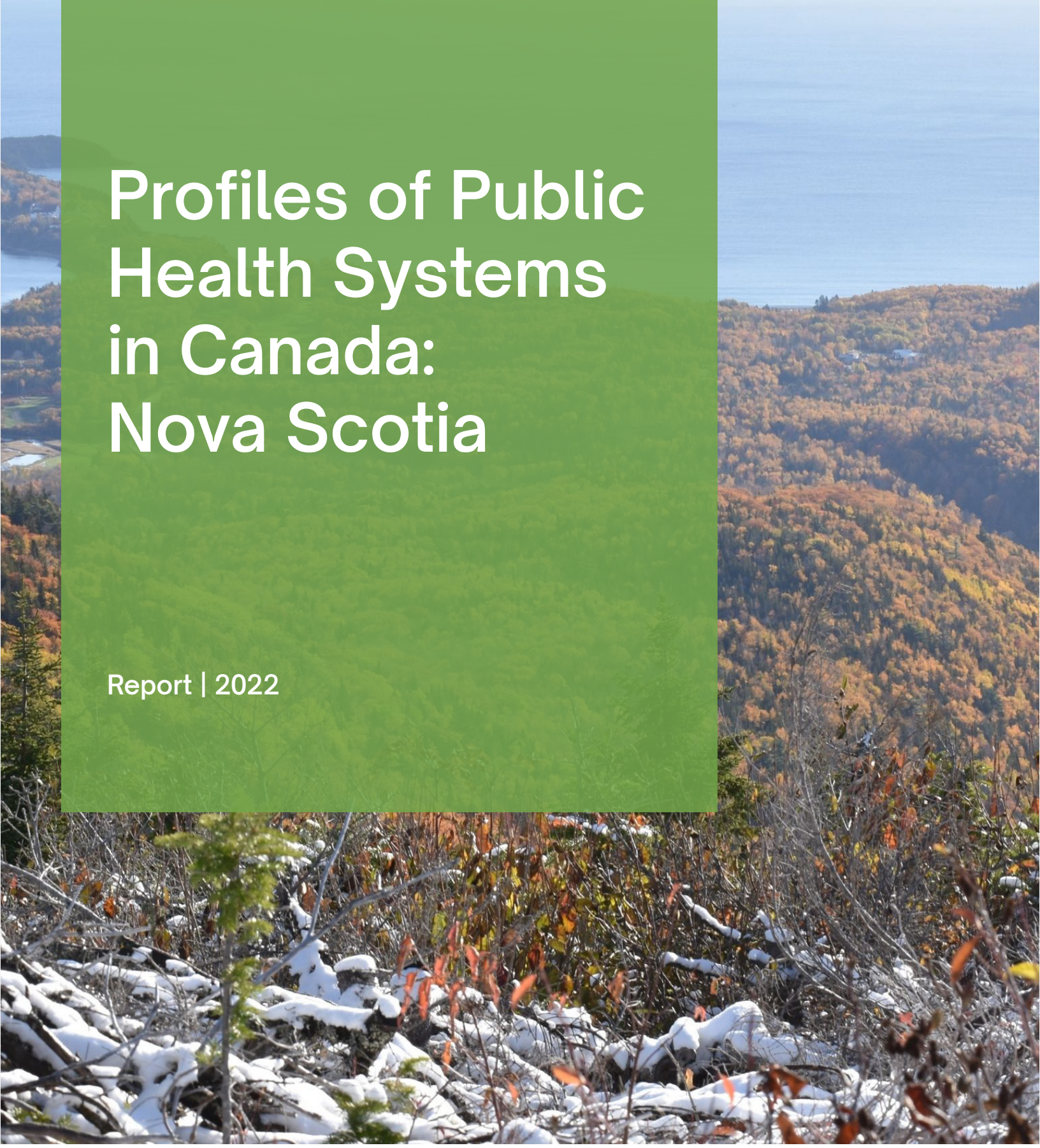
Profiles of Public Health Systems in Canada: Nova Scotia

Report | 2022



NORTH AMERICAN OBSERVATORY on Health Systems and Policies

Dalla Lana School of Public Health

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

UPSTREAMLAB

Population Health Analytics Laboratory

Centre de collaboration nationale sur les politiques publiques et la santé
National Collaborating Centre for Healthy Public Policy

Institut national de santé publique Québec

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About this research project: context, team and partners

The *Profiles of Public Health Systems in Canada* are part of a research project titled *Platform to Monitor the Performance of Public Health Systems,* led by Principal Investigators Dr. Sara Allin, Dr. Andrew Pinto and Dr. Laura Rosella from the University of Toronto. The project involves the participation of knowledge users, collaborators and an inter-disciplinary team of scholars from across Canada, and aims to develop a platform to compare public health system performance across Canada. To achieve this aim, the project comprises three phases:

1. Produce detailed descriptions of the public health financing, governance, organization, and workforce in each of the 13 provinces and territories using a literature review with results validated by decision makers.
2. Conduct a set of comparative in-depth case studies examining implementation and outcomes of reforms, and their impacts on responses to the COVID-19 pandemic.
3. Define indicators of public health system performance with structure, process, and outcome measures.

The National Collaborating Centre for Healthy Public Policy (NCCHPP) joined the research project working group in the early months of the COVID-19 pandemic, and is now proud to publish their work as a series of 13 Canadian Public Health System Profiles, with supplementary methodological materials. The series of public health system profiles are available on the NCCHPP website at: https://ccnpps-ncchpp.ca/profiles-of-public-health-systems-in-canadian-provinces-and-territories/.

About the National Collaborating Centre for Healthy Public Policy (NCCHPP)

The NCCHPP seeks to increase the expertise of public health actors across Canada in healthy public policy through the development, sharing and use of knowledge. The NCCHPP is one of six centres financed by the Public Health Agency of Canada. The six centres form a network across Canada, each hosted by a different institution and each focusing on a specific topic linked to public health. The NCCHPP is hosted by the Institut national de santé publique du Québec (INSPQ), a leading centre in public health in Canada.

Contents

List of acronyms

CHB	Community Health Board
CIHI	Canadian Institute for Health Information
CMOH	Chief Medical Officer of Health
DHA	District Health Authority
EPHO	Essential Public Health Operations
HPA	Health Protection Act
IWK	Izaak Walton Killam Health Centre
MOH	Medical Officer of health
MPH	Master of Public Health
NCCHPP	National Collaborating Centre for Healthy Public Policy
NGO	Non-governmental Organization
NSH	Nova Scotia Health
NSPHS	Nova Scotia Public Health Standards
PHI	Public Health Inspector

Introduction

Objectives

As Canada deals with the COVID-19 pandemic, one of the biggest public health challenges of our time, the need to strengthen public health systems has never been greater. Strong public health (PH) systems are vital to ensuring health system sustainability, improving population health and health equity, and preparing for and responding to current and future crises. There are considerable variations across provinces and territories in how public health is organized, governed and financed, as well as in how public health systems have been reformed and restructured in recent years. This report builds upon prior reports and describes Nova Scotia's public health system prior to the COVID-19 pandemic, including its organization, governance, financing, and workforce. It is part of a series of 13 public health system profiles[1] that provide foundational knowledge on the similarities and differences in the structures of public health systems across provinces and territories. In addition to summarizing what is known, these profiles also draw attention to variations and gaps to inform future priorities. This series will serve as a reference for public health professionals, researchers, students, and decision makers seeking to strengthen public health infrastructure in Canada.

Approach

Details on the jurisdictional review methodology are presented in the document *Profiles of Public Health Systems in Canada: Jurisdictional Review Methodology*.[1] The research team sought out information from peer-reviewed journal articles and publicly available grey literature (e.g., governmental and non-governmental organization reports, documents, webpages, legislation), and data sources (e.g., provincial/territorial budget estimates). The World Health Organization's essential public health operations (EPHOs) were used to define programs and services that constitute public health activities, and enabler EPHOs were used to define public health governance, organizational structure, financing, and workforce (Rechel, Maresso, et al., 2018; World Health Organization, 2015). The search terms were also informed by the research questions presented in a standardized data abstraction form adapted from the European Observatory for Health Systems and Policies (Rechel, Jakubowski, et al., 2018). A narrative synthesis was used to develop detailed profiles that were reviewed internally by the research team and externally by experts from each jurisdiction (e.g., public health policy makers and practitioners) for accuracy, completeness, and reliability. The reports were reviewed by public health key informants in each jurisdiction to assess the validity of our findings. We incorporated their comments and formally acknowledge their contributions at the start of each report.

Limitations

Despite this comprehensive iterative review process and our attempt to highlight information gaps, it should be noted that the process used to compile information was not a formal systematic search, and thus information sources may have been missed. Further, a detailed review of the role of the federal government and of First Nations, Inuit and Métis approaches to public health was beyond this project's scope and should be made a priority for future work. Moreover, by relying in large part on the published documents and websites of the key government actors and agencies in public health, we may not have fully captured how the system functions in practice, and whether and how actual roles and relationships may deviate from what is written in legislation and policy documents. Finally, these profiles describe the public health system prior to the COVID-19 pandemic; we do not review the governance structures, advisory groups and partnerships that were established in response to the COVID-19 pandemic.

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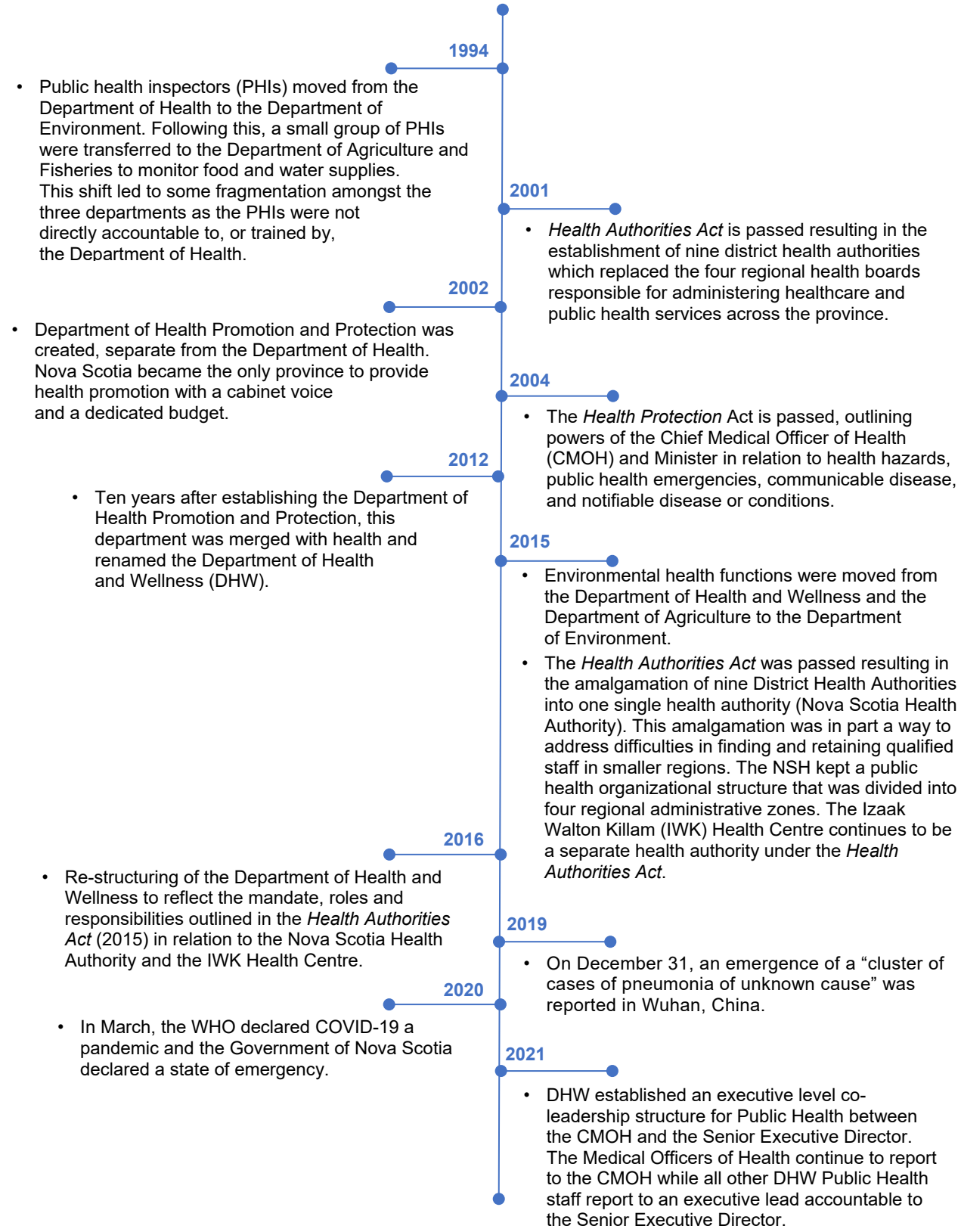
[1] The series of 13 public health system profiles and the jurisdictional review methodology document are available at: https://ccnpps-ncchpp.ca/profiles-of-public-health-systems-in-canadian-provinces-and-territories/.

1 Historical and Contextual Background

Public health in Nova Scotia is about "promoting and protecting health and preventing disease and injuries so that all Nova Scotians can live healthier lives" (Government of Nova Scotia, n.d.). Health equity and social justice are seen as fundamental to the population health perspective, and specifically to supporting the public health objectives of preventing disease and the conditions contributing to the burden of disease, and to promoting health and resilience within priority groups and the overall population (Nova Scotia Department of Health and Wellness, 2011b).

The timeline (Figure 1) presents a summary of proposed and enacted reforms impacting Nova Scotia's public health system. The frequency of legislative changes and restructuring may indicate challenges in operationalizing the public health functions and activities within the province. For example, the amalgamation of nine regional authorities into a single province-wide arm's length authority in 2015 was the most significant health system reform impacting public health in recent years. Since then, there have been some changes to public health roles and responsibilities within the provincial government, including the shifting of the environmental health functions, including inspectors, out of the Department of Health and Wellness and into the Department of Environment and Climate Change (previously named the Department of Environment). Inspection functions within the agriculture portfolio were also shifted to environment. There have also been efforts to clarify the roles and responsibilities of the different provincial actors in public health, including the province-wide health authority, the Office of the Chief Medical Officer of Health (CMOH), and other units within the Department of Health and Wellness.

Figure 1 Timeline of reforms impacting Nova Scotia's public health system



(Fierlbeck, 2018; Health Protection Act, 2004; Health Authorities Act, 2014; World Health Organization, 2020a, 2020b)

2 Organizational Structure

This section describes the organizational structure of Nova Scotia's public health system as of June 2021. We present the roles, responsibilities, and supervisory relationships of governmental and arms-length governmental institutions with a legislated role in public health, including health authorities, public health units, and key figures within each that lead the planning and delivery of public health services. Our focus is on those with public health as their primary role; therefore, we do not provide a detailed description of organizations and service providers in other sectors (e.g., primary care, mental health and addictions, social services, and non-governmental organizations (NGOs) that may perform essential public health functions as part of their work (e.g., immunization, health promotion, etc.).

Public health programs and services provided in Nova Scotia encompass all five WHO EPHOs: 1) surveillance of population health and well-being (e.g., non-communicable and communicable disease surveillance), 2) monitoring and responding to health hazards and emergencies (e.g., risk assessments and protocols, emergency preparedness, etc.), 3) health protection (e.g., environmental, tobacco and other substances, occupational and food safety, etc.), 4) health promotion (e.g., healthy families, prenatal/postpartum care, healthy eating, sexual health, child and youth programs, school programs, mental health, etc.), and 5) disease prevention (e.g., vaccinations, cancer screening). According to the 2011-2016 Nova Scotia Public Health Standards (NSPHS), the foundational standard incorporates principles of "understanding (including population health assessment and health surveillance), health equity and social justice, public health workforce development, public health emergency management and public health system infrastructure development" (Nova Scotia Department of Health and Wellness, 2011b).

2.1 Provincial

2.1.1 Department of Health and Wellness

The Department of Health and Wellness aims to "[provide] leadership to the health system for the delivery of care and treatment, prevention of illness and injury, and promotion of health and healthy living" (Nova Scotia Health Authority, n.d.-a). The Minister of Health and Wellness is responsible for policy development, health quality standards, and monitoring of the health system. In collaboration with health authorities and other partners, the Minister must "set the strategic direction of the health system by establishing a multi-year provincial health plan" and create an accountability framework to ensure that the objectives of the health plan are met (Health Authorities Act, 2014). The Department of Health and Wellness is the primary funder of publicly insured health services and public health programs and services in Nova Scotia. However, the administration of the Medical Services Insurance program is outsourced to Medavie Blue Cross, a not-for-profit medical care insurance company (Fierlbeck, 2018).

The Department of Health and Wellness was restructured in 2016 to align with the Nova Scotia Health (NSH) organizational structure (Fierlbeck, 2018); it was subject to further restructuring in 2021. The Department of Health and Wellness currently has nine branches, among which the Public Health Branch and the Chief Medical Officer of Health are jointly responsible for defining the strategic direction and providing leadership in health promotion and protection activities across the province (Treasury Board, 2017). A co-leadership model applies to the branch, with responsibilities shared between the CMOH and the Senior Executive Director, Public Health. The provincial and regional Medical Officers of Health (MOHs) report to the Deputy CMOH. There are three teams reporting into the Senior Executive Director via an Executive Lead, Public Health: Health Protection, Health Promotion, and Public Health Surveillance. From our search, some public health surveillance

activities are not routinely published, nor available at a disaggregated level by geographical or other factors.

2.1.2 Office of the Chief Medical Officer of Health

The Office of the Chief Medical Officer of Health (CMOH) is led by the CMOH. The CMOH reports to the Deputy Minister of Health and Wellness and oversees the Deputy CMOH and the MOHs in the province. In Nova Scotia, the CMOH's role aligns with the "Loyal Executive" typology characterized by the managerial responsibilities of a senior public service person but without legislated authority to communicate publicly (Fafard et al., 2018). Under the *Health Protection Act* (*HPA*), the CMOH is responsible for conducting epidemiological investigations, producing "a surveillance plan for notifiable diseases and conditions," creating a public communications plan, and controlling vector-borne diseases (Nova Scotia Health, 2005). The CMOH is further responsible for determining if the province should declare a public health emergency, which must be announced by the Minister. Following this declaration, the CMOH can implement a variety of corrective actions such as widespread immunization, closures of public spaces, and mass evacuations, among others. A public health emergency is concluded with a declaration by the Minister, with the CMOH's counsel. The CMOH may also delegate their authority to the Deputy CMOH, MOHs, or public health nurses and inspectors (Nova Scotia Health, 2005).

2.1.3 Department of Environment and Climate Change

The Department of Environment and Climate Change and the Inspection, Compliance, and Enforcement Division oversees and enforces the *HPA* and other environmental and health protection legislation (e.g., *Smoke-free Places Act, Tobacco Access Act, Tanning Beds Act, Snow Sport Helmet Act, Safe Body Art Act*) (Finance and Treasury Board, 2017b). Through inspections by public health inspectors (PHIs), audits, investigations, public education, and other administrative functions, the Department of Environment and Climate Change works with the Department of Health and Wellness and MOHs to prevent and respond to potential public health and food safety hazards (Finance and Treasury Board, 2017b; Government of Nova Scotia, 2017). This department is led by a Minister and Deputy Minister of Environment and Climate Change, and an executive director overseeing three regional directors (i.e., central, eastern, and western), who manage district managers for 10 districts (Government of Nova Scotia, 2021). The Department of Environment and Climate Change works with the Department of Health and Wellness in fulfilling these functions.

2.1.4 Nova Scotia Health and the Izaak Walton Killam Health Centre

Nova Scotia Health (NSH) and the Izaak Walton Killam (IWK) Health Centre are responsible for provincial and regional planning and delivery of healthcare and public health services. Following the 2015 reform which created the Nova Scotia Health Authority (now called Nova Scotia Health), administrative authority for public health services was transferred from the health department to NSH (Fierlbeck, 2018). NSH is responsible for a wide scope of services in Nova Scotia including "acute and tertiary care, mental health and addictions, primary healthcare, health system quality improvement, and some physician services" (Fierlbeck, 2018). NSH was also transferred responsibility for quality and performance management of its services (Fierlbeck, 2018). The IWK Health Centre in Halifax pre-dates recent reforms and is a health authority focused on delivering primary, secondary, and tertiary healthcare for women, children, and youth in the Maritimes (IWK Health Centre, 2016a). Related to public health, the IWK Health Centre currently oversees provincial programs including the Nova Scotia Breast Screening Program and the Reproductive Care Program of Nova Scotia (Fierlbeck, 2018; Nova Scotia Breast Screening Program, 2017).

Both NSH and the IWK Health Centre have a president and CEO, who is overseen by a board of directors. The NSH board is appointed by the Minister of Health and Wellness, while the IWK Health Centre board of directors "are self-perpetuating" (Fierlbeck, 2018). According to the IWK Health Centre bylaws, the board is comprised of twelve members elected by individuals of the Health Centre (representing communities throughout the Maritimes); two members selected by the Minister; one appointed by the IWK Health Centre Foundation Board; the Dean of Medicine at Dalhousie University; and "ex-officio non-voting Directors of the Board" (IWK Health Centre, 2016b). The NSH executive leadership team includes several Vice Presidents who report to the President and CEO, and are collectively responsible for strategic planning, monitoring and evaluation, budgeting, and "developing health and wellness integration networks at the provincial level" (Fierlbeck, 2018). The VP Health Services oversees the NSH public health program which is led by a Senior Director of Public Health (Public Health Physicians of Canada, 2019).

The NSH VP Integrated Health Services Program, Primary Healthcare and Population Health is responsible for provincially funded Indigenous health services (Fierlbeck, 2018). However, there is no single health authority coordinating Indigenous public health services as they are provided through an overlapping, and fragmented, network of actors (Fierlbeck, 2018). The creation of a Mi'kmaw health authority, Mi'kmaw Health & Wellness, reflects a long-term vision of health and wellness for Indigenous populations. However, the health authority has not taken on the provision of health services from Indigenous Services Canada (Ulnooweg, n.d.).

2.2 Regional

2.2.1 NSH Management Zones

NSH has authority over four management zones, which regionally govern healthcare and public health services (Nova Scotia Department of Health and Wellness, n.d.-c; Nova Scotia Health Authority, n.d.-b): 1) Western Zone-Annapolis Valley, South Shore and Southwest Nova Scotia; 2) Northern Zone–Colchester-East Hants, Cumberland, and Pictou areas; 3) Eastern Zone–Cape Breton, Guysborough and Antigonish areas; and 4) Central Zone–Halifax, Eastern Shore and West Hants.

Each zone is led by a Vice President of Operations, and a Public Health Director (Fierlbeck, 2018; Public Health Physicians of Canada, 2019). Each zone also has a Regional MOH. Executive Directors are "responsible for the integration and coordination of care and service within and across health care zones" and for ensuring that health services meet provincial standards (Fierlbeck, 2018).

2.2.2 Medical Officers of Health

Medical Officers of Health (MOHs) are public health and preventive medicine specialists employed by the Department of Health and Wellness (Nova Scotia Department of Health and Wellness, n.d.-c). They report to the CMOH and Deputy CMOH, form part of the NSH public health program's leadership team and oversee public health activities within their respective management zone.

MOHs have a variety of responsibilities, including performing health risk assessments and investigations for health hazards, and taking "reasonable action to protect public health" with appropriate notification to the Minister or Deputy Minister (Nova Scotia Health, 2005). As per the *HPA*, a MOH may access public health information from a wide range of sources, including "other government departments, other levels of government, non-governmental organizations (NGOs), hospitals, and Canadian Blood Services" (Nova Scotia Health, 2005). The Act provides a legal framework for ensuring the confidentiality of this information, but the MOHs do have the legal

authority to disclose personal information "as a last resort" to prevent the spread of communicable diseases (Health Protection Act, section 14.3). An evaluation of NSH in 2017 found the nascent co-leadership models emphasized physician and administrative collaboration; however, the roles of MOHs were not clarified or represented in official documentation in some zones (Accreditation Canada, 2017).

Under the *HPA*, MOHs are able to delegate authority to public health nurses and PHIs under certain circumstances (e.g., investigation of potential public health threats and enforcement of regulations) (Health Protection Act, 2004). Notifiable diseases and conditions must be reported to a MOH by physicians, nurses, lab technologists, personnel at educational institutions, and Canadian Blood Services, before the MOH takes further action as dictated by the Nova Scotia Communicable Disease Manual.

2.3 Local

2.3.1 Public Health Offices

There are 31 local public health offices delivering services across four management zones (Nova Scotia Health Authority, n.d.-c). Public health professionals report to the Public Health Director of their respective zone (Public Health Physicians of Canada, 2019). There is limited publicly available data on local public health office organizational structure, professional composition, and service delivery characteristics.

2.3.2 Community Health Boards

There are 37 Community Health Boards (CHBs) across the province that provide some advice to NSH on local perspectives, needs, and priorities, and provide feedback on NSH proposals (Fierlbeck, 2018). Key functions of CHBs include public engagement and the development of three-year community health plans which define health promotion priorities within their respective jurisdiction and a framework for addressing them (Nova Scotia Health Authority, 2019a). These plans are meant to be integrated within NSH health-services business plans according to the *Health Authorities Act* (2014). CHBs are led by a Chair and are comprised of nine to 15 volunteer members who reside within the defined CHB jurisdictions and are appointed by a delegate of the Minister of Health and Wellness (Health Authorities Act, 2014).

2.4 Integration, Intersectoral Coordination, and Inter-jurisdictional Partnership

Integrated health services involve seamless and easy navigation of the health system for users, and coordination of delivery (e.g., programs, services, information), governance (e.g., policies, stewardship), and financial arrangements (e.g., funding models and agreements) between providers and formal and informal partners (World Health Organization, 2008, 2018). Our search identified several programs and services that may constitute integration and intersectoral coordination within and beyond health sectors, as well as inter-jurisdictional partnerships aimed at supporting public health systems within First Nations communities.

2.4.1 Governmental Mechanisms

NSH has authority over public health services, in addition to primary care, acute and tertiary care, and mental health and addiction services, and aims to promote alignment between preventive and curative services (Fierlbeck, 2018). The coordination of public health services within and between management zones may be facilitated by each management zone having VPs and public health directors who report to NSH senior program and corporate leadership team members (Fierlbeck, 2018). The NSH VP Health Services plays an important role in the vertical integration of public health services across the province. This leadership structure is intended to ensure that services meet provincial standards and to reduce variation in the quality of services across regions (Fierlbeck, 2018). One mechanism for promoting province-wide coordination of public health services is the Public Health Steering Committee, which serves to bring together public health actors from the Department of Health and Wellness, the Department of Environment and Climate Change, and NSH. Despite the efforts to coordinate public health services across the province, there is limited publicly available information describing or evaluating some cancer care collaborations with NSH (e.g., HPV vaccination). Also, a Social Deputies Committee appears to convene actors from multiple provincial government departments to address social determinants of health (Department of Health and Wellness, 2019; Treasury Board, 2017). However, details regarding the constituents, activities, and authority of this committee are lacking.

2.4.2 First Nations Public Health Systems

The Tui'kn Partnership is an example of intersectoral collaboration to promote population health and population health assessment within Mi'kmaw communities (Tui'kn Partnership, n.d.-a). Tui'kn is a partnership between five communities of the Mi'kmaw Nation which share geographic boundaries with what is now referred to as Cape Breton. In collaboration with the Department of Health and Wellness, Health Canada, Dalhousie University and Medavie Blue Cross, the Tui'kn partnership created the Unama'ki Client Registry (The First Nations Information Governance Centre, 2014; Tui'kn Partnership, n.d.-b). This information system enables population data from Unama'ki communities to be linked with provincial health databases and shared with partners while ensuring Unama'ki communities retain ownership and control over access to and use of their data (The First Nations Information Governance Centre, 2014; Tui'kn Partnership, n.d.-b). Guided by a shared vision, the Tui'kn Partnership also leads intersectoral initiatives aimed at improving primary and mental healthcare, as well as population health interventions to promote oral health. Over the past decade, this initiative has expanded to include all 13 Mi'kmaw communities in Nova Scotia, with defined data governance and information sharing protocols. Now known as the Mi'kmaw Client Linkage Registry, this data source forms the foundation for comprehensive population health indicator reports developed in collaboration with Mi'kmaw health leaders, Department of Health and Wellness, NSH, and IWK Health Centre.

2.4.3 Local and Intersectoral Collaboration

The Nova Scotia Public Health Partnership Protocol describes the development of partnerships and collaborations with actors in the "voluntary sector, non-governmental organizations, local associations, community groups, networks, coalitions, academ[ia], [other] governmental departments, the private sector, Community Health Boards, and others" (Nova Scotia Department of Health and Wellness, n.d.-a). This includes work in "assessment, planning, implementation, monitoring and evaluation of programs and services" (Nova Scotia Department of Health and Wellness, n.d.-a).

PHIs assess and respond to health hazards, and their effective operations depend on collaboration across multiple government departments. This leads to the potential for overlapping authority and inaction where the source of a health hazard is unclear (Fierlbeck, 2018). This lack of clear responsibility is partially (but not completely) addressed under subsection 25.2 of the *HPA*, which states that a PHI is granted the "same power as a medical officer under subsection (1) if the public health inspector believes that, in the time necessary for a medical officer to take action, a health hazard could arise or an existing health hazard could worsen" (Health Protection Act, 2004). Moreover, the recent consolidation of environmental health functions, including inspectors, within one department (Environment) may help to address this issue of overlapping responsibilities.

3 Governance

Public health system governance comprises the legal, regulatory and policy frameworks (e.g., public health legislation, regulations, standards, guiding policies) which define the roles and responsibilities of key actors and the strategic vision, mission and goals directing the public health system (World Health Organization, 2015). Performance measurement and evaluation of public health activities are fundamental to assessing whether systems produce the intended outcomes and facilitate the continuous improvement of programs and services (World Health Organization, 2015).

3.1 Legal and Policy Framework for Public Health

3.1.1 Health Protection Act

The central public health law in Nova Scotia is *An Act to Provide for the Protection of Public Health*, commonly known as the *Health Protection Act* (*HPA*) (Health Protection Act, 2004). The Act has three parts. The first outlines the roles, responsibilities, and powers of key actors (e.g., the Minister, the Chief Medical Officer and MOHs) in preventing, identifying and managing health hazards and disease (i.e., notifiable and communicable diseases) (Health Protection Act, 2004). Part two focusses on food safety and outlines roles and responsibilities of actors in public health as well as food producers, retailers, and restaurants around for example, food establishment classification and permitting, inspections, and contamination control (Health Protection Act, 2004). Part three presents regulations and amendments to supporting legislation (e.g., *Health Authorities Act*, *Municipal Government Act*, *Dairy Industry Act*, and *Freedom of Information and Protection of Privacy Act*) (Health Protection Act, 2004). The HPA places emphasis on the balance between individual rights and public good (Nova Scotia Health, 2005). It provides the legal framework for the government to place restrictions on the private rights and freedoms of Nova Scotians in circumstances where restrictions are reasonably required, such as a health hazard, notifiable disease or condition, communicable disease, or public health emergency.

3.1.2 Nova Scotia Public Health Standards

The Nova Scotia Public Health Standards (2011-2016; NSPHS) establishes the expectations for public health for both the provincial and health authority levels (Nova Scotia Department of Health and Wellness, 2011b). The most recent version, referred to herein, is the 2011-2016 document which is on the Nova Scotia website. It was informed by the Ottawa Charter for Health Promotion and focuses on the following five key goals: to build healthy public policy; to create supportive environments; to strengthen community action; to develop personal skills; and to reorient health services. The NSPHS contains four interconnected standards and ten protocols which state societal and public health outcomes, as well as general requirements to be fulfilled through public health initiatives. The standards have more authority than the protocols. Unlike in some other provinces' standards and protocols documents, the NSPHS does not list specific or quantifiable targets to be achieved; rather, it puts forth general aims and objectives.

The NSPHS seeks to identify, engage, and support priority populations, as well as tailor "programs and services to meet population health needs including those of priority populations" (Nova Scotia Department of Health and Wellness, 2011b). The NSPHS does not specifically state which groups are included in priority populations, but rather leaves flexibility for policy makers to determine these in specific contexts. However, when discussing the aim of reducing health inequalities, the document does highlight the following communities and organizations as potential collaborators or target groups: First Nations; African Nova Scotians; immigrants; people with disabilities; anti-poverty

groups; faith-based communities; women's groups; the LGBT community; young children and youth; infants; and mothers.

3.2 Performance Management and Evaluation

In 2015, the Nova Scotia Department of Health and Wellness published its first Population Health Profile, which provides a descriptive report of the health and health status of the population (Nova Scotia Health Authority, 2015); however, there have been no updated reports published since then. The indicators were organized into three sections, disaggregated by age, sex, income, education, and geography, where possible: Who We Are, How Healthy Are We, and What Affects Our Health. The indicators offer a high-level overview of the descriptive data collected by the Department of Health and Wellness. However, health inequalities and inequities among communities made marginalized and geographic areas (e.g., urban versus rural) are not routinely published (Accreditation Canada, 2017). NSH is also responsible for monitoring and evaluating quality and performance of health programs and policies. Thus, NSH self-monitors the reporting, correction, quality, and improvement of its programs, which may pose issues for transparency and accountability (Fierlbeck, 2018).

Table 1 Nova Scotia Population Health Profile Indicators (Nova Scotia Health Authority, 2015)

Who We Are	How Healthy Are We	What Affects Our Health
Citizenship	Arthritis	Exclusive Breastfeeding
Immigration	Self-reported Health Status	Fruit and Vegetable Consumption
Visible Minorities	Self-reported Mental Health Status	Heavy Drinking
Aboriginal Identity	Heart Disease	Sense of Belonging
Population Growth	Respiratory Diseases	Smoking
Lone-Parent Families	Life Stress	Self-reported Physical Activity
Births	Deaths from Injury	Housing Affordability
Birth Rate	High Blood Pressure	
Life Expectancy at Birth	Health-Adjusted Life Expectancy at Birth	
Deaths	Low Birth Weight	
Unemployment Rate	Infant Mortality	
Low Income	Overweight or Obese	
Educational Attainment	Diabetes Prevalence	
	Cancer Incidence	
	Cancer Mortality	
	Hepatitis C	

Nova Scotia produces additional surveillance reports on their website (Nova Scotia Department of Health and Wellness, n.d.-b). These include: the Annual Notifiable Disease Surveillance Report (Nova Scotia Department of Health and Wellness, 2018); the Annual Influenza Surveillance Report (Nova Scotia Department of Health and Wellness, 2020a); the Respiratory Watch Report (every three weeks) (Nova Scotia Department of Health and Wellness, 2020b); School Based Immunization Coverage in Nova Scotia (annual) (Nova Scotia Department of Health and Wellness, 2017); and the Surveillance Report on HIV/AIDS in Nova Scotia (1983-2011) (Nova Scotia Department of Health and Wellness, 2011c). Furthermore, NSH has published a series of reports that include performance measurements and indicators on their website. For example, the 2017 Accreditation Report reviewed public health services; the Healthier Together: 2017-2018 Priorities Status Report offers insights into health system performance indicators (performance indicators not exclusive to public health); and other reports focus on cancer and immunization coverage (Nova Scotia Health Authority, 2020b).

Furthermore, sections six and eight of the *Health Authorities Act* mandate that the Department of Health and Wellness ensure health authorities develop, implement, and report on health-services business plans that include performance indicators related to financial management (Health Authorities Act, 2014; Nova Scotia Health Authority, 2018). However, these performance measurements have not been updated since 2017 (Nova Scotia Health Authority, 2020c).

4 Financing

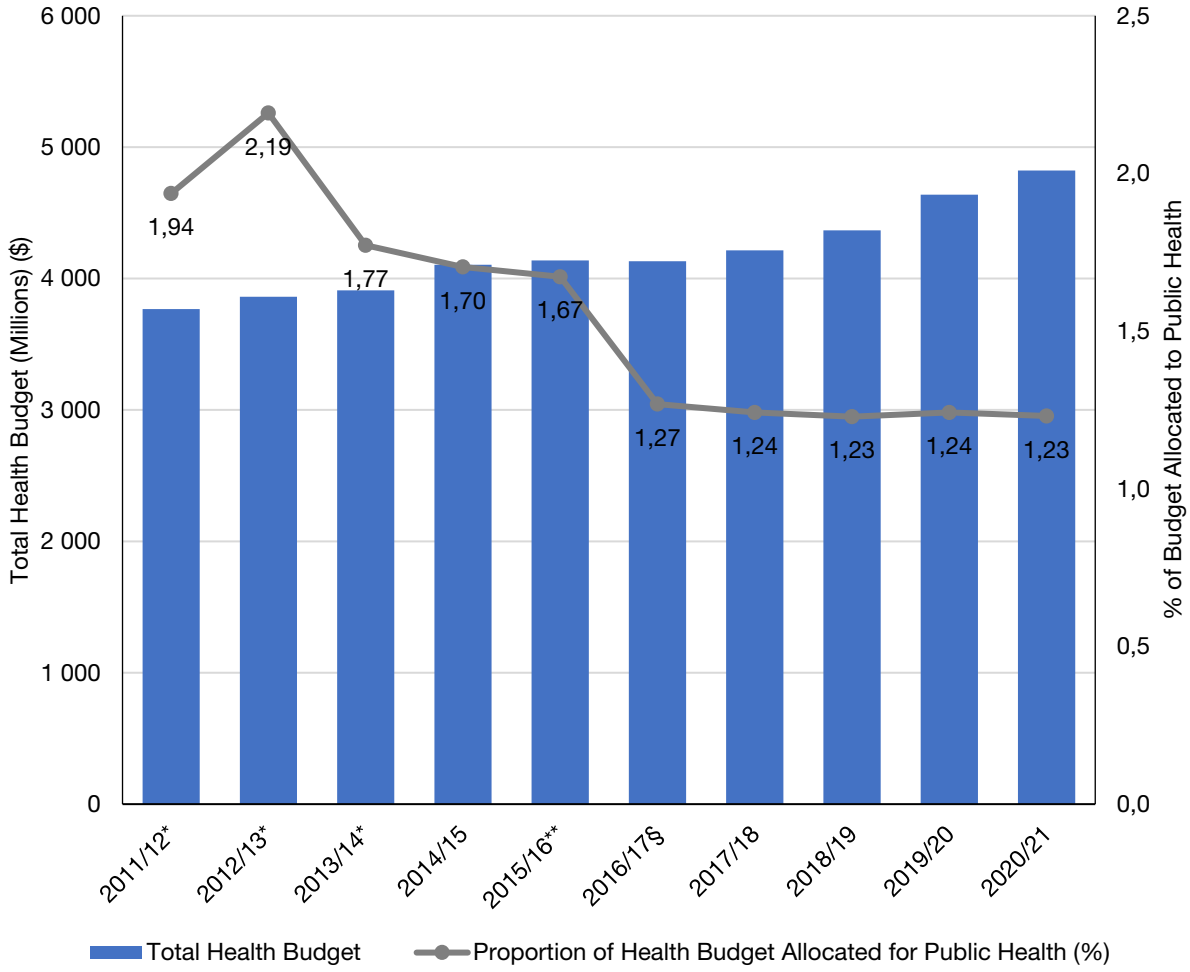
Among the EPHOs, financing refers to the "mobilization, accumulation and allocation of resources to cover population health needs, individually and collectively" (World Health Organization, 2015). Our search sought publicly available data from provincial budget reports and where public health expenditures were not specified, audited financial statements of key public health actors receiving provincial health funding (e.g., provincial, regional health authorities).

4.1 Provincial Public Health Spending

The provincial government is the primary funder of public health services. Provincial public health spending data is reported in the provincial budget Estimates and Supplementary Detail reports from fiscal years 2011/12 to 2020/21. IWK and NSH receive operating and capital grants from the Department of Health and Wellness to support public health and healthcare services (IWK Health Centre, 2020; Nova Scotia Health Authority, 2020a). Physicians are paid directly, using a mix of alternative clinical payments and fee-for-service, from the Department of Health and Wellness for preventive and acute health services.

Within the 2020/21 provincial budget, public health services and programs are estimated to account for 1.23% ($59.4 million) of the DHW's overall budget ($4.8 billion) (Figure 2). While the absolute amount (not adjusted for inflation) of funding allocated to public health has increased since the 2016/17 budget, the proportion of total health system spending has remained relatively stable (Figure 2). Higher proportions, between 1.7% and 2.2%, of the Department of Health and Wellness budget appear to have been invested in public health between 2011 and 2016 (Figure 2). However, these increases could at least in part be influenced by our inclusion of Active Living program expenditures (which may have been transferred to the Department of Communities, Culture, and Heritage in 2017/18) and Breast Screening which used to have a distinct provincial programs budget line.

Figure 2 **Department of Health and Wellness budget estimated operating expenditures, fiscal years 2011/12 to 2020/21 (CAD$, not adjusted for inflation) (Finance and Treasury Board, 2011, 2012, 2013, 2014, 2015, 2016, 2017a, 2018, 2019, 2020)**



Notes: Total Department of Health and Wellness expense estimate includes expenses for general administration, strategic direction and accountability, service delivery and supports, health authority transfers, and capital grants and healthcare amortization expenditures.

* Administration and Program budget lines for Active Living referred to as "Physical Activity, Sport and Recreation" within the budget; Active Living includes programs and services that promote physical activity, sport, and recreation with the aim of improving health outcomes and quality of life (Finance and Treasury Board, 2015); Budget for “District Health Authorities” presented under Nova Scotia Health.

** Active Living budget transferred to the Department of Communities, Culture, and Heritage in 2016.

§ Health promotion budget line within System Strategy and Performance program refers to "Risk Management - Health Promotion"; Chief Medical Officer of Health expense reduction likely attributable to restructuring activities which reduced the number of full-time equivalent staff from 65.7 (2015/16) to 16.4 (2016/17).

Comparable spending estimates were reported in a recent study that examined public health spending in Nova Scotia since the creation of the single health authority, NSH (Caldwell et al., 2021). Their analysis of 2015/2016 to 2019/2020 budgets from the Department of Health and Wellness found that the annual funding allocated to support public health was consistently below 1%. In addition, analysis of Canadian Institute for Health Information (CIHI) data from 1975 to 2018 found that expenditures on public health grew less than spending in other sectors in Nova Scotia, unlike in most other provinces where there was significant real growth in public health spending that outpaced spending in other sectors over this time period (Ammi et al., 2021).

The amount of funding dedicated to public health is largely determined based on spending patterns in the prior years. However, in 2005, a group comprised of stakeholders from the provincial government, health authority public health directors, and other public health professionals, was established to develop a novel methodology for allocating public health resources in Nova Scotia (Christian et al., 2006). The Task Team developed a formula that allocated 70% of "new funding" to district health authorities (DHAs), and the total amount allocated to specific DHAs was determined according to the following factors: cost of program delivery (base funding); the population size (population-based funding); and the jurisdiction's population density, proportion of residents without secondary education, median household income, and self-rated health (as a way to implement needs-based funding) (Christian et al., 2006). This formula was piloted for the 2006/07 and 2007/08 budget cycles, but there is no evidence of this formula being adopted beyond this pilot stage, nor any evaluation of how this formula differed from the previous approach.

4.1.1 Public Health Spending in Healthcare and Across Sectors

Within the health system, the largest proportions of funding are invested in health authorities, physician services, and continuing care (Finance and Treasury Board, 2020). Approximately 1.9% ($40.8 million) of transfer payments from the Department of Health and Wellness to NSH and the IWK Health Centre (total expenditure: $2.1 billion) was allocated to public health services in 2020/21 (Finance and Treasury Board, 2020). This portion has been fairly constant since fiscal year 2011/12. IWK Health Centre does not have a dedicated budget line for public health but was included in the total health authority expenditure figure because of its key role in maternal, infant and child healthcare and leadership of the Nova Scotia Breast Screening Program (Fierlbeck, 2018; Nova Scotia Breast Screening Program, 2017). When IWK Health Centre is excluded from the denominator of this proportion, approximately 2.2% of the NSH transfer payment is allocated to public health (in 2020/21) (Finance and Treasury Board, 2020).

Expenditures related to public health can also be found in the budgets of the Department of Communities, Culture, and Heritage, the Department of Education and Early Childhood Development, and the Department of Environment and Climate Change. The Department of Communities, Culture, and Heritage 2020/21 budget for the Communities, Sport, and Recreation program (total expenditure: $27.9 million) includes approximately $4.3 million to programs aimed at promoting physical activity (e.g., the provincial Let's Get Moving strategy) (Finance and Treasury Board, 2020; Province of Nova Scotia, n.d.). The Department of Environment and Climate Change 2020/21 budget includes $21.7 million for "Inspection, Compliance, and Enforcement" (51.2% of total departmental expenditure). These funds support inspection functions and enforcement activities (e.g., food safety, tobacco control, facility hygiene, water sanitation) and some functions arguably beyond public health (e.g., conservation officers from the Department of Natural Resources, etc.).

5 Public Health Workforce

The core public health workforce includes "all staff engaged in public health activities that identify public health as being the primary part of their role" (Rechel, Maresso, et al., 2018). This excludes professionals such as midwives, community pharmacists or family physicians who may promote public health, but only as part of their job. Our search sought information detailing the size and professional discipline composition of, and recruitment and retention trends and strategies for, the public health workforce in Nova Scotia.

5.1 Size, Composition, Recruitment and Retention

Nova Scotia's public health workforce consists of public health nurses, health educators, dental hygienists, nutritionists, support staff, MOHs, epidemiologists, and administrators/managers working at the provincial, district and community levels of the health system (Nova Scotia Department of Health, n.d.). Detailed information on the full scope and number of health professionals working in public health is not available. Each NSH management zone has an appointed MOH who works in a consulting role (Public Health Physicians of Canada, 2019). In 2019, there were seven public health and preventive medicine specialists working in Nova Scotia, equivalent to about one specialist per 100,000 people (Canadian Institute for Health Information, 2020b). As of April 1st, 2021, the government was conducting a search for MOHs with roles focussed on disease surveillance, workplace health, and two associate MOHs to support regional MOHs.

NSH employs 23,400 staff and 2,500 physicians and medical residents; however, there are no details concerning the number working in public health specifically (Nova Scotia Health Authority, 2019b). The most recent data on the full public health workforce in Nova Scotia is available in a 2006 report. At that time, there were 224 public health staff employed at the regional level including: 168 public health nurses, 1 epidemiologist, 13.5 nutritionists, 14 health educators, 19.2 dental hygienists, 20 managers and 8.7 persons in other roles (Nova Scotia Department of Health and Wellness, 2006). A 2017 evaluation of NSH identified several workforce challenges including: public health staff vacancies in the Central and Northern Zones; and vacancies in government positions that affected relationships with community partners and ability to respond to certain public health issues (e.g., infectious diseases and environmental services) (Accreditation Canada, 2017).

5.1.1 Workforce Capacity

The public health workforce was reviewed in 2006 and 2012. The 2006 report on public health in Nova Scotia highlighted public health system workforce challenges including: a lack of clarity in leadership, governance, roles, and responsibilities; uneven capacity and coordination; and shortage of public health human resources, including surge capacity (Nova Scotia Department of Health and Wellness, 2006). The province also lacked PhD-level epidemiologists within their public health workforce (Fierlbeck, 2018). Some of the proposed strategies to address the identified issues included: establishing and implementing a public health workforce development strategy; expanding the overall size of the workforce and those with specialized skill sets and partnering with the academic sector to establish training/practicum programs (Nova Scotia Department of Health and Wellness, n.d.-d, 2006). The 2012 follow-up report which assessed progress made since 2006 suggested there had been progress made in the recruitment of MOHs (Nova Scotia Department of Health and Wellness, n.d.-d). Moreover, by 2015, the province also reported employing four full-time epidemiologists (Fierlbeck, 2018; Nova Scotia Department of Health and Wellness, n.d.-d). The 2012 mid-course review also indicated that a working group had been established in order to develop and implement strategies to address workforce shortages such as building networks with educational

institutions and undertaking targeted recruitment. There has been no follow-up reporting on public health workforce capacity since 2012. Moreover, NSH identified the health system workforce as one of their 2019-24 Quality and Sustainability Plan priorities but did not mention the public health workforce specifically (Nova Scotia Health Authority, 2019b).

5.1.2 Human Resources Policy

There is limited information published on public health professional standards and on public health specific licensing and accreditation systems in Nova Scotia.

The 2006 public health renewal report noted that of all the full-time equivalent staff employed at the time, few individuals had graduate-level training in public health (Nova Scotia Department of Health and Wellness, 2006). Thus, a need to expand the overall size of the workforce and the number of those with specialized skill sets including epidemiologists, professionals with a Master of Public Health (MPH), and DHA directors of public health was identified as an objective. The 2012 follow-up report reiterated the challenges of recruiting a public health workforce that possesses the unique skills and competencies required in the sector (Nova Scotia Department of Health and Wellness, n.d.-d). Specific challenges include the limited availability of new staff who possess the required competencies to lead and facilitate the planning, delivery, and evaluation of needs- and evidence-based public health programming; the need for maintenance and development of skills over time; and specific capacity needs including epidemiologists and staff with a MPH, as well PHIs. The goal of having formal public health leaders MPH-qualified had not been achieved by the release of the 2012 follow-up report (Nova Scotia Department of Health and Wellness, n.d.-d). Though there is no MPH program in Nova Scotia, a Health PhD program was established in 2015 (Fierlbeck, 2018; Nova Scotia Department of Health and Wellness, n.d.-d), and Dalhousie University has graduate programs specializing in Health Promotion and Community Health and Epidemiology.

There is limited information available regarding the training requirements of specific public health actors. The CMOH and Deputy CMOH are public health and preventive medicine specialist physicians (Public Health Physicians of Canada, 2019) who undergo postgraduate training in a recognized specialty program. The Department of Health and Wellness employs public health and preventive medicine specialists to serve as MOHs (Nova Scotia Department of Health and Wellness, n.d.-c).The 2006 public health renewal report indicated that although nurses receive some preparatory public health practice training, some may require a significant amount of on-the-job training, the delivery of which is not formalized and whose provision is challenging for smaller organizations, who are also responsible for program delivery (Nova Scotia Department of Health and Wellness, 2006). PHIs working within the Department of Environment and Climate Change have post-secondary training in science and public health and are certified by the Canadian Institute of Public Health Inspectors (Government of Nova Scotia, 2018).

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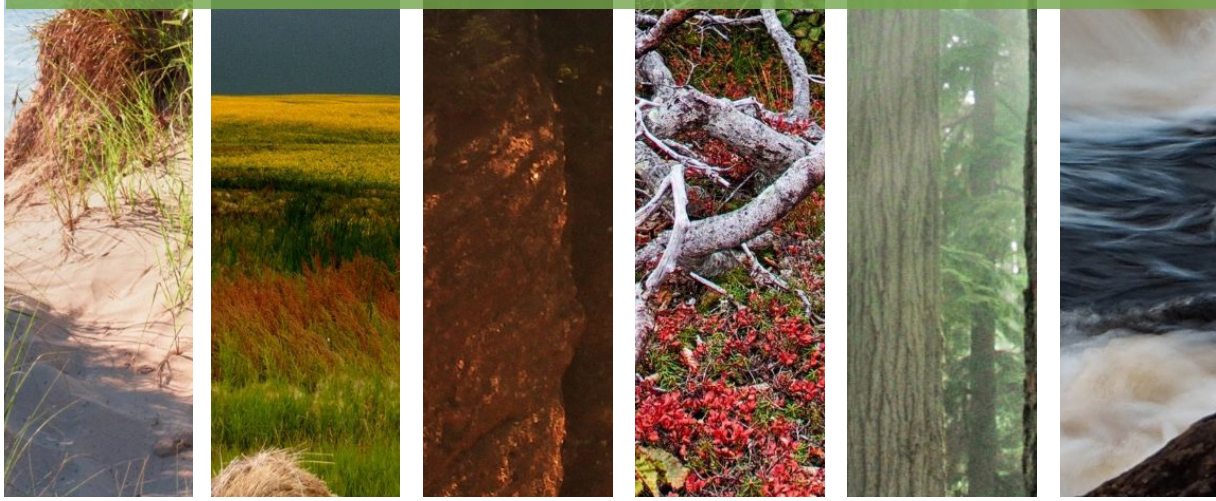

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