STRENGTHENING PRIMARY HEALTH CARE
through Primary Care and Public Health Collaboration.

UBC CENTRE FOR HEALTH SERVICES AND POLICY RESEARCH

An Environmental Scan of Primary Care and Public Health in the Province of British Columbia:

A Series Report

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UBC Centre for Health Services and Policy Research
201-2206 East Mall
Vancouver, BC V6T 1Z3
Canada

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Authors: Sabrina T. Wong PhD, RN, Marjorie MacDonald PhD, RN, Ruta K. Valaitis PhD RN, Janusz Kaczorowski MA, PhD, Valerie Munroe, RN, MN, and John Blatherwick CM, OBC, CD, MD, FRCP(C), LLD.

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About CHSPR

The Centre for Health Services and Policy Research (CHSPR) is an independent research centre based at the University of British Columbia. As leaders of independent, policy relevant research and graduate training, we are dedicated to fostering visionary research within a collaborative and innovative research environment. Our work engages and informs health policy and issues that matter to Canadians. Our faculty and staff carry out a diverse program of research, training, knowledge translation, and data development activities related to health services research and health care policy. We promote a collaborative and interdisciplinary approach, recognizing that contemporary problems in health systems and policy transcend traditional academic boundaries.

Along with our commitment to creating knowledge, we engage stakeholders in the translation of research for effective and innovative changes in health policy. By critically assessing and synthesizing research findings, we make meaning, identify best practices, and provide authoritative and relevant perspective for decision makers. CHSPR receives core funding from the British Columbia Ministry of Health to support research that informs policy decision-making and health care evaluation. Our researchers are also funded by competitive external grants from provincial, national, and international funding agencies.

For more information about CHSPR, please visit **chspr.ubc.ca**. We would like to acknowledge the Centre for Health Services and Policy Research for their support in the production and dissemination of this report.

About Strengthening Primary Health Care through Primary Care and Public Health Collaboration

A primary health care based health system ensures universal coverage and access to services that are acceptable to the population and equity-enhancing. It is widely believed that primary health care systems can be enhanced by building stronger collaborations between public health and primary care sectors, which will lead to more integrated systems and ultimately improved health outcomes.

This four year program of research aims to explore structures and processes required to build successful collaborations between public health and primary care at the systemic, organizational and interactional levels. The research team represents academic researchers and decision-makers from British Columbia, Ontario and Nova Scotia as well as national leaders in primary care and public health. By gaining a better understanding of structures and processes that support and hinder the development and maintenance of successful collaborations and the extent to which and in what settings they exist, this program of research will answer how to create and enhance future collaborations between these sectors. Our program of research is also committed to support the training of health services and policy researchers through the active involvement of graduate students as well as the development of training materials focused on collaboration.

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For more information about this program of research, please visit **strengthenPHC.mcmaster.ca**

Authors and Acknowledgements

Authors

Sabrina T. Wong, RN, PhD
Associate Professor and Faculty
School of Nursing and Centre for Health Services and Policy Research, University of British Columbia

Marjorie MacDonald, RN, PhD
Associate Professor and CIHR/PHAC Chair in Public Health Education and Population Intervention Research
School of Nursing, University of Victoria

Ruta K. Valaitis, RN, PhD
Associate Professor
Dorothy C. Hall Chair in Primary Health Care Nursing
School of Nursing, McMaster University

Janusz Kaczorowski, MA, PhD
Professor and Director of Research
Department of Family Medicine and Community Research at the Child & Family Research Institute, University of British Columbia

Valerie Munroe, RN, MN
Operations Director, Vancouver Community
Vancouver Coastal Health Authority

John Blatherwick CM, OBC, CD, MD, FRCP(C), LLD
Chief Medical Health Officer
Vancouver Coastal Health (retired)

Research Support (in alphabetical order)

Patricia Austin, MA, PhD(c)
Research Coordinator for Program of Research
School of Nursing, McMaster University

Rosalyn Milne
Research Assistant,
School of Nursing, University of Victoria

Sherri Pel, RN
Research Assistant
School of Nursing, University of Victoria

Lavleen Sihota, RN
Research Assistant,
School of Nursing, University of British Columbia

Luiza Souza, BA
Administrative Assistant,
Core Public Health Functions Research Initiative
School of Nursing, University of Victoria

Heather Wilson-Strosher, BA,
Coordinator, Core Public Health Functions Research Initiative
School of Nursing, University of Victoria

Donald White, MBA
Research Assistant
Rho-Orion Consulting

Albert Wu, BSc
Research Assistant
School of Nursing, University of British Columbia

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Executive summary

This report describes an environmental scan that was completed in May 2009 of primary care and public health in the province of British Columbia (BC) as one of a series of steps in a larger program of research: *Strengthening Primary Health Care through Primary Care and Public Health Collaboration Study (Strengthening PHC Study)*. It is one of three scans being completed for provincial health care systems, which include: British Columbia, Ontario and Nova Scotia. The purpose of the environmental scans is to provide current information about the provincial context of primary care and public health that may be contributing, either positively or negatively, towards integration and collaboration between these two health sectors.

The purpose of the environmental scans is to provide current information about the provincial context of primary care and public health that may be contributing, either positively or negatively, towards integration and collaboration between these two health sectors.

The integration of primary care and public health has been implemented in various models of health care service delivery in some provinces and local jurisdictions throughout Canada. Yet, there is a paucity of research that describes these models and the structures that support them, or determines the extent to which they have achieved the health outcomes hoped for. These scans are intended to help identify facilitators, barriers and opportunities that exist in the current provincial structures and processes that can help build such collaborations and where collaboration may or not make sense.

In British Columbia, we reviewed grey literature such as health authority service delivery plans, reports and websites and worked with our decision-maker partners to conduct informational interviews. All data were examined for the structures and processes that either support or create barriers to collaborations between primary care and public health.

Key Findings

Each of the five regional health authorities (Vancouver Coastal, Vancouver Island, Interior Health, Northern Health, Fraser Health) and the one provincial health authority (Provincial Health Services) are organized differently to provide primary care and public health services. Primary care and public health "portfolios" are managed by different divisions or departments within each health authority, with the exception of Northern Health. While there are some areas (e.g., childhood immunizations) of primary care and public health services delivery where collaboration does take place, structural factors (e.g., funding, location of providers) and lack of processes (e.g., streamlined ways of sharing information) create barriers to increasing collaboration.

Primary Care

The majority of primary care, delivered via three broad models, includes fee-for-service, community, and demonstration models. Much of the current primary care workforce consists of family physicians, registered nurses, and nurse practitioners. However, the imminent implementation of the Health Professions Act will have an impact on the delivery of primary care services because it changes the scope of practice for many professions. Implementation of the necessary infrastructure (e.g., electronic health record) remains slow across BC, yet where practices have implemented an electronic health record (e.g., Fraser Lake), interdisciplinary collaboration between primary care and public health has increased. While there are many primary care research projects in BC, more research is needed as the primary care landscape continues to change with emerging issues such as: widespread use of information technology; introduction and implementation of integrated health networks and the practice

support program; integration of nurse practitioners and other types of health care professionals; and implementation of new legislation (Health Professions Act) which will change the scope of practice for many professions.

Public Health

Public health renewal is currently underway in BC with the Core Functions Framework guiding the emphasis on 20 core programs in the areas of: health improvement; disease, injury, and disability prevention; environmental health; and health emergency management. Public health core competencies transcend the boundaries of specific disciplines and are independent of program and topic. Most of the public health workforce consists of registered nurses, medical health officers, nutritionists, environmental health officers, dental health professionals, epidemiologists, and speech/language/audiology professionals. With three schools of public health in BC and 25 or more Masters of Public Health programs across Canada, there may not be positions for all graduates, especially with all jurisdictions facing budget shortfalls. Additionally, there is concern about the availability of public health practicum placements in BC. BC has many public health-focused research projects and four of 15 Canadian Institutes for Health Research public health chairs. As core public health competencies and programs become more widely implemented, more work is needed to examine their effectiveness.

Conclusions

Primary care and public health services are, for the most part, delivered by different sectors of the health care system with the exception of some dual provider functions such as immunizations, screening and treatment for sexually transmitted infections or HIV, prenatal care and well-baby care, and chronic disease prevention.

There are a number of structures in BC that have the potential to enhance collaboration between primary care and public health:

- Particular population groups and disease groups may have health authority structures in place that promote or encourage integration between primary care and public health.
- Community health centres are organizational structures in which primary care and public health functions are already integrated, so these structures are promising avenues for exploring collaboration.
- Given the numbers of nurses (registered nurses and nurse practitioners) delivering primary care and public health, there are opportunities for this group to foster and facilitate increased collaboration.
- The implementation of integrated health networks, plus new ways of primary care delivery (e.g., group medical visits) and additional practice support in primary care already has increased collaboration across primary care and public health, as well as across different disciplines including medicine, nursing, nutrition, pharmacy and social work. These newer structures also have potential for intersectoral collaboration.

Challenges that inhibit collaboration between these two sectors include:

- Differing funding structures and the fact that each health authority invests in primary care and public health at a different level. These variations can create structural barriers to collaboration.
- Policies and mandates of different organizations within each health authority that influence how their health human resources are deployed.
- Training primary care and public health care professionals remains discipline-specific. Currently, we know of no programs that create multiple and sustained opportunities for interprofessional training.

Preamble

The health care system in Canada includes multiple health services components such as acute care, rehabilitation, home care, mental health, public health, and primary care. A primary health care (PHC) based-health system ensures universal coverage and access to services that are acceptable to the population and equity-enhancing [4]. It is widely believed that PHC systems can be enhanced by building stronger collaborations between public health and primary care sectors, and that this increased collaboration lead to more integrated systems and ultimately to improved health outcomes [7, 8]. This notion is further strengthened in the recent WHO report, "Primary Health Care Now More than Ever" [9]. One of the four sets of PHC reforms named in this report is the need for "reforms that secure healthier communities, by integrating public health actions with primary care and by pursuing public health policies across sectors – public policy reforms" (WHO, p. xvi).

In Canada, six core functions define the work of public health: population health assessment; disease and injury surveillance; health promotion; disease and injury prevention; health protection; and emergency preparedness and response [10]. Public health nurses, public health physicians and inspectors, epidemiologists, nutritionists, dental health professionals, health promoters and speech-language professionals make up the public health workforce. Although the focus of this work is on populations, individual and group services are also provided.

Health Canada identifies PHC broadly as an: "approach to health and a spectrum of services beyond the traditional health care system. It includes all services that play a part in health, such as income, housing, education, and environment. Primary care is the element within primary health care that focuses [sic] on health care services, including health promotion, illness and injury prevention, and the diagnosis and treatment of illness and injury." [11]. Services can include diagnosis and treatment, counseling, health promotion, minor surgery, maternal and child as well as primary mental health, palliative, emergency, and rehabilitative care. Primary care is the direct provision of first-contact services by health care professionals such as family physicians, nurse practitioners, and pharmacists [12]. PHC also performs a coordination function ensuring continuity and navigation through the health system when specialized services are required (e.g., specialists or hospitals).

It is widely believed that PHC systems can be enhanced by building stronger collaborations between public health and primary care sectors...

Stevenson Rowan and colleagues [8] have identified that natural linkages occur between the two sectors where their functions overlap, such as surveillance, health promotion and prevention of disease and injury activities. The integration of primary care with public health has been implemented in various models of health care service delivery in some Canadian provinces and localities – some focusing in particular on under-served populations, whether in rural, urban inner city, northern, remote locations or elsewhere [8, 13]. Other integrated models have been developed with provincial or national directions and policies that support structures consistent with the principles of PHC. Inherent in some PHC models were strong geographic decentralized structures responsive to local needs and conditions that support access and referral to prevention programs through to tertiary care [14, 15]. However, there is a paucity of research that describes these models and the structures that support them, or determines the extent to which they have achieved the health outcomes hoped for. It is important to explore the structures and processes that either support or create barriers to collaborations.

Purpose

This environmental scan for the province of British Columbia is one of the first steps in a larger program of research being conducted under the Strengthening Primary Health Care through Primary Care and Public Health Collaboration Study (Strengthening PHC Study). It is one of three scans being completed for provincial health care systems – including British Columbia, Ontario and Nova Scotia – that are being studied as part of our research program.

The purpose of the environmental scans is to assemble information (current as of May 1, 2009) about the context of primary care and public health that may be contributing, either positively or negatively, towards integration and collaboration and how each provincial context may impact directions to strengthen PHC. Each of the provincial scans will help readers, as well as the Strengthening PHC through Collaboration Study research team, better understand and analyze factors that may be impacting primary care and public health integration and collaboration efforts. The scans will also help to identify facilitators, barriers and opportunities that exist in the current provincial structures, as well as processes that can help build such collaborations. They will also help identify where collaboration may or may not make sense. Common themes identified in the scans might also help inform primary health care directions provincially and nationally and suggest areas where further research is needed. From this baseline the team will combine the findings of our recently completed scoping study [1] to analyze findings in the next phases of the research program in light of these contextual factors.

The scans will also help to identify facilitators, barriers and opportunities that exist in the current provincial structures, as well as processes that can help to build such collaborations.

Definitions

Primary Health Care

Globally, there has been a growing movement to renew Primary Health Care (PHC) as envisioned in 1978 in Alma Ata [2]. In light of the recent 30 year anniversary of the Primary Health Care Declaration in Alma Ata in 1978, the Declaration of Montevideo [3] reiterated the emphasis on preventive and promotive services which are part of an integrated health care system. A renewed definition of *primary health care* (PHC) which was developed in 2007 by the Pan American Health Organization and aimed at all countries, emphasizes the health system as a whole (http://www.paho.org/english/DD/PUB/pubHome.asp).

"A PHC-based health system (which) is composed of a core set of functional and structural elements that guarantee universal coverage and access to services that are acceptable to the population and that are equity-enhancing. It provides comprehensive, integrated, and appropriate care over time, emphasizes prevention and promotion, and assures first contact care. Families and communities are its basis for planning and action. A PHC–based health system requires a sound legal, institutional, and organizational foundation as well as adequate and sustainable human, financial, and technological

resources. It employs optimal management practices at all levels to achieve quality, efficiency, and effectiveness and develops active mechanisms to maximize individual and collective participation in health. A PHC-based system develops intersectoral actions to address other determinants of health and equity." [4]

In light of the fact that there has been much confusion regarding terms such as *primary health care, primary care* and *public health*, the definitions noted below are meant to clarify the readers' understanding of these terms as they are used in this environmental scan.

As per the Alma Ata Declaration, the definition of *Primary Health Care* is:

"…essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process." [2].

Primary Care

Primary care has been defined as the:

"level of a health service system that provides entry into the system for all new needs and problems, provides person-focused (not disease-oriented) care over time, provides care for all but very uncommon or unusual conditions, and coordinates or integrates care provided elsewhere or by others" [5].

Public Health

The Public Health Agency of Canada has defined the terms *public health, collaboration*, and *partnerships* in their core competencies document which we have adopted for the provincial environmental scans [6].

Public health is defined as:

…an organized activity of society to promote, protect and improve, and when necessary, restore the health of individuals, specified groups, or the entire population. It is a combination of sciences, skills, and values that function through collective societal activities and involve programs, services, and institutions aimed at protecting and improving the health of all people. The term "public health" can describe a concept, a social institution, a set of scientific and professional disciplines and technologies, and a form of practice. It is a way of thinking, a set of disciplines, an institution of society, and a manner of practice. It has increasing number and variety of specialist domains and demands of its practitioners [and] increasing array of skills and expertise [6].

Collaboration

Collaboration as defined in the Public Health Core Competencies document is:

A recognized relationship among different sectors or groups, which have been formed to take action on an issue in a way that is more effective or sustainable than might be achieved by the public health sector acting alone [6].

Partnerships

Partnerships as defined in the Public Health Core Competencies document are:

Collaborations between individuals, groups, organizations, governments or sectors for the purpose of joint action to achieve a common goal. The concept of partnership implies that there is an informal understanding or a more formal agreement (possibly legally binding) among the parties regarding roles and responsibilities, as well as the nature of the goal and how it will be pursued [6].

Overview and History of Primary Care and Public Health Service Delivery in BC

It is difficult to provide a succinct description of the organization and administration of primary care or public health services in BC for a variety of reasons. The structure and organization are a moving target as several reorganizations at the provincial level have occurred in the past decade. Responsibility for various health services delivery functions have been distributed across Ministries, and the Ministries themselves have undergone reorganization. For example, Public Health Nursing was at one point under the jurisdiction of the Ministry of Children and Family Development (MCFD), then repatriated to the Ministry of Health. In the past decade, the Ministry responsible for health has been organized at various times into: a single Ministry of Health; two ministries - Health Services and Health Planning; again a single ministry (Ministry of Health); and since the spring of 2008, two ministries again (Health Services and Healthy Living and Sport). The current organizational charts for both the Ministry of Health Services and the Ministry of Healthy Living and Sport are shown in Appendix A.

At the regional level, major reorganization in the past decade has significantly affected the structure and delivery of primary care and public health services. Figures 1a-c illustrates the complex governance structure that existed in 2001 prior to the most recent reorganization. At that time, for the purposes of health services delivery, the province was divided into 52 different regional health authorities with three separate governance models: seven community health services societies, 11 regional health boards, and 34 community health councils. Each of these had their own administration and bureaucracy, with a combined total of 52 CEOs and over 600 board members.

Figure 1a-c» **Complex Former Governance**

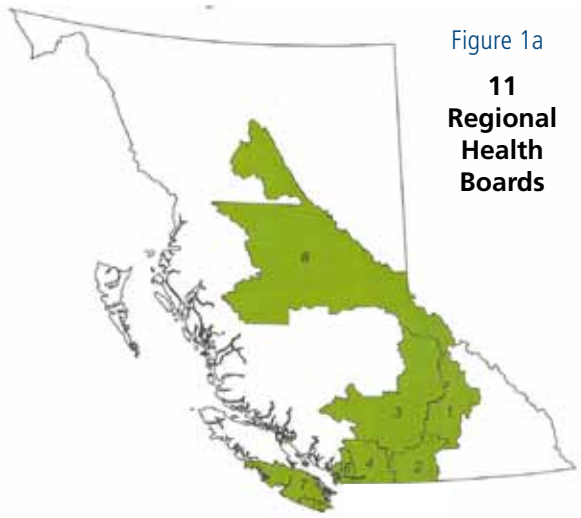


Figure 1a

11 Regional Health Boards

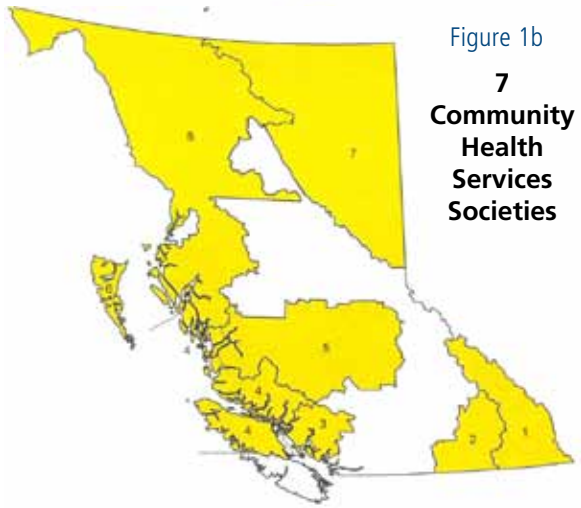


Figure 1b

7 Community Health Services Societies

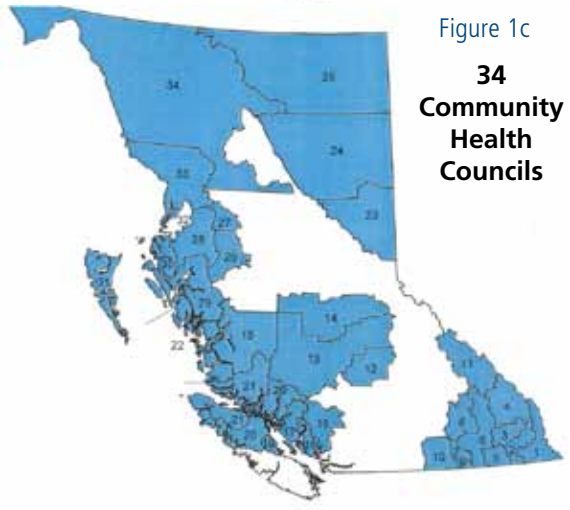


Figure 1c

34 Community Health Councils

Figure 2 presents the reorganized health governance structure implemented in 2002. Five geographic or regional health authorities were created, each of which delivered the full range of health services, including primary care and public health, within their region. The regional health authorities were responsible for: identifying regional health needs; planning and delivering appropriate programs and services; ensuring these are appropriately funded and managed; gathering data and information; and reporting activities and outcomes to the ministries. In addition, one provincial health services authority (PHSA) was created to work with the five regional health authorities in planning, coordinating and/or providing province-wide services.

Figure 2» **Simplified Health Authority Structure**

Effects of Regionalization

Given the present structures of health:

"the BC government has collapsed the previous myriad organizational pieces of government-funded health services into six large autonomous Health Authorities. While guided by the funding made available to them, the policy directions set through performance agreements with the Ministry of Health and the exercise of Ministry of Health's stewardship, the Health Authorities have been free to develop unique cultures. The differences that have evolved and continue through periodic cycles of renewal and transformation make it challenging to draw a stable picture of the operational realities of [primary care or] public health across the Health Authorities over the mid to long term. During the continuous transformations of the Health Authorities, [primary care has only recently received renewed interest, and] public health has often been the neglected member of the wedding party, hidden in the back row of the group photograph and rarely invited to sit at the head table" [16, p. 108].

Legislation About Regionalization

In 2001, under the Health Authorities Act, five regional health authorities were created as well as the PHSA. Health Authorities draw their authority from both the Health Authorities Act and the annual Government Letter of Expectation (GLE). The role of each health authority (HA) is to identify the health needs of the population it serves, plan and provide health services under legislation and ministry policy, partner with the PHSA to deliver their specialized services and compile and report financial and performance-related results to the Ministry of Health Services (MOHS) and the Ministry of Healthy Living and Sport (MHLS). Each HA has its own executive and governance structures. The ministry sets province-wide goals and standards for health authorities, develops legislation and policy, allocates funding, monitors the system and acts to improve performance as needed.

The GLE is a yearly agreement between the health authorities and the Government of British Columbia that defines key accountabilities, roles and responsibilities (including strategic priorities) and performance measures. It is individualized for each HA. The GLE's measures and targets are established by the Ministry and are regularly reviewed. The 2008/09 GLE outlines strategic priorities and its associated performance indicators and targets. Although each GLE is different for each HA, the core public health functions are identified as a strategic priority in all the HA GLEs.

Although each HA is governed by the same Health Authorities Act and focuses on some of the same strategic priorities identified within the GLEs, each HA is structured differently to provide public health services and has autonomy to prioritize and provide services that meet the identified health needs of the population it serves. This means that the supports for collaboration between primary care and public health are likely to differ across health authorities.

Structure of Health Authorities

Currently, each of the five regional HAs and the one provincial HA are organized differently to provide public health services. Primary care services are the responsibility of one particular branch, department or division, expect for Northern Health which considers itself a PHC organization. In most HAs, many of the public health services are the responsibility of a particular branch, department or division; not all of the core public health functions are provided out of the same operational area. This is particularly true for core programs such as reproductive health and mental health and addictions as responsibilities are distributed among different types of professionals including public health nurses, primary care physicians and nurses, social workers and mental health workers to name a few.

Provincial Health Services Authority (PHSA)

The Provincial Health Services Authority, established in December 2001, is governed by the Society Act and is responsible for a number of agencies, tertiary programs

and province-wide services and programs. The first organization of its kind in Canada, the PHSA works with the five geographically defined health authorities, the Ministry of Health Services and the Ministry of Healthy Living and Sport to meet local and provincial needs. As a provincial authority, PHSA and its eight provincial agencies are mandated to support the effective and high-quality delivery of selected, specialized, one-of-a-kind, or province-wide services to an estimated 4.3 million British Columbians [17].

Vancouver Island Health Authority (VIHA)

The Vancouver Island Health Authority serves 752,000 people over a varied geographic territory of 56,000 square kilometers. It operates over 138 facilities, and employs or contracts with approximately 17,000 health care professionals, technicians and support staff as well as 1,640 physicians. VIHA has an annual operating budget of $1.6 billion. Because of the geographic variation across the Island, regional health needs often differ. Thus, the service plan includes an integrated focus on three distinct geographic areas or Health Service Delivery Areas (HSDAs): North, Central and South. The long-term strategic direction of VIHA reflects an attempt to shift from a health care system focused on managing illness to one focused on helping people stay healthy, and to deliver a seamless, integrated continuum of services that spans the spectrum of care from prevention to end-of-life [18].

VIHA has an Integrated Health Service Model that encompasses five clinical services areas, each led by an Executive Medical Director and an Executive Director who have joint responsibility for programs and services across the HA. The five clinical areas are: Primary Health Care; Population and Family Health; Pharmacy, Diagnostic and Surgical Services; High Intensity and Rehabilitation Services; Continuing Health Services; and Medicine and Community Hospitals. Interestingly, PHC is integrated into the same clinical portfolio as population and family health, providing some attractive possibilities for public health and primary care collaboration.

These services are "planned regionally and delivered locally," and "linkages and integration within local communities and between service providers are critical" [18]. VIHA's vision is for a health care system that supports healthy people in healthy communities through seamless services. The vision includes multidisciplinary health centres that provide a full range of integrated services across the continuum of care. Again, this vision provides an opportunity for public health and primary care collaboration. In VIHA, there are four multidisciplinary community health centres (CHCs).

Programs and services are organized within five health sectors: population health and wellness, mental health and addictions, acute care and rehabilitation, home and community care and primary health care. Public health services fall primarily within the population health and wellness sector. Population health and wellness programs recognize the broad determinants of health. There is a focus on serving high risk populations or populations in need as well as the whole population. Clearly, there is an overlap in focus of primary care and population health and wellness with an emphasis on keeping people healthy and preventing illness. This is the key area of overlap.

Vancouver Coastal Health (VCH) Authority

Vancouver Coastal Health provides health services to approximately 25% of the population of BC (more than one million people). This geographic area includes: 12 municipalities and four regional districts in the coastal mountain areas; the coastal cities of Vancouver, North Vancouver, Richmond and West Vancouver; and 14 aboriginal communities [19]. Thus, the geographic regions served by VCH include urban, rural and remote communities. VCH serves not only geographically diverse populations, but also the most culturally and economically diverse populations in the province. For example, it includes some of the wealthiest and poorest postal codes in Canada. VCH has a growing homeless population and half of all new HIV cases in BC. It provides the largest range of tertiary/quaternary services in

the province and thus provides service to many individuals from other health regions [19].

VCH has developed a "Continuum of Care Service Delivery Model" that is intended to guide service integration across the continuum of services from birth to end of life, ranging from preventive and ambulatory through acute and long term care to rehabilitative and palliative (http://www.vch.ca/continuum/index.htm). Through a population health approach, the HA aims to move away from episodic and fragmented health service delivery to a fully integrated set of services. Three networks – Primary Care, Community Care, and One Acute – are corporate structures responsible for overall regional planning across the whole organization with the aim of facilitating integration.

VCH provides a broad range of health services in five areas: population health and wellness, primary health care, acute care, home and community services, and mental health and addictions. Although services are provided at the local level, population health and wellness is responsible for the implementation of core public health functions. The services fall into the four core program areas as outlined in the BC Core Public Health Functions Framework: health improvement, illness prevention, environmental health and health emergency management. Five of the 10 strategic priorities in the VCH service plan are particularly relevant to the delivery of public health services (although they may also be relevant to other health care services): core public health functions, Aboriginal health, mental health and addictions, "Greening" health care, and chronic disease prevention and management.

VCH has four Health Service Delivery Areas (HSDAs): Vancouver Acute, Vancouver Community, Richmond and Coastal. Each of these HSDAs has a Chief Operating Officer (COO). In Vancouver, all community services including Public Health report to the Vancouver Community COO. In Richmond and Coastal, all health services, including acute care and community, fall under the local COO. Public health services may be universal (available to all) or targeted to specific populations (generally those who are more vulnerable to worse health outcomes).

Fraser Health Authority (FH)

Fraser Health serves approximately 1.46 million people (1/3 of the BC population) making it the largest HA in the province. It has three Health Service Delivery Areas: Fraser North, Fraser South, and Fraser East. FHA is both urban and rural, running from Burnaby in the west, east to Hope, and north and south from the US border to Boston Bar. It has doubled its population since 1981 and is expected to increase by an additional 130,000 people by 2010 making it the fastest growing HA in the province. FHA services 22 municipalities and many other communities, ranging in size from small rural communities to large, rapidly growing urban areas. In addition, FHA serves 46,000 First Nations people in 35 bands. It also serves some of the fastest growing populations of people who speak English as a second language, such as South Asian, Chinese, Filipino, and Korean immigrants.

Fraser Health has adopted a population health approach and provides services along the continuum of care from prevention through primary care and community services to acute and specialized care. The service plan stipulates that multiple integrated strategies provided by multiple partners over time are essential for success in realizing the vision of "Better Health, Best in Care." [20] Similar to some other health authorities, they are moving toward an integrated approach to services in which public health will be integrated into the overall plan for service provision within the HA. Of particular interest, projected expenditures for public health in this service plan represent 3.1% of the health budget. Unfortunately, this information is not available for all the health authorities, in part because public health services are integrated into other health services and it is difficult to track the exact spending on public health.

In line with Ministry of Health Services and Ministry of Healthy Living and Sport goals and expectations, the major service areas include: population health and wellness; Aboriginal health and wellness; primary care and chronic disease management; mental health and addictions; acute care and rehabilitation; maternity care and prenatal health; home and community care; and safety and risks.

Interior Health Authority (IHA)

Interior Health Authority serves 714,000 people of which 57,000 are Aboriginal, living in 53 communities. The HA covers a geographic area of 215,000 km, and has a primarily remote rural population that is widely dispersed geographically. IHA is organized into four geographic health service delivery areas: East Kootenay, Kootenay Boundary, Okanagan and Thompson Cariboo Shushwap. To facilitate coordination of services, IHA has adopted an integrated service delivery model while at the same time maintaining a separate public health department or division [21].

IHA provides health care services to the Southern Interior of BC. Interior Health has five key service sectors:

- **Public health** – organized into six portfolios including population health, prevention services, health protection, Aboriginal health, communicable disease control, and administration. The focus of these departments is on "improving the health of the population, preventing communicable and chronic disease, reducing injury and disability and protecting the public from harms caused by environmental factors" (p. 2, IHA Service Plan).
- **Acute Care** – provides urgent care and treatment, primarily in hospitals and community health/primary health care centres.
- **Mental Health and Addictions** – provides treatment to adults and children with mental health, alcohol and drug use issues.
- **Home and Community Care** – provides residential and community health care services to residents who are frail, or who have acute, chronic, palliative, or rehabilitative care needs.
- **Corporate Services** – provides support for the operational areas.

In IHA, although the Acute Care service area is responsible for the 10 primary health care centres (CHCs) located in both urban and rural locations, these centres provide both primary care and public health services. Goldsmith [22] includes these in her census of BC Community Health Centres.

Northern Health Authority (NHA)

Northern Health Authority serves the largest geographic region in BC, covering two thirds of the province (598,000 square kilometers), but serves the smallest population (289,000) [23]. Northern Health (NH) residents have a significantly lower health status than residents in other health regions. This situation provides unique challenges in service delivery not faced by other provincial HAs. NHA is divided into three health service delivery areas: Northeast HSDA, Northwest HSDA and Northern Interior HSDA. Each is led by a Chief Operating Officer (COO). Eight Health Service Administrators report to the COOs. HSAs are responsible for the day-to-day operations of services provided to their community cluster. The population of NH is expected to increase by 2.5% by 2015 and 4.1% by 2020. The number of seniors in NH is expected to increase by 13.5% over the next two years. Over 35% of BC's aboriginal population resides in the north, and 20% of the NH population is Aboriginal [23].

Northern Health is a self-declared PHC organization containing seven major health service sectors: Aboriginal health, acute care, primary health care, home and community care, mental health and addictions, organizational support, and population health and wellness.

Primary Care

The Organization of Primary Health Care at the Provincial Level

Primary care implementation and service delivery is governed under the Assistant Deputy Minister (ADM) in the Ministry of Health Services for the Health Systems Planning Division. The general responsibilities of this Ministry are: leadership and support for the health service delivery system; performance management of the health authorities; health human resource planning; health regulation and licensing; health information systems and e-health; end of life and palliative care; community and home support services; mental health and addictions services; and BC Nurseline, BC Bedline, Medical Services Plan, PharmaCare, BC Ambulance Service and Vital Statistics [24]. This Ministry works closely with the province's six Health Authorities (five regional and one provincial), Medical Services Commission, Medical and Health Care Services Appeal Board, BC Patient Safety & Quality Council and the Hospital Appeal Board: http://www.gov.bc.ca/health/index.html.

There are two executive directors within this division of the Ministry, one for Health Systems Planning and one for PHC. Under the PHC executive director portfolio are the director of PHC, the director of "Patients as Partners" and a project director.

Policies/Mandates: PHC Renewal in British Columbia

Federal and Provincial Policies

Over the last decade there has been significant focus on transforming the delivery of PHC in Canada. Federal and provincial governments have made substantial investments in renewing the PHC system through a number of initiatives. Most, if not all, of these initiatives have focused on strengthening primary care and have included: the Health Transition Fund [25], the PHC Transition Fund [26] and the First Minister's Accord on Health Care Renewal [27]. Between 1997 and 2003, federal investments in PHC renewal and evaluation of the various initiatives exceeded one billion dollars [28].

Between 2002 and 2006 British Columbia received $74 million of the PHC transition fund to: "strengthen family practice and reduce pressure on the acute care system; improve health care delivery and health outcomes; and provide patients with a wider range of options for accessing services at the local level" [28]. The province's plan for PHC renewal was based on a strategic partnership with five of BC's six regional health authorities (Northern Health, Vancouver Island, Vancouver Coastal, Interior Health, and Fraser Health), which received the majority of this funding to help implement innovative solutions to deliver PHC more effectively. The remaining funds were used to support province and system-wide initiatives.

Partnerships for Delivering Primary Care

Currently, the delivery of a core component of PHC – primary care – is primarily through family practice physicians. Primary care services are publicly funded but privately delivered through predominantly solo and group practices of family practice physicians – most physicians practice in BC under a fee-for-service model but a few are salaried and remunerated under the "Alternative Payment Plan". Therefore, in 2002, the General Practice Services Committee (GPSC) was established as a vehicle for the Ministry of Health, the BC Medical Association (BCMA) and the Society of General Practitioners of BC to work in partnership to develop innovative solutions to support and sustain full service family practice in BC [29]. The committee is responsible for allocating $422 million from the BCMA agreement towards new and enhanced PHC initiatives with a focus on improving patient care, better chronic disease management and encouraging GPs to pursue full service family practice.

PHC Charter

In addition to investing in PHC, the BC Government created its first PHC charter in 2007. The Primary Health Care Charter (the Charter) sets the direction, targets and outcomes to support the creation of a strong, sustainable, accessible and effective primary health care system in BC [30]. The Charter focuses on seven priority areas:

- Improved access to primary health care;
- Increased access to primary maternity care,;
- Increased chronic disease prevention;
- Enhanced management of chronic diseases;
- Improved coordination and management of co-morbidities;
- Improved care for the frail elderly;
- Enhanced end-of-life care philosophy.

In order to achieve improvements in these areas much of the Charter focuses on aligning additional funding investments with the current BC government/BCMA agreement which includes dedicated change-management funding, investment in information management/information technology (IM/IT) for PHC and setting up the infrastructure to support the implementation of integrated health network teams with "patients as partners"[30].

The Charter outlines several initiatives that set the direction for the implementation and delivery of PHC services in BC. First, there is to be a patient-centred care approach in which "patients are partners" in the management of their chronic disease and are provided with additional resources such as life coaching and solution-focused counseling, group clinical visits, effective links to home and community care, medical specialists, transition-home teams, community development and social supports [30]. Second, the Charter outlines an electronic health (eHealth) strategy for PHC that includes incremental changes through the utilization of information technology and innovation to primary care practices such as:

- Scheduling for advanced access and monitoring improvements in access, patient registries to identify and manage "priority" populations (targeted approaches for high-risk populations aimed at reducing inequities) within PHC practices;
- Coordination of delivery of appropriate services and health-system planning across larger geographic areas;
- "Rule-based" recall to support planned care according to evidence-based clinical best practices, clinical templates and flow sheets for point-of-care access to clinical guidelines and evidence-based best practices;
- Decision support for patients, providers and health system planners at point-of-care, whole practice, community, regional and provincial levels;
- Data analysis and reports of clinical process measures and clinical outcomes, based on clinical evidence and priority measures as identified in the Charter;
- Integration with, and support of, BC eHealth initiatives to enable electronic medical records (EMRs) in primary health care provider offices;
- Access to key clinical and administrative data to

support patient care (e.g., patient lab and medication profiles, medical summaries, referrals/consultations, hospital discharge abstracts).

The Charter provides direction for a regional Practice Support Program (PSP) that provides expertise and support for clinical, practice, and IM/IT transformation [30]. The goal of the PSP is to engage family practice physicians and other health professionals to embed evidence-based changes. Using family practice physicians and medical office assistant champions, several PSP modules have been developed and selectively implemented across BC including: group visits, practice self-assessment, chronic disease management and toolkit, advanced access and patient self-management. For each module there is an evaluative component. Finally, the Charter provides direction for the development and implementation of integrated health network teams that are meant to shift the patient experience away from multiple fractured services to a patient-centred experience focused on supporting the central role of patients in staying healthy and managing their condition(s) (BC Ministry of Health Services). The integrated networks are intended to serve geographically defined communities that link family practice physicians with existing a health authority and community resources such as mental health, home and community care, and other services to meet the needs of the population and improve health outcomes. In addition, medical specialist, laboratory and imaging services will also need to be aligned for better integration with PHC.

Usual Models of Primary Care in BC

Fee for Service Model

Within PHC, a distinction is often made between primary medical care and PHC, a distinction borne out by a taxonomy of primary care models [31]. In British Columbia the predominant model of primary care is the **professional** or "**primary medical care model**." This model is oriented towards providing comprehensive medical services delivered predominantly through general practitioners and family physicians in solo and group practices using fee-for-service payment modality. These models can, but typically don't, offer comprehensive health education and promotion activities and rarely focus their attention on broader determinants of health. In BC, the professional model is reinforced through the "status quo" of primarily physician-led teams. In 2004/05 there were approximately 4,405 physicians actively engaged in clinical practice of primary care [32]. Most of these physicians were working within a group practice setting with fewer than 25% considered solo practitioners; In 2000/01 a total of 987 family practice physicians were considered solo practitioners, whereas 2,294 were considered part of a group practice [33]. Notably, this administrative data cannot tell us whether physicians sharing an office space are simply co-located (e.g., share overhead costs) and run practices similar to solo practices or if there is "group practice" values and activities such as sharing medical records, cross-patient coverage, or a common clinical philosophy [34, 35]. However, this model conforms to the definition of primary care as the first contact assessment of a patient and the provision of continuing care for a wide range of health concerns and includes the management of health problems, prevention and health promotion and ongoing support with family and community intervention where needed [36].

Community Health Care Model

The other type of usual primary care model in BC is the community or "primary health care model," sometimes referred to as "community-oriented primary care" [37-39]. Services are provided out of what are sometimes

referred to as community health centres (CHCs). In 2006, the BC Network of Community Health Centres listed 29 CHCs, but a more recent study by Goldsmith (2008) identified an additional 40 with 12 others that may possibly be included.

This model is oriented towards either meeting the needs of geographically defined populations, or to a group of people who have experienced access barriers (e.g., First Nations, seniors, immigrants and refugees). In addition to geography, there are often additional criteria that determine the "target" population for these primary care sites. In CHCs, services are more often delivered by interdisciplinary teams of health care providers which often consist of primary care providers, public health providers such as public health nurses, social workers, dental health workers and nutritionists. The majority of CHCs in BC are funded through regional authorities and based on a contract with the BC Ministry of Health Services (e.g., Ravensong, Mid-Main, South health units, Vancouver Native Health Society within Vancouver Coastal; Central Interior Native Health within Northern Health). This model conforms to the vision of PHC in the World Health Organization (WHO)'s 1978 Alma Ata Declaration on Primary Health Care which described primary health care as the first level of contact with the health system. The kinds of services outlined in the Declaration include a combination of both primary care and public health functions. The Alma Ata declaration proposed that the main health service functions in the community should be addressed through promotive, preventive, curative and rehabilitative services [2].

In BC, community health centres represent variations on the community model. However, within these models patients are often rostered with a particular community health centre and providers are generally remunerated through salary and/or sessional payments. In some cases, physicians who work in the centres are remunerated through a mix of salary, sessional and contracts. There is no publicly available data on the total number of physicians or primary care nurses working in BC's CHCs or the number of rostered patients. Goldsmith's current study on community health centres in BC will provide data on the final number of CHCs, governance and funding models, patient population served, providers and services involved, partnerships with other organizations and connection to the local community.

Physicians practicing primary care in more rural or remote parts of the province are likely to work in a community health centre model and receive their funding through the Alternative Payment Plan (salary or sessional payment). They may also participate in the Rural Retention Program or Medical On-Call Availability Program. That is, these physicians could receive additional income to work in an eligible rural community or to provide services to remote communities.

"Demonstration" Primary Care Service Delivery Models

Many demonstration projects that took place in BC were initiated by the PHCTF infusion of additional dollars. These projects were specific to each HA and have had limited sustainability past 2006 when the PHC transition fund ended. However, there are some models of primary care delivery that have seen widespread implementation across the province. For example, between 2003 and 2005, there were approximately 82 community collaboratives (CCs) formed in the areas of congestive heart failure (n=19) and diabetes (n=63) across BC [40]. In Northern Health these were originally in six sites (Kitimat, Prince George, Quesnel, Southside, MacKenzie, Masset), where health care providers focused on improving health outcomes by increasing adherence to recognized clinical guidelines [41]. This model was designed around a community-based interdisciplinary provider team and assumed simultaneous management of several chronic diseases. Each CC participated in "Learning Sessions", which were a structured time for all PHC providers participating in a community collaborative to discuss practice and patient management issues and strategize with

non-healthcare providers (e.g., recreation facility staff) on how to meet the needs of patients. In Northern Health, one of the key features of this model is a dedicated PHC coordinator who organizes the monthly "Learning Sessions" and acts as a support to all PHC providers in the specified community. In Vancouver Coastal, CCs were implemented through their practice support network. Specific PHC clinics were either established or redesigned in order to provide chronic disease management support within different health service delivery areas in four (Vancouver Coastal, Fraser, Interior, and Vancouver Island) of the five regional health authorities. For example, three urban primary care clinics (Pacific Spirit, Evergreen, and Raven Song) developed client registries to improve the quality of care to clients who had a chronic disease. To improve patient outcomes, funding was also used within the community collaboratives or practice networks to create opportunities for "shared care" initiatives where family practice physicians worked more closely with specialists, other health care professionals (e.g., nurses, social workers, midwives), or allied health professionals (e.g., doulas).

Within each HA, integrated health networks (IHNs) are currently being implemented. As of May 2009, there are several IHNs in BC including: three in Fraser Health, 10 in Interior Health, seven in Vancouver Island Health, three in Northern Health, and three in Vancouver Coastal [42]. IHNs consist of virtual networks composed of physicians practicing primary care in different geographical locations, some focusing on marginalized populations. The purpose of the IHNs is to improve patient care through coordinating after hours care, providing a medical home to patients to maintain continuity in their relationship with the same health care team, providing proactive care and information sharing related to their care. The IHNs currently operating in BC are targeted towards improving the quality of care for people with complex chronic health conditions (n=17), seniors at risk

In British Columbia the predominant model of primary care is the professional or "primary medical care model".

(n=3), mental health conditions (n=1) and people who are vulnerable because of structural and historical inequities in health and in accessing health care services (n=5).

More recently, following the introduction of the nurse practitioner role in BC, several demonstration projects involving the integration of a NP into a solo or group family practice have been funded by health authorities. While these have occurred primarily within Interior and Vancouver Island Health Authorities, in Northern Health Authority, a solo NP practice is being established in a rural setting.

Other Types of Primary Care Related Services

In addition to the models used to deliver the majority of primary care services in BC described above, there are a number of other resources, services and programs supporting the delivery of primary care. They include:

- **BC Health Guide and BC Health Guide Online** – provides information on more than 2,500 common health topics, tests, procedures and other resources. This searchable health database contains medically approved information from the Healthwise Knowledgebase [43].
- **BC Nurse Line** – offers confidential health information and advice 24 hours a day, seven days a week through a toll-free telephone line staffed by registered nurses. Translation services are available in 130 languages, in addition to services for the deaf or hard of hearing [44], http://www.health.gov.bc.ca/cpa/1-800.html#NurseLine).
- **BC Center for Disease Control STI/HIV Prevention and Control ambulatory clinic and the Prevention Street Program in the downtown eastside of Vancouver** – services provided through these programs include health promotion, disease prevention and episodic care for clients with STIs. Screening, counseling and referral to HIV services is also provided. The STI/HIV Prevention and Control division of the BCCDC is the major provincial training site in STIs and HIV for medical residents, interns and public health nurses. STI/HIV Prevention and Control also has an Aboriginal Program – Chee Mamuk – which provides education to Aboriginal communities and organizations in BC (BC Centre for Disease Control. Divisions: STI/HIV Prevention and Control, http://www.bccdc.org/division.php?item=3).
- **The Chronic Disease Self-Management Program** – helps patients self-manage a range of chronic conditions. Led by Dr. Patrick McGowan at the University of Victoria's Center on Aging, it offers patients and programs educational courses in the fundamental principles of self-management. This program provides the emotional support, knowledge and skills required to live a more active and healthy lifestyle (University of Victoria, Centre on Aging, http://www.coag.uvic.ca/cdsmp/).
- **Patient Health Portal** – currently underway is the BC Interoperable Electronic Health Record (iEHR, which will include a Patient Portal, allowing patients secure access to their longitudinal health record [45].

Primary Care Research in BC

Population-Based Research

Administrative Approaches

A number of population-based research projects have been completed or are underway using administrative data available in BC (primarily through the BC Health Linked Database (BCLHD)). Briefly, the BCLHD integrates health service records, population health data and census statistics, making it possible to link administrative records anonymously at the individual level. As of 2009, these data are housed at Population Data BC. Population Health BC is a multi-university, nationally active and recognized data and education resource that facilitates interdisciplinary research and teaching on the determinants of human health, well-being and development [46]. Examples of the primary care research carried out using administrative data include: creating algorithms to document the number of physicians and nurses delivering primary care; understanding the "anatomy" of the physician shortage; and mapping primary care indicators in BC.

Survey Approaches

Research is also being conducted where surveys are being developed and implemented. For example, there is information on patient experiences in primary care [47] and emergency departments [48]. A series of surveys are currently underway that examine patient experiences in primary care among people who speak Chinese (Mandarin, Cantonese), Punjabi, English, or French.

Specific-Patient Population Research

Mixed-method Approaches

There are numerous studies that examine access to, and delivery of, primary care services to specific patient populations. One study examines primary care experiences of Chinese and Punjabi-speaking groups (Wong, ST, Black, C., Lynam, MJ., MacEntee, M., et al), anther study examines how primary health care services are provided to people who have been marginalized by systemic inequities (Browne, A, Varoce, C, Wong, ST, Lavoie, J, Smye, V, Tu, D, et al), while another critically analyzes women's

Given the relatively new role of nurse practitioners to BC, there has been a flurry of research activity in this area.

experiences to understand what constitutes appropriate, safe health and social services, and support for Aboriginal women and families (Smye, V, Varcoe, C., Browne, A., et al). Another example is a study that examines a "social pediatrics" PHC practice initiative designed to foster access and deliver responsive primary care to vulnerable children (Lynam, MJ, Loock, C, Scott, L, Wong, ST, et al). Finally, another study examines the impact of group medical visits on access and effectiveness of primary care to northern and First Nation reserve communities (Wong, ST, Lavoie, J, Browne, A, Macleod, M, Horvat, D, et al). All of these studies use a combination of qualitative and quantitative approaches.

Within the Department of Family Medicine at UBC there are a number of research projects being completed by various faculty members. One project examines the need for, and accessibility of, mental health and addiction services in Vancouver Island Health Authority using a strength-based assessment, facilitated linkage methods (Anderson, E). Others examine new models of maternity

care including centering pregnancy and collaborative care (Harris, S), economic costing and multi-criteria evaluation of rural services for maternity care (Kornelsen, J) and the evaluation of medical-legal outcomes in sexual assault (McGregor, M).

Clinical Research

There are a number of projects using multiple approaches to examine clinical areas of primary care. Examples include a project directed at rural primary care and rural maternity care in BC in order to better understand the needs of parturient rural women and their families (Grzybowski, S). Another examines the administration of innovative treatment and screening tests for the human papillomavirus and STIs in hard-to-reach populations and those who are marginalized due to systemic inequities (Olgivie, G). Additionally, research is being done to examine fall and fracture prevention in older adults and cost of care for people who have adverse events due to falls (Singh, S), as well as evidence-based midwifery practice (Vedam, S).

Health Human Resources Research

Given the relatively new role of nurse practitioners (NPs) to BC, there has been a flurry of research activity in this area. Some projects include: the NP role in interprofessional practice and its relationship to role integration [49]; factors influencing NP implementation (Sangster-Gormley, E); the extent to which NPs are able to practice to their legislated scope of practice; factors influencing role implementation in BC [50]; and the study of advanced practice nurses in BC (Schreiber, R). In addition, some health authorities (e.g., VIHA and IHA) have contracted evaluations of specific pilot projects of NP integration in GP practices. The results of these research projects are just emerging and have not been published. However, at the recent annual BC Nurse Practitioner's Association Conference (March 2009), preliminary findings were reported which suggest very positive short-term outcomes. Longer term outcomes, particularly in terms of patient data, await follow-up.

Dr. Laurie Goldsmith, from Simon Fraser University, is exploring the organizational and delivery features of community health centres across the province in an environmental scan. This will be followed by case studies to examine the effectiveness of these features on community responsiveness, access to care, continuity of care, health status, patient and staff satisfaction and economic efficiency.

Another project about HHR, with primary care as a secondary focus, is "Anatomy of a Doctor Shortage" (Barer, M., McGrail, K., Evans, B., et al). This study uses administrative data to examine claims of a physician shortage and the surface stability of physician supply per capita. It aims to provide health human resources (HHR) policy-makers and planners with a more comprehensive and nuanced understanding of the service provision dynamics underlying the sudden shift in perceptions. This project is examining how workforce factors have influenced access to care in BC, how work patterns have changed since the early 1990s, and what environmental factors are important in influencing access.

Primary Care Workforce

The two types of providers delivering the majority of primary care services in BC are PHC physicians and registered nurses. There are relatively few (less than 150) NPs working in primary care in BC although some of the health authorities have identified a commitment and a desire to increase the number of NP positions within their jurisdictions and are continuing to recruit NPs.

Physicians

PHC physicians include medical doctors with a type of practice designation such as general practice and physicians practicing as part of a PHC organization [34]. In 2004/05 there were 4,405 PHC physicians in BC, which is approximately 105 physicians per 100,000 population, or one physician for every 953 people[32]. PHC physicians account for approximately 51% of BC's physicians. The proportion of PHC physicians to total physician supply declined 4% between 1996/97 and 2004/05 (55% vs. 51%, respectively).

The speed with which health authorities gained or lost PHC physicians over the eight-year period is noteworthy. The largest reduction in per capita supply between 1996/97 and 2004/05 occurred in Vancouver Coastal (14% relative decline), but this health authority also retained BC's highest PHC physician-to-population ratio (130 per 100,000) [32]. Fraser Health had a modest decline (2%) and the lowest level of supply in 2004/05 (77 per 100,000 population). Vancouver Island, however, saw a 13% increase in this same time frame, with a PHC physician to population ratio of 128 per 100,000 [32]. These shifts could be due to a number of factors, including immigration, emigration, changing specialty designations or practice patterns over time, and misdistribution of healthcare human resources within the province.

The UBC Faculty of Medicine, Department of Family Practice has multiple training sites (e.g., Vancouver, Kelowna, Victoria, Nanaimo, Prince George, etc) to train PHC physicians. The University of Northern British

PHC physicians and registered nurses deliver the majority of primary care services in BC.

Columbia specializes in training PHC physicians anticipated to work in rural and remote areas upon graduation.

Registered Nurses

PHC nurses in BC are defined as registered nurses (RNs) working in PHC based on their: work status (full-time or part-time); place of work (e.g., community health agency or home care agency); area of responsibility (e.g., community health, home care, or occupational health); and their position (e.g., staff nurse, home care, commu-

nity nurse or office) [51]. In 2000, there were 3,179 PHC nurses working in BC – that is, about 12% of all practicing RNs (n=27,570) were working in PHC. The supply of PHC RNs varied across health authorities and between health service delivery areas. The distribution ranged from 119 RNs per 100,000 population in Kootenay Boundary to 56 per 100,000 in Fraser South [51].

As of 2006, there has been almost an eight percent increase in PHC RNs in BC (n=4,111) [42], however, there appears to be disparities in the geographic distribution of PHC physicians and RNs across the province. Earlier work by Watson and colleagues [28] suggests that when counts of PHC physicians and RNs are combined, the extent of variability in supply among the primary care workforce of physicians and RNs is attenuated. Where there are fewer PHC physicians in British Columbia, there are more PHC RNs, and vice versa. It should be noted that PHC RNs are the combined workforce of RNs working in both primary care and public health.

Several BC college and university nursing education programs now grant a baccalaureate degree in nursing. Moreover, there are at least three universities in BC that offer nurse practitioner training.

Nurse Practitioners

Using the same methodology to identify PHC registered nurses in BC, we identified the number of nurse practitioners (NPs) working in PHC as of May 2009 using the College of Registered Nurses of BC registration database. There are over 240 NPs registered and actively practicing in BC, 140 are working in PHC in the area of family, adults and pediatrics [42]. Most PHC NPs are working in Vancouver Coastal (n=43), with some working on Vancouver Island (n=29) or Fraser health (n=27). Interior (n=12), Northern (n=15), and Provincial Health Services (n=14) have fewer NPs working in PHC. Roots [52] presented new data on the number and location of NPs practicing in BC as of March 16, 2009 which showed that of the PHC NPs, most are working as family nurse practitioners but some (approximately 13) are working as adult or pediatric NPs.

The major employers of NPs in BC are health authorities. Almost half of all PHC NPs are targeted to serve specific patient populations, including geriatrics, First Nations, immigrants and refugees [52]. Geographically, the majority of NPs are located in the metropolitan areas of the province (Lower Mainland, Fraser Valley, and Greater Victoria) with fewer PHC NPs found in rural and remote areas. Most practice with a physician, although there is one NP-only practice in Northern Health Authority. PHC NPs are currently funded through a combination of salaried and blended funding models.

Entry to practice as a NP in BC requires registration and a Master of Science in Nursing. There are currently three universities (UVIC, UNBC, and UBC) that offer NP training with approximately 40 NPs graduating in BC each year. NP education programs in BC are focused on educating family nurse practitioners (across the lifespan focus in primary health care), yet there is a need for acute care NP positions. The result has been a reported mismatch between NP education and jobs available. In part, this is because there has been no dedicated funding for Clinical Nurse Specialist (CNS) positions, and thus NPs were hired into the acute care settings instead of CNSs. However, all of the health authorities report a commitment to reducing this mismatch so that positions created reflect the current NP education [50].

Current Trends and Issues

- Implementation of the necessary infrastructure (e.g., electronic health record/electronic medical record) remains slow across BC. Anecdotal reports suggest that approximately 40% of all family practice physicians in Northern Health use an electronic health record (Clifford, B), much less than those in any other health authority (Blatherwick, J). Where practices have implemented an electronic health record there has been increased interdisciplinary collaboration (e.g., Fraser Lake) between medicine, nursing, and allied health professionals (Wong S, personal communication with Northern Health clinicians, 2009).The EHR also allows managers and practitioners to assess the appropriateness and quality of care (e.g., Central Interior Native Health HIV-primary care).

- More evidence is needed to document the effectiveness of primary care quality improvement strategies led by Impact BC. This not-for-profit organization is specifically established to work across BC's health system to support service improvement, representing a strategic alliance between BC's Ministry of Health Services, the BC Medical Association and provincial health authorities to support health system quality improvement. Impact BC builds capacity for continuous learning and improvement in a way that optimizes opportunities for sharing knowledge and experiences with the ultimate goal of system transformation.

- Privacy of information concerns remain unresolved and have impeded the ability of researchers to use some administrative data in order to inform primary care service delivery. For example, the BC Ministry of Health Services collects clinical data through the Chronic Disease toolkit which would inform primary care service delivery. Yet it is not available to researchers. There are currently few to no options available for the Ministry and researchers to work collaboratively on using these data.

- Implementation of the Health Professions Act (HPA) will have an impact on the delivery of primary care services because it changes the scope of practice for many professions. Services that historically were delivered or delegated only by physicians can now be delivered by other professions within their own scope of practice. For example, nurses are now able to conduct pap smears and pharmacists are able to prescribe selected medications. As J. Blatherwick notes, "as one would expect, physicians are quite concerned [about the implementation of the HPA]."

- Introduction and implementation of NPs and other types of health professionals (e.g., physician assistants) in delivery of primary care services is likely to increase in BC in the coming years although there continue to be barriers to role implementation. The major barriers are concerns about long-term funding for NP positions, and some opposition to and lack of understanding of the role by the public and other health care providers. Despite these challenges, many physicians who have worked with NPs are very supportive and there will be more opportunities for interprofessional collaboration in specific areas of focus such as health promotion, chronic disease management, disease prevention (e.g., sexually transmitted infections, cancer screening), and promoting healthy communities.

Public Health

Public health has a long history in BC, officially dating back to the introduction of the Health Act in 1893. For the purposes of this report, however, we focus on the recent history of public health because it is most relevant to understanding the opportunities and challenges for collaboration between public health and primary care in the province.

Prior to the regionalization that took place in BC over a decade ago, "public health was organized in separate organizational entities, Union Boards of Health, for which the accountability was towards municipalities and regional districts. This approach gave public health a distinct identity and ensured that municipal council representatives had a voice in decisions made across the broad field of public health. From a provincial perspective, this collection of interests was a somewhat unwieldy system which could be divisive, by sustaining separate organizational bases for the acute care, hospital, institutional sectors which sometimes were in opposition to each other and to public health sector." [16, p. 108]

Public Health Renewal in BC

In recent years, concerns have been raised about the inability of current public health infrastructures to adequately meet the growing health needs of the population. Several reports have identified systemic deficiencies in the Canadian public health system and have made recommendations [53-55]. In BC, the Select Standing Committee on Health [56] concluded that the public health system in this province needed to be strengthened. In 2004, the Canadian Institutes of Health Research made several recommendations for public health system improvement including: defining the public health system; strengthening public health system structures; strengthening supportive elements for effective service delivery; and collaborating to achieve common and developing health goals. One infrastructure element identified as necessary for an effective public health system was clearly defined essential functions of public health.

In 2001, the BC Ministry of Health Services initiated a provincial review of public health. At that time there was no accepted definition of public health, although there was a general consensus on the meaning of the term and the focus of public health services. The purpose of the review was "to establish a public health plan for BC and to reconfirm the importance of public health programs as an essential component of the health system, and to provide a vision and direction for the future." As a result of that review, which took place over a two to three year period, a new framework for public health services in BC was developed. It was led by Dr. Trevor Hancock who was recruited to the Ministry of Health from Ontario to provide leadership and direction on the renewal process.

The Clinical Prevention Policy Review begun by the Ministry of Health in 2007 is one provincial level process that may support collaboration between primary care and public health. The committee comprising key provincial and national experts recommended a systematic approach to implementing a "Lifetime Prevention Schedule" for evidence-based cost-effective clinical prevention interventions that have the potential to improve population health. Many of these clinical prevention interventions are also core public health programs or components of core programs (e.g. reproductive health and prenatal care, healthy infant, child, and youth care, chronic disease prevention, tobacco cessation) that may be provided and/or supported by public health and primary care. The challenge will be determining which sector is responsible and accountable for which interventions.

Core Public Health Functions Framework

A Framework for Core Functions in Public Health [57, 58] is a central component of the plan for public health renewal in BC and encompasses all the recommendations made by CIHR [59]. The Core Functions framework (Figure 3) identifies the public health services that health authorities will provide and that are expected to ultimately improve the health of the population. Germane to our purposes of identifying opportunities for collaboration between public health and primary care is that the intent of the Core Functions Framework is to "identify the key set of public health services that health authorities will provide and that will strengthen the link between public health, primary care, and chronic disease management" [57].

The main components of the framework are:

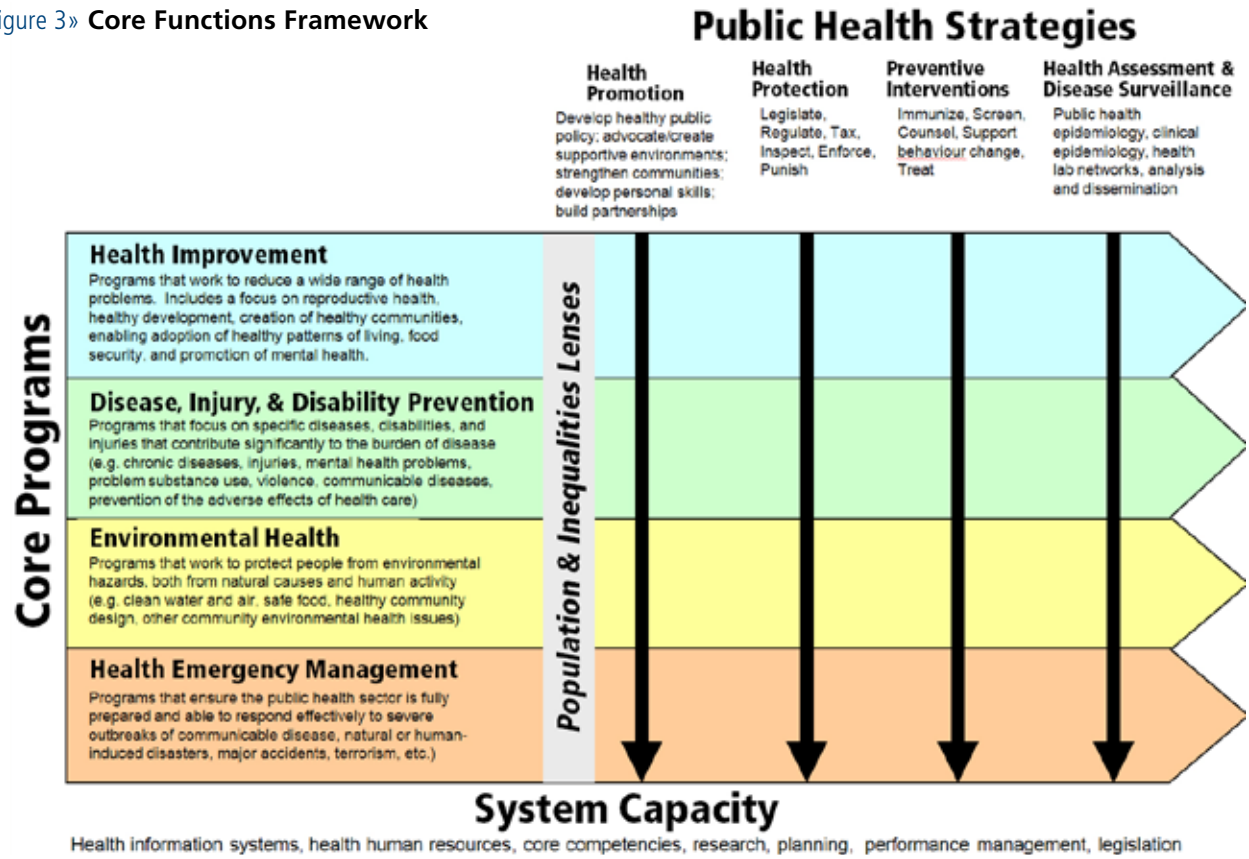
1. **20 core public health programs** iin four broad areas: health improvement, disease, injury and disability prevention, environmental health and health emergency management;

2. **Public Health Strategies** that will be used to implement core programs: health promotion, health protection, prevention, and health assessment/disease surveillance;

3. **Lenses** – a population lens and an equities lens are applied to all elements of the framework to address health inequities and ensure that the health needs of particular population groups are met;

4. **System Capacity Requirements** comprise those supportive infrastructure elements needed to deliver core programs, including competent and well trained staff, public health information systems, and research to support innovation and inform policy and practice improvement.

Figure 3» **Core Functions Framework**



The specific core public health programs within the four broad areas named above include:

1. **Health Improvement Programs**
    a. Reproductive Health – healthy sexuality, preconception health, family planning, prenatal care and education, post-partum care and support;
    b. Healthy Development – healthy infant and early child development (0-6), and healthy child and youth development;
    c. Healthy Communities – healthy schools, workplaces and care facilities, community development and capacity building;
    d. Healthy Living (population wide, non-specific) non-smoking/tobacco control, healthy eating, and active living;
    e. Mental Health Promotion;
    f. Food Security.

2. **Disease, Injury and Disability Prevention Programs**
    a. Chronic Disease Prevention – high risk populations and disease-focused: cardiovascular, cancer, neurological and sensory, musculoskeletal, chronic respiratory, digestive and diabetes;
    b. Unintentional Injury Prevention – falls, especially seniors and children, motor vehicle crashes, poisoning, recreational and leisure, and drowning, fires, etc.;
    c. Prevention of Violence, Abuse, and Neglect – assault including homicide, violent exploitation of women and child and elder abuse;
    d. Prevention of Mental Disorders and Problematic Substance Use – depression/anxiety, psychoses, suicide and suicide attempts, and problematic substance use and addictions;
    e. Communicable Disease Prevention and Control – vaccine preventable diseases, HIV/AIDS, STIs, blood-borne diseases, TB, vector-borne diseases, and new/emergent diseases;
    f. Dental Health and the Prevention of Dental Disease;
    g. Prevention of Disability –including appropriate early intervention for sensory (hearing, vision, speech), and other disabilities;
    g. Prevention of the Adverse Effects of the Health Care System – nosocomial infections, medical error, unnecessary/inappropriate provision of services and environmental impacts of care.

3. **Environmental Health Programs**
    a. Water quality – drinking water and recreational water
    b. Air Quality – indoor and outdoor
    c. Safe Food
    d. Community Sanitation and Environmental Health – waste management (sewage and solid waste), vector control, public exposure to chemicals and radiation, complaint response and assessment, land use and environmental planning.

4. **Health Emergency Management**
    a. Prevention and Mitigation
    b. Preparedness
    c. Response and Recovery

The range of initiatives for public health renewal is described in the core functions documents as "province-wide" rather than as "provincial initiatives." This language signals that the public health renewal initiatives go beyond the involvement of the health care system alone to include partnerships with voluntary organizations, municipalities, community groups and private sector organizations, as well as other government sectors. This framework and perspective thus provide an opportunity for enhancing primary health care through collaboration among public health, primary care, and other sectors.
To date, only a few of the new core programs have begun implementation, so there are currently no data to describe their implementation or their impact on particular

health outcomes. A program of research is underway to do this (see section on Public Health Research below).

Evidence Reviews

An important step in renewal of the public health system in BC has been to assemble an evidence base for core functions, specifically related to the core programs component of the framework. The Ministry of Health Services (MOHS) (now the responsibility of the Ministry of Healthy Living and Sport (MHLS) commissioned reviews of the evidence and best practices to support public health interventions in all of the core program areas in the framework. Some of the core programs have more than one evidence review related to various components of the program. For example, the Healthy Living Core Program has an evidence review on both healthy eating and active living. To date, 23 evidence reviews have been completed and approved by the Provincial Core Functions Steering Committee. The Core Functions website site map, hosted by the Public Health Association of BC, provides access to the reviews as well as other related documents. (http://www.phabc.org/modules.php?name=Contentcore&pa=showpage&pid=187)

Model Core Program Papers

Following completion and approval of the evidence review papers, a working group for each core program was established under the auspices of the Provincial Core Functions Steering Committee to develop a Model Core Program paper. The paper outlines the context, key components (informed by the evidence), benchmarks (where available), surveillance indicators, and performance measures. The Model Core Program Papers are approved by the Steering Committee, indicating agreement that the model program constitutes a model of good practice and that the indicators are appropriate for monitoring program performance.

Performance Monitoring Process

Each health authority is expected to engage in a performance improvement process related to the core functions. The expectations are that each HA should: include services related to each core program, although these may be clustered or grouped according to what works for that HA; develop a performance improvement plan for each core program that includes a baseline assessment, need/gap analysis, performance targets and key strategies; make the plan public; and provide regular reports on the progress. The performance improvement plans that have been posted to date can be accessed at the following link: http://www.phabc.org/modules.php?name=Contentcore&pa=showpage&pid=187

Legislation and Mandates

Another key aspect of public health renewal in BC is the development of a new Public Health Act to replace and modernize the original and now outdated Health Act introduced in 1893. The new Public Health Act was recently introduced in BC and was proclaimed in April 2009. Although the original Health Act had been added to and updated periodically over the years, there had never been a major overhaul and the introduction of the new act was necessary to address emerging public health challenges. An overview of the Public Health Act can be found on the website of the BC Ministry of Healthy Living and Sport at http://www.hls.gov.bc.ca/phact/overview.html

The full version of the Public Health Act is located at: http://www.leg.bc.ca/38th4th/3rd_read/gov23-3.htm

Prior to the new Act, public health services were provided under the authority of several separate pieces of legislation including: the Health Act, the Venereal Diseases Act and the Public Toilet Act. In the new Public Health Act many outdated provisions have been replaced with new provisions to strengthen the ministry's ability to monitor and prevent chronic disease. The new public health act addresses many issues that are addressed in the legislation of other provinces but were not included in BC's Health Act.

The development of the Public Health Act completes the modernization of key public health statutes in British Columbia: the Food Safety Act (2002), the Drinking Water Protection Act (2003), the Community Care and Assisted Living Act (2004) and the Tobacco Control Act (amended in 2007). These Acts replace parts of the previous Health Act.

Current Organization of Public Health in BC

Public health services in BC are organized, planned and delivered at the regional and health service delivery area (local) levels, but the regions are accountable for their activities at the provincial level. Each health authority is organized somewhat differently with respect to how public health services are provided. In some instances, public health is integrated into the broad range of health services and not identified as a distinct type of service. In other regions, public health is offered as a separate set of services and thus is less integrated. In some instances, public health is provided through a department or a division of public health (e.g., Interior Health). This inconsistency in the organization and delivery of public health services across the province has important implications for whether and how public health and primary care sectors are enabled and supported to collaborate. Below, we discuss the organization of public health at both the provincial and regional levels. The PHABC Map of Public Health Services [16] provides an overview of the organization of public health services in the health authorities (current as of 2006). For detailed information about the organization of public health in the health authorities, readers are encouraged to review the PHABC Map of Services document. We provide a brief update of relevant information drawn from the most recent service and strategic plans from the health authorities and the BC Ministry of Healthy Living and Sport.

Provincial Level

Ministry of Healthy Living and Sport

In BC, the MOHS and the MHLS act as stewards of the health system. These ministries work with health authorities and health providers to achieve the goals set out by the Service Plans of each Ministry. The MHLS is the ministry responsible for stewarding the implementation of core public health functions in BC. In fact, the goals of this ministry specifically reflect much of the focus of the core public health functions framework of BC (Figure 3).

The goals of this ministry include:

1. **Improved Health for British Columbians**
   a. Supporting British Columbians to make healthier choices and be more active, eat healthier foods, live tobacco free and use alcohol responsibly;
   b. Promoting age-friendly communities that support older adults in maintaining and improving their health status, keeping active and independent, and improving their skills, knowledge and experience;
   c. Advancing the health of women;
   d. Improving early childhood development;
   e. Enhancing health promotion by enhancing health information, engaging in public health planning and supporting individuals to be more involved in and responsible for their own health.

2. **Reduced Illness and Injury**
   a. Reducing the gap in health status between Aboriginal people and the rest of the population of British Columbia;
   b. Developing a comprehensive approach to addressing injuries among all British Columbians;
   c. Providing effective programs to protect individuals against communicable diseases.

3. **Healthier Communities**
   a. Setting standards, monitoring and reporting on air quality to improve human health;
   b. Setting standards, monitoring and reporting on water quality to improve human health;
   c. Developing regulations, legislation and public policies that protect the health of British Columbians.

Within the MHLS there are four major divisions: Public and Population Health; Corporate Support, Planning and Legislation; ActNow BC, Sport and Recreation; and Strategic Financial Services and Operations.

Public and Population Health Division

a. Senior's Healthy Living – responsible for seniors' health, supporting age friendly communities and supporting older workers.
b. Women's Healthy Living – responsible for women's health, maternal and child health, healthy childhood development, and dental, vision and hearing screening.
c. Aboriginal Healthy Living – responsible for stewardship for aboriginal health, implementation of the First Nations Health Plan and Transformation Accord with the First Nations Leadership Council, the Federal Government and the Health Authorities.
d. Health Protection – responsible for protection of the general public and vulnerable populations from environmental hazards, and for air and water monitoring and reporting.
e. Chronic Disease/Injury Prevention and Built Environment – responsible for tobacco policy, healthy eating and physical activity stewardship, injury prevention strategies, safe and healthy built environment, healthy schools, workplaces and communities, Dial-a-Dietitian and provincial nutritionist.
f. Communicable Diseases and Addictions Prevention – responsible for mental health promotion, illness prevention and harm reduction (substance use and disease), HIV/AIDS education and prevention and immunization.

The first three of these are also responsible for cross-government linkages to coordinate and influence health determinants.

Corporate Support, Planning and Legislation Division

a. Corporate Planning and Policy – responsible for public health human resources and legislation, strategic and service planning, corporate policy, research and analysis.

b. Public Health Specialists – responsible for community medicine consultation, policy and legislation advice, core public health functions, and support for the Provincial Health Officer.
c. Surveillance and Informatics – responsible for health assessment and disease surveillance, and public health informatics.

ActNow BC, Sport and Recreation Division

a. Sports and Recreation – responsible for encouraging physical activity through programming and policy, supporting high performance athletes, and pro-active event hosting activities.
b. ActNow BC – responsible for healthy living by promoting physical activity, optimal food choices and tobacco free living. Within ActNow BC one area is responsible for marketing and partner relations, another for performance management and evaluation, and one for cross-government relations to increase ActNow BC engagement by linking across the public sector through programs and policies.

Of the four core program areas in the Core Public Health Functions Framework, three are supported by the MHLS (health improvement, disease, injury and disability prevention and environmental health). The fourth core program area, Health Emergency Management, is supported through Corporate Services in the Ministry of Health Services. Health Emergency Management is viewed as a corporate service in the MOHS because of a strong focus on business continuity – that is, maintaining health care services in the face of a public health disaster.

Provincial Health Services Authority

One of the PHSA's key strategic directions, as identified in its five-year strategic plan, is population and public health (http://www.phsa.ca/HealthPro/PopPubHealth/default.htm). Of its eight provincial agencies, two provide services directly related to core public health functions: BC Cancer Agency and BC Centres for Disease Control. The BC Cancer Agency, although focused on providing cancer treatment, has a large prevention program. See: (http://www.bccancer.bc.ca/PPI/Prevention/default.htm). The British Columbia Centre for Disease Control (BCCDC) (http://www.bccdc.org/) focuses on preventing and controlling communicable disease and promoting environmental health for the province. The day-to-day public health work of the BCCDC is done in support of regional health authorities, the Ministries of Health Services and Healthy Living and Sport and the Provincial Health Officer. Scientific and technical support is provided by a number of specialized, yet integrated, operating divisions including: Epidemiology Services, Vaccine and Pharmacy Services, Hepatitis, Laboratory Services, STI/HIV Prevention and Control, Environmental Health Services and Public Health Emergency Management.

PHSA's Environmental Health Division hosts the Public Health Agency of Canada National Collaborating Centre on Environmental Health (NCCEC) (http://www.ncceh.ca/), one of six national collaborating centres on public health, established in 2004. For information on the other five NCCs visit http://www.phac-aspc.gc.ca/media/nr-rp/2004/2004_01bk2-eng.php.

PHSA, in their gap analysis for core functions, identified that all of their agencies are carrying out activities related to core public health functions. In particular, PHSA has responsibilities for three core programs: healthy living, healthy communities and health assessment and disease surveillance. Although not holding official responsibilities for the dental health core program, PHSA has identified several services that have relevance. The health assessment and disease surveillance core public health program relates most extensively to all PHSA agencies.

Provincial Level Public Health Functions

The Core Functions Framework recognizes that in addition to programs that will be developed and implemented by health authorities, there are provincial-level public health functions. These functions are broadly covered by

the concepts included in the Systems Capacity component of the Core Functions Framework. They are not necessarily performed by the Ministry of Healthy Living and Sport, but may be carried out by the PHSA or relevant academic, NGO and other organizations, as appropriate. These provincial level functions include:

- Policy and Legislation
- Public Health Human Resources
- Information Systems
- Organizational Competency/Accreditation
- Public Communications/ Advocacy
- Evidence Reviews/ Model Program Papers
- Evaluation of Provincial Public Health Programs
- Public Health Research & Evaluation
- Links to National-level Functions
- Health Assessment and Disease Surveillance
- Funding Levels
- Strategic Planning for Public Health

Several of the above provincial functions have begun and others are well on their way (e.g., Evidence reviews and model core program papers, Public health research – Core Public Health Functions Research Initiative – CPHFRI). Other provincial level functions have had only limited action to date, but the intent is for all to be developed. The Core Public Health Functions website provides a list of specific initiatives related to provincial level functions: http://www.phabc.org/modules.php?name=Contentcore&pa=showpage&pid=185

Regional Level

In a previous section of this scan, the structure and organization of the health authorities was presented and the location of public health within the authorities was identified. Below, we discuss specifically the organization of public health within the health authorities, with particular respect to the core public health functions.

Vancouver Island Health Authority (VIHA)

Of the nine strategic priorities identified in Vancouver Island Health Authority strategic plan, four relate quite directly to the core public health functions framework:

- Improved Health of High Needs Populations (relates to equity and population lenses in CF framework);
- Comprehensive primary health care – with a focus on helping people stay healthy, prevent illness and injury, manage illness and disease, and cope with end of life;
- Integrated mental health and addictions services – VIHA provides a range of prevention, treatment, and ongoing care services. The aim is to integrate these to better meet the needs of this population;
- A healthy workplace and engaged workforce – relates to the core public health program Healthy Communities (sub program Healthy Workplaces.)

VIHA has three major goals, the first of which is improved health and wellness of residents. This goal is expected to be realized through prevention, protection and environmental programs, all of which fall within the core public health functions framework. Given that this is the first goal, VIHA has apparently shifted priorities toward health promotion and prevention, and thus has developed a Population Health and Wellness Strategy.

The Public and Population Health Observatory (PPHO) was established in October 2003 as part of the portfolio of the Chief Medical Health Officer, Dr. Richard Stanwick. Its mandate is to ensure appropriate, timely and valid population health information to monitor health status, respond to health problems, and support planning, implementation and evaluation of health services and programs in VIHA. One initiative of the PPHO is an attempt to develop a Teaching Research Health Unit in VIHA to support public capacity building within the HA.

Vancouver Coastal Health Authority (VCHA)

VCHA has four Health Service Delivery Areas (HSDAs): Vancouver Acute, Vancouver Community, Richmond and Coastal. The Public Health services in Vancouver

Community are primarily operated out of six Community Health Centres: North, South, Raven Song, Three Bridges, Pacific Spirit and Evergreen. Falling under the Infant, Child & Youth Program (ICY), each site has an ICY manager to whom all local public health staff report. The work is focused on newborn follow-up, Child Health Clinics, parent-infant drop-ins, child and family follow-up, visits to daycares and preschools, nutrition, speech-language services, dental screening and follow-up, school health and youth clinics. Programs such as hearing, vision screening and immunization are part of many of these programs. Two Medical Health Officers work closely with program managers and staff.

In Richmond there is one office for Public Health with leaders responsible for school health, child and family health and communicable disease. One Medical Health Officer supports the program. Coastal has three offices on the North Shore and Public Health Offices in the major coastal communities. Two Medical Health Officers support the program (one in the North Shore and the other in the coastal areas). Services are similar to those offered in Vancouver Community.

Vancouver Coastal Health also has an Office of the Chief Medical Health Officer that includes a new position, Director of Prevention, reporting to the Chief MHO. This individual will provide leadership to the regional programs such as vision and hearing with the intent for an overall consistent approach across the health authority despite services being provided locally. A Director of Population Health also reports to the Chief MHO. The Population Health Team promotes and supports population health activities within VCHA and works to implement identified population health strategies and engage VCHA leaders in addressing the determinants of health. The Public Health Core Functions are under this portfolio, facilitated by a Policy Consultant, who supports the core functions work by providing resources to the provincial committees, reviewing and distributing documents and working with staff to develop Performance Improvement Plans. Ultimately, however, staff in the local areas deliver the services.

Fraser Health Authority (FHA)

In 2006, Fraser Health created its own internal Core Functions Initiative "to support, focus and engage" the organization in the broader provincial initiative [20]. A senior level steering committee is led by the Executive Director of Health Promotion and Prevention. Members include the Chief Medical Health Officer, the Regional Director of Health Protection, and Directors of the various operational areas that deliver the services within the core programs. Cross-functional working groups have been created to conduct gap assessments and develop performance improvement plans (PIPs) for each core program. The steering committee reviews these assessments and plans, approves them and then sends them to the Fraser Health Executive for final approval. The PIPs define the activities and strategies that will be implemented for each core program. Whereas other health authorities have clustered related core programs, FHA has chosen to create a PIP for each individual core program.

The office of the Chief Medical Health Officer, including MHOs responsible for a region within FHA, provides expert advice to senior decision makers on important ongoing and emerging public health issues. This office is not, however, responsible for direct public health service delivery and has no public health program staff reporting to the MHOs. This is different than in some other health authorities where the Office of the Chief MHO has responsibility for at least some operational areas in public health.

Interior Health Authority (IHA)

The public health department of IHA is organized into six key portfolios: Health Protection, Prevention Services, Population Health, Aboriginal Health, Communicable Disease Control, and Administration. Core functions implementation takes place within all of these portfolio areas with each responsible for various programs or functions. The IHA "Room to Grow" document (http://

www.interiorhealth.ca/uploadedFiles/Room_To_Grow/Health_Careers/Public%20Health-ebro%20(May%202008).pdf) provides a description of the responsibilities within each portfolio. Core public health programs are delivered primarily through the 48 public health centres in IHA, but some are also delivered through other health care facilities as well as homes, schools, and workplaces. The range of public health services provided in the 10 primary health care centres varies from centre to centre, although none of the centres provide a full range of public health services. The services provided include programs such as well baby clinics, immunization, chronic disease prevention and healthy living counseling, sexually transmitted infection prevention and treatment and prenatal classes. Public health nurses work collaboratively with physicians, primary care nurses and nurse practitioners to provide prevention and health promotion services. Social workers, dental health professionals, mental health workers, and nutritionists may also collaborate to provide primary health care (defined as integrating public health and primary care).

Northern Health Authority (NHA)

Population Health and Wellness provides public health services in two areas: Health Promotion and Prevention; and Health Protection. Each of these is led by a Regional Director. Included within Health Promotion are the following services:

- Early childhood development
- Maternal child and family
- Healthy living including community nutrition
- Healthy eating and active living (HEAL)
- Community development related to ACT Now BC!
- Heart health
- Immunization
- Injury prevention
- Road health
- School and youth health

Within Health Protection, the following services are provided:

- Communicable disease control
- Community care facility licensing
- Food establishment inspections
- Personal service inspections
- Swimming pool and water systems inspection
- Tobacco reduction and enforcement

Population Health and Wellness, as well as Mental Health and Addictions and Aboriginal Health are coordinated on a regional basis, led by a member of the NHA executive team with various regional management staff overseeing the delivery of services. No other HA service plan has highlighted the importance of community engagement and local consultation in the way that NHA has. Members of the Board go out to the community to consult with and obtain input and advice from community members. The Chief Medical Health Officer is a member of the senior executive team in NHA but does not directly receive reports from public health staff.

With respect to Core Public Health Functions, NHA groups the 21 core programs into eight Regional Core Function Strategies. Three of these are stand alone strategies, that is, each is single-focused. These three are: Health Assessment and Surveillance; Health Emergency Management; and Prevention of Adverse Effects of the Health Care System.

The remainders of the core programs are clustered into five Regional Core Function Strategies: Healthy Environment; Child and Family Health; Healthy Youth; Healthy Adults; and Healthy Seniors. What this means is that aspects or components of several core programs will be integrated into each cluster.

Although not located within NHA, the Public Health Agency of Canada National Collaborating Centre on Aboriginal Health is located in the north at the University of Northern British Columbia.

Public Health Research in BC

There is a significant amount of public health related research in BC, particularly given the development of three new schools of public health. The work to document the full range of public health research taking place in BC is beyond the scope of this review, primarily because very little of it relates specifically to the integration of primary care and public health. Thus, only a few programs of research are selected as they have some relevance (direct or indirect) to the collaboration between primary care and public health.

Canadian Institute for Health Research Applied Public Health Chairs

In 2007/08, CIHR awarded 15 applied public health chairs in Canada. Four of these were awarded to BC researchers: Dr. Benedikt Fischer (Faculty of Health Sciences at Simon Fraser University), Dr. Jean Shoveller (School of Public and Population Health at University of British Columbia (UBC)), Dr. Elizabeth Saewyc (School of Nursing, UBC) and Dr. Marjorie MacDonald (School of Nursing at the University of Victoria (UVIC)). Dr. Fischer's research focuses on determinants, dynamics and consequences of substance use from multi-disciplinary perspectives. Dr. Shoveller is examining the social and institutional contexts of youth health, with a particular emphasis on investigating the impact of gender, culture and place on sexual health disparities among young people. Dr. Saewyc's research is on health issues of youth, with a particular emphasis on the intersection of stigma, risk behaviors and protective factors that influence the health of vulnerable populations of young people. Dr. MacDonald's research includes a focus on public health services renewal and, in particular, the study of the implementation and impact of the Core Public Health Functions Framework in BC. This work is being conducted by a large interdisciplinary team from four BC universities, and decision makers from all six BC health authorities (see http://web.uvic.ca/~cphfri/). Related to the focus of this environmental scan is the inclusion of a study within Dr. MacDonald's research program, funded by a CIHR Emerging Team Grant, which aims to explore the linkages between public health and primary care.

In 2007/08, CIHR awarded 15 applied public health chairs in Canada. Four of these were awarded to BC researchers.

Core and Technical Competencies for Public Health in BC Project

A project funded by the Public Health Agency of Canada and the BC Ministry of Health (now the Ministry of Healthy Living and Sport) involves a collaboration between the Public Health Association of BC, the BC Academic Health Council and the Ministry of Healthy Living and Sport. The project includes a needs assessment phase and an educational response phase. The purpose of the needs assessment is "to identify the core and technical competencies most critical to implementing the BC Ministry of Health Framework for Core Functions in Public Health and to identify any competency gaps" [60]. The intent is to inform Phase 2, in which appropriate educational responses will be recommended to address any gaps in core public health competencies identified in the first phase. Phase 1 was completed in the fall of 2008 and the second phase began early in 2009. The entire project is to be completed by the end of 2009.

Public Health Workforce in British Columbia

The main public health professionals in BC are: public health nurses, medical health officers, nutritionists, environmental health officers, dental health professionals, epidemiologists and speech/language/audiology professionals. In March 2007, the Public Health Association of BC released the Map of Public Health Services in BC. This document (accurate to 2006) provides a summary and a count of the various types of public health professionals in the health authorities across BC. More recent data are not available.

The Map of Services can be located at: http://www.phabc.org/modules.php?name=Mapping&NSNST_Flood=767e103a06fc0bd7b20a91f957c5f42c

Education

There is a broad range of educational programs in the province that support development of the public health workforce. The following represent the major educational programs for public health practitioners in BC.

Medical Education

There is one medical school in BC, at UBC, although its program is offered on the campuses of the University of Victoria and the University of Northern British Columbia (UNBC). A third regional medical program is expected to open at the Okanagan campus of UBC in Kelowna. A review of the curriculum by Dr. Anne George in the UBC Faculty of Medicine situated at UNBC, revealed that there are no specific public health courses offered during years one to four in the program. There is, however, a "longitudinal" course (Doctor, Patient, and Society) offered throughout the four years that includes important public health content. Plenary sessions and small group tutorials address such themes as social determinants of health, evidence-based medicine, epidemiology, prevention, multiculturalism and marginalized populations.

There is also a Community Medicine Residency Program at UBC within the School of Public and Population Health. Community Medicine residents may take the academic component of their training by completing the Master of Public Health (MPH) Program. The MPH program at UBC is described in more detail in the section below on "Public Health Education."

Nursing Education

Core public health content in most nursing education programs in BC is integrated throughout the programs. There is no specialty focus on public health nursing, although there are community health focused courses that provide some of the relevant content for public health nursing. These courses provide content in such areas as community empowerment, community development, health promotion planning and community assessment. In addition, UBC offers an upper division undergraduate course in population health/primary health care, and advanced nursing electives are available in some schools (e.g., UVIC), which provide the theoretical foundations for public health nursing. However, not all students will take such courses, as they are electives. In recent years, concern has been expressed by public health nursing managers that many graduates of the nursing programs in BC are not sufficiently prepared to take on a public health nursing position out of university. They argue that there has been a loss of public health content in nursing programs since the shift to the requirement of a baccalau-

reate degree for entry to the practice of nursing. Master's programs in nursing provide some population-focused content and in most programs, nurses wishing to work in the area of public health can structure their education to focus elective courses and practica on public health.

Public Health Education

Undergraduate Programs

The University of Northern British Columbia has a Bachelor of Health Sciences program with two streams in Community and Population Health, one in Aboriginal and Rural Health, and the other in Environmental Health. The courses identified within the Program offer learning opportunities from a variety of disciplines, including Life Sciences, Social Sciences, Behavioural Sciences and Ethics and Law, to enable students to develop a body of knowledge and understanding relating to the dimensions of health. Graduation from either of the Community and Population Health Majors enables students to embark on careers or graduate programs in a variety of fields, including public health. (http://www.unbc.ca/calendar/undergraduate/undergraduate_programs/health_sciences.html)

Simon Fraser University's Faculty of Health Sciences offers both a Bachelor of Arts in Health Sciences and a Bachelor of Science in Health Sciences. The BA program incorporates multidisciplinary approaches to the study of health illness and disease in human communities. The program draws upon the biological, social, behavioural, and policy sciences, and focuses on the determinants of health, health promotion, disease prevention, health care systems, health policy and health technology. (http://www.fhs.sfu.ca/undergraduate-programs/BA-in-health-sciences). The BSc program overlaps with the BA program in terms of sharing some courses, but is aimed at students wishing to pursue careers that require detailed knowledge of the cellular, molecular and behavioural mechanisms that underlie health and disease. The BSc in Health Sciences is unique in its interdisciplinary approach to the scientific and social determinants of health and disease, especially infectious and environmental diseases. (http://www.fhs.sfu.ca/undergraduate-programs/BSc%20in%20Health%20Sciences).

The University of Victoria is currently developing an undergraduate health studies program within its proposed School of Public Health and Social Policy. No information is available on this program as of this writing.

Graduate Programs

Currently in BC, there is a Master in Community Health Science at UNBC as well as two Master of Public Health Programs – one at Simon Fraser University in the Faculty of Health Sciences, and the other at UBC in the School of Public and Population Health. In addition, an MPH and Diploma in Public Health are being developed at UVic with a projected start date of September 2010.

The Community Health Science master's program at UNBC is interdisciplinary and provides public/population health content with courses such as: critical social and health issues in northern communities, principles of epidemiology, community research methods, the health of First Nations People, health in developing countries, health education, advanced toxicology and environmental health, advanced techniques in epidemiology, cultural perspectives on health and illness and advanced qualitative research. The degree granted is an MSc in Community Health Science. Within this program, there is a nursing stream for registered nurses who wish to obtain graduate training in community health, broadly defined. This program is the oldest community/public health-related graduate program in the province. Information can be found at: http://www.unbc.ca/graduateprograms/communityhealthscience.html

Simon Fraser University offers two interdisciplinary graduate degrees: a Master's Degree in Public Health (MPH) and a Master of Science (MSc). In addition, they offer a graduate diploma in Global Health. Both a doctoral program (PhD) and a graduate certificate program in infec-

tious disease are under development. Information on the two approved graduate programs (MPH and MSc) can be found at: http://www.fhs.sfu.ca/graduate-programs. The MPH degree is a practice-based program in Population and Public Health. The aim of the program is to qualify public health leaders and practitioners to: improve the overall health and well-being of the population, prevent diseases, injuries and disabilities, and reduce inequities in health from local to global levels. There are four areas of concentration within the MPH program: Environmental and Occupational Health, Global Health, Population Health, and Social Inequities and Health. SFU is currently in the process of seeking accreditation from the Council on Education for Public Health (CEPH).

In the UBC School of Public and Population Health (http://www.spph.ubc.ca), there is a Master of Public Health Degree that is a two-year practicum-based program. It integrates learning in epidemiology, biostatistics, social, biological and environmental determinants of health, population health, global health, disease prevention and health systems management with skill-based learning in a practicum setting. The program is offered in a distributed learning format with a combination of on-site and online learning. The MPH is aimed at students from health sciences (medicine, nursing, physiotherapy, nutrition, pharmacy, midwifery etc.), science (biology, microbiology, environmental sciences etc.), arts (sociology, psychology and anthropology), engineering and business. It is also aimed at public health practitioners who wish to expand their knowledge base and develop a leadership role in public health.

The University of Victoria is also in the process of developing a new School of Public Health and Social Policy in the Faculty of Human and Social Development. An undergraduate degree in Health Studies will be offered in addition to a graduate diploma in Public Health and a Master's in Public Health. The diploma and MPH are "laddered" so that students can begin in the diploma program and then progress to the MPH as their diploma courses can be counted toward the requirements for the MPH degree. Within the diploma and MPH programs, four areas of focus will be offered: Indigenous Health Studies, Public Health Informatics, Public Health Nursing and Social Policy. The areas of focus at UVIC aim to differ considerably from the foci at other universities so that there is limited overlap. Information on the new School of Public Health and Social Policy can be obtained from Dr. Laurene Sheilds (lsheilds@uvic.ca).

Nutrition Education

There are few nutrition programs in BC. The University of British Columbia offers an undergraduate degree in food, nutrition and health.

Environmental Health Office Education

The British Columbia Institute of Technology (BCIT) offers a Bachelor of Technology in Environmental Health/Public Health Inspection, leading to a nationally recognized credential. It is a two-year program that admits students who have completed the first two years of a degree transfer program in the sciences: http://www.bcit.ca/study/programs/8500dbtech

The main public health professionals in BC are: public health nurses, medical health officers, nutritionists, environmental health officers, dental health professionals, epidemiologists and speech/language/audiology professionals.

Current Trends and Issues

- National and provincial core competencies, defined as "the essential knowledge, skills and attitudes necessary for the practice of public health, are now being implemented across BC and Canada. They transcend the boundaries of specific disciplines and are independent of program and topic, providing the building blocks for effective public health practice and the use of an overall public health approach." [61]. There are 36 core competencies organized under 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. The core competencies document can be found on the Public Health Agency of Canada (PHAC) website: http://www.phac-aspc.gc.ca/ccph-cesp/pdfs/cc-manual-eng090407.pdf

- Each public health discipline is now working toward the development of discipline-specific competencies based on the generic core competencies. In British Columbia, PHABC in collaboration with the BC Academic Health Council and funded by PHAC and the Ministry of Healthy Living and Sport, has undertaken a province-specific core competency project. The intent of this project is to identify the core and technical competencies most critical to implementing the BC Core Public Health Functions Framework and to put into place processes to address gaps in competency profiles in the work force. In addition, the project will recommend appropriate educational responses to public health competency needs [60].

- Public health funding in BC comprises approximately 3% of the provincial health care budget. Despite the recommendation of the government's own Select Standing Committee on Health [56], which urged that funding double to 6%, this level of funding has remained the same. Health authorities anticipate health budget cuts in 2010 in response to the current recessive economy. Public health staff in the HAs are very concerned that funding for public health programs will be reduced relative to curative and treatment services. Even now, there is considerable variability across the health authorities in terms of the funding available for particular public health programs. This will affect implementation of the core public health functions framework. For example, in IHA there is dedicated funding for an Injury Prevention Coordinator, whereas this is not the case in other health authorities. What this means is that IHA will likely have a more well developed and sophisticated plan for Injury Prevention than the other HAs. Funding for public health programs is likely to play an important role in supporting the potential for public health and primary care collaboration.

- There has been a proliferation of schools of public health across BC and Canada. With three schools of public health in BC, and some 25 or more MPH programs in the rest of the country, there is concern that these numbers are "overkill", and that, in the future, there may not be sufficient jobs for all graduates. Given the different foci of the three MPH programs in BC, this may be less of an issue than in other locations, but the situation bears watching. One concern with respect to having three MPH programs in the province is the availability of public health practicum placements.

Summary and Conclusions

Primary care and public health services are, for the most part, delivered by different sectors of the health care system with the exception of some dual provider functions such as immunizations, screening and treatment for sexually transmitted infections or HIV, prenatal care and well-baby care. Nonetheless, there are a number of structures in BC that have the potential to enhance collaboration between primary care and public health:

- Particular population groups and disease groups may have health authority structures in place that promote or encourage integration (e.g., homelessness, mental health plan, HIV care, Aboriginal care) of PH functions into PC.

- Community health centres are organizational structures in which primary care and public health functions are already integrated, so these structures are promising avenues for exploring collaboration.

- Recent studies in BC on nurse practitioner role integration suggest that NPs are taking strong leadership roles in reaching out to public health and establishing collaborations. There is a clear overlap between the services provided by NPs and PHNs, although the focus for NPs tends to be more oriented toward the primary care elements of PHC across the full continuum of care, while the focus for PHNs is toward the public health elements at the health promotion and illness prevention end of the continuum of care. Given their fundamental grounding in principles of primary health care, members of these two groups of nurses have considerable potential for leading and facilitating collaboration between primary care and public health.

- Registered Nurses (RNs) currently make up about half of the primary health care workforce [51]. While there are fewer RNs working in primary care, they make up most of the public health workforce. Within nursing, a vision of primary health care is one that integrates primary care and public health. In reviewing the elements of primary health care articulated in the Alma Ata Declaration, it is evident that the focus of both primary care and public health are integrated into the overall vision for primary health care. RNs are grounded in an underlying philosophy of primary care. Furthermore, as salaried employees, RNs can be flexible in the services they deliver, and soon they will be able to deliver more of them, thanks to an expanded scope of practice under the Health Professions Act. These conditions equip RNs with the potential to take a leadership role in moving towards collaboration of primary care and public health.

- There is a strategic plan for health information management in BC based on the period of 2002/03 to 2006/07 (http://healthnet.hnet.bc.ca/index.html#overview), as well as provincial and federal investment in putting the necessary infrastructure in place. Although implementation of health information technology remains slow across BC, the potential for sharing information in order to provider better quality patient and population health care is promising.

- The implementation of integrated health networks, new ways of primary care delivery (e.g., group medical visits) and additional practice support in primary care has already had some effect on collaboration across primary care and public health, as well as across different disciplines including medicine, nursing, nutrition, pharmacy and social work. These newer structures also have potential for greater intersectoral collaboration.

There are always challenges that inhibit collaboration between sectors. These challenges include:

- Disparities in the funding of the public health and primary care sectors create challenges for collaboration. Moreover, how providers are funded can

influence their behaviour. That is, privately delivered primary care services can act as a barrier to collaboration in a publicly funded system through a fee-for-service model.

- Policies and mandates of different organizations within each health authority will influence how its health human resources are deployed.

- Training primary care and public health care professionals remains discipline-specific. Currently, no programs that we know of create multiple and sustained opportunities for interprofessional training.

Potential to increase collaboration across primary care and public health in BC exists because of policy legislation, changes in funding structures (e.g., practice support program), wider implementation of health technology (e.g., electronic medical record) and through the introduction of new health care provider roles (e.g., nurse practitioners, physician assistants). Integrated health networks also increase the presence of interprofessional collaboration. More work is needed to examine where strengthening collaboration between primary care and public health results in better patient or population outcomes.

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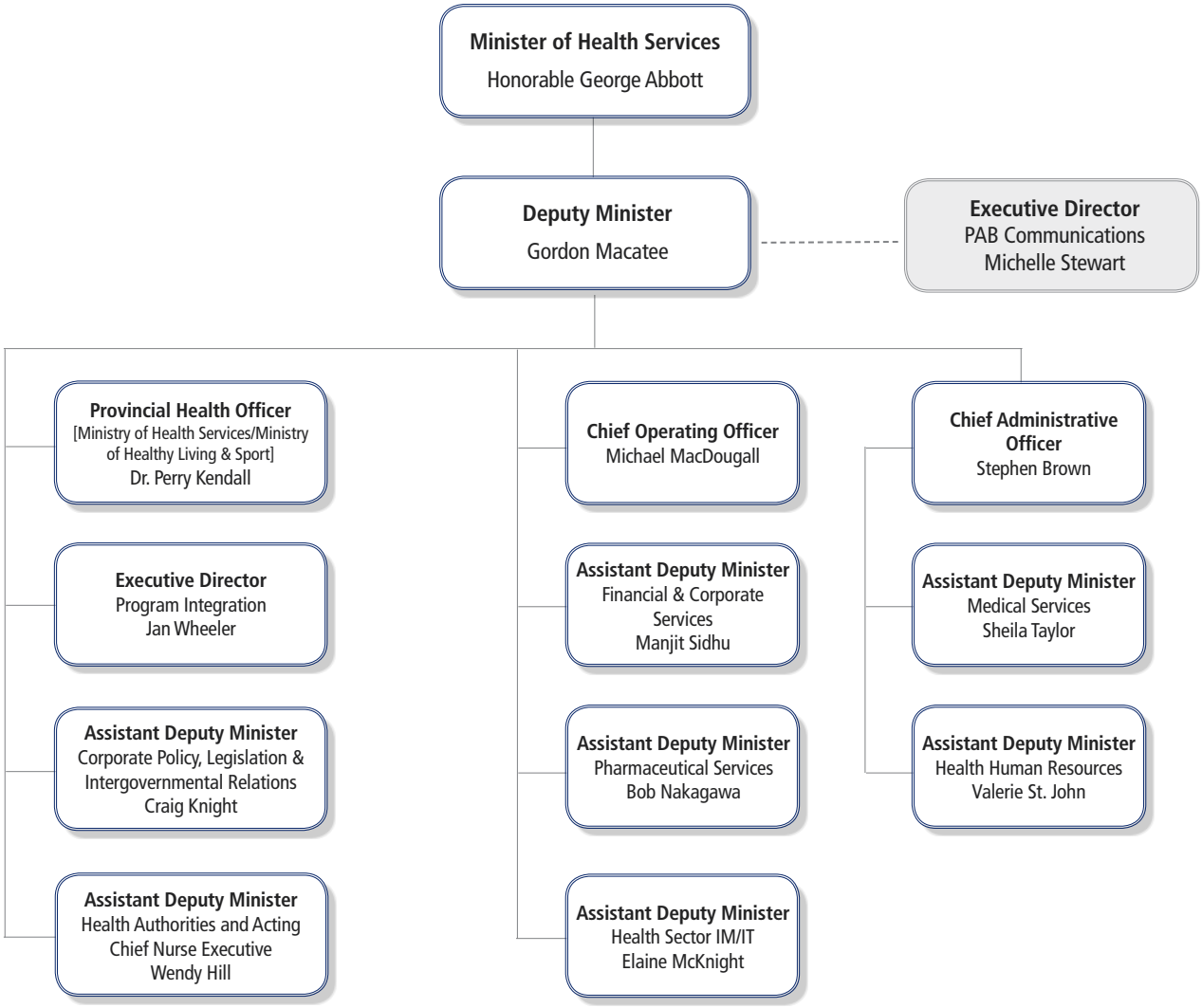
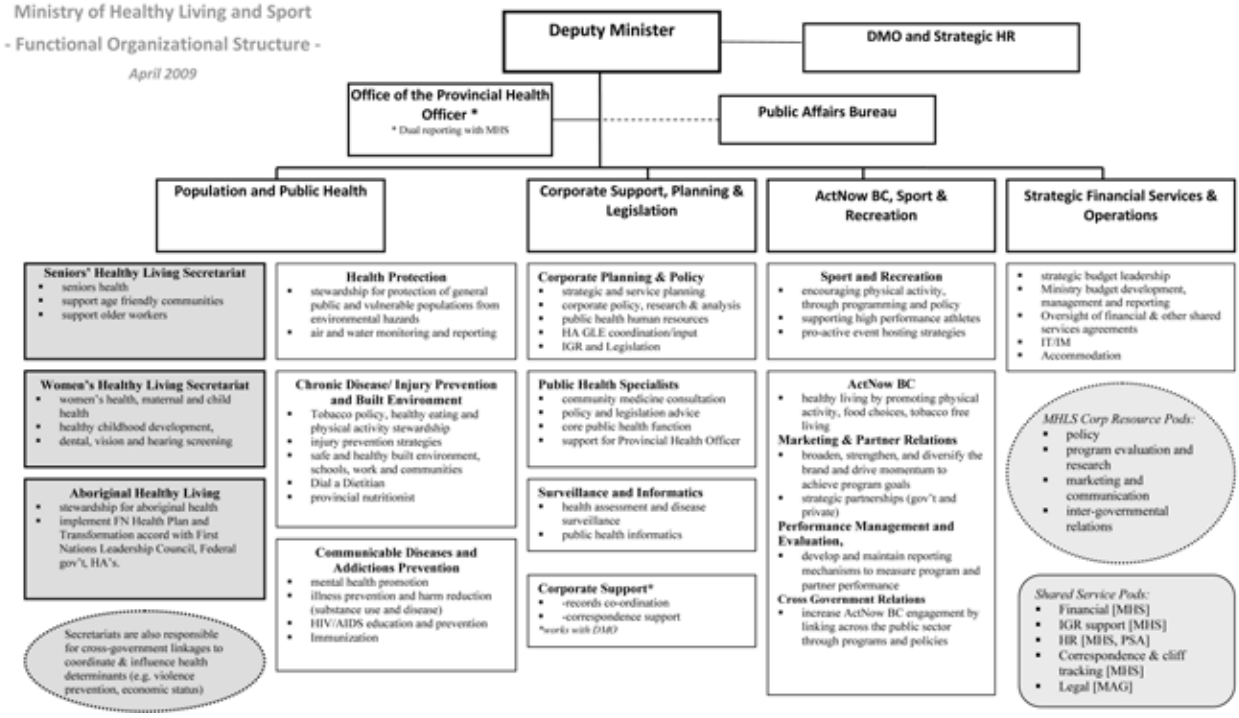
Appendix A

Ministry of Health Services
Top Level Organization Chart

Effective Date: February 2, 2009




Ministry of Healthy Living and Sport
- Functional Organizational Structure -
April 2009
Deputy Minister
DMO and Strategic HR
Office of the Provincial Health Officer *
* Dual reporting with MHS
Public Affairs Bureau
Population and Public Health
Corporate Support, Planning & Legislation
ActNow BC, Sport & Recreation
Strategic Financial Services & Operations
Seniors' Healthy Living Secretariat
seniors health
support age friendly communities
support older workers
Women's Healthy Living Secretariat
women's health, maternal and child health
healthy childhood development,
dental, vision and hearing screening
Aboriginal Healthy Living
stewardship for aboriginal health
implement FN Health Plan and Transformation accord with First Nations Leadership Council, Federal gov't, HA's.
Secretariats are also responsible for cross-government linkages to coordinate & influence health determinants (e.g. violence prevention, economic status)
Health Protection
stewardship for protection of general public and vulnerable populations from environmental hazards
air and water monitoring and reporting
Chronic Disease/ Injury Prevention and Built Environment
Tobacco policy, healthy eating and physical activity stewardship
injury prevention strategies
safe and healthy built environment, schools, work and communities
Dial a Dietitian
provincial nutritionist
Communicable Diseases and Addictions Prevention
mental health promotion
illness prevention and harm reduction (substance use and disease)
HIV/AIDS education and prevention
Immunization
Corporate Planning & Policy
strategic and service planning
corporate policy, research & analysis
public health human resources
HA GLE coordination/input
IGR and Legislation
Public Health Specialists
community medicine consultation
policy and legislation advice
core public health function
support for Provincial Health Officer
Surveillance and Informatics
health assessment and disease surveillance
public health informatics
Corporate Support*
-records co-ordination
-correspondence support
*works with DMO
Sport and Recreation
encouraging physical activity, through programming and policy
supporting high performance athletes
pro-active event hosting strategies
ActNow BC
healthy living by promoting physical activity, food choices, tobacco free living
Marketing & Partner Relations
broaden, strengthen, and diversify the brand and drive momentum to achieve program goals
strategic partnerships (gov't and private)
Performance Management and Evaluation,
develop and maintain reporting mechanisms to measure program and partner performance
Cross Government Relations
increase ActNow BC engagement by linking across the public sector through programs and policies
strategic budget leadership
Ministry budget development, management and reporting
Oversight of financial & other shared services agreements
IT/IM
Accommodation
MHLS Corp Resource Pods:
policy
program evaluation and research
marketing and communication
inter-governmental relations
Shared Service Pods:
Financial [MHS]
IGR support [MHS]
HR [MHS, PSA]
Correspondence & cliff tracking [MHS]
Legal [MAG]

UBC Centre for
Health Services and
Policy Research

Strengthening
Primary
Health Care
through Primary Care and
Public Health Collaboration.