



Pharmacists in Canada, 2019

Methodology Notes



Canadian Institute
for Health Information

Institut canadien
d'information sur la santé

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For permission or information, please contact CIHI:

Canadian Institute for Health Information
495 Richmond Road, Suite 600
Ottawa, Ontario K2A 4H6
Phone: 613-241-7860
Fax: 613-241-8120
cihi.ca
copyright@cihi.ca

ISBN 978-1-77109-942-4 (PDF)

© 2020 Canadian Institute for Health Information

How to cite this document:

Canadian Institute for Health Information. *Pharmacists in Canada, 2019 — Methodology Notes*. Ottawa, ON: CIHI; 2020.

Cette publication est aussi disponible en français sous le titre *Les pharmaciens au Canada, 2019 — notes méthodologiques*.

ISBN 978-1-77109-943-1 (PDF)

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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 providers. 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, 2019 — Data Tables* (XLSX)
- *Pharmacists (PTs): Supply, percentage change and rate per 100,000 population, Canada, 2019* (map)

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

- *Occupational Therapists in Canada, 2019 — Data Tables* (XLSX)
- *Occupational Therapists in Canada, 2019 — Methodology Notes* (PDF)
- *Occupational therapists (OTs): Supply, percentage change and rate per 100,000 population, Canada, 2019* (map)
- *Physiotherapists in Canada, 2019 — Data Tables* (XLSX)
- *Physiotherapists in Canada, 2019 — Methodology Notes* (PDF)
- *Physiotherapists (PTs): Supply, percentage change and rate per 100,000 population, Canada, 2019* (map)
- *Nursing in Canada, 2019: A Lens on Supply and Workforce* (PDF)
- *A profile of nursing in Canada, 2019* (infographic)
- *Nursing in Canada, 2019 — Chartbook* (PPTX)
- *Nursing in Canada, 2019 — Data Tables* (XLSX)
- *Nursing in Canada, 2019 — Methodology Notes* (PDF)
- *Health Workforce in Canada, 2019 — Quick Stats* (XLSX)
- *Canada's Health Care Providers, 2014 to 2018 — Data Tables* (XLSX)
- *Canada's Health Care Providers, 2014 to 2018 — Methodology Notes* (PDF)
- *Physicians in Canada, 2018* (PDF)
- *Supply, Distribution and Migration of Physicians in Canada, 2019* (data tables, methodology notes)

Feedback and questions are welcome at hhr@cihi.ca.

For more information, please contact

Health Workforce Information
Canadian Institute for Health Information
495 Richmond Road, Suite 600
Ottawa, Ontario K2A 4H6
Phone: 613-241-7860
Email: hhr@cihi.ca
Website: cihi.ca

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 providers to benefit the health of Canadians. They are health care providers who work in a variety of different settings, such as hospitals, community pharmacies, family health teams, the pharmaceutical industry, governments, associations, colleges and universities.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.

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, the collection period and/or CIHI's data exclusion criteria and 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.

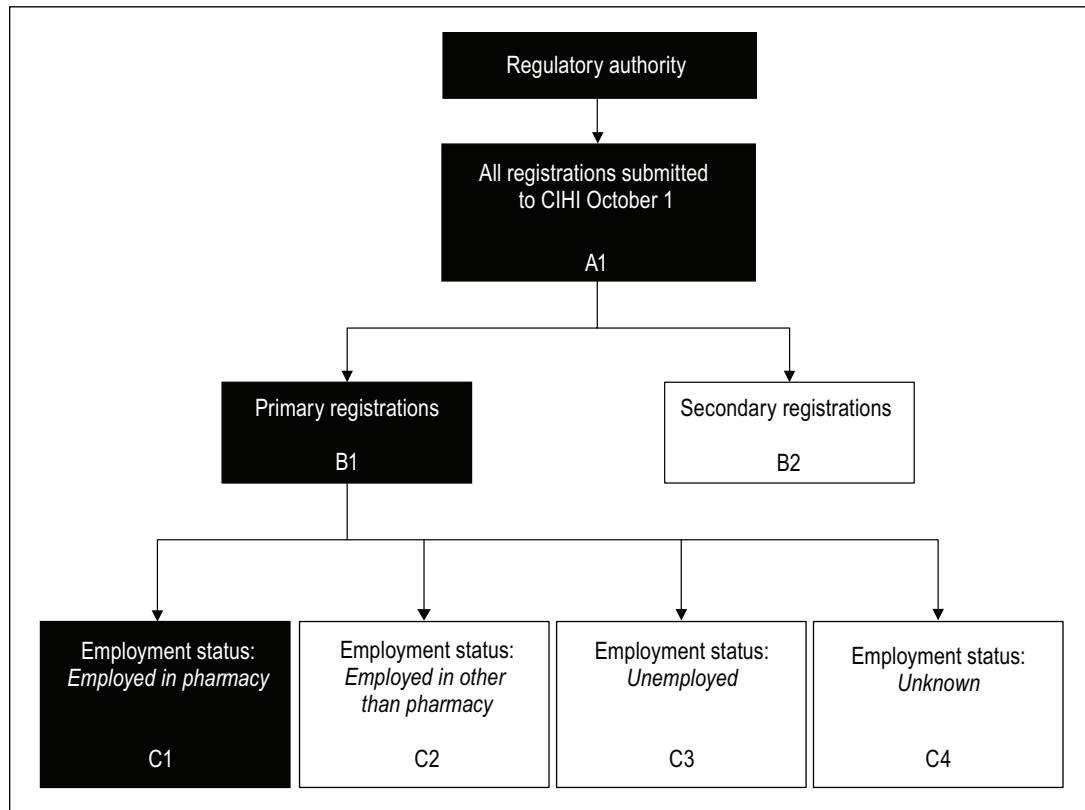
To better ensure timeliness, CIHI collects data prior to the end of the registration period, which varies among jurisdictions. For pharmacists, a cut-off date for data collection was established through consultation with the data providers and reflects a point in time when the majority of the registrations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

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 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. This prevents the double-counting of some pharmacists who register in more than one jurisdiction. The methodology that identifies primary and secondary registrations is explained in detail in 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 Quebec, 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.

There are a few potential sources of over-coverage:

- **Duplicate and out-of-scope records:** Over-coverage occurs when duplicate records appear in the HWDB or when out-of-scope records (i.e., inactive registrants) are included.
- **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 30 groups of health care providers 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 providers.
- 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.

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

Where

- i = Individual health care provider
- n = Total number of health care providers 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 and peer groups

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, 2019* 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 Conversion File (PCCF) are used to assign health care providers 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.

In order to facilitate comparisons among health regions, Statistics Canada developed a methodology that groups health regions with similar socio-economic and socio-demographic characteristics; these are referred to as peer groups. The [health region peer groups defined by Statistics Canada](#) are based on the 2018 classification of peer groups and are presented in [Pharmacists in Canada, 2019 — Data Tables](#).

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 is changing 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 is calculated by dividing the number of new registrants — pharmacists who were not registered to practise pharmacy in the same province or territory the year before — by the total number of registrants in the same 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 registration in a province or territory the following year. Outflow is calculated by dividing the number of registrants who did not renew their licence to practise pharmacy in the same province or territory by the total number of registrants in the same year. Outflow is influenced by a number of factors,

and these factors will 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 choosing an employment opportunity in another province, territory or country, leaving the profession, taking parental leave and fulfilling family responsibilities, or returning to school for additional education.

Population estimates and per 100,000 population counts

Using population estimates from Statistics Canada, rates per population can be calculated for health care providers. [Appendix B](#) includes Statistics Canada's population estimates by province and territory for 2010 to 2018.

Urban and rural/remote

A postal code analysis is performed to determine whether a health care provider is practising in an urban or a rural/remote setting.²⁻⁴ 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 to statistical area classifications (SACs) — urban or rural/remote. Urban areas are defined (in part) by Statistics Canada as communities with populations greater than 10,000 people; rural/remote is equated with communities outside the urban boundaries and is referred to as *rural and small town* (RST) by Statistics Canada.

RST communities are further subdivided by identifying the degree to which they are influenced in terms of social and economic integration with larger urban centres. Metropolitan influenced zone (MIZ) categories disaggregate the RST population into 4 subgroups: strong MIZ, moderate MIZ, weak MIZ and no MIZ.

Urban and rural/remote areas are classified as follows:

- Urban: SACtype = 1, 2, 3
- Rural/remote: SACtype = 4, 5, 6, 7, 8

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 2019 by province and territory for pharmacists.

Table 1 Pharmacist data submitted to CIHI, by province and territory, 2019

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

In an effort 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*.⁵ 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, 2019* 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 <i>Pharmacists in Canada, 2019 — Data Tables</i>
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, 2010 to 2019
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, 2010 to 2019
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, 2010 to 2019
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, 2010 to 2019
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, 2010 to 2019
1 – 11: Percentage of active health workers employed by facility type, by cadre	Table 10: Pharmacist workforce employed in direct care, by place of work, provinces/territories with available data, 2010 to 2019
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, 2010 to 2019
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, 2010 to 2019

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 2010 to 2019 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, 2019 — Data Tables](#). Caution should be used when comparing data within this time period.

Pharmacist data, 2010 to 2019

Supply and workforce

Province or territory	Data limitation
New Brunswick	Supply data was acquired from the National Association of Pharmacy Regulatory Authorities (NAPRA) for New Brunswick in 2014.
Quebec	Supply data was acquired from NAPRA for Quebec from 2010 to 2019.
Ontario	The flow of pharmacists in and out of Ontario between 2018 and 2019 is unavailable.
Yukon	In 2018 and 2019, the Yukon Department of Community Services submitted aggregate-level supply data for pharmacists. Data for 2010 to 2013 and 2015 was submitted at the record level. In 2014, 2016 and 2017, data was acquired from NAPRA.
Nunavut	From 2017 to 2019, the Nunavut Department of Health submitted aggregate-level supply data for pharmacists. Between 2010 and 2016, data was acquired from NAPRA.

Demographic

Province or territory	Data limitation
Manitoba	<p>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, Seniors and Active Living.</p> <p>In 2010, Age Group, Average Age and Gender were not reported due to a high proportion of missing values.</p> <p>In 2014 and from 2016 to 2018, Outflow by Age was not reported due to a high proportion of missing values.</p>
Yukon	<p>Data for Year of Birth was not available for 2010 and 2011. As such, the derived variables Flow by Age Group, Age Group and Average Age cannot be calculated for those years.</p> <p>In 2018, the Yukon Department of Community Services submitted aggregate-level supply data (including Gender, Age Group and Average Age) for pharmacists.</p> <p>In 2019, only aggregate-level supply data for Average Age is available.</p>
Nunavut	<p>In 2017 and 2019, the Nunavut Department of Health submitted only aggregate-level supply data for Gender for pharmacists.</p>

Education

Province or territory	Data limitation
New Brunswick	<p>Between 2010 and 2013, the New Brunswick Pharmaceutical Society (now the New Brunswick College of Pharmacists) was unable to differentiate Location of Graduation (Canada and international) for pharmacists in New Brunswick. Canadian and international graduate data is not available for those years.</p>
Ontario	<p>In 2011, the University of Waterloo had its first graduating cohort since its accreditation.</p>
Northwest Territories	<p>In 2014, Years Since Graduation was not reported due to a high proportion of missing values.</p>

Employment

Province or territory	Data limitation
Ontario	<p>Between 2011 and 2014, the Ontario College of Pharmacists coded all pharmacists as <i>permanent employee</i> for the data element Employment Category.</p> <p>Prior to 2017, the Ontario College of Pharmacists was unable to accurately identify Employment Status categories. As such, all pharmacists were coded as <i>employed in the profession of pharmacy</i> or <i>unemployed and seeking employment in the profession of pharmacy</i>. Since 2017, data for Employment Status has been accurately submitted.</p> <p>From 2010 to 2012, the number of employed pharmacists was under-reported due to a data collection issue.</p>
Yukon	<p>In 2010 and 2011, Employment Category and Position were not available.</p> <p>In 2015, workforce geography (urban and rural/remote) was not reported due to a high proportion of missing values.</p>

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.

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

Type of provider	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: Population estimates, by province and territory, Canada, 2010 to 2018

Year	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nun.	Canada
2010	522,009	141,654	942,107	753,035	7,929,222	13,135,778	1,220,780	1,051,443	3,732,082	4,465,546	34,596	43,285	33,352	34,004,889
2011	524,999	143,963	944,274	755,705	8,005,090	13,261,381	1,233,649	1,066,026	3,789,030	4,502,104	35,411	43,504	34,192	34,339,328
2012	526,345	144,530	943,635	758,378	8,061,101	13,390,632	1,249,975	1,083,755	3,874,548	4,566,769	36,234	43,648	34,672	34,714,222
2013	527,114	144,094	940,434	758,544	8,110,880	13,510,781	1,264,620	1,099,736	3,981,011	4,630,077	36,521	43,805	35,337	35,082,954
2014	528,159	144,283	938,545	758,976	8,150,183	13,617,553	1,279,014	1,112,979	4,083,648	4,707,103	37,137	43,884	35,971	35,437,435
2015	528,117	144,546	936,525	758,842	8,175,272	13,707,118	1,292,227	1,120,967	4,144,491	4,776,388	37,690	44,237	36,488	35,702,908
2016	529,426	146,969	942,790	763,350	8,225,950	13,875,394	1,314,139	1,135,987	4,196,061	4,859,250	38,547	44,649	36,975	36,109,487
2017	528,567	150,566	950,680	766,852	8,297,717	14,071,445	1,335,396	1,150,782	4,243,995	4,922,152	39,628	44,936	37,552	36,540,268
2018	525,355	153,244	959,942	770,633	8,390,499	14,322,757	1,352,154	1,162,062	4,307,110	4,991,687	40,476	44,541	38,396	37,058,856

Note

2018 population estimates were used for both 2018 and 2019 data.

Source

Statistics Canada, Demography Division.

Appendix C: Pharmacist data providers, 2019

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 D: Text alternative for average age image

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

References

1. Canadian Pharmacists Association. [Pharmacists in Canada](#). Accessed June 22, 2020.
2. McNiven C, Puderer H, Janes D. [Census Metropolitan Area and Census Agglomeration Influenced Zones \(MIZ\): A Description of the Methodology](#). 2000.
3. du Plessis V, et al.; Statistics Canada; Clemenson H; Agriculture and Agri-Food Canada. [Definitions of rural](#). *Rural and Small Town Canada Analysis Bulletin*. 2001.
4. Canadian Institute for Health Information. [Supply and Distribution of Registered Nurses in Rural and Small Town Canada, 2000](#). 2002.
5. World Health Organization. [National Health Workforce Accounts: A Handbook](#). 2016.

**CIHI Ottawa**

495 Richmond Road
Suite 600
Ottawa, Ont.
K2A 4H6
613-241-7860

CIHI Toronto

4110 Yonge Street
Suite 300
Toronto, Ont.
M2P 2B7
416-481-2002

CIHI Victoria

880 Douglas Street
Suite 600
Victoria, B.C.
V8W 2B7
250-220-4100

CIHI Montréal

1010 Sherbrooke Street West
Suite 602
Montréal, Que.
H3A 2R7
514-842-2226

cihi.ca

22371-0620

