Supporting Public Health Human Resource Planning: A Survey of Canadian Universities' Public Health Training Programs

REPORT - 2023

National Collaborating Centre for Methods and Tools
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National Collaborating Centre for Healthy Public Policy

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About the National Collaborating Centre for Healthy Public Policy

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The National Collaborating Centre for Methods and Tools (NCCMT) facilitates and scales evidence-informed decision-making in public health organizations in Canada. This is achieved by providing high-quality resources, real-world training and practical mentorship that evolves with, and responds to, the ever-changing needs of public health. The NCCMT is part of a network of six National Collaborating Centres for Public Health financed by the Public Health Agency of Canada. It is hosted by McMaster University, a leader in research and innovation in Canada.

About this report

This report was developed by the National Collaborating Centre for Healthy Public Policy (NCCHPP) and the National Collaborating Centre for Methods and Tools (NCCMT), in collaboration with the Network of Schools and Programs of Population and Public Health (NSPPPH), in response to a request from the Public Health Agency of Canada (PHAC).

This report echoes one of the priority areas for action identified by Canada's Chief Public Health Officer (CPHO) in her 2021 annual report concerning a transformed public health system in Canada in the post-COVID-19 context. The goal is to foster excellence in the public health workforce by planning a future-oriented workforce and strengthening workforce capacity (Public Health Agency of Canada [PHAC], 2021).

This report is intended to inform current discussions regarding the training capacity of Canadian universities' public health programs and the implications for public health workforce planning, while drawing attention to some activities that can strengthen Canada's public health workforce capacity.

This report first presents a short overview of initiatives implemented since the early 2000s which contributed to a better understanding of the training capacity of university-based public health programs in Canada. This is followed by brief summaries of the results of previous data collections on public health-related programs offered by Canadian universities, and a detailed presentation of the results of our data collection on the same topic, conducted from January to June 2022. This report concludes with an analysis and proposed actions to complement the current understanding of Canadian universities' public health training capacity.

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List of Acronyms

APHEA	Agency for Public Health Education Accreditation
ASPHER	The Association of Schools and Public Health in the European Region
BA	Bachelor of Arts
BAHCS	Bachelor of Arts in Health and Community Services
BASc	Bachelor of Arts and Science
BASc	Bachelor of Applied Science
BCCDC	BC Centre for Disease Control
BHP	Bachelor of Health Promotion
BHSc	Bachelor of Health Sciences
BPH	Bachelor of Public Health
BSc	Bachelor of Science
CAHME	Commission on the Accreditation of Healthcare Management Education
CaRMS	Canadian Resident Matching Service (Service canadien de jumelage des résidents)
CEPH	Council on Education for Public Health
CIHI	Canadian Institute for Health Information
CPHA	Canadian Public Health Association
CPHO	Chief Public Health Officer of Canada
DEPA	Diplôme d'études professionnelles approfondies (equivalent to DrPH)
DESS	Diplôme d'études supérieures spécialisées
DESS-PH	Diplôme d'études supérieures spécialisées en santé publique
DrPH	Doctor of Public Health (equivalent to DEPA)
F/P/T	Federal, Provincial and Territorial
INSPQ	Institut national de santé publique du Québec
MA	Master of Arts

MBA	Master of Business Administration
MHA	Master of Health Administration
MHE	Master of Health Evaluation
MHSA	Master of Health Services Administration
MHSc	Master of Health Science
MPH	Master of Public Health
MSc	Master of Science
NCC	National Collaborating Centres
NSPPPH	Network of Schools and Programs of Population and Public Health Canada
PHAC	Public Health Agency of Canada
PhD	Philosophiae Doctor or Doctor of Philosophy
PHO	Public Health Ontario
SARS	Severe Acute Respiratory Syndrome

Summary

Short overview of pan-Canadian initiatives related to public health training capacity since the early 2000s

According to information gathered, in the aftermath of the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, the National Advisory Committee on SARS and Public Health (Naylor Committee) reported that a thorough review of public health training programs was needed and that new entrants to the public health workforce would have to be appropriately qualified (Naylor & National Advisory Committee on SARS and Public Health, 2003). Following recommendations from this committee, the Pan-Canadian Public Health Network (Public Health Network), a key intergovernmental mechanism for public health collaboration was created (Pan-Canadian Public Health Network, 2008). Through its various activities, the Public Health Network Council (part of the Pan-Canadian Public Health Network) oversaw the implementation of actions recommended in the report *Building a Public Health Workforce for the 21st Century – A Pan-Canadian Framework for Public Health Human Resources Planning* (Joint Task Group on Public Health Human Resources, 2005), among which were those targeting a better understanding of public health training capacities in Canadian universities.

Before our 2022 data collection, four others were conducted on academic public health training programs: in 2005-2006 (Spasoff, 2005), 2011 (Moloughney & Lederer, 2011), 2014 (Jung et al., 2015) and in 2019 (Apatu et al., 2021). The 2005-2006 data collection presented an initial pan-Canadian portrait of the professional master's programs in public health offered by Canadian universities. The 2011 data collection characterized Master of Public Health (MPH) programs in Canada and outlined ways to improve the *Guidelines for MPH Programs in Canada*[1]. Jung et al.'s (2015) work presented data collected in 2014 from public health programs at Canadian universities at undergraduate and graduate levels, and also studied the number of students graduating from these programs. Apatu et al.'s (2021) work examined the extent to which, in 2019, MPH programs' course descriptions aligned with PHAC's *Core Competencies for Public Health in Canada*[2] (Public Health Agency of Canada [PHAC], 2008) to identify strengths and training gaps in these programs. These four rounds of data collection, of which two focused on MPH programs, showed an important changing context for academic public health training in Canada, characterized by rapid increases in the number of programs, enrollment and graduating students, and a constant diversification of programs at all three degree levels over the years.

Highlights of the 2022 data collection on public health programs offered in Canadian universities

Our 2022 data collection provides information on the location of Canadian universities offering public health programs, the types of programs and degrees they lead to, and the number of students enrolled in and graduated from these programs during the period 2017 to 2021. So, the purpose of the 2022 data collection, the detailed results of which are presented in section 4, may be seen as an initial step towards a better understanding of the current public health training capacity in Canadian universities.

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[1] The *Guidelines for MPH Programs in Canada* (2010) is a set of voluntary criteria for Master of Public Health degree programs prepared to support their development with sufficient consistency and quality to reconfigure the public health workforce in order to meet the public health systems' needs.

[2] The core competencies for public health in Canada are structured around seven categories: public health sciences; assessment and analysis; policy and program planning, implementation and evaluation; partnerships, collaboration and advocacy; diversity and inclusiveness; communication; and leadership (PHAC, 2008).

Of the 96 Canadian public universities[3], 28 were identified as offering 108 public health programs of more than 30 credits that lead to undergraduate (bachelor's), graduate (master's, PhD) and postgraduate degrees (public health and preventive medicine residency programs). Of the 108 public health programs identified, information (complete or partial) was obtained from 89 programs, for a response rate of 82%.

The 28 universities offering these programs are in 8 provinces: 12 in Ontario, 4 in Québec, 4 in British Columbia, 3 in Alberta, 1 in Saskatchewan, 1 in Manitoba, 2 in Nova Scotia and 1 in Newfoundland and Labrador. Programs identified were:

- Bachelor of Public Health-related programs were offered in 11 universities out of 28 (39%); generally only one type of bachelor's program was offered by each university;
- Master of Public Health-related programs were offered in 23 universities (82%), with some universities offering from one to three different master's degrees in public health-related programs. MPH programs were the most numerous, being offered at 19 of these 23 universities (83%);
- PhDs in public health-related programs were offered in 19 universities (68%), with some universities offering up to 3 or 4 PhD streams and 2 offering a DrPH;
- Public health and preventive medicine residency programs were offered by 14 out of 17 medical schools in Canada (82%).

Research conducted to select programs to be included suggested that:

- The supply of public health-related programs of more than 30 credits identified by the 2022 data collection underrepresents the actual supply of universities' public health training programs in 2022. Some programs whose titles did not include any of the key expressions used as selection criteria for public health programs (**Erreur ! Source du renvoi introuvable.**, e.g., public health, population health, community health, epidemiology, etc.) were not selected;
- The diversity of public health-related programs (bachelor's, master's, PhDs) has increased since 2014;
- The master's and PhD programs identified seem to be evolving towards more specialized fields of public health.

Students enrolled in 2017 and 2021, by program

There were 2846 students enrolled in the public health programs reporting in 2021, representing a 41% increase, or 821 more students enrolled, as compared to 2017 (1325). In 2021, increases in student enrollment were as follows:

- Bachelor's programs had the largest increase in student enrollment, from 469 in 2017 to 973 in 2021, an increase of 107%. The proportion of enrollees in this program to total enrollees in public health programs at all degree levels increased from 23% (469/2022) in 2017 to 34% (973/2846) in 2021;
- Master's programs had the largest number of students enrolled in 2017 (1325) and in 2021 (1594). The proportion of enrollees in master's programs to total enrollees in programs at all levels decreased from 65% (1325/2022) in 2017 to 56% (1594/2846) in 2021.

[3] See: https://www.educanada.ca/study-plan-etudes/university-universite.aspx?lang=eng#:~:text=Canada%20has%20exceptional%20quality%20and,French%20speaking%20countries%5B3%5D.

There were 1039 international students enrolled in the public health programs reporting in 2021, representing a 157% increase, or 634 more international students enrolled than in 2017 (405). In 2021, increases in international student enrollment were as follows:

- Bachelor's programs had the largest increase in the number of international student enrollees, from 185 in 2017 to 577 in 2021, an increase of 212%. The proportion of international students enrolled in bachelor's programs to total international student enrollees in all public health programs increased from 46% (185/405) in 2017 to 56% (577/1039) in 2021;
- Master's programs had the second largest increase in the number of international student enrollees, from 176 in 2017 to 401 in 2021, an increase of 128%. The proportion of international students enrolled in master's programs to total international student enrollees in all public health programs decreased from 44% (176/405) in 2017 to 39% (401/1039) in 2021.

The ratio of international students to total students enrolled in public health programs increased from 20% in 2017 to 37% in 2021:

- In 2017 and 2021, bachelor's programs had the highest proportion of international students enrolled of all programs, representing 39% and 59% of enrolled students.

Students graduating from programs in 2017 and 2020, by program

There was a 35% increase in the number of students who graduated from public health programs in 2020, with 439 more students graduating than in 2017. In 2020, graduating students were as follows:

- Bachelor's programs had a 114% increase in the number of graduates in 2020 compared to 2017, representing the highest increase in students graduated of the 3 public health program degree levels. The proportion of graduates from bachelor's programs as compared to total graduates from all levels increased from 16% (182/1252) in 2017 to 23% (389/1691) in 2020;
- Master's programs had the highest number of students graduating in 2017 (956) and in 2020 (1168). From 2017 to 2020, the number of students graduating from master's programs increased by 22%. The proportion of master's programs' graduating students to total graduating students decreased from 76% (956/1252) in 2017 to 69% (1168/1691) in 2020;
- PhD programs had a 22% increase in the number of graduates, from 98 graduating students in 2017 to 120 in 2020.

There was a 195% increase in international students graduating from public health programs in 2020 as compared to 2017, with 248 more international students graduating than in 2017. In 2020, international graduating students were as follows:

- Bachelor's programs had a 960% increase of international students graduating in 2020 compared to 2017, representing the highest rate of increase for international students graduating from the three degree levels of public health programs. The proportion of international students graduating from bachelor's programs to international students graduating from all public health programs increased from 18% (23/127) in 2017 to 65% (244/375) in 2020;
- Master's programs had the highest number of international students graduating in 2017 (90) and the second-highest number of graduates (115) after the bachelor's programs (244) in 2020. From 2017 to 2020, the number of international students graduating from master's programs increased by 28%.

The ratio of international students graduating to total graduating students increased from 10% in 2017 to 22% in 2020:

- The most significant change occurred in the bachelor's programs, where the proportion of international graduates increased from 13% in 2017 to 63% in 2020, with international students representing more than half of the 2020 graduated students;
- Ratios of international graduating students in master's programs increased slightly from 9% to 10%, while those in doctoral programs decreased slightly from 14% to 13%.

Students enrolled in 2017 and 2021, by province

In 2021, 2 provinces (New Brunswick and Prince Edward Island) and the 3 federal territories (Yukon, Northwest Territories and Nunavut) did not have universities offering public health programs.

From 2017 to 2021, the number of enrolled students in public health programs increased in 7 of the 8 provinces where the universities with public health programs are located. In four provinces, enrollment numbers increased by over 30% between 2017 and 2021:

- Nova Scotia universities had 723 students enrolled in 2021, or 248% more enrolled students than in 2017;
- Québec universities had 618 students enrolled in 2021, or 45% more enrolled students than in 2017;
- Alberta universities had 182 students enrolled in 2021, or 38% more enrolled students than in 2017; and
- A Saskatchewan university had 108 students enrolled in 2021, or 32% more enrolled students than in 2017.

In 2021, three provinces (Ontario, Québec and Nova Scotia) accounted for 78% (2225/2846) of students enrolled in public health programs. The distribution was as follows:

- Ontario universities had 31% of enrolled students, or 884 enrolled students;
- Nova Scotia universities had 25% of enrolled students, or 723 enrolled students;
- Québec universities had 22% of enrolled students or, 618 enrolled students.

In 2021, three provinces' (Nova Scotia, Saskatchewan and Québec) universities saw international students making up over 40% of enrollment in their public health programs:

- Nova Scotia universities had 529 international students enrolled, or 73% of their enrolled students were international students;
- A Saskatchewan university had 61 international students enrolled, or 56% of their enrolled students were international students;
- Québec universities had 275 international students enrolled, or 44% of their enrolled students were international students.

Students graduating from public health programs in 2017 and 2020, by province

From 2017 to 2020, the number of students graduating from public health programs increased in 5 provinces, of which three of them (Nova Scotia, Québec and Alberta) saw an increase of over 40% during that period:

- Nova Scotia universities had 215 more graduating students in 2020, or 652% more graduating students than in 2017;
- Québec universities had 133 more graduating students in 2020, or 88% more graduating students than in 2017;
- Alberta universities had 39 more graduating students in 2020, or 42% more graduating students than in 2017.

In 2020, three provinces (Ontario, Québec and Nova Scotia) accounted for 77% of graduating students:

- Ontario universities accounted for 45% of graduating students, or 756 of the 1691 graduating students and 67 more graduating students than in 2017;
- Québec universities accounted for 17% of graduating students, or 284 of the 1691 graduating students and 133 more graduating students than in 2017;
- Nova Scotia universities accounted for 15% of graduating students, or 248 of the 1691 graduating students and 215 more graduating students than in 2017.

In 2020, the percentage of international students graduating compared to total students graduating in Canadian universities located in 6 Canadian provinces ranged from 5% to 88%. In two provinces (Nova Scotia and Saskatchewan) international students made up more than 40% of all graduates:

- Nova Scotia universities had 219 graduating international students, or 88% of graduating students;
- A Saskatchewan university had 22 graduating international students, or 41% of graduating students.

The significant growth in the number of students enrolled in and graduating from public health programs reporting from 2017, 2020 and 2021, revealed a growing interest in public health programs offered by Canadian universities. This is particularly notable among international students, where the proportion of international students enrolled almost doubled, rising from 20% in 2017 to 37% in 2021, and the proportion of international students graduating more than doubled, from 10% in 2017 to 22% in 2020.

Proposed actions to complement the current understanding of Canadian universities' public health training capacity

In order to complement the information on the supply of public health-related programs offered by Canadian universities, it would be appropriate to:

- Maintain a comprehensive list of all public health academic programs offered by Canadian universities by identifying and classifying titles of all public health-related programs offered (less or more than 30 credits, continuing or professional education training programs) with a particular focus on program titles that include terms such as global health, environmental health, Indigenous health, Aboriginal health, vulnerable population health, health impact, occupational health, but

which do not contain or are not directly associated with public health, population or community health, health promotion, epidemiology, etc.

In order to better understand the diversity of undergraduate and graduate programs related to public health offered by Canadian universities, it would be appropriate to:

- Review the curricula, terms and conditions of bachelor's, master's, doctoral, medical residencies and other academic training programs related to public health that are offered by Canadian universities.

In order to learn about the employment niches of university students graduating from public health programs, it would be appropriate to:

- Continue routinely collecting data on students enrolled in and graduating from university public health programs in Canada, in order to have information on the programs and a breakdown of students by program;
- Collect data on the employment pathways of graduating students in these programs for a minimum of 5 years after graduation, using compatible methodologies.

In order to maintain a knowledge base on the composition, mix and distribution of Canadian universities' public health training capacity at the provincial and territorial levels, it would be appropriate to:

- Continue collecting data on students enrolled in and graduating from university public health programs in Canada, according to the provinces or federal territories of the universities offering these programs.

Scope of the project

In this project, we:

- Present an overview of initiatives implemented since the early 2000s which contributed to our understanding of the training capacity of university-based public health programs in Canada;
- Produce relevant, current data on the supply of public health programs offered in Canadian universities in 2022 and on students enrolled in and graduated from these programs in 2017, 2020 and 2021;
- Propose actions for collecting additional data on the supply of university public health programs to better understand public health training capacity in Canada;
- Recognize that information on academic public health training program capacity is only one of the essential components to inform workforce development planning and workforce capacity strengthening;
- Recognize that there is a need to identify the full range of questions and information to comprehensively inform public health workforce development planning and workforce capacity strengthening.

Introduction

The SARS-CoV-2 (COVID-19) pandemic has served as a reminder that strong public health systems are vital to ensuring health system sustainability, improving population health and health equity, and preparing to respond rapidly and appropriately to public health emergencies and crises along with changing population needs.

As mentioned in the Chief Public Health Officer's (CPHO) 2021 report, one of the priority areas for action towards a transformed public health system in Canada in the post-COVID-19 context is fostering excellence in the public health workforce by planning a future-oriented workforce and strengthening workforce capacity (PHAC, 2021). Reflections on how to plan the public health workforce and to strengthen its capacity from a pan-Canadian perspective are likely to grow (Commissaire à la santé et au bien-être, 2022; PHAC, 2021).

To inform these reflections, the National Collaborating Centre for Healthy Public Policy (NCCHPP) and the National Collaborating Centre for Methods and Tools (NCCMT), at the request of the Public Health Agency of Canada (PHAC) and in collaboration with the Network of Schools and Programs of Population and Public Health (NSPPPH), conducted a data collection on public health programs offered by Canadian universities. The current project may be seen as an initial step towards a better understanding of academic public health training capacity in Canada and as one component among several that would be needed to plan and strengthen the capacity of the public health workforce in Canada.

To help situate our data collection project, this report includes a short overview of past pan-Canadian initiatives aimed at contributing to a better understanding of the training capacity of public health programs offered by Canadian universities. The documents consulted identified that four prior surveys providing insights into the supply of Canadian universities' public health training programs were carried out between 2005 and 2019. As our 2022 data collection updates and complements these previous ones, we provide some of the findings from these past surveys before presenting our more recent results.

This report has five sections. The first one specifies the methodology. The second one provides a brief retrospective of key initiatives related to public health workforce planning and of university public health training programs in Canada since the early 2000s. The third section presents selected findings from the previous data collections that took place in 2005-2006, 2011, 2014 and 2019. The fourth section reports the results of our 2022 data collection related to the location of Canadian universities offering public health programs, the types of degrees they lead to, and the number of students enrolled in and graduated from those programs during the period 2017 to 2021. The final section analyzes and discusses these results and provides some proposed actions as potential next steps to continue towards a better understanding of the training capacity of public health programs in Canadian universities.

1 Methodology

This report is based on two research methods: a purposive review of literature for section 2, and a data collection for section 3.

1.1 Purposive review of literature method

The purposive review of literature had the following objectives:

1. Understand the context in which our project of documenting university-based public health programs in Canada in 2022 takes place;
2. Provide a retrospective of key initiatives related to public health workforce planning and university public health education programs in Canada since the early 2000s; and
3. Identify data collected previously on university-based public health training programs and their components since 2000.

The purposive review of literature was conducted in three successive steps:

Step 1: Consult experts and organizations (PHAC, NSPPPH) that have worked on these issues in recent years, requesting relevant reports and referrals to other experts and organizations.
45 documents were obtained.

Review these reports and identify selection criteria to extract relevant information according to our objectives. Based on the selection criteria listed in table 1, 15 of the 45 documents obtained were selected.

Table 1 Criteria for selecting reports

	Selection criteria	
	Inclusion	**Exclusion**
Topics	University-based public health training degree programs in Canada Public health human resources and workforce Public health workforce capacity and skills	Non-academic public health professional education programs
Languages	English or French	Other than English or French
Date of publication	Published since 2000	Published before 2000

Step 2: Search for new sources of information based on the selection criteria outlined in table 1 and in the bibliographic references of the documents consulted in Step 1. The search was done using Google and Google Scholar. The tables of contents and the first pages (or results) of the documents consulted were reviewed.

Forty-seven references of potential interest were identified at this stage, of which ten were included based on the criteria after fully reviewing the texts.

Step 3: Extract relevant information from the documents selected in Step 1 (15 documents) and in Step 2 (10 documents) regarding events, activities and milestones related to:

1. The prevailing context during the years 2000 to 2021 in terms of university public health training programs offered in Canada, and the public health workforce and human resources when related to public health training in Canada; and
2. Data collected on public health training programs in Canadian universities during the period 2000 to 2021.

Limitations

Some findings discussed in sections 2 and 3 of this report may be incomplete, for the following reasons:

- Some potentially relevant documents were unavailable because they were produced by third parties for internal use only or were never archived. It was not possible to follow a fully systematic approach.
- It was not possible to triangulate all of the relevant information retained for analysis and writing.

In order to minimize the potential effects of these limitations on the description of the contexts discussed in sections 2 and 3, both were reviewed by experts who participated in the process.

1.2 Data collection method

We first present the objectives of this data collection before outlining the methodological details.

Data were collected on public health-related degree programs offered by Canadian universities. The data collection took place from January to June 2022, and its aims were to:

- Quantify the current public health programs in Canadian universities and outline the programs' characteristics, including degrees conferred, areas of specialization, duration of programs, languages of instruction, whether part-time options were available, whether a practicum was required or an option, which organizations offered practicum opportunities for students, whether a thesis/dissertation or major paper was required or an option, whether a capstone was required or an option, and whether the program was accredited and by whom (Association of Schools and Public Health in the European Region [ASPHER], Agency for Public Health Education Accreditation [APHEA], Council on Education for Public Health [CEPH], etc.).
- Describe the student profile in 2017 and in 2021. These dates were chosen in order to examine any changes in the programs over a 4-year period while also excluding admissions for 2020 to minimize any bias resulting from the COVID-19 pandemic. Some of the data collected regarding the student profile included: the number of accepted and registered (new enrollees) students in these programs in 2017 and 2021, the number of students graduating from these programs in 2017 and 2020 (with 2020 being the most recent year for which complete statistics may have been available at the time of data collection in early 2022), the number of international students registered as a subset of all students registered, the number of international students graduated as a subset of all students graduated, and the percentage of eligible students who completed the program. Information relating to the subsequent employment of graduates was obtained when possible.
- Create a portrait of university public health programs in Canada and examine recent trends in the development of these programs.

To create the list of relevant academic public health programs in Canada, pre-existing lists compiled by different organizations were combined. These lists included:

- Distribution lists to public health programs used in previous data collections (Apatu et al., 2021; Jung et al., 2015; Moloughney & Lederer, 2011).
- Previous extraction forms compiling a list of Canadian Master of Public Health (MPH) programs[4] (Luddington & Papadopoulos, 2019).
- The PHAC's webpage entitled 'Educational Programs in Public Health' (https://www.canada.ca/en/public-health/services/public-health-practice/educational-programs-public-health.html).
- The website universitystudy.ca (https://www.universitystudy.ca/search-programs/).
- The website of the Canadian Resident Matching Service (CaRMS) (https://www.carms.ca/).

We completed the search using Google, combining the terms "Academic", "University", "Public Health Programs", "Canada", and the names of the provinces and territories.

Once a public health program belonging to a Canadian university was found, we used the inclusion and exclusion criteria presented in table 2 to select programs to be included in the list. In the end, across Canada, 108 relevant public health-related programs were identified.

Table 2 Selection criteria for public health programs

	Selection criteria	
	Inclusion	**Exclusion**
Topics	Any university programs with "public health" in the title (e.g., Bachelor of Public Health, Master of Public Health, PhD in Public Health, public health and preventive medicine residency). Public health programs labelled with or in combination with related programs including epidemiology, health promotion, community or population health. Programs closely related to public health (e.g., occupational health, social dimensions of health, Indigenous health, health evaluation, health sciences) were included after a case-by-case assessment.	Programs in health administration, health informatics, biostatistics (unless also in epidemiology), in the title.
Other characteristics	Programs offered by Canadian universities and granting a degree of more than 30 credits and 1-year minimum program duration. Undergraduate, graduate, or postgraduate medicine residency programs.	Any type of educational institution other than a Canadian university or Canadian school of public health.
Languages	English or French	Other than English or French
Date of launch	Programs launched before September 2021	Programs launched after September 2021
Country	Canada	Other than Canada

[4] List created for *Master of Public Health Program Summary (2019): Unpublished data collected* by Justice Luddington and Andrew Papadopoulos, University of Guelph.

While preparing the list of relevant public health programs offered by Canadian universities and the data entry questionnaire related to these programs, members of the NSPPPH helped to guide the project and define the fields to be collected.

A standardized data extraction form was created. Program websites were consulted to populate the form with any publicly available data. Then, each program lead was emailed a copy of the extraction form, adjusted to include only the subset of public health-related programs at their institution, populated with the program website data available, with the request that they validate and complete the form.

Outreach to public health-related programs began in January 2022. In order to improve the response rate, from two to seven data collection reminders were sent out from February to May via email and phone. As well, the NSPPPH was consulted on ways to improve the response rate.

Two weeks before the collection closed, a final reminder was sent to universities that had not yet responded. The reminder message included selected tables showing the gaps to which they were being asked to respond.

Data collection ended in the second week of June 2022 with a response rate of 82%, or 89 public health programs out of the 108 identified.

Data were checked for inconsistent data and cleaned. If necessary, respondents were contacted to help us revise or clarify data. Programs were grouped by variables such as degree conferred (e.g., MPH, MSc, PhD), number of students enrolled or graduated, Canadian or international students. An Excel spreadsheet was used to create sums, differences, percentage changes and to prepare descriptive statistical tables in order to proceed with the analysis.

The data collected on the 89 programs were classified into two categories:

1. The data that could be combined across programs. The data collected in this group include the province in which the university offering the programs is located, the name of the university, the types of programs offered, the number of students enrolled in and graduated from programs, and the number of international students enrolled in and graduated from programs.
2. The data that could not be combined across programs. In this case, this pertains to data, sometimes incomplete, involving interpretation, substitution, or conversion to a common scale, and the need to carry out additional validation requiring interviews with the program leads. These data mainly concern the terms and conditions of these programs such as: duration of the program, whether a part-time option was available, whether a practicum was required or an option, the names of organizations where students complete a practicum, whether a thesis/dissertation or major paper was required or an option, whether a capstone was required or an option, and whether the program was accredited and by whom (Association of Schools and Public Health in the European Region [ASPHER], Agency for Public Health Education Accreditation [APHEA], Council on Education for Public Health [CEPH], etc.).

Table 3 briefly presents these two categories, of which only the first was analyzed in this report (sections 4 and 5). A table with some variables related to terms and conditions of the programs that are not analyzed in this report (e.g., duration of the program, part-time option available, practicum required, practicum duration), has been appended to this report (table 39).

Table 3 Types of Information collected by whether or not analyzed in the report

Data collected	
Analyzed in the report	**Not analyzed in the report**
Program profile: Province of affiliation of the university offering the programs, name of the university offering the programs, types of programs offered based on the degree obtained. Student profile: Number of enrolled students in the programs in 2017 and 2021, number of students graduating from the programs in 2017 and 2020. Number of enrolled international students in the programs in 2017 and 2021, number of international students graduating from the programs in 2017 and 2020.	Duration of the program, part-time option available, practicum required or optional. Organizations where students may complete a practicum. Whether a thesis/dissertation or major paper was required or an option. Whether a capstone was required or an option. Whether the program was accredited and by whom. Employment of the graduates.

The data collection was conducted in 2022, but the data collected presented in this document could refer to the year 2022 (when data relate to program offerings) or to the years 2017, 2020 or 2021 (when data concern enrolled or graduated students).

Limitations:

- Availability and validity of university website data;
- Uncertainty about the quality of programs leads' validation of data from websites;
- Missing data for some variables limiting the potential for analysis;
- Programs with public health content may be underestimated in our results. Programs without 'public health' or related terms in their program titles were excluded (e.g., in a university-level institute of technology that offers environmental health programs to train public health inspectors[5]);
- Limited resources involved in this project did not allow for individual interviews and other methods that would have helped with missing data or with those needing clarification.

[5] See: https://www.bcit.ca/programs/environmental-health-public-health-inspection-bachelor-of-technology-full-time-8500dbtech/.

2 Public health workforce planning initiatives from 2000 to 2005

Sections 2 and 3 are based on the information collected by the purposive review of literature. This section provides a brief retrospective of key initiatives related to public health workforce planning and of university public health training programs in Canada since the early 2000s.

Until the end of the 1990s, the focus of most of the studies about public health-related human resources in Canada was on the human resources necessary to meet the needs of the health care system. This changed in the early 2000s, when reports began mentioning specific concerns about public health human resources. According to Spasoff (2005), the *Survey of Public Health Capacity in Canada* (Advisory Committee on Population Health, 2001, as cited in Spasoff, 2005) which assessed the ability of Canadian public health services to adequately fulfil their mandates for carrying out the essential public health functions, expressed concerns about the system's capacity to respond to ongoing and emerging public health issues and urgent threats to health. The main findings of this survey highlighted that Canadian public health systems were facing an aging workforce, unfilled positions in Indigenous and rural communities, deficient skills for developing new insights and innovative solutions and for evaluating the effectiveness of public health services, and inadequate continuing education opportunities (Advisory Committee on Population Health, 2001, as cited in Spasoff, 2005).

From 2001, and especially in the aftermath of SARS in 2003, many reports focusing on public health human resources identified systemic deficiencies related to human resources and particularly workforce capacity. As formal academic education has an important part to play in building public health workforce capacity across the country, the following years saw many projects and activities being set up to better understand academic public health training program availability in Canada, and to determine the extent to which these programs adequately addressed the needs of public health in Canada.

2.1 Need for public health human workforce planning in Canada since the SARS outbreak

In the fall of 2003, the report of the National Advisory Committee on Severe Acute Respiratory Syndrome (SARS) and Public Health, known as the Naylor report (Naylor & National Advisory Committee on SARS and Public Health, 2003), provided information on the circumstances surrounding the outbreak of SARS in Canada during the first quarter of 2003. The committee pointed out the weaknesses in public health infrastructure across Canada and the disparities in capacity from one province to the next in human resources for public health and growing recruitment/retention difficulties of the public health workforce (Naylor & National Advisory Committee on SARS and Public Health, 2003).

The Naylor report noted that even though data on public health nurses and public health inspectors (the two largest groups of public health professionals in Canada at the time) and on physicians working in public health had been collected for some years, no representative data on that workforce could be extracted. The report also mentioned that the public health workforce was poorly defined and that for all other public health workers, data were sparse, outdated or had not been collected. What was known about this workforce is that it was highly multidisciplinary and variable geographically, that professional qualifications were not well standardized, and that many public health workers had overlapping competencies or lacked appropriate educational qualifications.

According to the Naylor Report, the paucity of reliable data in 2003 on the public health workforce illustrated that insufficient attention had been paid to the state of public health human resources in Canada. This lack of data did not allow for the assessment of the extent to which the composition and distribution of the human workforce affected the application of core public health functions (Naylor & National Advisory Committee on SARS and Public Health, 2003). It also precluded forecasting and planning for public health human resources in Canada. The committee also reported that a thorough review of public health training programs was needed and that new entrants to the workforce would have to be appropriately qualified (Naylor & National Advisory Committee on SARS and Public Health, 2003).

The committee recommended setting up a national strategy for the renewal of public health human resources based on a partnership involving federal, provincial and territorial governments, academic stakeholders, institutional partners and professionals (Naylor & National Advisory Committee on SARS and Public Health, 2003).

2.2 Pan-Canadian public health workforce planning initiatives launched in 2004 and 2005

According to Spasoff (2005), in 2004, a pan-Canadian public health education initiative sponsored by Health Canada's Centre for Surveillance Coordination led to three regional workshops that set out "… to develop a vision for education of the public health workforce, identify current assets and barriers, and identify strategies and actions needed to realize the vision" (Spasoff, 2005, p. 7). The author also mentioned that "[t]he workshops stated the importance of defining competencies for various levels of public health workers, the importance of developing open and attractive career paths, and the need for more comprehensive educational programs than currently available" (Spasoff, 2005, p. 7). Among the needs identified by the participants were: better information on available educational opportunities, continuing education programs, and the recruitment of high school and university students into public health (Spasoff, 2005).

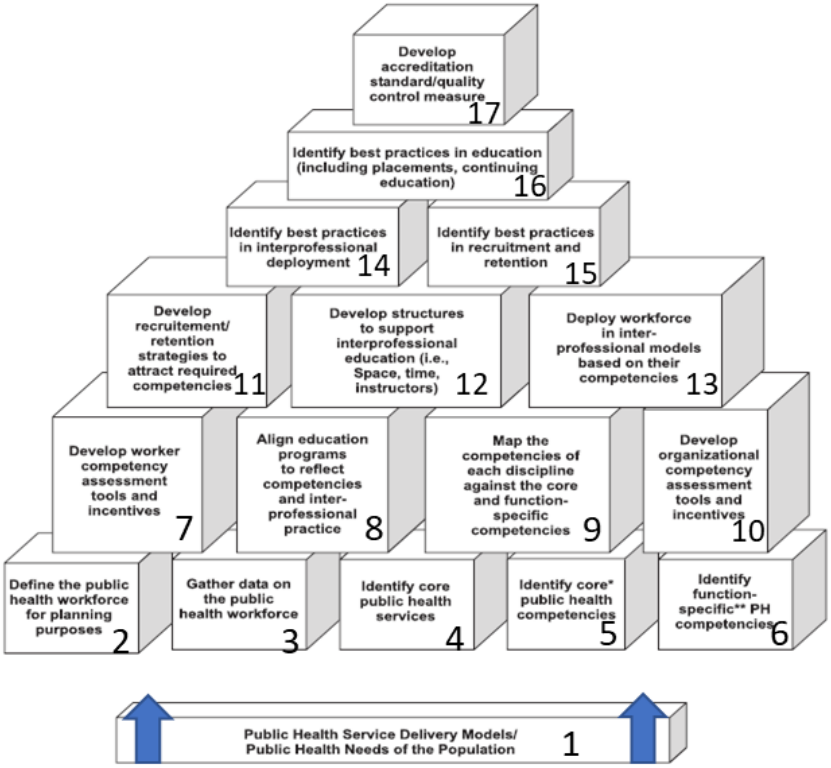
As early as 2005, the priorities and the workplan of the Pan-Canadian Public Health Network (Public Health Network), a key intergovernmental mechanism for public health collaboration created in the aftermath of the SARS outbreak, included a continued emphasis on building public health infrastructure and organizations across Canada (Pan-Canadian Public Health Network, 2008). The Public Health Network Council (part of the Pan-Canadian Public Health Network) had to oversee, among other things, the implementation of some recommendations from the report entitled *Building a Public Health Workforce for the 21st Century – A Pan-Canadian Framework for Public Health Human Resources Planning* (Planning Framework) (Joint Task Group on Public Health Human Resources, 2005), produced by the Joint Task Group on Public Health Human Resources[6] (Joint Task Group).

According to the Joint Task Group's (2005) report, the planning framework reflected the types of collaboration needed to develop the public health workforce of the 21st century. The planning framework, which was consistent with a broader, collaborative, public health human resources action plan, gave the structure for several projects regarding public health human resources and training capacity that ensued over the years 2005-2019.

[6] In 2005, the Joint Task Group on Public Health Human Resources was composed of the Advisory Committee on Health Delivery & Human Resources (ACHDHR), the Advisory Committee on Population Health and Health Security (ACPHHS) and the F/P/T Strengthening Public Health System Infrastructure Task Group (Joint Task Group on Public Health Human Resources, 2005).

The planning framework was composed of 17 building blocks, using a population health needs-based analysis (figure 1, block 1), which is one of the 6 blocks providing the foundation of the framework (figure 1, blocks 1 to 6). It focused on the skills and competencies required to perform public health functions. According to the planning framework, each building block had to be activated concurrently to achieve an effective public health sector (figure 1) (Joint Task Group on Public Health Human Resources, 2005).

Figure 1 Pan-Canadian Framework for Public Health Human Resources Planning



Note*: Core competencies refer to those competencies required by all public health workers (PHAC, 2008).

Note 2**: Function-specific competencies include those required to perform certain public health functions, including those specific to the scopes of practice of certain regulated health professions or disciplines.

Source: adapted from Joint Task Group on Public Health Human Resources, 2005, p. 12.

The planning framework had four goals:

1. "To increase all jurisdictions' capacity to plan for the optimal number, mix and distribution of public health skills and workers.
2. To develop an interprofessional public health workforce with the skills and competencies to fulfill public health functions and meet population health needs at the local, provincial, national and international levels.
3. To enhance all jurisdictions' capacity to achieve the appropriate mix of public health workers and deploy them in interprofessional, population and client-centred service models that make full use of their skills and competencies.
4. To enhance all jurisdictions' capacity to recruit and retain Public Health providers and maintain a stable, affordable public health workforce in healthy, safe work environments."

(Joint Task Group on Public Health Human Resources, 2005, p. 10)

The Joint Task Group identified preliminary strategies articulated around these four goals. Each strategy had many diverse activities to pursue – over the short-, medium- and long-term – to activate the building blocks of the planning framework. Many activities of the planning framework undertaken after 2005 included successive overviews to better characterize the public health workforce and training programs offered in Canadian universities.

This current report is aligned with strategy 2.2. of goal 2 aiming to "[d]evelop a better understanding of the Public Health education system and how it can support PHHR [public health human resources] planning" (Joint Task Group on Public Health Human Resources, 2005, p. 17, strategy 2.2). Our data collection is in continuity with one activity of strategy 2.2, which states: "[e]nsure the minimum dataset for education capacity (CIHI) includes public health programs and provides regular reports on the production capacity of public health education programs and the public health educator workforce" (Joint Task Group on Public Health Human Resources, 2005, p. 17, strategy 2.2).

Anticipating an eventual transition out of the acute phase of the current COVID-19 pandemic, this report was produced in order to contribute an essential component to the reviews and activities to come with regards to Canada's public health training capacity, workforce planning, and workforce capacity more generally.

According to the knowledge gathered in the purposive review of literature, four prior data collections have taken place relating to academic training that are relevant to strategy 2.2 of the planning framework. The present data collection can be positioned as the fifth. The previous four data collection projects were undertaken to provide datasets of academic public health programs and student enrollment during the years 2005 to 2019. The following section provides an overview of the main findings from these four prior data collections.

3 Overview of data collections on public health programs offered by Canadian universities conducted from 2005 to 2019

A look back reveals that, a half-century ago, the supply of university public health programs was very low. According to Massé & Moloughney (2011), up until the early 1970s, only two schools of public health or hygiene existed in Canada: one was established at the University of Toronto (1927-1975) and the other was at the Université de Montréal (1945-1975). They were both closed in the mid-1970s and integrated into their respective faculties of medicine. Then, limited options were offered for graduate training in public health. In the mid-1970s, community medicine was recognized as a speciality by the Royal College of Physicians and Surgeons of Canada, but some trainees were still obliged to further their academic training in basic public health sciences elsewhere, whether in the United States or overseas (Massé & Moloughney, 2011). A look back in time also shows us that, from 1975 to 2005, no data collection on public health training offered in Canadian universities was undertaken.

From 2005 to 2019, the four data collections conducted on academic public health training programs (2005-2006, 2011, 2014 and 2019), provided progressively more detail, contributing to a better understanding of academic public health training systems. Although incomplete and partial, the data collected over this period showed an important contextual change for academic public health training in Canada: the number of programs, enrollment and graduated students increased rapidly, and those same years saw considerable diversification of programs at all three degree levels. The main results of these data collections are presented briefly in the following paragraphs.

3.1 2005-2006 data collection

According to the report prepared by Spasoff (2005), some formal public health educational programs at the time were at the undergraduate level, while most programs were at the graduate level. His report presents the results of a two-stage survey conducted in 2005-2006 that was focused solely on professional Master of Public Health programs (representing the master's in health sciences and other applied public health master's-level programs). The survey showed that these professional programs were primarily course-oriented programs that included a practicum aimed at preparing graduates for public health practice.

Spasoff's report shows that until the mid-1970s, there were only two professional Master of Public Health programs in Canada, a Master of Health Science at the University of Toronto, and a Master of Community Health at the Université de Montréal. From the late 1970s to 2005, the offering of public health programs increased from 2 to 8. According to Spasoff (2005), the context greatly changed between 2005 and 2006, since the supply went from 8 in 2005 to 14 in 2006. A total of 342 students were admitted to these academic programs in 2006, of which 214 (63%) were at Ontario universities. Table 4 shows the increase in the number of professional public health programs and students admitted during the years 1975 to 2006.

Table 4 **Number of professional Master of Public Health programs and students admitted per year in Canada, by province and region, 1975-2006**

Year	Number of professional Master of Public Health programs and students admitted per year in Canada, by province and region, 1975-2006											
	Atlantic		Québec		Ontario		Prairies		British Columbia		Total	
	Prog.	Students admitted	Prog.	Students admitted	Prog.	Students admitted	Prog.	Students admitted	Prog.	Students admitted	Prog.	Students admitted
1975	-	-	-	-	1	-	-	-	-	-	1	-
1976	-	-	1	-	1	-	-	-	-	-	2	-
1978	-	-	1	-	1	-	-	-	-	-	2	-
1984	-	-	1	-	2	-	-	-	-	-	3	-
1994	-	-	1	-	3	-	-	-	-	-	4	-
1996	-	-	1	33	3	104	1	20	-	-	5	**157**
2002	-	-	1	33	4	154	1	20	-	-	6	**207**
2005	-	-	1	33	4	154	2	40	1	30	8	**257**
2006	1	20	2	33	6	214	4	45	1	30	14	**342**
Unknown	-	-	1		-	-	-		1		2	
Total	1		3		6		4		2		16	

Note*: Because these two programs were already underway, the date of the first student intake was unknown.

Source of data: Spasoff, 2005.

According to Spasoff (2005), in 2005-2006:

- Professional Master of Public Health programs were not standardized (no uniform core curricula, with little guidance available for the universities offering these programs), so it was impossible to say whether they were covering basic public health functions.
- Only one professional Master of Public Health program (Université de Montréal) was accredited by the Council on Education in Public Health (CEPH), making it the first CEPH-accredited MPH in Canada[7].
- In many faculties, such as nursing, medicine, social or environmental sciences, students did not receive specific training in public health (i.e., their courses were not focused on public health), and a focus on the 'public health' side of health care education was often lacking.
- There was nothing called a "school of public health"[8]. Two universities, the Université de Montréal and the University of Toronto, had departments that possessed most of the characteristics of such a school, and two others, the University of Alberta and the University of Manitoba, were considering developing one.

3.2 2011 data collection

The 2011 information-gathering survey aimed to identify the composition of university Master of Public Health program (MPH) offerings and how they aligned with the *Guidelines for MPH Programs in Canada*[9] (*Guidelines*) (Moloughney & Lederer, 2011; Public Health Agency of Canada [PHAC], 2010). According to the guidelines, "[t]he acronym 'MPH' includes other master's degrees in the Canadian context (e.g. MHSc, MHA, MHSA, MHS, MSPH, MSc) whose programs: focus on preparing individuals for public health practice in a community setting; and meet the MPH Program Guidelines' criteria with respect to program organization, content and capacity" (PHAC, 2010, sections: Introduction, Background). Some of the results of this data collection are presented below as they relate to MPH programs or students.

The results of the 2011 data collection indicated that most MPH programs were using the guidelines and found them useful. The use of these guidelines was associated with the development of key program characteristics such as program content, the use of the two broad categories specialized[10] or generalist[11], the duration of full-time study, the presence of practicum components, and the responsibilities of MPH program actors (Moloughney & Lederer, 2011; PHAC, 2010).

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7 See: https://admission.umontreal.ca/programmes/maitrise-en-sante-publique/.

8 As specified by Massé & Moloughney (2011), "[a]mong Canadian universities, the term 'school' is used to refer to academic units of varying size and organizational level within university structures: a department, a sector or many departments under the authority of a faculty or even an independent school" (Massé & Moloughney, 2011, p. 282).

9 The Guidelines for MPH Programs in Canada (2010) sets out voluntary criteria for Master of Public Health degree programs prepared to support their development with sufficient consistency and quality to reconfigure the public health workforce in order to meet the system's needs. According to the Guidelines for MPH in Canada (2010) the acronym "MPH" includes other master's degrees in the Canadian context: Master of Health Administration (MHA), Master of Health Science (MHSc), Master of Science (MSc), Master of Health Services Administration (MHSA), Master of Health Science (MHS), Master of Science Public Health (MSPH).

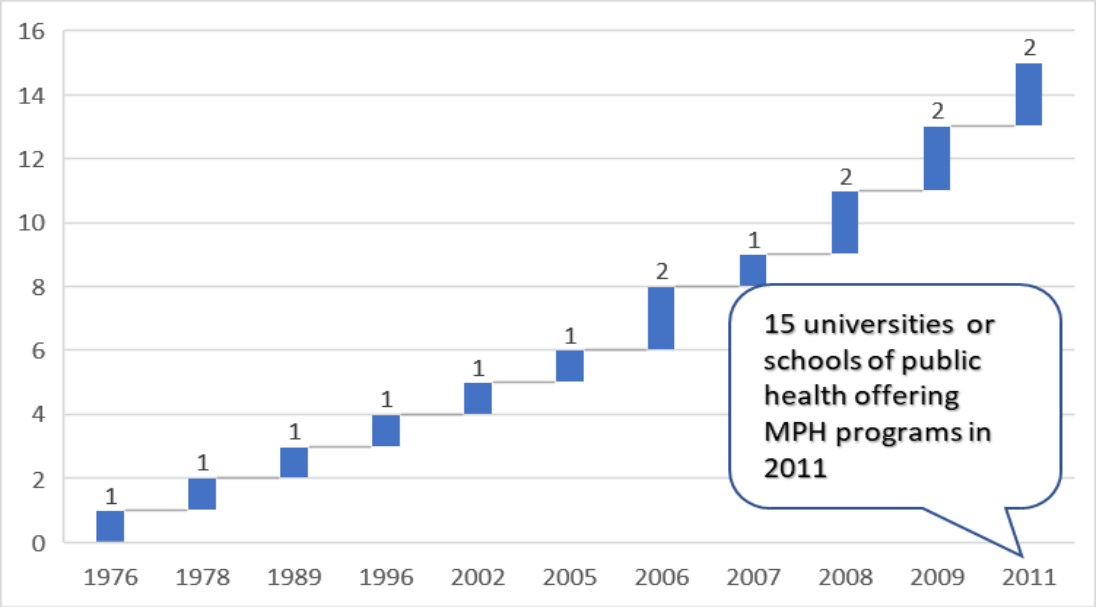
10 As indicated in the Guidelines for MPH in Canada, "Specialized MPH offers one or more courses of study in selected areas of basic public health knowledge or closely related areas, sufficient to constitute an area of specialization. For example, a specialized MPH program may focus on areas such as health promotion, community nutrition, communicable disease control or applied epidemiology" (PHAC, 2010, sec. Introduction, Vision).

11 As indicated in the Guidelines for MPH in Canada, "Generalist MPH offers a course of study to provide the student with a sound academic background in order to practise competently as a generalist in public health" (PHAC, 2010, sec. Introduction, Vision).

According to that survey, in 2011, 15 Canadian universities were offering MPH and master's-type degree programs in public health, and among these, three were also providing public health-focused undergraduate degree programs. According to Moloughney & Lederer (2011), two thirds of respondents (10/15) had MPH program launch dates during or after 2005.

A timeline of the evolution of the number of universities offering MPH programs during the period 1976 to 2011, developed from data collected by Moloughney & Lederer (2011), reveals steady growth, from only one university offering this program in 1976, to 15 in 2011[12].

Figure 2 New and cumulative number of Canadian universities offering MPH programs from 1976 to 2011



Sources of data: Moloughney & Lederer, 2011; Spasoff, 2005.

According to Moloughney & Lederer (2011) and Massé & Moloughney (2011), some universities – including schools of public health – were accredited or were seeking accreditation from CEPH or from the Commission on the Accreditation of Healthcare Management Education (CAHME), and most were offering graduate-level training, including e-learning and continuous professional development.

Table 5 shows that in 2011, the MPH programs offered were specialized (4/15), generalist (6/15) or both (5/15), and that they all offered a practicum (Massé & Moloughney, 2011). These programs were available in a wide variety of areas of focus or concentration: epidemiology and biostatistics; occupational and environmental health; maternal child health; global and Indigenous health; health services and policy; social and life course determinants of health; public health and emerging threats; social inequities and health; health policy and management; health promotion; public health leadership; nursing; community nutrition; family and community medicine, etc. (Moloughney & Lederer, 2011).

[12] It should be noted that a difference was found between the number of MPH programs identified in the 2005-2006 data collection (Spasoff, 2005) (table 4, year 2006, 14 programs) and the number of universities offering MPH programs identified in the 2011 data collection (Moloughney & Lederer, 2011) (figure 1, year 2006, 8 programs).

Table 5 MPH programs in Canadian universities in 2011, by type

Canadian universities	Type of MPH program(s)	
	Generalist	Specialized
1 - University of Victoria	✓	
2 - University of British Columbia		✓
3 - Simon Fraser University	✓	✓
4 - University of Alberta		✓
5 - University of Saskatchewan	✓	
6 - University of Manitoba	✓	
7 - University of Waterloo	✓	✓
8 - University of Guelph	✓	
9 - University of Toronto		✓
10 - Lakehead University	✓	✓
11 - Queen's University	✓	
12 - Université de Montréal*	✓	
13 - McGill University**	✓	✓
14 - Université Laval*		✓
15 - Memorial University	✓	✓

Note: MPH identified as *Maîtrise en santé communautaire;
**Master of Science in Public Health.
Sources of data: Massé & Moloughney, 2011; Moloughney & Lederer, 2011.

Enrollment for 13 MPH programs[13] totalled 1017 in 2009-10 and 1237 in 2010-11. These programs also saw a total of 366 graduates in 2009-10 (table 6). When comparing data collected by Spasoff (2005) and Moloughney & Lederer (2011), one can see a notable increase in the number of students enrolled in public health academic programs, from 257 in 2005 (table 4) to 1237 in 2010-11 (table 6). As mentioned by Moloughney and Lederer, the gap between students enrolled and graduating numbers reflected a combination of factors such as full-and part-time students, typical program duration of 4 to 5 semesters, increasing enrollment trends, and graduation rates of less than 100% (Moloughney & Lederer, 2011, p. 14).

[13] Programs at the University of Victoria and McGill University were launched after the release of the survey, and they were thus not included.

Table 6 Student enrollment in and graduation from MPH programs, 2009-2011

Canadian universities	Number of students and graduates in MPH programs		
	2009-10 enrollment	2010-11 enrollment	2009-10 graduates
1 – University of British Columbia	35	36	34
2 – Simon Fraser University	130	130	35
3 – University of Alberta	204	251	35
4 – University of Saskatchewan	29	92	12
5 – University of Manitoba	10	10	4
6 – University of Waterloo	149	172	41
7 – University of Guelph	25	37	8
8 – University of Toronto	232	277	93
9 – Lakehead University	111	105	34
10 – Queen's University	10	16	10
11 – Université de Montréal	47	62	32
12 – Université Laval	20	35	18
13 – Memorial University	15	14	10
TOTAL	**1,017**	**1,237**	**366**

Note: Enrollment and graduation totals include full- and part-time students, as well as multiple MPH streams.
Source of data: Moloughney & Lederer, 2011.

From 2005 to 2011, several universities across Canada established new schools of public health. According to Massé & Moloughney (2011), many of these Canadian schools of public health reflected the transition from long-standing public health-related departments (for example, public health as a specialty within a medical school) toward a dedicated school of public health, with different levels of governance and autonomy within their respective universities. Massé & Moloughney (2011) mentioned that there was considerable heterogeneity in the levels and types of degrees offered by these schools of public health. While most offered master's- and doctoral-level degrees, only 2 had bachelor-level degrees.

Table 7 Degrees offered by schools of public health in Canada, 2011

University	School	Degrees offered
University of Victoria	1-School of Public Health and Social Policy	Bachelor of Arts in Health and Community Services (BAHCS); Master of Public Health (MPH)
University of British Columbia	2-School of Population and Public Health	Master of Health Administration (MHA); Master of Health science (MHSc); MPH; Master of Science (MSc); Philosophiae Doctor (PhD)
University of Alberta	3-School of Public Health	MPH; MSc; PhD
University of Saskatchewan	4-School of Public Health	MSc; MPH; PhD
Ryerson University (now Toronto Metropolitan University)	5-School of Occupational and Public Health	Bachelor of Applied Science (BASc)
University of Toronto	6-Dalla Lana School of Public Health	MPH (replaced MHSc); MSc; Master of Science in Community Health; PhD
Université de Montréal	7-School of Public Health	MSc with a thesis or with practicum; PhD

Source of data: Massé & Moloughney, 2011.

According to Spasoff (2005), until the early 2000s, most public health professional undergraduate programs were discipline-specific (e.g., public health nurses were trained with other nurses, separately from other public health workers) and there were no generic undergraduate public health programs. From 2005, some universities – Ryerson University (now Toronto Metropolitan University) and Brock University in Ontario, and the University of Lethbridge in Alberta – began offering public health-focused undergraduate degree programs (Massé & Moloughney, 2011; Moloughney & Lederer, 2011). Massé & Moloughney (2011) also pointed out that, compared to graduate-level public health programs, little discussion had occurred regarding undergraduate programs and their relation to system needs, training paths and competencies.

According to Moloughney & Lederer (2011), even though data collected over the 2005 to 2011 period showed a rapid increase in the supply of public health programs and of MPH graduates, they found no evidence that this increase met the needs or demands of the public health system.

3.3 2014 data collection

In 2014, Jung & al. conducted a data collection aimed to identify public health programs – graduate and undergraduate – in Canadian universities and the number of students graduating from these programs. Unlike the 2011 survey (Moloughney & Lederer, 2011), this study looked at all public health-related programs in Canadian universities, and not just the MPH programs (Jung et al., 2015). The following two subsections present a summary of the results of this survey.

3.3.1 Public health programs

As data were collected according to the faculties offering programs (e.g., faculties of medicine, schools of public health) it was possible to have more than one faculty per university offering public health programs. In 2014, 36 faculties in 32 universities (out of 93 universities in Canada) were identified as offering public health-related programs (Jung et al., 2015).

In 2014, the province of Ontario had the highest number of faculties offering public health-related programs (17/36), while there were none in Prince Edward Island, New Brunswick, or the Yukon, Northwest Territories and Nunavut. Three provinces, Ontario (17/36), British Columbia (5/36) and Québec (3/36) together made up about 70% (25/36) of all faculties offering public health-related programs in Canada (table 8).

Table 8 Number of Canadian universities offering public health-related programs in 2014

Province/Territory	Number of universities offering public health-related programs (faculties)	
	Number	%
British Columbia	5 (5)	15% (14%)
Alberta	4 (4)	12% (11%)
Saskatchewan	2 (2)	6% (6%)
Manitoba	1 (1)	3% (3%)
Ontario	14 (17)	43% (47%)
Québec	3 (3)	9% (8%)
Newfoundland and Labrador	1 (1)	3% (3%)
Prince Edward Island	-	
New Brunswick	-	
Nova Scotia	2 (3)	6% (8%)
Yukon	-	
Northwest Territories	-	
Nunavut	-	
Total	32 (36)	100% (100%)

Source of data: Jung et al., 2015.

As mentioned above, in the early 2000s, certain faculties (medicine, hygiene) offered public health training as subspecialties (Spasoff, 2005). According to Jung et al. (2015), in the decade from 2005 to 2014, public health education in Canadian universities was transformed from a subspecialty to a distinct academic discipline. The creation of schools of public health over these years (from 0 in 2005 to 9 in 2014) showed the integration of various faculty-based programs into these new academic units (Jung et al., 2015). The schools of public health identified by Jung et al. (2015) include both self-declared schools and those accredited by CEPH (e.g., Université de Montréal).

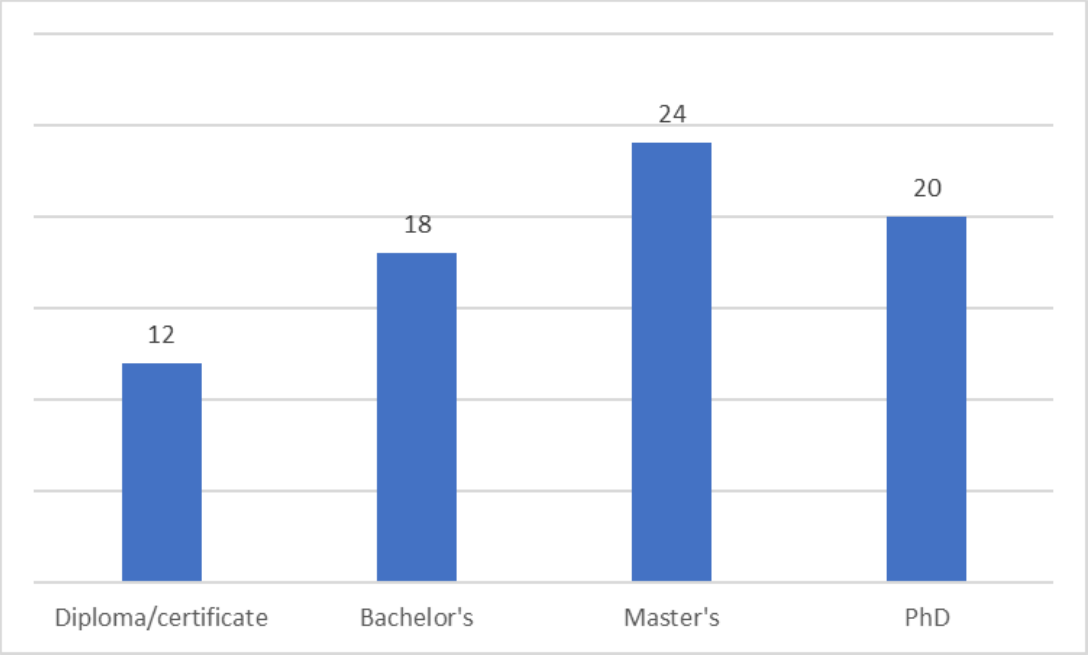
Table 9 Schools of public health in Canada, 2005, 2011 and 2014

2005
None
2011 (7 Schools)
1 - School of Public Health and Social Policy (University of Victoria, B.C.)
2 - School of Population and Public Health (University of British Columbia, B.C.)
3 - School of Public Health (University of Alberta, Alta.)
4 - School of Public Health (University of Saskatchewan, Sask.)
5 - School of Occupational and Public Health (Ryerson University, Ont. now Toronto Metropolitan University)
6 - Dalla Lana School of Public Health (University of Toronto, Ont.)
7 - School of Public Health (Université de Montréal, Que.)
2014 (2 additional schools)
8 - School of Epidemiology, Public Health and Preventive Medicine (University of Ottawa, Ont.)
9 - School of Public Health and Health Systems (University of Waterloo, Ont.)

Source of data: Jung et al., 2015; Massé & Moloughney, 2011.

During the years 2011 to 2014, many public health-focused undergraduate degree programs were created. While Massé & Moloughney (2011) noted the existence of 3 undergraduate programs in 2011, by 2014 there were about 30 (12 faculties were offering certificates and 18 were offering bachelor's degrees). Overall, for graduate-level public health programs, in 2014 there were 24 faculties providing a master's degree, and 20 faculties providing a PhD degree related to public health (figure 3).

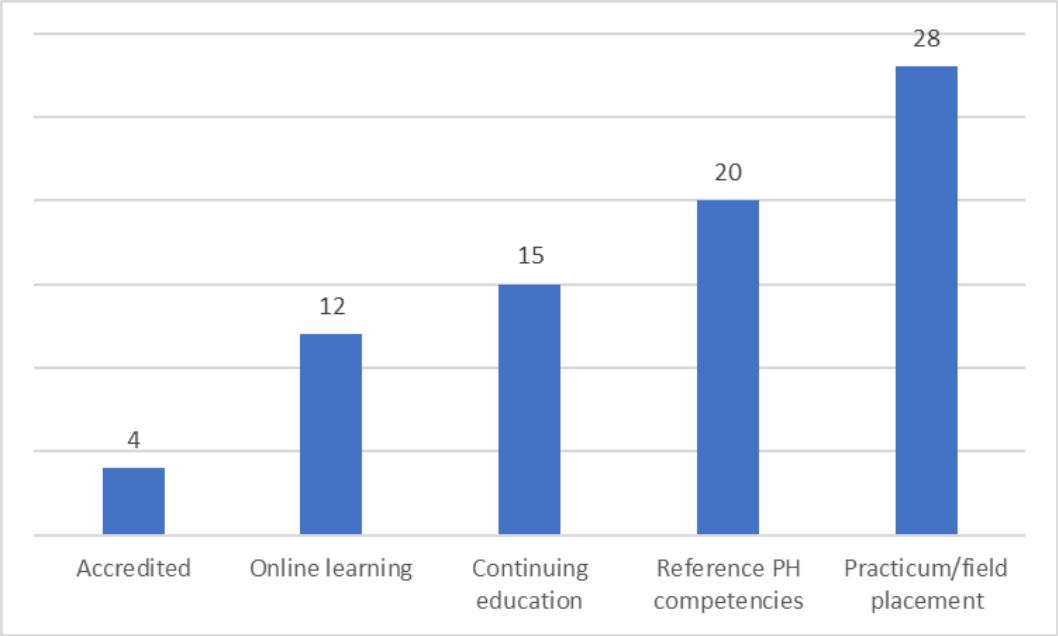
Figure 3 Types of public health-related degree programs offered in 36 faculties in 2014



Source of data: Jung et al., 2015.

As shown in figure 4, according to Jung et al.'s survey (2015), about half (20) of the 36 faculties reported offering a skill or competency-based learning curriculum; less than half (15) of the faculties offered continuing education opportunities for public health professionals; and four offered public health programs accredited by the public health association. A total of 12 faculties used online learning for their degrees and/or for their continuing education programs related to public health. Of these 12 faculties, 5 indicated that their MPH programs were delivered completely online. Most of the faculties (28/36) provided practicum, co-op[14], or field placements as degree requirements for students to gain work experience (Jung et al., 2015).

Figure 4 Some characteristics of public health-related programs offered by 36 faculties in 2014



Source of data: Jung et al., 2015.

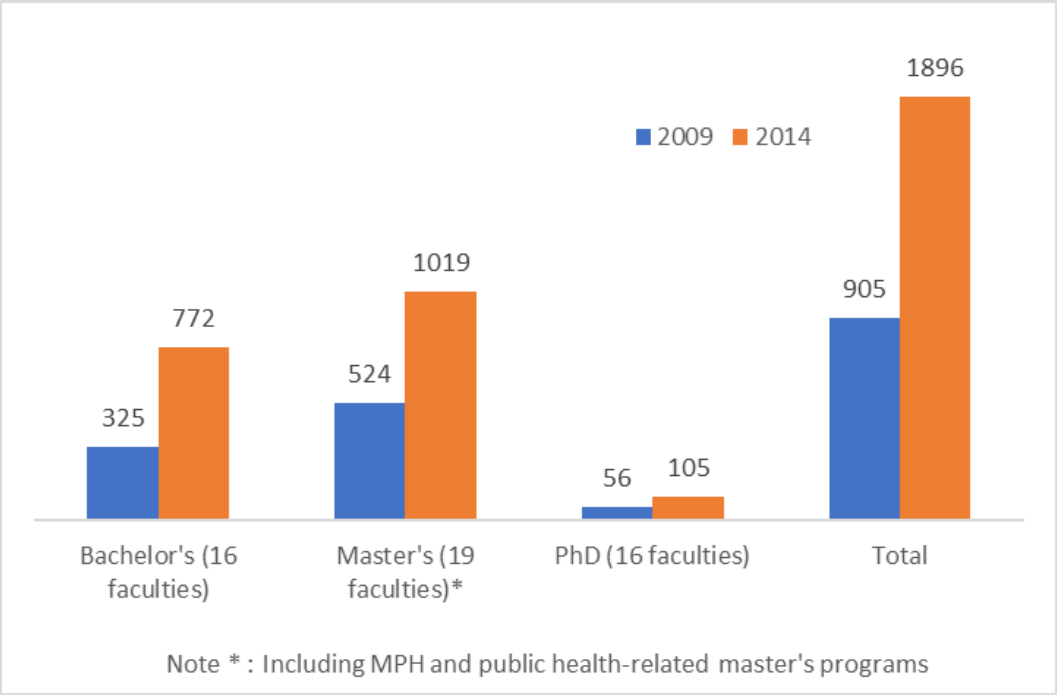
3.3.2 Public health students

As shown in figure 5, based on responses from the 16 faculties that were offering bachelor-level public health programs, the number of students graduating from these programs increased more than twofold between 2009 (325 graduates) and 2014 (772 graduates). Based on responses from the 18 faculties[15] that were offering MPH and public health-related master's programs, the number of graduates from these programs almost doubled over the same period (from 524 in 2009 to 1019 in 2014). Based on responses from the 16 faculties out of the 20 that were offering PhD programs, the number of PhD graduates shows a similar increase, from 56 in 2009 to 105 in 2014. Overall, between 2009 and 2014, the number of public health graduates more than doubled, from 905 to 1896 (Jung et al., 2015).

[14] According to the StudyinCanada website, "Co-op education, or co-operative education, is a program where students get the chance to work in an industry related to their field" https://www.studyincanada.com/News/11/1510/Redirect.

[15] One faculty that responded to the survey indicated no graduates for both years and has not been included.

Figure 5 Trend in number of public health students issued a degree from 2009 to 2014



Source of data: Jung et al., 2015.

According to Jung et al. (2015), only half of the responding faculties claimed to track students' employment post-graduation. Due to different methods of tracking students, no data about employment of public health graduates were compiled or published.

3.4 2019 data collection

The survey carried out in 2019 (Apatu et al., 2021) examined the degree to which MPH programs' course descriptions aligned with PHAC's 7 categories of core competencies for public health in Canada[16] (PHAC, 2008), in order to identify potential strengths and training gaps in these programs across Canada. Core competencies are "the essential knowledge, skills and attitudes necessary for the practice of public health," and they provide a baseline for what is required to fulfill public health system core functions (PHAC, 2008, p. 1).

This survey provided descriptive data on some of the MPH programs offered at selected Canadian universities. A sample of 18 universities was chosen from PHAC's list of post-secondary educational programs related to public health in Canada, published in 2017 and accessed in 2019 (Apatu et al., 2021).

The survey sample consisted of 1 MPH program offered in Eastern Canada (6%), 8 in Ontario (44%), 3 in Québec (17%), 2 in Central Canada (11%), and 4 in Western Canada (22%) (table 10).

[16] The 7 categories of core competencies for public health in Canada are: public health sciences; assessment and analysis; policy and program planning; implementation and evaluation; partnerships, collaboration and advocacy; diversity and inclusiveness; and communication and leadership (PHAC, 2008).

Table 10 Location of selected Canadian universities offering MPH programs in 2019, by number and %

Region of Canada	#	%
Eastern Canada (Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick): Memorial University	1	6%
Québec: McGill University, Université de Montréal, Université Laval	3	17%
Ontario: Lakehead University, McMaster University, Queen's University, University of Guelph, University of Toronto, Western University, Brock University, University of Waterloo	8	44%
Central Canada (Manitoba, Saskatchewan): University of Saskatchewan, University of Manitoba	2	11%
Western Canada (Alberta, British Columbia): Simon Fraser University, University of British Columbia, University of Victoria, University of Alberta	4	22%
Territories (Yukon, Northwest Territories, Nunavut)	0	0
Total	18	100%

Source of data: Apatu et al., 2021.

As shown in table 11, among the universities selected, 61% offered only a practicum stream (n = 11), and 39% offered both a practicum and a thesis stream (n = 7). There were 8 programs (44%) that offered specialized MPH streams, for example, in epidemiology and health promotion. The remaining 10 programs did not offer specific streams or options. Programs typically ranged from 1 to 2 years in duration. On the basis of the available information, 6 programs (33%) explicitly stated that they were using the *Core Competencies for Public* Health in Canada (PHAC, 2008) as a guide in formulating their curricula. In addition, 5 programs (28%) were accredited by international accrediting bodies, 4 programs by the Council on Education for Public Health (CEPH), and 1 by the Association of Schools and Public Health in the European Region (ASPHER). The remaining programs did not report using a public health competency framework to formulate their curricula (n = 8).

Table 11 Type, duration and competencies of MPH programs offered by a selection of 18 Canadian universities in 2019

	Number (n = 18)	% of Total
Type of program		
Only practicum available	11	61%
Practicum & thesis available	7	39%
	18	100%
Specialized MPH streams available (e.g., epidemiology and/or health promotion)	8	44%
Generalist	10	66%
	18	100%
Duration of program		
Less than 12 months	2	11%
12-20 months	8	44%
20-24 months	1	6%
12-24 months	3	17%
16-24 months	4	22%
	18	100%
Competency framework*		
PHAC	6	33%
CEPH	4	22%
ASPHER	1	6%
Not stated	8	44%

Note:* One program was using more than one competency framework.
Source of data: Apatu et al., 2021.

3.5 In brief

Of the four data summaries briefly presented above, the results of the first Canada-wide collection of academic public health programs and students reported by Spasoff (2005) played an important role, as this report served as a baseline for comparisons with the results of subsequent data collections. This report presented an overview of the composition of public health training programs offered by Canadian universities in 2005. It also noted the need to continue to build data on public health training capacity.

Moloughney & Lederer's (2011) and Apatu et al.'s (2021) data collections focused solely on MPH programs in Canada. In 2011, Moloughney & Lederer's project characterized MPH programs in Canada and the ways to improve the guidelines for MPH Programs in Canada (2010). Ten years later, Apatu et al.'s project (2021) examined how, in 2019, MPH programs' course descriptions aligned with PHAC's 7 categories of core competencies (PHAC, 2008) to identify strengths and training gaps in these programs. Jung et al.'s (2015) data collection project presented data collected from public health programs delivered by Canadian universities at undergraduate and graduate levels and included the number of students graduating from these programs in 2014. These four rounds of data collection, covering the years from 2005 to 2019, contributed to a better understanding of the composition of public health training programs offered in Canadian universities.

The present (2022) project is more closely aligned with Jung et al.'s (2015) study, in that it collected data on public health programs at the undergraduate and graduate levels delivered by Canadian universities. The 2022 project also included data from public health and preventive medicine residency programs from 14 of the 17 Canadian medical schools[17], which none of the previous data collections did. The following section presents the results of our 2022 data collection.

[17] See: https://www.afmc.ca/resources-data/education/faculty-resources/

4 Results of the 2022 data collection

This section focuses on the aggregate results from the data collection conducted from January to June 2022 on public health programs offered by 28 Canadian universities. Of the 108 public health programs identified offered by these universities, information (complete or partial) was obtained from 89, for a response rate of 82%.

Selection criteria resulted in certificate programs and other public health-related degrees of 30 credits and less being excluded from the 2022 data collection. Only one 30-credit graduate program, called the *Diplôme d'études supérieures spécialisées en santé publique* (DESS-PH) offered by the School of Public Health at the Université de Montréal, was included and classified as a master's program, because all of the courses in this program were recognized at the master's level.

This section is divided into four subsections. The first subsection deals with the results relating to the universities that offer public health training programs, the degree level to which they belong and their location in Canada. The second subsection presents the public health programs by province of origin and the level of study (undergraduate, graduate, postgraduate). The third subsection briefly outlines the variety of public health programs offered by the universities surveyed. The fourth subsection deals with the students enrolled in and graduating from programs according to the provinces in which the universities are situated.

The data presented below refer to the year 2022 when they concern program offerings (sections 4.1, 4.2, and 4.3) and to the years 2017, 2020 or 2021 when they concern enrolled or graduated students (section 4.4).

4.1 Canadian universities' public health program offering in 2022

The 2022 data collection identified 28 Canadian universities offering public health programs in 8 provinces. Ontario had 12 universities (43%), Québec 4 (14%), British Columbia 4 (14%), Alberta 3 (11%), Nova Scotia 2 (7%), Manitoba 1 (4%), Saskatchewan 1 (4%) and Newfoundland and Labrador 1 (4%) respectively. Universities in Prince Edward Island, New Brunswick and in the Yukon did not have any public health programs as defined in the selection criteria (table 2 in the methodology section). The Northwest Territories and Nunavut did not have any universities.

Table 12 Canadian universities offering public health programs, by province/territory, number and %, 2022

Province/territory	Universities offering public health programs in Canada	
	Number	%*
British Columbia (B.C.) ▪ Simon Fraser University ▪ University of British Columbia ▪ University of Northern British Columbia ▪ University of Victoria	4	14%
Alberta (Alta.) ▪ University of Alberta ▪ University of Calgary ▪ University of Lethbridge	3	11%
Saskatchewan (Sask.) ▪ University of Saskatchewan	1	4%
Manitoba (Man.) ▪ University of Manitoba	1	4%
Ontario (Ont.) ▪ Brock University ▪ Lakehead University & Northern Ontario School of Medicine (NOSM) ▪ McMaster University ▪ Queen's University ▪ Toronto Metropolitan University (formerly Ryerson University) ▪ University of Guelph ▪ University of Ottawa ▪ University of Toronto ▪ University of Waterloo ▪ Western University ▪ Wilfrid Laurier University ▪ York University	12	43%
Québec (Que.) ▪ McGill University ▪ Université Laval ▪ Université de Montréal ▪ Université de Sherbrooke	4	14%
Newfoundland and Labrador (N.L.) ▪ Memorial University	1	4%
Prince Edward Island (P.E.I.)	-	
New Brunswick (N.B.)	-	
Nova Scotia (N.S.) ▪ Cape Breton University ▪ Dalhousie University	2	7%
Yukon (Y.T.)	-	-
Northwest Territories (N.W.T.)	-	-
Nunavut (Nvt.)	-	-
Total	28	100%

Note*: Percentages by province may not add up to 100% due to rounding.

Very few comparisons between the 2014 (Jung et al., 2015) and 2022 collections could be done because of the composition of their respective samples, which differed between 2022 (n = 28) and 2014 (n = 32). Table 13 compares the samples from these 2 collections and highlights some of their differences. Five universities included in the 2014 sample were not included in the 2022 sample because:

- One was not a university (British Columbia Institute of Technology);
- One university no longer offered public health programs (Laurentian University);
- Some public health programs offered by universities met the exclusion criteria (e.g., Concordia University of Edmonton, University of Ontario Institute of Technology, First Nations University of Canada).

Regarding Université de Sherbrooke (Québec), the master's program in community health existed in 2014, but was not identified in Jung et al.'s collection (2015), while it was selected for the 2022 collection.

Table 13 Sample comparisons of the 2014* (n = 32) and 2022 (n = 28) data collections

Differences	Included in 2014* (n = 32) and not in 2022 (n = 28)	Included in 2022 (n = 28) and not in 2014* (n = 32)
British Columbia	1 - British Columbia Institute of Technology	
Alberta	2 - Concordia University of Edmonton	
Manitoba	3 - First Nations University of Canada	
Ontario	4 - Laurentian University 5 - University of Ontario Institute of Technology	
Québec		1 - Université de Sherbrooke

Source: Jung et al., 2015.

The 2022 data collection identified 10 schools of public health, one more than those listed by Jung et al. (2015) (table 9). The additional school was the School of Population and Global Health at McGill University (Montréal, Québec) founded in 2016, which began enrolling new students in 2021. The 2022 collection also found that of the 28 universities identified as offering public health programs, two had public health-related institutes. These were the Institute for Global Public Health[18] created in February 2020 at the University of Manitoba and the O'Brien Institute of Public Health[19] at the University of Calgary, which was created in 2010 but changed its name in 2014.

Public health programs offered by the 28 Canadian universities identified in the 2022 data collection are undergraduate, graduate and post-graduate degree programs. They can be certificates or diplomas, bachelor's degrees, master's degrees (MPH and other master's degrees), doctoral degrees (PhD), professional doctorate degrees (DrPH[20]) and medical specialty degrees from medical school/faculty residency programs. As certificates and other diplomas related to public health were

[18] See: https://umanitoba.ca/institute-for-global-public-health/.

[19] See: https://obrieniph.ucalgary.ca/.

[20] A DrPH is the "practitioner doctorate" for public health, to "prepare individuals for leadership roles in their field and for translating research into real-world solutions." See: https://drphcoalition.org/drphvsphd.

generally 30 credits or less (ranging from 12, 15, 16, and 30 credits) they were not included in the data collection.

Although not included in the sample of programs analyzed but in order to give an overview of these types of programs, they are briefly summarized in table 14. The category of certificates and other public health-related diplomas included both undergraduate and graduate studies and were variously named graduate certificate, graduate embedded certificate, certificate, diploma, graduate diploma, post-diploma bachelor's degree, post-baccalaureate diploma, and microprogram. Table 114 lists[21] some certificates and other academic public health-related degrees of 30 credits or less. Information was drawn from 16 universities, 14 of which were included in the 2022 data collection, while 2 were excluded (Concordia University of Edmonton, Université du Québec à Trois-Rivières) because their website information indicated that they offered only public health programs of 30 credits or less.

[21] A list of these certificates and other diplomas, with links to program webpages, can be found in table 40 of appendix 3.

Table 14 Selected Canadian universities with public health-related certificate or degree programs of 30 credits or less, 2022

University	Program
University of British Columbia (B.C.)	Graduate Certificate in Indigenous Public Health
University of Victoria (B.C.)	Graduate Diploma in Public Health
University of Alberta (Alta.)	Graduate Embedded Certificate in Climate Change and Health
	Graduate Embedded Certificate in Community-Based Research & Evaluation
	Graduate Embedded Certificate in Communicable Diseases
University of Lethbridge (Alta.)	Post-Diploma Bachelor of Health Sciences - Public Health Leadership
	Post-Diploma Bachelor of Health Sciences - Aboriginal Health
	Graduate Certificate in Epidemiology and Biostatistics
	Graduate Certificate in Public Health Program and Policy Planning and Evaluation
Concordia University of Edmonton (Alta.)	Graduate Certificate in Public Health (3 programs: Leadership, Vulnerable Populations, and Strategic Communications. These were under review, and the university was not taking new applications[22] in June 2022.
	Graduate Diploma in Environmental Public Health Practice
University of Manitoba (Man.)	Diploma in Population Health
McMaster University (Ont.)	Graduate Diploma in Clinical Epidemiology
University of Guelph (Ont.)	Graduate Diploma in Public Health
University of Ottawa (Ont.)	Graduate Diploma in Population Health Risk Assessment and Management
University of Toronto (Ont.)	Certificate in Health Impact
Western University (Ont.)	Graduate Diploma in Applied Health Sciences
Wilfrid Laurier University (Ont.)	Graduate Diploma in Public Safety
Memorial University (P.E.I.)	Diploma in Community Health Diploma in Clinical Epidemiology
Cape Breton University (N.S.)	Post-Baccalaureate Diploma in Occupational Health & Safety Management
Dalhousie University (N.S.)	Certificate in Public Health
Université de Montréal (Que.)	Microprogramme de 2e cycle en santé publique pour cadres et professionnels en exercice
	Mineure en santé publique et mondialisation
	Certificat en sécurité du travail et santé publique
Université Laval (Que.)	Microprogramme de 2e cycle en surveillance en santé publique
	Microprogramme de 2e cycle en santé publique - santé mondiale
	Microprogramme de 2e cycle en santé publique - promotion de la santé
	Microprogramme de 2e cycle en santé publique - évaluation
Université du Québec à Trois-Rivières (Que.)	Certificat en soins infirmiers de santé publique

[22] See: https://concordia.ab.ca/science/graduate/public-health-leadership-graduate-certificate/.

4.2 Canadian universities' public health program offering according to the province of location and the type of degree in 2022

This subsection presents the information collected based on the province of location of universities offering public health programs.

The largest number of public health programs is offered at the graduate and post-graduate levels, i.e., master's, doctoral and medical school residency (table 15). Master's programs are offered at 23 (82%) of 28 universities, doctoral programs at 19 (68%), and public health and preventive medicine residency programs through faculties of medicine at 14 (50%). Undergraduate bachelor's programs are offered at 11 (39%) universities.

Only four of the eight provinces (Ontario, British Columbia, Alberta and Québec) have universities offering public health training at all levels (undergraduate, graduate and residency). The largest number of universities offering public health training are located in Ontario (12 universities), British Columbia (4 universities) and Québec (4 universities). These three provinces account for more than 70% of the identified Canadian universities offering public health programs (20 of 28 universities).

Table 15 Level and type of public health degrees offered by Canadian universities, by province, 2022

Province / # universities		Undergraduate degrees		Graduate and postgraduate degrees					
				Graduate				Post-graduate	
		Bache-lor's	%	MPH & master's	%	PhD-DrPH	%	Residency programs	%
British Columbia	4	2	50%	3	75%	2	50%	1	25%
Alberta	3	1	33%	3	100%	3	100%	2	33%
Saskatchewan	1	-		1	100%	1	100%	1	100%
Manitoba	1	-		1	100%	1	100%	1	100%
Ontario	12	5	42%	9	75%	6	50%	5	42%
Québec	4	1	25%	4	100%	4	100%	4	100%
Newfoundland and Labrador	1	-		1		1	100%	-	
Nova Scotia	2	2	100%	1	50%	1	50%	-	
Total	28	11	39%	23	82%	19	68%	14	50%

Undergraduate public health education programs

Undergraduate programs related to public health are offered in 5 provinces (British Columbia, Alberta, Ontario, Québec, and Nova Scotia). These programs have six different titles. The most numerous programs are the Bachelor of Arts (BA) and the Bachelor of Health Sciences (BHSc). The 4 BA programs related to public health are offered by 3 universities in Ontario and 1 in Alberta, while the 3 BHSc programs are offered by 1 university in British Columbia, 1 in Alberta and 1 in Nova Scotia. The other two most common programs are the Bachelor of Arts and Science (BASc), two of which are offered at two Ontario universities, and the Bachelor of Public Health (BPH), also offered at two Ontario universities. The other undergraduate programs are the Bachelor of Science (BSc) offered at a Québec university and the Bachelor of Health Promotion (BHP) offered at a Nova Scotia university.

Three types of bachelor's degree programs are offered at five Ontario universities: the BA, BASc and BPH. Two of these offer 2 types of bachelor's degrees related to public health. Brock University offers the BA and BPH, and Wilfrid Laurier University offers the BA and BASc.

Table 16 Canadian university Bachelor of Public Health program offerings, by province, 2022

Province / # universities		Bachelor's degrees offered by Canadian universities by province of origin #						Bachelor's degrees Total (# univ.)
		BA	BHSc	BASc	BPH	BSc	BHP	
British Columbia	4	1	1					2 (2)
Alberta	3		1					1 (1)
Saskatchewan	1							0
Manitoba	1							0
Ontario	12	3		2*	2			7 (5**)
Québec	4					1***		1 (1)
Newfoundland and Labrador	1							0
Nova Scotia	2		1				1	2 (2)
Total	28	4	3	2	2	1	1	13 (11)

Note: BA - Bachelor of Arts; BHSc - Bachelor of Health Sciences; BPH - Bachelor of Public Health; BSc - Bachelor of Science BHP - Bachelor of Health Promotion.

* One university offers a BASc: Bachelor of Arts and Science in Community Health (Wilfrid Laurier University) while another offers a different BASc: Bachelor of Applied Sciences in Public Health (Toronto Metropolitan University, formerly Ryerson University).

** Two universities offer 2 bachelor's programs: Brock University offers a BA and a BPH (Bachelor of Public Health); Wilfrid Laurier University offers a BA and a BASc (Bachelor of Arts and Science in Community Health).

*** A BSc in Environmental Public Health and Occupational Health was recently launched by the Université de Montréal School of Public Health.

Graduate and postgraduate public health education programs

Master's programs

As with undergraduate programs, graduate-level public health-related master's programs are identified by different titles, such as MSc, MPH, MA, MHSc, MScCH, MHE or MScPH. In one case, a graduate program called DESS en santé publique offered by a Québec university was classified as a master's-level program because all the courses in this program were recognized at the master's level.

Universities located in the provinces of Ontario (17 Master's programs including 9 MPH, 6 MSc, 1 MScCH, and 1 MHE), British Columbia (8 programs including 3 MSc, 3 MPH, 1 MA, and 1 MHSc), and Québec (8 programs including 4 MSc, 2 MPH, 1 MScPH, and 1 DESS) offer the largest number of master's programs related to public health. The 33 master's programs related to public health offered at universities in these three provinces represent almost three quarters (73%) of the 46 programs offered in Canada.

Table 17 Canadian university Master of Public Health program offerings, by province, 2022

Province / # universities		Master's degrees offered by Canadian universities by province of origin #								Master's degrees Total (# univ.)
		MSc	MPH	MA	MHSc	MScCH	MHE	MScPH	DESS	
British Columbia	4	3	3	1	1					8 (3)
Alberta	3	3	2							5 (3)
Saskatchewan	1	1	1							2 (1)
Manitoba	1	1	1							2 (1)
Ontario	12	6	9			1	1			17 (9)
Québec	4	4	2					1	1	8 (4)
Newfoundland and Labrador	1	1	1							2 (1)
Nova Scotia	2	1		1						2 (1)
Total	28	20	19	2	1	1	1	1	1	46 (23)

PhD programs

Eight provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Québec, Newfoundland and Labrador, and Nova Scotia) have universities offering 21 public health-related PhD programs. The provinces of Ontario, Québec and Alberta have the most with 7, 5, and 3 public health-related PhD programs respectively. Québec and Ontario are the only two Canadian provinces with universities offering both a professional doctorate in public health and a PhD related to public health.

Table 18 Canadian university public health-related PhD program offerings, by province, 2022

Province / # universities		PhD-DrPH degrees offered by Canadian universities, by province of origin #		
		PhD	DrPH	PhD-DrPH Total (# univ.)
British Columbia	4	2		2 (2)
Alberta	3	3		3 (3)
Saskatchewan	1	1		1 (1)
Manitoba	1	1		1 (1)
Ontario	12	6	1	7 (6)
Québec	4	4	1	5 (4)
Newfoundland and Labrador	1	1		1 (1)
Nova Scotia	2	1		1 (1)
Total	28	19	2	21 (19)

Public health and preventive medicine residency programs in medical schools

Six provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Québec) have 14 university medical schools with residency programs in public health and preventive medicine. Ontario and Québec have the largest number of medical schools with 5 and 4 schools respectively. For three provinces, Saskatchewan (1 university), Manitoba (1 university) and Québec (4 universities), all universities that have public health programs also have a faculty of medicine that offers a residency program in public health and preventive medicine.

Table 19 Availability of public health and preventive medicine residency programs at Canadian university faculties of medicine, by province, 2022

Public health and preventive medicine residency programs offered by faculties of medicine at Canadian universities, by province of origin		
Province	**# universities**	**Residency programs total (# universities)**
British Columbia	4	1 (4)
Alberta	3	2 (3)
Saskatchewan	1	1 (1)
Manitoba	1	1 (1)
Ontario	12	5 (5)
Québec	4	4 (4)
Newfoundland and Labrador	1	-
Nova Scotia	2	-
Total	28	14

4.3 Overview of titles given to public health programs offered by Canadian universities in 2022

This subsection presents public health programs by their titles. This is a way, for each of the 28 universities surveyed, to illustrate the diversity of program streams as well as the areas of specialization targeted by universities.

For all 28 universities, there are some 106 program titles listed[23]. In table 20, these 106 program titles are classified according to the type of degree awarded (bachelor's for undergraduate programs, master's and PhDs for graduate programs, public health and preventive medicine for postgraduate residency programs).

Thus, for each university, when considering program titles, an unspecified MSc degree and an MSc in Epidemiology represent 2 program titles. What applies to the MSc is also valid for bachelor's and PhD degrees (e.g., for one university offering a PhD in Public Health, a PhD in Health Promotion and Socio-behavioural Sciences, and a PhD in Epidemiology, these would be counted as 3 different PhD titles but 1 PhD program degree). Of these 106 program titles, 13 are undergraduate degrees (bachelor's), 79 are graduate degrees (master's and PhDs) and 14 are school of medicine postgraduate degrees.

[23] This number should not be confused with the number of programs (108) identified according to criteria used to select the list of relevant academic public health programs in Canada (table 2). The number 106 is based on program-specific titles identified and not the types of degrees awarded by these programs (e.g., for one university, 3 different PhD titles represent only one type of degree awarded which is a PhD).

The 79 graduate program titles (master's and PhD) represent 74% of all public health program titles identified. Of these 79 graduate program titles, 49 belong to master's programs (master's and MPH). These are the most numerous and diverse, accounting for 62% of the graduate degrees. Of these 49, there are 19 MPH degrees, 14 Master of Science (MSc) degrees and 9 Master of Science (MSc) in Epidemiology, representing respectively 39%, 29% and 18% of the master's programs. The other titles of master's programs related to public health identified are: Master of Arts (2 programs), Master of Science in Public Health (1 program), Master of Health Science (1 program), Master of Science in Community Health (1 program), Master of Health Evaluation (1 program) and a graduate diploma in public health (*diplôme d'études supérieures spécialisées en santé publique, DESS-PH*) (1 program).

The majority of the surveyed universities, 23 out of 28 (82%), offer master's programs related to public health. Of these 23 universities, 18 offer at least 2 types of master's program, and 16 of these offer an MPH as an option for a master's program. The 9 universities that offer master's programs in epidemiology also offer at least one other master's program (MPH, MA, etc.).

The distinct titles of the 30 doctoral programs (28 PhD, 2 DrPH) offered by 19 universities are listed in table 20. These count for 38% of the graduate program titles offered (30/79). Two types of doctoral degree in public health are offered by Canadian universities, the main and most numerous being the Doctor of Philosophy (PhD) offered by the 19 universities. The second type of doctorate offered by only two universities is the Professional Doctorate in Public Health (DrPH). Of these two universities, one offers both the Doctor of Philosophy and a DrPH (Université de Montréal) while the second offers a PhD program and started a DrPH program in 2021 (University of Toronto). A PhD in Epidemiology is available at 9 of the 19 universities offering PhD programs (47%). Six universities out of 19 (32%) offered more than one PhD title (University of Alberta, University of Saskatchewan, University of Guelph, University of Toronto, McGill University, and Université Laval).

Finally, of the 28 universities surveyed, 14 have schools of medicine that offered postgraduate public health and preventive medicine residency programs.

Of the 28 universities surveyed, only the Université de Montréal (Québec) offers all levels of public health programs: bachelor's[24], master's, PhD, DrPH and the public health and preventive medicine residency program in its faculty of medicine.

[24] The BSc in Environmental Public Health and Occupational Health was recently launched by the Université de Montréal School of Public Health.

Table 20 Public health degree programs, according to their titles, offered by the 28 Canadian universities surveyed, 2022

University	Undergraduate degrees	Graduate and postgraduate degrees		
		Graduate		Post-graduate
	Bachelor's	Master's & Master of Public Health (MPH)	Philosophiae Doctor (PhD) & Doctor of Public Health (DrPH)	medical school residency program
Simon Fraser University (B.C.)		MPH, Master of Science (MSc)		
University of British Columbia (B.C)		Master of Health Science (MHSc), MPH, MSc	PhD in Population and Public Health	Public health and preventive medicine
University of Northern British Columbia (B.C.)	Bachelor of Health Science (BHSc)			
University of Victoria (B.C.)	Bachelor of Arts (BA)	Master of Arts (MA), MSc, MPH	PhD in Social Dimensions of health	
University of Alberta (Alta.)		MPH, MSc, MSc in Epidemiology	PhD in Public Health, PhD in Epidemiology, PhD in Health Promotion and Socio-behavioural Sciences	Public health and preventive medicine
University of Calgary (Alta.)		MSc	PhD in Community Health Services	Public health and preventive medicine
University of Lethbridge (Alta.)	BHSc	MSc,	PhD in Population Studies in Health	
University of Saskatchewan (Sask.)		MSc, MPH	PhD in Epidemiology, PhD in Community and Population Health Sciences	Public health and preventive medicine
University of Manitoba (Man.)		MPH, MSc	PhD in Community Health Sciences	Public health and preventive medicine
Brock University (Ont.)	BA; Bachelor of Public Health (BPH)	MPH, MPH/MBA		
Lakehead University - Northern Ontario School of Medicine (Ont.)		MPH		Public health and preventive medicine
McMaster University (Ont.)		MPH		Public health and preventive medicine
Queen's University (Ont.)		MPH, MSc in Epidemiology	PhD in Public Health Sciences	Public health and preventive medicine

Table 20 Public health degree programs, according to their titles, offered by the 28 Canadian universities surveyed, 2022 (cont'd)

University	Undergraduate degrees	Graduate and postgraduate degrees		
		Graduate		Post-graduate
	Bachelor's	Master's & Master of Public Health (MPH)	Philosophiae Doctor (PhD) & Doctor of Public Health (DrPH)	medical school residency program
Toronto Metropolitan University (formerly Ryerson University) (Ont.)	Bachelor of Applied Science in Public Health (BASc)			
University of Guelph (Ont.)		MSc, MPH MSc in Epidemiology	PhD in Epidemiology, PhD in Public Health,	
University of Ottawa (Ont.)		MPH, MSc in Epidemiology	PhD in Epidemiology	Public health and preventive medicine
University of Toronto (Ont.)		MPH, MSc, Master of Science in Community Health (MScCH)	PhD in Epidemiology, PhD in Biostatistics, PhD in Occupational and Environmental Health, PhD in Social and Behavioural Health Sciences, DrPH	Public health and preventive medicine
University of Waterloo (Ont.)	BPH	MPH, Master of Health Evaluation (MHE); MSc	PhD in Public Health and Health Systems	
Western University (Ont.)		MPH, MSc in Epidemiology	PhD in Epidemiology and Biostatistics	
Wilfrid Laurier University (Ont.)	BA; Bachelor of Arts and Science in Community Health (BASc)			
York University (Ont.)	BA			
McGill University (Que.)		Master of Science in Public Health (MScPH), MSc in Epidemiology, MSc	PhD in Epidemiology, PhD in Digital Public Health (dual degree program)	Public health and preventive medicine
Université Laval (Que.)		MPH, MSc in Epidemiology	PhD in Epidemiology, PhD in Community Health	Public health and preventive medicine
Université de Montréal (Que.)	BSc in Environmental Public Health and Occupational Health	MPH, MSc in Epidemiology, *Diplôme d'études supérieurs spécialisées (DESS-PH)*	PhD in Public Health, DrPH (DEPA)	Public health and preventive medicine

Table 20 Public health degree programs, according to their titles, offered by the 28 Canadian universities surveyed, 2022 (cont'd)

University	Undergraduate degrees	Graduate and postgraduate degrees		
		Graduate		Post-graduate
	Bachelor's	Master's & Master of Public Health (MPH)	Philosophiae Doctor (PhD) & Doctor of Public Health (DrPH)	medical school residency program
Université de Sherbrooke (Que.)		MSc	PhD in Research in Health Sciences, (community health concentration)	Public health and preventive medicine
Memorial University (N.L.)		MPH, MSc	PhD in Community Health	
Cape Breton University (N.S.)	BHSc			
Dalhousie University (N.S.)	BHP (Bachelor of Health Promotion)	MA; MSc in Epidemiology	PhD in Community Health and Epidemiology	
Total universities (n = 28) 100%	11 (39%)	23 (82%)	19 (68%)	14 (50%)
Total programs (106) 100%	13 (12%) (4 BA, 3 BHSc, 2 BPH, 2 BASc, 1 BHP, 1 BSc)	49 (46%) (19 MPH, 14 MSc, 9 MSc. Epidemiology, 2 MA, 1 MHSc, 1 MScCH, 1 MHE, 1 MScPH, 1 DESS-PH)	30 (28%) (28 PhD, 1 DrPH, 1 DEPA)	14 (14%)

Note: BA - Bachelor of Arts; BASc - Bachelor of Arts and Science in Community Health; BASc - Bachelor of Applied Sciences in Public Health; BHP - Bachelor of Health Promotion; BHSc - Bachelor of Health Sciences; BPH - Bachelor of Public Health; BSc - Bachelor of Science; DEPA - diplôme d'études professionnelles avancées (DrPH equivalent); DESS - Diplôme d'études supérieures spécialisées en santé publique; DrPH - Doctor of Public Health; MA - Master of Arts; MHE - Master of Health Evaluation; MPH - Master of Public Health; MPH/MBA - Master of Business Administration and Public Health (concurrent master's degree); MSc - Master of Science; MHSc - Master of Health Science; PhD - Doctor of Philosophy.

4.4 Students enrolled in and graduating from public health programs in Canadian universities in 2017, 2020 and 2021

The tables presented in this subsection are based on the availability of student data. Thus, when data such as the number of students or international students were missing for a program, it was excluded from the statistical analysis and the number of programs used as a reference for the calculations (# of programs reporting) was adjusted accordingly. Since for the majority of universities identified, data on students in epidemiology programs were provided separately from other programs, these were given a separate category in the statistical processing. Table 21 specifies the programs' reference samples that are used in the tables in this subsection.

Table 21 Number of programs reporting number of students and international students enrolled in public health programs at surveyed Canadian universities, by degree type, 2021

Programs	# of programs identified	All students	International students
		# programs reporting	# programs reporting
Bachelor's	16	10	10
Master's including:	50	44	41
MPH	19	17	15
MSc epidemiology	9	8	7
Master's other	22	19	19
PhD including:	28	25	24
PhD epidemiology	19	17	17
PhD other	9	8	7
Residency in public health and preventive medicine*	14	10	0
Total (residency programs included)	108	89	75
Total (residency programs excluded)	94	79	75

Note*: Generally, since medical schools accept mainly students who are Canadian residents, the 14 residency programs in public health and preventive medicine offered by these schools were excluded from the sample of programs reporting for international students.

The information provided in this subsection is intended to present the evolution of the number of students enrolled in and graduating from public health programs at selected Canadian universities, broken down by public health programs and home province of universities offering these programs in 2017 and 2021 for student enrollment, and 2017 and 2020 for those graduating from these programs.

4.4.1 Students enrolled in public health programs at Canadian universities in 2017 and 2021

Students enrolled in public health programs in 2017 and 2021

Based on the 89 programs reporting, the number of students enrolled[25] in public health programs increased substantially (41%) between 2017 and 2021. Data obtained on enrolled students showed an increase of 824 enrollees between 2017 (2022 enrollees) and 2021 (2846 enrollees) (table 22).

The largest increase in enrollees occurred at the undergraduate level, where enrollment increased from 469 enrollees in 2017 to 973 in 2021, an increase of 107%. Doctoral programs other than those in epidemiology also showed an increase enrollment since 2017, with 40% more students enrolled in 2021 than in 2017 (from 121 to 169). The number of enrollees in PhD programs in epidemiology remained the same in 2017 and 2021 (85 students enrolled).

The programs with the largest numbers of enrollees in 2021 were the 44 master's programs, with 1594 enrollees, and the 10 bachelor's programs, with 973 enrollees, which accounted for 56% and 34% of the enrollees in 2021 respectively. The share of enrollees in 2021 in master's programs (56%) decreased from the 2017 share (65%), while the share of enrollees in bachelor's programs increased from 23% in 2017 to 34% in 2021.

In 2021, of the 1594 enrollees in master's programs, 64% (1015) were in MPH programs and 22% (350) were in master's programs other than MPH and MSc in Epidemiology.

Despite having the largest numbers of students enrolled, all master's programs (MPH and other master's) had smaller increases in enrollment between 2017 and 2021 than bachelor's and PhD programs. All master's degree programs showed a 20% increase in enrollment (from 1325 to 1594). The rate of increase changed depending of the type of master's program: MSc in Epidemiology enrollment increased by 27% (from 181 to 229), MPH enrollment increased by 20% (from 846 to 1015) and all other master's program enrollment increased by 17% (from 298 to 350).

Enrollment in faculty of medicine public health and preventive medicine residency programs remained stable between 2017 and 2021. This is mainly due to an annual enrollment quota generally set between 2 and 3 enrollees per program per academic year per faculty of medicine.

[25] New enrollees per year.

Table 22 Number of students enrolled, by degree type and % change, 2017 and 2021, 89 programs reporting

Programs (# prog.)	Students enrolled				Students enrolled % change 2017 - 2021
	2017		2021		
	#	%	#	%	%
Bachelor's (10 prog.)	469	23%	973	34%	107%
Master's (44 prog.) including:	1325	65%	1594	56%	20%
MPH (17 prog.)	846	42%	1015	36%	20%
MSc epidemiology (8 prog.)	181	9%	229	8%	27%
Master's other (19 prog.)	298	15%	350	12%	17%
PhD (25 prog.) including:	206	10%	254	9%	23%
PhD epidemiology (8 prog.)	85	4%	85	3%	0%
PhD other (17 prog.)	121	6%	169	6%	40%
Residency in public health and preventive medicine (10 prog.)	22	1%	25	1%	4%
Total (89 prog.)	2022	100%	2846	100%	41%

International students enrolled in public health programs in 2017 and 2021

Based on the 75 public health programs reporting, data obtained on international students enrolled in 2017 and 2021 showed an increase of 634, from 405 in 2017 to 1039 enrollees in 2021, a 157% increase. The bachelor's, master's, and PhD programs showed increases in enrollees by 212%, 128%, and 39% respectively between 2017 and 2021 (table 23). The data provided do not enable us to identify the countries of origin of international students.

Bachelor's and MPH programs admitted the most international students in both 2017 and 2021. The largest increase in the number of international students enrolled occurred in the bachelor's programs, from 185 international students in 2017 to 577 in 2021, an increase of 212%. There were 176 international students enrolled in the 41 master's programs in 2017 and 401 in 2021, for an increase of 128%. Of the master's programs, the MPH had the largest increase in enrollment, from 79 students in 2017 to 260 in 2021, representing an increase of 229%.

The programs with the largest numbers of international students enrolled in 2021 were the 10 bachelor's programs, which accounted for 56% of the international students enrolled in 2021, an increase from 46% in 2017. In 2021, the 41 master's programs had 401 international students enrolled, or 39% of all international students enrolled in that year. Bachelor's and master's programs accounted for nearly 95% of international students enrolled in 2021, and nearly 89% in 2017.

Table 23 Number of international students enrolled, by degree type and % change, 2017 and 2021, 75 programs reporting

Programs (# prog.)	International students enrolled				International students enrolled, % change 2017 - 2021
	2017		2021		
	#	%		%	%
Bachelor's (10 prog.)	185	46%	577	56%	212%
Master's (41 prog.) including:	176	43%	401	39%	128%
MPH (15 prog.)	79	20%	260	25%	229%
MSc epidemiology (7 prog.)	29	7%	48	5%	66%
Master's other (19 prog.)	68	17%	93	9%	37%
PhD (24 prog.) including:	44	11%	61	6%	39%
PhD epidemiology (7 prog.)	13	3%	16	2%	23%
PhD other (17 prog.)	31	8%	45	4%	45%
Total (75 prog.)	405	100%	1039	100%	157%

Comparisons between all students enrolled and international students enrolled in public health programs in 2017 and 2021

Comparing the evolution of the number of all enrolled students reported by 79 programs and the number of enrolled international students provided by 75 programs reporting is informative, despite the fact that the number of programs from which they are drawn differs slightly. However, this gap of 4 programs should be taken into account when analyzing these data.

In 2017, international students enrolled in public health programs represented 20% (405/2000) of all students enrolled. The highest representation was in the bachelor's degree programs, where 185 enrolled international students represented 39% of all students enrolled in those programs. International students enrolled in master's and PhD programs represented 13% and 21% of students enrolled in these programs respectively (table 24)

Table 24 Comparison between students enrolled and enrolled international students enrolled in public health programs in 2017, by degree type, number and %, by programs reporting

Programs	Students enrolled, 2017 (# prog.)	International students enrolled, 2017 (# prog.)	International students enrolled/students enrolled, 2017 %
Bachelor's	469 (10 prog.)	185 (10 prog.)	39%
Master's including:	1325 (44 prog.)	176 (41 prog.)	13%
MPH	846 (17 prog.)	79 (15 prog.)	9%
MSc epidemiology	181 (8 prog.)	29 (7 prog.)	16%
Master's other	298 (19 prog.)	68 (19 prog.)	23%
PhD including:	206 (25 prog.)	44 (24 prog.)	21%
PhD epidemiology	121 (8 prog.)	31 (7 prog.)	26%
PhD other	85 (19 prog.)	13 (17 prog.)	15%
Total	2000 (79 prog.)	405 (75 prog.)	20%

In 2021, international students enrolled in public health programs represented 37% of all students enrolled. The highest representation of enrolled students was in bachelor's programs, where they represented nearly 60% of all students enrolled. International students enrolled in master's and PhD programs represented 25% and 24% of students enrolled in these programs respectively (table 25).

Table 25 Comparison between students enrolled and international students enrolled in public health programs in 2021, by degree type, number and %, by programs reporting

Programs	Students enrolled, 2021 (# prog.)	International students enrolled, 2021 (# prog.)	International students enrolled/students enrolled, 2021 %
Bachelor's	973 (10 prog.)	577 (10 prog.)	59%
Master's including:	1594 (44 prog.)	401 (41 prog.)	25%
MPH	1015 (17 prog.)	260 (15 prog.)	26%
M.Sc epidemiology	229 (8 prog.)	48 (7 prog.)	21%
Master's other	350 (19 prog.)	93 (19 prog.)	27%
PhD including:	254 (25 prog.)	61 (24 prog.)	24%
PhD epidemiology	85 (8 prog.)	16 (7 prog.)	19%
PhD other	169 (17 prog.)	45 (17 prog.)	27%
Total	2821 (79 prog.)	1039 (75 prog.)	37%

4.4.2 Students' graduating trends in public health programs at Canadian universities in 2017 and 2020

Students graduating from public health programs in 2017 and 2020

The number of students graduating from the 89 identified programs increased by 35% between the years 2017 (1252 graduates) and 2020 (1691 graduates). The largest increase in graduates was noted in bachelor's programs, where the number of students graduating increased from 182 in 2017 to 389 in 2020, an increase of 114%. Master's programs had the largest number of graduates in both 2017, with 76% of graduates (956 graduates), and in 2020, with 69% of graduates (1168 graduates). The number of graduates from master's programs increased by 22% (212 more graduates) in 2020 compared to 2017. The number of graduates from public health PhD programs also increased by 22% in 2020, with 22 more PhD graduates in 2020 than in 2017 (table 26).

Table 26 Students graduating from public health programs in 2017 and 2020, by degree type, number, %, and % change, 89 programs reporting

Programs (# prog.)	Students graduating				Students graduating % change 2017 - 2020
	2017		2020		
	#	%	#	%	
Bachelor's (10 prog.)	182	16%	389	23%	114%
Master's (44 prog.) including:	956	76%	1168	69%	22%
MPH (17 prog.)	707	56%	780	46%	10%
MSc epidemiology (8 prog.)	89	7%	124	7%	39%
Master's other (19 prog.)	160	13%	264	16%	65%
PhD (25 prog.) including:	98	8%	120	7%	22%
PhD epidemiology (8 prog.)	31	2%	45	3%	45%
PhD other (17 prog.)	67	5%	75	4%	12%
Residency in public health and preventive medicine (10 prog.)	16	1%	14	1%	-12%
Total (89 prog.)	1252	100%	1691	100%	35%

International students graduating from public health programs in 2017 and 2020

Based on the 75 public health programs reporting, the number of international students graduating in 2020 (375) was almost 3 times higher than in 2017 (127), equivalent to a 195% increase (table 27). Almost all public health programs saw an increase in the number of their international student graduates (with the exception of non-epidemiology PhD international graduates, where there was a slight decrease). This significant increase in the number of international students graduating is almost entirely explained by the very large increase in bachelor's students graduating, from 23 in 2017 to 244 in 2020, an increase of 960%. The second largest increase is found in master's programs, where the number of international students graduating grew by 28% (25 more graduates) from 2017 to 2020. From 2017 to 2020, the increase in the number of international students graduating from MPH programs (from 52 in 2017 to 54 in 2020, or 2 more graduates), from MSc in Epidemiology programs (from 5 in 2017 to 12 in 2020, or 7 more graduates), or from other master's programs (from 33 in 2017 to 49 in 2020, or 16 more graduates) were quite moderate.

In 2017, 18% of international students graduating came from bachelor's programs, while in 2020 this proportion was 65%. The reverse was true for master's programs, which saw 71% of international students graduating from master's programs in 2017 (90 graduates/127), dropping to 31% (115 graduates/375) in 2020.

Table 27 International students graduating from public health programs in 2017 and 2020, by degree type, number, %, and % change, 75 programs reporting

Programs (# prog.)	International students graduating				International students graduating % change, 2017 - 2020
	2017		2020		
	#	%	#	%	%
Bachelor's (10 prog.)	23	18%	244	65%	960%
Master's (41 prog.) including:	90	71%	115	31%	28%
MPH (15 prog.)	52	41%	54	14%	4%
MSc epidemiology (7 prog.)	5	4%	12	3%	140%
Master's other (19 prog.)	33	26%	49	13%	49%
PhD (24 prog.) including:	14	11%	16	4%	14%
PhD epidemiology (7 prog.)	2	2%	6	2%	200%
PhD other (17 prog.)	12	9%	10	3%	-17%
Total (75 prog.)	127	100%	375	100%	195%

Comparisons between all students graduating and international students graduating from public health programs in 2017 and 2020

Please note that the data presented in this subsection are drawn from two sets: there are data concerning students graduating from 79 public health programs, and there are data concerning international students graduating from 75 public health programs. In 2017, international students graduating represented 10% of all students graduating (127/1236). Bachelor's (13%) and PhD programs (14%) had the highest proportions of international students graduating (table 28).

Table 28 Comparison of all students graduating and international students graduating from public health programs in 2017, by degree type, number and %, by programs reporting

Programs	Students graduating (# prog.) 2017	International students graduating (# prog.) 2017	International students graduating/students graduating 2017 %
Bachelor's	182 (10 prog.)	23 (10 prog.)	13%
Master's including:	956 (44 prog.)	90 (41 prog.)	9%
MPH	707 (17 prog.)	52 (15 prog.)	7%
MSc epidemiology	89 (8 prog.)	5 (7 prog.)	6%
Master's other	160 (19 prog.)	33 (19 prog.)	21%
PhD including:	98 (25 prog.)	14 (24 prog.)	14%
PhD epidemiology	31 (8 prog.)	2 (7 prog.)	6%
PhD other	67 (17 prog.)	12 (17 prog.)	18%
Total	1236 (79 prog.)	127 (75 prog.)	10%

In 2020, international students graduating represented 22% of all students graduating (375/1677). In bachelor's programs in 2020, international students graduating represented 63% of all students graduating (table 29).

Table 29 Comparison of all students graduating and international students graduating from public health programs in 2020, by degree type, number and %, by programs reporting

Programs	Students graduating (# prog.) 2020	International students graduating (# prog.) 2020	International students graduating/students graduating 2020 %
Bachelor's	389 (10 prog.)	244 (10 prog.)	63%
Master's including:	1168 (44 prog.)	115 (41 prog.)	10%
MPH	780 (17 prog.)	54 (15 prog.)	7%
MSc epidemiology	124 (8 prog.)	12 (7 prog.)	10%
Master's other	264 (19 prog.)	49 (19 prog.)	19%
PhD including:	120 (25 prog.)	16 (24 prog.)	13%
PhD epidemiology	45 (8 prog.)	6 (7 prog.)	13%
PhD other	75 (17 prog.)	10 (17 prog.)	13%
Total	1677 (79 prog.)	375 (75 prog.)	22%

4.4.3 Students enrolled in public health programs in 2017 and 2021, by the home province of universities offering these programs

As noted above, the 2022 data collection identified 28 Canadian universities offering public health programs located in 8 provinces (table 12). However, data on enrolled and graduating students was only provided by universities located in 7 provinces, including Ontario, Québec, British Columbia, Alberta, Nova Scotia, Manitoba and Saskatchewan. These data allow for an estimation of the distribution of the number of students enrolled in or graduating from public health programs at Canadian universities by the province in which they are located (table 30).

According to the reported data, in 2017, the three provinces of Ontario (840 enrollees, 41%), Québec (425 enrollees, 21%), and British Columbia (325 enrollees, 16%) accounted for 78% of the enrollees in university public health programs identified in these regions. The situation was somewhat different by 2021, when the three provinces of Ontario (884 enrollees, 31%), Nova Scotia (723 enrollees, 25%) and Québec (618 enrollees, 22%) accounted for 78% of enrollees. British Columbia is the only province that saw a decrease in enrollees in 2021, with 7 fewer enrollees compared to 2017. In 2021, enrollments from universities in Québec and Nova Scotia increased sharply by 193 and 515 enrollments respectively, equivalent to increases of 45% and 248% compared to 2017.

Table 30 Students enrolled in public health programs in 2017 and 2021, by province of university location, number, %, and change in number and %

Province of university location	Students enrolled				Students enrolled # and % change 2017 - 2021	
	2017		2021			
	#	%	#	%	#	%
British Columbia	325	16%	318	11%	-7	-2%
Alberta	132	7%	182	6%	48	38%
Saskatchewan	82	4%	108	4%	26	32%
Manitoba	10	0.5%	13	0.5%	3	30%
Ontario	840	41%	884	31%	44	5%
Québec	425	21%	618	22%	193	45%
Nova Scotia	208	10%	723	25%	515	248%
Total 7 provinces	2022	100%	2846	100%	822	41%

According to the reported data, in 2017 and 2021, there were international students enrolled in 6 provinces (British Columbia, Alberta, Saskatchewan, Ontario, Québec and Nova Scotia). In 2017, the provinces of Nova Scotia (168 international students, 41%), Québec (103 international students, 25%) and Ontario (60 international students, 15%) accounted for 82% of international students enrolled in university public health programs. The situation was somewhat different in 2021, as two provinces, Nova Scotia (529 international students, 51%) and Québec (275 international students, 27%), accounted for 78% of international students enrolled. In 2021, enrollments at universities in Nova Scotia and Québec increased significantly, with respective increases of 167% and 215% compared to 2017. The case of Alberta is unusual due to the fact that, in 2017, among the public health programs identified in universities in that province, there was 1 international student, while in 2021 there were 39, an increase of 3800% (table 31).

Table 31 International students enrolled in public health programs in 2017 and 2021, by province of university location, number, %, and change in number and %

Province of university location	International students enrolled				International students enrolled # and % change 2017 - 2021	
	2017		2021			
	#	%	#	%	#	%
British Columbia	46	11%	59	6%	13	28%
Alberta	1	0.2%	39	4%	38	3800%
Saskatchewan	33	8%	61	6%	28	85%
Ontario	60	15%	76	7%	16	27%
Québec	103	25%	275	27%	172	167%
Nova Scotia	168	41%	529	51%	361	215%
Total 6 provinces	411	100%	1039	100%	628	153%

4.4.4 STUDENTS GRADUATING FROM PUBLIC HEALTH PROGRAMS IN 2017 AND 2020, BY HOME PROVINCE OF UNIVERSITIES OFFERING THESE PROGRAMS

In 2017, the data collected shows that the province of Ontario had 689 graduates, or 55% of the students graduating from public health programs in the 7 Canadian provinces where the universities offering programs were located. Two other provinces, British Columbia and Québec, accounted for 18% (228 graduates) and 12% (151 graduates) respectively. Together, these 3 provinces accounted for 85% of the students graduating in the 7 provinces (1068/1252 graduates). In 2020, the provinces of Ontario, Québec, Nova Scotia and British Columbia accounted for 90% of graduating students (1500/1691 graduates). Of these 4 provinces, Ontario accounted for 45% of graduates from public health programs. The province of Nova Scotia saw the largest increase in graduates (652%), from 33 graduates in 2017 to 248 in 2020, while British Columbia was the only province with a decrease in graduates (-7%), from 228 graduates in 2017 to 212 in 2020 (table 32).

Table 32 Students graduating from public health programs in 2017 and 2020, by province of university location, number, %, and change in number and %

Province of university location	Students graduating				Students graduating # and % change 2017 - 2020	
	2017		2020			
	#	%	#	%	#	%
British Columbia	228	18%	212	13%	-16	-7%
Alberta	93	7%	132	8%	39	42%
Saskatchewan	53	4%	54	3%	1	2%
Manitoba	5	0.4%	5	0.3%	0	0%
Ontario	689	55%	756	45%	67	10%
Québec	151	12%	284	17%	133	88%
Nova Scotia	33	3%	248	15%	215	652%
Total 7 provinces	1252	100%	1691	100%	439	35%

The data collected showed a 191% increase in the number of international students graduating from public health programs in 6 provinces from 2017 to 2020, from 129 students in 2017 to 376 in 2020. In 2017, Ontario (34 international students graduated), Québec (26 international students graduated), British Columbia (27 international students graduated), and Saskatchewan (25 international students graduated) accounted for 86% of the international students graduating from university public health programs identified in these regions. In 2020, the provinces of Nova Scotia (219 international students graduated), Ontario (50 international students graduated), and Québec (50 international students graduated) accounted for 85% of international students graduating (319 of 376). Of these 3 provinces, Nova Scotia had the largest increase in international students graduated, from 10 in 2017 to 219 in 2020 (a 2090% increase). Also, in 2020, two provinces saw a small decrease in international students graduating: Saskatchewan, whose number of international students graduating decreased from 25 in 2017 to 22 in 2020 (-12%), and Alberta, where there was a decrease from 7 to 6 (-14%) (table 33).

Table 33 International students graduating from public health programs in 2017 and 2020, by province of university location, number, %, and change in number and %

Province of university location	International students graduating				International students graduating, # and % change 2017 - 2020	
	2017		2020			
	#	%	#	%	#	%
British Columbia	27	21%	29	8%	2	7%
Alberta	7	5%	6	2%	-1	-14%
Saskatchewan	25	19%	22	6%	-3	-12%
Ontario	34	26%	50	13%	16	47%
Québec	26	20%	50	13%	24	92%
Nova Scotia	10	8%	219	58%	209	2090%
Total 6 provinces	129	100%	376	100%	247	191%

5 Analysis and proposed actions

The data collected in 2022 on public health programs offered by 28 selected Canadian universities is a continuation of the four previous data collections completed since 2005 (Apatu et al., 2021; Jung et al., 2015; Moloughney & Lederer, 2011; Spasoff, 2005). However, because the samples and objectives of the public health academic training capacity projects conducted previously were different from one other, a detailed trend analysis over the past two decades could not be performed.

Of the 108 public health programs identified that were offered by these 28 universities, information (complete or partial) was obtained from 89, for a response rate of 82%. Like the previous studies, the goal of this data collection was to contribute to a better understanding of the training capacity of public health programs in Canadian universities. Also, the results of the 2022 data collection will be informative for discussions and useful for drawing out implications for public health workforce planning, as well as for activities focusing on how to strengthen the Canadian public health workforce capacity to address post-COVID-19 and emerging public health issues in Canada.

The following subsections analyze the main results of the 2022 data collection and provide some proposed actions to be considered as potential next steps to add to a better understanding of public health training capacity in Canadian universities.

5.1 Locations of university public health programs in Canada

Of the 96 Canadian public universities[26], 28 were identified as offering 108 public health programs of more than 30 credits[27] that lead to undergraduate (bachelor's), graduate (master's, PhD) and postgraduate degrees (medical school specialty degrees in public health and preventive medicine).

These 28 universities are situated in 8 provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Québec, Newfoundland and Labrador, and Nova Scotia. Three provinces, Ontario (12 universities), British Columbia (4 universities), and Québec (4 universities) are home to the most universities offering these programs (20 of 28 universities, or 71%). This is slightly different from the 2014 data collection results (table 8), where 3 provinces, Ontario (14 universities), British Columbia (5 universities) and Alberta (4 universities) accounted for 72% of universities offering these programs (23 of 32 universities) (Jung et al., 2015).

The provinces of New Brunswick and Prince Edward Island, and the 3 territories had none of these public health training programs. Jung et al.'s (2015) study also found that only universities in the same eight provinces offered public health-related university education (table 8).

In 2022, 10 schools of public health were identified, one more than those observed by Jung et al. in 2014 (table 9), which is very few, given that the years 2005 to 2014 saw the creation of 9 schools of public health (Jung et al., 2015). The most recent is the School of Population and Global Health at McGill University (Montréal, Québec). This school was founded in 2016 and began enrolling new students in 2021. According to the data collected in 2022, of the 10 Canadian schools of public health, 4 were in Ontario, 2 in British Columbia, 2 in Québec, 1 in Alberta and 1 in Saskatchewan.

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[26] See: https://www.educanada.ca/study-plan-etudes/university-universite.aspx?lang=eng#:~:text=Canada%20has%20exceptional%20quality%20and,French%20speaking%20countries%5B3%5D.

[27] The only 30-credit graduate program included is the Graduate Diploma in Public Health (DESS-PH) from the Université de Montréal School of Public Health, because all the courses in this program were recognized at the master's level. See: https://espum.umontreal.ca/etudes/programmes/maitrises-dess-et-microprogrammes-de-2e-cycle/dess-et-microprogrammes-de-2e-cycle/.

The 2022 data collection also found that of the 28 universities identified as offering public health programs, two had public health-related institutes. These were the Institute for Global Public Health, created in February 2020 at the University of Manitoba, and the O'Brien Institute of Public Health at the University of Calgary, which was created in 2010 and changed its name in 2014.

The 2022 data collection also enabled us to obtain an overview of universities offering public health programs of 30 credits or less. Some 31 of these, offered by 18 Canadian universities in 7 provinces (British Columbia, Alberta, Manitoba, Ontario, Prince Edward Island, Nova Scotia and Québec) were identified (table 14). Since research on these 30-credit or less programs was not systematic, their number is likely underestimated here. This overview indicated that these programs are offered at both the undergraduate and graduate levels and their titles are varied (table 14, table 40).

The 2022 data collection found that there was considerable diversity in the titles given to public health-related academic programs of more than 30 credits. Some program titles encountered did not include any of the key expressions used as selection criteria for public health programs (table 2; e.g., public health, population health, community health, epidemiology, etc.) and were not selected. This suggests that the supply of public health programs of more than 30 credits identified by the 2022 data collection underrepresents the actual supply of this category of university public health training programs in 2022.

Proposed action to complement the current understanding of Canadian universities' public health training capacity

In order to complement the information on the supply of public health-related programs offered by Canadian universities, it would be appropriate to:

- Maintain a comprehensive list of all public health academic programs offered by Canadian universities by identifying and classifying titles of all public health-related programs offered (less or more than 30 credits, continuing or professional education training programs) with a particular focus on program titles that include terms such as global health, environmental health, Indigenous health, Aboriginal health, vulnerable population health, health impact, occupational health, but which do not contain or are not directly associated with public health, population or community health, health promotion, epidemiology, etc.

5.2 Public health programs offered in Canadian universities in 2022

The program titles identified from the public health programs reporting made it possible to i) notice that there are public health-related programs available at all academic levels, and ii) capture a diversity of program streams as well as areas of specialization targeted by these programs. Some titles listed by degree level are presented below:

- Bachelor's program titles such as Bachelor of Arts, Bachelor of Science, Bachelor of Arts and Science, Bachelor of Health Sciences, Bachelor of Public Health, and Bachelor of Health Promotion (table 16 and table 20);
- Master's program titles such as Master of Arts, Master of Health Evaluation, Master of Public Health (MPH), Master of Business Administration and Public Health (concurrent master's degree), Master of Science in Public Health, Master of Science, and Master of Health Science (table 17 and table 20); and
- Doctoral program titles such as PhD in Public Health, PhD in Epidemiology, PhD in Occupational and Environmental Health, PhD in Health Promotion and Socio-behavioural Sciences, PhD in Social Dimensions of Health, and PhD dual degree program in Digital Public Health, etc. (table 18, table 20).

According to the program titles listed in table 20, with the exception of bachelor's and medical school residency programs, most of the master's and PhD programs appeared to be more specialized[10] (programs with various titles other than or combined with "public health") than generalist[11] (programs identified as only "public health").

The data collected identified undergraduate Bachelor of Public Health-related programs in 11 universities out of 28 (39%) (table 20). Generally, these universities offered only one type of bachelor's degree.

The situation is different for the 23 universities out of 28 (82%) that offered master's degrees. Some universities offered up to 3 different master's degrees in public health-related programs (e.g., MPH, MSc, MA). Among the master's programs, the MPH programs were the most numerous, being offered at 19 of the 23 universities offering master's programs (83%). The second most represented type of master's program was the Master's in Epidemiology, which was offered at 9 of 23 universities (39%). Based on information from Jung et al.'s (2015) data collection that identified 17 MPH programs in 2014, there has been a slight increase in the number of MPHs offered in 2022, where 19 of them were identified.

PhD programs are the second most common graduate programs in terms of numbers. They were offered at 19 universities out of 28 (68%), of which two of these offer a DrPH: the School of Public Health at the Université de Montréal offers a professional doctoral program in public health (DrPH), while the University of Toronto's Dalla Lana School of Public Health began admitting students for DrPH programs in Fall 2021 (table 20).

The 2022 collection also provided information on the public health and preventive medicine residency programs offered by 14 out of 17 medical schools in Canada[28] (82%), which was not done in the 4 previous data collection projects. The 2022 collection did not allow for a comparison of residency programs across universities, and although they all have the same title, program curricula may differ by university.

Of the 28 universities surveyed, only the Université de Montréal School of Public Health (Québec) offers all levels of public health programs: bachelor's[29],master's, PhD, DrPH and the public health and preventive medicine residency program through their school of medicine.

The three studies conducted[30] in 2005-2006, 2011 and 2014 showed an increase in the supply of public health programs at all degree levels, and particularly for the MPH degrees. The data collected in 2022 suggest that there has been a continuation of this growth in the number of programs from 2014 to 2021, but with the exception of the MPH programs, where 2 more were identified, the growth of all other programs can't be quantified precisely.

Comparisons of results on programs in the 2022 collection with those from previous collections are limited. However, it can be argued that:

- The diversity to be found among the public health-related programs – bachelor's, master's, and PhDs – has increased since 2014;

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28 https://www.afmc.ca/resources-data/education/faculty-resources/

29 A BSc in Environmental Public Health and Occupational Health was launched recently by the Université de Montréal School of Public Health.

30 The 2019 survey (Apatu et al., 2021) is not included in this list because it provided descriptive data only on some of the MPH programs offered by a sample of 18 selected Canadian universities chosen from PHAC's list of post-secondary educational programs related to public health in Canada (table 10).

- Master's and PhD programs seem to be evolving towards more specialized fields of public health.

Proposed action to complement the current understanding of Canadian universities' public health training capacity

In order to better understand the diversity of undergraduate and graduate programs related to public health offered by Canadian universities, it would be appropriate to:

- Review the curricula, terms and conditions of bachelor's, master's, doctoral, medical residencies and other academic training programs related to public health that are offered by Canadian universities.

5.3 Students enrolled in and graduating from public health programs in Canadian universities in 2017, 2020 and 2021, by program

5.3.1 Students enrolled in public health programs in Canadian universities in 2017 and 2021, by program

Students enrolled in public health programs in 2017 and 2021, by program

According to the data collected, there were 2846 students enrolled in the public health programs reporting in 2021, representing a 41% increase, or 821[31] more students enrolled than in 2017 (table 22). In 2021, increases in student enrollment were as follows:

- 56% of enrolled students, or 1594 students, were enrolled in public health master's programs, representing 269 more students enrolled than in 2017;
- 34% of enrolled students, or 973 students, were enrolled in public health bachelor's programs, or 504 more students enrolled than in 2017; and
- 9% of enrolled students, or 254 students, were enrolled in public health doctoral programs, or 48 more students enrolled than in 2017.

Bachelor's programs had the largest increase in student enrollment, from 469 in 2017 to 973 in 2021, an increase of 107%. The proportion of enrollees in these programs to total enrollees in all programs increased from 23% (469/2022) in 2017 to 34% (973/2846) in 2021 (table 22).

Master's programs had the largest number of students enrolled in both 2017 and 2021. However, the proportion of enrollees in these programs as compared to total enrollees in all programs decreased from 65% (1325/2022) in 2017 to 56% (1594/2846) in 2021 (table 22).

International students enrolled in public health programs in 2017 and 2021, by program

According to the data collected, there were 1039 international students enrolled in the public health programs reporting in 2021, representing a 157% increase, or 634 more international students enrolled than in 2017. In 2021, increases in international student enrollment were as follows (table 23):

- 56% of international students enrolled, or 577 international students, were enrolled in public health bachelor's programs, or 392 more international students enrolled than in 2017;
- 39% of international students enrolled, or 401 international students, were enrolled in public health master's programs, or 225 more students enrolled than in 2017; and

[31] The 3 enrollees in medical residency programs are not included.

- 6% of international students enrolled, or 61 international students, were enrolled in public health doctoral programs, or 17 more students enrolled than in 2017.

Bachelor's programs had the largest increase in the number of international student enrollees, from 185 in 2017 to 577 in 2021, an increase of 212%. The proportion of international students enrolled in these programs to total international student enrollees increased from 46% (185/405) in 2017 to 56% (577/1039) in 2021 (table 23).

Master's programs had the second largest increase in the number of international student enrollees, from 176 in 2017 to 401 in 2021, an increase of 128%. The proportion of international students enrolled in these programs to total international student enrollees in all programs decreased from 44% (176/405) in 2017 to 39% (401/1039) in 2021(table 23).

Comparison of ratios of international students enrolled to total students enrolled in public health programs in 2017 and 2021, by program

According to the data collected, the ratio of international students enrolled to total students enrolled in public health programs[32] increased from 20% in 2017 to 37% in 2021 (table 34). With the exception of the PhD in Epidemiology programs, in which the proportion of international students enrolled to total students enrolled decreased in 2021 compared to 2017, all other programs showed increases in the proportion of international students in 2021 (table 34).

In 2017 and 2021, bachelor's programs had the highest proportion of international students enrolled of all programs, representing 39% and 59% of enrolled students, respectively (table 34).

Table 34 Comparison of ratios of international students enrolled to total students enrolled in public health programs in 2017 and 2021, by % and trends

Programs	International students enrolled/students enrolled 2017 %	International students enrolled/students enrolled 2021 %	Trends 2017 - 2021
Bachelor's	39%	59%	Increase
Master's including:	13%	25%	Increase
MPH	9%	26%	Increase
MSc epidemiology	16%	21%	Increase
Master's other	23%	27%	Increase
PhD including:	21%	24%	Increase
PhD epidemiology	26%	19%	Decrease
PhD other	15%	27%	Increase
All programs	20%	37%	Increase

[32] Information about the method of calculation used to obtain this ratio is presented in sub-section 4.4.1, (table 24, table 25).

5.3.2 Students graduating from public health programs in Canadian universities in 2017 and 2020, by program

Students graduating from public health programs in 2017 and in 2020, by program

According to the data collected, there was an increase in students graduating from public health programs by 35% in 2020, or 439 more graduated than in 2017. In 2020, graduating students were as follows (table 26):

- 69%, or 1168 students, were graduates of public health master's programs, or 212 more graduates than in 2017;
- 23%, or 389 students, were graduates of public health bachelor's programs, or 207 more graduates than in 2017;
- 7%, or 120 students, were graduates of public health doctoral programs, or 22 more graduates than in 2017.

Bachelor's programs had a 114% increase in students graduating in 2020 compared to 2017. This is the highest increase among students graduating from the 3 public health program degree levels. The proportion of bachelor's program graduating students to total graduating students increased from 16% (182/1252) in 2017 to 23% (389/1691) in 2020.

Master's programs had the highest number of students graduating in 2017 (956) and in 2020 (1168). From 2017 to 2020, the number of students graduating from these programs increased by 22% (table 26).

PhD programs had a 22% increase in students graduating, from 98 students graduating in 2017 to 120 in 2020 (table 26).

International students graduating from public health programs in 2017 and 2020, by program

According to the data collected, there was a 195% increase in international students graduating from public health programs in 2020, with 248 more international students graduating than in 2017. In 2020, international students graduating were as follows (table 27):

- 65%, or 244 international students, graduated from public health bachelor's programs, or 221 more than in 2017;
- 31%, or 115 international students, graduated from public health master's programs, or 25 more than in 2017; and
- 4%, or 16 international students, graduated from public health doctoral programs, or 2 more than in 2017.

Bachelor's programs had a 960% increase in international students graduating in 2020 compared to 2017. This is the highest increase of international students graduating among the 3 public health program levels. The proportion of bachelor's programs' international graduating students to total international graduating students increased from 18% (23/127) in 2017 to 65% (244/375) in 2020 (table 28, table 29).

Master's programs had the highest number of international students graduating in 2017 (90) and the second highest (115) after the bachelor's programs (244) in 2020. From 2017 to 2020, the number of graduates in master's programs increased by 28% (table 27).

Comparison of ratios of international students graduating to total students graduating from public health programs in 2017 and 2020, by program

According to the data collected, the ratio of international students graduating to all students graduating [33] increased in 2020 (22%) compared to 2017 (10%). The most significant change was at the bachelor's level, where the proportion increased from 13% in 2017 to 63% in 2020, when over half of the graduates from bachelor's programs were international students (table 35).

From 2017 to 2020, the proportion of international students among graduates from master's programs increased slightly from 9% to 10%, while those in doctoral programs decreased slightly, from 14% to 13% (table 35).

Table 35 Comparison of ratios of international students graduating to students graduating from public health programs in 2017 and 2020, by % and trends

Programs	International students graduating/students graduating, 2017 %	International students graduating/students graduating, 2020 %	Trends 2017 - 2020
Bachelor's	13%	63%	Increase
Master's including:	9%	10%	Increase
MPH	7%	7%	Stable
MSc epidemiology	6%	10%	Increase
Master's other	21%	19%	Decrease
PhD including:	14%	13%	Decrease
PhD epidemiology	6%	13%	Increase
PhD other	18%	13%	Decrease
All programs	10%	22%	Increase

The significant growth in the number of students enrolled in and graduating from public health programs reporting from 2017, 2020 and 2021, revealed a growing interest in public health programs offered by Canadian universities. Also, the proportion of international students enrolled almost doubled, from 20% in 2017 to 37% in 2021.

The data collected also showed a 35% increase in graduating students in 2020 compared to 2017, and that the proportion of international students graduating more than doubled, from 10% in 2017 to 22% in 2020.

Proposed actions to complement the current understanding of Canadian universities' public health training capacity

In order to learn about the employment niches of university students graduating from public health programs, it would be appropriate to:

- Continue routinely collecting data on students enrolled in and graduating from university public health programs in Canada, in order to have information on the programs and a breakdown of students by program;
- Collect data on the employment pathways of graduating students in these programs within a minimum of 5 years after graduation, using compatible methodologies.

[33] Information about the method of calculation used to obtain this ratio is presented in sub-section 4.4.2, table 28, table 29.

5.4 Students enrolled in and graduating from public health programs in 2017, 2020 and 2021, by the home province of universities offering these programs

5.4.1 Students enrolled in public health programs in 2017 and 2021, by the home province of universities offering these programs

According to the data collected, from 2017 to 2021, with the exception of British Columbia, where there was a 2% decrease (7 fewer students enrolled), the number of enrolled students in public health programs increased in 6 of the 7 provinces where universities with public health programs were located. The four provinces where university public health programs saw a greater than 30% increase in the number of students enrolled between 2017 and 2021 were (table 30):

- Nova Scotia universities had 723 students enrolled in 2021, or 248% more than in 2017;
- Québec universities had 618 students enrolled in 2021, or 45% more than in 2017;
- Alberta universities had 182 students enrolled in 2021, or 38% more than in 2017;
- A Saskatchewan university had 108 students enrolled in 2021, or 32% more than in 2017.

According to the data collected, the number of students enrolled in university public health programs by province sometimes varied greatly from province to province (from 13 students enrolled in Manitoba to 884 students enrolled in Ontario). In 2021, three provinces (Ontario, Québec, and Nova Scotia) accounted for 78%, or 2225 of 2846 students enrolled in public health programs. The distribution was as follows (table 30):

- 31% of enrolled students, or 884 students, were at Ontario universities;
- 25% of enrolled students, or 723 students, were at Nova Scotia universities;
- 22% of enrolled students, or 618 students, were at Québec universities.

According to the data collected, in 2021, the ratio of international students enrolled in Canadian universities in 6 provinces represented 37% of all enrolled students, or 1039 international students enrolled (table 36). The three provinces where more than 40% of enrolled students in public health programs were international students in 2021 were (table 36):

- Nova Scotia universities had 529 international students enrolled, or 73% of their enrolled public health students were international students;
- A Saskatchewan university had 61 international students enrolled, or 56% of their enrolled public health students were international students;
- Québec universities had 275 international students enrolled, or 44% of their enrolled public health students were international students.

Table 36 Students and international students enrolled in public health programs in 2021, by province of university location, number, %, and ratios

Province	2021				International students enrolled/students enrolled
	Students enrolled		International students enrolled		
	#	%	#	%	%
British Columbia	318	11%	59	6%	19%
Alberta	182	6%	39	4%	21%
Saskatchewan	108	4%	61	6%	56%
Ontario	884	31%	76	7%	9%
Québec	618	22%	275	27%	44%
Nova Scotia	723	25%	529	51%	73%
Total 6 provinces	2846	100%	1039	100%	37%

5.4.2 Students graduating from public health programs in 2017 and 2020, by home province of universities offering these programs

According to the data collected, from 2017 to 2020, with the exception of British Columbia which saw a 7% decrease (16 fewer graduating students) and Manitoba (where the number of graduating students remained stable) the number of students graduating from public health programs increased in 5 of the 7 provinces where universities with public health programs were located. The three provinces where the number of graduating students from university public health programs increased by over 40% between 2017 and 2020 were as follows (table 32):

- Nova Scotia universities had 215 more graduating students in 2020, or 652% more than in 2017;
- Québec universities had 133 more graduating students in 2020, or 88% more than in 2017; and
- A Saskatchewan university had 39 more graduating students in 2020, or 42% more than in 2017.

According to the data collected, in 2020, three provinces (Ontario, Québec, and Nova Scotia) accounted for 77% of graduating students, as follows (table 32):

- Ontario universities represented 45% of graduating students, or 756 of 1691 graduating students, and 67 more than in 2017;
- Québec universities represented 17% of graduating students, or 284 of 1691 graduating students, and 133 more than in 2017;
- Nova Scotia universities represented 15% of graduating students, or 248 of 1691 graduating students, and 215 more than in 2017.

According to the data collected, in 2020, international students graduating as a proportion of graduating students from public health programs in universities in 6 Canadian provinces ranged from 5% to 88%. The two provinces where international students made up more than 40% of graduates from university public health programs in 2020 were (table 37):

- Nova Scotia universities had 219 international students graduating, or 88% of all graduating students;
- A Saskatchewan university had 22 international students graduating, or 41% of all graduating students.

Table 37 Students and international students graduating from public health programs in 2020, by province of university location, number, %, and ratio

Province	2020				International students graduating/students graduating %
	Students graduating		International students graduating		
	#	%	#	%	
British Columbia	212	13%	29	8%	14%
Alberta	132	8%	6	2%	5%
Saskatchewan	54	3%	22	6%	41%
Ontario	756	45%	50	13%	7%
Québec	284	17%	50	13%	18%
Nova Scotia	248	15%	219	58%	88%
Total 6 provinces	1691	100%	376	100%	----

According to the data collected, in 2021, 2 provinces (New Brunswick and Prince Edward Island) and the 3 federal territories (Yukon, Northwest Territories and Nunavut) did not have universities offering public health programs. Data on enrollment and graduation of all students were obtained only from universities in 7 of the 8 provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Québec and Nova Scotia), and from 6 provinces for data on international students (British Columbia, Alberta, Saskatchewan, Ontario, Québec and Nova Scotia) (table 30, table 31).

The data collected allowed us to estimate the distribution of students enrolled in or graduating from academic programs in public health according to the province in which universities are located. It also provided a provincial and territorial perspective on public health training capacity in Canadian universities.

Proposed action to complement the current understanding of Canadian universities' public health training capacity

In order to maintain a knowledge base on the composition, mix and distribution of Canadian universities' public health training capacity at the provincial and territorial levels, it would be appropriate to:

- Continue collecting data on students enrolled in and graduating from university public health programs in Canada, according to the provinces or federal territories of the universities offering these programs.

Conclusion

During the years 2005 through 2019, activities aimed at better understanding the training capacity of academic public health programs were undertaken to contribute to public health workforce planning and development. Also, over the past decade, these have been complemented by reports and recommendations concerning the adequacy of public health training capacity to meet the needs of public health in Canada[34].

Our project can be positioned as the fifth and most recent data collection on public health training programs offered by Canadian universities. It provides information on the supply of these programs in 2022, and on students enrolled in and graduating from these programs in 2017, 2020 and 2021.

According to the information consulted, collected and analyzed, the current supply of academic public health training programs is greater than the 108 programs identified. It would be most appropriate to continue with this collection process to have a better understanding of the various curricula as well as other public health training programs (e.g., continuing education programs in universities and offered by other organizations such as the Canadian Public Health Association (CPHA), the Institut national de santé publique du Québec (INSPQ), the BC Centre for Disease Control (BCCDC), Public Health Ontario (PHO), the National Collaborating Centres (NCCs), etc., to comprehensively document the current public health training capacity in Canada.

Relevant data on university-based public health training capacity is only one among the essential components that can contribute to planning a future-oriented workforce and strengthening workforce capacity in public health in Canada. While essential, this component will only fulfill its complete function if it is activated concurrently with the other components that are necessary to realizing this broader aim. Nevertheless, the information contained in this report represents an important step in that direction by:

- Presenting an overview of initiatives implemented since the early 2000s that contributed to better understanding the training capacity of university-based public health programs in Canada;
- Producing relevant, current data on the supply of public health programs offered in Canadian universities in 2022, and on students enrolled in and graduating from these programs in 2017, 2020 and 2021;
- Proposing actions for collecting additional data on the supply of university public health programs to better understand public health training capacity in Canada;
- Recognizing that information on academic public health training program capacity is only one of the essential components to informing workforce development planning and workforce capacity strengthening;
- Recognizing that there is a significant need to identify the full range of questions and information gaps to comprehensively inform public health workforce development planning and workforce capacity strengthening.

[34] (Apatu et al., 2021; Archer et al., 2020; Bell & MacDougall, 2013; Britten et al., 2014; Canadian Public Health Association [CPHA], 2010, 2016; Di Ruggiero et al., 2020; Jung et al., 2015; McAteer et al., 2018; Moloughney, 2016a, 2016b; PHAC, 2017; (Public Health Agency of Canada [PHAC] & Health Canada, 2016; Public Health Human resources Task Group & Di Ruggiero, 2012; Regan et al., 2014; Riley et al., 2015; Sibbald et al., 2022; Yassi et al., 2017).

References

List of references cited in the text only (those consulted only are not included).

Apatu, E., Sinnott, W., Piggott, T., Butler-Jones, D., Anderson, L. N., Alvarez, E., Dobbins, M., Harrison, L. & Neil-Sztramko, S. E. (2021). Where are we now? A content analysis of Canadian master of public health course descriptions and the Public Health Agency of Canada's core competencies. *Journal of Public Health Management and Practice*, *27*(2), 201-207. https://doi.org/10.1097/PHH.0000000000001173

Archer, A., Berry, I., Bajwa, U., Kalda, R. & Di Ruggiero, E. (2020). Evidence synthesis - Preferred modalities for delivering continuing education to the public health workforce: A scoping review. *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice*, *40*(4), 116-125. https://doi.org/10.24095/hpcdp.40.4.03

Bell, M. & MacDougall, K. (2013). Adapting online learning for Canada's Northern public health workforce. *International Journal of Circumpolar Health*, *72*(1), 21345. https://doi.org/10.3402/ijch.v72i0.21345

Britten, N., Wallar, L. E., McEwen, S. A. & Papadopoulos, A. (2014). Using core competencies to build an evaluative framework: Outcome assessment of the University of Guelph Master of Public Health program. *BMC Medical Education*, *14*(1), 158. https://doi.org/10.1186/1472-6920-14-158

Commissaire à la santé et au bien-être. (2022). *Le devoir de faire autrement PARTIE 1 : Renforcer le rôle stratégique de la santé publique -Mandat sur la performance des soins et services aux ainés – COVID-19*. Gouvernement du Québec. https://www.csbe.gouv.qc.ca/fileadmin/www/2022/Rapportfinal_Mandat/CSBE-Rapport_final_Partie1_SP.pdf

Canadian Public Health Association (CPHA). (2010). *Enhancing the public health human resource infrastructure in Canada—Presentation to the House of Commons Standing Committee on Health*. https://www.cpha.ca/sites/default/files/assets/policy/enhance_ph_e.pdf

Canadian Public Health Association (CPHA). (2016). *Public health workforce survey*.

Di Ruggiero, E., Papadopoulos, A., Steinberg, M., Blais, R., Frandsen, N., Valcour, J. & Penney, G. (2020). Strengthening collaborations at the public health system–academic interface: A call to action. *Canadian Journal of Public Health*, *111*(6), 921-925. https://doi.org/10.17269/s41997-020-00436-w

Joint Task Group on Public Health Human Resources. (2005). *Building the public health workforce for the 21st century—A pan-canadian framework for public health human resources planning*. https://publications.gc.ca/collections/collection_2008/phac-aspc/HP5-12-2005E.pdf

Jung, J., Alexandre, B., Sarker, S. & La Prairie, A. (2015). Enumeration of the schools and students of public health in Canada: Continuing trends and gaps. *Pedagogy in Health Promotion*, *1*(3), 134-143. https://doi.org/10.1177/2373379915599405

Luddington, J. & Papadopoulos, A. (2019). *List created for Master of Public Health Program Summary (2019).): Unpublished data*.

Massé, R. & Moloughney, B. (2011). New era for schools and programs of public health in Canada. *Public Health Reviews*, *33*(1), 277-288. https://doi.org/10.1007/BF03391633

McAteer, J., Ruggiero, E. D., Fraser, A. & Frank, J. W. (2018). Bridging the academic and practice/policy gap in public health: Perspectives from Scotland and Canada. *Journal of public health*. https://doi.org/10.1093/pubmed/fdy127

Moloughney, B. (2016a). *Developing pan-canadian competencies for health promoters Final report*. https://www.healthpromotioncanada.ca/wp-content/uploads/2016/07/HPC-Competencies-Final-Report-Main-Body-Only.pdf

Moloughney, B. (2016b). *The role of the Public Health Agency of Canada in public health continuing education: Informing a 5-Year plan: Final report March 2016*. Public Health Agency of Canada.

Moloughney, B. & Lederer, J. (2011). *A survey of Canadian universities offering MPH programs: Assessing use and areas for improvement of Canadian MPH program and practicum guidelines post-Canadian Public Health Association workshop report*.

Naylor, D. & National Advisory Committee on SARS and Public Health. (2003). *Learning from SARS - Renewal of public health in Canada. A report of the National Advisory Committee on SARS and Public Health*. Health Canada. https://www.phac-aspc.gc.ca/publicat/sars-sras/pdf/sars-e.pdf

Pan-Canadian Public Health Network. (2008). *Pan-Canadian Public Health Network annual report 2006-08*.

Public Health Agency of Canada (PHAC). (2008). *Core competencies for public health in Canada* Release 1.0. https://www.canada.ca/content/dam/phac-aspc/documents/services/public-health-practice/skills-online/core-competencies-public-health-canada/cc-manual-eng090407.pdf

Public Health Agency of Canada (PHAC). (2010, January 10). *Guidelines for MPH programs in Canada* [Guidance]. https://www.canada.ca/en/public-health/services/public-health-practice/guidelines-mph-programs-canada/guidelines-mph-programs-canada-references.html

Public Health Agency of Canada (PHAC). (2017, February 14). *Results at a glance—Evaluation of the Public Health Agency of Canada's (PHAC) public health workforce development activities* [Audit]. https://www.canada.ca/en/public-health/corporate/mandate/about-agency/office-evaluation/evaluation-reports/evaluation-public-health-workforce-development-activities-2010-2011-2014-2015/summary.html

Public Health Agency of Canada (PHAC). (2021). *A Vision to transform Canada's public health system: Chief Public Health Officer's report on the state of public health in Canada 2021* [Research]. https://www.canada.ca/content/dam/phac-aspc/documents/corporate/publications/chief-public-health-officer-reports-state-public-health-canada/state-public-health-canada-2021/cpho-report-eng.pdf

Public Health Agency of Canada (PHAC) & Health Canada. (2016). *Evaluation of the Public Health Agency of Canada's public health workforce development activities 2010-2011 to 2014-2015*. https://www.canada.ca/en/public-health/corporate/mandate/about-agency/office-evaluation/evaluation-reports/evaluation-public-health-workforce-development-activities-2010-2011-2014-2015.html

Public Health Human Resources Task Group & Di Ruggiero, E. (2012). *Presentation to Public Health Infrastructure Steering Committee*.

Regan, S., MacDonald, M., Allan, D. E., Martin, C. & Peroff-Johnston, N. (2014). Public health human resources: A comparative analysis of policy documents in two Canadian provinces. *Human Resources for Health*, *12*, 13. https://doi.org/10.1186/1478-4491-12-13

Riley, B., Harvey, J., Di Ruggiero, E. & Potvin, L. (2015). Building the field of population health intervention research: The development and use of an initial set of competencies. *Preventive Medicine Reports*, *2*, 854-857. https://doi.org/10.1016/j.pmedr.2015.09.017

Sibbald, S., El-Aloul, L. & Shelley, J. (2022). Education of future public health professionals through integrated workshops. *Pedagogy in Health Promotion*, *8*(4), 23733799221103204. https://doi.org/10.1177/23733799221103203

Spasoff, R. (2005). *A pan-Canadian strategy for public health workforce education—Pan-Canadian Public Health Human Resources Committee*. https://phabc.org/wp-content/uploads/2015/07/Pan-Canadian-Strategy-for-Public-Health-Workforce-Education.pdf

Yassi, A., Lockhart, K., Gray, P. & Hancock, T. (2017). Is public health training in Canada meeting current needs? Defrosting the paradigm freeze to respond to the post-truth era. *Critical Public Health*, *29*(1), 40-47. https://doi.org/10.1080/09581596.2017.1384796

Appendix 1

Input grid

Table 38 Input grid sent to each program lead

Province	University	Degree Conferred	Type	Data Rec'd	Program Website URL	Number of Eligible Applicants 2017	Number of Eligible Applicants 2021	Number of Students Accepted Each year (Website)	Number of Students Accepted 2017	Number of Students Accepted 2021	Number of International Students Accepted 2017 (subset of all students)	Number of International Students Accepted 2021 (subset of all students)	Number of Students Graduated 2017	Number of Students Graduated 2020	Number of International Students Graduated 2017 (subset of all graduates)	Number of International Students Graduated 2020 (subset of all graduates)	% of eligible students who completed program 2017	% of eligible students who completed program 2020
ritish Columb	Simon Fraser University	Master of Public Health	MPH															
		Master of Science with speci	MSc															
	iversity of British Colum	Master of Public Health	MPH															
		Master of Science in Populatio	MSc															
		Master of Health Science	MSc															
		Doctor of Philosophy in Popula	PhD															
		Public Health & Preventive Me	PrevMed															
		Master of Science in Occupatio	MSc															
	ity of Northern British Co	Bachelor of Health Science w	Bach															
	University of Victoria	Bachelor of Arts in Health an	Bach															
		Master of Public Health	MPH															
		Graduate Diploma in Public H	Cert															
		Master of Arts/Science in soc	MSc															
		PhD in Social Dimensions of	PhD															

Province	University	Degree Conferred	Type	Length of Program	Language of Instruction (E/F)	Areas of specialization /content 'streams'	Part-time Option available (y/n)	Practicum, Required or Option (y/n) ; length	Names of major organizations where Students Complete Practica (if applicable)	Thesis/ Dissertation or major paper, Required or Option (y/n)	Major Paper, Required or Option (y/n)	Capstone, Required or Option (y/n)	Is the Program Accredited? (yes/no, type: ASPHER, APHEA, CEPH)	% of Graduates Employed in relevant field within 1 year	Organizations that Employ Graduates	Name	Position	Phone, email
ritish Columb	Simon Fraser University	Master of Public Health	MPH															
		Master of Science with speci	MSc															
	iversity of British Colum	Master of Public Health	MPH															
		Master of Science in Populatio	MSc															
		Master of Health Science	MSc															
		Doctor of Philosophy in Popula	PhD															
		Public Health & Preventive Me	PrevMed															
		Master of Science in Occupatio	MSc															
	ity of Northern British Co	Bachelor of Health Science w	Bach															
	University of Victoria	Bachelor of Arts in Health an	Bach															
		Master of Public Health	MPH															
		Graduate Diploma in Public H	Cert															
		Master of Arts/Science in soc	MSc															
		PhD in Social Dimensions of	PhD															

Appendix 2

MPH program logistics

MPH program logistics

The partial information presented in table 39* reflects the data reported by some universities that participated in the data collection, as well as data collected from some program websites. This partial information was not analyzed in this report (table 3).

Table 39 MPH program logistics*

Variable		Program
Duration of program	1 year	3[a]
	12-24 months	5[b]
	2 years	11[c]
Language of instruction	English	17
	French	2[d]
Part-time option available	Yes	15
	No	3[e]
	Unknown	1[f]
Practicum duration	12 weeks	4
	12-16 weeks	4
	16 weeks	2
	420-450 hours	4
	Unknown	5**
Capstone required or optional	Yes	14
	No	4
	Unknown	1
Thesis option	Yes	7
	No	11[g]
	Unknown	1[h]
Accredited	Yes	4
	No	11
	Unknown	4

[a] Including Brock University (MPH only), Western University and Memorial University.

[b] Including University of Alberta, McMaster University, Queen's University, University of Ottawa, and University of Toronto.

[c] Including Simon Fraser University, University of British Columbia, University of Victoria, University of Saskatchewan, University of Manitoba, Brock University (MBA & MPH), Lakehead University, University of Guelph, University of Waterloo, Université Laval, and Université de Montréal.

[d] Including Université Laval and Université de Montréal.

[e] Including Simon Fraser University, University of British Columbia and University of Ottawa.

[f] Including Western University.

[g] Including University of British Columbia, University of Alberta, Brock University (MPH only and MBA & MPH), Queen's University, University of Guelph, University of Ottawa, University of Toronto, University of Waterloo, Western University and Université de Montréal.

[h] Including University of Manitoba.

Note*: Some of the data from these tables were collected from program websites for the two programs that did not respond, including University of Manitoba and Memorial University.

Note**: The University of Toronto provided its measurement of practicum duration in the form of full-course equivalents (FCE's), but we did not determine how many hours/weeks/terms one FCE is equal to.

Appendix 3

Overview of public health-related certificate or degree programs of 30 credits or less

Table 40 Selected Canadian universities with public health-related certificate or degree programs of 30 credits or less, with program name and link

University	Program	Link to access
University of British Columbia	Graduate Certificate in Indigenous Public Health	https://www.grad.ubc.ca/prospective-students/graduate-degree-programs/graduate-certificate-indigenous-public-health
University of Victoria	Graduate Diploma in Public Health	https://www.uvic.ca/hsd/publichealthsocialpolicy/future-students/graduate/graduate_diploma/index.php
University of Alberta	Graduate Embedded Certificate in Climate Change and Health	https://www.ualberta.ca/public-health/programs/graduate-certificates/index.html
	Graduate Embedded Certificate in Community-Based Research & Evaluation	https://www.ualberta.ca/public-health/programs/graduate-certificates/index.html
	Graduate Embedded Certificate in Communicable Diseases	https://www.ualberta.ca/public-health/programs/graduate-certificates/index.html
University of Lethbridge	Post-Diploma Bachelor of Health Sciences - Public Health Leadership	https://www.ulethbridge.ca/healthsciences/publichealth
	Post-Diploma Bachelor of Health Sciences - Aboriginal Health	https://www.ulethbridge.ca/healthsciences/aboriginal-health
	Graduate Certificate in Epidemiology and Biostatistics	https://www.ulethbridge.ca/future-student/graduate-studies/graduate-certificate-epidemiology-and-biostatistics
	Graduate Certificate in Public Health Program and Policy Planning and Evaluation	https://www.ulethbridge.ca/future-student/graduate-studies/graduate-certificate-public-health-program-and-policy-planning-and-evaluation
Concordia University of Edmonton	Graduate Certificate in Public Health (3 programs: Leadership, Vulnerable Populations and Strategic Communication. These were under review, and the university was not taking new applications in June 2022.)	https://concordia.ab.ca/science/graduate/public-health-leadership-graduate-certificate/
	Graduate Diploma in Environmental Public Health Practice	https://concordia.ab.ca/science/graduate/environmental-public-health-practice-graduate-diploma/
University of Manitoba	Diploma in Population Health	https://umanitoba.ca/faculties/health_sciences/medicine/units/chs/educational_programs/9383.html
McMaster University	Graduate Diploma in Clinical Epidemiology	https://healthsci.mcmaster.ca/hei-gdce

Table 40 Selected Canadian universities with public health-related certificate or degree programs of 30 credits or less, with program name and link (cont'd)

University	Program	Link to access
University of Guelph	Graduate Diploma in Public Health	https://graduatestudies.uoguelph.ca/programs/phlt
University of Ottawa	Graduate Diploma in Population Health Risk Assessment and Management	https://catalogue.uottawa.ca/en/graduate/graduate-diploma-population-health-risk-assessment-management/
University of Toronto	Certificate in Health Impact	https://www.dlsph.utoronto.ca/programs/certificate-in-health-impact/
Western University	Graduate Diploma in Applied Health Sciences	https://uwo.ca/fhs//programs/ahs/diploma.html
Wilfrid Laurier University	Graduate Diploma in Public Safety	https://www.wlu.ca/programs/human-and-social-sciences/diplomas/public-safety-diploma/index.html
Memorial University	Diploma in Community Health Diploma in Clinical Epidemiology	https://www.mun.ca/medicine/chh/programs/diploma/
Cape Breton University	Post-Baccalaureate Diploma in Occupational Health & Safety Management	https://www.cbu.ca/academics/programs/post-baccalaureate-in-occupational-health-safety-management/
Dalhousie University	Certificate in Public Health	https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=105&chapterid=6497&topicgroupid=29498&loaduseredits=True
Université de Montréal	Microprogramme de 2 cycle en santé publique pour cadres et professionnels en exercice	https://admission.umontreal.ca/programmes/microprogramme-de-2e-cycle-en-sante-publique/
	Mineure en santé publique et mondialisation	https://admission.umontreal.ca/programmes/mineure-en-sante-publique-et-mondialisation/#:~:text=Un%20programme%20flexible%20qui%20repose,%2C%20%C3%A9thique%2C%20droit%20et%20politique
	Certificat en sécurité du travail et santé publique	https://espum.umontreal.ca/etudes/programmes/programmes-de-1er-cycle/certificat-en-securite-du-travail-et-sante-publique/

Table 40 Selected Canadian universities with public health-related certificate or degree programs of 30 credits or less, with program name and link (cont'd)

University	Program	Link to access
Université Laval	Microprogramme de deuxième cycle en surveillance en santé publique	https://www.ulaval.ca/etudes/programmes/microprogramme-de-deuxieme-cycle-en-surveillance-en-sante-publique#:~:text=Ce%20microprogramme%20vous%20permet%20de,des%20autorit%C3%A9s%20de%20sant%C3%A9%20publique
	Microprogramme de deuxième cycle en santé publique - santé mondiale	https://www.ulaval.ca/etudes/programmes/microprogramme-de-deuxieme-cycle-en-sante-publique-sante-mondiale
	Microprogramme de deuxième cycle en santé publique - promotion de la santé	https://www.ulaval.ca/etudes/programmes/microprogramme-de-deuxieme-cycle-en-sante-publique-promotion-de-la-sante#:~:text=Ce%20microprogramme%20vous%20permettra%20de,vie%20de%20centaines%20de%20personnes
	Microprogramme de deuxième cycle en santé publique - évaluation	https://www.ulaval.ca/etudes/programmes/microprogramme-de-deuxieme-cycle-en-sante-publique-evaluation
Université du Québec à Trois-Rivières	Certificat en soins infirmiers de santé publique	https://oraprdnt.uqtr.uquebec.ca/pls/apex/f?p=106:10:::

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