

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education,
Training and Distribution Study



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Les soins offerts aux Canadiens : l'avenir de l'effectif en santé au Canada
Étude sur l'éducation, la formation et la répartition de l'effectif en santé au Canada

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Table of contents

Overview 1

Indigenous health workforce 18

Methodology 35

Current state analysis 52

Challenges and barriers. 78

Innovations in education and training of Canada’s health workforce . . 82

Workforce supply, demand and gap projection results 94

Reflections 161

Recommendations 162

Future considerations 165

Appendices 167



Overview

Acknowledgements

The Caring for Canadians: Canada's Future Health Workforce report of the Canadian Health Workforce Education, Training and Distribution Study (the Study) is the result of a collective effort of many individuals and groups. The engagement of the federal, provincial, and territorial (FPT) Committee on Health Workforce (CHW), who provided data, valuable feedback on the report and are guiding considerations of next steps, was greatly appreciated.

The report was led by an FPT Project Team composed of Eli Purchase (NT); Brendan King (BC); David Lamb (ON); Karen Dickson (NL); Deborah Cohen (Health Workforce Canada); Chantal Couris (Canadian Institute of Health Information) and numerous Health Canada staff. Their input and support were invaluable.

The Study was informed by an engagement process that included over 30 health education and workforce organization leaders and experts. This included consultations on methodology and forecasting as well as on data use and modelling assumptions. The input, knowledge, experience and expertise provided contributed greatly to the quality of this report. Please see Appendix A for a list of participants.

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With great appreciation to all,

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Introduction

Providing a health workforce that meets population needs continues to be one of the greatest challenges facing Canada's health care systems. For decades, health professionals have reported alarming trends including unmanageable workloads and worsened mental health that have created very challenging working conditions.^{1,2} These issues were worsened by the pandemic and led to high turnover, absences from work and a record high number of overtime hours worked by health professionals.³ Higher burnout, early retirement and low retention rates among health professionals are now prevalent across the country.⁴ Recent surges in health care job vacancies suggest that demand for health care is outpacing the gains in supply.⁵

Reports of health services closures across the nation, especially in rural, remote and northern communities,^{6,7} and a declining number of Canadians reporting access to a primary care provider, have become commonplace.^{8,9} Specifically, there have been increased reports about shortages of family physicians and nursing professionals in primary care.^{10,11,12,13}

While the challenges affecting Canada's health workforce are shared with health workforces across the globe, the need to ensure an adequate health workforce plan that can meet patient needs in the short- and long-term has never been more critical.¹⁴ Federal, Provincial and Territorial (FPT) governments have been working together to establish a path forward, including addressing the root causes of the health workforce challenges and develop transformative and innovative solutions.

During the Health Ministers' Meeting (HMM) in 2023, FPT Ministers of Health, except Quebec,ⁱ committed to several initiatives seeking to address these challenges for Canada's health workforce¹⁵ including the establishment of a new health workforce data and planning agency named Health Workforce Canada (HWC), supporting an agile and flexible workforce by advancing efforts to strengthen labour mobility in Canada, focusing attention on the retention of health professionals, such as its commitment to disseminate and implement the Nursing Retention Toolkit,¹⁶ and streamlining foreign credential recognition processes to advance the integration of internationally educated health professionals.¹⁷

ⁱ Quebec does not subscribe to the pan-Canadian approach regarding the health workforce and intends to retain its full autonomy in its jurisdiction over health.

About the Study

HMM 2023 also set a commitment to enhance Canada's capacity to produce a domestic supply of key health professionals. To address this challenge, the FPT Health Ministers, except Quebec, called for a study of the education and training supply and demand for health professions (the Study) that would help identify the best pan-Canadian approaches to meet future health care demands for Canadians over the next decade. As part of this work, the Study is also meant to explore strategies and initiatives to support the inclusion, recruitment, and retention of Indigenous Peoples in the health workforce, and addressing the misalignment in the distribution of health workers across regions and settings.¹⁸ Health Ministers called for a report by the next HMM in the fall of 2024.

The Study is the first national initiative of its kind to collect information on the education and training of select health professionals, building on national efforts to develop an appropriate health workforce model that can assess the gap between the supply and demand of health professionals in Canada. We know that Canada has a limited capacity to assess if the current domestic capacity to supply health professionals will meet the demand for health services. This data gap has caused challenges for Provincial and Territorial (PT) governments to implement expansions, policies and programs necessary to ensure an adequate supply and distribution of domestically educated and trained health professionals. This information will be critical in addressing the next steps required to address the challenges facing health workforce planning and management from the perspective of the education and training programs.

Governance

The Study terms of reference were approved by FPT Deputy Ministers, except Quebec,ⁱⁱ in January 2024. The Committee for Health Workforce (CHW), comprising of federal and provincial co-chairs and health workforce planning leaders from each provincial, territorial and federal ministry of health, was confirmed as the body providing general oversight for the Study.

The day-to-day work related to the Study was managed by an FPT Project Team chaired by Health Canada's Chief Medical Workforce Advisor. Membership of the FPT Project team included representatives from four PT governments (Northwest Territories, Newfoundland and Labrador, Ontario and British Columbia), the Canadian Institute for Health Information (CIHI), HWC and Health Canada.

Purpose

The primary goal of the Study was to conduct an in-depth stock-taking and assessment of the domestic supply capacity, demand for and distribution of selected health professions within Canada. By providing a better understanding of the existing landscape, the Study aims to pave the way for Canada to identify key challenges, opportunities and potential recommendations for the education and training of health professionals.

ⁱⁱ Quebec considers health human resources to be its exclusive responsibility. However, Quebec remained open to sharing information and best practices with other jurisdictions, thereby participated on the CHW as an observer.

Scope

Given the complexity and short timeframe to complete the Study, the scope was limited to professions engaged in primary care that had existing and available health workforce information from CIHI. Although there are many other health professions that need to be assessed, time and data limitations did not allow further expanding the scope of the Study. As such, the Study focuses on the following professions:

- Nursing professionals
 - Licensed Practical Nurses (LPN)
 - Registered Psychiatric Nurses (RPN)
 - Registered Nurses (RN)
 - Nurse Practitioners (NP)
- Occupational therapists
- Physiotherapists
- Pharmacists
- Physicians (with a specific focus on family physicians)

The Study was guided by the following focal areas and questions:

1. Current state gathering
 - a. How many health professionals are there today for each identified health profession?
 - b. What is the location and length of training for each health profession and where are they distributed geographically post-graduation?
 - c. What is the current capacity of the training and education system for these health professionals (such as faculty members and teaching capacities) and resources and/or constraints to carry out the education and training of health professionals (such as capital resources, physician space, clinical placement opportunities, etc.)?
2. Current gap analysis
 - a. To what extent does the existing domestic supply and geographic distribution of these health professions meet today's demand for health services?
3. Base case and scenario projections
 - a. Assuming no innovations or interventions are deployed (for example, status quo), and under circumstances that could increase demand or decrease supply, how many health professionals could there be 5 years from now? How many could there be 10 years from now?
 - b. To what extent could domestic supply adequately meet future demands for health services?
 - c. How could future supply fill estimated future demand in the training and education system?
4. Promising practices
 - a. What training and education policy interventions have been leveraged or considered in other jurisdictions to address domestic supply and geographic distribution challenges related to the identified health professions?

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

The Study will lay the groundwork for:

- The formulation of education and training recommendations to better meet demand for health care services.
- Providing equitable training opportunities and distribution of health workers.
- Accelerating training across Canada.

All acronyms and terms used in the Study can be found in appendices B and C, respectively.



Education and training of health professionals in Canada

Typical educational pathways to practice

The following sections describe the typical education programs in Canada for nurses (LPNs, RPNs, RNs and NPs), occupational therapists, physiotherapists, pharmacists and physicians.

As these are regulated health professions, completion of an approved educational program is a required component for graduates to be licensed or registered by their provincial or territorial regulatory body. Graduates of educational programs must meet additional requirements set by their regulatory authority, such as passing a competency or licensing exam to become licensed/registered. Additional regulatory requirements are beyond the scope of the Study.

Licensed Practical Nurse (LPN)

LPN is the term for practical nurses in every jurisdiction in Canada with the exception of Ontario where they are called Registered Practical Nurses. For the purposes of CIHI reporting, and to maintain continuity between provinces and territories, they are referred to as licensed practical nurses.

To become a LPN in Canada, with the exception of Quebec, individuals typically complete a post-secondary diploma program in practical nursing offered by an approved college.¹⁹ Practical nursing programs offer a combination of theoretical education including nursing theory, anatomy, physiology, and pharmacology, ethics and therapeutic relationships, as well as clinical instruction in medical and surgical nursing and practical skills related to patient care. Students receive supervised clinical training in a variety of health care settings including hospitals, retirement homes, long-term care facilities and primary care settings to develop practical clinical experience. The courses can usually be completed in two years of full-time study.²⁰ Applicants must usually have a high school diploma or equivalent to apply to a LPN program. In Quebec, LPNs typically obtain a Diploma (DEP) in Health, Assistance and Nursing which can usually be completed in 14 to 24 months.²¹

Registered Psychiatric Nurse (RPN)

Currently in Canada, British Columbia, Alberta, Saskatchewan and Manitoba are the only provinces to educate and license psychiatric nurses as a category of licensure that is distinct from other nursing categories. RPNs are also regulated in Yukon, the Northwest Territories and Nunavut.²²

RPN education and training is offered at a number of western colleges and universities by way of either a Bachelor of Science in Psychiatric Nursing (B.Sc.P.N), Bachelor of Psychiatric Nursing (BPN), which would typically take three or four years of full-time study, or a 24–30 month Diploma in Psychiatric Nursing. There is also one Master of Psychiatric Nursing program in Canada. Pre-requisites for admission into RPN programs include high school graduation with a competitive average, including courses in math and sciences. These programs typically attract students who have an established interest in psychiatric nursing care across the continuum.

Registered Nurse (RN)

To become an RN in Canada, an individual must complete an approved program of study that blends theoretical education and practical/clinical training from a recognized institution. These programs must address the regulatory entry-to-practice competencies in their curriculum, however *how* the competencies are met varies and how many clinical hours of study are included depends on the post-secondary educational program and/or regulatory requirements in that jurisdiction.

With the exception of Quebec, a Bachelor of Nursing (BN) or Bachelor of Science in Nursing (BSN or BScN) degree from an approved college or university is required to become an RN in Canada.²³ The programs typically require two to four years of full-time study to complete, depending on whether it is an accelerated or second-entry program for students with some university education or a traditional direct entry program for high school graduates. These programs provide students with a comprehensive education in nursing, including nursing theory, anatomy, physiology, and pharmacology, ethics and therapeutic relationships among other nursing health sciences, and clinical practice. Students gain practical experience through clinical placements in a variety of settings throughout the program.²⁴ Some examples of clinical placements include hospitals, long-term care facilities, community health centers, public health, and other health care settings affiliated with the program to provide the student with an opportunity to apply their knowledge and skills in a range of care specialties and settings such as medical and surgical inpatient care, psychiatry and mental health, pediatrics, labour and delivery and perinatal care, community health, among others.

Admission requirements of BN and BScN programs typically include a high school diploma, with courses in math and sciences. As acceptance into these programs is very competitive, a high school average in the mid-80s or higher may be required. The province of Quebec offers several pathways to becoming an RN. The shortest route requires a three-year Diploma of Collegial Studies (DEC) in Nursing.²⁵ An alternative to the DEC-N is a three-year Bachelor's in Nursing degree, which requires as admission criteria a DEC in Science or the equivalent. A two-year Bachelor's in Nursing degree is also available to RNs who have their DEC in Nursing, which is commonly referred to as the post-DEC bacc.²⁶

Nurse Practitioner (NP)

In Canada, the advanced education and training to become an NP is provided through recognized Master of Nursing programs, which are offered by universities across the country.²⁷

To enter a Master of Nursing program with the aim of becoming an NP, a Bachelor of Science in Nursing (BSN) degree or a Bachelor of Nursing (BN) degree is usually required. The applicant must also be licensed or be eligible for licensure as an RN and may need to have relevant clinical experience as an RN, depending on the requirements of the particular program.²⁸ While MN programs have several streams, the MN leading to NP certification typically requires two to three years of full-time study to complete, including clinical practicum components.

Occupational therapist

The entry-to-practice educational degree program required in all provinces and territories is a Master's degree in Occupational Therapy often called an MSc(OT). Typically, applicants must have a four-year undergraduate degree to be admitted to the program, and may be required to have completed select pre-requisite undergraduate courses. Accredited programs usually entail two years of full-time study, and include courses in human anatomy, physiology, psychology, occupational therapy theory and practice, mental health and wellness. Students participate in clinical placements which provide the practice component of the program and usually take place in a variety of practice sites²⁹ in and around the educational institution.

Physiotherapist

In Canada, the educational pathway to prepare a student to practice as a physiotherapist consists of the completion of an accredited professional, entry-to-practice level university program at the Master's level. Fifteen universities in Canada offer an entry-to-practice Master's degree in physiotherapy.³⁰

Admission to Master's degree in physiotherapy programs is competitive and typically requires applicants to have a four-year undergraduate degree with a strong grade point average.³¹ Physiotherapy programs usually run over two years of full-time study, covering basic sciences, exercise and movement sciences, clinical decision making, clinical practice and rehabilitative research.³² Students must also complete over 1,000 clinical placement hours in hospitals, clinics, schools and rehabilitation centres, where they put their knowledge into practice.³³ Physiotherapy programs, including placements, are traditionally taught in and around the university and their associated health facilities.

Pharmacist

Becoming a pharmacist in Canada involves completing a combination of coursework, laboratory instruction, hands-on learning and experiential rotations from an accredited entry to practice degree program.³⁴ The entry to practice degree for pharmacists is a Bachelor of Science in Pharmacy (BScPharm) or a Doctor of Pharmacy (PharmD).³⁵ Eleven Canadian universities now offer entry-to-practice PharmD programs. These typically take four years of full-time study to complete and cover topics such as pharmaceutical sciences, pharmacology, clinical therapeutics, pharmacy practice, communication, sociology and patient care. The patient-focused PharmD program integrates the professional roles of communicator, collaborator, leader-manager, scholar and health advocate.³⁶

Interprofessional education is woven throughout the curriculum, offering opportunities for pharmacy students to learn alongside other health care students. PharmD programs also include at least 40 weeks of practical experiential rotations, often starting in year 1, that help students transfer knowledge and skills from the classroom into real life pharmacy practice. Rotations take place in a variety of health care settings, including hospitals (inpatient and ambulatory care), community pharmacies, primary care clinics and at rural or remote sites. Typically, applicants must have completed at least two years of university prerequisites to be eligible for admission to PharmD programs in Canada.³⁷ International pharmacy graduates may be required to take a university bridging program prior to licensure.

Physician

Physicians in Canada require a medical degree and completion of a residency program. There are currently 17 medical schools in Canada that offer a Doctor of Medicine degree (MD). Except in the province of Quebec, entry into medical school requires prior undergraduate university education.³⁸

In 11 of the 13 medical schools outside Quebec, the medical degree program is a four-year program with summer breaks after the first two years, while two universities offer the degree in three years with no breaks. At the four medical schools in Quebec, a medical degree is completed after four years for students entering from university and five years, including a preparatory year, for those entering from a college (CEGEP).³⁹

The medical curriculum includes basic science subjects, pathophysiology, therapeutics as well as communication and physical skills development with progressive clinical experiences. An important component of medical school is clerkship during which medical students engage in the day-to-day management of patients under the supervision of clinical preceptors. Clerkship takes place in the third and fourth years of the programs. Typical rotations include internal medicine, family medicine, psychiatry, surgery, emergency medicine, obstetrics and gynecology and pediatrics. Elective rotations are also provided to allow students to explore areas of interest.

In their last year in medical school, students apply for residency positions in their preferred specialty through a national match process. Residency training in Canada is a minimum of two years for family medicine and may be as long as six years in surgical specialties.^{40 41}

Existing data sources on health profession education and training

The current literature on health workforce data focuses on data collected at the time of registration or licensure, with less emphasis on health workforce data prior to or during their education and training. This is largely due to the historical approach to health workforce data collection, which has been structured around the regulatory models employed by PT governments to regulate health professions. As regulatory bodies are mandated to create a registry of the individual members within their health professions, personal and professional information is collected at the time of registration and subsequent years when memberships are renewed. This allows regulatory bodies to create datasets on the number of members within their health professions.⁴² While information on the health workforce is more readily available, there are several profession-led efforts to provide information on the education and training of health professionals in Canada.

The databases described in this section contain important but fragmented information on health professionals. Only a few national health profession organizations release self-reported data from faculties on the education and training of their respective profession. There are varied efforts at the PT level to collect information on the domestic supply of health professionals within each province and territory but the collection, analysis and reporting of this data remains inconsistent.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

The most robust information on the education and training of health professionals in Canada is available for physicians. The Association of Faculties of Medicine of Canada (AFMC) administers the annual Canadian Medical Education Statistics (CMES) survey to collect information on the applicants, students and faculty members across all Canadian faculties of medicine. Their report includes the numbers and types of physicians trained and how they are distributed throughout Canada. However, the CMES is a voluntary, self-reported survey that currently has gaps in the information reported in recent years.⁴³

The Canadian Post-M.D. Education Registry (CAPER) reports on the postgraduate medical education of physicians in Canada, specifically, medical residencies and fellowships. This data repository provides sociodemographic information and details of current and past training programs for medical residents and fellows in Canada, also based on voluntary, self-reported survey collection. Finally, the Canadian Resident Matching Service (CaRMS) provides information on the results of the annual matches between medical graduates and residency positions in Canada. These results can provide decision-makers with insights into the changing trends and preferences of medical school graduates, which have implications for the supply of physicians.⁴⁴

The Canadian Association of Schools of Nursing (CASN) provides some information on the education and training of RNs and NPs in Canada through the Registered Nurses Education in Canada Statistics Survey.⁴⁵ They report on the number of RN and NP students administered, enrolled, and graduating from Canadian nursing programs, types of programs offered and information on faculty members. Their results are based on voluntary, self-reported responses with the most recent report noting an overall response rate of 73.0% and a response rate of 98.9% among CASN members. Their report is unclear on their methods to collect college level information for RN programs. While their survey results provide valuable information on trends in the education and training for two nursing categories, there is a substantial gap about the education and training of other nursing programs in Canada.

Statistics Canada manages the Postsecondary Student Information System (PSIS) survey that provides the enrolment and graduate student counts in Canadian public postsecondary institutions more broadly, that is outside of health care related fields of study.⁴⁶ However, the released public-facing data is based on the Classification of Instructional Programs that groups various health-specific careers into broader categories for more health professions. For example, data on registered nursing is reported with nursing administration, nursing research and clinical nursing, and there is a broader category of rehabilitation and therapeutic professions that includes occupational therapists and physiotherapists. The survey results do not allow greater specificity within their existing products for the purposes of assessing the counts of enrolment for health workforce planning.

Many stakeholders rely on the databases held by CIHI for information on health professions and health systems in Canada. As an independent, not-for-profit organization, CIHI works closely with FPT partners and stakeholders to provide high-quality, integrated health data to drive the planning of health programs and services and the delivery of care. They report information on health profession education obtained at the time of registration, including education level, graduation year, and province, territory, or country of graduation.⁴⁷

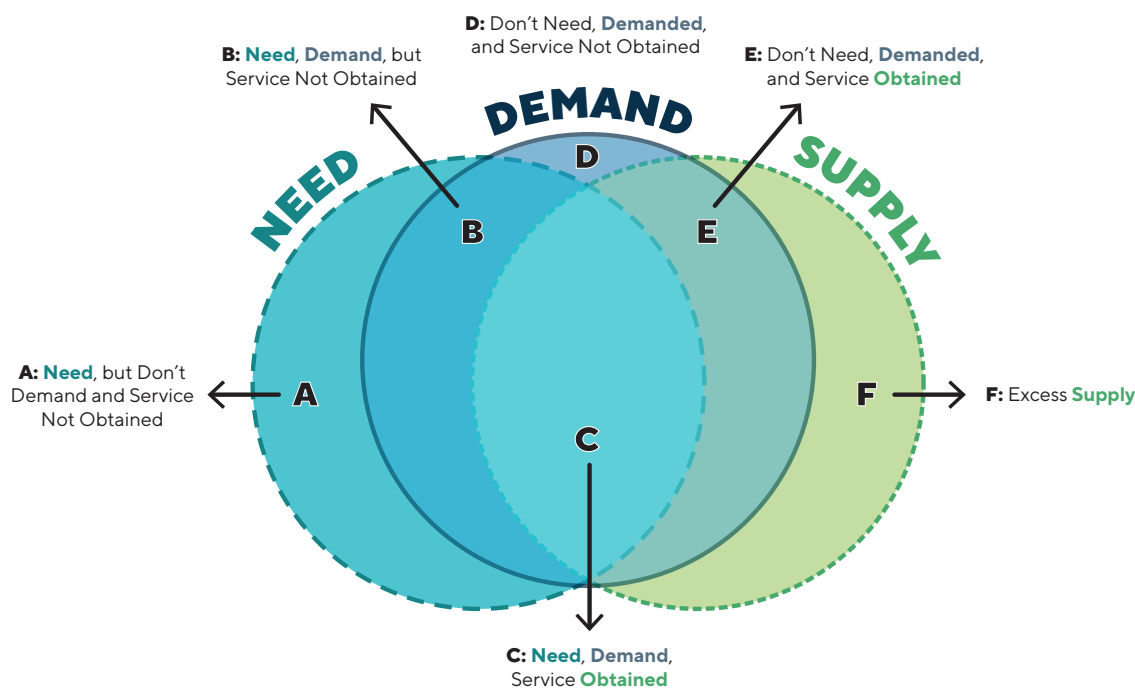
Health workforce supply and demand projections

This section provides background information on the current state of health workforce modelling in the context of estimating current and future supply and demand in Canada, data gaps and modelling constraints and other considerations as they relate to the Study.

Needs, demand and supply

Demand and need are different concepts but are often used interchangeably. Figure 1 provides a conceptualization of health workforce demand, need and supply. To determine whether workforce supply is adequate, supply, demand and/or need are compared. Given the definitions of supply, workforce supply, demand and need, understanding how those can intersect can help refine the concept of a workforce shortage.

Figure 1. The intersection of supply, demand and need: what is a shortage?



Source: Forte.⁴⁸

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Supply, in the context of this study, represents the number of health professionals registered within their regulatory organization, that is, they have an active license to work in that profession. It should be noted, however, that having a license does not necessarily mean the professional is employed in the field or working full-time. The Study focuses on workforce supply, a subset of supply, and represents professionals who explicitly state that they are employed within their health care profession.

Need can be defined as the capacity to benefit from health care, including effective treatment, prevention and supportive care, in improving, maintaining, or slowing the deterioration of health now and/or in the future.⁴⁹ It is specific to “appropriate” health care, which therefore excludes care that may be considered as cost-ineffective or unnecessary. Need can also reflect the number of health professionals needed to provide enough health services to the population to achieve a desired health standard within the population.

The demand for health care is the level of use at which the perceived marginal health benefits of care equal the marginal cost of accessing care.⁵⁰ Individuals will continue to consume health care if benefits outweigh costs and additionally the cost of care is affordable. Costs and benefits as perceived by patients and health professionals will influence demand and are a function of factors including, but not exclusive to, health status, access barriers such as distance to travel and wait times, demographic characteristics and health literacy. In the Study, it is meant to reflect the number of health professionals needed to provide at least the reported or predicted service utilization at a given year as well as to meet estimated unmet needs or demand, in a given year.

The demand reflects a mix of those who want to access services and need those services, as well as those who want to access but do not need them. In the Study, the term demand is throughout and is meant to loosely represent provider numbers needed to allow adequate system capacity to provide services, either as needed or demanded.

When stakeholders identify shortages in health professionals, they are sometimes describing situations where individuals cannot obtain services they demand due to access issues related to more than just workforce supply scarcity (Areas B and D), to need due to not seeking medical care, or related to low health literacy (Area A). Further, there can be instances where services are demanded and received but not needed (Area E), for example, unnecessary health care or overuse of health care that results in higher volume of services provided or cost than is appropriate. The shortage can also occur when there are a surplus of providers (Area F), which reflects resources available that are beyond what is needed or demanded. The intersection of supply, demand, and need can be experienced differently by different populations based on demographic and socioeconomic characteristics, such as ethnicity, insurance status, income, education, and geographic location. Ideally, supply, demand, and need would coincide as illustrated in the area labeled C. Health policy often aims to expand Area C while minimizing Areas A, B, D, E and F.

Existing health workforce models and tools

Based on a rapid review of the recent literature, there have been several health workforce models developed in Canada. For the most part, these studies have focused on select professions such as physicians and nurses, or for a particular jurisdiction, institution, sector or setting.^{51 52 53 54} HWC has engaged in an environmental scan of existing models in Canada and internationally.

On the whole, there is no one existing pan-Canadian health workforce projection model that can predict supply, demand, and gap that was suitable for the current study. As a result, existing tools and data to make these projections for the within-scope health professions were leveraged.

The Physician Resource Planning Tool

The pan-Canadian Physician Resource Planning Tool (PRPT) is managed and maintained by CIHI. The objective of the PRPT is to provide a data-rich tool to evaluate the impact of user-defined scenarios on the future supply-demand gap. In 2016, The Conference Board of Canada was commissioned by Health Canada to develop the PRPT prototype with guidance and oversight by the FPT Committee on Health Workforce. Since that time, CIHI took over the maintenance and management of the PRPT. In 2023, CIHI launched the updated tool with new data. The PRPT is comprised of three components: supply, demand and gap. The supply component includes various data parameters including inflows related to medical school seats, graduates (domestic and international), outputs representing exits from practice including retirements, migration and deaths. The demand component includes data parameters related to population profiles, disease prevalence and physician services utilization and physician workload. The gap component of the tool is the simple difference between supply and demand. Additional information about the PRPT can be found in CIHI's website.⁵⁵

Current pan-Canadian health workforce data

As noted previously on the PRPT, CIHI leverages its own data, as well as the education data from CMES, in the projection of physician supply and utilization, specifically supply data captured in the Scott's Medical Database (SMDB) and National Physician Database (NPDB). The tool uses population projections data that are readily available from Statistics Canada. For most modelling in the country that is based on population growth, Statistics Canada is the typical source for these estimates for a range of growth scenarios.

The SMDB provides information on the number of physicians and their distribution across Canada. It also contains demographic, education and migration information. Since physicians can be uniquely identified in this database, changes in physician type as well as physician movement among provinces and territories can be tracked over time. CIHI⁵⁶ purchases raw data annually from Scott's Directories, owned by iMD Health Global Corp. Scott's Directories collects data from a number of organizations and institutions, such as jurisdictional registrars, medical schools, the Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada. CIHI uses physician counts and demographic information about physicians from a variety of Canadian sources to conduct comparisons, validation checks and perform data quality exercises on the SMDB data.

These data were used to report on the current workforce supply for physicians (family and all other specialties). Most recent data are for the year 2022.

The NPDB provides information on demographic characteristics of physicians, physician payments and physicians' level of activity within Canada's healthcare systems. The NPDB contains socio-demographic, payment and service utilization data of physicians, service utilization data, by age group and sex, of physicians' patients. CIHI receives data from provincial and territorial medicare programs through a standardized set of data elements. In terms of data coverage, billings by physicians in Canada for health care services are detailed at the individual physician level as well as for patient sex and age groupings. Information on physicians' non-billings payments is collected at both the individual physician level and an aggregate level. The National Grouping System (NGS) organizes fee codes from billings data into equivalent categories for each province and territory, which allows for comparisons of physician services and activities across the country. It can also be used to isolate select billing codes associated with select activities when establishing supply and utilization for a sub-set of physicians. Data are most recent for the year 2022.

CIHI collects data and information on more than 30 groups of health professions, with detailed record-level information available for some occupation groups in the Health Workforce Database (HWDB). This includes those in-scope for the Study, that is nurses, occupational therapists, physiotherapists, pharmacists and physicians. The HWDB receives data from national professional societies and associations, provincial and territorial regulatory bodies and provincial and territorial governments. The HWDB can provide comprehensive national, provincial and territorial portraits, including information on supply, distribution, migration, education and employment. Data are most recent for the year 2022. Although the data are available as head counts, there are some data that can be used to estimate full-time equivalents (FTEs), that is full-time or part-time status for nurses and hours-worked for occupational therapists, pharmacists and physiotherapists. Labour force data from Statistics Canada can also be used to help fill the gap in determining FTEs from supply head counts, specifically the Labour Force Survey (LFS) includes data on hours worked by occupation.

The data gaps are largest when it comes to estimating demand for each of the occupational groups. For physicians, demand in the PRPT is based on disease prevalence and service utilization (based on physician billing data comprised of fee-for-service and salaried/contract physicians who shadow bill) and currently accounts for unmet needs in the population. For example, according to the 2022 Canadian Community Health Survey (CCHS), about 14% of the Canadian population do not have a regular care provider and 22% do not have a family doctor or NP as their regular care provider (see subsequent section on Primary care for further assessment on primary care unattachment). With this data source, the estimated demand in the PRPT could be adjusted for unmet need or primary care unattachment to family physicians or NPs. There was little data available to adjust demand for unmet needs for all other medical specialties. As a result, the Study focusses on providing supply and demand projections for family physicians and not all physicians.

While there are some data on family physician utilization and unmet need, these data do not exist at the pan-Canadian level for the other occupational groups included in the Study. Current provider counts per population counts can be a way to proxy for utilization or demand,^{57 58 59} however this approach is limited due to the lack of consideration for unmet need.

One of the key goals of the Study is to establish gaps in rural and urban areas. Not all data used in the projections modelling was available at the rural and urban geographic level. As a result, in some cases, estimates of the rural and urban split for some parameter data are based on general rural and urban shares based on other data, such as population distributions based on census data or unattachment in primary care distributions based on health survey data. It should be noted that there is nuance in how care is delivered in rural and remote areas and different regions across Canada. Quantitative models estimating workforce supply and demand are often reliant on most available data, which are often heavily weighted to, or over-represented by, more populous regions. While the Study attempts to stratify results by rural and remote and urban geography, given data limitations, the results may not be representative of how care is organized or delivered in the territories and rural and remote areas.

Primary care

Landing on a clear and concise definition for primary care was an early challenge in the Study.

Team Primary Care⁶⁰ describes four core functions of primary care:

1. First contact—access to, and use of, health services whenever necessary;
2. Comprehensiveness—a full range of health promotion, prevention, treatment and rehabilitation services appropriate to the primary care context;
3. Coordination—linkage and seamless integration of all the health care the patient receives and needs; and
4. Continuity—a professional relationship with the patient over time, leading to the establishment of strong mutual trust and thorough understanding of the patient.

Further, comprehensive primary care can be described as the following types of service domains and services:⁶¹

- community and patient focused
 - population and community health
 - holistic person and family-centred care
 - case management
 - social care
- comprehensive services
 - prevention and screening
 - diagnostic procedures
 - routine patient care/procedures
 - chronic care
 - mental health services
 - rehabilitation
 - specialized services
 - substance use support

- across the life cycle
 - reproductive and gynecological care
 - maternal and well-baby care
 - child, youth and adolescent care
 - older adult/geriatric care
 - end of life planning and care

Consultations with family physician experts noted that an agreed-upon definition for primary care does not exist in Canada. Through these discussions, it was also clear that scope of activities performed by the family physician workforce would need to be limited to activities that would be performed by those who address primary care needs in the population.

Three descriptions, associated for three supply and demand scenarios for family physicians, were used, representing grouped services provided:

- Office-based family physician services: represents services that were predominately provided by family physicians in Canada and which were provided out of hospital
- Comprehensive primary care services: represents services that were predominately provided by family physicians in Canada, including some in-hospital services, and captures services that many rural family physicians and some urban physicians would typically provide
- All family physician services: represents all services provided by at least one family physician in Canada.

At the outset, the Study aimed to include analysis related to primary care teams, specifically consideration of the supply and demand for interprofessional primary care providers within a team-based setting. Given the time constraints of the Study and challenges related to modelling supply and demand for each of the in-focus occupational groups within an integrated, interprofessional team-based model, the Study analysis focusses on how projected supply of family physicians and NPs could fill the primary care unattachment gap within the base case and scenario analyses for family physicians and NPs.

Attachment to a regular care provider is defined as formal or informal patient access to the same individual primary care provider or group of providers.⁶² Lower attachment is usually experienced among people with low comorbidity (or healthier populations), high residential instability, material deprivation, individuals residing in rural areas, and recent immigrants.⁶³ Based on analyses of the 2022 Canadian Community Health Survey, about 86.2% of respondents said they had a regular care provider (or 13.8% did not). However, removing those who said their regular care provider was someone other than a family physician or nurse practitioner results in an estimated 77.5% who have a regular care provider who is either a family physician or a nurse practitioner.⁶⁴ These estimates are used in the Study to reflect current attachment in primary care. Being attached in primary care is associated with better access to quality care, including preventive services, earlier diagnoses and treatment, chronic disease management, and has shown to reduce unnecessary care, that is lower rates of hospital admissions.^{65 66 67} The repercussions of not having a regular primary care provider is higher patient mortality, higher rates of emergency department visits, diagnoses of late-stage diseases which are often more difficult and costly to treat, and poor patient experiences.^{68 69 70} There may be regional, provincial and territorial variation in primary care unattachment estimates used in the Study as the study looks at the national level approach versus PT approach. As noted before, various estimates for unmet need or unattachment in primary care have been assessed across different studies and surveys based on varying methodology and definitions for primary care.

Team-based, interprofessional primary care teams are defined as the coordinated involvement of multiple primary care providers in patient care.^{71 72} They are associated with increased quality of care that better meets population health needs.⁷³ They are also associated with more timely access to community-based services and reduced use of unnecessary care, particularly in the use of walk-in clinics.⁷⁴ Health care providers in these teams can vary, but typically include one or more family physicians and NPs as well as one or more other health care providers, such as other nurses, physiotherapists, occupational therapists, pharmacists, physician assistants, mental health workers, including social workers and other allied health professionals.^{75 76} Given the expanded scope of practice of NPs in Canada, they have for more than a decade played a key role in increasing primary care access, attachment and positive patient experiences, across the country and in particular rural and remote communities.^{77 78 79}

In the context of the Study, unmet demand or need is represented by levels of unattachment in primary care, specifically to a family physician or NP, within the population. It is important to note that attachment in primary care, however, does not necessarily mean access. For example, an individual may be attached or have regular or continuous access to family physician or NP, but may have trouble accessing the care they need, when and where they need it.

Indigenous health workforce

The Indigenous health workforce component of the Study underscores the significant disparities and challenges experienced by First Nations, Inuit and Métis Peoples in accessing health care provider education and training opportunities in Canada. Rooted in historical injustices and ongoing systemic barriers, these issues necessitate urgent action to foster a culturally safe and more culturally informed health workforce. The research considers five key health professions within Canada's health systems, including nursing, occupational therapy, physiotherapy, pharmacy and medicine, but is not limited to the narrow scope of five health professionals, and considers the roles of Indigenous health helpers, such as Elders and Knowledge Keepers. The study's inclusive Indigenous-informed approach to health learner and profession sampling is highly significant to the analyses of the overall Indigenous health workforce, education and training in Canada.

Methodology

In partnership with the Canadian Health Workforce Education, Training and Distribution Study FPT Project Team (FPT Project Team), Karhinéhtha' Cortney Clark, a Mohawk woman from Wáhta Mohawk Territory, and Indigenous health researcher, conducted the Indigenous education study activities. To begin, the First Nation health researcher reviewed Indigenous data-sovereignty guidelines and incorporated First Nations, Inuit and Métis informed data processing and stewardship practices into the Indigenous education research activities. The creation of an Indigenous-informed protocol, by way of an Indigenous Data Processing Consent Form (Appendix D), for data collection and information management processes ensures that the researchers involved in the study appropriately steward the information gleaned from the First Nation, Inuit and Métis contexts. The data processing protocol information was shared with and consented to, from each study participant, during discussions between the Indigenous health lead researcher and participant through virtual engagement dialogues, to ensure adherence to culturally safe research and consent of data processing.

Through a snowball sampling approach, First Nations, Métis, Inuit as well as non-Indigenous health education learners and professionals, with lived experiences in education and health systems in Canada were invited to engage in individual or group discussions, or both. The initial study participants were identified through the FPT Project Team and included representatives across the health professions. A total of 16 interviews were conducted with health learners, professionals, and organizations representing First Nations, Métis and Inuit and had representation beyond the focus of the study's health professions. The Indigenous education interviews were scheduled through email to general and personal email addresses of Indigenous health professions associations, organizations, community-based groups and individuals. The interviews were carried out via Microsoft Teams platform, ranging from one hour to three hours in length, dependent on the participants' comfort levels and desire to provide insights. Overall, data on the Indigenous health workforce was collected from various sources, including Statistics Canada, First Nations, Métis and Inuit organizations, interviews with Indigenous and non-Indigenous health learners and practitioners, academic research and grey literature.

The recommendations in this report are informed by the study interview data and framed within a comprehensive review of existing Indigenous-led research and related reports, including but not limited to publications by the First Nations Information Governance Centre, the National Consortium for Indigenous Medical Education Catalogues, the Indigenous Physicians Association of Canada, Inuit Taparit Kanatami, Nunavut Tunngavik Incorporated (NTI), Indigenous Pharmacy Professionals of Canada, the Principal Nursing Advisors Task Force, the Truth and Reconciliation Commission of Canada's (TRC) Final Report, as well as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

Background: Indigenous health

First Nations, Métis and Inuit

Indigenous health conceptualizations are deeply rooted in holistic and interconnected views of health, which encompass physical, mental, emotional, and spiritual components that contribute to an overall balance of health and well-being. Indigenous health education and training opportunities reflect and emphasize the importance of Indigenous nation and community connections to culture, language and the environment in preserving balance and to promote the integration of Indigenous-informed healing practices. Indigenous Ways of Knowing, Being and Doing in relation to health perspectives differ from, western biomedical models of health, but can serve to broaden institutional and community-based approaches to innovating health education, training and workplace environments.

UNDRIP,⁸⁰ particularly articles 21, 23, and 24, which have implications for FPT governments, addresses the rights to self-determination that Indigenous Peoples possess regarding their health and health care.

Article 21: Indigenous peoples have the right, without discrimination, to the improvement of their economic and social conditions, including, inter alia, in the areas of education, employment, vocational training and retraining, housing, sanitation, health and social security.

Article 23: Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. Indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.

Article 24: Indigenous peoples have the right to their traditional medicines and to maintain their health practices, including the conservation of their vital medicinal plants, animals and minerals. Indigenous individuals also have the right to access, without any discrimination, to all social and health services. Indigenous individuals have an equal right to the enjoyment of the highest attainable standard of physical and mental health. States shall take the necessary steps with a view to achieving progressively the full realization of this right.

In addition to UNDRIP's general application nationally, FPT governments have taken some measuresⁱⁱⁱ to address the challenges affecting the relations between and First Nations, Inuit and Métis Peoples and FPT governments in ways that respect the Constitution.^{81 82 83 84 85 86 87 88 89}

Education and self-determination

Indigenous-led decolonization initiatives within educational and health institutions are required to address the profound and widespread health inequities experienced by Indigenous populations of Turtle Island. More specifically, the disproportionate allocations of money, power and resources continue to erode Indigenous health outcomes and disrupt access to protective determinants of health such as language, traditional governance, land-based activities and healing practices.⁹⁰ To innovate the future of health care delivery, the standard, biomedical curricular model that is currently widely used across health sciences professional program education requires innovation. One primary role that health leaders can promote is to actively decolonize formal and informal health contexts through prioritizing the recommendations released in the TRC's 94 calls to action.⁹¹

ⁱⁱⁱ The *United Nations Declaration on the Rights of Indigenous Peoples Act* came into force in 2021 in Canada, creating a framework to advance the implementation of the UN Declaration at the federal level. Since March 2023, Canada has worked intensively with Indigenous peoples, who identified gaps and brought forward hundreds of additional priorities, including numerous legislative, regulatory, policy and program changes for alignment with the UN Declaration, many of which have been included in the UN Declaration Act Action Plan released in 2023. BC has established its Declaration on the Rights of Indigenous Peoples Act as the framework for reconciliation, which commits BC to specific actions, as set forth in the Declaration on the Rights of Indigenous Peoples Action Plan.

The TRC Final Report describes 94 system-focused calls to action, with seven health-care specific calls to action. Therefore, the TRC calls to action serve as stepping-stones to creating culturally safe health sciences teaching and learning environments and begin to address the interconnected health care equity gaps in health care practice. Specifically, calls to action 22 and 23 within the TRC will be of focus for the purposes of examining Indigenous education:

22. We call upon those who can effect change within the Canadian health-care system to recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and Elders where requested by Aboriginal patients.

23. We call upon all levels of government to:

- i. Increase the number of Aboriginal professionals working in the health-care field.
- ii. Ensure the retention of Aboriginal health-care providers in Aboriginal communities.
- iii. Provide cultural competency training for all healthcare professionals.

Calls to action 22 and 23, focus on recognition of the value of Indigenous healing practices and Elders within the health care system, as well as emphasize the importance of retaining Indigenous health care providers in Indigenous Communities. To accomplish this, a distinct approach is required with its core values and design informed by the lived experiences and teachings from First Nations, Métis and Inuit. In addition, diverse leadership teams in educational settings are necessary to support incremental educational experiences for youth within their own Indigenous Communities, both in urban and rural settings where learners have kinship support and the ability to remain in their culture. Thus, the community-centred methods to encourage engagement in recruitment and retention support a sense of belonging to the greater health and educational systems. This contributes to capacity-building in Indigenous populations and increases retention of Indigenous experts in the community, further supporting the spirit and intent of the TRC calls to action.

The role of Elders and Knowledge Keepers

There is widespread agreement that First Nations, Inuit and Métis Elders occupy a crucial role in upholding the health of Indigenous Peoples. Elders are recognized by their communities for possessing common qualities that are highly valued strengths in leadership, accrued wisdom, compassion, community devotion and dedication to personal healing. Elders hold important roles within their communities, where they are often recognized for their leadership, traditional knowledge, they are guardians of the community knowledge and supporters of its collective spirit.⁹²

Working with Elders can provide opportunities to assert or reclaim cultural identity as part of treatments and address the cultural marginalization many Indigenous people experience in urban health care settings, such as education and health institutions. The TRC's call to action 22⁹³ is the inclusion of Elders in the treatment of Indigenous patients in Canadian health care systems. However, Elders have not been formally included or recognized as care providers within Canadian health care systems.

Current state of the Indigenous health workforce

The breadth of information gleaned highlights the distribution, value and varied educational backgrounds of First Nations, Métis and Inuit health professionals that differs from the “typical” education and training path of the non-Indigenous population in Canada to becoming a health care professional and participating in the workforce. First Nations, Métis and Inuit Ways of Knowing, Being and Doing have been directly undermined, criminalized, challenged and threatened by generations of colonialism, anti-Indigenous racism, and other forms of systemic oppressions in education and health systems, which contributes to the challenges experienced by First Nations, Métis and Inuit in accessing health professions education and training. Legal barriers have been imposed on First Nations, Métis and Inuit through government sponsored policies, stemming from the Indian Act, including forcible enfranchisement if an individual wanted to pursue post-secondary; banning spiritual practices that are an integral part of holistic health; and not being legally allowed to receive loans for school.

In general, First Nations, Métis and Inuit representation remains low across all health professions. Only 1.2% of all Canadian health professionals are Indigenous health professionals. There are approximately 13,010 health professionals that identify as Indigenous. Of this number, 9,695 are nurses and approximately 74.5% of First Nations, Métis and Inuit health professionals are Registered Nurses.⁹⁴ In 2016, the Canadian Census reported that 760 of the 93,985 physicians identified as Indigenous meaning that they represent less than 1% of physicians in Canada.⁹⁵

Data collection challenges persist, hindering accurate tracking of Indigenous workforce demographics and educational outcomes.⁹⁶ It is worth noting that collecting data on, and regarding, Indigenous peoples in Canada has a particularly harmful history. Processes for data collection and evaluation are not immune from lasting and ongoing consequences of colonialism. The gaps in comprehensive data are extensions of the low numbers of First Nations, Métis and Inuit representation, the historic patterns of harmful data extraction (such as, a reticence to share information because of past colonial oppressions), and data is not controlled by a centralized mechanism, or maintained, because of important considerations for Indigenous data stewardship protocols.

Gaps in data are compounded by reports of unfamiliar pathways to engage with education and health systems, a notable barrier to active integration among First Nations, Métis and Inuit.⁹⁷ Formal collaborations among national health education organizations and Indigenous health professions associations, reinforced through increased information sharing across FPT governments, are essential to further examine the context of health professions regarding the Indigenous student populations and to improve representation over the long term in the national health workforce. Overall, the lack of comprehensive data representative of Indigenous Peoples in health professions, presents challenges to health human resource forecasting. Health education institutions and national Indigenous organizations are foundational to sustain the data stewardship and relationship-building protocols to

communicate with and effectively engage Indigenous trainees and students across the health professions. Through the formalization of culturally informed data collection partnerships, recruitment and retention of Indigenous human health resources will inform and reflect population-specific long-term career intentions, mental health patterns and resources, financial barriers and individual and community priorities, with regional and culturally relevant considerations.⁹⁸

First Nations

First Nations principles for data collection including Ownership, Control, Access and Possession (OCAP®, a registered trademark of the First Nations Information Governance Centre)⁹⁹ were foundational principles to the Indigenous education study protocol. These principles honour First Nation rights to self-determination, in particular with attention to First Nations ownership and control of how information can be used through application of the data processing consent form, while ensuring transparency and member-checking throughout the reporting processes.

Indigenous Services Canada (ISC) is working with Indigenous partners to reform its policies and programs related to recruitment and retention in post-secondary education, guided by First Nations' input and resolutions. The Assembly of First Nations' Resolution #05/2018 supports the First Nations Post-Secondary Education Policy Proposal, emphasizing that First Nations have the inherent and treaty rights to control their education systems. The proposal seeks stronger federal support for post-secondary education through self-governed and regional models that respect First Nations' autonomy and cultural values.¹⁰⁰

Métis

Métis Principles and protocols to data collection and culturally informed knowledge translation honours the ethical principles captured in the Ownership, Control, Access, and Stewardship (OCAS) guidelines. They also maintain accordance with the governing Principles of Métis Research, to ensure respectful governance and data stewardship throughout the entirety of the study, to promote self-determination through research.¹⁰¹ All research participants / interviewees underwent an informed consent process to limit potential risks in data processing, and discussions were rooted in ethical foundations to promote the "4 R's" to Indigenous research relationships: respect, relevance, responsibility and reciprocity.¹⁰²

Inuit

Data governance principles are comprehensively outlined by Inuit Tapiriit Kanatami (ITK). Of importance is the National Inuit Strategy on Research that targets governments, academia, and research institutions and identifies areas for partnership and action that can strengthen the impact, efficacy, and usefulness of Inuit Nunangat research for Inuit. The goal of supporting Inuit by improving access to education, research, data ownership, and dissemination relies on effective policy development to capture accurate and reliable data. Despite extensive research on Inuit and societies, significant data gaps hinder policy advancement and governmental accountability).¹⁰³

Inuit women, men, youth, Elders and gender diverse folks possess unique needs in relation to accessing Canada's education and health systems. Most Inuit communities are served by a single nursing station only, and this reality is a factor that has impacted long term exposure and integration into the Canadian health workforce for most Inuit communities.¹⁰⁴ Therefore, Inuit who reside in their communities across the Inuit Nunangat, such as the described rural and remote Territories, are not provided equitable access to nor do they make up proportional representation across the Canadian education and health systems. NTI operates through initiatives that address the interconnected nature of social and health issues, necessitating a holistic approach to policy and program development. Overall, the broad and complex nature of the issues it addresses are aimed at long-term impacts, recognizing that significant social and cultural changes require sustained effort and time.¹⁰⁵

Culturally appropriate Inuktitut language education

Inuktitut language education is vital for Inuit well-being and self-determination. These identified areas have not been fully realized, leading to a consistent erosion of Inuit educational rights. This regression has contributed to a broader crisis in Nunavut's education system, marked by low attendance and completion rates. The current education system has failed to prioritize Inuit knowledge, language, and culture, further disadvantaging Inuit students. The current education system has failed to prioritize Inuit knowledge, language and culture, further disadvantaging Inuit students, resulting in poor educational outcomes for Inuit students.¹⁰⁶

Indigenous representation in health professions education, training and workforce distribution

Nursing

Nurses represent the largest health profession in all jurisdictions in Canada. Indigenous Peoples, however, are underrepresented in nursing services and nursing education, which impacts Indigenous Peoples' sense of belonging, value and acceptance within nursing spaces. The Canadian Association of Schools of Nursing (CASN) has published two reports from their Indigenous Nursing Student and Faculty Survey (INSFS) in 2021 and 2022, in partnership with the Canadian Indigenous Nurses Association (CINA).¹⁰⁷ As stated by CASN: "[The report] addresses the Truth and Reconciliation Commission Report (TRC) Action 23 which calls for an increased number of Indigenous health professionals. An annual survey of Indigenous nursing students and faculty in Canadian schools of nursing will allow the public to assess the national progress in increasing the number of Indigenous nurses."¹⁰⁸

One study participant noted that nursing education programs in Canada underscore the barriers to self-identifying for Indigenous individuals, and these barriers are connected to the experiences reported with unsafe educational and training environments, such as the reported hyper vigilance and more rigorous assessment of work for Indigenous students once admitted. This observation is supported by the 2020–2021 INSFS report that quotes on of their participants: “I don’t feel as though they [nursing school] . . . understand my struggles and like the balancing act of everything on top of my cultural identity and feeling accepted in my school.”¹⁰⁹ The lack of widespread Indigenous representation across Canadian health education programs contributes to students’ feelings of authentically in expressing themselves, including their Indigenous identities, with the fear of being othered and feelings of a lack of sense of belonging.

The 2020–2021 INSFS report¹¹⁰ provided some information on the number of Indigenous nursing student and faculty populations. Schools of nursing were asked to provide details on how they determined the number of Indigenous nursing students in their program(s). Of the 87 schools that responded to this question, 19% (n=17) indicated that they do not collect this data.¹¹¹ They reported that:

- 976 Indigenous students were enrolled in a RN entry-to-practice programs.
- 337 Indigenous students were admitted to RN entry-to-practice programs.
- 218 Indigenous students graduated from the RN entry-to-practice programs.
- 45 Indigenous students were enrolled in a Master’s program (not including NP programs), 25 were enrolled in a NP program, and 14 Indigenous students were enrolled in a doctoral program across Canada.
- 72 permanent full-time, 9 contract full-time and 13 contract part-time Indigenous faculty were teaching in Canadian schools of nursing.¹¹²

The 2020–21 INSFS Report noted key findings concerning recruitment and retention of Indigenous nursing students and faculty. As stated in the report:

[The schools of nursing] were asked about the structures and policies their school has in place to support Indigenous student and faculty recruitment and retention. More than a majority of schools 56% (n=59) did not respond to the question, while 11% reported they did not have any policies and structures in place. The remaining respondents reported having multiple structures and policies in place. Strategies used most frequently by the respondents included a committee focused on increasing recruitment and retention and a school policy on anti-racism, diversity, and equity.

When asked about strategies and supports the nursing program uses to increase retention of Indigenous nursing students, 57% (n = 60) did not respond. The most common strategies and supports offered by schools include peer support programs (15 schools) and specifically designed orientations (6 schools). Eleven schools responded using “other” strategies, most commonly having Elders in residence and Indigenous centers on campus. Eighteen per cent (18%) of respondents reported having no strategies or supports in place to increase retention.

With regards to supporting the recruitment and retention of Indigenous faculty, 55% (n = 58) of schools did not respond, and 15% (n =16) reported having no strategies in place. Faculty job postings and support for using an Indigenous pedagogy were mostly commonly selected by respondents.¹¹³

Regarding employment terms, nearly two-thirds of the faculty currently teaching in nursing programs in Canada were employed in a short-term contract capacity. Recruitment of faculty members in rural and northern communities is challenging in itself, with a shortage of nurse practitioner, master's, and doctor-prepared candidates, lower salaries and fewer benefits, and remote location and small community size.¹¹⁴ However, INSFS focus group participants agreed that cultural disconnection and systemic racism within health care and educational systems were big factors that specifically limited the recruitment of Indigenous faculty members in these communities.¹¹⁵

The impact of nursing is even more pronounced in rural, remote and Indigenous communities in Canada. National and provincial Auditor General reports have reported that nurses play a critical role in the accessibility and sustainability of health services in northern, rural and remote communities. They deliver the most direct patient care, and in some communities, they are "the only resident health care provider".¹¹⁶

The enduring, severe underrepresentation of Indigenous nursing faculty by employment status, as of 2021, is indicated by the number of reported Indigenous faculty, with 72 permanent faculty (2.2% of faculty workforce reporting as Indigenous), 9 contract full-time faculty (1.5% of faculty workforce reporting as Indigenous) and 13 contract part-time faculty (less than 1% of faculty workforce reporting as Indigenous) in Canada.¹¹⁷

Nursing case study: Mahkwa omushki kiim: Pathway to Indigenous Nursing Education (PINE)

Mahkwa omushki kiim: Pathway to Indigenous Nursing Education (PINE), offers a combination of academic, personal and cultural supports to prepare First Nations, Métis and Inuit students for entrance into the University of Manitoba's Bachelor of Nursing (BN) degree program and to support learners with appropriate personal wellness and cultural continuity resources throughout the program.¹¹⁸

Occupational therapy

There is a noticeable gap in the representation of Indigenous Peoples within the occupational therapy field. Efforts to increase this representation include dedicated seats for Indigenous students in rehabilitation programs. For instance, certain universities reserve 20% of program seats for Indigenous students in their occupational and physiotherapy programs, however culturally informed and community-led recruitment and retention initiatives are lacking resulting in underrepresented enrolment of Indigenous learners in these programs.¹¹⁹

The Canadian Association of Occupational Therapists (CAOT) acknowledges the significant influence of colonization on Indigenous health and prioritizes promoting culturally safe practices and decolonizing occupational therapy. Further advocacy is necessary for increased Indigenous representation and culturally relevant education and practice.¹²⁰

By embedding principles of social accountability into occupational therapy education, addresses cultural safety in recruitment and retention, promotes equity and justice, provides resources, and sustains anti-colonial processes for curriculum design, outreach, and recruitment that are rooted in relationship building and reciprocity with regional underserved communities. By embedding social accountability principles, the organization contributes to shifting power through a sustained focus on collaborative relationship focused practice and through enacting plans to improve access and service use by and for underrepresented individuals and communities. Actions are informed by strategies that increase access to all aspects of rehabilitation therapy (such as, access to education, employment, mentorship, leadership, management, tenure and that considers current barriers for equity-denied groups).¹²¹

Challenges persist in recruitment and retention of Indigenous occupational therapy students. To address these issues, some Canadian universities have Indigenous-specific support programs for health care students, providing culturally relevant resources and socially accountable environments. These programs also focus on fostering a sense of community and belonging. As one study participant noted, enhanced distinctions-based policies and supports for Indigenous students in occupational therapy programs are critical to long-term improvements in Indigenous health through the provision of opportunities to access training in Indigenous nations and community. Additionally, the structural barriers such as pay equity and case load management are identified obstacles to improving workforce distribution. A study participant also noted that in rural, remote and community-based positions, increased attention is needed to build longevity among the workforce, and recruitment and retention efforts must address the lack of regional supports and access to resources in health professions training and employment.

Physiotherapy

Indigenous Peoples are underrepresented in physiotherapy programs in Canada. To combat this, various educational institutions have implemented strategies such as scholarships, reserved seats, and specialized pathways to increase the recruitment and retention of Indigenous students.¹²²

Targeted initiatives to boost the number of Indigenous health professionals have focused on recruiting Indigenous youth from high schools, offering scholarships, and providing dedicated support programs throughout their educational journey. One area for improvement is increasing community outreach to Indigenous youth, showcasing the wide range of opportunities in health professions, which calls for enhanced collaboration in recruitment efforts. Furthermore, educational institutions and professional associations must prioritize regional models that support self-determination and allow Indigenous communities the autonomy to design and manage their own education and health programs. This fosters local control and ensures that programs are better aligned with the community's needs and goals.¹²³

First Nations, Métis and Inuit students in physiotherapy programs often experience isolation and a lack of community support. In a recent study,¹²⁴ Indigenous rehabilitation students were asked to tell their story of learning about, applying to, and being in their rehabilitation program and how their Indigenous identity impacted these experiences. The students appreciated the opportunities afforded to them by being admitted to their programs in an Indigenous Peoples category, with resources and supports of identity affirmation. However, for most students, being in an Indigenous Peoples category came with feared or experienced stigma, or both. Further, one's efforts to develop a health professional identity compounds the already challenging work of developing and maintaining an Indigenous identity in the colonized university environment.

Therefore, the complexity of developing a rehabilitation professional identity as an Indigenous student requires universities to transform into an environment where Indigenous students can be fully accepted for their unique gifts and the identities given to them at birth. Initiatives like the Indigenous Health Professional Student Support program help mitigate these challenges by offering a supportive environment. As noted by a study participant, experiential learning (or education in place) and mentorship programs, which focus on Indigenous professional identity and leadership development, are vital areas where collaboration with Indigenous partners can enhance relationship-building throughout the educational trajectory. In the long term, sustainable Indigenous health human resources depend on addressing systemic barriers, promoting equity and fostering a sense of belonging in health education and professional practice. A study participant also noted that efforts must continue to ensure that Indigenous learners feel supported and valued within these systems.

Pharmacy

The lack of representation of Indigenous Peoples within pharmacy education, training, and the workforce led to the creation of the Indigenous Pharmacy Professionals of Canada (IPPC) in 2023. This organization aims to connect and support Indigenous pharmacy professionals and foster better inclusion in the field. Currently, the IPPC, supported by the Canadian Pharmacists Association, includes about 40 Indigenous pharmacists, highlighting that pharmacy remains another health profession underrepresented by Indigenous Peoples.¹²⁵

Indigenous pharmacy professionals report that isolation is a significant issue, with many Indigenous learners indicating they were often the only Indigenous person in their program, leading to a lack of community.¹²⁶ Some Indigenous students also mentioned that they might not disclose their background if they pass as non-Indigenous to avoid uncomfortable situations.¹²⁷

In response, the IPPC has launched several scholarships for Indigenous pharmacy technician and PharmD students, including a four-year full scholarship. The organization also plans to introduce scholarships for pharmacy assistant programs in the future. Additionally, the IPPC is committed to increasing culturally informed representation of Indigenous pharmacists. They plan to expand their membership, develop recruitment strategies for Indigenous high school students, and advocate for greater representation in pharmacy schools and health systems across Canada. They also aim to address anti-Indigenous racism with the goal of increasing Indigenous representation in the pharmacy profession.¹²⁸

Physician

The Canadian Medical Association (CMA) calls for enhanced data collection, stronger national collaboration, and federal leadership to establish a sustainable and well-distributed health workforce across Canada.¹²⁹ A significant part of this strategy includes integrating Indigenous knowledge and Indigenous-led health curriculum models and practices into health education and human resource planning, particularly in recruitment and retention processes, as these steps are crucial for improving the retention of Indigenous health professionals.¹³⁰ To achieve this, cooperative strategies are required that support the unique realities of Indigenous communities within both health education settings and the health professions.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Indigenous health learners and professionals recommend that anti-racism training and Indigenous-led curriculum development be prioritized to promote culturally safe health care training and work environments. The National Consortium for Indigenous Medical Education (NCIME) has conducted a multi-year review of medical education and identified institutional practices that are most effective in recruiting and retaining Indigenous medical learners. This review underscores the importance of focusing on the overall safety and wellness of Indigenous learners throughout their educational journey.¹³¹

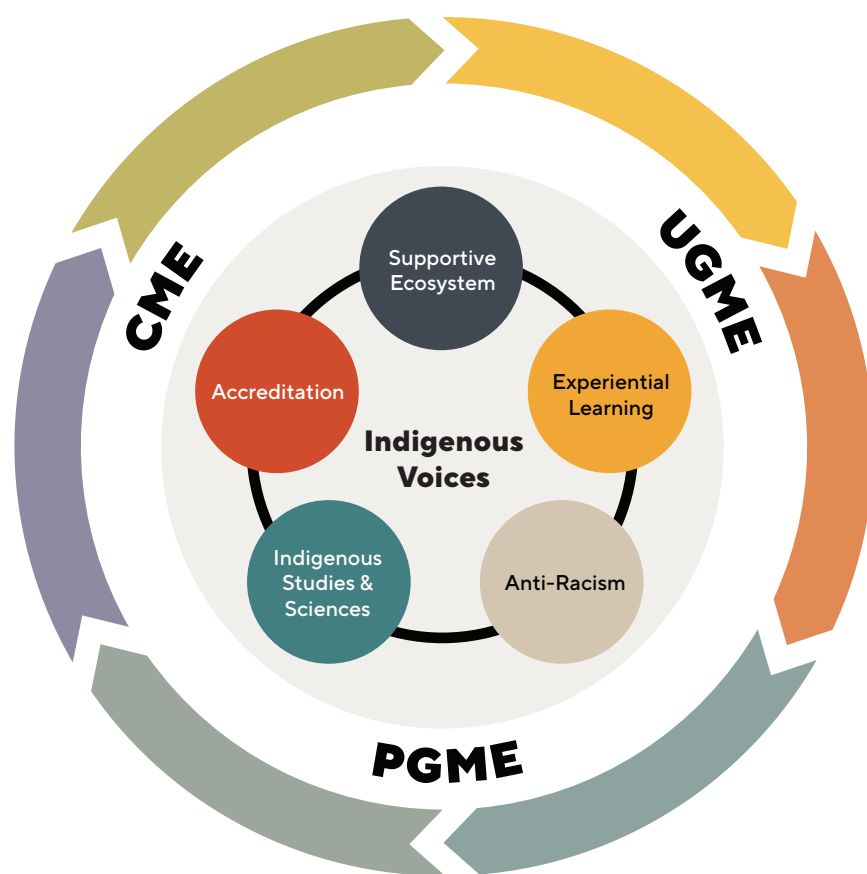
Culturally safe training in health education is essential because First Nations, Métis and Inuit individuals' unique cultural perspectives significantly influence their health beliefs, making it crucial to cultivate culturally safe education and training environments. By fostering greater community engagement and trust, Indigenous health learners and professionals are better equipped to understand socio-cultural contexts, thereby improving relationships within the health care system and enhancing access to care. Additionally, increased diversity in health professions education enriches the learning environment by promoting cultural awareness among students and a broader understanding of diverse perspectives, contributing to a more inclusive and well-rounded health profession.^{132 133}

Increasing Indigenous representation in the health workforce aligns with the principles of self-determination and equitable access to education and training. Building relationships and enhancing resources are key strategies for amplifying opportunities and incentivizing accessible education and training, while formal partnerships with Indigenous health authorities and organizations are essential to sustain recruitment and retention efforts.¹³⁴ Indigenous health learners and professionals also serve as role models, inspiring others in their communities to pursue careers in health care. Encouraging leadership and amplifying the voices of Indigenous mentors and role models is critical to foster the next generation of Indigenous health professionals.

Recruiting Indigenous health learners and professionals not only diversifies the workforce but also contributes valuable perspectives to research and policy development, particularly in addressing unique health challenges related to Indigenous contexts.¹³⁵ Moreover, health profession schools recognize their social accountability, and increasing Indigenous representation is seen to address health inequities and foster a more inclusive health care system. Indigenous communities often experience significant health disparities, and a more equitable distribution of Indigenous health professionals will improve culturally relevant and informed engagement, ultimately leading to more effective responses to regional contexts.¹³⁶

The need for a strong Indigenous health curriculum in medical programs is best illustrated by the NCIME (Figure 2):

Figure 2. *Needs for Strong Indigenous Health Curriculum in Medical Education*



This figure depicts the elements needed to support a strong Indigenous health curriculum in medical education. The central circle, represented by Indigenous Voices, is required to inform all aspects of Indigenous health curriculum even radiating out to the levels of medical education [Undergraduate Medical Education, Postgraduate Medical Education, Continuing Medical Education]. The smaller circles that are found with the Indigenous Voices space are the elements needed for strong Indigenous health curriculum in medical education (Supportive Ecosystem, Experiential Learning, Anti-Racism, Indigenous Studies and Sciences, and Accreditation). The colourful arrows on the outside indicate the many micro transitions that occur within the medical education curriculum.

Source: Reproduced from the NCIME¹³⁷

In 2023, Indigenous students at the University of British Columbia led a survey of Indigenous medical students across Canada that provided reflections on the ongoing challenges in creating culturally safe learning and practice environments. Their report card summary¹³⁸ set out the following areas for improvement:

- Ability for Indigenous students to opt out of cultural safety training
- Lack of access to Indigenous Elders, spaces, practices or mentorship
- Need for expanded, mandatory cultural safety training for educators and students
- Need for improved Indigenous curriculum
- Lack of Indigenous faculty and staff

On the ability for Indigenous students to opt-out of cultural safety training, they noted “90% of students responded that they feel that Indigenous medical students need to be granted the autonomy to opt out of the Indigenous cultural safety training ... the opportunity to opt out of, or undergo training in an Indigenous-only space, will increase the safety of the learning environment for Indigenous students.”¹³⁹

On the lack of access to Indigenous Elders, spaces, practices or mentorship, communicating to students the supports that are available to them is an important enabler in improving transparency. The Report Card Summary noted “the ongoing, multifaceted support, such as cultural, financial, emotional, or spiritual—to Indigenous medical students is essential to support wellbeing and success.”¹⁴⁰

Regarding the need for expanded, mandatory cultural safety training for educators and students, the Report Card Summary noted: “While all Canadian medical schools offer cultural safety training in some capacity, only 62% of students indicated that they feel their educators are at least somewhat culturally safe. Only 38% of students indicated that they feel their educators are Indigenous allies.”¹⁴¹

In terms of experiences with racism, the Report Card Summary noted: “Furthermore, only 6% of respondents indicated that they never experience racism from their classmates—while 24% indicated this is a frequent occurrence.” It further expands on this issue by noting that “...remaining students responded that they experience racism from their classmates *sometimes* (45%) or *rarely* (31%).” In terms of key insights, the Report Card Summary recommended mandatory cultural safety training for all non-Indigenous students and educators, in pursuit of reducing instances of racism for all accessing the health care systems in Canada.¹⁴²

On the need to improve Indigenous curriculum, the Report Card Summary noted: “Medical schools must include topics in their curriculum to produce physicians that are well-equipped to care for Indigenous patients, understand the role that culture can play in medicine, and value the importance of preventing history from repeating itself to reduce harm to future generations of Indigenous people in Canada.”¹⁴³

Finally, regarding the lack of Indigenous faculty and staff, the Report Card Summary noted that medical schools in Canada are underperforming with respect to the number of Indigenous faculty and staff employed. "Students reported having very few to no Indigenous faculty at ANY domain (lecturer, lab instructor, small-group session leader, clinical, etc.) and students at several schools reported being unaware whether their school even employed a staff member whose role was dedicated to supporting Indigenous students."¹⁴⁴ The Report Card Summary further noted: "Not only is there is a desperate need for increased hiring, but respondents to the survey have indicated that in recent years, multiple Indigenous staff positions across Canada have been cut, resulting in the loss of support that was previously provided to and appreciated by students."¹⁴⁵ In relation to impacts of these particular issues: "This not only affects the Indigenous students, but also the existing and remaining Indigenous faculty and staff who work tirelessly to make progress by increasing the burden that is placed on them to uphold reconciliation efforts."¹⁴⁶ The Report Card provides additional insight on the opportunity in employing Indigenous faculty and staff in various positions in education and training programs, as it is "...crucial for creating a culturally safe and representative academic environment that respects and values Indigenous perspectives and knowledge systems and supports Indigenous students".¹⁴⁷

Discussion

The recruitment and retention of Indigenous health professionals, particularly in nursing, occupational therapy, physiotherapy, pharmacy and medicine, continue to face systemic challenges and widespread underrepresentation. A study participant noted that Indigenous students frequently encounter barriers to post-secondary education, including financial constraints, cultural disconnection, and limited preparatory programs. A study participant also noted that these challenges are exacerbated in rural and remote communities, where access to health education programs is often limited. This geographical divide hinders equitable workforce distribution and contributes to disparities in health care access for Indigenous populations.

As noted by a study participant, efforts to address barriers to recruitment and retention of First Nations, Métis and Inuit health professionals must prioritize culturally distinct, community-based recruitment and retention strategies. Programs led by Indigenous communities hold the potential to significantly impact Indigenous health education and improve retention of Indigenous health professionals, and experiential programs should emphasize Indigenous knowledge, traditions, and self-determination.¹⁴⁸ In rural and remote communities, increasing access to regional health professions programs through local partnerships is vital.¹⁴⁹ The recommendations (below) for Indigenous health education, training, and workforce development emphasize the prioritization of Indigenous-led solutions in all related policies and agreements.

National, provincial, and territorial Indigenous health profession collectives can drive collaboration and strengthen support systems for Indigenous students and professionals. Targeted financial support and mentorship programs that connect Indigenous learners with experienced professionals are crucial for sustaining engagement and success within the educational and professional environments. Flexible scholarships, funding models informed by the specific needs of Indigenous populations, and mentorship programs that extend across generations and professions are essential.¹⁵⁰ Initiatives must create networks that support Indigenous students from the earliest stages of their education through to their professional careers.¹⁵¹

The decolonization of health education environments requires addressing the systemic barriers that Indigenous students experience. As noted by a study participant, these include financial burdens, lack of access to education in remote areas, and uncertainties about placements or career pathways. Increasing Indigenous leadership in health faculties and educational institutions is key to bridging the gap in representation and ensuring that Indigenous knowledge and lived experiences are integral components across health education training.¹⁵²

Formal partnerships between health organizations, educational institutions, and Indigenous communities should be advocated for. As partnerships between health disciplines, professionals, and Indigenous nations increase, the understanding of roles within interprofessional teams contribute to the co-creation of health programs.

Ongoing research, both Canadian and international, highlights the importance of culturally informed care and the need for more Indigenous health care workers to bridge health equity gaps. A representative health workforce would improve health outcomes by providing care in Indigenous languages and cultures and incorporating Indigenous Knowledges and healing practices into health education and training. Continued support for culturally informed initiatives enables governments and partners to build a sustainable, culturally significant health workforce that addresses the needs of underrepresented communities.

Recommendations

These Indigenous-led solutions in supporting health education, training and workforce development should address gaps in Indigenous representation, recruitment, and retention, while aligning with the TRC's Calls to Action, the UNDRIP, and regional Indigenous-led data collection and reporting.

It is also essential to establish sustainable resourcing mechanisms that support the long-term implementation of Indigenous-led recruitment and retention strategies to support community-based roles within Indigenous communities and nations, and contribute to health education and training.

In collaboration with First Nations, Métis and Inuit leaders and organizations, educational pathways that consider the unique lived experiences of Indigenous learners and address barriers such as access to education, cultural safety, anti-Indigenous racism, language challenges, and recruitment and retention criteria, must be developed to increase the recruitment of Indigenous students into health professions. Additionally, enhanced culturally relevant student and professional supports should be provided.

Further, collaborative efforts are needed in the co-development of data collection processes, forecasting of workforce needs, and creating culturally-appropriate health programs and services. Regular monitoring and reporting on the progress of Indigenous health workforce recruitment, retention, and educational outcomes are crucial for accountability.

Finally, Indigenous health perspectives should be integrated into curricula across all health professions and continuous cultural safety training for all health professionals should be mandated. Training should focus on recognizing historical injustices enacted against Indigenous Peoples in Canada, self-determination and power imbalances, institutional and personal biases, and creating environments where Indigenous learners and the Indigenous workforce feel respected and valued.

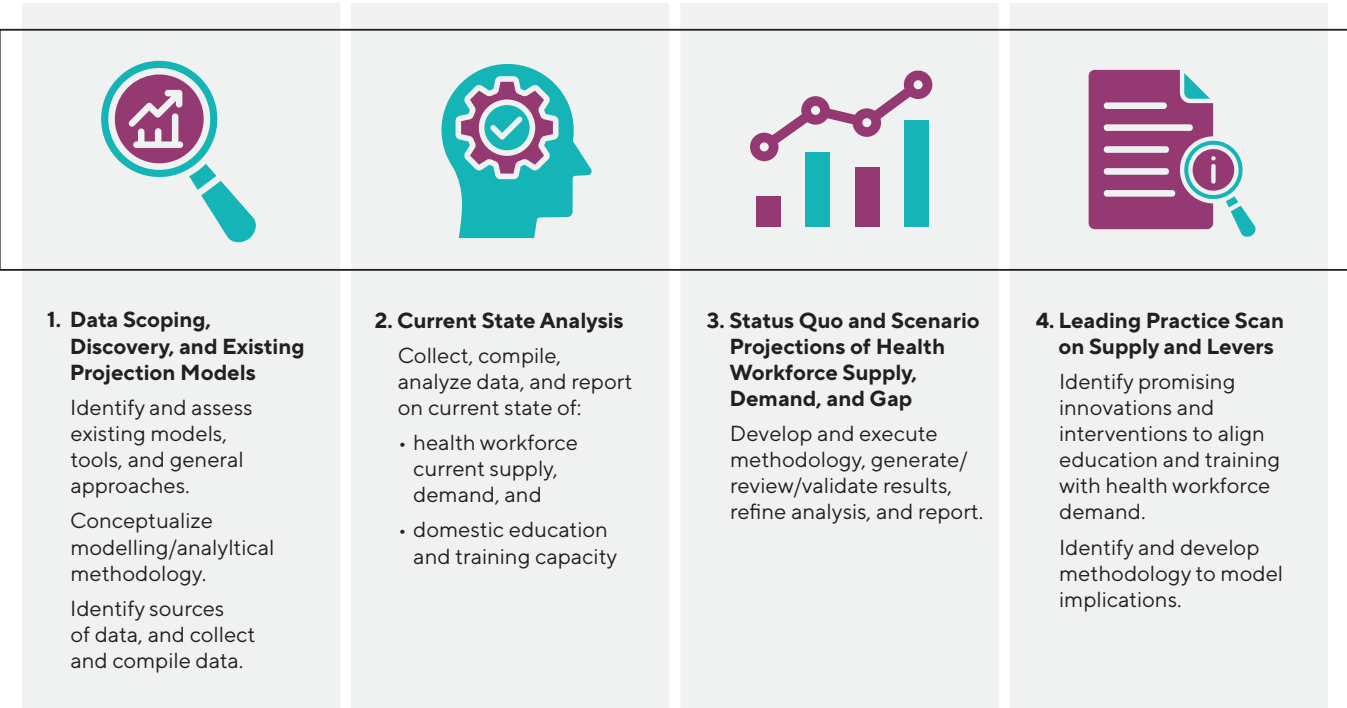
Conclusion

In light of the information and insights in this report, FPT Ministers of Health in concert with regional health and educational institutions can contribute to building a more equitable and culturally informed education and training experience to broaden the health workforce in Canada. Collective and coordinated actions are crucial to increase the Indigenous health workforce, in pursuit of advancing reconciliation and improving health outcomes for Indigenous Peoples from coast to coast to coast. Effective collaboration and sustained investment in Indigenous health education and health professions programs, supported by intentional decolonial workforce development efforts are essential steps towards achieving these goals.

Methodology

This section provides an overview of the research methods used for each of the Study’s research components. Figure 3 is a high-level visualization of the Study framework with separate but interconnected components of the Study that are described below including data and information sources, analytic assumptions, analytic and modelling approaches, and other considerations.

Figure 3. Canadian Health Workforce Education, Training and Distribution Study Framework



Data scoping, discovery and existing projection models

In this initial phase of work, a review and assessment of existing and available health workforce supply and demand sources, and supply and/or demand health workforce projection models was conducted.

The PRPT from CIHI was selected for the pan-Canadian physician supply and demand projections, given the sophistication of the tool in terms of data already employed.

There were no adequate pan-Canadian supply and demand projection models available for the other professions. There was adequate workforce supply data available on nurses, occupational therapists, pharmacists and physiotherapists. A microsimulation model was developed to project pan-Canadian health workforce supply of and demand for nurses, occupational therapists, pharmacists and physiotherapists (Health Canada's pan-Canadian Health Workforce Projections Model). Microsimulation models are computer models that operate at the level of the individual behavioural entity, such as a person, family or organization. Such models simulate large representative populations of these low-level entities in order to draw conclusions that apply to higher levels of aggregation such as an entire country.¹⁵³ The pan-Canadian Health Workforce Projections model operates at the level of the individual.

For the current state analysis, the most recent year of pan-Canadian supply data were sourced from CIHI's SMDB and the NPDB for physicians, and the HWDB for nurses, occupational therapists, physiotherapists and pharmacists.

Other data that could be used to fill modelling gaps include employment survey data from Statistics Canada (such as the Labour Force Survey). It was also expected that the published and grey literature and expert opinion were other potential sources of information to help fill knowledge and data gaps.

Current state of Canadian education and training capacity

Without a dedicated source of information on the education and training of health professionals in Canada, we requested information from PT members of the Committee on Health Workforce and associations representing the faculties and educational programs of the health professions identified within the Study scope (Table 1).

Table 1. Information Sources on the Education and Training of Health Professions

Health Profession	Source
Nursing	PT members of the Committee on Health Workforce, except Quebec
Occupational therapy	Association of Canadian Occupational Therapy University Programs (ACOTUP)
Physiotherapy	Canadian Council of Physiotherapy University Programs (CCPUP)
Pharmacy	Association of Faculties of Pharmacy of Canada (AFPC)
Medicine	• Association of Faculties of Medicine of Canada (AFMC) • Canadian Medical Education Survey (CMES) • Canadian Post-M.D. Education Registry (CAPER) • Canadian Resident Matching Service (CaRMS)

Note: In addition to all the nursing information, PT members of the Committee on Health Workforce were asked to provide information on the anticipated program capacity changes for occupational therapists, physiotherapists, pharmacists, and physicians. As Quebec considers the health workforce to be its exclusive responsibility, Quebec did not provide data for the Study. All information in this report on the education and training programs in Quebec were provided by the respective associations representing the faculties and educational programs of the health profession.

Given the breadth and complexity of nursing education and training facilities, and that no one organization could assist in providing information on nursing students in both university and college-level programs in all categories, it was determined that PT governments would be best positioned to provide the information necessary to complete the Study within the expected timeframe. PT members of the Committee of Health Workforce were asked to assist in the data collection for their province or territory.

An Excel template was developed to provide a standardized approach to collecting this information. Respondents were asked six categories of questions, including: program information, student metrics, information on the delivery of sponsored seats, graduate employment, constraints on program expansions, and four qualitative questions to determine any barriers, challenges, and innovations related to the delivery of education and training programs in different community settings. For physicians, a unique template was created to incorporate questions related to the post-M.D. residency programs and information directly related to family medicine residency programs. PT contacts were also asked to provide information on anticipated program capacity changes (such as expansions or reductions of program seats) in the next 10 years for all the health professions. For the four categories of the nursing profession, the question was integrated within the existing templates, while a separate template was developed to collect this information on the other health professions. A complete list of the questions is available in Appendix D.

All respondents completed the questions for the Study with varying degrees of completeness. It was recognized that this aspect of the Study would be challenging for all participants because of the timing specifically, asking respondents to complete the templates at the end the winter term for post-secondary calendars, and during fiscal year end for PT governments) and the Study constraints, such as the short turn-around for submission. Respondents were advised to provide information where it was available and within their own capacities, as it was recognized that many were under resourced when the request was made.

As information became available, submissions were cleaned and compiled into datasets for each health profession. For certain data that appeared to be inconsistent or include possible interpretation or recording errors, respondents were contacted for verification. Some missing data were filled, where possible, such as establishing rural or urban geography based on the address locator for an academic or training program. Descriptive statistics, namely frequencies, were reported into summary data tables.

The information on medical students, residents, and graduates was provided by the AFMC from the CMES and the Canadian Post-MD Education Registry (CAPER). The information on program capacity for medical residents, the number of in-year applications for residency programs, and the number of unfilled residency positions was provided by the Canadian Resident Matching Service (CaRMS). All efforts were made to ensure the data was comparable across datasets, and only included information directly related to Canadian Medical Graduates (CMGs) and International Medical Graduates (IMGs) to ensure the results remained within the scope of the Study. Notes were included in the physician results tables to clearly identify the source of the information. The CaRMS data reflected the entirety of its matching process so some calculations were required to ensure the results represented the scope of the Study. The program capacity for medical residents were calculated based on the quota numbers for the first iteration of the CaRMS process. This calculation omitted quotas for military applicants, as well as program streams that did not submit a rank order list for applicants.

CMG program capacity numbers were calculated by combining the CMG and competitive stream quotas. A competitive stream is open to applicants with either CMG and IMG eligibility, and the position is matched regardless of the eligibility type.¹⁵⁴ However, the competitive stream is mostly applied to medical residency positions in Quebec where only a handful of positions are available in the CMG stream. For this reason, competitive stream positions were included in the CMG totals.

The program capacity calculations included reversions, which is an option for medical residency programs to revert or “donate” unfilled residency positions in one program to another during the match process.¹⁵⁵ Unlike the competitive stream, where eligibility is open to either CMG or IMG applicants, a reversion also allows residency positions to transfer across programs. For the in-year applications, calculations excluded American medical graduates (USMGs) because they are often reported separately in other data sources. Finally, the unfilled medical residency positions were based on the results following the second iteration of the match process.

To comprehensively understand the challenges, barriers, and innovations in the education and training of health professionals in Canada, information was collected through two primary methods. The survey included open-ended questions (Appendix D) that were analyzed using content analysis to identify common themes and concepts within participants' answers. The responses from these organizations highlighted specific regional and professional challenges. Individual or small group engagements were also completed with over 20 stakeholders and experts specializing in Canadian health workforce education and training. These one-hour discussions provided in-depth insights into the key challenges and barriers affecting the education and training of health professionals, as well as promising practices and innovative approaches they encounter in their respective fields.

Current health workforce supply and demand

Estimates for the number of active physicians (head counts) were derived from CIHI's PRPT for the year 2022. Inputs for 2019 to 2021 in the PRPT were adjusted so that the projected family physician supply resembled as closely as possible to known supply numbers in the SMDB from CIHI. Active physicians are defined as individuals with a Doctor of Medicine (MD) degree and a valid mailing address. Physician supply excludes residents, physicians in the military, and semi-retired physicians. The results from the presented analysis are a projection from the PRPT, therefore the estimates presented will be slightly different than the family physician supply estimates generated from the SMDB for the year 2022 and which are reported by CIHI publicly.¹⁵⁶

The HWDB managed by CIHI was used to report for the current supply of nurses by category (LPN, RPN, RN and NP), occupational therapists, physiotherapists and pharmacists currently in the workforce. There is a difference between supply and workforce. This Study focused on health professionals currently in the workforce to better represent those actively working.

Supply refers to all registrants eligible to practice in the given year including those employed and not employed at the time of registration. Note that inactive and secondary registrants are excluded from the supply, except nurses working in the territories. For the year 2022, secondary registrants are not removed for nurses working in Manitoba because PT of practice data used to determine secondary registrations was not provided.

Workforce refers to only those registrants (subset of supply) who were employed in the profession at the time of annual registration, including those on leave who submit an active practicing registration. The workforce excludes regulated nurses who are not working in nursing using information from the Employment Status data element.

FTEs represent the average number of "full-time" professionals. Currently, we estimate the number of FTE physicians by using FTE coefficients by age and gender by physician specialty obtained from CIHI's PRPT. The FTE coefficients in the PRPT were calculated using FTEs obtained from individual-level physician data from the NPDB. PRPT defines the FTE coefficient as the average FTE by physician specialty, age group, and recorded sex or gender calculated by dividing the sum of physician FTEs for a cohort of physicians from selected jurisdictions by the head count of unique physicians.

For nurses, occupational therapists, pharmacists and physiotherapists, FTEs were estimated using hours-worked data from Statistics Canada's Labour Force Survey (LFS). The LFS data was not available for individuals older than 65, so the HWDB hours worked data was used for occupational therapists and physiotherapists to estimate the average FTE of individuals working who are over the age of 65. Hours worked data from the LFS were provided at the national level, therefore the analysis does not capture the jurisdictional and urban/rural variation among the FTE coefficients.

Supply to population ratios were calculated as the head count and FTE numbers for each occupational group per 100,000 population for Canada in 2022. The distribution of supply by rural and urban geography is based on available supply data in the SMDB for physicians and the HWDB for the other professions. LPNs in Nunavut, RPNs in Yukon, and pharmacists in Quebec, Nunavut, and Yukon were excluded from the analysis due to data limitations.

Workforce counts were not available for RNs in Prince Edward Island, NPs and RNs in Manitoba, RPNs and LPNs in Yukon Territory, LPNs in Nunavut, NPs in Northwest Territories and Nunavut, pharmacists in Quebec, physiotherapists and pharmacists in Yukon and pharmacists in Nunavut. When supply counts were available while workforce counts were not (in all cases), the average ratio of workforce counts to supply counts where data were available was used to estimate workforce counts to fill these gaps. Similarly, when rural or remote workplace locations were not available, rural to urban proportions for the province using data from other professions were used to impute missing rural and urban data.

Demand estimates for 2022 reflect baseline estimates in the modelling projections (see next section). For family physicians' demand, the current state analysis reports on the third base case scenario which includes all services provided by family physicians in Canada.

All current analysis results represent each of the in-scope profession working across all settings of the health care system. The only limits to the workforce supply are those professionals working in direct care. This also applies to the workforce supply projections.

Projected health workforce supply and demand

Expert consultations

Throughout the development and refinement of the methodology used to make health workforce supply and demand projections, there were consultations with various experts representing researchers and practitioners within each occupational group included in the Study. Consultations also included academics and researchers with experience in health workforce research and modelling, as well as members of the FPT Project Team. Consultations with experts took place as virtual meetings. Over a

dozen consultations took place between March 2024 and June 2024. Additionally, experts were invited to complete a series of feedback forms prior to and following the consultation meetings to allow for the consideration of written feedback. During this process, those consulted supported the work and provided constructive guidance in improving the methodology and assumptions. Other individuals and groups who have or are currently engaged in health workforce modelling at the provincial and territorial ministries of health and health care institution-levels were consulted as part of Health Canada's process of refining methodology and to validate results. This process occurred from April 2024 through June 2024.

Knowledge mobilization products used throughout the consultation processes included presentations and Health Canada's dashboard tool used to present and validate PT-level results with PT government stakeholders.

Foundational tools and models

The general approach taken to make projections for workforce supply and demand for family physicians is illustrated in Figure 4, and Figure 5 provides an overview of Health Canada's Health Workforce Supply and Demand Model which was used for the supply and demand projections for nurses, occupational therapists, pharmacists and physiotherapists.

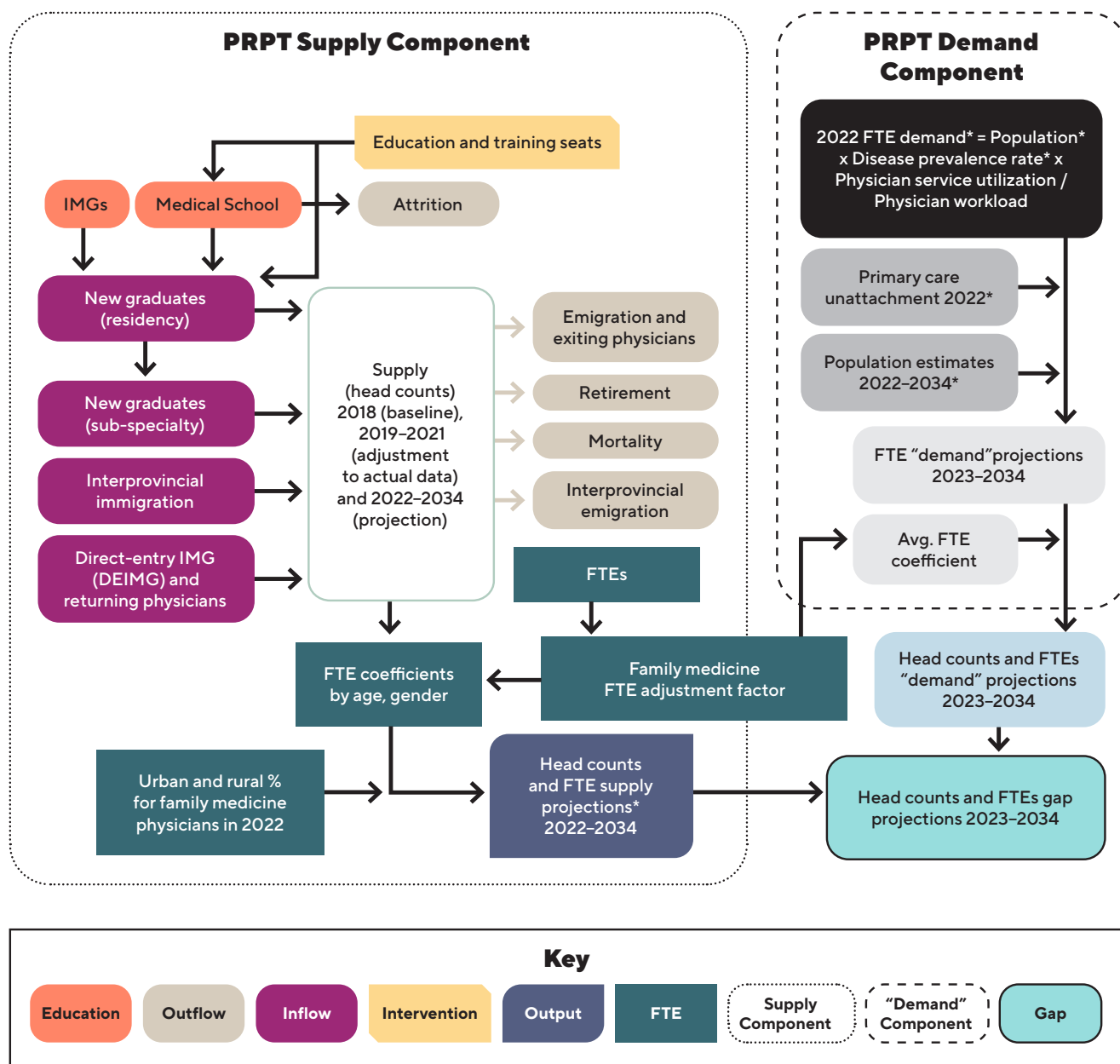
The physician supply and demand analyses' foundation is the PRPT. To improve the fit of the tool for the purpose of the Study, several adjustments were made, including adjustments to historical inflows to match with actual supply estimates from 2018 to 2022. In addition, adjustments were made to the population projections to match Statistics Canada's current medium-growth scenario for the base case analysis. Further, unattachment in primary care was integrated into the demand estimates based on adjustments to utilization in the tool.

Health Canada's Pan-Canadian Health Workforce Projections Model, a microsimulation model, was created predominately using workforce supply data on nurses by category, occupational therapists, physiotherapists and pharmacists in the HWDB. The demand component is based on an employment approach that starts with a current ratio for demand based on the number of those employed (workforce supply) and unfilled jobs (vacancies) and the population count. The 2022 vacancies data come from Statistics Canada's Job Vacancies and Wages Survey data available up to 3Q2023. Demand is further expanded to reflect other drivers of need or demand for that profession.

Time horizon

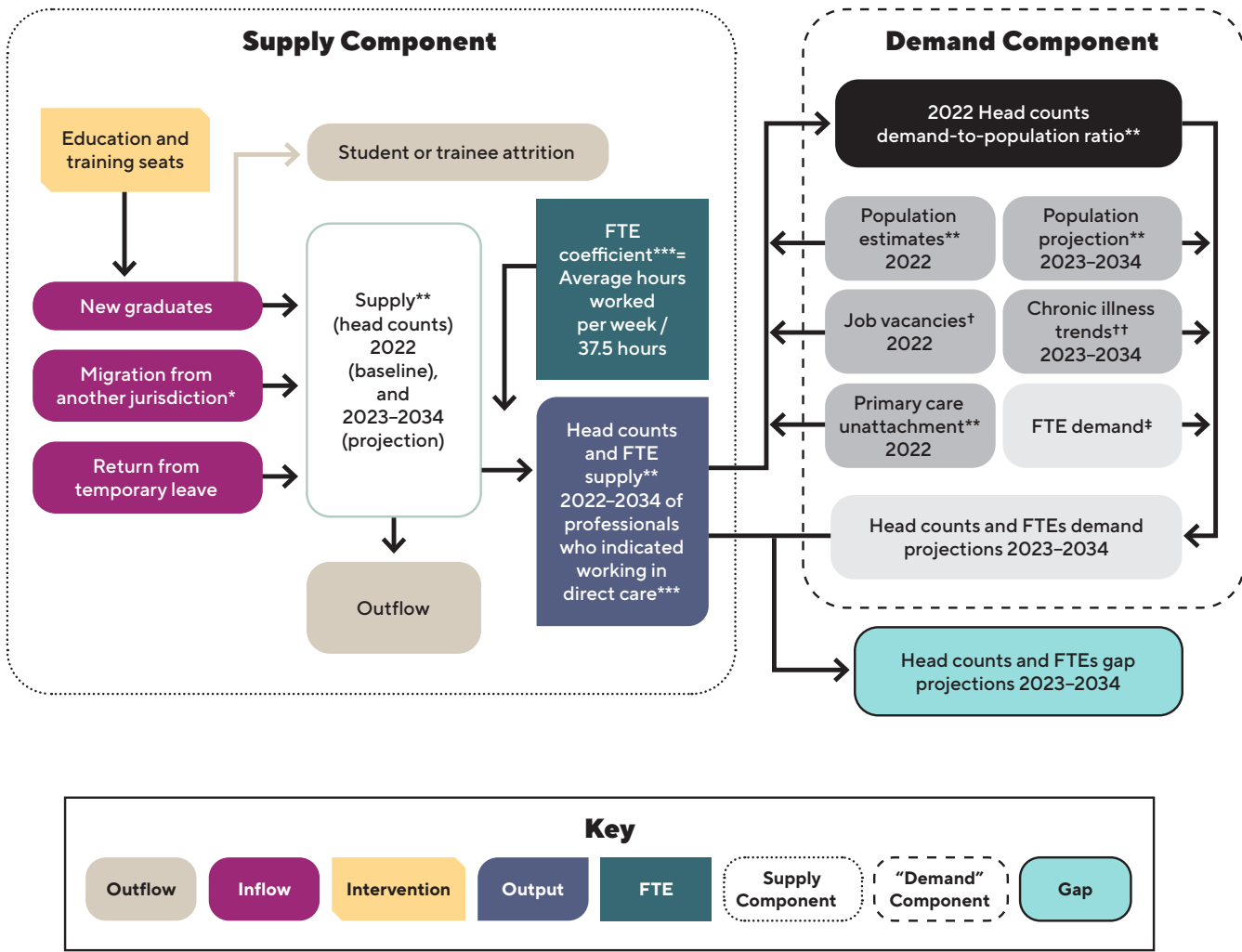
As set out by the Study's terms of reference, health workforce supply and demand estimates are reported over a 10-year period with reporting at 5-years (2029) and at 10-years (2034), from the year of the Study's initiation (2024). While the Study reports results at 5 and 10 years from 2024, the baseline year for the analysis is 2022, the year in which most current health workforce supply data were reported to CIHI. The projection results are for the years 2023 and beyond.

Figure 4. Family physician supply and demand projections approach overview



Notes: The Physician Resource Planning Tool (PRPT) is managed and maintained by the Canadian Institute for Health Information (CIHI). *By province/territory and rural and urban area.

Figure 5. Supply and demand projections for nurses, occupational therapists, physiotherapists and pharmacists approach overview



Notes: *Jurisdictions include international migration and interprovincial migration. **By province/territory and rural/urban area. ***Participation in direct care was defined if the professional indicated that their primary area of responsibility was direct care. †Urban/rural distribution of the population was applied to vacancies. Urban/rural splitting applies to every aspect of the supply modelling. FTE = full-time equivalent. ††Disease trends were adjusted for one of the scenarios. *FTE Demand = FTE Supply / Headcounts Supply × Head Counts Demand.

Modelling components: Workforce supply, demand and gap

Profession supply represents the number of health professionals available to meet health care demand or need in the population. By definition, supply refers to all registrants who were eligible to practise in the given year (including those employed and not employed at the time of registration). The focus of this Study is on the workforce supply, which is the number of health providers that are registered within their regulatory organization and who explicitly state that they are employed within their health care profession. Only primary registrations (where the province of registration reflects the registrant's primary jurisdiction of practice) are included. The Study focusses on the workforce supply of health professionals working in direct care (health professionals who provide services directly to patients at least some of the time in a given year). The workforce supply includes health professionals regardless of workplace sector (for example, professionals who work in hospital, community health, nursing home and other settings are included as long as they indicated working in direct care).

Demand is estimated as the number of health care providers needed to provide at the least current services, as measured by current utilization rates, and to fill unmet needs. In the context of primary care, unmet needs is proxied with estimates of unattachment to a family physician or NP in primary care. Current access represents a mix of met need and demand. Projected demand in the Study attempts to best reflect a mix of need and demand, although the desire is to, at a minimum, capture needs.

Workforce supply-demand gap can be interpreted as the number of health professionals that are needed to fill unmet demand or need. It can also be interpreted as the workforce shortage. In the context of the Study, the estimated workforce supply-demand gap is calculated as the difference between demand and supply in head counts or FTEs (demand minus supply). The Study presents various metrics to reflect gap, such as workforce supply-demand gap as head counts or FTEs or workforce supply counts per 100,000 population. Gaps are also presented related to the overall workforce supply for each profession, such as gap count per 1,000 workforce supply.

The gap projections are reported for each in-scope profession working in all health care settings who provide direct care to patients. While primary care is the focus for family physicians, the base case analysis for family physicians examines three sub-groups representing family physicians who provide office-based services, comprehensive primary care, and any care (all settings). For NPs, unmet demand includes primary care unattachment in addition to job vacancies across all health settings.

Additional definitions for key terms are included in the glossary of terms (Appendix C).

Supply-demand gap calculation steps and examples are available in Appendix E. Further detail on the methodology for the base case and scenario analyses are described below.

Base case analysis

The base case projections assume a status quo or do-nothing scenario. The base case however reflects information on known added or created education and training seats based on data provided through the data collection on education and training capacity. From these data, adjustments were also made to reflect education and training attrition. The model assumes that when new education and training seats are added to a specific province, the graduating health professional will enter the supply within that province.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

For physicians, increased training seats were provided for the undergraduate programs and family medicine residency programs. The increased seats in undergraduate programs were entered into the PRPT for each medical school, using the medical school entries variable. Increased seats in family medicine residency programs were entered into the PRPT for each province, using the residency target variable. The PRPT used specialty distribution by medical school and province to distribute the newly added students/residents into specialties, inclusive of family medicine.

For nurses, occupational therapists, physiotherapists and pharmacists, newly added education and training seats were added into the inflow within the microsimulation model. For each education and training seat, a provider was generated each year starting with the announced year plus the program duration. For example, a training seat announced for 2025 with a program duration of two years will see an increase in inflow in 2027. Program attrition was estimated using the education and training data collected for the Study. Attrition rates ranged from 1% to 11% across professions, representing percentage reductions in the number of providers added to yearly supply. For example, an attrition rate of 10% on 100 additional education and training seats would result in 90 professionals being added to the supply.

Inflows for future years were based on a 5-year historical average up to and including 2022 (the most recent year of data) and include new educational and training seats based on the data collected for the Study. A 5-year horizon was chosen to smooth out any volatility in the data that might have been caused by COVID-19, however not long enough where recent changes to inflow (for example, increases to training seats in the last decade) would be severely underestimated. Inflows were generated by determining the average number of individuals that entered the workforce in the last 5 years for each profession and province. The Pan-Canadian Health Workforce Projections Model determines the number of inflows to generate for each health care provider and province, for which the model then randomly samples from a list of historical inflows that includes information on characteristics of health care providers (for example, urban or rural, gender, providing direct care and other).

Outflows were based on a 10-year historical average, and they reflect a combination of reasons including retirement, deaths, migration, and temporary leaves lasting longer than a year. A 10-year horizon was chosen in order to obtain higher sampling, resulting in reliable outflows by age group, gender, province, and profession. Outflow rates were estimated for each health provider category by profession, province, gender, and age groups. Each year, each generated health provider has a chance of exiting workforce given the outflow rate.

For the physician projections, FTE ratios were also applied to the supply and demand estimates to reflect the three service groupings; office-based family physician services, comprehensive primary care services, and all family physician services as described in the introduction section.

FTE ratios used for converting physician supply to FTEs were available within the PRPT, sourced from the 2018–19 National Physician Database (NPDB). To adjust the FTEs to reflect different service group types (for example, office-based family physician services and comprehensive primary care services) the FTE adjustment factor was applied to the FTE ratios by age group and gender. The FTE adjustment factor is the proportion of payments to family medicine physician for selected services out of total payments made to family medicine physicians for all services calculated using 2022–23 NPDB.

The National Grouping System (NGS), which organizes fee codes into homogenous categories for comparison of physician services across Canada, was used to select a list of services for each of the three service group types. The office-based family physician services are all services billed for by any family physician in Canada excluding services where a large majority (minimum 85%) were performed in a hospital setting, and services whereby family physicians represented less than 30% of billings across all billings for that service. The comprehensive primary care services include all services selected from office-based services and include select services chosen by experts. All family physician services include all services billed for by any family physician in Canada.

PRPT used a model balancing variable (workload) to calculate the family physician demand FTEs. The workload was calculated once at the base year by assuming all Canadians had their needs met in that year (2022). The workload represents the number of patient visits one physician FTE can handle each year. Specifically, the measure is calculated as the ratio of the total number of family physician visits in a year to the total supply number in that year. This was calculated for each PT and used to convert physician visits to FTE. Further, the FTE adjustment factor, described in the previous paragraph, was applied to the calculated FTE demand to adjust for the three service grouping categories (scenarios) defined above.

For the nurses, occupational therapists, physiotherapists and pharmacists supply projections, FTEs were established using Statistics Canada's LFS data on hours worked. Where data was missing for certain age groups, data from CIHI's HWDB were used. Working 37.5 hours per week was assumed to represent one FTE.

Adjustments to the family physician demand in the PRPT to account for unmet need was done by increasing utilization as a proxy for demand in the tool. This would reflect need that is based on current utilization as well as current unmet needs (unattachment) in primary care. Estimates for unmet need are based on the percentage of the population that does not have a regular care provider who is specifically a family physician or NP. The source of these estimates is the 2022 CCHS. In the base case scenario, following the 2022 CCHS estimated distribution of those with a regular care provider who is a family physician or NP, it was assumed that family physician demand includes attachment to 97% of the population with unmet needs (are unattached in primary care).

Nurse Practitioners are already, and are likely to continue, helping to reduce the patient unattachment rates in primary care. In the NP base case scenario, it was assumed that NPs could fill a fraction of the supply-demand gap and that each FTE NP could, on average, maintain a panel size of 800 patients.¹⁵⁷ It was assumed that NPs could provide primary care for 20% of Canadians without a primary care provider in base case for provinces and 40% in the Territories. This would require family physicians to cover 80% of patients without a primary care provider in the provinces and 60% in the Territories. This assumption is based in part on British Columbia's Primary Care Network strategy launched in 2019, which stipulates the production of new supply that would result in a 20% NP attachment rate. CCHS data suggest higher attachment to NPs in the Territories. Further, estimates on attachment to NPs in the CCHS for 2022, which is approximately only 3% overall, has been established as likely too low to reflect reality. This under estimate based on actual utilization of NPs in primary care could reflect a general misunderstanding among patients on who they see in primary care.

Demand projections from the baseline were largely driven by growth in the population. The base case analysis uses Statistics Canada's medium-growth (M1) scenario, as of June 2024. The medium-growth scenario was developed by Statistics Canada based on assumptions reflecting different internal migration patterns observed in the past (medium level of fertility, mortality, immigration, and emigration). The medium-growth scenario was chosen for the base case analysis as it best reflects the most likely population growth scenario given current and predicted conditions, for example, considers the recent high immigration patterns. Population projections were stratified into rural and urban areas based on Statistics Canada's rural population proportion data.¹⁵⁸ To capture the changes to rural population proportions over time, projections were adjusted based on historical trends (see Appendix F for more details). Projected population counts by age, sex, and PT were used for the family physician demand projections, therefore aging was inherently considered. For the other professions, projected population estimates by PT were applied due to other data constraints. Impact of aging on demand of health services was integrated into the demand projections by applying a growth factor to account for the growth in the population age 65 years and older in each projection year.

Urban and rural physician supply was estimated by applying the proportion of physicians working in urban and rural for each province and territory using the 2022 SMDB.

Scenario analyses

The following scenarios reflect adjustments to the base case projections. Several possible scenarios were considered as they relate to adjustments to both the demand and supply projections and the resulting gap estimates. Scenarios are independent of each other. Each scenario result only represents the impact of that scenario, specifically the impact of a change to one demand (or supply) driver incremental to the base case.

Larger future population

For this scenario analysis, Statistics Canada's highest population growth scenario was selected, which brings together assumptions consistent with higher population growth than in the medium-growth scenarios at the Canadian level. Specifically, assumptions that entail high fertility, low mortality, high immigration, low emigration, and high numbers of non-permanent residents are the foundation of the high-growth scenario. This reflects larger demand projections compared to the base case, which employs a medium-growth scenario, for all occupations.

Growth in the prevalence of chronic conditions

For all occupations, additional analyses were conducted to reflect the possible impact on demand with increasing rates of chronic conditions in Canada (disease prevalence growth). Based on consultations with provider experts and on the available data, 23 conditions across six broad categories, as shown in Table 2, were included. These conditions were selected as the key drivers in the utilization of all in-scope health professionals today and into the future. Growth in the prevalence of these conditions was either based on established projected rates estimated by other researchers or based on an average annual increase based on historical trends. For non-physician occupations, the overall Canadian annual rate of change was used for all provinces. Adjusting for growing prevalence of chronic conditions increases demand and the supply-demand gap. See Appendix G for the growth rates by condition and overall growth rates used in the analysis.

Table 2. Chronic conditions for which growth in prevalence was included in the scenario analyses

Category of health condition	Health condition
Diabetes	• Diabetes mellitus type I and II
Musculoskeletal	• Osteoarthritis
Cerebrovascular	• Stroke
Cardiovascular	• Acute myocardial infarction, shock or arrest • Coronary artery disease • Heart failure • Hypertension
Mental Illness	• Bipolar or manic mood disorder • Delusional disorder (including schizophrenia) • Neurotic, anxiety, or obsessive-compulsive disorder
Neurological Conditions	• Dementia (including Alzheimer's)
Cancer	• Bladder cancer • Brain cancer • Breast cancer • Cervical cancer • Colorectal cancer • Lung cancer • Leukemia or lymphoma • Oral, ear, nose or throat cancer • Other unspecified primary cancer • Ovarian cancer • Prostate cancer • Thyroid cancer

Attachment to primary care provider (family physicians and nurse practitioners)

In the base case analyses, unattachment in primary care reflects predominately unmet need and includes the population that may have self-identified as having a regular care provider that was not a family physician or NP. This scenario was selected given current and future concerns regarding access to primary care in the population. It also allows for the consideration of the opportunity to leverage NPs and their current and expanding role in primary care in closing the supply-demand gap for family physicians. These scenarios reflect the potential distribution of unmet need across family physicians and NPs in terms of primary care attachment.

In the scenario analyses for family physicians, the unattachment rate in primary care that is met by family physicians was reduced by 20% and 30% in provinces (40% and 50%, respectively, in territories) to reflect a proportion of unattachment being met by NPs (in the NP base case and scenario analysis).

The NP scenario analysis reflects 30% of the unattached population in provinces (and 50% of those in the territories) being attached to NPs. This analysis could represent family physicians and NPs working together in interprofessional primary care teams as well as in solo practices, depending on the capacity for NPs to take on their own patients across jurisdictions.

Early retirement

Outflows were adjusted to reflect earlier retirement, which would reduce overall supply each year. This scenario adjustment explores the impact on supply and gap if all providers were to retire when they reached the age of 65. This scenario was selected to reflect the possibility of decreasing supply due to health professionals retiring at or before 65 years of age. This reflects observational studies on health workforce early retirement and it is a common scenario explored in other health workforce modeling studies.^{159 160 161} Some factors reported contributing to early retirement include organizational restructuring, financial possibility and caregiving responsibilities, lack of support in clinical and non-clinical roles such that the health professionals feel they cannot provide quality care, excessive non-clinical (for example, administrative) responsibilities, poor health, or just the desire to stop working for various other reasons.^{162 163}

Limitations

Current state of Canadian education and training capacity

Using an approach similar to survey research was determined as the best method to collect information on the education and training of health professionals in Canada, given the anticipated variations of data elements among data sources. The limitations of this method are well known. Measurement error is likely because of misinterpretation of the questions, and data input is prone to human error. The open-ended questions in particular are likely to result in self-reported bias.¹⁶⁴ However, the use of a template provided some standardization for data collation and analysis to ensure accuracy within the survey results. Furthermore, we followed-up with respondents when the initial data review found inconsistencies or significant outliers.

The results are constrained by the limitations of the data holdings. It was often noted by respondents for physicians that the missing information from MD programs in Ontario in the CMES was a notable data problem for this data holding,¹⁶⁵ likely to result in underreported numbers on program capacity, medical students, and medical graduates due to the large number of medical students in Ontario. The number of students in nursing programs across Canada is also underreported since Quebec did not provide data for the Study.

In regard to the location of health profession education programs (that is, whether the program is located in an urban, rural, or remote community), it was determined that respondents may have provided postal codes for the location of the program office, instead of the actual location where the education or training occurred. As such, the results may be skewed and not representative of the actual allocation of programs in rural or remote communities.

More information on data limitations to specific result tables will be described within the corresponding section.

Projected health workforce supply and demand

The analyses in the base case or in the scenarios do not reflect other drivers of possible demand. In consultations with representatives of the different occupational groups included in the analyses, there was discussion on the potential impact of expanded scopes of practice or increases in the practice to full scope. Given the uncertainty of the relationships between practice scope and demand, and the confounding factors related to access, this was not a consideration in the current analyses.

The Study did not delineate demand for services in the public and private sectors due to data limitations, that is, supply or demand data were not available by public or private sector.

The 5-year horizon may underestimate inflows if there were recent permanent changes to the inflows (for example, increased training seats or other policy impacting inflow in the last couple of years) for specific professions. Inflows may underestimate the workforce supply in the future and may overestimate the gaps.

For all occupations, the analyses use the same average FTE coefficients by age and sex, for each province and territory, as well as for urban and rural areas, over the projection period. These could be different but there is little data to show a significant variation to support any specific adjustments to these values.

In the family physician projections, supply may be underestimated in the later years given certain constraints with the PRPT. For example, there is a new medical school in Prince Edward Island to be established in 2025 (20 new seats planned). This could add up to an additional 20 physicians to total supply in 2031 and onwards to the province and country, but they would not likely appear in the workforce until much later in the projection period. These potential new seats are not included in the analysis as there is no input for medical school graduates from that province in the PRPT. As CIHI updates the PRPT every year, this can be added in the next iteration of the tool.

For several occupations, there may be discrepancies as there may be more seats being included in the education and training capacity data than in the modelling due to data arriving after the submission deadline, resulting in an underestimation in the projected supply and gap. The workforce supply projections for the base case and scenario analyses include all new education and training seats on or after 2022 from the education and training capacity data submitted before June 17, 2024. This was the cut-off date for the workforce supply and demand projections.

Other challenges that were not considered due to data availability issues are that there are people residing in rural areas that seek care in urban areas, and vice versa. The analysis also could not consider the needed supply to fill temporary leaves, including education leaves, parental leaves, sickness leaves, etc.

Although CIHI typically remove secondary registrations from their supply data, they are still included for some jurisdiction (territories and Manitoba). Secondary registrants are Health professionals who register simultaneously in multiple provinces and territories. For Manitoba, secondary registrants were not removed for nurses because, as per the CIHI description, the PT of practice data used to determine secondary registrations was not available. For the territories, secondary registrants were included, as per CIHI description, to reflect the nurses who work in the territories on a temporary basis and who may return to their home province for part of the year. Due to not excluding secondary registrants for some jurisdictions, the actual available workforce supply may be overestimated in these jurisdictions and in the overall national estimates due to the inclusion of some nurses across multiple jurisdictions.

Demand projections for the non-physician occupations were particularly challenging due to lack of data, with even utilization being difficult to quantify with any accuracy. In the context of unmet demand, there are few data that would reflect true unmet needs or demand based on population demographics or health status. The Study uses an estimated ratio of demand today which is proxied using supply numbers and vacancies. Throughout our consultations experts confirmed that vacancies data are imprecise and do not reflect demand or need in the population. It is therefore likely that, in the base case analysis, demand estimates are underestimated.

Generally, limitations in the modelling work reflect severe data gaps. The Study uses pan-Canadian data reported into CIHI that may be higher-level than data available to the PTs, (for example, hours-worked data for each of the professions). In addition, for the purposes of the Study, there was a focus on workforce providing direct care. There are some limits to the data elements available in the workforce data that may generate different numbers for direct care workforce in the Study compared to what other organizations or health care delivery institutions may have. It should be noted however that the higher-level, aggregate data held by CIHI reflects efforts to compile the data with a methodology that would allow for pan-Canadian comparability and should not be perceived as poorer quality data.

FTE estimates may also have validity and reliability issues as they are dependant upon self-reported hours-worked data collected within the LFS which only covers a sample of workers. Currently available data also do not distinguish between the type of work (hours worked in direct care). As a result, the analysis may reflect an over-estimate of FTE supply.

Finally, the primary care analysis is limited to the assessment of the impact of demand for family physicians and NPs in relation to unattachment in primary care.

Current state analysis

Current state of the Canadian education and training supply

The request for information on the education and training capacity has reinforced the need for a standardized approach to data collection. There were many differences in how the various sources provided the requested information, as we will describe below. In addition to the time constraints posed by the Study, several PTs and other sources indicated that much of the survey information was not available because they either did not collect it, did not have the human resources to compile the additional information outside of their typical information (such as student information at the time of application), or the information was not available electronically.

Most respondents of the education and training survey were able to complete the questions related to program information, student metrics, sponsored seats, anticipated program capacity changes, program expansion constraints and the qualitative questions. Few respondents were able to answer questions related to students living in rural, remote or northern communities prior to application to the program, and questions related to the education and training in these communities. Fewer still had information on the employment of their graduates in their first year, which limited our ability to analyze the movement of graduates from education and training programs to service delivery. Those who responded to this question often had self-reported information from graduate surveys, but they noted their answers were approximate numbers based on the percentage of graduates who responded.

The survey results that could be reported include program information, program capacity, number of in-year applicants, number of students enrolled in their first year, total number of students in the program, number of students who withdrew prior to program completion, and the number of in-year graduates and anticipated program capacity changes. Other results that could be reported included information on the challenges, barriers, and innovations within health profession programs, which are discussed in the following sections.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Few respondents could offer information about the number of students enrolled in their first year who resided in a rural or remote area at the time of their application, the number of students provided with clinical experiences in rural or remote communities during their education and training programs, or whether students obtained employment after graduation. There were also significant variations in the information obtained about the gender and age of in-year students at graduation. Some respondents were able to break down graduation information by either age or gender, and in a few cases both age and gender. In most cases, only the total number of in-year graduates (regardless of gender or age) was available. Since few respondents could provide this information, these survey questions on age and gender were omitted, and only the total number of in-year graduates were reported.

An overview of the available education programs in Canada for the selected health professions, including the national program capacity and number of institutions, is available in Table 3. An explanation of the typical educational program for these health professions is available in the overview of the study.

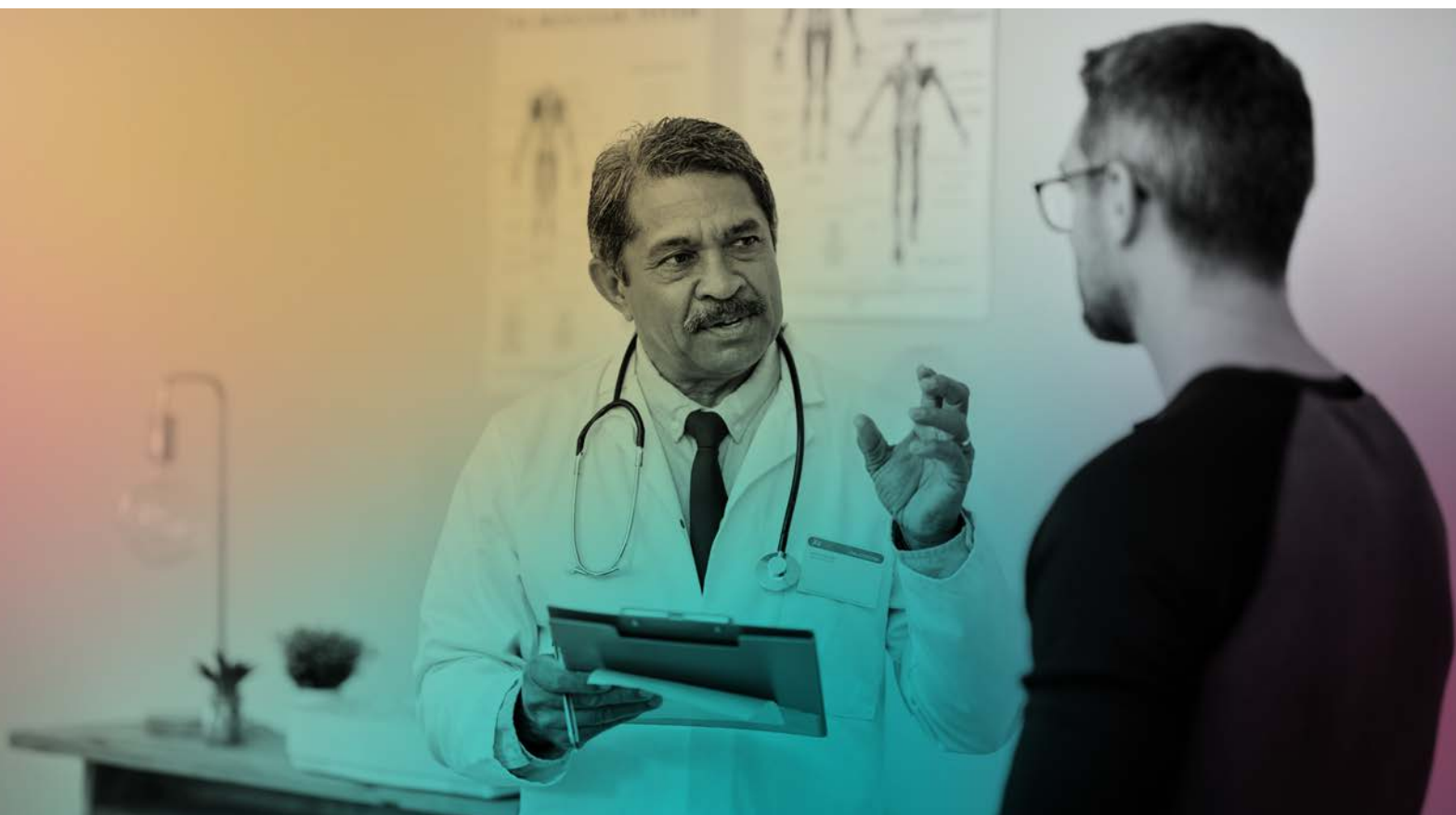


Table 3. Education and training programs available in Canada for select health professionals, 2022–2023

Professionals	Program capacity ¹	Number of institutions ²	Number of PTs offering the education or training program
Nurses³			
Licensed Practical Nurses	NR	69	13
Registered Psychiatric Nurses	NR	6	4
Registered Nurses	NR	77	12
Nurse Practitioners	NR	24	10
Occupational therapists	1,339	14	7
Physiotherapists	1,302	15	7
Pharmacists ⁴	1,436	10	8
Physicians			
MD program	3,005	17	8
All medical residency positions	3,393	17	8
Family medicine residency positions	1,557	17	8

Notes

1. NR: not reported. The program capacity for nursing programs could not be reported.
2. Institution refers to any accredited college or university that delivered an educational or training program for the selected health profession.
3. The number of institutions offering a nursing program does not include programs in Quebec; there are no RPN programs in Quebec. As Quebec considers its health workforce to be its exclusive responsibility, Quebec did not provide data for the Study.
4. A new pharmacy program was established at the University of Ottawa, with admission starting in September 2023. This information is not reflected in this table given the scope of the Study (2018–19 to 2022–23). As of 2023–24, the program capacity increased to 1,496 across 11 universities and 8 provinces in Canada.

Table 4 provides a summary of the number of programs delivered in urban and rural or remote communities in 2022–2023; the definition for urban, rural, or remote communities is found in Appendix C. Most health profession programs were located in urban communities. However, there was a higher number of programs in rural and remote communities for LPNs (61.0%), RPNs (33.3%), and RNs (31.0%). There was also a greater number of family medicine residency positions in rural or remote communities (54.5%) compared to urban communities. However, it is important to note that a greater number of programs in rural or remote communities does not necessarily indicate the number of students training in those communities.

Table 4. Number of education and training programs located in urban and rural or remote communities for select health professionals, 2022–2023

Professionals	Urban community	Rural or remote community
Nurses¹		
Licensed Practical Nurses	62 (39.0%)	97 (61.0%)
Registered Psychiatric Nurses	6 (66.7%)	3 (33.3%)
Registered Nurses	87 (69.1%)	39 (31.0%)
Nurse Practitioners	27 (90.0%)	3 (10.0%)
Occupational therapists	17 (94.4%)	1 (5.6%)
Physiotherapists	20 (90.9%)	2 (9.1%)
Pharmacists	10 (100%)	0 (0.0%)
Physicians		
MD program	17 (100%)	0 (0.0%)
All medical residency positions ²	451 (84.9%)	80 (15.1%)
Family medicine residency positions ³	60 (45.5%)	72 (54.5%)

Notes

1. As Quebec considers its health workforce to be its exclusive responsibility, Quebec did not provide data for the Study.
2. There were 46 medical residency programs with insufficient information to determine the type of community where the program was delivered.
3. There were 29 family medicine residency programs with insufficient information to determine the type of community where the program was delivered.

Nursing

The submissions received from respondents on the education and training of nurses were particularly varied. It was determined that the information provided on program capacity in the survey submissions was too incomplete to include in this report. Other information that was removed from this report include the number of in-year applicants and the number of students who withdrew from nursing programs.

Several respondents also could not provide information from the 2022–2023 academic year because the information was not yet available. As such, the information on nursing programs is only reported from the academic years of 2018–19 to 2021–22.

Licensed Practical Nurse

Respondents reported 69 institutions with LPN programs across Canada in 2022–23 (Table 3). There has been a gradual increase (9.1%) in the number of LPN students enrolled in their first year from 7,097 in 2018–19 to 7,740 in 2021–22. Likewise, the total number of students in the program has also increased gradually (11.2%) from 13,266 in 2018–19 to 14,757 in 2021–22 (Table 5).

A drop in the number of in-year graduates was witnessed from 5,877 in 2018–19 to 5,382 in 2019–20. There was also a greater total number of students in 2020–21 (14,831) compared to 2021–22 (14,757). These differences were attributed to the effects of the COVID-19 pandemic, which limited students' opportunity to complete program requirements (clinical placements) and delayed the graduation of students from these programs (Table 5).

Table 5. Number of students and graduates in licensed practical nursing programs in Canada, 2018–19 to 2021–22¹

Year	Number of students enrolled in their first year ²	Total number of students (sum across all cohorts) ³	Number of in-year graduates ⁴
2018–19	7,097	13,266	5,877
2019–20	7,502	14,139	5,382
2020–21	7,624	14,831	5,489
2021–22	7,740	14,757	6,295

Notes

1. These results do not include information on students or graduates of LPN programs in Quebec.
2. Missing information varied from year to year. In 2018–19, four provinces and two territories; 2019–20 and 2020–21, one province and two territories; and 2021–22, three provinces and one territory.
3. Missing information varied year to year. In 2018–19, two provinces and two territories; 2019–20 and 2020–21, two provinces and two territories; and 2021–22, one province and one territory.
4. Missing information varied year to year. In 2018–19, two provinces and two territories; 2019–20 and 2020–21, two territories; and 2021–22, one territory.

Registered Psychiatric Nurse

Respondents reported six institutions in British Columbia, Alberta, Saskatchewan and Manitoba with RPN programs in 2022-23 (Table 3). There has been a gradual increase (11.7%) in the number of RPN students enrolled in their first year from 189 in 2018-19 to 214 in 2021-22. However, the total number of students in the program increased at a lower rate (2.0%) from 940 in 2018-19 to 958 in 2021-22 (Table 6).

A drop in the number of in-year graduates was witnessed from 313 in 2018-19 to 303 in 2019-20. There was also a greater total number of students in 2020-21 (966) compared to 2021-22 (958) (Table 6). These differences were attributed to the effects of the COVID-19 pandemic, which limited students' opportunity to complete program requirements (clinical placements) and delayed the graduation of students from these programs.

Table 6. Number of students and graduates in registered psychiatric nursing programs in Canada, 2018-19 to 2021-22

Year	Number of students enrolled in their first year ¹	Total number of students (sum across all cohorts) ²	Number of in-year graduates
2018-19	189	940	313
2019-20	205	980	303
2020-21	189	966	318
2021-22	214	958	336

Notes

- Two provinces did not report the number of students enrolled in their first year.
- One province did not report the total number of students.

Registered Nurse

Respondents reported 77 institutions with RN programs across Canada in 2022-23 (Table 3). There has been an increase (20.6%) in the number of RN students enrolled in their first year from 6,247 in 2018-19 to 7,535 in 2021-22. Likewise, the total number of students in the program has also increased (14.8%) from 29,752 in 2018-19 to 34,168 in 2021-22 (Table 7).

While other nursing categories witnessed a decrease in the number of in-year graduates from 2018-19 to 2019-20, in the case of RN in-year graduates, an increase was witnessed from 8,559 to 9,085, respectively. A decrease in this number occurred in 2020-21 with 8,548 in-year graduates compared to 9,085 in-year graduates in 2019-20 (Table 7).

The number of in-year graduates in 2021-22 has not yet surpassed the highest number of in-year graduates in 2019-20. While the COVID-19 pandemic likely affected the RN graduation numbers, further analysis of these findings should be completed to assess why the decrease occurred a year later than other nursing categories.

Table 7. Information on number of students and graduates in registered nursing programs in Canada, 2018–19 to 2021–22¹

Year	Number of students enrolled in their first year ²	Total number of students (sum across all cohorts)	Number of in-year graduates
2018–19	6,247	29,752	8,559
2019–20	6,826	32,095	9,085
2020–21	6,629	32,150	8,548
2021–22	7,535	34,168	8,992

Notes

1. These results do not include information on students or graduates of RN programs in Quebec.
2. Two provinces did not report the number of students enrolled in their first year.

Nurse Practitioner

Respondents reported 24 institutions with NP programs across Canada in 2022–23 (Table 3). There has been a significant increase (42.9%) in the number of NP students enrolled in their first year from 319 in 2018–19 to 456 in 2021–22. Likewise, the total number of students in the programs has also increased gradually (32.4%) from 1,498 in 2018–19 to 1,983 in 2021–22 (Table 8).

A decrease in the number of in-year graduates occurred from 364 in 2018–19 to 349 in 2019–20. However, there was also a significant increase (51.1%) in 2020–21, when the number of in-year graduates increased to 583 from 349 in 2019–20 (Table 8). This significant increase can be attributed to two provinces who provided data between 2018–19 and 2021–22 about the number of in-year NP graduates. Given there is no missing information from these provinces for this period of time, these results suggest a significant expansion of NP programs prior to 2019–20.

The number of in-year NP graduates did not decrease until 2021–22 when the number dropped to 550 from 583 in 2020–21. The sudden increase of in-year NP graduates during this period obscures what effects the COVID-19 pandemic might have had on graduation rates. It is likely that NP students were similarly delayed in their training by the COVID-19 pandemic but further analysis of these findings is required to assess the reasons for the declined number of in-year graduates in 2021–22 (Table 8).

Table 8. Number of students and graduates in nurse practitioner programs in Canada, 2018–19 to 2021–22¹

Year	Number of students enrolled in their first year ²	Total number of students (sum across all cohorts)	Number of in-year graduates ³
2018–19	319	1,498	364
2019–20	401	1,731	349
2020–21	416	1,862	583
2021–22	456	1,983	550

Notes

1. These results do not include information on students or graduates of NP programs in Quebec.
2. Three provinces did not report the number of students enrolled in their first year.
3. One province did not report the number of in-year graduates. Two provinces did not report the number of in-year graduates in 2018–19.

Occupational therapists

All the occupational therapy programs in Canada reported information on the education and training of occupational therapists for the Study. As of 2022–23, there were 1,339 seats for occupational therapy students across 14 universities in Canada (Table 3). There has been a 15.0% increase in the program capacity for occupational therapists from 1,164 in 2018–19 to 1,339 in 2022–23 (Table 9).

As with the other education programs for health professions, there was a decrease in the number of in-year applicants and students enrolled in their first year during the 2020–21 and 2021–22 academic years. However, as in most cases, the overall number for occupational therapy programs had also increased over time. For example, the number of students enrolled in their first year increased from 932 in 2018–19 to 1,067 in 2022–23 and, consequently, the total number of students has also increased, from 2,172 in 2018–19 to 2,630 in 2022–23 (Table 9).

While there is some missing information on the number of in-year students who withdrew prior to program completion, as well as the number of in-year graduates, the results demonstrate a concerning issue for student retention in the occupational therapist programs. Occupational therapy programs reported a consistently high number of students who withdrew from the programs, ranging from 2.7% (70 in 2021–22) to 4.6% (122 in 2022–23) of the total number of students in the program. The number of graduates has increased 6.2% from 870 in 2018–19 to 924 in 2022–23 (Table 9).

Table 9. Number of students and graduates in occupational therapy programs in Canada, 2018-19 to 2022-23

Year	Program capacity	Number of in-year applicants ¹	Number of students enrolled in their first year	Number of in-year students who withdrew prior to program completion ¹	Total number of students (sum across all cohorts) ²	Number of in-year graduates ³
2018-19	1,164	5,724	932	105	2,172	870
2019-20	1,288	5,687	1,057	86	2,412	849
2020-21	1,300	5,608	1,033	92	2,457	852
2021-22	1,324	6,204	1,033	70	2,594	873
2022-23	1,339	5,809	1,067	122	2,630	924

Notes

1. Three occupational therapy programs did not report the number of in-year applicants and students who withdrew from their programs.
2. One occupational therapy program did not report the total number of students in their program from 2018-19 to 2020-21.
3. One occupational therapy program did not report the number of in-year graduates from their program.

Physiotherapists

All the physiotherapy programs in Canada reported information on the education and training of physiotherapists for the Study. As of 2022-23, there were 1,302 seats for physiotherapy students across 15 universities (Table 3). The program capacity for physiotherapists has fluctuated from year to year but there has been an increase of 3.3% from 1,260 in 2018-19 to reach 1,302 in 2022-23 (Table 10).

During the 2019-20 and 2020-21 academic years, there was a decrease in the number of in-year applicants. However, this number has increased 12.9% from 8,143 in 2018-19 to 9,191 in 2022-23 (Table 10). It should be noted that this number is likely underreported as three physiotherapy programs were unable to provide a number of in-year applicants, which would indicate the number of in-year applicants and percent change is higher than reported.

The physiotherapy programs did not demonstrate any notable decrease in the number of students enrolled in their first year, or the number of in-year graduates, during the academic years that were most affected by the COVID-19 pandemic. There have been slight increases in both student metrics. The number of students enrolled in their first year increased from 989 in 2018-19 to 1,035 in 2022-23. The number of in-year graduates also increased from 792 in 2018-19 to 815 in 2022-23 (Table 10). However, these numbers are also likely underreported because of missing information from two physiotherapy programs.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

It was reported that the number of students who withdrew prior to program completion has decreased from 4.5% (92 in 2018/29) to 1.9% (45 in 2022–23) of total number of students (Table 10). This decrease is isolated to those programs who reported the highest number of student withdrawals, suggesting a shift within the programs themselves that have helped student retention. While this trend is promising, further research is needed to validate this finding given that there remain information gaps in the number of students who withdrew prior to program completion.

Table 10. Number of students and graduates in physiotherapy programs in Canada, 2018–19 to 2022–23

Year	Program capacity	Number of in-year applicants ¹	Number of students enrolled in their first year ²	Number of in-year students who withdrew prior to program completion ¹	Total number of students (sum across all cohorts) ¹	Number of in-year graduates ²
2018–19	1,260	8,143	989	92	2,055	792
2019–20	1,282	7,767	1,000	97	2,073	778
2020–21	1,300	7,787	1,012	99	2,079	808
2021–22	1,270	8,831	1,005	67	2,307	770
2022–23	1,302	9,191	1,035	45	2,375	815

Notes

1. Three physiotherapy programs did not report the number of in-year applicants, number of students who withdrew, and the total number of students within their programs.
2. Two physiotherapy programs did not report the number of students enrolled in their first year and the number of in-year graduates from their programs.

Pharmacists

All the pharmacy programs in Canada reported information on the education and training of pharmacists for the Study. As of 2022–23, there were 1,436 seats for pharmacy students across 10 universities in Canada (Table 3). There has been an increase of 3.9% in program capacity from 1,382 in 2018–19 to 1,436 in 2022–23 (Table 11).

During the 2020–21 academic year, there was a significant decrease in the number of in-year applicants to 5,827 applicants from 6,835 in 2018–19. However, the number of applicants increased 12.4% in the following years, reaching 7,685 in-year applicants for the 2022–23 academic years (Table 11).

The number of students enrolled in their first year decreased by 17.3% from 1,395 in 2018–19 to 1,153 in 2021–22 (Table 11). Programs in two different provinces noted a significant decrease in the number of students enrolled in their first year that academic year, which suggests a broader implication that may have affected interest in this health profession.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

The number of students enrolled in their first year compared to the reported program capacity was greater in 2018–19 and 2019–20; more students were enrolled in pharmacy programs across Canada than there were seats. However, this trend has been corrected since 2020–21 where the number of students enrolled in their first year remained below the program capacity.

Despite program capacity among pharmacy programs having increased 3.9% since 2018–19, the number of in-year-graduates has remained relatively steady. It was reported that 1,256 students graduated in 2018–19 but only an additional 19 graduates, for a total of 1,275, were reported in 2022–23 (Table 11). Unfortunately, the pharmacy programs were unable to report the number of students who withdrew before program completion to provide some context for this finding. Further research into the graduation rate among pharmacy programs is needed to understand this trend.

Table 11. Number of students and graduates in pharmacy programs in Canada, 2018–19 to 2022–23

Year	Program capacity	Number of in-year applicants	Number of students enrolled in their first year	Total number of students (sum across all cohorts)	Number of in-year graduates
2018–19	1,382	6,835	1,395	5,278	1,256
2019–20	1,392	6,413 ¹	1,421	5,235	1,255
2020–21	1,402	5,827	1,393	4,518 ²	1,222 ²
2021–22	1,421	7,156	1,153	5,300	1,217
2022–23	1,436	7,685	1,405	5,338	1,275

Notes

1. One pharmacy program was unable to provide the number of in-year applications for the 2019–20 academic year.
2. One pharmacy program was unable to provide the total number of students and the number of in-year graduates for the 2020–21 academic year.

Physicians

Doctor of Medicine (MD) education

As of 2022–23, there were 3,005 seats for medical students at 17 faculties of medicine across Canada (Table 3). Program capacity has steadily increased (5.4%) from 2,850 in 2018–19 to 3,005 in 2022–23 and the number of students enrolled in their first year has similarly increased (5.4%) from 2,922 in 2018–19 to 3,080 in 2022–23 (Table 12). However, the total number of students and the number of in-year graduates have continued to decline over time, –4.6% and –0.6%, respectively. The information on MD programs in Canada was obtained from the CMES so it is likely this missing information is resulting in underreported numbers for students and graduates of MD programs.

Table 12. Number of students and graduates of MD programs in Canada, 2018–19 to 2022–23

Year	Program capacity	Number of in-year applicants	Number of students enrolled in their first year	Total number of students (sum across all cohorts)	Number of in-year graduates
2018–19	2,850	39,284	2,922	11,445	2,857
2019–20	2,870	20,231	2,917	11,491	2,865
2020–21	2,969	19,861	2,994	11,540	2,894
2021–22	2,915	24,728	2,998	10,772	2,862
2022–23	3,005	29,810	3,080	10,921	2,840

Source: CMES 2019–2022, and personal correspondence with the AFMC and CaRMS. Many Ontario MD programs did not report data to the CMES for the years 2018–19 to 2022–23.

Medical residency: All disciplines

For the medical residency programs, there were 3,393 positions available to medical graduates in 2022–23 (Table 3). There has been a 2.6% increase in the number of positions since 2018–19 where 3,306 positions existed. Again, there were decreases in the student and graduate metrics during the 2019–20 and 2020–21 academic years but the demand for medical residency positions has remained high (Table 13).

The number of in-year applications increased 16.1% from 101,807 in 2018–19 to 118,166 in 2022–23. However, the other metrics have fluctuated over the years and have resulted in only nominal increases. For example, the number of residents in their first year of training increased by 0.7% from 3,229 in 2018–19 to 3,252 in 2022–23; the difference is only 23, yet program capacity increased by 87 in that same period. The number of graduates has increased by 52 (1.5%), from 3,543 in 2018–19 to 3,595 in 2022–23 (Table 13).

Table 13. Number of medical residents and graduates of medical residency programs in Canada, 2018–19 to 2022–23

Year	Program capacity ¹	Number of in-year applicants ²	Number of unfilled residency positions ³	Number of residents in their first year of training ⁴	Total number of students (sum across all cohorts) ⁴	Number of graduates ⁴
2018–19	3,306	101,807	78	3,229	14,095	3,543
2019–20	3,333	105,376	47	3,270	14,170	3,469
2020–21	3,373	100,491	52	3,270	14,230	3,503
2021–22	3,345	105,406	84	3,214	14,276	3,470
2022–23	3,393	118,166	111	3,252	14,287	3,595

Notes

1. Source: CaRMS. Determined based on the quota numbers during the first iteration of the match process, excluding quotas for military applicants or program streams that did not submit a rank order list for applicants.
2. Source: CaRMS. Excludes American medical graduates (USMGs).
3. Source: CaRMS. Calculated based on the results following the second iteration of the match process.
4. Source: CAPER.

In reviewing these results among medical residents based on eligibility—CMG versus IMG—there are similar trends. Both the number of CMG and IMG applications have increased substantially since 2018–19 (Table 14). For CMGs, there were 60,238 applications in 2018–19 and 71,244 by 2022–23 for a percent increase of 18.3%. For IMGs, there were 41,549 applications in 2018–19 and 46,925 by 2022–23 for a percent increase of 12.9%.

The program capacity of CMGs has increased by 3.3% from 2,963 in 2018–19 to 3,062 in 2022–23. However, fewer IMG positions were available in 2022–23 (331) compared to 2018–19 (343) while the number of IMG residents in the first year of training has increased from 410 to 453 (Table 14).

Table 14. Number of medical residents and graduates of medical residency programs in Canada, by eligibility, 2018–19 to 2022–23

Year	Program capacity ¹		Number of in-year applications ²		Number of unfilled residency positions ²		Number of residents in their first year of training ³	
	CMG	IMG	CMG	IMG	CMG	IMG	CMG	IMG
2018–19	2,963	343	60,258	41,549	77	1	2,819	410
2019–20	3,007	326	62,290	43,086	45	2	2,856	414
2020–21	3,048	325	63,188	37,303	52	0	2,845	425
2021–22	3,023	322	61,852	43,554	84	0	2,797	417
2022–23	3,062	331	71,244	46,925	111	0	2,799	453

Notes

1. Source: CaRMS. Determined based on the quota numbers during the first iteration of the match process, excluding quotas for military applicants and program streams that did not submit a rank order list for applicants. CMG program capacity includes the quotas for the competitive application stream. The competitive stream is open to both CMG and IMG applicants; this option is used mostly by programs in QC, but it has also been applied to some residency positions in AB, BC, ON and SK. IMG program capacity was determined by the quota for residency positions available only to IMGs during the first iteration of the match process.
2. Source: CaRMS. The number of in-year applications excludes American medical graduates (USMGs). The number of unfilled residency positions was calculated based on the sum of unfilled quota after the second iteration of the match process.
3. Source: CAPER.

Family medicine residency

Of the medical residency positions in Canada, in 2022–23, 1,557 (46%) were allocated to family medicine (Table 3). Program capacity for this discipline has increased (1.6%) from 1,532 in 2018–19. The number of in-year applications for family medicine residency has increased by 35% from 60,963 in 2018–19 to 81,992 in 2022–23, indicating ongoing interest for this discipline (Table 15).

However, the number of residents in their first year of training has decreased. In 2018–19, there were 1,372 family medicine residents, and while the number fluctuated over the last five years, the number of residents in their first year actually decreased to 1,366 in 2022–23 (Table 15). Similarly, the total number of family medicine residents also decreased, from 2,934 in 2018–19 to 2,889 in 2022–23 (Table 15).

Table 15. Number of family medicine residents and graduates of family medicine residency programs in Canada, 2018–19 to 2022–23

Year	Program capacity ¹	Number of in-year applicants ²	Number of unfilled residency positions ³	Number of residents in their first year of training ⁴	Total number of students (sum across all cohorts) ⁴	Number of graduates ⁴
2018–19	1,532	60,963	65	1,372	2,934	1,279
2019–20	1,542	64,718	28	1,449	2,977	1,320
2020–21	1,552	63,997	45	1,429	3,076	1,317
2021–22	1,543	67,243	79	1,355	2,998	1,362
2022–23	1,557	81,992	95	1,366	2,889	1,443

Notes

1. Source: CaRMS. Determined based on the quota numbers during the first iteration of the match process, excluding quotas for military applicants and program streams that did not submit a rank order list for applicants.
2. Source: CaRMS. Excludes American medical graduates (USMGs).
3. Source: CaRMS. Calculated based on the results following the second iteration of the match process.
4. Source: CAPER.

There were similar trends in reviewing the results for family medicine residents based on eligibility—CMG versus IMG. The number of in-year applications increased significantly for both CMG and IMG positions. For CMG positions, the number increased from 32,940 in 2018–19 to 43,721 in 2022–23. For IMG positions, the number increased from 28,023 in 2018–19 to 38,271 in 2022–23 (Table 16). These suggest a continued interest in family medicine as a discipline among medical graduates.

Program capacity for family medicine residency programs increased by 2.9% for CMG positions from 1,348 in 2018–19 to 1,387 in 2022–23. The number of unfilled residency positions for CMGs has also increased from 65 in 2018–19 to 95 in 2022–23. However, for IMG positions, program capacity decreased from 184 in 2018–19 to 170 in 2022–23 (Table 16). Despite the fewer number of positions for IMG applicants, the number of IMG family medicine residents in their first year of training continues to exceed program capacity and there are no unfilled IMG residency positions in recent years.

Table 16. Number of family medicine residents and graduates of family medicine residency programs in Canada, by eligibility, 2018–19 to 2022–23

Year	Program capacity ¹		Number of in-year applications ²		Number of unfilled residency positions ²		Number of residents in their first year of training ³	
	CMG	IMG	CMG	IMG	CMG	IMG	CMG	IMG
2018–19	1,348	184	32,940	28,023	65	0	1,180	192
2019–20	1,375	167	35,360	29,358	28	0	1,248	201
2020–21	1,384	168	36,881	27,116	45	0	1,212	217
2021–22	1,377	166	34,231	33,012	79	0	1,148	207
2022–23	1,387	170	43,721	38,271	95	0	1,144	222

Notes

1. Source: CaRMS. Determined based on the quota numbers for the first iteration of the match process, excluding quotas for military applicants and program streams that did not submit a rank order list for applicants. CMG program capacity includes the quotas for the competitive application stream. The competitive stream is open to both CMG and IMG applicants; this option is used mostly by programs in QC, but it has also been applied to some residency positions in AB, BC, ON, and SK. IMG program capacity was determined by the quota for residency positions available only to IMGs during the first iteration of the match process.
2. Source: CaRMS. The number of in-year applications excludes American medical graduates (USMGs). The number of unfilled residency positions was calculated based on the sum of unfilled quota after the second iteration of the match process.
3. Source: CAPER.

Overall, the trends within the data for MD education and medical residences demonstrate a nominal increase to the number of students and graduates. The data demonstrates a continued interest in family medicine as a discipline among medical graduates. Changes to the matching process by some faculties (such as reversions) have enabled more IMGs to be matched. This change partially explains the increase in the number of IMG residents training in Canada despite no concurrent increase in program capacity for IMGs.

Current health workforce supply, demand and gap

The results shown here represent analysis of the most recent health workforce supply data held by CIHI for the year 2022 for all of Canada. Summarized below are the number of active nurses (LPN, RPN, RN, and NPs), occupational therapists, physiotherapists, pharmacists, and family physicians, working in all health care settings. Other physician specialties were not included in the analysis due to time constraints, and the Study's focus on primary care.

Estimates presented reflect workforce supply head counts as well as FTE as absolute values and per 100,000 population. Estimates are also provided for the number of active workforce and the workforce who self-reported providing direct care (which will always be a subset of the total head counts). For nurses, occupational therapists, physiotherapists, and pharmacists, summary tables that are inclusive of demand and gap estimates are focused on workers in direct care.

Additionally, estimates for supply and demand are presented by rural and urban geography for each health profession. For physicians, the FTEs presented represent all activities that were billed by family physicians in Canada, meaning we did not focus only on office-based or comprehensive primary care services for the current state analysis.

The methodology and data sources for the presented data and results are found in the previous section.

Overall, there are substantial supply-demand gaps for all of the professions who provide direct care. For family physicians, while the gap is smaller in rural areas compared to urban areas in both head counts and FTEs, the gap per 100,000 population is larger in rural areas than urban areas. For other health providers, the gap is usually smaller in rural areas than urban areas, in both absolute values and per 100,000 population. The FTEs are smaller than head counts for every profession, illustrating that the average health provider works less than full-time (due to some health providers working part-time).

Nursing workforce supply, demand and gap

Table 17. Licensed practical nurse workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	117,710 (303)	111,265 (286)
Demand	131,685 (339)	124,476 (320)
Gap	13,976 (36)	13,210 (34)
Rural and remote areas		
Supply	13,469 (196)	12,698 (185)
Demand	15,771 (229)	14,868 (216)
Gap	2,302 (33)	2,170 (32)
Urban areas		
Supply	104,241 (326)	98,567 (308)
Demand	115,914 (362)	109,605 (342)
Gap	11,673 (36)	11,038 (34)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. Head counts represent workforce counts (unadjusted for full-time hours). FTEs are estimated by Health Canada. Notes: Licensed Practical Nurses in Nunavut are excluded from the analysis due to data limitations.

Table 18. Registered psychiatric nurse workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	5,611 (45)	5,201 (42)
Demand	6,084 (49)	5,640 (45)
Gap	473 (4)	439 (4)
Rural and remote areas		
Supply	650 (31)	602 (29)
Demand	732 (35)	677 (33)
Gap	82 (4)	76 (4)
Urban areas		
Supply	4,961 (48)	4,599 (44)
Demand	5,352 (52)	4,962 (48)
Gap	392 (4)	363 (4)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. Head counts represent workforce counts (unadjusted for full-time hours). FTEs are estimated by Health Canada. Notes: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the analysis due to data limitations.

Table 19. Registered nurse workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	269,200 (691)	248,766 (639)
Demand	296,808 (762)	274,279 (704)
Gap	27,608 (71)	25,513 (66)
Rural and remote areas		
Supply	25,426 (369)	23,418 (340)
Demand	29,983 (435)	27,615 (400)
Gap	4,557 (66)	4,197 (61)
Urban areas		
Supply	243,774 (761)	225,349 (703)
Demand	266,826 (833)	246,658 (770)
Gap	23,052 (72)	21,309 (67)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. Head counts represent workforce counts (unadjusted for full-time hours). FTEs are estimated by Health Canada.

Table 20. Nurse practitioner workforce supply, demand, and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	7,523 (19)	7,305 (19)
Demand	10,168 (26)	9,874 (25)
Gap	2,646 (7)	2,569 (7)
Rural and remote areas		
Supply	1,102 (16)	1,067 (15)
Demand	1,507 (22)	1,460 (21)
Gap	406 (6)	393 (6)
Urban areas		
Supply	6,421 (20)	6,238 (19)
Demand	8,661 (27)	8,414 (26)
Gap	2,240 (7)	2,176 (7)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. Head counts represent workforce counts (unadjusted for full-time hours). FTEs are estimated by Health Canada.

Occupational therapist, Physiotherapist, Pharmacist workforce supply, demand and gap

Table 21. Occupational therapist workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	16,074 (41)	14,529 (37)
Demand	17,940 (46)	16,215 (42)
Gap	1,866 (5)	1,687 (4)
Rural and remote areas		
Supply	1,031 (15)	933 (14)
Demand	1,370 (20)	1,239 (18)
Gap	339 (5)	307 (4)
Urban areas		
Supply	15,043 (47)	13,596 (42)
Demand	16,570 (52)	14,976 (47)
Gap	1,527 (5)	1,380 (4)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. FTEs calculated by Health Canada.

Table 22. Physiotherapist workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	25,774 (66)	22,682 (58)
Demand	28,318 (73)	24,920 (64)
Gap	2,543 (7)	2,238 (6)
Rural and remote areas		
Supply	1,846 (27)	1,610 (23)
Demand	2,245 (33)	1,959 (29)
Gap	400 (6)	349 (5)
Urban areas		
Supply	23,928 (75)	21,071 (66)
Demand	26,072 (81)	22,959 (72)
Gap	2,144 (7)	1,888 (6)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. FTEs calculated by Health Canada. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

Table 23. Pharmacist workforce supply, demand and gap, in direct care, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	30,850 (102)	29,482 (98)
Demand	32,465 (108)	31,025 (103)
Gap	1,614 (5)	1,543 (5)
Rural and remote areas		
Supply	3,183 (61)	3,048 (58)
Demand	3,477 (67)	3,330 (64)
Gap	294 (6)	281 (5)
Urban areas		
Supply	27,668 (111)	26,434 (106)
Demand	28,988 (116)	27,695 (111)
Gap	1,320 (5)	1,262 (5)

Source: Health Canada analysis using data from the Health Workforce Database, 2022; Canadian Institute for Health Information. FTEs calculated by Health Canada. Notes: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

Family physician workforce supply, demand and gap

Table 24. Family physician supply, demand and gap, Canada, 2022

Workforce	Head counts (# per 100,000 population)	FTEs (# per 100,000 population)
Overall		
Supply	46,145 (114)	41,589 (103)
Demand	68,968 (170)	62,331 (154)
Gap	22,823 (56)	20,742 (51)
Rural and remote areas		
Supply	5,983 (85)	5,389 (77)
Demand	12,500 (178)	11,297 (161)
Gap	6,517 (93)	5,908 (84)
Urban areas		
Supply	40,162 (120)	36,199 (108)
Demand	56,468 (169)	51,034 (153)
Gap	16,306 (49)	14,835 (44)

Source: Health Canada analysis using The Physician Resource Planning Tool; Canadian Institute for Health Information. Head counts represent workforce counts unadjusted for full-time hours. FTEs are based on the scenario that is inclusive of all services provided by family physicians in Canada. Rural and urban disaggregation is based on Health Canada's methodology using proportions from Scott's Medical Database. Head count results will not match exactly those reported by CIHI for 2022.

Discussion

Rural and urban distribution of supply

Based on Statistics Canada population estimates, 17.8% of the Canadian population in 2021 resided in rural areas.¹⁶⁶ However, the proportion of the health workforce working in rural areas is often lower. CIHI reports¹⁶⁷ that in 2022, only 13.1% of family medicine physicians were practicing in rural or remote areas, while 19.4% of nurses in Canada practiced in rural or remote areas. The breakdown of nurse professions working in rural or remote areas is as follows; 22.8% for NPs, 14.0% for RNs, 15.4% for RPNs, and 25.4% for LPNs. The proportion of the other in-scope occupations practicing in rural or remote areas in 2022 was only 5.1% of occupational therapists, 9.7% of pharmacists, and 6.9% of physiotherapists.

Supply and demand gaps

Overall, there are substantial gaps across all study in-scope health professions. Relative gap to the population consistently identifies larger gaps in rural areas compared to urban areas particularly for family physicians, where the gap per capita is more than double in the rural areas than in the urban areas.

Caution in the interpretation of the results

Demand for each of the in-scope health profession presented in this analysis are based on minimal data and information related to utilization and need in the population. Although demand for family physicians is based on tracked utilization data, it is based on billing information which may not capture fully all care received. Demand for family physicians is based on a measure of utilization, estimated physician workloads, and population survey-based data on primary care unattachment. These can be imprecise and therefore could either under or over-estimate true demand.

For nurses, occupational therapists, pharmacists and physiotherapists, there was little reliable data available to faithfully estimate demand. The analysis relied on a simplified employment approach whereby utilization is proxied by current supply and unmet demand as survey-based job vacancies, which would not fully capture demand in the current state nor into the future. Given the high level of uncertainty around the demand estimates, the estimated gaps should also be interpreted and used with caution.

Challenges and barriers

The Study's information request and multiple engagements with health profession education program leaders revealed that significant challenges and barriers exist in the education and training of the in-scope health professions. The key challenges and barriers to expansion of current programs that were identified were consistent across all professions. The identified themes include financial constraints, availability of adequate clinical placements, and educational infrastructure. Faculty and support staff shortages, student considerations, education models and drop-out rates were also mentioned, and all of these challenges are greater in rural and remote areas.

Financial constraints

Financial constraints were identified by all professions as being a critical challenge to increasing seats to better meet the health care needs of Canadians. Of the information request respondents, programs for occupational therapists agreed at 78.9%, programs for physiotherapists agreed at 71.0%, and programs for pharmacists agreed at 90.9%. Increased funding would allow educational programs to hire more human resources including course instructors, administrative supports and clinical preceptors, which stakeholders say would be necessary to increase enrolment. The lack of funding was also often connected by respondents with other barriers and challenges mentioned, such as updating equipment and making more space available within the educational institutions. Further, the timing of funding increases was identified as a potential challenge. Institutions require sufficient notice of seat increases to prepare for program expansion by ensuring that the adequate human and physical resources are in place. Some respondents also noted that PT mandated tuition decreases contribute significantly to restraining program budgets.

Clinical placements and preceptors

One of the most pressing challenges seen by all health professional schools is the lack of clinical placements and supervisors. Of the respondents, programs for occupational therapists agreed at 88.9%, programs for physiotherapists agreed at 85.7%, and programs for pharmacists agreed at 72.7%. These placements are crucial for meeting accreditation requirements and ensuring that students gain the necessary hands-on experience. Lack of space, particularly in small hospitals with a small number of beds, is a contributing factor to the limited number of clinical placements. However, the lack of preceptors to supervise and teach students was the reason more commonly reported for the shortage of clinical placements. Despite an increase in seat capacity in some professional programs, such as nursing, the expansion of necessary clinical placements has not kept pace. The recruitment and retention of qualified preceptors remains a significant challenge, as potential preceptors are already feeling overworked. Preceptors are generally not compensated for the extra work, and in some cases, supervising students may decrease the preceptor's income and the number of patients seen. For example, physicians with very high caseloads are not primarily employed to educate students, and their remuneration is often based on patient care rather than educational duties. The discrepancy between demand and supply of clinical placements has created a bottleneck where many students currently struggle to find suitable clinical experiences.

Educational infrastructure

Barriers and challenges relating to educational infrastructure include space constraints within universities and teaching hospitals, with many institutions and stakeholders reporting a lack of space to accommodate any more learners in the existing classrooms and labs. Of the respondents, programs for occupational therapy agreed at 89.5%, programs for physiotherapy agreed at 81.0%, and programs for pharmacists agreed at 81.8%. Lack of consistent and dependable internet and equipment required to support online learning, telehealth and satellite campuses were also identified.

Faculty and support staff

Respondents were asked if an insufficient number of faculty members to carry out educational programs was a constraint that prevented their programs from increasing the number of student seats. Of the respondents for occupational therapist programs, slightly more disagreed (52.6%) than agreed (47.4%) that there was an insufficient number of faculty members. Of the survey respondents for physiotherapist and pharmacist programs, most agreed (81.0% and 63.6%, respectively) that there was an insufficient number of faculty members.

Survey respondents were asked if an insufficient number of support staff to carry out educational programs was a constraint that prevented their programs from increasing the number of student seats. Of the respondents for occupational therapist programs, most disagreed (74.7%) that there was an insufficient number of support staff. Of the respondents for physiotherapist and pharmacist programs, more agreed (57.1% and 72.7%, respectively) that there was an insufficient number of support staff.

Student considerations

Student considerations were frequently raised as barriers to enabling the health workforce supply to meet the present and future health service needs of Canadians. Program leaders and experts see financial and other strains placed on students by the programs as barriers to expansion. High tuition costs and the financial burden of paying for double rent and travel expenses for placements were consistently mentioned as a barrier to prospective students. Additionally, the rising cost of living further complicates the scenario, as many prospective students are financially constrained and unable to leave their jobs to study. Students from underrepresented backgrounds are often more affected by these financial challenges.

Again, students learning in rural or remote areas can face even greater challenges and barriers. The logistical and financial burdens of participating in rural or remote placements are substantial. In addition to feelings of isolation, the very high costs of rent for temporary housing, if available, and travel costs can be a barrier to expansion. Participants mentioned limitations on the bursaries or financial supports provided to students who undertake placements in rural or remote locations. Students who come from rural or remote communities of less than a thousand people face additional challenges and barriers including access to the required high school science courses and prerequisites to program admission.

Outdated education models, drop-out rates and admission processes

Three additional barriers and challenges to allowing for the growth of these programs were mentioned by several respondents. Outdated education models are said to be preventing programs from keeping up with the evolving scope of practice within health care. Curriculum development may not always keep pace, leaving graduates underprepared for modern roles, while the requirement of students to accumulate a set number of clinical hours leaves programs at the mercy of clinicians who choose to volunteer their time to become preceptors. Mid-program drop-out rates have also been identified as a challenge to increasing the number of graduates, as many students use entry into one health profession program as a springboard into another program, such as medical school or dentistry, or leave their program due to an initial lack of understanding of what the profession entails. Finally, admission processes often pose barriers for applicants, particularly for those from underrepresented backgrounds. These challenges and barriers hinder the expansion of education and training programs and the accommodation of increased student numbers over the short term.

Challenges and barriers in rural and remote communities

The challenges and barriers mentioned above are exacerbated in rural and remote areas. Clinical placements in rural and remote communities offer valuable learning experiences, as students encounter a broader range of patients and conditions due to the limited health care resources in these areas. However, a critical challenge in rural and remote areas is the lack of clinical placements and supervisors. A lack of space due to the small numbers of beds in rural and remote facilities makes it challenging to take on more students. For example, where a cohort of eight student nurses might be supervised by one preceptor in a large teaching hospital, the small number of beds in a small rural or remote hospital might only accommodate a maximum of four clinical placements. As in the rest of Canada, however, the main challenge to clinical placements in rural and remote areas is the limited number of instructors and preceptors, which is exacerbated by a shortage of health care workers in rural and remote areas generally. Stakeholders noted that the reduced volume of care provided while teaching can diminish the focus on teaching, particularly in rural and remote communities. The lack of housing for students and faculty members is yet another limiting barrier to expansion. Furthermore, as rural and remote locations rely heavily on remote learning and telehealth, poor internet access can be a barrier, as it could prevent classroom participation through synchronous discussions or online simulations. Temporary rural placements are considered by medical schools to be less effective than Longitudinal Integrated Clerkships, highlighting the need for improved educational models in northern, rural and remote areas. Financial constraints make it challenging to address these issues.



Innovations in education and training of Canada's health workforce

Through the data collection and engagement process, many innovations and promising practices designed to better meet the present and future health care needs of Canadians in all regions of Canada were brought to light. The innovations highlighted in this section focus on producing graduates to help meet the health care needs of Canadians. This is being done by creating programs to fill an unmet need, by making programs more accessible to students and removing barriers to their entry into programs, such as by accelerating the program, building on previous education, or eliminating some prerequisites. Highlighted innovations include some that aim to improve access to health care for Canadians in rural and remote areas by offering education and training in these areas. There is evidence to show that people who have lived in rural or remote locations are more likely to continue to live and work in these locations when they are educated there.¹⁶⁸ Some specifically target students who are currently living in or who plan to work in rural or remote locations. Several of the innovations shared in the Study promote team-based interprofessional collaboration, and adapting curricula to ensure graduates are prepared for new workplace models of care and expanding scopes of practice.¹⁶⁹

The following are but a sample of the innovative programs, partnerships and activities taking place in Canadian educational institutions as education and government leaders seek to work around barriers and challenges to prepare Canada's future workforce. They represent each health profession under study and jurisdictions from across the country.

Curriculum design innovations

Queen's-Lakeridge Health MD Family Medicine Program

The Queen's-Lakeridge Health MD Family Medicine Program based at the Queen's University satellite campus at Lakeridge Health in Durham Region is an innovative, first-in-Canada medical education model designed to address the shortage of family doctors. Launched in September 2023, this program delivers the MD Program learning objectives through the lens of Family Medicine and Primary Care. Students will have immersive longitudinal clinical experiences from Year 1 through Year 4 of the program in a variety of Family Medicine practice settings.

The Queen's-Lakeridge Health MD Family Medicine Program has dedicated postgraduate Family Medicine Residency positions set aside for successful graduates under the Queen's Family Medicine Training Program. This means that the students do not have to go through the CaRMS¹⁷⁰ matching process in Year 4 to obtain a residency position. Rather, the program's curriculum is designed to advance students' learning in Family Medicine in their final year of the medical program as they transition to residency and ultimately, a rewarding career practicing comprehensive Family Medicine.¹⁷¹

University of Waterloo, School of Pharmacy—Communities of Practice Model

The University of Waterloo (UW) School of Pharmacy (the School) has developed and implemented a Communities of Practice model¹⁷² that provides the infrastructure for students to complete three 8-week patient care rotations at the end of the 4-year professional Doctor of Pharmacy (PharmD) program. Rotations are in settings of community pharmacy, primary care, hospital and long-term care. This model has been highly effective, and the concept has been replicated by other pharmacy programs in Canada.

Since 2015, the School has employed faculty, named Regional Clinical Coordinators (RCCs), in 14 regions in Ontario that cover near-North and Northern regions as well as rural and urban centres. The RCCs support students, sites and preceptors, and oversee activities and placements in their region. The RCCs are familiar with local pharmacists, practice sites, and other health professionals and link them into a Community of Practice that can meet local needs and enhance information sharing. RCCs act as a direct link to the School, despite geographical distance, and are supported by the Experiential Coordinator, Patient Care Rotations located at the School.

This model makes it possible to expand the School's reach to preceptors, practice sites and populations not usually connected to academic (medical) centres. Approximately 600 preceptors are engaged in the program with very little turnover. As capacity building is inherent in the model, this allows for flexibility during times of crisis (for example the COVID-19 pandemic, staffing shortages). This was demonstrated in March 2020 when 50% of sites could not maintain students in their rotation. Within one week, 14 RCCs and hundreds of preceptors worked together to place every student and the entire Pharmacy 2020 cohort graduated on time.

The School is committed to ensuring the needs of Northern and rural communities are met and up to 16 students per year are placed in Sudbury, Sault St. Marie, and Thunder Bay. Additionally, eight of the 14 regions in Ontario offer Northern or rural experiences. Since 2015, students from the UW have completed close to 600 clinical placements in Northern Ontario and well over 200 in rural parts of the province. The School's PharmD students are provided the opportunity to explore varied populations and experience patient care in a variety of settings.

A decentralized regional rotation model has afforded the UW School of Pharmacy an opportunity to expose students to one of 14 regions in Ontario where they are immersed in that region's interconnected health care community. In exploring the experiences of students within these communities, the School has showcased how delivery of care within and between health settings varies between regions; both in terms of patient populations and the opportunities for care delivery by student pharmacists.

The University of Manitoba's PharmD Experiential Education Program

The University of Manitoba Doctor of Pharmacy (PharmD) program is a second-entry four-year professional program focused on patient care. Recognizing that pharmacists are taking on expanded roles and that the world of pharmacy continues to evolve, the PharmD program offers a broad experience in patient care through experiential placements in hospital and community pharmacies, as well as a rotation in primary care, to ensure that students are ready for practice to their full scope immediately upon graduation.¹⁷³

The PharmD Experiential Education Program is a series of practice-based courses that help students transfer knowledge and skills from the classroom into pharmacy practice. Working with preceptors in patient care clinics, hospitals, community pharmacies and with primary care teams, students develop confidence and build the strong patient-care skills they'll need for careers of their own. Experiential education takes place in Year 2 and Year 4 of the PharmD program and can happen in any part of the province. Each student must undertake a rural experience over the duration of the professional program. The curriculum is designed to ensure that all students in the program complete a primary care rotation which will help meet the demand for pharmacists in this practice area. Each of these clinical rotations is eight weeks in duration, focusing on the provision of patient-centered care in a primary care site, addressing patients' medication-related needs, and takes place during the fourth year of the program.

Innovative and more flexible program design

UNB Step up to Nursing Earn as you Learn Education Pathway LPN to BN Bridging Program

In collaboration with the New Brunswick Community College, Collège communautaire du Nouveau-Brunswick, University of New Brunswick, Université de Moncton, Horizon Health Network, Vitalité Health Network and the New Brunswick Association of Nursing Homes, the Government of New Brunswick has created new pathways in nursing education. These initiatives permit participants currently employed within the health care system to acquire the education and skills required to progress to the next level in their nursing career.

The Step Up to Nursing (SUN) initiative is a workplace-based, wage-supported learning model that offers an opportunity to individuals working in New Brunswick as Personal Support Workers (PSW) or as LPNs to advance in their careers by continuing their nursing education and becoming either an LPN or an RN while continuing to be employed in their positions. Participants continue to work part-time while also studying on a part-time basis. They are paid a full-time wage commensurate with their level of experience and certification level. The provincial government also covers tuition. The Licensed Practical Nurse Bridge (LPNBR) program stream is a 3-year 8-month program for LPNs and leads to the Bachelor of Nursing (BN). The Practical Nurse Program is designed for PSWs to continue to work while completing the LPN Program, with participants working and studying part-time on a two-day/three-day weekly rotation continuously for three years.¹⁷⁴

Aurora College's Licensed Practical Nurse Bridge-In Program: LPN to BSN

Aurora College in Northwest Territories delivers relevant and meaningful education and research rooted in strong connections to Northern land, tradition, community, and people. Its programs are designed to meet the labour market needs of the North.¹⁷⁵

Aurora College's Licensed Practical Nurse Bridge-In Program LPN to BSN is a 45-hour, 3 credit course offered by distance for LPNs. It allows LPNs to build on their previous education and training to continue to advance in the nursing profession. Upon successful completion of the course, participants can transition into the second year of the four-year Bachelor of Science in Nursing Program (BSN) at Aurora College. LPN students may receive credit for some second-year courses, depending on their work experience and previous education through the Recognition of Prior Learning Process for LPN Bridge-In students. Admission to the bridge-in program preference is given to long-term northern residents from Northwest Territories, Yukon and Nunavut.

A wide variety of practical placements include First Nations, Métis, and Inuit communities; small rural hospitals; and community health centres; as well as a territorial hospital and community clinics. This diversity reflects the Canadian context of nursing practice and prepares students for unique contexts in achieving the goal of BSN education. It offers Community and Leadership focused theory and practice courses, and clinical practice sites offer both preceptorships and instructor-led clinical courses. All students have access to acute care placements in medicine/surgery, pediatrics, obstetrics, mental health and community-based nursing.

Not only does this bridge-in program reduce the number of years students must study on a full-time basis to obtain their BSN, but this pathway also reduces the barrier to entry into a BSN program by recognizing and valuing experience and education as an LPN.¹⁷⁶

Since 2012, the program has had 16 LPNs Bridge-In students graduate from the BSN program. In the earlier years, the program accepted one to two students per year, then up to five students every second year; in the past two years it has accepted 10–15 students. There are currently 23 LPN Bridge-In students across years in the BSN program. Interest in the program has grown which provides a great opportunity for LPNs to advance their education while also increasing in territory BSN graduates as a whole.

University of Prince Edward Island's Accelerated Bachelor of Science in Nursing

Students in the Accelerated Bachelor of Science in Nursing Program are able to complete their Bachelor of Science in Nursing (BScN) program in twenty-three months by building on their previous undergraduate university course work.

The Accelerated BScN program is unique in that it recognizes previous course work toward completion of the degree. As a prerequisite for admission, applicants must have already completed 60 credit hours of university undergraduate coursework, including a list of specific pre-nursing, prerequisite courses, that contribute to total credit degree requirements.

Students in the Accelerated BScN program are required to take the same nursing courses and have the same number of clinical hours as students in the four-year BScN program. These students will complete 81 semester hours of nursing specific courses in the accelerated program to fulfill the degree requirements for the BScN. Students enter the program in January each year and the Accelerated BScN program is continuous. There are no breaks in the spring and summer semesters. Accelerated BScN program students as a cohort, take introductory courses together from January to August. Then they merge with the 4-year BScN program stream, from September to April.

From May to program completion, students return to their Accelerated BScN program cohort. Accelerated students complete their BScN degree requirements in December. Once degree requirements have been met, students are eligible to write their NCLEX-RN exam and enter the RN workforce.¹⁷⁷

Red River College Polytechnic's Licensed Practical Nurse to Bachelor of Nursing (BN) Pathway

Red River College Polytechnic's Licensed Practical Nurse to BN Pathway allows LPNs to bridge into the four-year BN Program having received credit for up to one full year of learning. Students attend only 22 months of the 32-month Nursing degree program (equivalent to four academic years) including a senior practicum. Each year of study is 10 months long and includes theory and clinical practice concurrently. The 450-hour senior clinical practicum follows the final year.

As this program is provincially funded, only Manitoba residents are eligible to apply. The program is offered in three locations across the province, including Winnipeg, Portage la Prairie, and Winkler. The Winnipeg Campus offers three separate entry dates beginning in August, November, and March, while the two rural campuses have start dates once every three years. Following successful completion of the Nursing program at any of these locations, students will receive a Bachelor of Nursing (BN) degree from Red River College Polytechnic.¹⁷⁸

Rural or remote

Northern Ontario School of Medicine University's Comprehensive Community Clerkship Program

Northern Ontario School of Medicine University (NOSMU) was purpose built to address the health needs of the people living in Northern Ontario¹⁷⁹. Its Longitudinal Integrated Clerkship Program, known as their Comprehensive Community Clerkship (CCC), offers medical students immersive exposure to training and clinical practice, focused on family medicine, and in northern, rural, Indigenous and Francophone communities. While NOSMU graduates are ready and able to undertake postgraduate training anywhere in Canada, this program is designed to enhance the students' personal and professional development and turn out graduates who can confidently work in northern, rural, or remote communities.

The CCC is a seven-month clerkship offered in Year 3 of the four-year undergraduate medical program. Third year NOSM U students are assigned to small urban or rural Northern communities, in groups ranging from two to eight students per community. The students are “attached” to family practice setting through which they undertake most of their learning. The core curriculum covers seven disciplines: family medicine, emergency medicine, internal medicine, obstetrics and gynecology, pediatrics, psychiatry and surgery.

To prepare students for the CCC, 12 weeks of placements in diverse Northern locales have historically been embedded in the curriculum of Years 1 and 2, providing students’ experience with remote and remote practice and Indigenous communities and culture. Specialty clerkship rotations in Year 4 provide medical students with clinical learning in a “block” format to emergency medicine, internal medicine, obstetrics and gynecology, pediatrics, psychiatry and surgery in either Thunder Bay or Sudbury.

The exposure to living and working in rural and remote communities, to health care delivery environments and the understanding of the skill sets required in rural settings that is provided in the CCC is expected to increase the likelihood that some graduates will choose to live and work in northern, rural, or remote communities after graduation. Indeed, NOSM U data suggests that there is a high “return rate” of learners to their CCC site as future clinicians. Ultimately, this is expected to continue to reduce the shortage of physicians in these communities.¹⁸⁰

Distance learning: distributed learning

University of British Columbia MD Undergraduate Program’s Northern and Rural Pathway to Practice

The Northern and Rural Pathway, one of several pathways to practice offered by University of British Columbia’s (UBC) MD Undergraduate Program,¹⁸¹ was designed for students who are interested in practicing medicine in rural, remote, and northern communities. One of the goals of this pathway is to help meet the need for doctors in rural and remote communities in BC by serving underrepresented communities in these regions.

UBC’s MD Undergraduate Program makes complete undergraduate medical training available at four distributed sites throughout BC, and each site has its own program: the Northern Medical Program, the Southern Medical Program, the Island Medical Program, and the Vancouver Fraser Medical Program. For example, the Northern Medical Program is delivered in partnership with University of Northern British Columbia (UNBC) on their campus in Prince George, at the University Hospital of Northern British Columbia and in communities across the north. Its goal is to train physicians to deliver primary care in BC’s northern, rural, remote, and Indigenous communities, and to serve underrepresented communities in rural, remote, and northern regions across the province. This distributed medical program was the first of its kind in North America and has proven to be a highly effective.¹⁸²

A remote and rural suitability score and panel interview are used to help select students who live and have experience in northern, rural, remote, and Indigenous communities, as connection to community is one of the qualities the program values in its future medical doctors.

University of Calgary and Alberta Health Services' Bachelor of Nursing (BN) Rural Community Degree Program

The University of Calgary and Alberta Health Services' Bachelor of Nursing (BN) Rural Community Degree Program is an Indigenous and rural community pathway to nursing education. It allows residents of rural communities to earn a baccalaureate degree to become a Registered Nurse without leaving their home community. There are multiple program sites in East-Central and Northeastern Alberta, including in Wainwright, Alberta, where the pilot program was launched in September 2021.

Prioritizing local residents, the program uses a blended model of online and in-person learning. University of Calgary delivers the training and Alberta Health Services provides classroom resources, and hands-on clinical learning opportunities at a nearby local health centre.

The purpose of this program is to enhance Alberta's rural nursing workforce capacity. It is hoped that this program will address the chronic shortage of Registered Nurses in these rural and remote areas. The program invites cohorts of 8–9 students per year to enter the program, and the first two cohorts of nursing students will convocate in June 2025.¹⁸³

University of Saskatchewan's Bachelor of Science in Nursing (BSN) Distributed Nursing Education

University of Saskatchewan (USask) College of Nursing has adopted a "Learn where you live" approach to nursing education. In addition to the USask campuses in Saskatoon and Prince Albert, the college has created strategic partnerships with numerous regional colleges to extend distributed undergraduate nursing education to learners across Saskatchewan improving access for rural, remote, and northern communities. By leveraging and augmenting existing post-secondary and health care infrastructure in the province, the college creates opportunity for students in Île-à-la-Crosse, La Ronge, Yorkton and Lloydminster to complete the full BSN degree locally. Distributed nursing students participate in classroom learning through a suite of innovative technologies. Hands-on bedside skills and simulation take place in local nursing procedure labs. Most of the clinical learning hours are completed locally through the Saskatchewan Health Authority and other clinical agencies, enabling students to obtain the entry level competencies to become Registered Nurses in Saskatchewan.

The College of Nursing is currently in the process of expanding the "Learn where you live" approach by adding four new communities for learners to complete their BSN, including North Battleford, Muenster, Weyburn, and Swift Current. The BSN curriculum is approved by the College of Registered Nurses of Saskatchewan and accredited by Canadian Association of Schools of Nursing. It aims to be culturally relevant to people living in these communities and includes Indigenous perspectives of health for all learners. A recently completed study focused on social Return on Investment has illustrated the positive impact the distributed nursing program has created for students, families, patients, and communities.¹⁸⁴

USask College of Nursing also extends the distributed learning approach into graduate level nursing programs. Students can complete their Master of Nursing (MN), Primary Health Care Nurse Practitioner (NP), Post-Graduate Nurse Practitioner Certificate (for students who have already completed a MN), and Doctor of Philosophy in Nursing (PhD) throughout Saskatchewan and across the country using innovative distributed learning approaches. Students in the MN and PhD programs can complete their entire program without ever visiting the USask main campus in Saskatoon. NP students attend one week of residency in Saskatoon, while completing the classroom and clinical components of the 24-month program from their home communities across Canada.

Bachelor of Science in Nursing (Arctic Nursing) Program in Iqaluit, Nunavut: Dalhousie University and the Nunavut Arctic College Partnership

The Bachelor of Science in Nursing (Arctic Nursing) Program is a four-year nursing program that was developed collaboratively by Nunavut Arctic College and Dalhousie University. It is delivered in Iqaluit, Nunavut, and leads to a BScN (Arctic Nursing) from Dalhousie University. The program was developed collaboratively by the two institutions to respond to a need for professional nursing education that is accessible to Inuit students and relevant to health care in Nunavut.

The curriculum emphasizes awareness and respect for Inuit culture. The first three years of the program are weighted towards preparation for nursing in an acute care hospital setting and the fourth year focuses on community health and primary health care, including knowledge and skills required to work in remote communities in Nunavut. Clinical practicums occur in a wide variety of settings.^{185 186}

The University of British Columbia (UBC) Master in Physical Therapy-North (MPT-North) Program

The Master in Physical Therapy-North (MPT-North)¹⁸⁷ is one of the distributed sites of the UBC MPT Program. The MPT-N is located in northern British Columbia at the University of Northern British Columbia Prince George campus. The MPT-North cohort integrates academic and clinical learning with a focus on the needs of northern, rural, and remote communities, and has a goal to increase recruitment and retention of physiotherapists in northern and rural areas of BC.

UBC's MPT Program's fully distributed model of learning allows instructors and students to interact in real time at multiple locations, and all MPT students complete the same curriculum at the same time, regardless of site. However, as the MPT-North cohort aims to graduate Physical Therapists who are committed to enhancing rehabilitation services in northern and rural areas, these students experience a variety of clinical settings within the Northern Health Authority, or sites that are designated as rural, under the supervision of local physiotherapists. To facilitate the recruitment of students with an interest in working in Northern and rural settings, the MPT-North cohort has an additional requirement as part of the admissions process to identify applicants with "lived experiences" in rural communities.¹⁸⁸

Using technology: distance learning

British Columbia Institute of Technology Critical Care and Emergency Nursing Specialty Program Distance Learning

British Columbia Institute of Technology (BCIT) offers a number of Nursing Specialty Advanced Certificate Programs, such as the Critical Care Nursing Specialty Advanced Certificate and Emergency Nursing Specialty Advanced Certificate. These advanced certificate programs are designed for practising Registered Nurses who want critical care or emergency nursing certification, while some courses in the programs are offered to undergraduate nursing student.¹⁸⁹

A key innovative element of these Advanced Certificate Programs is the flexibility they offer through curriculum design and program delivery. Theory courses in these Nursing Specialty programs are delivered fully online. As the programs are offered on a part-time basis, usually taking two and a half years to complete, the programs provide learners with the flexibility to learn at their own pace from their homes while continuing to work full-time.

BCIT's Specialty Nursing programs also value work experience. Nurses can take advantage of BCIT's Prior Learning Assessment & Recognition (PLAR) which provides credit for skills learned outside recognized educational programs, including volunteer work, hobbies, on-the-job experience, or independent study for exemption for particular courses. This allows learners to fast-track their advanced certification education.¹⁹⁰

The Government of Yukon and the University of New Brunswick "Learn Where You Live" virtual LPN to BN Pathway Program

As part of the Government of Yukon's ongoing efforts under the Yukon's Health Human Resources Strategy to recruit, retain, and develop health care professionals in the territory, the Government of Yukon has partnered with the University of New Brunswick (UNB) to offer UNB's "Learn Where You Live" program to licensed practical nurses (LPNs) in the Yukon. This unique pathway program allows LPNs to continue working in the Yukon while pursuing a Bachelor of Nursing degree (BN) through virtual learning.

The Government of Yukon is covering one-third of the costs of tuition fees for all Yukon participants. Upon completion, graduates will qualify to be registered nurses, helping to meet the growing demand for health care professionals in the Yukon.

Students and faculty will use virtual reality simulation scenarios combined with in-person clinical simulation and client care for their clinical learning experiences. This approach blends remote theory courses with virtual simulations, allowing students to further their education while continuing to work and with minimal disruption to their personal lives. This cutting-edge program was developed by UNB. It uses technology to meet students where they are, which makes health care education more accessible to everyone. The first cohort of 17 Yukon licensed practical nurses began the program in September 2024, with a second cohort of up to 20 LPNs set to begin in fall 2025.

McGill University School of Physical and Occupational Therapy (SPOT) use of telehealth, The TeleRehab SPOT

The TeleRehab SPOT was created by the School of Physical and Occupational Therapy at McGill University to provide rehabilitation clinicians (OT, PT and speech-language pathologists) with the most current online health care tools to both empower and improve their virtual practice. The online hub gathers clinical and evidence-informed resources in one place to fill knowledge gaps that are identified by clinicians and researchers in the SPOT community on an ongoing basis. This platform continues to be updated and consists of resources for beginning and improving their telerehabilitation services.

Virtual and online tools have had a major impact on the delivery of health care services. Telehealth practices improve and support accessibility to health care for diverse populations in a variety of regions across the province. Clinicians in both the public and private sectors continue to overcome multilevel challenges as telerehab and hybrid practices evolve.

The TeleRehab SPOT website (<https://www.telerehab-spot.com>) aims to serve health care users from remote and urban regions in both French and English by providing clinicians with current tools and resources in the original language of development. All rehab clinicians, no matter their specialty or geographical location, can benefit from learning more about available telehealth resources.

This initiative is funded by Health Canada and supported by Dialogue McGill at McGill University under the Action Plan for Official Languages—2018–2023: Investing in Our Future. It was undertaken by SPOT leadership with an advisory team during the early stages of the recent COVID-19 pandemic. During this time SPOT integrated tele rehabilitation into the clinical courses for both OT and PT students in order to prepare students for new channels of service delivery in their mandatory student placements.¹⁹¹

Interprofessional education to support team-based models of care

Queen's Weeneebayko Health Education Program and Campus

Queen's University and the Weeneebayko Area Health Authority (WAHA) in Northeastern Ontario are partnering to implement a comprehensive health education program to support Indigenous youth interested in pursuing health professions, with support from the Mastercard Foundation. This initiative includes the development of the Weeneebayko Health Education Campus (WHEC). Located in Moosonee, Ontario, the WHEC will recruit and prepare Indigenous students from local communities for careers in medicine, nursing, physiotherapy, occupational therapy and paramedicine. The new hospital in Moosonee will be well equipped to support learners from these health professions educational programs.

The Integrated Health Campus will provide integrated interprofessional education, with the first two years being common integrated learning years for all programs. Co-created by WAHA and Queen's University, its interprofessional curriculum is designed to break down professional silos and prepare graduates to deliver patient care using team-based approaches. It will also offer a decolonized curriculum grounded on the rights of self-determination, and the right to deliver health care and education by First Nations and for First Nations, with Indigenous ways of knowing woven throughout the program.

Engagement with youth will begin early in their education with resources that will enable them to envision, pursue, and succeed in health profession training. After graduation, a mentorship into practice program will promote graduate retention within local communities. Enrolment could start as early as September 2026 with an ultimate class size of 60 students across the health professions.

Queen's Health Sciences (QHS) is building on its existing relationship with WAHA and youth living in the community through the QHS–WAHA summer program, an intensive summer camp for high school students from the western James Bay coast that launched in 2022. It was created to address the barriers that Indigenous youth from rural communities face in accessing and attaining post-secondary education and training in health sciences and provides students with a vision and pathway for a career in health care.

Memorial University Centre for Collaborative Health Professional Education

The Centre for Collaborative Health Professional Education (CCHPE) at Memorial University in Newfoundland and Labrador is dedicated to enhancing interprofessional education (IPE) for health professions. It aims to achieve this by developing, implementing, and evaluating IPE activities that bring together learners from various health and social care backgrounds, including medicine, nursing, pharmacy, social work, psychology, and other disciplines, to learn with, from, and about each other.¹⁹²

CCHPE maximizes the use of teaching human resources and allows students from different programs and health professionals to be educated together. The activities it sponsors foster teamwork and prepare students to work effectively in interdisciplinary health care teams. For example, the IPE Skills Training Series¹⁹³ is a two-year program that focuses on collaborative processes and their impact on interprofessional team-based health and social care. IPE activities are taught in small interprofessional teams and focus on collaborative skill development such as communication and conflict management in a variety of clinical environments.

The Centre's mission includes reaching practicing health and social care teams to develop opportunities to build interprofessional collaborative practice skills and effect outcomes for patients, clients, and care professionals. Working closely with provincial educational and health stakeholders, CCHPE develops and delivers training programs designed to optimize collaborative practice in Family Care Teams working in Newfoundland and Labrador. Resources and training are made available to Family Care Teams through the Family Care Teams Resource Hub website.

In summary, responses to questions regarding the leading practices and innovations designed to help meet the future demand for health services for Canadians from both the data collection findings and engagement with health professional education leaders generally fell into four main overlapping themes:

- Increased use of technology, simulation learning, and other advances, to allow for more online learning. These would allow programs to mitigate some of the limitations and challenges created by a shortage of preceptors and clinical placement opportunities to some extent and allow for more distance and virtual learning.
- Programs that allow students to benefit from previous learning through bridging programs, and condensed and accelerated programs.
- Increased theoretical and clinical programming in rural and remote locations, satellite campuses, “learn where you live” curriculum designs to allow students living in rural or remote areas to learn in their communities.
- Modernizing curricula to increase culturally safe approaches to learning, to provide more interprofessional learning opportunities, and to adapt curricula to meet ever-changing scopes of practice of health care workers.

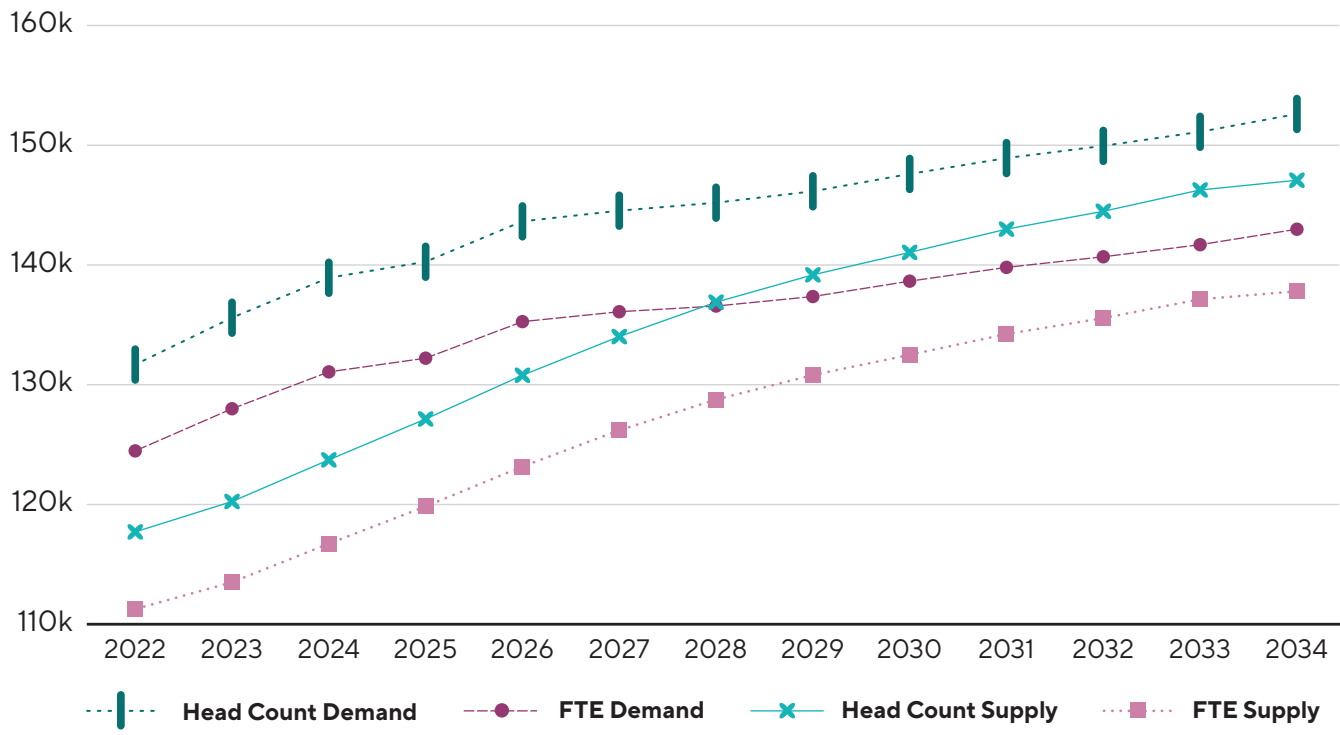
Workforce supply, demand and gap projection results

Base Case Projections

Licensed Practical Nurses

Figure 6 and Table 25 provide the base case supply-demand gap base case projection results for LPNs. Over the projection period there are estimated substantial gaps in head counts and FTEs.

Figure 6. Projected licensed practical nurse workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 25. Projected licensed practical nurse workforce supply and demand, Canada, 2029 and 2034

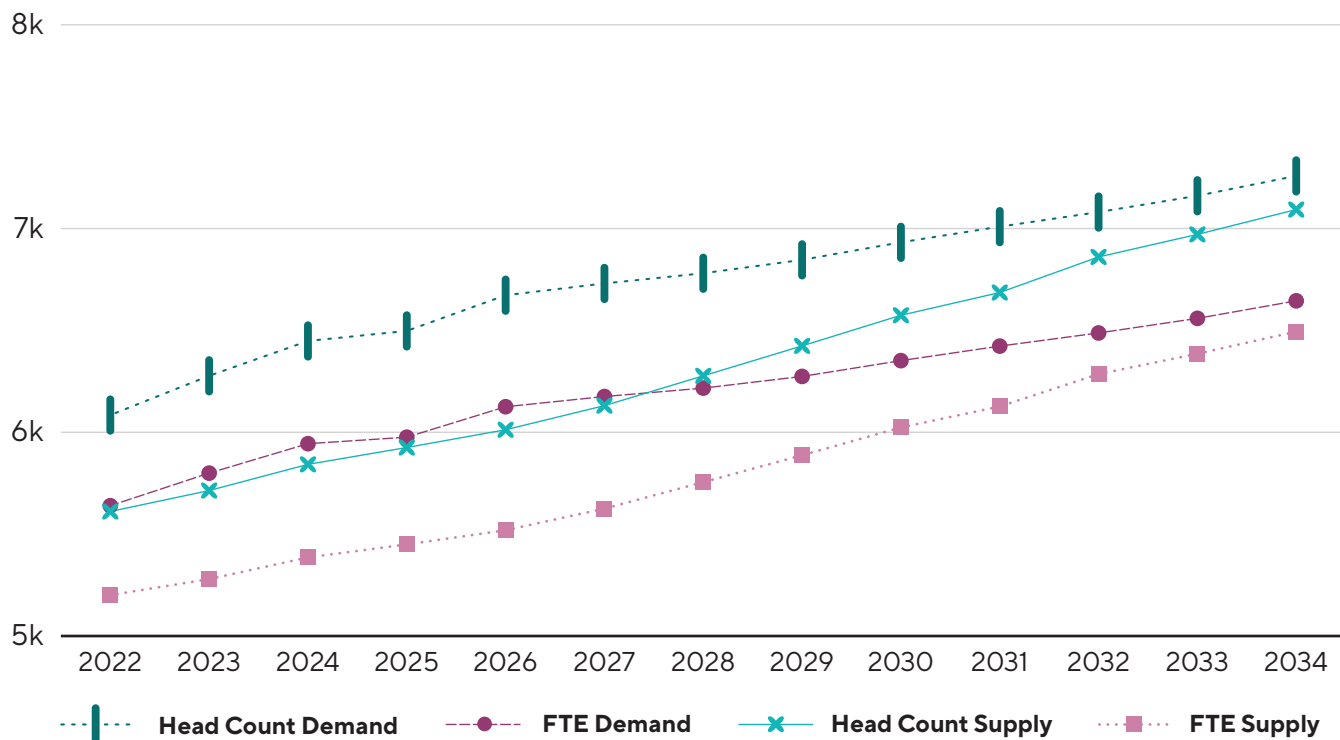
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	139,176 (324)	130,808 (305)	147,076 (324)	137,803 (304)
Demand	146,153 (341)	137,365 (320)	152,609 (336)	142,987 (315)
Gap	6,976 (16)	6,557 (15)	5,533 (12)	5,184 (11)
Rural and remote areas				
Supply	15,840 (210)	14,844 (196)	16,856 (21238)	15,769 (198)
Demand	17,533 (232)	16,430 (217)	18,211 (230)	17,091 (215)
Gap	1,693 (22)	1,587 (21)	1,414 (18)	1,323 (17)
Urban areas				
Supply	123,336 (349)	115,964 (328)	130,220 (348)	122,034 (326)
Demand	128,619 (364)	120,931 (342)	134,339 (359)	125,895 (337)
Gap	5,283 (15)	4,967 (14)	4,119 (11)	3,860 (10)

Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

Registered Psychiatric Nurses

Figure 7 and Table 26 provide the base case supply-demand gap and base case projection results for RPNs. Over the projection period, estimates project modest gaps between supply and demand for both head counts and FTEs. The supply and demand lines start to converge later in the projection period which may reflect increases in supply driven by newly added education and training seats.

Figure 7. Projected registered psychiatric nurse workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 26. Projected registered psychiatric nurse workforce supply, demand and gap, Canada, 2029 and 2034

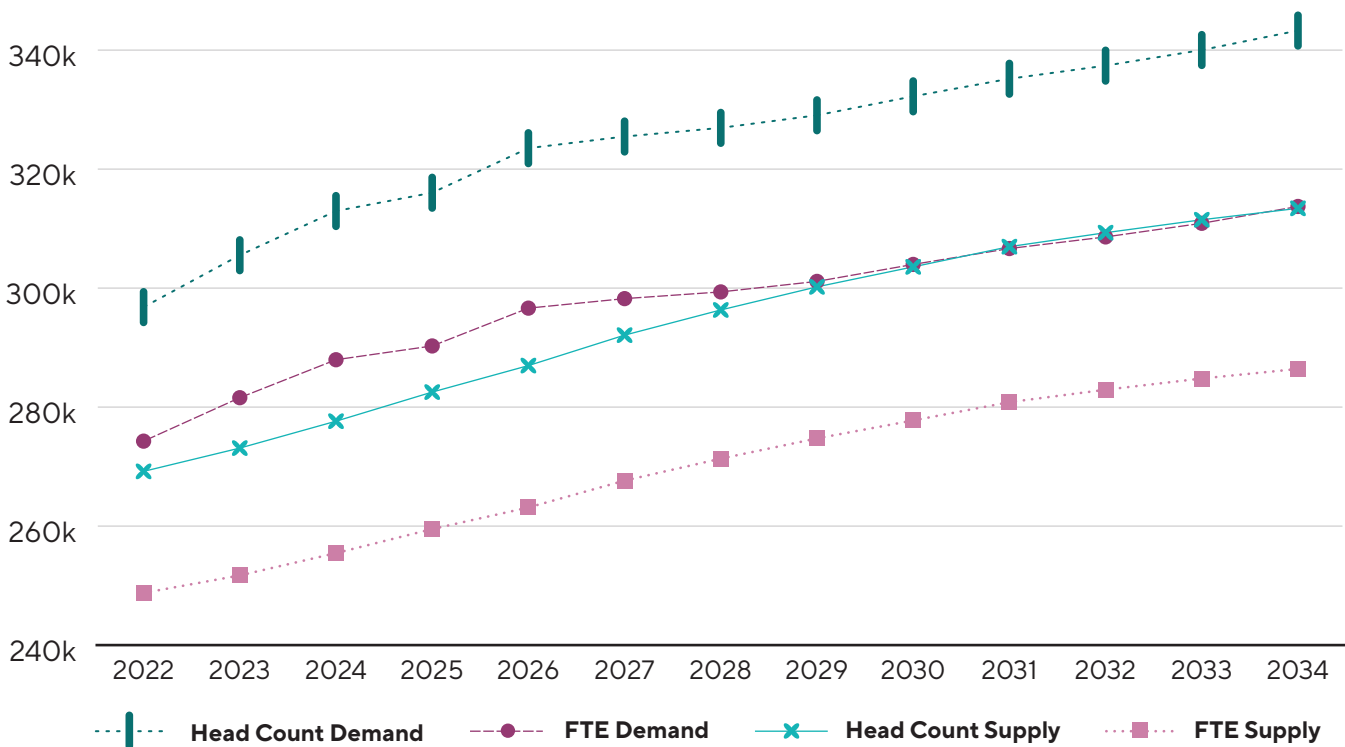
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	6,424 (46)	5,887 (42)	7,093 (47)	6,494 (43)
Demand	6,846 (49)	6,274 (45)	7,258 (48)	6,645 (44)
Gap	422 (3)	387 (3)	165 (1)	151 (1)
Rural and remote areas				
Supply	734 (31)	670 (29)	833 (33)	761 (30)
Demand	826 (35)	754 (32)	874 (35)	798 (32)
Gap	92 (4)	84 (4)	40 (2)	37 (1)
Urban areas				
Supply	5,690 (48)	5,217 (44)	6,260 (49)	5,733 (45)
Demand	6,020 (51)	5,520 (47)	6,385 (50)	5,847 (46)
Gap	331 (3)	303 (3)	125 (1)	114 (1)

Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

Registered Nurses

Figure 8 and Table 27 provide the base case supply-demand gap and base case projection results for registered nurses. Over the projection period, estimates project substantial gaps between supply and demand for both head counts and registered nurse FTEs.

Figure 8. Projected registered nurse workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 27. Projected registered nurse workforce supply, demand and gap, Canada, 2029 and 2034

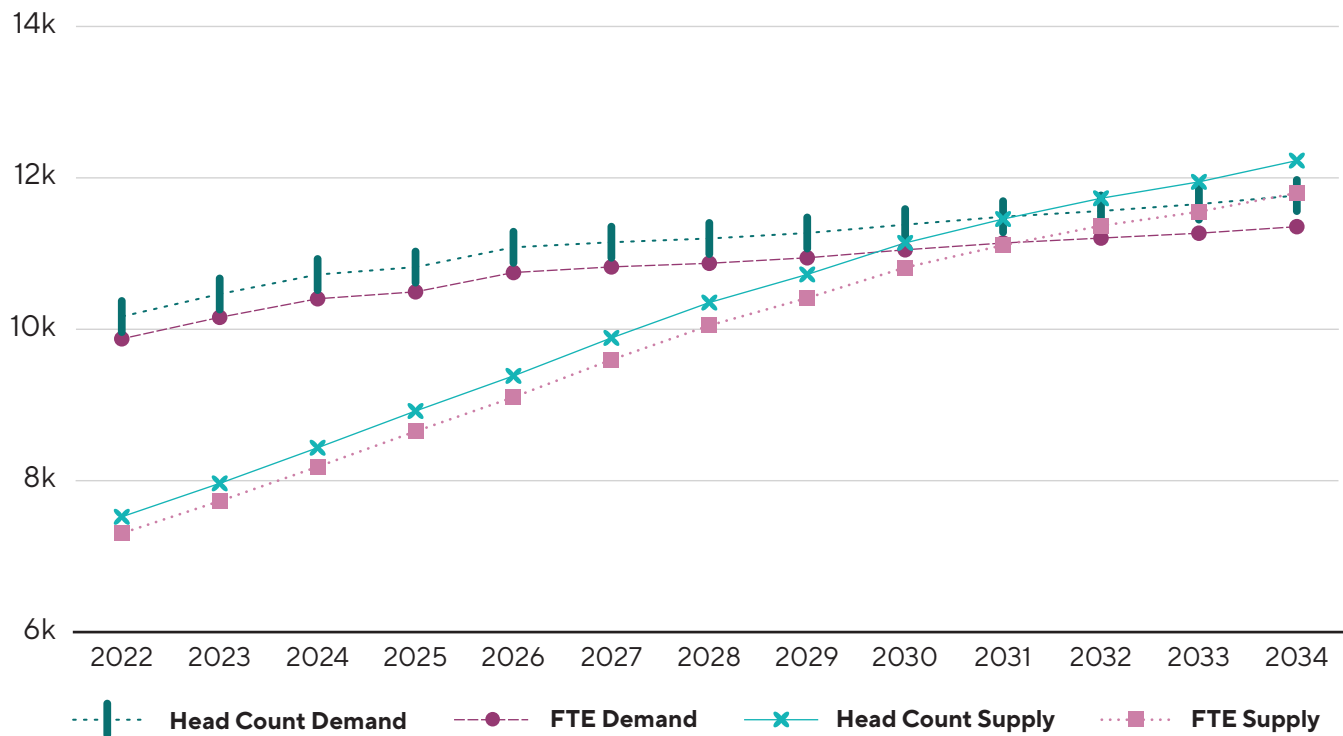
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	300,212 (699)	274,738 (640)	313,410 (690)	286,418 (631)
Demand	329,049 (766)	301,129 (701)	343,287 (756)	313,723 (691)
Gap	28,837 (67)	26,390 (61)	29,878 (66)	27,305 (60)
Rural and remote areas				
Supply	28,925 (382)	26,376 (348)	30,526 (383)	27,829 (349)
Demand	33,121 (437)	30,202 (398)	34,361 (431)	31,326 (393)
Gap	4,196 (55)	3,826 (50)	3,836 (48)	3,497 (44)
Urban areas				
Supply	271,287 (767)	248,363 (702)	282,884 (756)	258,589 (691)
Demand	295,928 (837)	270,922 (766)	308,926 (826)	282,395 (755)
Gap	24,641 (70)	22,559 (64)	26,042 (70)	23,806 (64)

Source: Health Canada analysis.

Nurse Practitioners

Figure 9 and Table 28 present the supply-demand gap projection results for NPs. Overall, there is a projected gap up until 2031 and additional capacity starting in 2032. This reflects a significant recent historical growth in new supply and in new education seats.

Figure 9. Projected nurse practitioner workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 28. Projected nurse practitioner workforce supply, demand and gap, Canada, 2029 and 2034

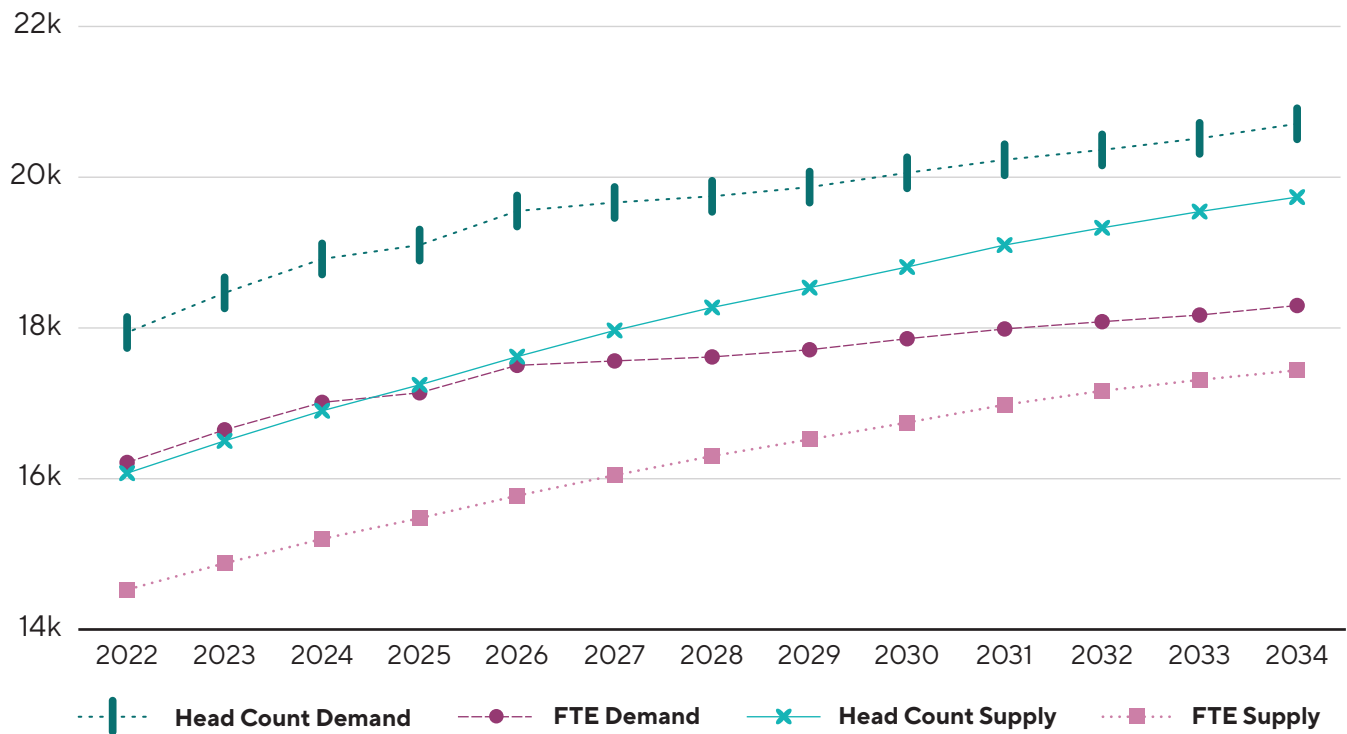
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	10,724 (25)	10,413 (24)	12,228 (27)	11,801 (26)
Demand	11,271 (26)	10,944 (25)	11,767 (26)	11,355 (25)
Gap	547 (1)	531 (1)	-461 (-1)	-445 (-1)
Rural and remote areas				
Supply	1,497 (20)	1,447 (19)	1,694 (21)	1,632 (20)
Demand	1,663 (22)	1,608 (21)	1,727 (22)	1,664 (21)
Gap	167 (2)	161 (2)	34 (0)	32 (0)
Urban areas				
Supply	9,228 (26)	8,966 (25)	10,535 (28)	10,169 (27)
Demand	9,608 (27)	9,335 (26)	10,040 (27)	9,691 (26)
Gap	380 (1)	370 (1)	-495 (-1)	-478 (-1)

Source: Health Canada analysis.

Occupational therapists

Figure 10 and Table 29 provide the base case supply-demand gap and base case projection results for occupational therapists. Over the projection period, estimates project large but declining gaps.

Figure 10. Projected occupational therapist workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 29. Projected occupational therapist workforce supply, demand and gap, Canada, 2029 and 2034

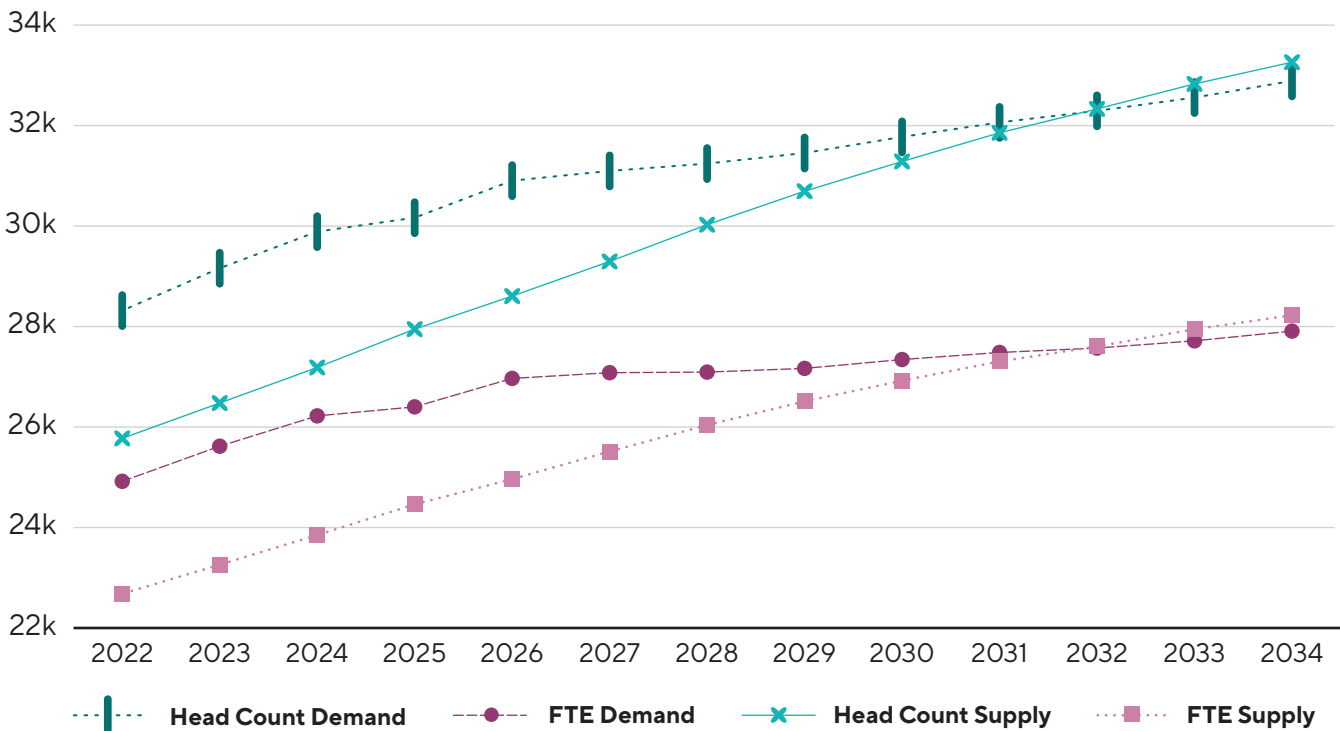
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	18,535 (43)	16,522 (38)	19,736 (43)	17,438 (38)
Demand	19,869 (46)	17,711 (41)	20,709 (46)	18,298 (40)
Gap	1,334 (3)	1,189 (3)	973 (2)	859 (2)
Rural and remote areas				
Supply	1,197 (16)	1,067 (14)	1,268 (16)	1,124 (14)
Demand	1,509 (20)	1,345 (18)	1,559 (20)	1,383 (17)
Gap	312 (4)	278 (4)	292 (4)	259 (3)
Urban areas				
Supply	17,338 (49)	15,455 (44)	18,469 (49)	16,314 (44)
Demand	18,360 (52)	16,366 (46)	19,150 (51)	16,916 (45)
Gap	1,022 (3)	911 (3)	681 (2)	602 (2)

Source: Health Canada analysis.

Physiotherapists

Figure 11 and Table 30 provide a summary of the supply, demand and gap projection results for physiotherapists. Large gaps are anticipated in the first few years of the projection, which start to narrow by 2027, eventually resulting in additional capacity starting in 2032. The increase in supply is due to new education and training seats and high inflows in recent years in certain jurisdictions.

Figure 11. Projected physiotherapist workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 30. Projected physiotherapist workforce supply, demand and gap, Canada, 2029 and 2034

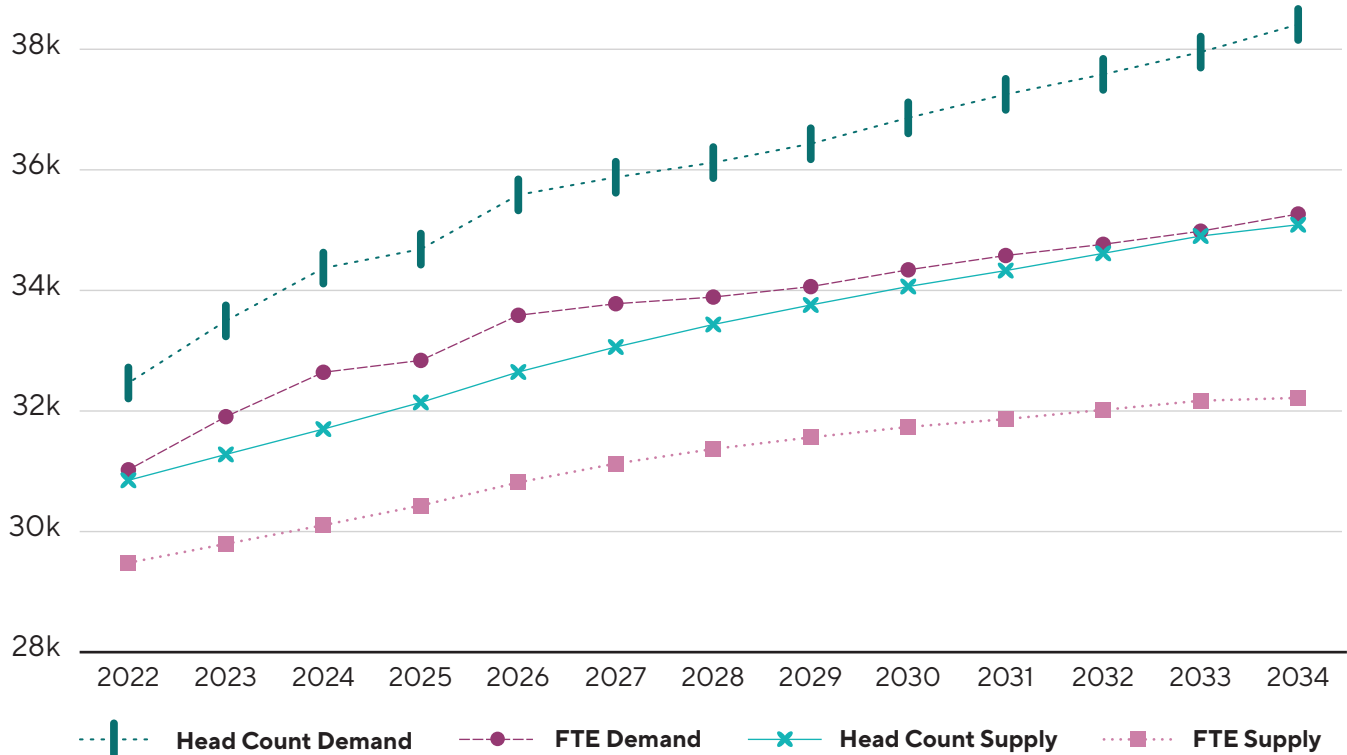
Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	30,694 (72)	26,510 (62)	33,262 (73)	28,225 (62)
Demand	31,455 (73)	27,167 (63)	32,890 (73)	27,910 (62)
Gap	760 (2)	657 (2)	-372 (-1)	-315 (-1)
Rural and remote areas				
Supply	2,157 (29)	1,849 (25)	2,320 (29)	1,958 (25)
Demand	2,488 (33)	2,133 (28)	2,590 (33)	2,185 (28)
Gap	331 (4)	284 (4)	270 (3)	228 (3)
Urban areas				
Supply	28,537 (81)	24,661 (70)	30,942 (83)	26,267 (70)
Demand	28,966 (82)	25,032 (71)	30,300 (81)	25,723 (69)
Gap	429 (1)	371 (1)	-641 (-2)	-545 (-1)

Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

Pharmacists

Figure 12 and Table 31 provide the base case supply-demand gap and base case projection results for pharmacists. Over the projection period, estimates project substantial and increasing gaps.

Figure 12. Projected pharmacist workforce supply and demand, Canada, 2022 to 2034



Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

Table 31. Projected pharmacists workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	33,759 (100)	31,563 (94)	35,089 (98)	32,218 (90)
Demand	36,433 (108)	34,063 (101)	38,411 (107)	35,267 (98)
Gap	2,674 (8)	2,500 (7)	3,322 (9)	3,050 (8)
Rural and remote areas				
Supply	3,519 (61)	3,295 (57)	3,706 (60)	3,415 (55)
Demand	3,887 (67)	3,639 (63)	4,071 (66)	3,751 (61)
Gap	368 (6)	344 (6)	365 (6)	336 (5)
Urban areas				
Supply	30,240 (108)	28,268 (101)	31,383 (105)	28,803 (97)
Demand	32,546 (117)	30,424 (109)	34,340 (115)	31,516 (106)
Gap	2,306 (8)	2,156 (8)	2,956 (10)	2,713 (9)

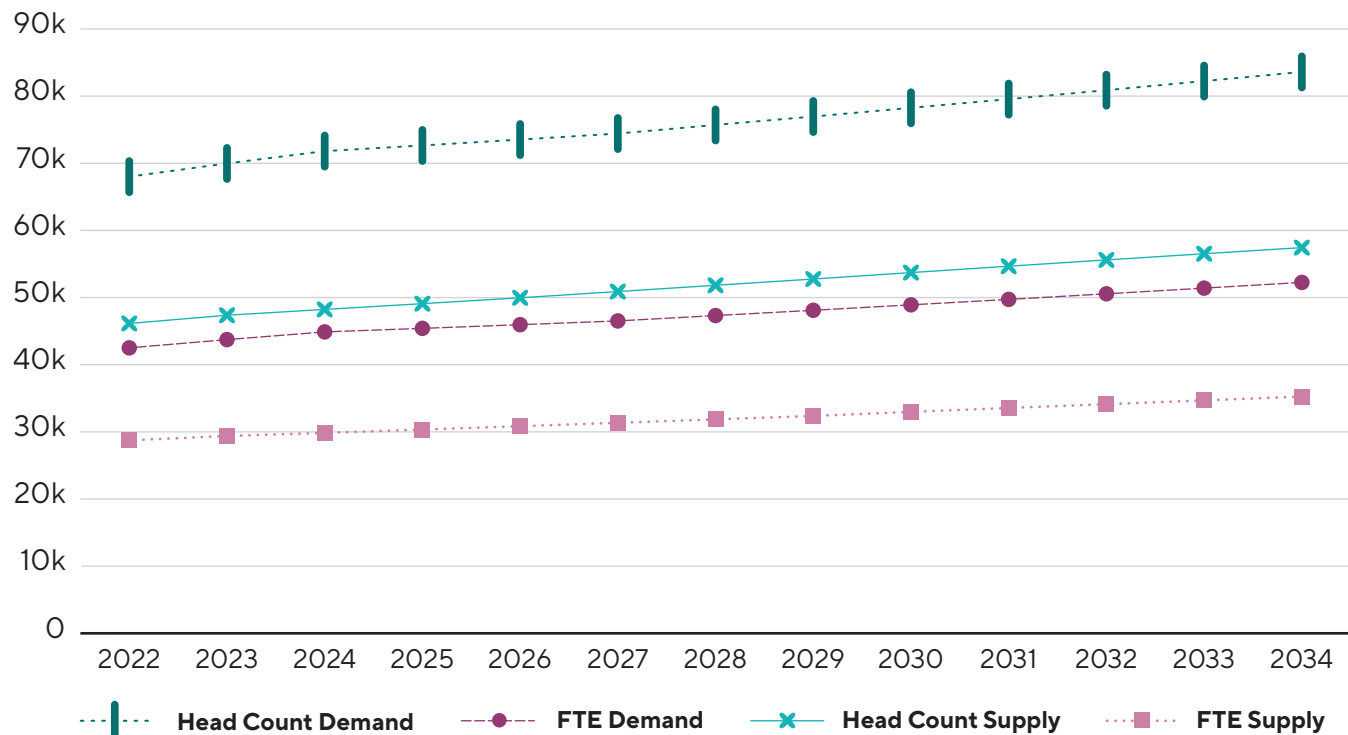
Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

Family physicians

Figures 13(A-C) and Tables 32 (A-C) provide summary results of the base case projections for family physicians across the three service grouping scenarios: A) office-based services, B) comprehensive primary care, and C) all services. Details on the description of these service grouping scenarios and methodology is found in the methodology section.

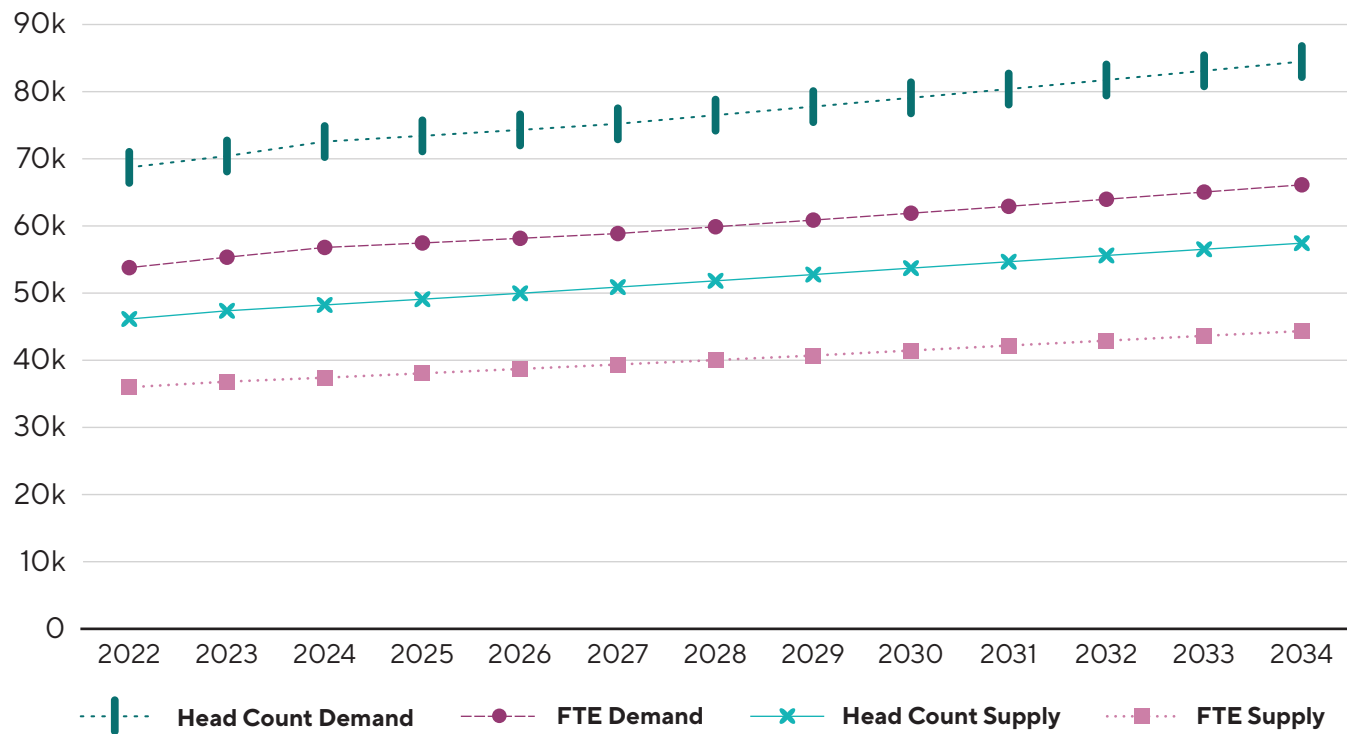
The difference between demand and supply (the gap) is positive, meaning projected supply is not expected to be sufficient, by a large margin, to meet projected demand over the next 10 years. When observing disaggregated results by rural and urban geography, the family physician supply-demand gap per capita is substantially higher in rural areas than in urban areas in terms of head counts and FTEs, and across the service grouping scenarios.

Figure 13A. Projected family physician workforce supply and demand, office-based services, Canada, 2022 to 2034



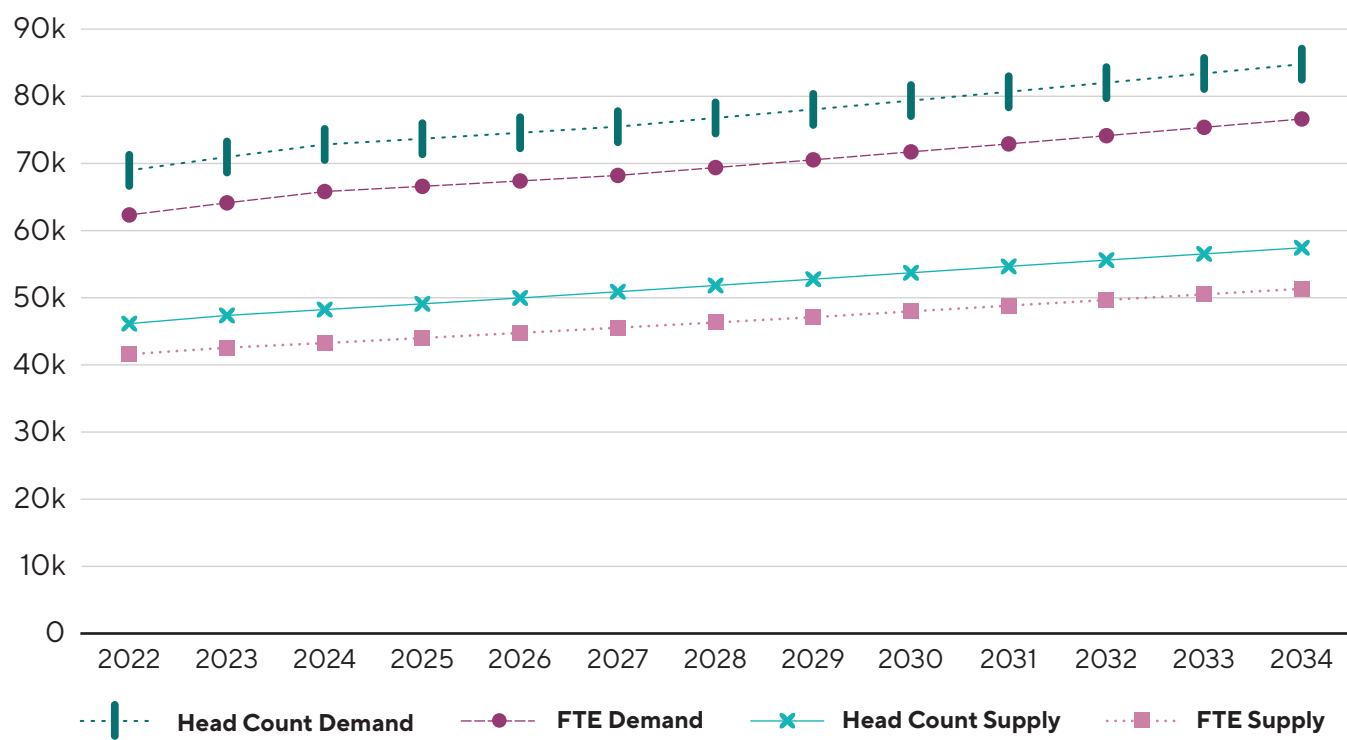
Source: Health Canada analysis.

Figure 13B. Projected family physician workforce supply and demand, comprehensive primary care, Canada, 2022 to 2034



Source: Health Canada analysis.

Figure 13C. Projected family physician workforce supply and demand, all services, Canada, 2022 to 2034



Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 32A. Projected family physician workforce supply, demand and gap, office based services, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	32,374 (74)	57,439 (126)	35,250 (77)
Demand	76,961 (176)	48,106 (110)	83,603 (183)	52,257 (114)
Gap	24,200 (55)	15,732 (36)	26,164 (57)	17,007 (37)
Rural and remote areas				
Supply	6,782 (93)	4,160 (57)	7,327 (96)	4,493 (59)
Demand	13,375 (183)	8,360 (114)	14,374 (189)	8,985 (118)
Gap	6,593 (90)	4,201 (57)	7,047 (93)	4,492 (59)
Urban areas				
Supply	45,979 (126)	28,215 (78)	50,111 (132)	30,756 (81)
Demand	63,586 (175)	39,746 (109)	69,229 (182)	43,273 (114)
Gap	17,607 (48)	11,531 (32)	19,117 (50)	12,517 (33)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 32B. Projected family physician workforce supply, demand and gap, comprehensive primary care, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	40,700 (93)	57,439 (126)	44,349 (97)
Demand	77,773 (178)	60,874 (139)	84,484 (185)	66,126 (145)
Gap	25,012 (57)	20,174 (46)	27,045 (59)	21,777 (48)
Rural and remote areas				
Supply	6,782 (93)	5,226 (71)	7,327 (96)	5,651 (74)
Demand	13,516 (185)	10,579 (145)	14,525 (191)	11,369 (150)
Gap	6,734 (92)	5,353 (73)	7,199 (95)	5,718 (75)
Urban areas				
Supply	45,979 (126)	35,474 (98)	50,111 (132)	38,697 (102)
Demand	64,257 (177)	50,294 (138)	69,959 (184)	54,757 (144)
Gap	18,278 (50)	14,821 (41)	19,847 (52)	16,060 (42)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 32C. Projected family physician workforce supply, demand and gap, all services, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	47,106 (108)	57,439 (126)	51,336 (112)
Demand	78,048 (179)	70,537 (161)	84,783 (186)	76,624 (168)
Gap	25,287 (58)	23,431 (54)	27,344 (60)	25,288 (55)
Rural and remote areas				
Supply	6,782 (93)	6,046 (83)	7,327 (96)	6,541 (86)
Demand	13,564 (185)	12,259 (168)	14,577 (192)	13,174 (173)
Gap	6,782 (93)	6,212 (85)	7,250 (95)	6,633 (87)
Urban areas				
Supply	45,979 (126)	41,059 (113)	50,111 (132)	44,796 (118)
Demand	64,484 (177)	58,279 (160)	70,206 (185)	63,450 (167)
Gap	18,505 (51)	17,220 (47)	20,095 (53)	18,654 (49)

Source: Health Canada analysis.

Base Case Summary

As shown in Table 33, the average annual growth in the projected workforce supply ranges from 1.1% for pharmacists to 4.1% for NPs, from 2022 to 2034.

Table 33. Average growth rates of the workforce supply projections by provider type, Canada

Health occupation	Average annual growth rate (2022 to 2034)
Licensed Practical Nurse*	1.9%
Registered Psychiatric Nurse*	2.0%
Registered Nurse	1.3%
Nurse Practitioner	4.1%
Occupational therapist	1.7%
Physiotherapist	2.1%
Pharmacist*	1.1%
Family physician	1.8%

Notes: *Licensed Practical Nurses in Nunavut, Registered Psychiatric Nurses in Yukon, and Pharmacists in Quebec, Nunavut, and Yukon were excluded from the analysis due to data limitations.

Overall, substantial supply-demand gaps are projected for most of the professions. They are most prominent and growing for family physicians, pharmacists, and RNs. NPs and physiotherapists are the only in-scope professions that are anticipated to have additional capacity by the end of the projection period. The increase in NP supply is in part driven by the substantial increase in educational and training seats that have been added across the country in recent years and those which are planned for future years. This will lead to a substantial growth in the supply of NPs in certain jurisdictions. For physiotherapists, the projections model uses historical inflows which have recently been higher than outflows based on the workforce data out of CIHI, resulting in positive net new workforce supply values that eventually generate additional capacity starting in 2032.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 34 provides the trends in the supply-demand gap for each health profession. As described below, the gaps are projected to increase over the 10-year study period for registered nurses, pharmacists and family physicians. Decreases are projected for LPNs, RPNs, NPs, occupational therapists and physiotherapists.

Table 34. Base case workforce supply-demand gap, head counts, by profession, Canada, 2022–2034

Health professions								
Year	LPN	RPN	RN	NP	OT	PT	PH	FP
2022	13,976	473	27,608	2,646	1,866	2,543	1,614	22,823
2023	15,350	563	32,414	2,501	1,964	2,684	2,215	23,596
2024	15,207	606	35,326	2,288	2,014	2,704	2,671	24,591
2025	13,132	572	33,506	1,901	1,855	2,218	2,542	24,586
2026	12,855	660	36,542	1,698	1,932	2,298	2,938	24,600
2027	10,514	600	33,385	1,264	1,698	1,802	2,816	24,583
2028	8,306	504	30,605	846	1,475	1,216	2,685	24,946
2029	6,976	422	28,837	547	1,334	760	2,674	25,287
2030	6,553	358	28,662	241	1,250	489	2,798	25,642
2031	5,934	323	28,221	30	1,132	208	2,923	26,005
2032	5,460	220	28,078	-168	1,033	-37	2,969	26,422
2033	4,858	190	28,530	-293	971	-271	3,050	26,872
2034	5,533	165	29,878	-461	973	-372	3,322	27,344

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. Source: Health Canada analysis using CIHI's PRPT with adjustments and Health Canada's pan-Canadian Health Workforce Projections Model. Family physician projection gaps are based on the scenario that is inclusive of all services provided by family physicians in Canada, which generated the largest gaps across all service grouping scenarios.

Table 35 brings together the supply, gap and graduates for 2022, the most recent year for which graduate data is available. The data highlights the significant discrepancies that currently exist between the size of the gap and the number of graduates per year for many health professions.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 35. Base case workforce supply, supply-demand gap, and graduates, head counts, by profession, Canada, 2022

Profession	LPN	RPN	RN	NP	OT	PT	PH	FP
Supply	117,710	5,611	269,200	7,523	16,074	25,774	30,850	46,145
Gap	13,976	473	27,608	2,646	1,866	2,543	1,614	22,823
Graduates	6,295	336	8,992	550	873	770	1,217	1,362

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. Source: Health Canada analysis using CIHI's PRPT with adjustments and Health Canada's pan-Canadian Health Workforce Projections Model. Family physician projection gaps are based on the scenario that is inclusive of all services provided by family physicians in Canada, which generated the largest gaps across all service grouping scenarios. The number of graduates is based on the 2021-22 academic year, as reported in Tables 5-11 and Table 15.

Table 36. Base case workforce supply-demand gap as head counts per 1,000 workforce supply, by profession, overall, rural and remote and urban geographic area, Canada, 2029 and 2034

Geographic area	LPN	RPN	RN	NP	OT	PT	PH	FP
Year 2022								
Overall	119	84	103	352	116	99	52	495
Rural and remote areas	171	126	179	368	329	216	92	1,089
Urban areas	112	79	95	349	102	90	48	406
Year 2029								
Overall	50	66	96	51	72	25	79	479
Rural and remote areas	107	125	145	111	261	153	105	1,000
Urban areas	43	58	91	41	59	15	76	402
Year 2034								
Overall	38	23	95	-38	49	-11	95	476
Rural and remote areas	84	49	126	19	229	116	98	989
Urban areas	32	20	92	-47	37	-21	94	401

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. The FP gap results reflect the all services scenario of the base case analysis.

Table 36 expresses the estimated supply-demand gaps in 2022, 2029 and 2034 as a head counts per 1,000 workforce supply by profession. This allows for a different type of comparison that reflects the size of each profession in a given year.

Scenario analyses

Larger future populations

Under this scenario, a larger future population is considered. Based on a high-growth population scenario published by Statistics Canada in June 2024, the analysis assumes larger populations over the 10-year projection period compared to the base case. According to Statistics Canada, the population in high-growth projection is 3% higher than medium-growth scenario in 2029 and 6% higher in 2034.

Tables 37.1 through 37.8 show the supply-demand gap results of this scenario for each of the health professions. Across all scenarios, growth in the population has the largest impact on the estimated supply-demand head count gap. Overall, it results in the below head count gap increases by 2029 and 2034, compared to the base case:

- LPNs: +54.8% by 2029 and +148.0% by 2034
- RPNs: +45.0% by 2029 and +252.7% by 2034
- RNs: +29.6% by 2029 and +61.2 by 2034
- NPs: +54.8% by 2029 and +139.0% by 2034
- Occupational therapists: +38.5% by 2029 and +112.7% by 2034
- Physiotherapists: +109.2% by 2029 and +478.2% by 2034
- Pharmacists: +36.6% by 2029 and +64.3% by 2034
- Family physicians: +8.2% by 2029 and +15.0% by 2034

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.1. Larger populations—projected licensed practical nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	139,176 (315)	130,808 (296)	147,076 (306)	137,803 (287)
Demand	149,973 (339)	140,955 (319)	160,796 (335)	150,658 (313)
Gap	10,796 (24)	10,147 (23)	13,720 (29)	12,855 (27)
Rural and remote areas				
Supply	15,840 (203)	14,844 (191)	16,856 (200)	15,769 (187)
Demand	17,967 (231)	16,837 (216)	19,211 (228)	17,971 (214)
Gap	2,127 (27)	1,993 (26)	2,354 (28)	2,202 (26)
Urban areas				
Supply	123,336 (338)	115,964 (318)	130,220 (328)	122,034 (308)
Demand	132,006 (362)	124,115 (340)	141,585 (357)	132,686 (335)
Gap	8,669 (24)	8,151 (22)	11,366 (29)	10,651 (27)

Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.2. Larger populations—projected registered psychiatric nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	6,424 (44)	5,887 (40)	7,093 (44)	6,494 (40)
Demand	7,036 (48)	6,448 (44)	7,675 (48)	7,027 (44)
Gap	612 (4)	561 (4)	582 (4)	533 (3)
Rural and remote areas				
Supply	734 (30)	670 (28)	833 (31)	761 (28)
Demand	847 (35)	773 (32)	921 (34)	841 (31)
Gap	113 (5)	103 (4)	87 (3)	80 (3)
Urban areas				
Supply	5,690 (47)	5,217 (43)	6,260 (47)	5,733 (43)
Demand	6,190 (51)	5,675 (47)	6,755 (50)	6,186 (46)
Gap	500 (4)	458 (4)	495 (4)	453 (3)

Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.3. Larger populations—projected registered nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	300,212 (678)	274,738 (620)	313,410 (651)	286,418 (595)
Demand	337,580 (762)	308,936 (698)	361,560 (751)	330,422 (687)
Gap	37,368 (84)	34,197 (77)	48,150 (100)	44,004 (91)
Rural and remote areas				
Supply	28,925 (370)	26,376 (338)	30,526 (362)	27,829 (330)
Demand	33,933 (434)	30,942 (396)	36,103 (428)	32,914 (390)
Gap	5,008 (64)	4,567 (58)	5,577 (66)	5,085 (60)
Urban areas				
Supply	271,287 (744)	248,363 (681)	282,884 (713)	258,589 (652)
Demand	303,647 (832)	277,988 (762)	325,457 (820)	297,506 (750)
Gap	32,360 (89)	29,626 (81)	42,573 (107)	38,917 (98)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.4. Larger populations—projected nurse practitioner workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	10,724 (25)	10,413 (24)	12,228 (27)	11,801 (26)
Demand	11,571 (26)	11,235 (25)	12,409 (26)	11,975 (25)
Gap	847 (2)	822 (2)	180 (0)	174 (0)
Rural and remote areas				
Supply	1,497 (20)	1,447 (19)	1,694 (21)	1,632 (20)
Demand	1,706 (22)	1,649 (21)	1,818 (22)	1,752 (21)
Gap	209 (3)	202 (3)	124 (1)	120 (1)
Urban areas				
Supply	9,228 (26)	8,966 (25)	10,535 (28)	10,169 (27)
Demand	9,865 (27)	9,585 (26)	10,560 (27)	10,223 (26)
Gap	637 (2)	619 (2)	56 (0)	54 (0)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.5. Larger populations—projected occupational therapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	18,535 (42)	16,522 (37)	19,736 (41)	17,438 (36)
Demand	20,383 (46)	18,170 (41)	21,806 (45)	19,268 (40)
Gap	1,848 (4)	1,648 (4)	2,070 (4)	1,829 (4)
Rural and remote areas				
Supply	1,197 (15)	1,067 (14)	1,268 (15)	1,124 (13)
Demand	1,545 (20)	1,377 (18)	1,636 (19)	1,451 (17)
Gap	348 (4)	310 (4)	368 (4)	327 (4)
Urban areas				
Supply	17,338 (48)	15,455 (42)	18,469 (47)	16,314 (41)
Demand	18,838 (52)	16,792 (46)	20,170 (51)	17,818 (45)
Gap	1,501 (4)	1,338 (4)	1,702 (4)	1,503 (4)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.6. Larger populations—projected physiotherapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	30,694 (69)	26,510 (60)	33,262 (69)	28,225 (59)
Demand	32,284 (73)	27,884 (63)	34,668 (72)	29,419 (61)
Gap	1,590 (4)	1,373 (3)	1,407 (3)	1,194 (2)
Rural and remote areas				
Supply	2,157 (28)	1,849 (24)	2,320 (28)	1,958 (23)
Demand	2,551 (33)	2,186 (28)	2,723 (32)	2,298 (27)
Gap	394 (5)	337 (4)	403 (5)	340 (4)
Urban areas				
Supply	28,537 (78)	24,661 (68)	30,942 (78)	26,267 (66)
Demand	29,733 (82)	25,695 (71)	31,945 (81)	27,119 (68)
Gap	1,197 (3)	1,034 (3)	1,004 (3)	852 (2)

Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.7. Larger populations—projected pharmacists workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	33,759 (97)	31,563 (91)	35,089 (92)	32,218 (84)
Demand	37,411 (108)	34,978 (101)	40,548 (106)	37,230 (98)
Gap	3,653 (11)	3,415 (10)	5,459 (14)	5,012 (13)
Rural and remote areas				
Supply	3,519 (59)	3,295 (55)	3,706 (57)	3,415 (52)
Demand	3,984 (67)	3,730 (62)	4,285 (66)	3,947 (61)
Gap	465 (8)	435 (7)	578 (9)	533 (8)
Urban areas				
Supply	30,240 (105)	28,268 (98)	31,383 (99)	28,803 (91)
Demand	33,428 (116)	31,248 (109)	36,264 (115)	33,282 (105)
Gap	3,188 (11)	2,980 (10)	4,881 (15)	4,479 (14)

Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 37.8. Larger populations—projected family physician workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	47,106 (108)	57,439 (126)	51,336 (112)
Demand	80,127 (183)	72,416 (166)	88,879 (195)	80,326 (176)
Gap	27,366 (63)	25,310 (58)	31,440 (69)	28,990 (63)
Rural and remote areas				
Supply	6,782 (93)	6,046 (83)	7,327 (96)	6,541 (86)
Demand	13,911 (190)	12,572 (172)	15,254 (201)	13,786 (181)
Gap	7,129 (97)	6,526 (89)	7,927 (104)	7,245 (95)
Urban areas				
Supply	45,979 (126)	41,059 (113)	50,111 (132)	44,796 (118)
Demand	66,216 (182)	59,844 (164)	73,625 (193)	66,540 (175)
Gap	20,237 (56)	18,785 (52)	23,514 (62)	21,744 (57)

Source: Health Canada analysis. Family physician projections are based on the scenario that is inclusive of all services provided by family physicians in Canada.

Increase in disease prevalence over time

In this scenario, it is assumed that the prevalence of key chronic conditions could increase over the 10-year projection period, resulting in an increase in demand for services. For this scenario, disease prevalence is projected to increase by 2.5% in Canada by 2034.

Tables 38.1 through 38.8 show the supply-demand gap results of this scenario for each of the health professions. Increased disease prevalence is projected to increase the supply-demand gap compared to the base case. Overall, it results in the below head count gap increases by 2029 and 2034, compared to the base case:

- LPNs: +28.8% by 2029 and +69.6% by 2034
- RPNs: +22.5% by 2029 and +112.1% by 2034
- RNs: +15.7% by 2029 and +28.9% by 2034
- NPs: +28.2% by 2029 and +63.8% by 2034
- Occupational therapists: +20.5% by 2029 and +53.8% by 2034
- Physiotherapists: +57.1% by 2029 and +223.4% by 2034
- Pharmacists: +18.8% by 2029 and +29.3% by 2034
- Family physicians: +4.1% by 2029 and +7.5% by 2034

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 38.1. Increased disease prevalence—projected licensed practical nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	139,176 (324)	130,808 (305)	147,076 (324)	137,803 (304)
Demand	148,163 (345)	139,254 (325)	156,459 (345)	146,595 (323)
Gap	8,987 (21)	8,446 (20)	9,383 (21)	8,792 (19)
Rural and remote areas				
Supply	15,840 (210)	14,844 (196)	16,856 (212)	15,769 (198)
Demand	17,773 (235)	16,655 (220)	18,729 (235)	17,520 (220)
Gap	1,933 (26)	1,812 (24)	1,872 (24)	1,752 (22)
Urban areas				
Supply	123,336 (349)	115,964 (328)	130,220 (348)	122,034 (326)
Demand	130,390 (369)	122,596 (347)	137,731 (368)	129,073 (345)
Gap	7,054 (20)	6,632 (19)	7,511 (20)	7,039 (19)

Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

Table 38.2. Increased disease prevalence—projected registered psychiatric nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	6,424 (46)	5,887 (42)	7,093 (47)	6,494 (43)
Demand	6,941 (49)	6,361 (45)	7,443 (49)	6,814 (45)
Gap	517 (4)	474 (3)	350 (2)	320 (2)
Rural and remote areas				
Supply	734 (31)	670 (29)	833 (33)	761 (30)
Demand	837 (36)	764 (33)	896 (36)	818 (32)
Gap	103 (4)	94 (4)	63 (2)	57 (2)
Urban areas				
Supply	5,690 (48)	5,217 (44)	6,260 (49)	5,733 (45)
Demand	6,104 (52)	5,597 (48)	6,547 (52)	5,996 (47)
Gap	414 (4)	380 (3)	287 (2)	263 (2)

Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 38.3. Increased disease prevalence—projected registered nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	300,212 (699)	274,738 (640)	313,410 (690)	286,418 (631)
Demand	333,562 (776)	305,258 (711)	351,923 (775)	321,615 (708)
Gap	33,350 (78)	30,520 (71)	38,513 (85)	35,197 (78)
Rural and remote areas				
Supply	28,925 (382)	26,376 (348)	30,526 (383)	27,829 (349)
Demand	33,374 (443)	30,614 (404)	35,223 (441)	32,111 (402)
Gap	4,648 (61)	4,239 (56)	4,697 (59)	4,282 (54)
Urban areas				
Supply	271,287 (767)	248,363 (702)	282,884 (756)	258,589 (691)
Demand	299,988 (848)	274,639 (777)	316,700 (846)	289,502 (774)
Gap	28,701 (81)	26,276 (74)	33,817 (90)	30,912 (83)

Source: Health Canada analysis.

Table 38.4. Increased disease prevalence—projected nurse practitioner workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	10,724 (25)	10,413 (24)	12,228 (27)	11,801 (26)
Demand	11,425 (27)	11,093 (26)	12,061 (27)	11,640 (26)
Gap	701 (2)	681 (2)	-167 (-0)	-161 (-0)
Rural and remote areas				
Supply	1,497 (20)	1,447 (19)	1,694 (21)	1,632 (20)
Demand	1,686 (22)	1,630 (21)	1,770 (22)	1,705 (21)
Gap	189 (3)	183 (2)	76 (1)	74 (1)
Urban areas				
Supply	9,228 (26)	8,966 (25)	10,535 (28)	10,169 (27)
Demand	9,739 (28)	9,463 (27)	10,291 (27)	9,934 (27)
Gap	512 (1)	497 (1)	-243 (-1)	-235 (-1)

Source: Health Canada analysis.

Table 38.5. Increased disease prevalence—projected occupational therapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	18,535 (43)	16,522 (38)	19,736 (43)	17,438 (38)
Demand	20,142 (47)	17,955 (42)	21,232 (47)	18,760 (41)
Gap	1,607 (4)	1,433 (3)	1,496 (3)	1,321 (3)
Rural and remote areas				
Supply	1,197 (16)	1,067 (14)	1,268 (16)	1,124 (14)
Demand	1,530 (20)	1,364 (18)	1,598 (20)	1,417 (18)
Gap	332 (4)	296 (4)	331 (4)	293 (4)
Urban areas				
Supply	17,338 (49)	15,455 (44)	18,469 (49)	16,314 (44)
Demand	18,613 (53)	16,591 (47)	19,633 (52)	17,343 (46)
Gap	1,275 (4)	1,137 (3)	1,165 (3)	1,029 (3)

Source: Health Canada analysis.

Table 38.6. Increased disease prevalence—projected physiotherapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	30,694 (72)	26,510 (62)	33,262 (73)	28,225 (62)
Demand	31,888 (74)	27,541 (64)	33,721 (74)	28,615 (63)
Gap	1,194 (3)	1,031 (2)	459 (1)	390 (1)
Rural and remote areas				
Supply	2,157 (29)	1,849 (25)	2,320 (29)	1,958 (25)
Demand	2,523 (33)	2,162 (29)	2,655 (33)	2,240 (28)
Gap	365 (5)	313 (4)	335 (4)	283 (4)
Urban areas				
Supply	28,537 (81)	24,661 (70)	30,942 (83)	26,267 (70)
Demand	29,365 (83)	25,377 (72)	31,066 (83)	26,373 (71)
Gap	828 (2)	716 (2)	124 (0)	105 (0)

Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

Table 38.7. Increased disease prevalence—projected pharmacist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	33,759 (100)	31,563 (94)	35,089 (98)	32,218 (90)
Demand	36,936 (110)	34,533 (103)	39,383 (110)	36,160 (101)
Gap	3,177 (9)	2,970 (9)	4,294 (12)	3,943 (11)
Rural and remote areas				
Supply	3,519 (61)	3,295 (57)	3,706 (60)	3,415 (55)
Demand	3,940 (68)	3,690 (64)	4,174 (68)	3,846 (63)
Gap	421 (7)	394 (7)	468 (8)	431 (7)
Urban areas				
Supply	30,240 (108)	28,268 (101)	31,383 (105)	28,803 (97)
Demand	32,995 (118)	30,844 (111)	35,209 (118)	32,315 (109)
Gap	2,756 (10)	2,576 (9)	3,826 (13)	3,512 (12)

Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

Table 38.8. Increased disease prevalence—projected family physician workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	47,106 (108)	57,439 (126)	51,336 (112)
Demand	79,090 (181)	71,479 (164)	86,846 (190)	78,488 (172)
Gap	26,329 (60)	24,373 (56)	29,407 (64)	27,152 (59)
Rural and remote areas				
Supply	6,782 (93)	6,046 (83)	7,327 (96)	6,541 (86)
Demand	13,740 (188)	12,418 (170)	14,922 (196)	13,486 (177)
Gap	6,958 (95)	6,372 (87)	7,595 (100)	6,945 (91)
Urban areas				
Supply	45,979 (126)	41,059 (113)	50,111 (132)	44,796 (118)
Demand	65,350 (180)	59,061 (162)	71,924 (189)	65,002 (171)
Gap	19,371 (53)	18,003 (49)	21,812 (57)	20,206 (53)

Source: Health Canada analysis. Family physician projections are based on the scenario that is inclusive of all services provided by family physicians in Canada.

Greater potential attachment in primary care to nurse practitioners and lower potential attachment in primary care to family physicians

In this scenario, it was assumed that NPs could attach to more of the population in primary care. In the context of this analysis, attachment does not refer to actual attachment but potential to attach or to meet unmet needs in the population. This would effectively increase demand for NPs in primary care. The scenario considers an attachment rate to NPs at 30% in the provinces and 50% in the Territories. It should be noted that the rates used in this scenario are for demonstration purposes and is not a proposition or endorsement of a specific model of primary care delivery, organization or governance.

For family physicians, the first scenario reflects alignment with the nurse practitioner base case analysis, that is, family physicians could attach to 80% of the unattached population in the provinces and 60% in the territories, while NPs could attach to 20% in the provinces and 40% in the territories. The second scenario aligns with the scenario analysis for NPs; family physicians could attach to 70% of the population in the provinces and 50% in the Territories.

Table 39.1 show the supply-demand gap results for NPs under the 70% attachment to NPs scenario. Tables 39.2 and 39.3 show the supply-demand gap results for family physicians for the scenario with 80% and 70% attachment to family physicians in the provinces, respectively, and 40% and 50% attachment to family physicians in the territories, respectively.

The results show an increase in the supply-demand head count gap for NPs compared to the base case analysis by +115.9% (2.2-times higher) overall by 2029 and +143.0% (2.4-times higher) overall by 2034. The results of the scenario with 80% in provinces and 60% in territories attachment to family physicians show a decrease in the supply-demand head count gap for family physicians compared to the base case by -8.1% overall by 2029 and -8.0% overall by 2034. The results of the scenario with 70% in provinces and 50% in territories attachment to family physicians show a decrease in the supply-demand head count gap for family physicians compared to the base case by -13.3% overall by 2029 and -19.4% overall by 2034.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 39.1. Higher attachment to nurse practitioners in primary care—projected nurse practitioner workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	10,724 (25)	10,413 (24)	12,228 (27)	11,801 (26)
Demand	11,906 (28)	11,560 (27)	12,436 (27)	11,992 (26)
Gap	1181 (3)	1147 (3)	198 (0)	191 (0)
Rural and remote areas				
Supply	1,497 (20)	1,447 (19)	1,694 (21)	1,632 (20)
Demand	1,762 (23)	1,704 (22)	1,829 (23)	1,762 (22)
Gap	265 (3)	257 (3)	135 (2)	130 (2)
Urban areas				
Supply	9,228 (26)	8,966 (25)	10,535 (28)	10,169 (27)
Demand	10,144 (29)	9,855 (28)	10,597 (28)	10,229 (27)
Gap	916 (3)	890 (3)	63 (0)	60 (0)

Source: Health Canada analysis. Assumes 30% unattached in primary care population can be attached to NPs in the provinces, and 50% in the Territories.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 39.2. Lower attachment to family physicians in primary care (80% in provinces, 60% in territories)—projected family physician workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	47,106 (108)	57,439 (126)	51,336 (112)
Demand	76,003 (174)	68,689 (157)	82,594 (181)	74,646 (164)
Gap	23,242 (53)	21,583 (49)	25,155 (55)	23,310 (51)
Rural and remote areas				
Supply	6,782 (93)	6,046 (83)	7,327 (96)	6,541 (86)
Demand	13,179 (180)	11,911 (163)	14,169 (186)	12,806 (168)
Gap	6,397 (87)	5,865 (80)	6,843 (90)	6,265 (82)
Urban areas				
Supply	45,979 (126)	41,059 (113)	50,111 (132)	44,796 (118)
Demand	62,824 (173)	56,779 (156)	68,425 (180)	61,840 (163)
Gap	16,845 (46)	15,720 (43)	18,314 (48)	17,044 (45)

Source: Health Canada analysis.

Table 39.3. Lower attachment to family physicians in primary care (70% in provinces, 50% in territories)—projected family physician workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	52,761 (121)	47,106 (108)	57,439 (126)	51,336 (112)
Demand	74,683 (171)	67,496 (154)	81,182 (178)	73,369 (161)
Gap	21,922 (50)	20,390 (47)	23,743 (52)	22,033 (48)
Rural and remote areas				
Supply	6,782 (93)	6,046 (83)	7,327 (96)	6,541 (86)
Demand	12,938 (177)	11,693 (160)	13,914 (183)	12,575 (165)
Gap	6,157 (84)	5,647 (77)	6,588 (87)	6,034 (79)
Urban areas				
Supply	45,979 (126)	41,059 (113)	50,111 (132)	44,796 (118)
Demand	61,745 (170)	55,803 (153)	67,267 (177)	60,794 (160)
Gap	15,766 (43)	14,744 (41)	17,156 (45)	15,998 (42)

Source: Health Canada analysis.

Early retirement

Under this scenario, the analysis considers the possibility that more of the workforce will retire from the profession earlier than in previous years. The analysis assumes the workforce will retire at the latest at the age of 65 years. This can also be interpreted as no one in the workforce will work past the age of 65 years.

Tables 40.1 through 40.8 show the supply-demand gap results of this scenario for each of the health professions. Increased early retirement is projected to increase the supply-demand gap compared to the base case. Overall, it results in the below head count gap increases by 2029 and 2034, compared to the base case:

- LPNs +85.9% by 2029 and +149.5% by 2034
- RPNs: +95.3% by 2029 and +336.4% by 2034
- RNs: +65.7% by 2029 and +69.9% by 2034
- NPs: +158.5% by 2029 and +264.0% by 2034
- Occupational therapists: +78.4% by 2029 and +228.0% by 2034
- Physiotherapists: +304.1% by 2029 and +1191.8% by 2034
- Pharmacists: +154.4% by 2029 and +223.1% by 2034
- Family physicians: +29.6% by 2029 and +27.1% by 2034

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.1. Early retirement—projected licensed practical nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	133,182 (310)	126,220 (294)	138,803 (306)	131,480 (290)
Demand	146,153 (341)	137,365 (320)	152,609 (336)	142,987 (315)
Gap	12,970 (30)	11,145 (26)	13,807 (30)	11,507 (25)
Rural and remote areas				
Supply	14,950 (198)	14,151 (187)	15,832 (199)	14,983 (188)
Demand	17,533 (232)	16,430 (217)	18,271 (230)	17,091 (215)
Gap	2,583 (34)	2,280 (30)	2,439 (31)	2,108 (27)
Urban areas				
Supply	118,232 (335)	112,069 (317)	122,971 (329)	116,497 (311)
Demand	128,619 (364)	120,931 (342)	134,339 (359)	125,895 (337)
Gap	10,387 (29)	8,862 (25)	11,368 (30)	9,398 (25)

Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.2. Early retirement scenario—projected registered psychiatric nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	6,023 (43)	5,585 (40)	6,539 (43)	6,061 (40)
Demand	6,846 (49)	6,274 (45)	7,258 (48)	6,645 (44)
Gap	824 (6)	690 (5)	720 (5)	584 (4)
Rural and remote areas				
Supply	685 (29)	634 (27)	746 (30)	691 (27)
Demand	826 (35)	754 (32)	874 (35)	798 (32)
Gap	141 (6)	120 (5)	127 (5)	107 (4)
Urban areas				
Supply	5,338 (45)	4,950 (42)	5,792 (46)	5,370 (42)
Demand	6,020 (51)	5,520 (47)	6,385 (50)	5,847 (46)
Gap	683 (6)	570 (5)	592 (5)	477 (4)

Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.3. Early retirement—projected registered nurse workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	281,277 (655)	260,502 (607)	292,518 (644)	270,882 (597)
Demand	329,049 (766)	301,129 (701)	343,287 (756)	313,723 (691)
Gap	47,773 (111)	40,626 (95)	50,770 (112)	42,841 (94)
Rural and remote areas				
Supply	26,924 (355)	24,889 (328)	28,445 (357)	26,301 (330)
Demand	33,121 (437)	30,202 (398)	34,361 (431)	31,326 (393)
Gap	6,197 (82)	5,312 (70)	5,917 (74)	5,025 (63)
Urban areas				
Supply	254,353 (719)	235,613 (666)	264,073 (706)	244,582 (654)
Demand	295,928 (837)	270,922 (766)	308,926 (826)	282,395 (755)
Gap	41,575 (118)	35,309 (100)	44,853 (120)	37,813 (101)

Source: Health Canada analysis.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.4. Early retirement—projected nurse practitioner workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	9,858 (23)	9,669 (23)	11,010 (24)	10,786 (24)
Demand	11,271 (26)	10,944 (25)	11,767 (26)	11,355 (25)
Gap	1414 (3)	1275 (3)	756 (2)	569 (1)
Rural and remote areas				
Supply	1,322 (17)	1,295 (17)	1,499 (19)	1,467 (18)
Demand	1,663 (22)	1,608 (21)	1,727 (22)	1,664 (21)
Gap	342 (5)	314 (4)	229 (3)	197 (2)
Urban areas				
Supply	8,535 (24)	8,375 (24)	9,512 (25)	9,319 (25)
Demand	9,608 (27)	9,335 (26)	10,040 (27)	9,691 (26)
Gap	1072 (3)	961 (3)	528 (1)	372 (1)

Source: Health Canada analysis.

Table 40.5. Early retirement—projected occupational therapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	17,489 (41)	15,754 (37)	17,518 (39)	15,804 (35)
Demand	19,869 (46)	17,711 (41)	20,709 (46)	18,298 (40)
Gap	2,380 (6)	1,957 (5)	3,191 (7)	2,494 (5)
Rural and remote areas				
Supply	1,119 (15)	1,007 (13)	1,126 (14)	1,017 (13)
Demand	1,509 (20)	1,345 (18)	1,559 (20)	1,383 (17)
Gap	390 (5)	338 (4)	433 (5)	366 (5)
Urban areas				
Supply	16,370 (46)	14,747 (42)	16,392 (44)	14,787 (40)
Demand	18,360 (52)	16,366 (46)	19,150 (51)	16,916 (45)
Gap	1,990 (6)	1,619 (5)	2,758 (7)	2,129 (6)

Source: Health Canada analysis.

Table 40.6. Early retirement—projected physiotherapist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	28,384 (66)	24,912 (58)	28,810 (64)	25,160 (56)
Demand	31,455 (73)	27,167 (63)	32,890 (73)	27,910 (62)
Gap	3,071 (7)	2,255 (5)	4,080 (9)	2,749 (6)
Rural and remote areas				
Supply	1,957 (26)	1,712 (23)	1,980 (25)	1,725 (22)
Demand	2,488 (33)	2,133 (28)	2,590 (33)	2,185 (28)
Gap	531 (7)	421 (6)	610 (8)	461 (6)
Urban areas				
Supply	26,426 (75)	23,200 (66)	26,830 (72)	23,436 (63)
Demand	28,966 (82)	25,032 (71)	30,300 (81)	25,723 (69)
Gap	2,540 (7)	1,833 (5)	3,470 (9)	2,287 (6)

Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.7. Early retirement — projected pharmacist workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	29,630 (88)	28,303 (84)	27,676 (77)	26,403 (74)
Demand	36,433 (108)	34,063 (101)	38,411 (107)	35,267 (98)
Gap	6,802 (20)	5,760 (17)	10,735 (30)	8,864 (25)
Rural and remote areas				
Supply	3,028 (52)	2,904 (50)	2,902 (47)	2,778 (45)
Demand	3,887 (67)	3,639 (63)	4,071 (66)	3,751 (61)
Gap	859 (15)	736 (13)	1,170 (19)	973 (16)
Urban areas				
Supply	26,603 (95)	25,399 (91)	24,774 (83)	23,625 (79)
Demand	32,546 (117)	30,424 (109)	34,340 (115)	31,516 (106)
Gap	5,943 (21)	5,024 (18)	9,565 (32)	7,891 (27)

Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Table 40.8. Early retirement—Projected family physician workforce supply, demand and gap, Canada, 2029 and 2034

Workforce	Projections for 2029 head counts (# per 100,000 population)	Projections for 2029 FTEs (# per 100,000 population)	Projections for 2034 head counts (# per 100,000 population)	Projections for 2034 FTEs (# per 100,000 population)
Overall				
Supply	45,288 (104)	41,331 (95)	50,032 (110)	45,720 (100)
Demand	78,048 (179)	70,537 (161)	84,783 (186)	76,624 (168)
Gap	32,760 (75)	29,206 (67)	34,751 (76)	30,904 (68)
Rural and remote areas				
Supply	5,796 (79)	5,286 (72)	6,360 (84)	5,808 (76)
Demand	13,564 (185)	12,259 (168)	14,577 (192)	13,174 (173)
Gap	7,768 (106)	6,972 (95)	8,217 (108)	7,365 (97)
Urban areas				
Supply	39,494 (109)	36,048 (99)	43,673 (115)	39,911 (105)
Demand	64,484 (177)	58,279 (160)	70,206 (185)	63,450 (167)
Gap	24,990 (69)	22,231 (61)	26,533 (70)	23,539 (62)

Source: Health Canada analysis. Family physician projections are based on the scenario that is inclusive of all services provided by family physicians in Canada.

Summary of gaps relative to the workforce supply

Tables 41.1 through 41.4 present scenario gap results in relation to the workforce supply, that is, head count gap per 1,000 workforce supply, for each profession and each scenario analysis. Presenting gap results in this way provides a different approach to making comparisons across health professions, which vary in size.

Table 41.1. Larger future populations—workforce supply-demand gap as head counts per 1,000 workforce supply, by profession, overall, rural and remote and urban geographic areas, Canada, 2022, 2029 and 2034

Geographic area	LPN	RPN	RN	NP	OT	PT	PH	FP
Year 2022								
Overall	119	84	103	352	116	99	52	495
Rural and remote areas	171	126	179	368	329	216	92	1,089
Urban areas	112	79	95	349	102	90	48	406
Year 2029								
Overall	78	95	124	79	100	52	108	519
Rural and remote areas	134	154	173	140	291	183	132	1,051
Urban areas	70	88	119	69	87	42	105	440
Year 2034								
Overall	93	82	154	15	105	42	156	547
Rural and remote areas	140	106	183	73	290	174	156	1,082
Urban areas	87	79	150	2	92	32	156	469

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. The FP gap results reflect the all services scenario of the base case analysis.

Table 41.2. Increase in disease prevalence over time—workforce supply-demand gap as head counts per 1,000 workforce supply, by profession, overall, rural and remote and urban geographic areas, Canada, 2022, 2029 and 2034

Geographic area	LPN	RPN	RN	NP	OT	PT	PH	FP
Year 2022								
Overall	119	84	103	352	116	99	52	495
Rural and remote areas	171	126	179	368	329	216	92	1,089
Urban areas	112	79	95	349	102	90	48	406
Year 2029								
Overall	65	80	111	65	87	39	94	499
Rural and remote areas	122	140	154	126	278	170	120	1,026
Urban areas	57	73	106	55	74	29	91	421
Year 2034								
Overall	65	80	111	65	87	39	94	499
Rural and remote areas	122	140	154	126	278	170	120	1,026
Urban areas	57	73	106	55	74	29	91	421

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. The FP gap results reflect the all services scenario of the base case analysis.

Table 41.3. Greater attachment to nurse practitioners and lower attachment to family physicians in primary care—workforce supply-demand gap as head counts per 1,000 workforce supply, by profession, overall, rural and remote and urban geographic area, Canada, 2022, 2029 and 2034

Geographic area	NP	FP1	FP2
Year 2022			
Overall	119	84	103
Rural and remote areas	171	126	179
Urban areas	112	79	95
Year 2029			
Overall	110	441	415
Rural and remote areas	177	943	908
Urban areas	99	366	343
Year 2034			
Overall	17	438	413
Rural and remote areas	80	934	899
Urban areas	6	365	342

NP: nurse practitioner; FP: family physician. The FP gap results reflect the all services scenario of the base case analysis.

FP1—Lower attachment to family physicians in primary care (80% in provinces, 60% in territories).

FP2—Lower attachment to family physicians in primary care (70% in provinces, 50% in territories).

Table 41.4. Early retirement—workforce supply-demand gap as head counts per 1,000 workforce supply, by profession, overall, rural and remote and urban geographic area, Canada, 2022, 2029 and 2034

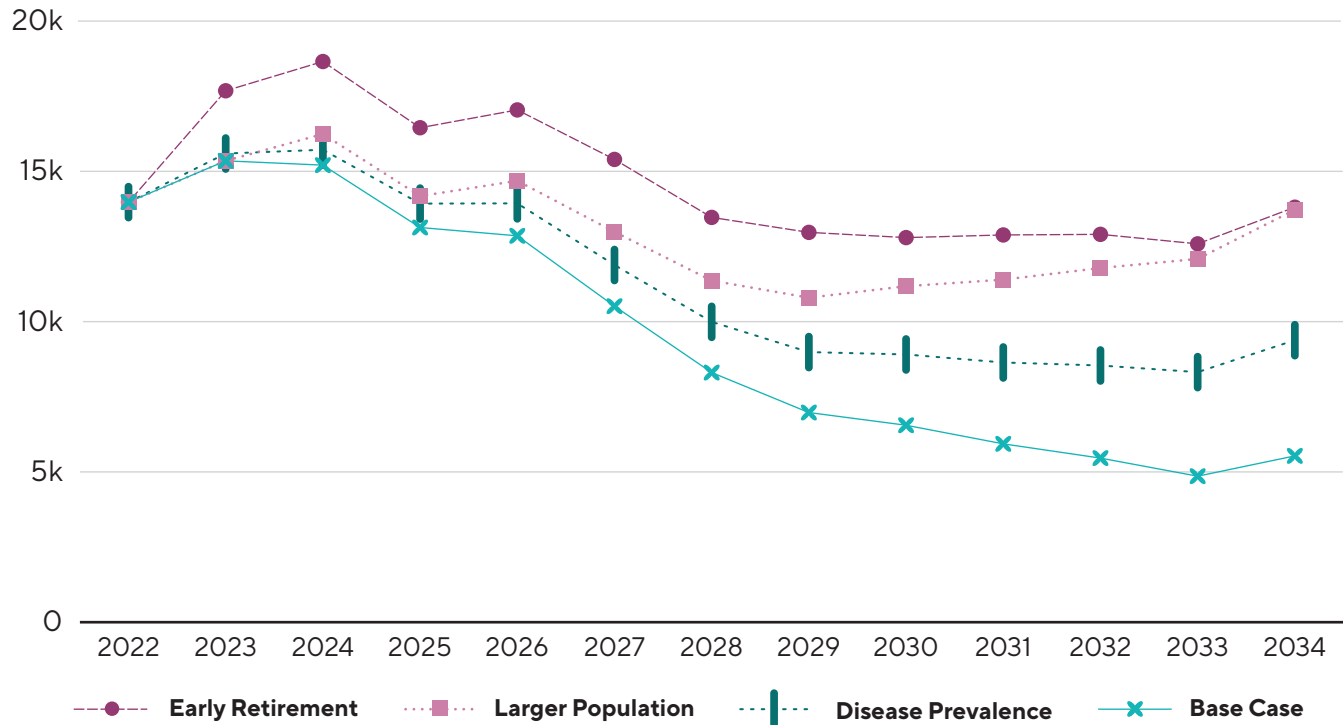
Geographic area	LPN	RPN	RN	NP	OT	PT	PH	FP
Year 2022								
Overall	119	84	103	352	116	99	52	495
Rural and remote areas	171	126	179	368	329	216	92	1,089
Urban areas	112	79	95	349	102	90	48	406
Year 2029								
Overall	97	137	170	143	136	108	230	723
Rural and remote areas	173	206	230	258	349	271	284	1,340
Urban areas	88	128	163	126	122	96	223	633
Year 2034								
Overall	99	110	174	69	182	142	388	695
Rural and remote areas	154	172	208	152	385	308	403	1,292
Urban areas	92	102	170	56	168	129	386	608

LPN: licensed practical nurse; RPN: registered psychiatric nurse; RN: registered nurse; NP: nurse practitioner; OT: occupational therapist; PT: physiotherapist; PH: pharmacist; FP: family physician. The FP gap results reflect the all services scenario of the base case analysis.

Overall summary

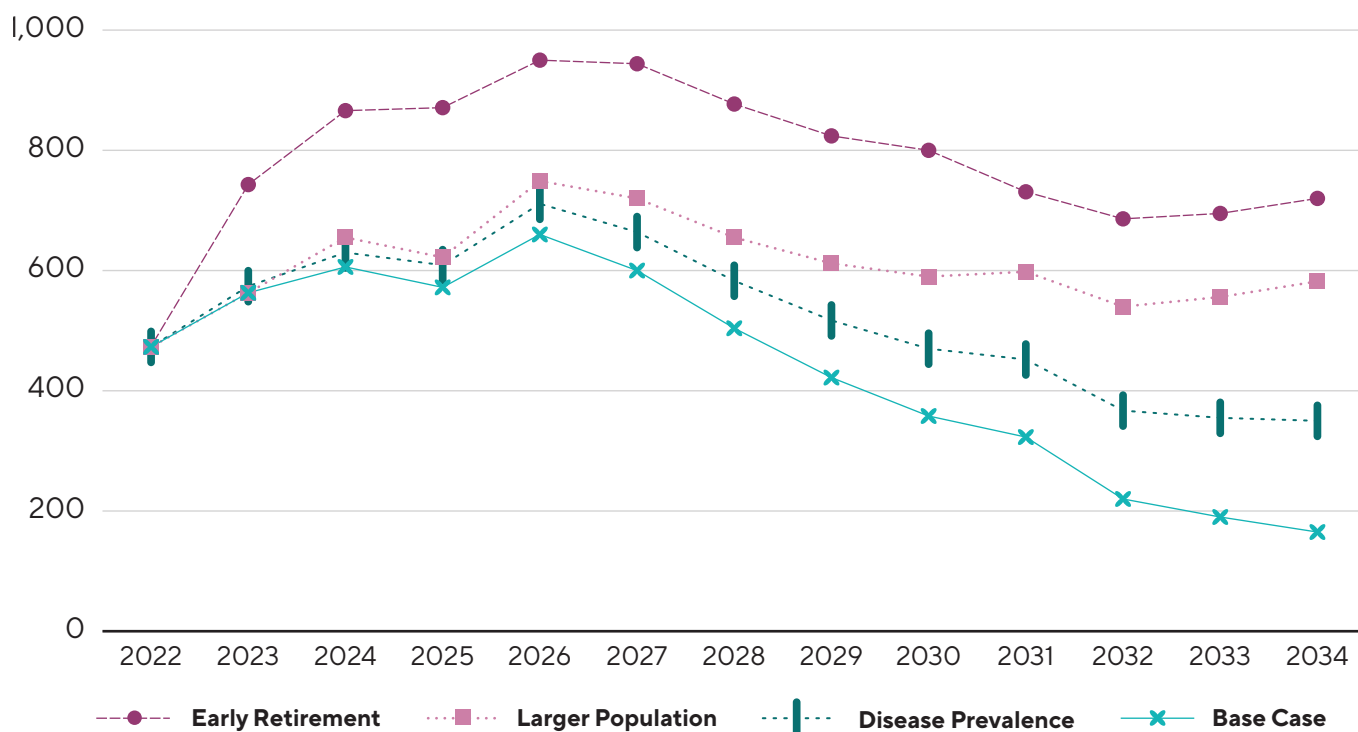
The scenario analyses show that population growth (larger population size), increases in disease prevalence, and early retirement would substantially increase demand and therefore the supply-demand gap across all health professions. Figures 14.1 through 14.8 show the overall workforce supply-demand head count gap projection results for the base case analyses and scenario analyses for each profession.

Figure 14.1. Projected licensed practical nurses gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



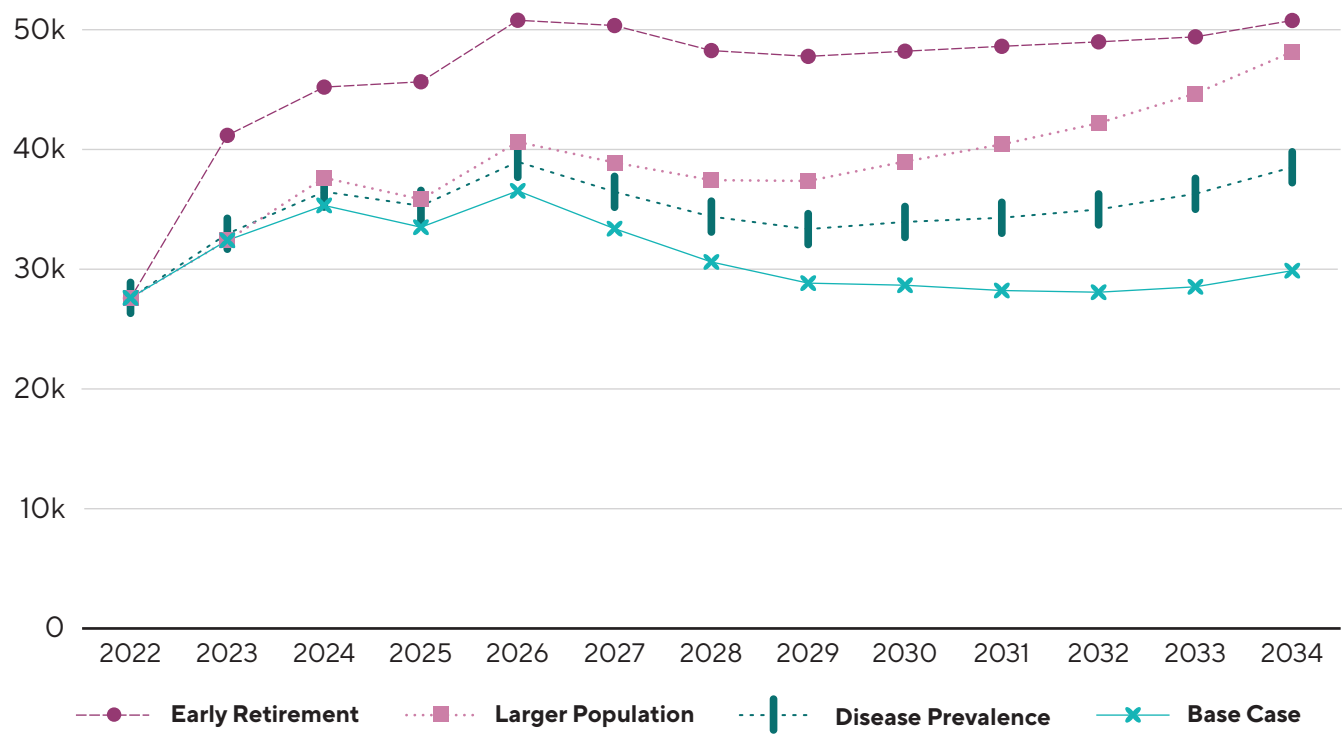
Source: Health Canada analysis. Note: Licensed Practical Nurses in Nunavut are excluded from the projections due to data limitations.

Figure 14.2. Projected registered psychiatric nurses gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



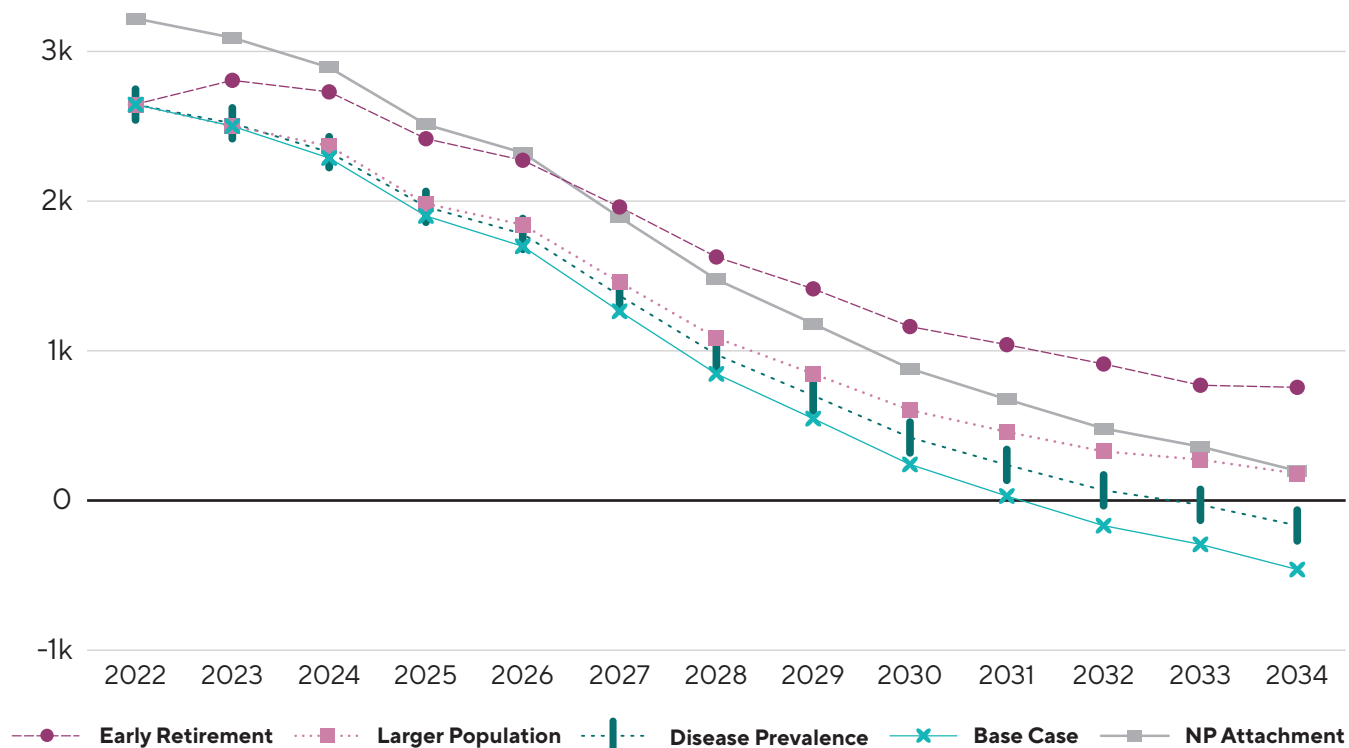
Source: Health Canada analysis. Note: Registered Psychiatric Nurses in Yukon, Northwest Territories and Nunavut are excluded from the projections due to data limitations.

Figure 14.3. Projected registered nurses gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



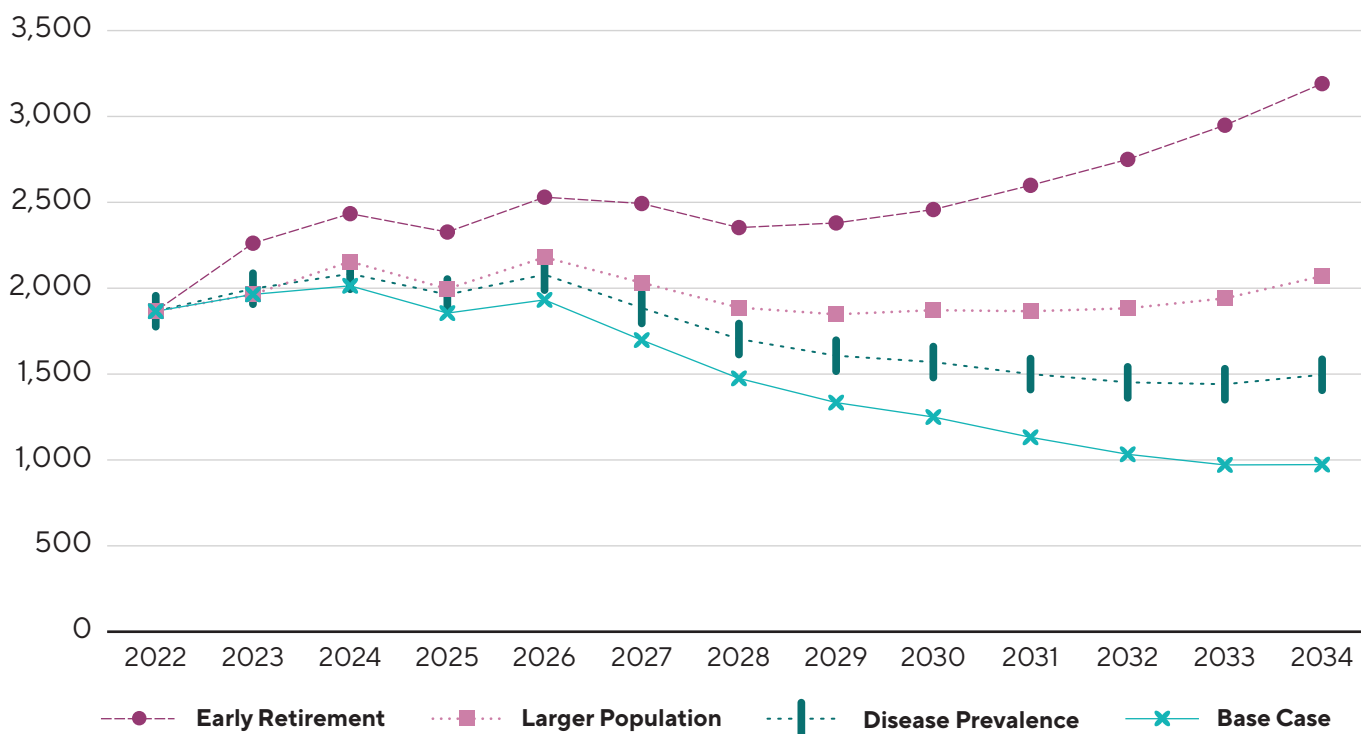
Source: Health Canada analysis.

Figure 14.4. Projected nurse practitioners gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



Source: Health Canada analysis.

Figure 14.5. Projected occupational therapists gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



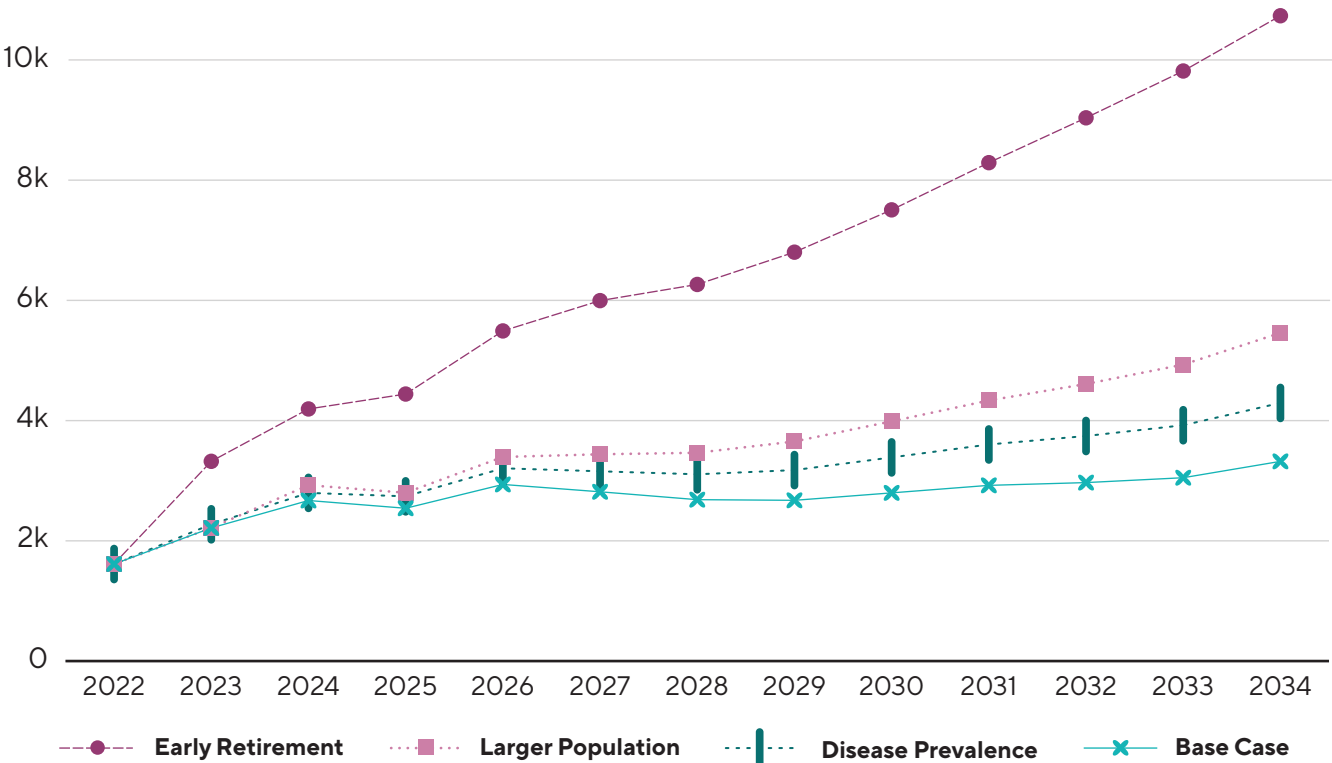
Source: Health Canada analysis.

Figure 14.6. Projected physiotherapists gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



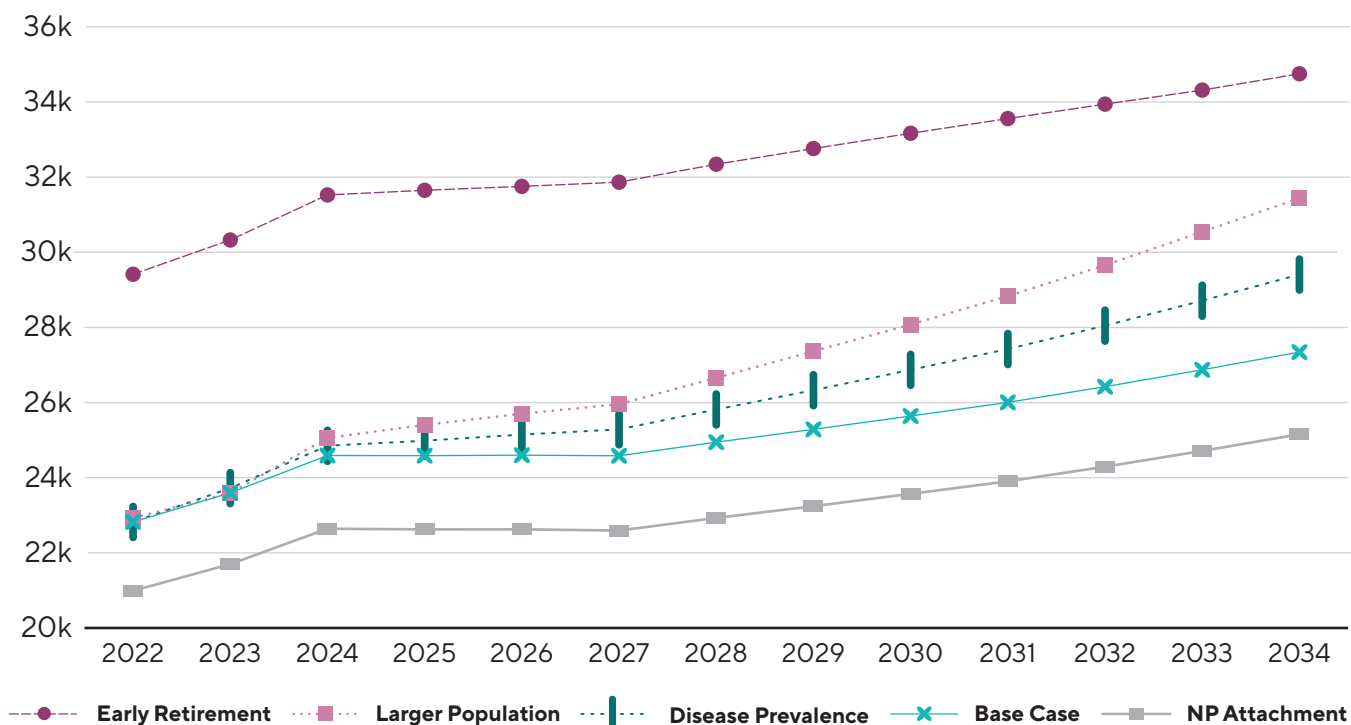
Source: Health Canada analysis. Note: In the Northwest Territories and Nunavut, Physiotherapists are not regulated, therefore, data for these territories are not available.

Figure 14.7. Projected pharmacists gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



Source: Health Canada analysis. Note: Pharmacists in Quebec, Nunavut, and Yukon are excluded from the analysis due to data limitations.

Figure 14.8. Projected family physicians gap, head counts, base case and scenario analyses, Canada, 2022 to 2034



Source: Health Canada analysis. Family physician projections are based on the scenario that is inclusive of all services provided by family physicians in Canada. Note: NP attachment scenario presented in the figure reflects alignment with the nurse practitioner base case analysis, that is, family physicians could attach to 80% of the unattached population in the provinces and 60% in the territories, while Nurse Practitioners could attach to 20% in the provinces and 40% in the territories.

Overall, the base case analysis shows that projected workforce supply across in-scope health professions will be insufficient to meet projected demand for the in-scope health professions for all or most of the 10-year projection period. The gaps are particularly large and constantly increasing over the projection period for family physicians and registered nurses, while the gaps for NPs and physiotherapists start out as large but narrow over time, to the point that additional capacity is generated from 2032 and onward.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

For pharmacists, the gaps are large and growing over the projection period, while the occupational therapists and LPNs gap starts out as large but narrow closer to the end of the projection period. The projected relatively steep increase in nurse practitioner workforce supply is largely driven by the substantial number of new educational and training seats recently added in several jurisdictions and which are planned for future years. For physiotherapists, the narrowed gap over time is predominately due to relatively higher historical inflows compared to outflows, resulting in an increase in net new physiotherapist workforce supply in the projection.

There are several limitations to the analysis outlined in the methodology section as they relate to significant data gaps and uncertainty in regard to assumptions applied to the projections analyses. The high degree of uncertainty, particularly in terms of estimating demand, affects the validity and reliability of the presented gap results, therefore readers should take great care in the interpretation and use of any of the estimated values presented. However, the direction of the results provides for a general message regarding the current and future challenges in meeting population health care demand with domestic supply.



Reflections

The Study's request for information on the education and training capacity has reinforced the need for a standardized approach to data collection for health professions education across Canada. Except for physicians, it is not possible to follow a health professional from training through practice and retirement. This is a significant limitation in health workforce planning as jurisdictions are unable to track graduates into and out of the workforce or movement between categories of professionals (such as, LPN to RN or RN to NP) or between different professions altogether (such as, physiotherapists or occupational therapists to medicine).

As jurisdictions have separate ministries of education and health, collaborative data sharing and health workforce planning are not inherently part of the departmental structures. This must be addressed for health professions education and training to respond to the health care needs within the jurisdiction.

Future work in improving data quality, integrity, comprehensiveness and timeliness is important to improve the robustness of the results, as are continual refreshes on the modeling with these new data. These analyses should be considered a starting point in better understanding some of the potential challenges and opportunities in connecting education and training capacity, and workforce supply and demand today, and into the future.

Given the complexity of issues related to the health system and its workforce, there is no one policy lever that will address all desired outcomes. Health workforce planning should function as an adaptive learning system that is evidence informed, integrated and interactive.¹⁹⁴ This endeavour can only be successful if there is a regular influx of timely, good quality data.

Recommendations

Education, training and health workforce data

A minimum data standard on health professions students and their education programs should be created and required for all health profession programs to complete and report on.

Data on health professions students and their education programs should be available to those who undertake health workforce planning.

Health professions students should have a unique identifier that will not change through their entire professional career to facilitate monitoring of location and practice patterns for health workforce planning purposes.

For the Indigenous health workforce, collaborative efforts should be made to co-develop data collection processes, forecast workforce needs, and create culturally appropriate health programs and services. Regular monitoring and reporting on the progress of Indigenous health workforce recruitment, retention, and educational outcomes are crucial for accountability.

Health professions education and training planning

Significant increases in education and training seats are required to meet the current and future demand for nurses, occupational therapists, physiotherapists, pharmacists and family physicians in Canada. Specific gaps and needs must be determined by PT health profession education and health workforce planners.

Health professions education planning should be undertaken with an interprofessional approach involving, at a minimum, PT ministries of health, PT ministries of education, health professions education leaders, health care institutions, and community members.

In collaboration with First Nations, Métis and Inuit community leaders and organizations, educational pathways that consider the unique lived experiences of Indigenous learners and address barriers such as access to education, cultural safety, anti-Indigenous racism, language challenges, and recruitment and retention criteria must be developed to increase the recruitment of Indigenous students into health professions. Additionally, enhanced culturally relevant student and professional supports should be provided.

Health professional education and training should be structured from a perspective of required competencies for primary care.

Health workforce projection modelling

An FPT community of practice for health workforce modellers in Canada should be developed to enable the application of new technical approaches to modelling and the use of different data and assumptions that would generally improve health workforce planning at various levels.

Integrated supply and demand projection models for interprofessional primary care teams should be created based on population health needs to improve decision makers' ability to develop interdisciplinary care teams that optimize the health workforce.

Rural and remote education

The minimum data standard on health profession students should include information regarding student location at the time of application, during education and practice location.

Health profession students from rural and remote communities should be supported to enroll in programs with training in rural and remote communities by local preceptors and supported by the communities in which they train. Should they require advanced training away from their communities, opportunities and incentives should be in place to return to their community.

The additional educational support required for rural and remote education programs and their teachers and preceptors should be considered in the financing of rural and remote education programs.

A rural and remote health professional education and training network across PTs should be established to enable collective sharing of innovative practices and solutions.

Sustainable resourcing mechanisms that support the long-term implementation of Indigenous-led recruitment and retention strategies for roles based within Indigenous communities and nations, that contribute to health workforce education and training, must be established.

Employer role

Health care employers should be ensuring the successful transition of new graduates and provide support and mentoring as they enter into practice. Employers should be attentive to the need for a positive work environment and actively address retention efforts.

Health professions role

Accreditation and regulation of health professions education must adapt as quickly as necessary to align changes to the education and training of health professionals to respond to societal needs.

Health professions education leaders need to work collaboratively to accelerate interprofessional educational transformation aligned with primary care competencies. Creating a new structure to break down the silos that currently exist would be beneficial.

Health professional associations should encourage their members to engage in the education of the next generation of health professionals as clinical faculty and preceptors, and support their professional development as teachers.

Ongoing study

Ongoing work to access and create health professions education and training capacity data for cyclical reporting should be undertaken to help inform health workforce projections at a pan-Canadian level.

Data on all health professions (and other specialties) should be collected and considered in health workforce planning. Record level standardized data, with timely collection, need to be updated on a regular basis to produce reliable forecasting estimates that can be tracked and adjusted over time.

Engagement is required with First Nations, Métis and Inuit organizations across the country to determine the best ways forward to identify and build on Indigenous-led solutions to grow the Indigenous health workforce. Building relationships and enhancing resources are key strategies for amplifying opportunities and incentivizing accessible education and training, while formal partnerships with Indigenous health authorities and organizations are essential to sustain recruitment and retention efforts.

Future work should consider the needs of other equity deserving groups and marginalized populations with a focus on educating future health professionals in culturally safe care for people in Canada.

Future considerations

This Study is the first national initiative of its kind to collect information on the education and training of select health professionals, and to provide estimated supply-demand projections for multiple health professions. This information will be critical to support considerations on next steps to address the supply challenges within the health workforce. This work builds on current efforts being made across Canada to develop appropriate health workforce models that can assess the gap between the supply and demand of health professionals. Policy makers across the country are also working on other important areas such as increased scope of practice, moving towards more team-based primary care models, and supporting qualified internationally trained health care professionals to practice in Canada.

Canada clearly has urgent work to do to address the current and future gaps in the number of health professionals studied. While investing in this enhanced training capacity, innovations highlighted in the Study can be scaled and spread to accelerate positive change. Regular review of projections must be undertaken using up to date information from reliable sources. A commitment to establishing robust data requirements, and collaboration between health profession education and workforce leaders, are key to supporting the complex adaptive system required to succeed in providing the health workforce Canada needs. We have a strong workforce; we must now find a way to better leverage those strengths and innovate at the same time.

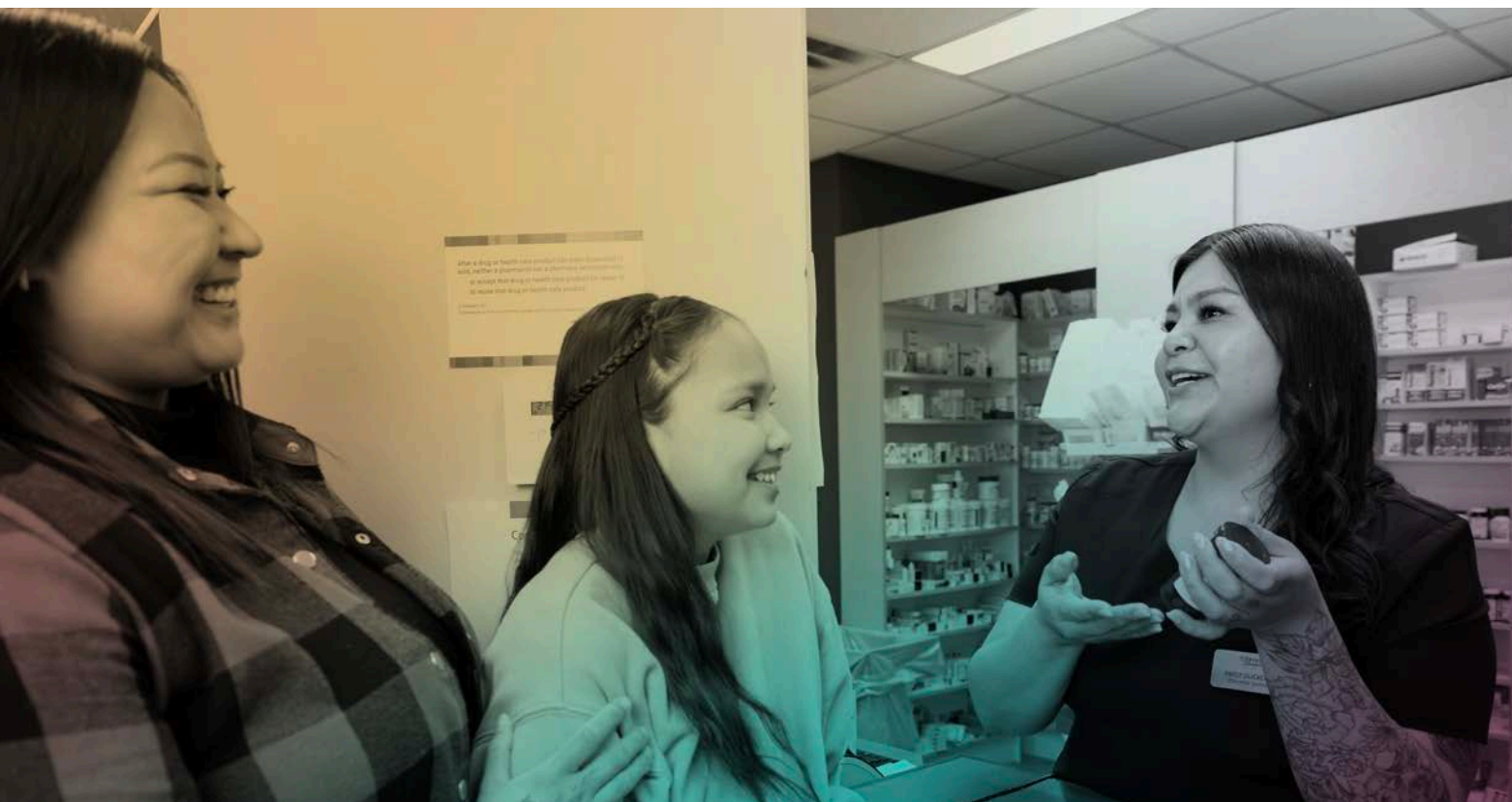
By addressing the recommendations, health ministries, in concert with regional health and educational institutions, can contribute to building a more equitable and culturally informed education and training experience to broaden the health workforce in Canada. Collective and coordinated actions are crucial to increase Indigenous health human resources, in pursuit of advancing reconciliation and improving health outcomes for Indigenous Peoples from coast to coast to coast. Effective collaboration and sustained investment in Indigenous health education through to health professions programs supported by intentional decolonial workforce development efforts are essential steps towards achieving these goals.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

An ideal future state for health professions education and workforce planning is one where a minimal data standard exists that allows knowledge of the individual as a trainee and a worker along their career trajectory. Data would be regularly inputted from appropriate sources to allow cyclical adjustments to databases to help adapt projections and implement any required changes in education seats and other parameters. Second, an interprofessional health profession education and workforce planning collaborative council is established including ministries of health and education, Indigenous leaders, employers, regulators, accreditors, educators, learners and communities to collectively address the health and health care needs of Canadian populations. Third, a transformative learning health workforce education system is created where timely adaptations of policy decisions are based on a regular stream of robust data to inform and enable adjustment of assumptions for best modelling and predictions is possible.

With collaboration and coordination amongst all key stakeholders, Canada can reach the goal of caring for Canadians by educating Canada's future health workforce.



Appendices

Appendix A: List of Participants

The Federal Provincial Territorial Study Project Team

Chair and Project Team Lead:

- Geneviève Moineau, Chief Medical Workforce Advisor, Health Canada, Government of Canada

Project Team members:

- Eli Purchase, Strategic Recruitment Specialist, Government of Northwest Territories
- Karen Dickson, Senior Issues Advisor, Regional Services, Department of Health and Community Services, Government of Newfoundland and Labrador
- Brendan King, Senior Policy Analyst, Strategic Priorities Research and Reporting, Ministry of Health, Government of British Columbia
- David Lamb, Director, Capacity and Health Workforce Planning Branch, Ministry of Health, Government of Ontario
- Chantal Couris, Manager, Health Human Resources, Data Methods and Tools, Canadian Institute of Health Information
- Deborah Cohen, Chief Operating Officer, Health Workforce Canada
- Thy Dinh, Manager, Policy Research, Economics and Analytics Unit, Health Canada
- Leigh Chapman, Chief Nursing Officer of Canada, Health Canada
- Lynn Menard, Senior Policy Advisor, Health Canada
- Olena Schell, Policy Analyst, Health Canada
- Beck Dysart, Senior Policy Analyst, Health Canada

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Thank you to all who participated, contributed and collaborated on the Study:

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Margaret Duffy	Christina Murray	Paul Winwood
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Organizations and associations

Members of the Association of Canadian Occupational Therapy University Programs
Members of the Association of Faculties of Pharmacy of Canada
Members of the Canadian Council of Physiotherapy University Programs

Indigenous health workforce study

Individuals

Lisa Bourque Bearskin	Amélie Blanchet Garneau	Margot Latimer
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Sheila Blackstock	Jason Hickey	

Additional Study Contributors requested to have their identities remain anonymous

Organizations, associations and government ministries

Canadian Nursing Students Association
Canadian Nurses Association
Canadian Association of Schools of Nursing
First Nations, Inuit Health Branch, Indigenous Services Canada

Appendix B: Acronyms

ACOTUP:	The Association of Canadian Council of Physiotherapy University Programs
AFMC:	The Association of Faculties of Medicine of Canada
AFPC:	The Association of Faculties of Pharmacy of Canada
CAPER:	Canadian Post-M.D. Education Registry
CASN:	Canadian Association of Schools of Nursing
CCHS:	Canadian Community Health Survey
CCPUP:	Canadian Council of Physiotherapy University Programs
CHW:	Committee on Health Workforce
CIHI:	Canadian Institute for Health Information
CMA:	Canadian Medical Association
CMG:	Canadian Medical Graduate
FPT:	Federal, Provincial, and Territorial
FTE:	Full-time equivalent
HMM:	Health Ministers' Meeting
HWC:	Health Workforce Canada
HWDB:	Health Workforce Database
IMG:	International Medical Graduate
INSFS:	Indigenous Nursing Student and Faculty Survey
IPE:	Interprofessional education
ITK:	Inuit Tapiriit Kanatami
LFS:	Labour Force Survey
NGS:	National Grouping System
NPDB:	National Physician Data Base
NTI:	Nunavut Tunngavik Incorporated
PRPT:	Physician Resource Planning Tool
PSW:	Personal Support Workers
PT:	Provincial and Territorial
SMDB:	Scott's Medical Database
TRC:	Truth and Reconciliation Commission
UNDRIP:	United Nations Declaration on the Rights of Indigenous Peoples

Appendix C: Glossary of Terms

Academic year: The annual period from September to August when educational institutions provide academic sessions.

Campus, satellite or distributed site: A branch of a university or college that is physically at a distance from the main university or college area. It can be located in another city in the same province or territory, or in another province or territory. Virtual or distance learning, and any other method of delivering a program, are not to be considered satellite or distributed site of the program.

Canadian medical graduate: A graduate from an accredited medical program in Canada.

Competitive stream: In the context of medical residency programs, a competitive stream is the process to match applicants to a residency position regardless of their eligibility type as a Canadian or international medical graduate. It is more commonly used in Quebec.

Demand: The level of use of health care at which the perceived marginal health benefits of care equal the marginal cost of accessing care. Individuals will continue to consume health care if benefits outweigh costs and the cost of care is affordable. Costs and benefits as perceived by patients and health professionals will influence demand and are a function of factors including, but not exclusive to, health status, access barriers such as distance to travel and wait times, demographic characteristics and health literacy. In the Study, it is estimated as the number of health professionals needed to provide at least the reported or predicted service utilization at a given year, as well as to meet estimated unmet needs or demand, in a given year.

Direct care: Health care providers who provide services directly to clients.

Enrolled students: Students who are registered at the time of their first term of the academic year.

Entry-to-practice: The minimum educational requirements obtained by completing an educational and/or training program to practice as a member of the health profession.

Family physician: Family physicians provide comprehensive medical care for all people, ages, life stages and presentations. This care includes all clinical domains, both acute and chronic, and all stages, from preventive to palliative care. Family physicians work across care settings and regulatory environments, including: primary care, emergency care, home and long-term care, hospital care and maternal and newborn care.

Full-time equivalent (FTE): The measure used to estimate the number of full-time health care providers in the workforce.

Full-time equivalent (FTE) coefficient: The proportion of the average number of hours worked in a week out of 37.5 hours by a group of health professionals. The FTE coefficient is used to convert the supply to FTEs.

In-year applicants: Prospective students who applied to the program within a specific academic or cohort year.

In-year graduates: Students who have completed the academic program requirements to graduate at the end of the academic year.

Inflow: Inflow refers to the number of registrants entering the profession. Inflow occurs when a health care provider registers to practice in a province or territory in which they did not register the previous year, for example, new graduates, immigration, return from temporary leave. For physicians, inflow occurs when a physician indicates that they are an active physician while not actively practising the previous year.

International medical graduate (IMG): A graduate from an accredited medical program outside of Canada.

Licensed Practical Nurse (LPN): Health care providers who work independently or in collaboration with other members of a health care team. They assess clients and work in health promotion and illness prevention. They assess, plan, implement and evaluate care for clients. In Ontario, these professionals are called registered practical nurses. For the purposes of CIHI reporting, and to maintain continuity between provinces and territories, these registered practical nurses are still referred to as LPNs throughout this report.

Migration: When a health care provider moves to or from another jurisdiction, such as province/territory or another country.

Mortality: When a health provider leaves the workforce due to being deceased.

National Grouping System (NGS): The physician services that are captured in provincial and territorial health care data sets can vary. For each province and territory, a schedule of medical benefits outlines which physician services are medically insured. Each service is uniquely identified by an alphanumeric code (a fee code) specific to the province or territory. The NGS organizes fee codes into homogenous categories for each province and territory, which allows for comparisons of physician services and activities across the country.¹⁹⁵

Need: Number of health care providers that need to provide enough health services to the population to achieve a desired health standard within the population.

Nurse Practitioners (NPs): Advanced practice nurses who integrate clinical skills associated with nursing and medicine in order to assess, diagnose and manage patients in primary health care settings and acute care populations, as well as ongoing care for populations with chronic illness.

Occupational therapist: Health care providers who promote health, well-being and quality of life by enabling individuals, families, organizations and communities to participate in occupations that give meaning and purpose to their lives. Occupational therapy is a type of health care that helps to solve the problems that interfere with a person's ability to do the things that are important to them – everyday things such as caring for themselves, being productive and enjoying leisure activities.

Outflow: The number of health care providers leaving a specific province or territory. Outflow occurs when a health care provider fails to renew their registration in a province or territory the following year, for example, retirement, emigration, parental leave. For physicians, outflow occurs when they indicate they are not an active physician the following year.

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Pharmacist: Medication management experts of the health care team who collaborate with patients, their families and other health professionals to benefit the health of Canadians.

Physiotherapist: Health care providers who aim to prevent, assess and treat the impact of injury, disease and/or disorders in movement and function. They work to promote optimal mobility; help improve physical activity and overall health and wellness; prevent disease, injury and disability; manage acute and chronic conditions; manage activity limitations and participation restrictions; improve and maintain optimal functional independence and physical performance; rehabilitate injury and the effects of disease or disability; and educate clients and plan maintenance and support programs to prevent reoccurrence, re-injury or functional decline.

Program capacity: The total number of students that an educational institution can accommodate during the academic year to prepare for entry-to-practice as a health profession.

Registered Nurse (RN): Health care providers who work both autonomously and in collaboration with others to enable individuals, families, groups, communities and populations to achieve their optimal levels of health. They deliver direct health care services to those at all stages of life and in situations of health, illness, injury and disability; they also coordinate care and support clients in managing their own health.

Registered Psychiatric Nurse (RPN): Health care providers who work both autonomously and in collaboration with clients and other health care team members to coordinate health care and provide client-centred services to individuals, families, groups and communities. They focus on mental and developmental health, mental illness and substance use, while integrating physical health and utilizing bio-psycho-social and spiritual models for a holistic approach to care.

Reversion: In the context of matching applicants to residency programs, a reversion is an option for medical residency programs to revert or “donate” unfilled residency positions in one program to another during the match process. Unlike the competitive stream, where eligibility is open to either CMG or IMG applicants, a reversion also allows residency positions to transfer across programs.

Rural and remote: In the context of the workforce supply and demand modelling, rural and remote is defined as a geographical location outside of census metropolitan and census agglomeration areas.

In the context of the education and training capacity, the definition is based on the Canada Student Loan forgiveness program for family doctors, NPs and nurses, where rural or remote is defined as a geographical location outside of:

- Metropolitan areas;
- Areas with an urban core population of 50,000 or more; and
- Provincial capitals.

Secondary registrants: Health professionals who register simultaneously in multiple provinces and territories.

Seats: An available spot for a student to register within the educational program.

Sponsored seat: A seat for an out-of-province student that has been sponsored by their home provincial or territorial government.

Supply: The number of health providers who were registered within their regulatory organization and eligible to practise in the given year (including those employed and not employed at the time of registration).

Workforce supply: The number of health providers that are registered within their regulatory organization and who explicitly state that they are employed within their health care profession (for example, RNs who are employed as a nurse professional). Only primary registrations (where the province of registration reflects the registrant's primary jurisdiction of practice) are included.

Workforce supply-demand gap: Workforce supply-demand gap can be interpreted as the number of health professionals that are needed to fill unmet demand or need. It can also be interpreted as the workforce shortage. In the context of the Study, the estimated workforce supply-demand gap is calculated as the difference between demand and supply in head counts or FTEs (demand minus supply). The Study presents various metrics to reflect gap, such as workforce supply-demand gap as head counts or FTEs or workforce supply counts per 100,000 population. Gaps are also presented related to the overall workforce supply for each professions (gap count per 1,000 workforce supply).

Workload: The number of patient visits that one full-time equivalent family physicians can handle in a year. The workload was calculated for each province and territory by assuming all Canadians had their needs met in the base year (2022). Specifically, the measure was calculated as the ratio of the total number of family physician visits in a year to the total supply number in that year.

Unattached population: Canadians who do not have a family physician or a NP as their primary care provider. It is estimated in the Study as the percentage of population who say they do not have a regular care provider that is a family physician or NP based on data from the 2022 CCHS and which is applied to the estimated population, by age, sex and geography. In the Study, it reflects the level of unmet need for primary care.

Appendix D:

Consent Forms and Questions

Indigenous Data Processing Consent Form

Why we ask for your consent:

We are committed to protecting the privacy of all personal data you provide us for consideration. The following statements describe what we are doing with your data and how long we store it, so you are fully informed prior to you submitting your personal information for research and informational purposes.

Data Controller Contact:

Microsoft Software—MS Word, Outlook/Gmail email

Contact person: Cortney Clark, Indigenous Health Researcher, Canadian Health Workforce Education, Training and Distribution Study FPT Project Team

Email: [redacted]

Our Data Protection Officer and Process

Contact person: Geneviève Moineau

Chief Medical Workforce Advisor | Conseillère en chef des effectifs médicaux

Strategic Policy Branch | Direction générale de la politique stratégique

Health Canada/Santé Canada

Email: SharePoint site hosted by Canadian Health Workforce Education, Training and Distribution Study FPT Project Team at Health Canada (virtual link)

Why we are asking for personal data:

We ask for your personal data to produce research reflective of Indigenous health human resource information in Canada.

Third Parties that will see your personal data:

Your anonymized data may be shared with other organisations and third parties in order to enhance the Study recommendations and contribute to the development of support systems for Indigenous health human resources. Reported identifiers and experiences from data collection and data review will be removed in all public reporting of data to protect the confidentiality of contributors.

These could include:

Indigenous organizations, Contributors to the Study

Health researchers, contributors to the Study

Federal, Provincial and Territorial Health Ministers

Other parties associated with the Government of Canada

How long will we hold onto your personal data?

Your personal data will be retained by us for up to 12 months after the conclusion of the research study in Fall 2024.

I give consent

YES

NO

I REQUIRE ADDITIONAL INFORMATION

Education and Training Capacity Questions

All Health Professions, except Physicians

Program Information

1. What is the name of the institution and program for [the health profession]? Please include any applicable bridging programs, including programs for internationally educated health professionals.
2. If the same program is delivered at multiple sites, please consider each campus, satellite, or distributed site as distinct from the “main program” for the purpose of this survey. Please name all the associated campuses, satellites, or distributed sites.
3. What is the program duration (the normal instructional time to complete the course work for the entire program for a full-time student by traditional program delivery)?
4. What is the location of the program (city name, province and postal code)?
5. Is this main program and/or campus, satellite, or distributed site considered to be in a rural or remote community?

Program Capacity and Student Information

6. For the past five years (2018–19 to 2022–23):
 - a. What is the program capacity (number of seats available in the program for the academic year of entry)?
 - b. What number of students are provided with a clinical experience in a rural or remote community?
 - c. What is the number of applicants to the program?
 - d. How many students enrolled in their first year?
 - e. What is the number of students enrolled in their first year, who resided in a rural or remote area at the time of their application (prior to registration)?
 - f. How many students withdrew prior to program completion?
 - g. What is the total number of students in the program (sum across all cohorts)?
 - h. How many students graduated from the program?
 - i. Please provide the age and gender of the students within your educational program at the time of graduation.

Sponsored Seats

7. For the past five years (2018–19 to 2022–23), how many program seats were sponsored by other provinces and/or territories? From which provinces and territories?

Anticipated Program Changes

8. Over the next ten years, please confirm the planned or announced change(s) in the number of seats within existing, or new, education programs for [the health profession].

Employment Location

9. For the past five years, how many graduates entered the health workforce in a rural or remote location? How many graduates entered the health workforce in each employment type, that is, full-time, part-time or other?

Program Expansion Constraints

10. Of the following options, which constraints prevent your educational program from increasing the number of student seats?
 - a. Funding limitations (for example, budgets).
 - b. Limited physical space (for example, lecture rooms, clinics, etc.).
 - c. Insufficient number of faculty members to carry out educational programs.
 - d. Insufficient support staff to carry out educational programs.
 - e. Insufficient clinical placements.
 - f. Insufficient number of applicants.
 - g. Other, please specify.
11. Do you have any comments that would you like to share about the constraints that prevent you from increasing the number of student seats in the educational program?

Qualitative Questions

12. What are the key challenges and barriers in the education and training of [the health profession] that prevent the health workforce supply from meeting the present and future health service needs of Canadians?
13. Please highlight any current leading practices related to the education and training of [the health profession] that are designed to help meet the future demand for health services by Canadians?
14. What future innovations are being considered to advance the education and training of [the health profession] to help meet the future demand for health services by Canadians?
15. What are the challenges or barriers in the education and training of [the health profession] in rural or remote communities? What are the promising practices or innovations in the education and training of [the health profession] in rural or remote communities?

On Medical Education and Residency Programs

Program Information

1. What is the name of the institution and program delivering undergraduate medical education?
2. If the same program is delivered at multiple sites, please consider each site as distinct from one another and name each site.
3. What is the program duration (the normal instructional time to complete the course work for the entire undergraduate medical education program for a full-time student by traditional program delivery)?
4. What is the location of the program (city name, province and postal code)?
5. Is this main program and/or campus, satellite, or distributed site considered to be in a rural or remote community?

Program Capacity and Student Information

6. For the past five years (2018–19 to 2022–23):
 - a. What is the program capacity (number of seats available in the program for the academic year of entry)?
 - b. What number of students are provided with a clinical experience in a rural or remote community during the undergraduate medical education program?
 - c. What is the number of applicants to the program?
 - d. How many students enrolled in their first year?
 - e. What is the number of students enrolled in their first year, who resided in a rural or remote area at the time of their application (prior to registration)?
 - f. How many students withdrew prior to program completion?
 - g. What is the total number of students in the program (sum across all cohorts)?
 - h. How many students graduated from the program?
 - i. Please provide the age and gender of the students within your educational program at the time of graduation.

Sponsored Seats

7. For the past five years (2018–19 to 2022–23), how many undergraduate medical education program seats were sponsored by other provinces and/or territories? From which provinces and territories?

Qualitative Questions

8. What are the key challenges and barriers in the education and training of physicians that prevent the health workforce supply from meeting the present and future health service needs of Canadians?
9. Please highlight any current leading practices related to the education and training of physicians that are designed to match the health workforce supply with the current and future health service demands of Canadians?
10. What future innovations are being considered to advance the education and training of physicians to help meet the future demand for health services by Canadians?
11. What are the challenges or barriers in the education and training of physicians in rural or remote communities? What are the promising practices or innovations in the education and training of physicians in rural or remote communities?

Medical Residencies

12. For all medical residency programs in the past five years (2018-19 to 2022-23):
 - a. What is the program capacity (number of seats available in the program for the academic year of entry) at the post-secondary institution?
 - b. What is the total number of residents (sum across all cohorts)?
 - c. What is the number of medical graduates who applied to the medical residency program?
 - d. What is the number of residents in their first year of training?
 - e. What is the number of Canadian Medical Graduates in their first year of training in a medical residency program?
 - f. What is the number of International Medical Graduates in their first year of training in a medical residency program?
 - g. How many residents graduated from their program?
 - h. Please provide the age and gender of residents at the time of their graduation.
 - i. How many residents withdrew prior to completing the program?

Family Medicine Residency Programs

13. What is the name of the post-secondary institution for the family medicine residency program?
14. If the family medicine residency program is delivered at multiple sites, please consider each site as distinct from one another and name each site.
15. Please provide the location of each program site (city name, province, postal code).
16. Is this location considered to be in a rural or remote community?

Family Medicine Resident Information

17. For family medicine residency programs for the past five years (2018-19 to 2022-23):
 - a. What is the program capacity (number of seats available in the program for the academic year of entry)?
 - b. What is the number of medical graduates who applied to the family medicine residency program?
 - c. What is the total number of family medicine residents (sum across all cohorts) at the post-secondary institution?
 - d. What is the number of family medicine residents in their first year of training?
 - e. What is the number of Canadian Medical Graduates in their first year of training in the family medicine residency program?
 - f. What is the number of International Medical Graduates in their first year of training in the family medicine residency program?
 - g. How many family medicine residents graduated from their program?
 - h. Please provide the age and gender of family medicine residents at the time of their graduation?
 - i. How many family medicine residents withdrew prior to completing the family medicine residency program?

Appendix E: Supply-demand gap estimation steps and example calculations

The below steps and example calculations are based on made-up numbers and are presented for demonstration purposes.

Supply

Nurses, occupational therapists, physiotherapists, pharmacists and family physicians

Step 1: Start with the base year, for example, family physician (FP) supply (2022) by age and sex

Step 2:

- Inflow—calculate number of new entrants expected next year by age and sex
- Outflow—using historical data, calculate probability of a provider leaving the system in a given year based on age and sex

Step 3: Calculation:

$$Supply_i = Supply_{(i-1)} + Inflow_i - Outflow_{(i-1)}$$

Example:

Suppose the FP supply in 2022 was 30,000 and there were 1,500 new entrants from all paths and 250 exits. Then the supply for 2023 was calculated as:

$$Supply_{2023} = Supply_{2022} + Inflow_{2023} - Outflow_{2022}$$

$$Supply_{2023} = 30,000 + 1,500 - 250$$

$$Supply_{2023} = 31,250$$

Demand

Nurses, occupational therapists, physiotherapists and pharmacists

Step 1: Calculate the projected demand estimates workforce requirement to maintain the current employment-to-population ratio over the projection period.

$$Demand_{year\ i} = \frac{(Supply_{2022} + Vacancies_{2022})}{Population_{2022}} * Projected\ Population_{year\ i}$$

For nurse practitioners, projected demand reflects NPs needed to fill gaps in primary care access, the employment ratio is adjusted for primary care unattachment. The formula is:

$$\begin{aligned} & \text{Demand}_{\text{year } i} \\ &= \frac{(\text{Supply}_{2022} + \text{Vacancies}_{2022} + \text{Primary care nurses needed}_{2022})}{\text{Population}_{2022}} * \text{Projected Population}_{\text{year } i} \end{aligned}$$

As an example for an occupation with the employment-to-population ratio of 85 professionals per 100,000 population in 2022, the projected demand in 2029 is determined by maintaining this ratio given the projected population of 46.3 million in 2029.

$$\text{Demand}_{2029} = \left(\frac{85}{100,000} \right) * 43,600,000$$

$$\text{Demand}_{2029} = 37,060$$

Family physicians

Step 1: Calculate the workload (number of patient visits that one FTE FP can handle) for each province and territory (PT) by assuming all the demand was met at the base year (that is, $\text{Supply}_{2022} = \text{Demand}_{2022}$).

$$\text{Workload}_{PT} = \frac{\text{Total number of FP visits}_{2022,PT}}{\text{FP Supply}_{2022,PT}}$$

For example, if the total number of FP visits reported in 2022 was 8,000,000, then the FP workload was calculated as:

$$\text{Workload}_{PT} = \frac{8,000,000}{30,000} = 267 \text{ visits per physician per year}$$

Step 2: Calculate the number of people with a given disease by multiplying the disease prevalence by population projections.

$$\begin{aligned} & \text{Number of people}_{\text{age-sex-disease-PT-year}} \\ &= \text{Prevalence}_{\text{age-sex-disease-PT}} * \text{Population}_{\text{age-sex-PT-year}} \end{aligned}$$

Step 3: Calculate the number of required FP visits for those who have diseases by multiplying the number of people with a given disease (calculated in Step 2) by the annual number of visits required for each disease per patient (physician service utilization adjusted for unmet needs).

$$\begin{aligned} & \text{Required physician visits}_{\text{age-sex-disease-PT-year}} \\ &= \text{Number of people}_{\text{age-sex-disease-PT-year}} * \text{Utilization}_{\text{age-sex-PT}} \end{aligned}$$

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Step 4: Convert the demand for physician visits (calculated in Step 3) to FTE demand by dividing that by physician workload, which is the number of patient visits that 1 FTE physician can handle.

$$Demand_{PT-year} = \frac{\sum_{age-sex-disease} Required\ physician\ visits_{PT-year}}{Workload_{PT}}$$

Example:

Number of females aged between 45 to 49 with diabetes in Ontario:

$$\begin{aligned} &Number\ of\ people_{(45-49)-female-diabetes-ON} \\ &= Prevalence_{(45-49)-female-diabetes-ON} * Population_{(45-49)-female-ON} \\ &Number\ of\ people_{(45-49)-female-diabetes-ON} = 0.12 * 24,000 \\ &Number\ of\ people_{(45-49)-female-diabetes-ON} = 2,880 \end{aligned}$$

Number of required FP visits for those females aged between 45 to 49 with diabetes in Ontario:

$$\begin{aligned} &Required\ physician\ visits_{(45-49)-female-diabetes-ON} \\ &= Number\ of\ people_{(45-49)-female-diabetes-ON} * Utilization_{(45-49)-female-ON} \\ &Required\ physician\ visits_{(45-49)-female-diabetes-ON} = 2,880 * 2.14 \\ &Required\ physician\ visits_{(45-49)-female-diabetes-ON} = 6,163 \end{aligned}$$

Number of FP FTEs need to deliver 6,163 visits for females aged between 45 to 49 with diabetes in Ontario:

$$\begin{aligned} Demand_{(45-49)-female-diabetes-ON} &= \frac{Required\ physician\ visits_{(45-49)-female-diabetes-ON}}{Workload_{PT}} \\ Demand_{(45-49)-female-diabetes-ON} &= \frac{6,163}{267} = 23.1\ FTE \end{aligned}$$

The total demand was calculated by summing up all age-sex-disease-PT-specific demands.

Supply—demand gap

Calculate the gap between FP supply and demand for each year.

Appendix F: Population Change in Canada's Rural Areas

Population projections were stratified into rural and urban areas based on Statistic Canada's rural population proportion data. To capture the changes to rural population proportions over time, projections were adjusted based on historical trends.

According to Statistics Canada, urban area includes census metropolitan area (CMA) and census agglomeration area (CA). A CMA must have a total population of at least 100,000, based on data from the current Census of Population Program. A CA must have a core population of at least 10,000 also based on data from the previous Census of Population Program. Rural areas include areas located outside CMAs and CAs.

Proportion of population living in rural areas for census years 2011 and 2021

P/T	2011 rural proportion	2021 rural proportion	Rate of change
NL	0.406	0.4	-1.5%
PEI	0.533	0.54	1.3%
NS	0.434	0.411	-5.3%
NB	0.475	0.491	3.4%
QC	0.194	0.19	-2.1%
ON	0.141	0.133	-5.7%
MB	0.276	0.253	-8.3%
SK	0.332	0.317	-4.5%
AB	0.169	0.152	-10.1%
BC	0.138	0.127	-8.0%
YT	0.393	0.364	-7.4%
NWT	0.408	0.347	-15.0%
NU	0.518	0.549	6.0%

All provinces and territories except Prince Edward Island, New Brunswick and Nunavut show negative rate of change indicating that the rural population is shrinking. PT specific ten-year rate of change of the proportion of rural population was used to divide the population projections to urban and rural.

Appendix G: Disease Prevalence Growth Applied in Supply and Demand Scenario Analyses

As the base case assumes disease prevalence rates will remain constant throughout the projection, in the scenario analyses, demand was further adjusted to account for chronic illness trends or projections. Various sources were used to derive annual growth rates for the prevalence of 23 health conditions across six broad categories, as shown in the table below, and applied that on the physician demand projection model.

Annual prevalence growth rate by sex/gender used in scenario analyses

Category of health condition	Health condition	Rate of change in males	Rate of change in females	Source
Diabetes	Diabetes mellitus type I and II	0.52%	0.52%	Diabetes Canada (2020) Diabetes in Canada Background ¹⁹⁶
Musculoskeletal	Osteoarthritis	1.39%	1.29%	A comparison of three strategies to reduce the burden of osteoarthritis: A population-based microsimulation study PLOS ONE ¹⁹⁷
Cerebrovascular	Stroke	3.17%	3.17%	Older study from 2015: Prevalence of Individuals Experiencing the Effects of Stroke in Canada: Trends and Projections ¹⁹⁸
Cardiovascular	Acute myocardial infarction, shock and arrest	0.83%	0.44%	Canadian Chronic Disease Surveillance System (CCDSS) ¹⁹⁹
Cardiovascular	Coronary artery disease	0.00%	0.00%	Canadian Chronic Disease Surveillance System (CCDSS)
Cardiovascular	Heart failure	1.40%	0.11%	Canadian Chronic Disease Surveillance System (CCDSS)

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Category of health condition	Health condition	Rate of change in males	Rate of change in females	Source
Cardiovascular	Hypertension	0.24%	0.00%	Canadian Chronic Disease Surveillance System (CCDSS)
Mental illness	Bipolar disorder and manic mood disorder	1.09%	2.20%	Canadian Chronic Disease Surveillance System (CCDSS)
Mental illness	Delusional disorder (including schizophrenia)	1.63%	1.45%	Canadian Chronic Disease Surveillance System (CCDSS)
Mental illness	Neurotic, anxiety and obsessive-compulsive disorders	1.09%	2.20%	Canadian Chronic Disease Surveillance System (CCDSS)
Neurological condition	Dementia (including Alzheimer's)	3.54%	3.54%	Canadian Chronic Disease Surveillance System (CCDSS)
Cancer	Bladder cancer	2.13%	2.13%	Canadian Partnership Against Cancer (custom results) ²⁰⁰
Cancer	Brain cancer	2.55%	2.55%	Canadian Partnership Against Cancer (custom results)
Cancer	Breast cancer	2.14%	2.14%	Canadian Partnership Against Cancer (custom results)
Cancer	Cervical cancer	0.86%	0.86%	Canadian Partnership Against Cancer (custom results)
Cancer	Colorectal cancer	3.28%	3.28%	Canadian Partnership Against Cancer (custom results)
Cancer	Lung cancer	7.02%	7.02%	Canadian Partnership Against Cancer (custom results)
Cancer	Leukemia and lymphoma	3.26%	3.26%	Canadian Partnership Against Cancer (custom results)

CARING FOR CANADIANS: CANADA'S FUTURE HEALTH WORKFORCE

The Canadian Health Workforce Education, Training and Distribution Study

Category of health condition	Health condition	Rate of change in males	Rate of change in females	Source
Cancer	Oral, ear, nose and throat cancers	2.75%	2.75%	Canadian Partnership Against Cancer (custom results)
Cancer	Other unspecified primary cancer	4.26%	4.26%	Canadian Partnership Against Cancer (custom results)
Cancer	Ovarian cancer	2.03%	2.03%	Canadian Partnership Against Cancer (custom results)
Cancer	Prostate cancer	2.95%	2.95%	Canadian Partnership Against Cancer (custom results)
Cancer	Thyroid cancer	3.98%	3.98%	Canadian Partnership Against Cancer (custom results)

These rates of changes were applied on each jurisdiction, age group and sex equally to adjust the prevalence rates of the selected diseases During the projection period.

Further, these rates were also used to adjust demand for chronic conditions trends for the nurses, occupational therapists, pharmacists and physiotherapists. As the demand analysis for non-physician occupations are not defined by health conditions as is in the physician model, overall average annual growth rates of these key health conditions were used.

Overall Chronic Disease Prevalence Annual Growth Rates, by Year (%)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Growth Rates	0.00%	0.18%	0.37%	0.57%	0.77%	0.97%	1.18%	1.39%	1.61%	1.83%	2.06%	2.29%	2.52%	2.76%

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