.

Appendices

Appendix A: Pharmacists, first year of regulation, by province and territory

Type of professional	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nun.
Pharmacists	1910	1905	1876	1884	1875	1871	1878	1911	1911	1891	1986	1953	1999

Appendix B: Pharmacist data providers, 2023

Pharmacists	
Newfoundland and Labrador	Newfoundland & Labrador Pharmacy Board
Prince Edward Island	Prince Edward Island College of Pharmacy
Nova Scotia	Nova Scotia College of Pharmacists
New Brunswick	New Brunswick College of Pharmacists
Quebec	National Association of Pharmacy Regulatory Authorities
Ontario	Ontario College of Pharmacists
Manitoba	College of Pharmacists of Manitoba
Saskatchewan	Saskatchewan College of Pharmacy Professionals
Alberta	Alberta College of Pharmacy
British Columbia	College of Pharmacists of British Columbia
Yukon	Department of Community Services, Government of Yukon
Northwest Territories	Department of Health and Social Services, Government of the Northwest Territories
Nunavut	Department of Health, Government of Nunavut

Appendix C: Text alternative for average age image

Average age equals numerator 1 over denominator n (defined as the total number of health care professionals in a jurisdiction or Canada) times the sum of the individual health care professionals' ages for the total number of n health care professionals; the count of individual health care professionals i equals 1 to n.

References

1. Canadian Pharmacists Association. [Pharmacists in Canada](). Accessed June 26, 2024.

2. Statistics Canada, Centre for Demography. Population estimates, July 1 (based on 2021 census), by age group and gender for Canada, provinces, territories, health regions. Accessed summer 2024.

3. World Health Organization. *National Health Workforce Accounts: A Handbook*. 2016.

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