



**CORE**

Public Health Functions for BC

**Model Core Program Paper:  
Communicable  
Disease**

**BC Health Authorities**

**BC Ministry of Healthy Living and Sport**

February 2009

*This Model Core Program Paper was prepared by a working group consisting of representatives of the BC Ministry of Healthy Living and Sport and BC's health authorities.*

*This paper is based upon a review of evidence and best practice, and as such may include practices that are not currently implemented throughout the public health system in BC. This is to be expected, as the purpose of the Core Public Health Functions process—consistent with the quality improvement approach widely adopted in private and public sector organizations across Canada—is to put in place a performance improvement process to move the public health system in BC towards evidence-based best practice. Where warranted, health authorities will develop public performance improvement plans with feasible performance targets and will develop and implement performance improvement strategies that move them towards best practice in the program component areas identified in this Model Program Paper.*

*This Model Program Paper should be read in conjunction with the accompanying review of evidence and best practice.*

***Model Core Program Paper approved by:***

Core Functions Steering Committee (February 2009)

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## **EXECUTIVE SUMMARY**

This paper identifies the core elements that should be provided by British Columbia health authorities for the prevention and control of communicable diseases. It is intended, as part of the BC Core Functions in Public Health, to reflect evidence-based practice and to support continuous performance improvement.

A Working Group of representatives from the Ministry of Healthy Living and Sport, Provincial Health Services Authority and the regional health authorities worked together in the development of this paper. The Working Group agreed that the overall goal of the program is to reduce and maintain at the lowest achievable level, the incidence, prevalence and complications from communicable diseases in British Columbia. Specific objectives are to:

- Prevent the acquisition and transmission of communicable diseases.
- Decrease individual and population level vulnerabilities and risk factors associated with acquiring communicable diseases.
- Reduce the severity, disability and harm from communicable diseases.
- Improve utilization of animal health and environmental health data with human health surveillance for early detection of human communicable diseases.

The Working Group further determined a set of program components, which together form a comprehensive strategy for the prevention and control of communicable diseases by health authorities. These are:

- Surveillance;
- Prevention of communicable diseases:
  - Immunization.
  - Harm reduction.
  - Screening.
- Management and control of communicable diseases:
  - Individual case management and contact notification.
  - Outbreak management.
  - Health emergency management.
- Health promotion.
- Health protection strategies.
- Program monitoring, evaluation and applied research.

A number of strategies and initiatives are described for each of these components. “Better” or “promising” practices are identified, based on the literature and exemplary practices widely recommended by experts in the field. A multi-disciplinary and multi-sectoral approach is highlighted as an essential element in dealing effectively with communicable diseases. The recommended practices for an integrated strategy include:

- Collaborating and partnering with all public health sectors, primary and acute care health professionals, regional and local governments, community organizations and provincial ministries and agencies to enhance the effectiveness of the program.
- Collecting, managing and interpreting a range of data relevant to regional communicable disease issues / impacts, and disseminating data to decision-makers, planners, program delivery staff, and community partners.
- Delivering an immunization program that increases the uptake of vaccines to protect the population from vaccine preventable diseases.
- Collaborating in harm reduction initiatives to reduce the risk of infectious diseases associated with the use of substances.
- Screening, and tracing/notifying partners and contacts, for early detection of communicable diseases, and providing as required, testing, post-exposure prophylactic drug therapy, education, counselling and referrals.
- Investigating communicable disease outbreaks and implementing response measures to ensure control and prevent further transmission.
- Collaborating in the development of emergency response plans and business continuity plans for potentially large-scale communicable disease outbreaks, including strategies for prevention, risk reduction and mitigation.
- Delivering multiple health promotion initiatives to prevent communicable diseases, including public education and awareness, advocacy for healthy public policies, and community development and partnership building to strengthen capacity and integrate local services.
- Collaboration and consultation in safeguarding water quality, food quality, hospitals and community care facilities, as well as community environmental health.
- Applied public health research including program evaluation and continuous performance improvement.

The paper provides an overall direction rather than detailed measures for implementing the range of initiatives. In some cases, more specific strategies are included in other model core programs (e.g., health assessment and disease surveillance, prevention of harms associated with substance use, health emergency management, food safety, air quality, water quality, healthy community environments, etc.).

In addition, the Working Group recommends that the public health laboratory system in the province be strengthened, as an integral element to enhancing the prevention and control of communicable disease. Recommendations are:

- Strengthen the public health laboratory network through enhanced partnerships with other types of microbiology laboratories within the jurisdiction by building on current networking.
- Enhance efficiencies and effectiveness through clearly defined roles and responsibilities regarding service/program core functions within laboratory networks.
- Support the need for leadership in fundamental areas, particularly in information management and 'quality management systems' development.

Key factors that ensure a health authority's successful implementation of the prevention and control of communicable disease include: strong support from the Board and management; well-trained and competent staff; a well-developed information system that provides appropriate practice support, linkage to electronic records, and interface with other health professionals; an efficient procurement and transportation infrastructure for vaccine; allocation of sufficient resources; and clear mechanisms for reporting and accountability.

## **1.0 OVERVIEW/SETTING THE CONTEXT**

As demonstrated in recent Canadian reports, public health needs to be better structured and resourced, in order to improve the health of the population. The Framework for Core Functions in Public Health is a component of that renewal in British Columbia. It defines and describes the core public health activities of a comprehensive public health system. This policy framework was accepted in 2005 by the then-Ministry of Health and the health authorities.

Implementation of core functions will establish a performance improvement process for public health, developed in collaboration between the Ministry of Healthy Living and Sport, the health authorities and the public health field. This process will result in greater consistency of public health services across the province, increased capacity and quality of public health services and improved health of the population. To ensure collaboration and feasibility of implementation, the oversight of the development of the performance improvement process is managed by a Provincial Steering Committee, with membership representing all health authorities and the ministry.

What are core programs? They are long-term programs representing public health services that health authorities provide in a renewed and modern public health system. Core programs are organized to improve health; they can be assessed ultimately in terms of improved health and well-being and/or reductions in disease, disability and injury. In total, 21 programs have been identified as “core programs,” of which the program to control and prevent communicable diseases is but one. Many of the programs are interconnected and thus require collaboration and coordination between them.

In a “model core program paper,” each program will have clear goals, measurable objectives and an evidentiary base that shows it can improve people’s health and prevent disease, disability and/or injury. Programs will be supported through the identification of best practices and national and international benchmarks (where such benchmarks exist). Each paper will be informed by an evidence paper, other key documents related to the program area and by key expert input obtained through a working group with representatives from each health authority and the Ministry of Healthy Living and Sport.

The Provincial Steering Committee has indicated that an approved model core program paper constitutes a model of good practice, while recognizing it will need to be modified to meet local context and needs. The performance measures identified are appropriate indicators of program performance that could be used in a performance improvement plan. The model core program paper is a resource to health authorities that they can use to develop their core program through a performance improvement planning process. While health authorities must deliver all core programs, how each is provided is the responsibility of the health authority, as are the performance improvement targets they set for themselves.

It is envisioned that the performance improvement process will be implemented over several years. During that time the process will contribute to and benefit from related initiatives in public health infrastructure, health information and surveillance systems, workforce competence assessment and development and research and evaluation at the regional, provincial and national

levels. Over time these improvement processes and related activities will improve the quality and strengthen the capacity of public health programs, and this in turn will contribute to improving the health of the population.

## **1.1 An Introduction to This Paper**

This model core program paper is one element in an overall public health performance improvement strategy developed by the Ministry of Healthy Living and Sport in collaboration with provincial health authorities and experts in the field of communicable diseases. It builds on previous work from a number of sources.

In March 2005, the then-Ministry of Health released a document entitled *A Framework for Core Functions in Public Health*. This document was prepared in consultation with representatives of health authorities and experts in the field of public health. It identifies the core programs that must be provided by health authorities, and the public health strategies that can be used to implement these core programs. It provides an overall framework for the development of this document.

Other documents that have informed this paper include:

- *Prevention of Mental Disorders: Evidence Review* (2007), by the Ministry of Health, Population Health and Wellness.
- *Mental Health Promotion: Evidence Review* (2007), by K. Balfour, Balfour Consulting Group, for the Ministry of Health, Population Health and Wellness.

A number of evidence reviews as well as a variety of BC documents on communicable disease strategic priorities and policy frameworks provide a foundation for this core program. They include:

- *The Evidence Base for Health Promotion Strategies in Communicable Diseases Prevention and Control* (2008), by M. Steinberg, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *A Core Program in Immunization: The Evidence Base* (2006), by L. Yuan, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *Evidence and Best Practice for the Employment of Harm Reduction Activities in Program Aimed at Controlling Communicable Diseases* (2006), by T. Kerr and E. Wood, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *Vector-Borne Disease Management* (2006), by R.A. Ellis, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *Evidence or Best Practice for Public Health Measures Based on Infection Prevention and Control and Supported by Legislation* (2007), by L. Yuan, S. Peck, and B. Henry, for the Ministry of Healthy Living and Sport.

- *The Evidence Base for Secondary Prevention of Communicable Diseases* (2006), by M. Steinberg, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *The Evidence Base for Communicable Disease Surveillance* (2006), by L. Yuan and A. Vogel, BC Centre for Disease Control, for the Ministry of Healthy Living and Sport.
- *Healthy Pathways Forward: a Strategic Integrated Approach to Viral Hepatitis in BC* (2007), by the Ministry of Health.
- *Immunize BC: A Strategic Framework for Immunization in BC* (2007), by the Ministry of Health.
- *Following the Evidence: Preventing Harms from Substance Use in BC* (2006), by the Ministry of Health.
- *Harm Reduction: A British Columbia Community Guide* (2005), by the Ministry of Health.
- *Evidence Base for Best Practices for Public Health Laboratories and their Networks* (2006), by Provincial Health Services Authority Laboratories, for the Ministry of Healthy Living and Sport.
- *The Public Health Laboratories in British Columbia: Evidence Paper #2* (2008), by Amhurst Healthcare Consultants in collaboration with BCCDC Laboratory Services, for the Ministry of Healthy Living and Sport.
- *Control Modalities Applied to Communicable Disease Groupings* (2007), by D. Patrick and R. Brunham, BC Centre for Disease Control.

In addition, the Ministry of Health Planning document *Priorities for Action in Managing the Epidemics: HIV/AIDS in BC (2003-2007)*, which sets out comprehensive strategies that have guided BC's response to HIV/AIDS, has been used as a resource.

A Working Group on Prevention and Control of Communicable Diseases was formed in June 2007, of experts from the Ministry of Healthy Living and Sport, the Provincial Health Services Authority (specifically the BC Centre for Disease Control), and the health authorities. The group provided guidance and direction in the development of the model core program paper during meetings in 2007 and 2008, as well as through telephone and e-mail discussions.

## **1.2 Introduction to Prevention and Control of Communicable Diseases**

Public health in the 19th and early 20th century focused on the most common causes of death and disease, namely communicable disease. This approach was so successful that today communicable diseases represent only a small proportion of the burden of disease. However, the emergence of HIV/AIDS, the re-emergence of tuberculosis, and the importation of exotic diseases such as SARS and dengue fever means that the prevention and control of communicable diseases remains an important public health priority. It is now a dynamic area with constantly shifting challenges and variations across regions, which require management and guidance

through ongoing epidemiological analysis. At the present time, key priorities across the province include:

- Vaccine-preventable communicable diseases, including diphtheria, pertussis, tetanus, polio, haemophilus influenzae type b, hepatitis A and B, meningococcal disease, pneumococcal disease, measles, mumps, rubella, varicella, and influenza.
- Sexually transmitted and blood-borne communicable diseases, including HIV/AIDS, chlamydia, gonorrhoea, syphilis, and viral hepatitis B and C.
- Foodborne and waterborne communicable diseases.
- Tuberculosis, especially multiple resistant strains.
- Nosocomial infections (health care-associated infections).
- Travel-related, imported, and exotic diseases, including rare but potentially serious conditions such as Lassa fever or Ebola virus.
- New and emerging communicable diseases, including potential bio-terrorist threats.

Of these diseases:

- BC has the highest rate of HIV/AIDS and hepatitis B and hepatitis C in Canada (Ministry of Health, 2005); an estimated 10,000 people in BC are living with HIV and AIDS (Ministry of Health Planning, 2003); approximately 60,000 British Columbians have chronic hepatitis B infection, and estimates suggest another 60,000 are affected by hepatitis C (BC Centre for Disease Control [BCCDC], 2006, unpublished data).
- The rate of tuberculosis in BC is higher than the national average (BCCDC, 2006, unpublished data).
- The rates for immunization coverage: the percentage of BC children up-to-date for age for all vaccine agents combined increased from 63.5 per cent in children born in 2004 to 66.5 per cent in children born in 2006. When vaccine agents were considered individually, 59.8 to 89.4 per cent of children born in 2006 were up-to-date for age for each agent (BCCDC, 2009).
- Several sexually transmitted infections (STIs) are on the rise in BC—rates of chlamydia and gonorrhoea have increased substantially in BC since 1997; syphilis rates are nearly double that of other provinces.<sup>1</sup>
- The number of cases of vector-borne illness in BC has not been fully documented but some researchers expect it may be an emerging issue (Ellis, 2006).

Best evidence indicates that individuals, communities and the health system must act together to prevent new infections through coordinated, collaborative and integrated responses to communicable diseases. It is necessary to include not only traditional, disease-specific approaches, but also strategies that support principles of population health, service integration,

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<sup>1</sup> Only health authorities using the iPHIS immunization registry are included in this data; Vancouver/Richmond Health Service Delivery Areas are not included.

improved communicable and chronic disease management. Evidence in this field has been widely acknowledged; in particular, there is solid evidence that the following have a direct impact on preventing and controlling communicable diseases:

- Sanitation and hygiene.
- Safe food and water.
- Immunization.
- Harm reduction strategies associated with substance use.
- Healthy community environments.
- Licensing/inspection of personal service establishments.
- Antimicrobial therapy and infection control.
- Health-promoting behaviours (through the use of healthy public policies, supportive environments, etc).

The determinants of health—social, economic, educational, cultural, and environmental conditions—are important considerations in planning and implementing initiatives that are responsive to the needs of specific communities and groups. Many communicable diseases disproportionately affect vulnerable populations and require complex prevention strategies for a coordinated and integrated response that addresses multiple vulnerabilities. Community action for health has been shown to involve both individual empowerment and community empowerment to influence and control the determinants of health and the quality of community life (Steinberg, 2006). For example, BC's aboriginal population experience higher levels of poverty, lower levels of educational attainment, higher unemployment and higher rates of chronic disease, premature mortality and morbidity. Discussions with Aboriginal groups point to the need for a distinct and complementary implementation strategy—developed in partnership with Aboriginal people—to address the unique circumstances faced by Aboriginal communities across the province.

## **2.0 SCOPE AND AUTHORITY FOR THE PREVENTION AND CONTROL OF COMMUNICABLE DISEASES**

In order to implement the program to prevent and control communicable diseases, there must be clarity on the roles and responsibilities of the Ministry of Healthy Living and Sport, the Provincial Health Services Authority, the regional health authorities and other ministries and levels of government.

### **2.1 International Roles and Responsibilities**

The World Health Organization (WHO) supports prevention and control of communicable diseases through worldwide communicable disease surveillance, development and distribution of international communicable disease guidelines, and travel advisories and warnings. The WHO administers International Health Regulations, which govern international obligations to collect and report information on cases of a number of communicable diseases (e.g., cholera, plague and yellow fever).

At the international level, there are several automated systems that communicate alerts and provide updates on communicable diseases to assist in worldwide early detection. These include:

- Pro-Med, a database of the International Society for Infectious Disease, which reports outbreaks of emerging diseases and toxins.
- APIC, a multi-disciplinary, voluntary, international reporting system provided by the Association for Professionals in Infection Control and Epidemiology.
- LRN (Lab Response Network), an international network of laboratories equipped to respond quickly to emerging communicable diseases, chemical/biological terrorism and public health emergencies (managed by the United States Centers for Disease Control and Prevention).

### **2.2 National Roles and Responsibilities**

On the national level, the Public Health Agency of Canada (PHAC) has a public education, training, coordination and surveillance role at the national level. Its mandate includes:

- National surveillance, including collection and reporting of data on nationally notifiable communicable diseases and notification of the WHO (and neighbouring American states) on communicable diseases in Canada.
- Information monitoring and sharing through its Global Public Health Intelligence Network (GPHIN), an Internet-based, early warning system that gathers preliminary report of public significance on a real-time, 24/7 basis.
- Management of the Centre for Infectious Disease Prevention and Control, Centre for Emergency Preparedness and Response, the Pandemic Preparedness Secretariat, National Microbiology Laboratory, and Laboratory for Foodborne Zoonoses.

- Responsibility for administering the federal *Quarantine Act*, the *Indian Act* with respect to communicable diseases in First Nation communities, and communicable disease inspections on airplanes and ships.
- Skills training for public health practitioners in Canada (e.g., Federal Epidemiologist Program, On-line Skills Enhancement Program).

In addition, PHAC works closely with provincial and territorial authorities to reach agreement on communicable disease initiatives through federal/provincial/territorial committees on communicable disease issues. For example, they coordinate development of specific clinical and public health guidelines; common data standards (Canada Health Infoway); and cooperative initiatives such as the Public Health Network (PHN). PHAC also has a funding program to support health promotion projects related to HIV and hepatitis C (HCV) conducted by community groups.

A number of other federal agencies are also actively involved in this field:

- Health Canada is responsible for administering federal legislation on the licensing of drugs under the *Controlled Drugs and Substances Act*.
- Federal correctional services manage federal prisons.
- Department of National Defence and the RCMP handle health-related security and threats of biological terrorism.
- Citizenship and Immigration Canada administers regulations regarding the health of immigrants.
- Canadian Institutes of Health Research (CIHR) provides support in health research and analysis.
- Canadian Food Inspection Agency (CFIA) has a mandate to respond to nationally notifiable animal communicable diseases (in cooperation with the Canadian Cooperative Wildlife Health Centre).

## **2.3 Provincial Roles and Responsibilities**

### **2.3.1 Ministry of Healthy Living and Sport Roles and Responsibilities**

The mandate of the Ministry of Healthy Living and Sport is to

- Promote health and prevent disease, disability and injury.
- Protect people from harm.
- Facilitate quality opportunities to increase physical activity, participation and excellence in sport.
- Support the health, independence and continuing contributions of women and older people.

In its stewardship role, the Ministry of Healthy Living and Sport provides leadership, strategic policy direction, legislation and monitoring for public health and sports programs to support the delivery of appropriate and effective public health services in the province. The ministry has a role in addressing health inequalities, with a specific focus on the development of policies and programs to close the gap in Aboriginal health status. The Ministry works with the health authorities to provide accountability to government and the public for public health service outcomes.

Specifically in the area of prevention and control of communicable diseases, the Ministry of Healthy Living and Sport is responsible for provincial level strategic planning, policies and legislation:

- Advising the Minister on communicable disease policies and legislation.
- Developing provincial health promotion and health protection strategies in collaboration with health authorities and other provincial ministries and agencies, as appropriate.
- Coordinating the development of plans and strategies with regional health authorities to enhance communicable disease programs such as immunization, prevention of blood-borne pathogens, and harm reduction, as well as provision by the Provincial Health Services Authority/BC Centre for Disease Control of research, data analysis, health promotion and other technical services.
- Leading/facilitating the development of provincial networks and coalitions.
- Facilitating collaborative partnerships with other provincial ministries, the federal government, and federal/provincial forums on communicable disease control and prevention.

### 2.3.2 Provincial Health Officer's Roles and Responsibilities

The Provincial Health Officer (PHO), located in the Ministry of Healthy Living and Sport, has an independent oversight role and is responsible for:

- Providing advice and ensuring accountability in fulfilling the legal requirements for communicable disease reporting, examination and treatment, quarantine and isolation, and other action that may be required for communicable disease prevention and control throughout the province.
- Coordinating (in conjunction with the Ministry of Healthy Living and Sport and the Ministry of Health Services) responses to public health emergencies and keeping the government and the public fully informed about threats to public health.
- Collaborating with other jurisdictions and contributing to leadership in public health communicable disease planning and policy development at the provincial, national and international levels.
- Establishing standards of practice for, and performance review of, medical health officers.

Within the province, the PHO may order a Medical Health Officer to take action, or legislation may provide direct authority to regional Medical Health Officers to ensure compliance with legal requirements.

### 2.3.3 Other Provincial Ministries Roles and Responsibilities

The Ministry of Healthy Living and Sport has a unique relationship with the Ministry of Health Services as they are the primary linkage to the regional health authorities and are responsible for service delivery of public health programs. The role and functions of the Ministry of Health Services are predominantly focused on: leadership for the delivery of health services and programs; funding and accountability for regional health authorities; ensuring long-term sustainability of the health care system; improved patient care; leadership, direction and support to health care service delivery partners; setting province-wide goals, standards and expectations for health care service delivery by health authorities; and management of the Medical Services Plan, Pharmacare, Ambulance Services, and BC HealthGuide self care program.

Many other provincial ministries and agencies have a role in preventing and controlling communicable diseases, including the Ministry of Public Safety and Solicitor General (coordinates provincial emergency preparedness and response as well as services to correctional institutions); Ministry of Education; Ministry of Children and Family Development; Ministry of Environment; and Ministry of Agriculture and Lands.

### 2.3.4 Provincial Health Services Authority Roles and Responsibilities

The Provincial Health Services Authority (PHSA) is responsible for ensuring that high-quality specialized services and programs are coordinated and delivered within the regional health authorities. PHSA operates eight provincial agencies including BC Mental Health and Addiction Services, BC Children's Hospital, BC Women's Hospital & Health Centre, BC Centre for Disease Control, BC Cancer Agency, BC Renal Agency, BC Transplant and Cardiac Services BC.

One of PHSA's four key strategic directions is population and public health. A steering committee consisting of representation from all PHSA agencies and programs oversees population and public health activity across PHSA. Due to the provincial scope of PHSA's mandate, a dual role for PHSA is emerging: improvements aimed at streamlining population and public health activities within PHSA agencies and programs, as well as potential provincial coordination in areas such as surveillance, consistent messaging, expert advice, and supporting development of healthy public policy.

Key drivers for shaping PHSA's role in core programs are the needs of the regional health authorities, the Ministry of Healthy Living and Sport and the Ministry of Health Services. As PHSA's role evolves, the opportunity arises to develop mechanisms to convene and coordinate provincial dialogue; facilitate the identification of common needs and joint problem-solving; collaborate with and support regional and provincial partners to meet common needs; and jointly identify available resources for common initiatives.

The majority of PHSA communicable disease prevention and control services are delivered through the BC Centre for Disease Control (BCCDC), the provincial organization responsible for tertiary/quaternary health services related to communicable disease control, environmental health and public health emergency preparedness. BCCDC carries out the following functions:

- Communicable disease surveillance and epidemiological analysis.
- Outbreak investigation support for regional health authorities.
- Communicable disease policy analysis and advice on best practice guidelines and tools.
- Delivery of certain, direct clinical services where provincial delivery is appropriate (tuberculosis and sexually transmitted infections).
- Public health information system management.
- Expert knowledge translation and program consultation.
- Scientific support for the PHO and Province related to communicable disease prevention and control, including networking with provincial, federal, pan-Canadian, and/or international groups.
- Vaccine management (i.e. purchasing and distribution of vaccines and related supplies).
- Applied public health research, quality assurance, evaluation and training.

BCCDC divisions include: a communicable disease epidemiology group, vaccine and pharmacy services, STD/AIDS control, hepatitis, tuberculosis control, and environmental health (food protection, radiation protection, toxicology, drug and poison information and control), and a harm reduction group. BCCDC houses and provides medical leadership for PHSA Public Health Laboratory Services.

PHSA PH Laboratory, the provincial public health and reference laboratory (BCCDC Laboratory Services including Central Processing Receiving site) plays a key role in providing state-of-the-art reference testing, specialized screening, diagnostic analysis, biocontainment and biohazard response, outbreak detection and management, emergency response, and interpretation, analysis and information dissemination to clients. Both reference microbiology and public health testing are conducted at the provincial level—microbiological testing is conducted by both regional and provincial labs depending on complexity, while 90 per cent of public health testing and diagnosis (e.g., pathogens in water, food, etc.) is centralized at the provincial level. In addition, the PHSA Public Health Laboratory leads oversight and continued development of the BC Public Health Laboratories network (BC-PHLN); linkages to national laboratories; policy development and evaluation; laboratory quality management systems development with a focus on public health; and training and education of laboratory staff in the province.

PHSA also conducts population health surveillance (i.e., chronic disease and lifestyle), clinical pediatric surveillance, as well as vaccine research to contribute to the knowledge base for communicable disease analysis in BC.

## **2.4 Health Authorities Roles and Responsibilities**

The role of health authorities is to identify and assess the health needs in the region, to deliver health services (excluding physician services and BC Pharmacare) to British Columbians in an efficient, appropriate, equitable and effective manner, and to monitor and evaluate the services which it provides. In the area of communicable diseases, the health authorities are responsible for:

- Surveillance including accessing/collecting, reporting, analyzing and sharing data.
- Disease prevention strategies encompassing the delivery of immunization programs, harm reduction, and screening initiatives.
- Management and control of communicable disease outbreaks including individual case management and partner/contact notification; management and control of outbreaks; and emergency management of large-scale communicable disease outbreaks.
- Health promotion involving multiple strategies for public education and awareness, advocacy for healthy public policies and community development.
- Health protection through collaboration and coordination to safeguard water quality, food quality, hospitals and community care facilities, and community environmental health.
- Applied public health research including program evaluation and continuous performance improvement.

At the health authority level, the legal authority for public health action and communicable disease control rests primarily with the Medical Health Officers (MHOs). MHOs are appointed through Order-in-Council and have powers to protect public health under the *Health Act*. MHOs have powers and duties that are consistent with those of the PHO, on a regional level, such as providing independent advice to health authorities and local governments about public health issues, and making public reports. MHOs may delegate duties to regional public health inspectors, environmental health officers, drinking water officers, licensing officers, and/or public health nurses. They have authority to:

- Conduct inspections, collect samples, request and disclose information for the purposes of monitoring and controlling infectious and hazardous agents.
- Require people infected with specific infections to take preventive measures such as quarantine, isolation, vaccination, compliance with medical instructions, etc.
- Regulate activities that may cause health hazards (e.g., sewage systems, swimming pools, etc.).
- Issue orders, and enforce orders in situations where individuals are not compliant with the Act.

## **2.5 Local Roles and Responsibilities**

Municipalities and regional districts have legislated authority to enact local health by-laws to support prevention and control of communicable diseases. Local governments often have direct

responsibility for the development and operation of safe drinking water systems, operation of recreational water facilities, as well as for decisions related to environmental and vector control, and emergency response systems.

## **2.6 Aboriginal Communities Roles and Responsibilities**

It is important that Aboriginal communities and groups have full involvement in the planning and delivery of programs provided to First Nations reserves as well as Aboriginal people in all communities. Collaboration and partnerships with Aboriginal people can strengthen the management, planning and delivery of priority services to their communities and support the shift toward self-government of the health care system.

With the signing of the *Transformative Change Accord*, the Leadership Council representing the First Nations of British Columbia, the Province of British Columbia and the federal government have agreed to a shared commitment to action on closing health, social, and economic gaps between First Nations and other British Columbians. Involvement of the various levels of government can assist in enhancing the success of health programs for First Nations people.

## **2.7 Legislation and Policy Direction**

The overall legislative and policy direction for communicable disease prevention and control is derived from:

- The following provincial acts and regulations:
  - *Public Health Act* (when it comes into force).<sup>2</sup>
  - *Health Act* and its regulations, including the Health Act Communicable Disease Regulation, Health Hazard Regulation, Food Premises Regulation, Industrial Camps Health Regulation, Personal Service Establishments Regulation, Public Place Sanitary Facilities Regulation, Sanitary Regulations, Sewerage System Regulation, Swimming Pool, Spray Pool and Wading Pool Regulations, and West Nile Virus Control Regulation.
  - *Emergency Program Act* and Emergency Program Management Regulation.
  - *Drinking Water Protection Act* and Drinking Water Protection Regulation.
  - *Environmental Management Act* and related regulations including Agricultural Waste Control Regulation, Contaminated Sites Regulation and Organic Matter Recycling Regulation.
  - *Venereal Disease Act* and Venereal Disease Act Regulation and the Venereal Disease Act Treatment Regulation.

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<sup>2</sup> When this core program paper was written, this act was not in force. The *Public Health Act* came into force on March 31, 2009. As a result, certain legislation and regulations were repealed, including the *Public Toilet Act*, the *Venereal Disease Act* and associated regulations (Venereal Disease Act Regulation and Venereal Disease Act Treatment Regulation), and the Health Hazard Regulation and Sanitary Regulations.

- *Community Care and Assisted Living Act* and the Adult Care Regulations, Assisted Living Regulation, Child Care Licensing Regulation, and Community Care and Assisted Living Regulation.
- *Food Safety Act* and the Meat Inspection Regulation.
- *Milk Industry Act* and Milk Industry Standards Regulation and Milk Pasteurization Regulation.
- *School Act*.
- *Public Toilet Act*.
- *Child, Family and Community Service Act*.
- *Freedom of Information and Protection of Privacy Act*.
- Federal legislation, including the *Quarantine Act*, and the *Canadian Food Inspection Agency Act*.
- At the international level, the International Health Regulations.
- Local government by-laws related to health.
- Provincial policy documents, including *Immunize BC: A Strategic Framework for Immunization in BC* (2007), *Following the Evidence: Preventing Harm From Substance Use in BC* (2006), and *Healthy Pathways Forward: A Strategic Integrated Approach to Viral Hepatitis in BC* (2007).
- *A Framework for Core Functions in Public Health* (March 2005).
- Specific policies/priorities that may be established by the health authority, the Ministry of Healthy Living and Sport or the provincial government.

As noted earlier, the Provincial Health Officer and regional Medical Health Officers are appointed by Order-in-Council and have legislated authority and powers to protect public health under the *Health Act* and Regulations.

### **3.0 PRINCIPLES**

Principles for a model program to prevent and control communicable diseases, at the regional health authority level, are:

- Collaboration across all health protection, disease prevention and health promotion programs within the health authority.
- Program accessibility across geographic areas.
- “Timely” early detection/early response supported by an infrastructure with:
  - Standardized information and testing.
  - Leadership and cohesiveness.
  - A trained and competent workforce.
- Coordination and partnerships across multiple sectors, with physicians, local governments, schools, non-governmental organizations, the private sector and provincial ministries/agencies.
- A population health approach considering determinants of health, risk factors and vulnerable populations.
- Community development and responsiveness to local needs and issues, including provision of culturally relevant programs for population sub-groups.
- Balance between the public good and respect for individual autonomy, confidentiality and human rights.
- Respect for, and empowerment of, individuals to encourage them to take responsibility for their health.
- Integration of animal health, environmental health and human health.
- Application of research and evaluation to strengthen evidence-based practices, decision-making and performance improvement.

## **4.0 GOALS AND OBJECTIVES**

The overall goal of the program is to reduce and maintain at the lowest achievable level, the incidence, prevalence and complications from communicable diseases in British Columbia. The specific objectives are to:

- Prevent the acquisition and transmission of communicable diseases.
- Decrease individual and population-level vulnerabilities and risk factors associated with acquiring communicable diseases.
- Reduce the severity, disability and harm from communicable diseases.
- Improve utilization of animal health and environmental health data with human health surveillance for early detection of human communicable diseases.

## **5.0 MAIN COMPONENTS AND SUPPORTING EVIDENCE**

A set of inter-related program components contribute to a comprehensive strategy for the prevention and control of communicable diseases by BC health authorities. These are:

- Surveillance.
- Prevention of communicable diseases:
  - Immunization.
  - Harm reduction.
  - Screening.
- Management and control of communicable diseases:
  - Individual case management and contact notification.
  - Outbreak management.
  - Health emergency management.
- Health promotion.
- Health protection strategies.
- Program monitoring, evaluation and applied research.

The program components are described in detail in the following sections along with brief descriptions of evidence that highlight their effectiveness. The components focus on primordial prevention and primary prevention, and to a lesser extent, early secondary prevention. Secondary prevention is seen mainly as the task of preventive primary care medicine; however, early detection and prompt interventions to control disease provides not only secondary prevention at the individual level, but also primary prevention at the population level by preventing further transmission.

Effective initiatives for prevention and control of communicable disease encompass collaboration with multiple sectors both within the health authority and outside the health care system. Collaboration, partnerships and networking across a wide range of organizations is required to successfully implement the program components and to build upon, supplement, expand and strengthen the initiatives. Collaboration and linkages with the following partners is essential:

- Core public health programs including:
  - Health assessment and disease surveillance.
  - Prevention of harms associated with substance use.
  - Reproductive health and prevention of disabilities.

- Healthy infant and child development.
  - Healthy communities (healthy municipalities, health care facilities, workplaces, and schools).
  - Healthy living.
  - Food safety.
  - Food security.
  - Drinking water and recreational water quality.
  - Healthy community environments.
  - Health emergency preparedness and response.
- Acute and tertiary care practitioners.
  - Primary care physicians in the region. Physicians are required to comply with reporting requirements and ensure appropriate case follow-up and management of patients with communicable diseases. The health authorities provide vaccines; provide guidelines on vaccine use, handling and storage; and provide guidance on communicable disease issues.
  - Long-term care institutions, day cares, schools and post-secondary institutions.
  - Regional and community emergency preparedness/response groups.
  - Local governments and First Nations governments with respect to community development and integrated service delivery.
  - Federal agencies with respect to food recalls.
  - Community and non-governmental organizations to enhance consultation, information sharing and reporting in an efficient manner (e.g., the media, social services, justice and correctional services, housing, environmental groups, community groups under contract to deliver services on behalf of the health authority, immigrant services, etc.).
  - Provincial ministries and agencies including the Ministry of Health Services, Ministry of Healthy Living and Sport, PHSA and in particular the various divisions of the BC Centre for Disease Control.

## **5.1 Surveillance**

Communicable disease surveillance by regional health authorities includes:

- Collecting and managing data on specific regional and local communicable disease issues, including:

- Laboratory support for monitoring environmental samples for risk assessment (i.e., data from inspections/investigations related to environmental health, food safety, water quality, waste management, community health, vector-borne diseases and zoonosis).
- All reportable communicable diseases (legislation requires that reportable communicable diseases must be reported to the Medical Health Officer).
- Healthcare associated infections (HAIs) in acute-care facilities, long-term care and residential care facilities operated by the health authority.
- Data on individual clients, case contacts, and community contacts/surveys.
- Local and regional immunization rates for specific age groupings, and vaccine-adverse events.
- Gathering and managing relevant national, provincial and additional regional data from other sources (NOTE: The provincial-level role is to provide national and provincial data from multiple sources to health authorities including demographic, laboratory, environmental, educational, health care utilization, and other relevant health, social and economic data).
- Undertaking epidemiological analysis and interpretation of data from multiple sources to detect outbreaks, emerging pathogens, and trends, using:
  - Recognized data standards and methodologies that are consistent with other health authorities and the provincial level (to facilitate sharing and integration of data).
  - Timely, efficient methods that ensure quality.
  - Privacy protection measures.
- Disseminating appropriate and timely surveillance information, including hospital infection surveillance and audit reports, to the public, within the health authority (i.e., senior management, acute care managers, policy makers, program planners, relevant programs) and to health care partners in the community (i.e., physician, pharmacists, and others).
- Ensuring that surveillance reports (including HAI reports) are available and used by all programs to improve practice across the health authority, as appropriate.
- Collaborating, cooperating and sharing information with provincial agencies including reporting of notifiable diseases to BCCDC.

NOTE: The data collection, analysis and surveillance processes for prevention and control of communicable diseases are closely linked to the core program on health assessment and disease surveillance and should be developed in close collaboration with that program to ensure an integrated approach

### 5.1.1 Summary of Supporting Evidence

The evidence suggests that quality data analysis and interpretation is dependent upon having: educated and qualified personnel; appropriate tools; and standard approaches and methodologies (Ministry of Health, Population Health and Wellness, 2006). The appropriateness of data is a key consideration—the evidence suggests that priorities be established to determine which communicable diseases should be under surveillance. Nationally notifiable diseases are determined by consensus among federal, provincial and territorial officials (Doherty, 2006). Provinces or regions may establish additional priorities that reflect the unique health challenges in their area. If regional health authorities wish to establish additional surveillance priorities, criteria developed by the Public Health Laboratory Service (PHLS) in the United Kingdom may assist in this defining these priorities; i.e., the present burden of ill health; social and economic impact; potential threats; health gain opportunity; public concern and confidence; and PHLS-added value (Giesecke, 1999).

The report of the Auditor General of British Columbia (2007) entitled *Infection Control: Essential for a Healthy British Columbia*, found that the health authorities do not have an effective integrated system in place for infection prevention, surveillance and control across all service delivery responsibilities. Although public health initiatives for communicable disease control are in place, it was recommended that a comprehensive surveillance program be established, which includes healthcare-associated infections (HAIs), and that information management support to the HAI infection control program be provided for data collection, analysis and reporting. It was further recommended that health authorities ensure that infection surveillance and audit reports are available and used by all programs to improve practice across the health authority.

## **5.2 Prevention of Communicable Diseases**

### 5.2.1 Immunization Program

Strategies for delivery of an evidence-based immunization program to protect the population from vaccine-preventable diseases include:

- Promoting the immunization program publicly and with health care professionals to enhance support for its vision, goals and objectives.
- Improving access to immunization services:
  - Address barriers through innovative ways to extend service provision and engage hard-to-reach populations (e.g., reduce costs for low-income clients, etc.).
  - Implement enhanced and flexible hours, provide service in non-traditional settings, and provide outreach where appropriate (e.g., provide vaccinations through the public health home visit programs, schools, etc.).
  - Promote consistent delivery of immunizations by all providers (e.g., primary care, public health and private physicians).

- Enhancing the quality of services and ensuring an adequate supply of knowledgeable, trained service providers:
  - Articulate immunization program functions, roles and responsibilities to all providers.
  - Strengthen partnerships with private physicians through enhanced communication, advocacy, support and promotion for quality services.
  - Regularly communicate current competency requirements to all providers.
  - Expand the range of professionals trained to provide the services (e.g., licensed practical nurses, nurse practitioners and others).
- Creating an integrated immunization registry:
  - Undertake the planning necessary to create an automated immunization registration system that can support all program functions (including client reminder and recall systems), in cooperation with provincial and other health authority officials.
  - Implement improvements in automated health records, system performance, data records, and/or information standards that are required as elements or steps in establishing an automated immunization registry over time.
- Providing a stable, safe, timely and affordable vaccine supply:
  - Implement a vaccine inventory system including processes for efficient ordering, safe management and timely delivery of vaccines.
  - Promote a common understanding by providers of the criteria for program success and establish specific standards for each element, including vaccine wastage, cold chain standards, protocols for vaccine distribution, vaccine return policies.
  - Advocate implementation of best practice strategies by providers to enhance vaccine management and administration procedures.
  - Provide laboratory support to ensure vaccine efficacy.

### *Summary of Supporting Evidence*

The efficacy of vaccines is well proven and immunization remains one of the most cost-effective measures available in public health. However, achieving high immunization coverage has remained a challenge (evidence indicates that client factors associated with low rates of immunizations among children include lower socio-economic status, lower parental education, single-parent families, larger families, minority families, and mothers without prenatal care) (Lutwick, 2000; Santoli, Szilagyi, & Rodewald, 1998).

Evidence has found a number of successful initiatives for improving vaccination coverage, in particular client reminder and recall systems (Jacobson & Szilagyi, 2005) Cochrane Collaborative Review, 2005; United States Task Force on Community Prevention Services, 2003), as well as other measures including provider reminder and recall systems; multi-faceted interventions combined with public education; vaccination requirements for child care, school and college attendance; reduced client costs for vaccination; vaccination assessment and delivery through the home visitation program; assessment and feedback for vaccination providers; and maintenance of the cold-chain to ensure optimal vaccine potency (United States Task Force on Community Prevention Services, 2003; Yuan, 2006). Public education and awareness alone was found to have limited impact on its own (but was effective as part of a multi-faceted strategy) (United States Task Force on Community Prevention Services, 2003). Immunization registries (consolidated, population-based, confidential, automated records of immunization) are viewed as an important element in immunization programs by supporting clinical care and public health functions (Yuan, 2006).

NOTE: In BC, both public health staff and private physicians deliver immunization services (in some areas private practitioners provide up to 80 to 90 per cent of the services). Accountability issues arise with private physicians as health authorities have little direct control over the services they provide and must rely on strategies to strengthen partnerships and positively influence the provision of consistent quality services. As there is no evidence at the present time on effective strategies to achieve quality outcomes through third-party providers, the issue is highlighted here as a priority topic for future research. It should also be noted that there is no difference in immunization coverage between public health and mixed delivery immunization systems (BCCDC, Survey data 2001 birth cohort); however, in practice, concerns have been noted in the delivery of mixed systems.

#### 5.2.2 Harm Reduction

Harm reduction<sup>3</sup> initiatives, in collaboration with the program to prevent harm associated with substances, are necessary to reduce the risk of infectious diseases associated with the use of alcohol and problematic substances. These include:

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<sup>3</sup> Harm reduction strategies are based on the pragmatic goal of reducing the associated harms of illicit drug use (e.g., infectious disease spread, overdose deaths, etc.) without aiming for the elimination of substance use or imposing the precondition of abstinence. Harm reduction is defined as a policy or program directed towards decreasing the adverse health, social and economic consequences of drug use.

- Planning, policy development, coordination and community development to strengthen harm reduction measures.
- Public awareness initiatives targeted to safer alcohol and drug use.
- Public education on safer sex to reduce the transmission of sexually transmitted infections (STIs) and HIV, including distribution of condoms and information resources.
- Structural interventions to reduce risk and create safer contexts for substance use, such as distribution of harm reduction supplies (e.g., needles), prison-based harm reduction supplies, safer crack kit distribution, and supervised injection facilities.
- Replacement therapy for opiate addiction, such as methadone maintenance therapy, prison-based methadone.
- Outreach programs for out-of-treatment injection drug users (IDUs) to provide brief interventions including education, counselling, and referral to testing, treatment, and other support services.

NOTE: Although harm reduction is a separate public health program, it plays a major role in preventing and controlling communicable disease; thus, active collaboration with that program is important. Harm reduction initiatives and the related evidence are described in greater detail in the core program paper for prevention of harms associated with substance use.

### ***Summary of Supporting Evidence***

With respect to harm reduction programs, there is strong evidence to support needle distribution programs, replacement therapies for opiate addiction, outreach interventions, and supervised injection sites (Kerr & Wood, 2006).<sup>4</sup> The evidence also indicates a number of factors that affect the efficacy of harm reduction programs, for example: early intervention to avoid the rapid spread among drug-using communities; responsiveness to immediate and emerging risk behaviours (based on key informant interviews, inclusion of individuals who use illicit drugs in designing services and rapid assessment methods); program coverage that includes sexual partners, children and the social networks of individuals who use drugs; a comprehensive range of interventions delivered in various locations; and involvement of those who currently/formerly used illicit drugs in service delivery and promotion (Kerr & Wood, 2006).

#### **5.2.3 Screening**

Screening for early detection of communicable diseases should include:

- Establishing regional policies and guidelines on communicable disease screening (taking into account evidence-based guidelines), including:

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<sup>4</sup> *Evidence and Best Practice for the Employment of Harm Reduction Activities in Programs aimed at Controlling Communicable Diseases* (Kerr & Wood, 2006) describes successful supervised injections sites in Europe. For evidence on a site in Vancouver, BC, see Kerr, Small, Moore, & Wood, 2007; Milloy et al., 2008; Stoltz et al., 2007; and Wood, Tyndall, Montaner, & Kerr, 2006.

- Prenatal screening.
- Neonatal and infant screening.
- High-risk and special populations (e.g., needle drug users, sex trade workers, etc.).
- Asymptomatic general population screening.
- Providing screening based on regional guidelines, either through public health clinics or coordination and partnership health care providers.
- Enhancing access to screening and early detection for targeted populations through:
  - Increasing awareness, knowledge and support among health care providers about screening guidelines.
  - Targeting awareness and education of at-risk populations about the importance of regular testing for communicable diseases.
- Providing/facilitating rapid and accurate test responses through state-of-the-art testing laboratories.

### ***Summary of Supporting Evidence***

Screening is viewed in the literature as the core strategy for early detection and intervention to control disease and minimize disability (Steinberg, 2006). Generally accepted criteria for screening programs require that the screened condition be an important public health problem; a safe, publicly accepted and reliable screening test is available; an effective intervention is available; and the risk of harm, both physical and psychological, is less than the potential benefit (Peters, Wildschut, & Weiner, 1996). Recommendations on screening for specific communicable diseases are provided in *The Evidence Base for Secondary Prevention of Communicable Diseases* (Steinberg, 2006), based on evidence reviews conducted by the Public Health Agency of Canada (2006), Canadian Task Force on Preventive Health Care,<sup>5</sup> the Centers for Disease Control and Prevention (2002), and the UK National Screening Committee.<sup>6</sup>

Multimedia HIV testing campaigns targeted directly to at-risk populations have been shown to be successful—the greatest increases occurred when peer images were used and when detailed information was provided about how to access testing at a specific centre (McOwan, Gilleece, Chrislett, & Mandalia, 2002).

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<sup>5</sup> Evidence reviews can be found at the Canadian Task Force on Preventive Health Care website at <http://www.ctfphc.org/map/map.htm>.

<sup>6</sup> Evidence reviews can be found at the National Health Service's Health Information Resources website at <http://www.library.nhs.uk/Default.aspx>.

### **5.3 Management and Control of Communicable Diseases**

Communicable disease management and control involves management of individual clients, management of outbreaks, as well as emergency management and response to large-scale outbreaks.

#### **5.3.1 Individual Case Management**

Case management of clients with a communicable disease, and follow-up with exposed partners or contacts includes:

- Tracing and notifying partners and contacts using a confidential, respectful, systematic approach (based on Canadian and BCCDC guidelines for legally notifiable diseases, STIs, HCV, and other specific diseases) using a combination of:
  - Provider referral (i.e., health care personnel notifies partner/contact).
  - Patient or self referral (i.e., patient notifies partner).
  - Outreach teams from the community or social network notify and educate partners/contacts.
- Managing individual cases and their partners or other contacts in a respectful, non-discriminatory manner, through public health clinics or collaboration with health care providers:
  - Test for specific diseases as required.
  - Provide post-exposure prophylactic immunization or anti-microbial therapy to prevent the communicable disease.
  - Refer to treatment and additional services as required.
  - Encourage compliance with preventive measures through the use of education and counselling.
  - Issue orders, as necessary, to require people with infectious diseases to take preventive measures to protect the health of the public (e.g., exclusion from certain settings, quarantine, isolation, compliance with medical instructions, etc.), and enforce orders as required.

#### ***Summary of Supporting Evidence***

There are clear Canadian recommendations for contact tracing and partner notification in the Canadian Guidelines on Sexually Transmitted Diseases (PHAC, 2006) and in guidelines prepared by the BC Centre for Disease Control (2005). For example, the latter include guidelines for HIV, hepatitis A, hepatitis B, meningococcal disease, B. pertussis, varicella zoster, haemophilus influenzae type b, and tuberculosis. “In the main, these two sets of guidelines are viewed as best practice” (Steinberg, 2006). Provider referral has been shown to be more effective than self-referral (Macke & Maher, 1999); however, strategies have been identified to improve

the effectiveness of patient referral, including verbal education by nurses combined with patient-centred counselling by lay workers (Steinberg, 2006).

### 5.3.2 Outbreak Management

The management of communicable disease outbreaks within the health authority requires:

- Investigating communicable disease outbreaks, utilizing members of the Outbreak Management Team as appropriate (the Medical Health Officer, communicable disease manager, specialists in epidemiology, infection control, environmental health, administration, health information analysis, public information and emergency health), through the use of:
  - Collaboration with Public Health Laboratory Network in monitoring and investigation to provide state-of-the-art timely and accurate laboratory testing.
  - Surveillance, data collection and epidemiological analysis.
  - Collaboration with BCCDC and/or other health authorities when an outbreak encompasses more than one health authority or jurisdiction.
- Implementing response measures to control and prevent transmission of infectious diseases, including:
  - Provision and delivery of appropriate vaccines to priority groups.
  - Protective measures in hospitals and community care facilities such as routine practices such as handwashing, disinfection and sterilization; use of personal protective equipment for health care workers (e.g., gloves, gowns, masks); screening of patients and staff; and patient and staff cohorting (e.g., grouping infected and non-infected patients in separate wards, assigning staff to work in either affected or unaffected areas, and closure of facilities as necessary).
  - Community-based communicable disease control, such as exclusion of infected children from facilities, exclusion of infected workers at workplaces, restrictions on public gatherings, and closure of public buildings, etc.
  - Quarantine or isolation (either at home, a designated facility, or a hospital) considering disease parameters, ethics, support for isolated individuals, and legal requirements).
  - Issue orders, as necessary, to require people with infectious diseases to comply with preventive measures to protect the health of the public, and enforce orders when required.
  - Regular surveillance of people who have contracted the disease, or are in close contact with the disease.

### *Summary of Supporting Evidence*

Expert opinion is the basis of many recommended community-based interventions for controlling the transmission of communicable diseases. Although closures and restrictions on public gatherings have been shown to have moderate or limited success in controlling outbreaks (Yuan, Peck, & Henry, 2007), isolation of ill patients is well-accepted, effective practice. Consensus opinion by experts is also the basis for recommendations in the literature for the use of protective equipment in health care facilities. Other measures in health care facilities such as patient and staff cohorting, patient and staff screening for multi-drug resistant organisms, staff screening for tuberculosis and MRSA, visitor screening for influenza, and restriction of admissions or transfers are supported by somewhat limited evidence but are recommended by experts in the field. More specific information is included in the evidence reviews and in BCCDC's published guidelines on best practices on the prevention and control of specific infectious diseases including antibiotic resistant organisms, influenza-like illness, gastroenteritis outbreaks, vaccine-preventable diseases, enteric, and zoonotic diseases.<sup>7</sup> Also, Health Canada has published *Infection Control Guidelines: Routine Practices and Additional Precautions for Preventing Transmission of Infections in Health Care* (1999).

Results of mathematical modeling suggest that quarantine and isolation interventions taken by a number of governments were moderately effective during the SARS outbreak in 2003 (Yuan et al., 2007). Because quarantine and isolation pose difficult questions about the acceptability of restrictive measures, researchers suggest that four principles be applied: clear and measurable harm to others is expected; use of the least restrictive measures proportional to the goal of disease control; reciprocity and support to assist isolated individuals; and transparency in communication with a process of appeal (Upshur, 2003).

#### 5.3.3 Health Emergency Management

The management of large-scale communicable disease outbreaks requires collaboration and coordination with health emergency management officials and other health authority and community health officials in:

- Collaborating in the development of emergency response plans and business continuity plans for potential large-scale infectious disease outbreaks, including:
  - Assess and prioritize potential communicable disease threats;
  - Prepare and implement plans for prevention, risk reduction and mitigation of the major threats;
  - Develop outbreak management and surge capacity plans, including infrastructure requirements to ensure that key resources can be mobilized in a timely fashion;
  - Coordinate and conduct training, drills and exercises for regional health staff, local public health units and other health-related community stakeholders.

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<sup>7</sup> The guidelines can be found at the BC Centre for Disease Control website at <http://www.bccdc.org>.

- Taking leadership, with health emergency management officials, in responding to major disease outbreaks through the mobilization of coordinated regional and local resources, based on emergency response plans, to ensure early intervention and rapid response; and
- Collaborating and cooperating with all levels of government at each stage of planning, organizing and responding to major disease outbreaks.

NOTE: Although health emergency management (HEM) is a separate core public health program, collaboration and partnership with HEM is essential for effective response to major communicable disease outbreaks. More detail on HEM initiatives and the related evidence are described in the core program paper on that topic.

### *Summary of Supporting Evidence*

A number of evaluations and studies point to key issues and considerations that contribute to the development of effective outbreak response plans; for example, the primary importance of collaboration, coordination and communication among all relevant sectors; clear roles and responsibilities; and the need for communication strategies for those affected and their families (Kort, Stuart, & Bonotovics, 2005). Overall, health emergency management procedures are structured and standardized within the BC Emergency Response Management System (BCERMS) through the Provincial Emergency Program. Emergency Operation Centres are established when it is necessary to coordinate operations on a regional and/or provincial level to respond to an emergency.

## **5.4 Health Promotion**

Health promotion includes a set of strategies that enable and empower individuals, families and communities to prevent communicable diseases. Multiple initiatives, rather than single measures, have been shown to be necessary for success. These include:

- Providing media alerts and educational resources (e.g., fact sheets and posters, school-based education, websites, workshops, videos, etc.) targeted to specific health threats, including risk factors, protective measures and available services.
- Public awareness and social marketing campaigns to shift attitudes and encourage safe behaviours (NOTE: small media campaigns are delivered by the health authorities, while federal and provincial governments are generally responsible for developing larger public awareness and media campaigns).
- Coordinating cross-organizational policies and practices within the health authority to strengthen consistent and integrated initiatives for controlling and preventing communicable diseases.
- Advocating with key community decision-makers to enhance local health protection by-laws and policies in communities, schools, social service agencies, housing agencies, care facilities, recreational facilities, environmental groups and other relevant organizations.
- Identifying and targeting high-risk population groups and facilitating regional and local action to respond to their specific needs:

- Establish partnerships with Aboriginal groups to enhance health promotion focused on their unique needs.
  - Address the needs of cultural groups, immigrants and other at-risk populations.
  - Support the special needs of individuals who use illicit substances, such as development of policies that support needle distribution programs.
  - Develop strategies to prevent communicable disease among vulnerable populations who have social, economic, educational and environmental challenges.
- Leading community development and community capacity building to enhance partnerships, local expertise, needs assessment, collaborative planning and program delivery among key groups and stakeholders including at-risk and vulnerable individuals and groups.

#### 5.4.1 Summary of Supporting Evidence

The World Health Organization (WHO) Bangkok Charter for Health Promotion (2005) explicitly mentions communicable diseases in its definition of health promotion and identifies the need to address the determinants of health and build on the values, principles and action established by the Ottawa Charter for Health Promotion (WHO, 1986). The Ottawa Charter describes “health as a holistic concept, social justice, equity, empowerment, inclusion and respect”. The recommended actions are a continuum of functions considered fundamental to achieving effective health promotion: developing healthy public policies, creating supportive environments, strengthening community action, developing personal skills, and reorienting health services (WHO, 1986).

Studies of health promotion initiatives point to a number of factors that increase the likelihood of successful outcomes, including participatory planning and evaluation (Health and Welfare Canada, 1986); a focus on real and felt needs of the target population; cultural sensitivity (Resnicow, Baranowski, Ahluwalia, & Braithwaite, 1999); short and long-term outcomes (Briss et al., 2000); multiple interventions (linked, multi-level interventions) (Smedley & Syme, 2000); accessibility by socially excluded groups (Hamer, 2004); and program sustainability over time (Swerissen & Crisp, 2004). As there is limited evidence on specific initiatives, an outcome-based model is proposed in the evidence review (Steinberg, 2006) to support evaluation and assess the effectiveness of health promotion measures.

## **5.5 Health Protection Strategies**

Collaboration and coordination with a wide range of health protection programs is necessary to avert threats from multiple sources:

- Collaborating in the investigation, detection and control of communicable diseases in partnership with programs focused on safeguarding food and water, hospital and community care facilities, and community environmental health:

- Investigation and outreach activities to prevent the spread of tuberculosis.
  - Infection control and protection measures to minimize nosocomial, or healthcare-associated infections.
  - License, inspect/investigate, and enforce food safety requirements, and standards for safe drinking water systems and safe recreational water facilities.
  - License, inspect/investigate, and enforce health standards for community care facilities including residential care for vulnerable adults and children, and day care centres for children.
  - Inspect, investigate and enforce regulations and standards for personal service establishments, (e.g., tattoo, piercing, laser, massage, and cosmetic services).
  - Monitor, assess and advise on waste management and advise on health measures related to land-use and environmental planning.
- Controlling disease vectors such as ticks, flies, rats and other animals that may carry or transmit infectious diseases to humans:
    - Surveillance of vector species to identify and track the species that are present, and monitor viral activity in people and other hosts.
    - Advise local governments and community organizations on implementation of an integrated mosquito control plan, tick-borne disease management, and/or other measures required to address vector-borne and other zoonotic diseases when necessary.

NOTE: Many of these functions will involve partnerships with other core public health programs including food safety, drinking water and recreational water quality, healthy community environments, and the prevention of adverse effects of the health care system.

### 5.5.1 Summary of Supporting Evidence

The evidence and description of program initiatives for food safety, air quality, drinking water/recreational water, and healthy community environments are addressed in core public health evidence reviews published by the BC Ministry of Healthy Living and Sport, and the related model program papers on each of these topics developed through collaborative planning with BC health authorities.

The evidence suggests that the key elements of a “modern comprehensive vector management strategy consist of surveillance, including arbovirus in mosquitoes, birds, and humans and bacterial surveillance in ticks; integrated vector management including prevention, personal protection and control; and public education programs both for the public and for health and vector management officials” (Ellis, 2006). The current weight of evidence also indicates that human-health risks from residential exposure to mosquito insecticides are low and not likely to exceed levels of concern (Ellis, 2006).

## **5.6 Program Monitoring, Evaluation and Applied Research**

Health authorities should establish monitoring and evaluation processes to assess the impact of communicable disease programs and strive toward continuous quality improvement in testing and implementing new initiatives:

- Monitoring program effectiveness based on information from a range of sources including feedback from multi-sector partners, high-risk populations, the results of community engagement, public awareness initiatives, as well as routine surveillance data (in conjunction with the core program on health assessment and disease surveillance).
- Establishing and implementing an evaluation plan for communicable disease prevention and control programs, with a focus on assessing initiatives that have received little attention in the research literature.
- Collaborating with researchers in universities, professional organizations, federal/provincial governments, and communities to test and apply new laboratory technologies and quality management systems; and conduct pilot projects and other applied research initiatives to support continuous quality improvement.

### **5.6.1 Summary of Supporting Evidence**

“It is recognized that although the performance of public health, and prevention programs in particular, is difficult to measure, it is nonetheless likely that we will be able to manage—and improve—core functions in public health if we can measure performance” (Ministry of Health, 2005). A prevention information system capable of telling us how well we are doing is necessary for this purpose. As well, the public has a right to expect that the public health sector, along with the rest of the health care system, is paying attention to the quality and effectiveness of the interventions it undertakes, and is working to improve that quality (Ministry of Health, 2005).

## **6.0 BEST PRACTICES**

Often, there is no one “best practice” that is agreed upon; rather, there are practices that may have been successful in other settings and should be considered by health authorities. The terms “promising practices” or “better practices” are often preferred to reflect the evolving and developmental nature of performance improvement.

The initiatives described under each of main program components in Section 5.0 are based on evidence-based best practices. The evidence reviews noted in Section 1.1 provide further extensive descriptions of many best practices in this field.

### **6.1 Best Practice Recommendation – Public Health Laboratories**

In addition to the recommendations identified in Section 5.0, the Working Group recommends additional initiatives to strengthen the public health laboratory system in British Columbia. They highlight the need for a strong public health laboratory network as an integral part of communicable disease prevention and control. Recommendations, based on the Public Health Laboratories Evidence Review, are:

- Strengthen the public health laboratory network through enhanced partnerships with other types of microbiology laboratories within the jurisdiction by building on current networking.
- Enhance efficiencies and effectiveness through clearly defined roles and responsibilities regarding service/program core functions within laboratory networks.
- Support the need for leadership in fundamental areas, particularly in information management and Quality Management Systems development.

## **7.0 INDICATORS, BENCHMARKS AND PERFORMANCE TARGETS**

### **7.1 Introduction**

It is important to define what one means by the terms *indicators*, *benchmarks*, and *performance targets*. An indicator is a measurement (usually numerical) of a factor which constitutes an important reflection of some aspect of a given program or service. Indicators need to be standard so that they can be compared across different organizational entities such as health regions. Benchmarks are reflective of “best” practices. They represent performance that health authorities should strive to achieve. Benchmarks are determined by: reviewing the literature; reviewing the best practice experience in other jurisdictions; or by determining “consensus” opinion of leading experts and practitioners in the field. Performance targets are locally determined targets that represent a realistic and achievable improvement in performance for a local health authority.

This section presents a number of key indicators or performance measures for a program on prevention and control of communicable diseases. Suggested benchmarks can apply across the province, while other benchmarks may need to be modified to account for key variables such as geographic size, or population density of the health authority.

One can develop indicators related to the inputs, activities, outputs and outcomes (immediate, intermediate or final) of each of the respective components of the program on prevention and control of communicable diseases. Thus, it is not necessary to only have outcome-related indicators and benchmarks. Furthermore, indicators need to be understood within a broader context. For example, a low per-capita cost for a specific program could reflect on the efficiency and effectiveness of a given program, or reflect a program that is under-resourced. It is recognized that programs to prevent communicable diseases are multi-faceted, and that it may be difficult to link interventions with direct health outcomes, particularly as initiatives involve multiple factors and multiple sectors, which all play a role in determining outcomes. In general, it is best to consider a number of indicators, taken together, before formulating a view on the performance in this area. Indicators and benchmarks work best as flags to indicate a variance from accepted norms and standards. Further investigation is usually required to determine the causes of any given variance from such norms or standards. The causes may or may not be under the control of a health authority.

A health authority could establish its performance targets by assessing its current (and perhaps historical) level of performance, and then, based on consideration of local factors, determine a realistic performance target. This performance target would be consistent with the goal of performance improvement but would be achievable within a reasonable period of time. Initially, health authorities will set performance targets for a number of indicators. However, over time, and particularly if consistent data collection methods and definitions are applied, it would be realistic for health authorities to share information related to their targets and then develop a consensus approach to determine provincial benchmarks for these indicators. In other words, locally developed performance targets, over time, could lead to development of provincial benchmarks.

## **7.2 Indicators for the Prevention and Control of Communicable Diseases**

Collecting indicators will assist a health authority in monitoring communicable disease trends and patterns. It is recognized that health authorities may not be currently collecting such information, and that the Ministry of Healthy Living and Sport and the BCCDC play a major role in collecting provincial and regional data to assist both in surveillance and assessment.

Indicators that may be used by the health authorities are included in Appendix 12, following the Logic Model for the program (Appendix 11). The indicators were selected by members of the Working Group who ranked them as the most important measures for assessing performance in the prevention and control of communicable disease. They are divided into categories including incidence, timeliness, completeness, and short-term outcomes. The list represents a catalogue of possible indicators from which each health authority can select those that are most relevant to their circumstances.

It is understood that some of the indicators may not be under the control or influence of health authorities, but they can, nevertheless, provide important information for the health authorities to collect. Those indicators and benchmarks that are under the control and influence of health authorities provide a basis for ongoing performance review and evaluation. In many cases, baseline data will need to be established to provide a basis for comparative analysis in future years. Benchmarks are currently not available but will be determined over time between the Ministry of Healthy Living and Sport and the health authorities. In some instances, it may be more appropriate to establish local or regional performance targets.

## **8.0 EXTERNAL CAPACITY AND SUPPORT REQUIREMENTS**

### **8.1 Key Success Factors/System Strategies**

The previous sections outlined the main components and best practices that health authorities could include in the prevention and control of communicable diseases. As well, successful implementation of effective strategies will also require:

- Strong support from the Board and management of the health authorities, from the Ministry of Healthy Living and Sport, and from the other key players in the region, such as the school board and local governments.
- Allocation, by the health authorities, of sufficient resources to deliver high quality programs.
- Clear, realistic and measurable objectives.
- Well-trained and competent staff with the necessary policies and equipment to carry out their work efficiently.
- Information systems that provide appropriate practice support, linkage to electronic records and interface with other health professionals and databases.
- An efficient procurement and transportation infrastructure for vaccine.
- Clear mechanisms of reporting and accountability to the health authority and external bodies.

### **8.2 Intersectoral Collaboration and Coordination**

A program for prevention and control of communicable diseases does not exist in isolation and will not achieve optimum efficiency or effectiveness unless it works collaboratively with other key partners involved in this field. Intersectoral collaboration and coordination on the local and regional levels is essential to ensuring the active participation of those who can contribute to controlling and preventing communicable diseases from multiple sources.

On the provincial level, the key linkages are the Ministry of Healthy Living and Sport, Ministry of Public Safety and Solicitor General, Ministry of Advanced Education and Labour Market Development, Ministry of Education, Ministry of Children and Family Development, Ministry of Environment, and Ministry of Agriculture and Lands.

At the regional health authority level, linkages include emergency departments, acute care and primary care physicians, infection prevention and control practitioners, health emergency preparedness and response, public health programs, home continuing care, residential care facilities, health promotion, community development, communication departments, pharmacies, trauma services, addiction programs, mental health services, and Aboriginal health services. Coordination with other public health programs should include core programs for reproductive health, healthy infant and child development, healthy communities, healthy living, food safety,

drinking water and recreational water quality, environment health, prevention of harms associated with substance use, and prevention of the adverse effects of the health care system.

At the regional and local level, it is essential to link with municipalities and a wide range of local organizations and agencies such as schools, police, ambulance, fire departments and social service agencies.

### **8.3 Information Management**

It will be important for health authorities to review their existing information and monitoring systems with respect to their ability to measure and monitor performance indicators. It may be necessary to strengthen information management processes, including:

- Establishing new policies and procedures for some activities to ensure that the necessary data is gathered.
- Facilitating the process of recording and monitoring data (in this respect, it should be noted that consistency and compatibility among all health authorities is desirable)
- Establishing key regional indicators, considering the importance of consistent and compatible reporting systems across the province.
- Developing baseline data where necessary to determine current levels, and thus provide a basis for calculating shifts and trends in the future.

Health authorities will also need to consider the impact of program monitoring and evaluation on their staffing resources. Expertise will be needed in the fields of program monitoring, program analysis and program evaluation to ensure effective implementation and assessment of the core functions improvement process.

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## **APPENDIX 1: THE EVIDENCE BASE FOR HEALTH PROMOTION STRATEGIES IN COMMUNICABLE DISEASE PREVENTION AND CONTROL**

**Taken from:** *The Evidence Base for Health Promotion Strategies in Communicable Disease Prevention and Control* (2008), by M. Steinberg, for the Ministry of Health, Population Health and Wellness.

### **Introduction**

This evidence paper focuses on the application of health promotion to the prevention and control of communicable diseases, excluding immunization and harm reduction interventions which are the subjects of additional evidence papers that include an assessment of health promotion strategies. It takes its lead from two meetings, one held by Interior Health in November 2005 and a second by Vancouver Health Authority in February 2006 that focused on population health and health promotion including specific sessions on their relevance to communicable diseases. Both meetings demonstrated the gap between the rich discourse located in academic literature on health promotion and population health and its application on the ground. More so, these meetings confirmed that health promotion strategies have not been a priority focus of communicable disease prevention initiatives. This was reconfirmed through a search of the literature and discussions with a key informant that has been intimately involved with international reviews of the evidence base for health promotion.

Thus this paper devotes significant attention to ‘unpacking’ the concepts embedded in health promotion and developing an outcome model for health promotion approaches to communicable disease prevention. Using this framework, the paper then explores the challenges in developing an evidence base for health promotion interventions before turning to examine two critical areas of hand hygiene and sexual health as illustrative examples.<sup>8</sup> The paper concludes by recommending a best practices approach for the health authorities to uncover communicable disease health promotion initiatives within their jurisdiction as a first step towards their strengthening.

Material for this paper was located using a number of strategies described in more detail later in this paper. In the first instance, a traditional search was carried out of MEDLINE using search terms that included all the communicable diseases and health promotion. This served to confirm the scarcity of literature in this area. This was followed by the development of an outcome model for health promotion approaches to communicable disease prevention. In the second step, MEDLINE and other databases were searched using extended health promotion concepts. Databases included more qualitative sources not usually included in evidence based searches. The third strategy searched the grey literature using various search engines and exploring grey literature databases and included key informant interviews. All these attempts confirmed the lack of material in this area and supported the approach taken in this paper.

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<sup>8</sup> The reader is referred to two other communicable disease evidence papers that address immunization and harm reduction for intravenous drug users, both of which include health promotion issues.

## **APPENDIX 2: THE EVIDENCE BASE FOR IMMUNIZATION**

**Taken from: *A Core Program in Immunization: The Evidence Base* (2006), by L. Yuan, for the Ministry of Health, Population Health and Wellness**

### **Introduction**

The efficacy of vaccines is well proven and immunization remains one of the most cost effective measures available in public health. In addition to the direct protection of individuals who are vaccinated, a high level of immunization in a community may disrupt the transmission of disease, thus protecting those who have not been immunized. This indirect protection is called “herd immunity”.

- Despite the incontrovertible evidence that many vaccines are an efficient and cost-effective means of reducing morbidity and mortality, achievement and maintenance of high coverage rates have remained a challenge. Ensuring high coverage rates requires an understanding of the barriers to immunization and effective strategies to overcome them.
- The report is divided into four parts. The first addresses client, provider and system barriers to immunization. The second reviews interventions which can improve vaccination coverage. The third discusses infrastructure issues like vaccine registries and vaccine storage and handling. The fourth reviews the role of vaccines in relation to other diseases e.g. TB, blood borne diseases, infection control etc.

### **Summary of the Evidence to Improve Coverage**

#### **Effective Interventions to Improve Coverage of Universally Recommended Vaccines**

| <b>Effective Interventions</b>   | <b>Type of Evidence*</b> |
|--|--------------------------|
| Client reminder and recall systems   | 1+                       |
| Multi-component interventions that include client or community or provider education | 2++                      |
| Vaccination requirements for child care, school, and college attendance              | 2++                      |
| Standing orders for adults   | 2++                      |
| Reducing out-of-pocket costs of vaccination  | 2++                      |
| Expanding access in healthcare settings as part of a multi-component intervention    | 2++                      |
| Vaccination programs in schools  | 2++                      |
| Home visits  | 2++                      |
| Provider/reminder and recall systems   | 2++                      |
| Assessment plus feedback for vaccination providers                                   | 2++                      |

## Effective Interventions to Improve Coverage of Targeted Vaccines

Interventions when used alone:

| <b>Effective Interventions</b> | <b>Type of Evidence*</b> |
|--------------------------------|--------------------------|
| Provider reminder system       | 2++                      |

Interventions when implemented in combination:

| <b>Intervention</b>  | <b>Type of Evidence</b> |
|--|-------------------------|
| Enhanced access<br><i>plus</i><br>Provider/system intervention | 2++                     |

| <b>Intervention</b>  | <b>Type of Evidence</b> |
|--|-------------------------|
| Enhanced access<br><i>plus</i><br>Provider/system intervention<br><i>plus</i><br>Client intervention | 2++                     |

## Conclusions

1. Client reminder and recall systems as well as provider reminder and recall systems have been found to be effective in improving immunization coverage in children and adults in a range of primary care settings.
2. Multi-component interventions which include client or community or provider education as a component have been found to be effective in improving vaccination coverage. There is inadequate evidence to show the effectiveness of client or provider education when used alone.
3. System-oriented interventions such as standing orders, reducing out-of-pocket costs of immunization, expanding access to healthcare settings have been found to be effective in improving vaccination coverage.
4. Existing home visitation programs should consider including vaccination assessment and delivery as a component of its service because this would increase vaccine coverage.
5. Multi-component interventions which enhance access combined with provider interventions and/or client interventions have been found to be effective in improving vaccine uptake by at-risk groups (e.g. healthcare workers).
6. Provincial governments should commit to developing and supporting immunization registries, and be prepared to provide adequate on-going operating funds.
7. Great strides have been made to improve vaccine thermo-stability but many vaccines remain sensitive to temperature and environmental conditions. In order for vaccines to induce optimal immunity, vaccine potency needs to be maintained by careful attention to the cold-chain.

## **APPENDIX 3: THE EVIDENCE BASE FOR THE EMPLOYMENT OF HARM REDUCTION ACTIVITIES IN PROGRAMS AIMED AT CONTROLLING COMMUNICABLE DISEASES**

**Taken from:** *Evidence and Best Practice for the Employment of Harm Reduction Activities in Programs Aimed at Controlling Communicable Diseases (2006)*, by T. Kerr and E. Wood, for the Ministry of Health, Population Health and Wellness

### **Background**

The primary strategies to address the illicit drug problem have historically included: (a) primary prevention of illicit drug use through educational interventions and other means, (b) supply reduction activities which seek to reduce availability of illicit drugs and provide criminal sanctions against those caught using illicit drugs, and (c) drug treatment for those individuals with a clinical diagnosis of addiction.

During the last decade, an illicit drug strategy that has become of increased interest to policy-makers is the concept of harm reduction. Unfortunately, the concept of harm reduction is widely misunderstood by policy-makers and the public at large. In general, with respect to illicit drugs, the concept of harm reduction requires an acknowledgement of the limits of supply reduction. Harm reduction strategies are based on the pragmatic goal of reducing the associated harms of illicit drug use (e.g., infectious disease spread, overdose deaths, etc.) without aiming for the elimination of substance use or imposing the precondition of abstinence on drug users. Thus, harm reduction has been defined as a policy or program directed towards decreasing the adverse health, social, and economic consequences of drug use without requiring abstinence from drug use.

### **Harm Reduction Interventions**

Most harm reduction programs can be broadly dichotomized into structural interventions and substitution therapies. Structural interventions seek to alter the risk environment, which refers to the context in which illicit drug use takes place (e.g., settings where clean syringes may be scarce). In general, structural interventions involve the provision of sterile syringes, safer crack kits, and/or supervised settings for illicit drug use. However, they also include educational approaches and outreach-based interventions that seek to educate individuals and groups and to modify behaviour.

#### **1. Needle Exchange**

Since a primary risk factor for blood-borne infections including HIV and hepatitis C is the sharing of used syringes, a cornerstone of harm reduction for injection drug users involves making sterile syringes available through needle exchange programs (NEP) and other means. The specific biologic action of NEP is a form of vector control that acts by reducing the time that needles spend in circulation and by providing ready access to unused syringes.

*Evidence:* Overall, the evidence regarding the efficacy of NEP for communicable disease control was found to be Class A, given consistent findings from a large body of 2++ studies for efficacy, with strong evidence of corroboration.

**2. Prison-based Needle Exchange**

An increasing number of penal institutions have established and evaluated needle exchange or distribution programs as a means to control the spread of infectious diseases among inmates who inject drugs.

*Evidence:* Evaluations of prison-based needle exchange programs have primarily focused on process dimensions, although declines in behaviours that result in infectious disease spread (e.g., syringe sharing) have been noted. Given the favourable results pertaining to implementation of prison-based needle exchange programs, there is no evidence to suggest that the benefits of this approach observed in the community are not replicated in prisons. In fact, given the nature of prison environments, programs such as needle exchange may be particularly beneficial in this setting.

Overall, the evidence for prison-based needle exchange programs is Class A.

Further, it should be noted that the “principle of equivalence” is applicable to even the most controversial HIV prevention programs, including needle exchange. Although there have been successes with prison-based needle exchange in a number of countries, including those with limited resources, prison-based needle exchange remains unimplemented in Canadian prisons.

**3. Safer Crack Kit Distribution**

It has been suggested that a potential source of blood-borne disease transmission lies in the sharing of non-injection drug use equipment – namely pipes, straws, and spoons. The potential risk originates from the fact that the equipment comes into contact with blood or other bodily fluids in the nose and mouth, and thus, when it is shared, provides a route of transmission for HCV and other pathogens, including tuberculosis.

*Evidence:* Safer crack kit distribution programs were graded as Class D evidence for communicable disease control. This grade, however, was based on lack of evidence, and evaluation of this approach is warranted given the increasing harms of crack cocaine and the few tools available to address these growing concerns.

**4. Supervised Injection Facilities (SIF)**

In response to ongoing drug-related harms among IDU, several countries have added supervised injection facilities to the array of health programs and services that are offered. Unlike illegal ‘shooting galleries’ run by drug dealers, supervised injection facilities (SIF) are controlled health care settings where drug users inject pre-obtained illicit drugs under staff supervision and receive sterile injecting equipment, primary health care, counselling, and referral to health and social services.

*Evidence:* Despite the evidence that SIF reduce syringe sharing and reduce injection drug use in risky environments (e.g., shooting galleries, alleys, etc.), to date there have been no studies of the impact of SIF on the incidence of HIV or other blood-borne diseases. In the

absence of available studies, SIF were graded as Class B for the evidence of their effectiveness in controlling communicable diseases.

**5. Supervised Smoking Facilities**

Because of the success of SIF in several European nations, Australia, and most recently Vancouver, there has emerged growing interest in supervised smoking facilities (SSF). The primary objectives of SSF are similar to those established for SIF.

*Evidence:* SSF were graded as Class D evidence for communicable disease control. This grade, however, was based on lack of evidence, and evaluation of SSF is warranted given the increasing harms of crack cocaine and methamphetamine and the few tools available to address these growing concerns. For instance, SSF may prove of value for reducing transition into injection drug use, a key communicable disease control strategy.

**6. Replacement Therapy for Opiate Addiction**

In North America, the primary method for the treatment of opiate addiction is the provision of long-acting opiate agonists, primarily methadone hydrochloride, for short- or long-term maintenance therapy.

- **Methadone Maintenance Therapy**

Methadone is a long-acting synthetic opiate agonist that is easily absorbed when taken orally and has a half-life of 24-36 hours, allowing for once-daily administration. Generally, methadone maintenance therapy (MMT) involves providing methadone on a daily basis to the patient.

*Evidence:* Overall, the provision of methadone is graded as Class A evidence for communicable disease control, based on randomized studies showing the drug's efficacy for the treatment of opiate dependency and reduction of subsequent drug-related harms.

- **Prison-based Methadone**

A small number of evaluations of MMT programs in prisons have indicated positive results.

*Evidence:* Given the favourable results pertaining to implementation of prison-based methadone programs, there is no evidence to suggest that the benefits of this approach that have been observed in the community are not replicated in prisons. Specifically, there is nothing about the prison environment that suggests the evidence should not be graded as Class A (i.e., same as community derived evidence). Further, prisoners on methadone maintenance prior to imprisonment should be able to continue this treatment while in prison. This point is particularly relevant in light of findings indicating that people taken off methadone once incarcerated often return to narcotic use, usually within the penal institutions, and often via injection. Also consistent with the principle of equivalence, it has further been recommended that initiation of MMT should also be available in prisons in countries where methadone maintenance is available in the community.

- **Heroin Prescription**

Although scientific documentation of the efficacy of methadone treatment is well established, the therapy does not represent a cure-all for the problem of opiate addiction. In light of the limitations with MMT, several European countries have initiated programs that provide alternative forms of drug treatment, including injectable opiates such as heroin.

*Evidence:* Overall, there is Class A evidence that heroin prescription may be more effective than methadone for reducing the harms associated with opiate addiction, including the spread of communicable disease.

**7. Educational Approaches**

Harm reduction messages are frequently disseminated through a variety of educational programs. Typical strategies include use of posters and brochures in settings and services frequented by drug users, web-based materials, videos, and the use of outreach workers and service providers within healthcare settings to provide education to individuals and groups. While such educational efforts typically cover a range of topics, including overdose prevention, many focus on the reduction of communicable disease transmission.

*Evidence:* Overall, there is Class C to Class D evidence indicating that educational interventions, on their own, can reduce the harms of illicit drug use by, among other things, promoting communicable disease control through the reduction of risk behaviour directly linked to communicable disease transmission. However, this grading should be interpreted with great caution, as educational approaches vary immensely in their design and delivery, and therefore not all educational interventions can be regarded as C or D grade.

**8. Outreach Interventions**

Outreach programs have also been widely implemented in community-based settings, and have been credited as being one of three components contributing to low HIV prevalence in several cities. Outreach programs are used to make contact with out of treatment IDU who may be at highest risk for HIV infection. Once initial contact is made, education, resources (e.g., sterile syringes, condoms, bleach kits, literature), and counselling support are often provided, and outreach workers serve as an important link between active IDU and institutional testing, prevention, and addiction treatment services.

*Evidence:* Overall, there is Class A evidence supporting the efficacy of outreach interventions in promoting communicable disease control. However, it should be noted that this rating may not apply equally to all outreach-based interventions, which vary considerable in their design and delivery. The evidence to date indicates that those that involve peers (i.e., drug users), involve the dissemination of sterile syringes, and have direct links to infectious disease testing, counselling services, and addiction treatment are likely to be most effective in reducing communicable disease transmission.

**9. Factors Affecting the Efficacy of Harm Reduction Programs**

The present review indicates that various harm reduction interventions have been found by rigorous research and evaluation to be efficacious. However, given the social circumstances and heterogeneity surrounding illicit drug use, a growing body of literature has identified a number of factors which can positively or negatively affect the efficacy of any harm reduction program. These factors are:

- **Early Intervention**

Although there is considerable regional heterogeneity associated with communicable disease transmission among drug users as a result of differences in drug use patterns and available programs, once established, diseases such as HIV and HCV can spread rapidly within drug-using communities. Therefore, it is critical that interventions be implemented as early as possible.

- **Responsiveness**

In order to address immediate and emerging risk behaviours, harm reduction interventions should be informed by ongoing data collection and monitoring. Strategies that have been successful in informing harm reduction interventions include participant observation, key informant interviews, inclusion of drug users in service design, and rapid assessment methods.

- **Coverage**

While communicable disease transmission among drug users is often attributed to needle sharing, secondary transmission to sexual partners and offspring is also widespread. Therefore, in order to ensure adequate coverage, HIV prevention and risk reduction programs should target not only drug users but also their intimate partners, and the social networks they participate in. Examples of successful social network interventions have been documented throughout the developed and developing world.

- **Comprehensiveness, Location, and Design**

Given the observed diversity in risk behaviour within and across drug-using communities, an effective harm reduction response requires that a comprehensive range of low and medium threshold interventions be delivered in various locations and at various times.

- **Involvement of Current/Former Drug Users**

In response to the limitations of traditional provider-client models of service delivery, peer-driven interventions, involving current/former drug users, have been developed throughout the world as one method of promoting the reduction of communicable disease transmission.

**Summary**

Injection drug use affects all Canadians. An enormous financial burden arises from the costs of law enforcement, incarceration, and healthcare expenditures. In addition, there are large social and human costs that stem from the crime, disease, and death that arise from illicit drug use. A review of the scientific evidence indicates that various harm reduction programs have been implemented successfully and now serve to complement ongoing enforcement, treatment, and prevention initiatives. Given the ongoing drug-related harm throughout British Columbia, efforts to significantly expand and appropriately evaluate harm reduction programs are an urgent priority.

## **APPENDIX 4: THE EVIDENCE BASE FOR VECTOR-BORNE DISEASE MANAGEMENT**

**Taken from: *Vector-Borne Disease Management (2008)*, by R.A. Ellis, for the Ministry of Health, Population Health and Wellness**

The annual number of cases of vector-borne illness in BC has not been fully documented but it is expected to be significant. Mosquitoes and ticks are the most important biting arthropods that transmit disease in the province.

In order to lower the number of cases of arthropod-borne illness in the community and the costs of such cases to society, a modern comprehensive Vector Management Strategy is necessary. The key elements include Surveillance: including virus in mosquitoes, birds, and humans and bacterial surveillance in ticks; Integrated vector management: including prevention, personal protection, and control; and Public education programs: both for the public and for health and vector management officials.

### **Mosquito-borne Disease Management**

Effective prevention of human West Nile viral infections depends on the careful development of comprehensive, integrated arboviral surveillance and vector mosquito management programs in areas where the virus occurs.

Ideally, mosquito vector management programs, sometimes called public health mosquito control programs, should be based on already existing nuisance mosquito management programs. With experienced and knowledgeable staff and readily available equipment and materials, a nuisance control program can easily be enlarged to include disease vector mosquito species.

A multidisciplinary team to conduct surveillance is required. Trained personnel conduct mosquito surveys to identify the species that are present, track the population levels during the spring and summer, and determine appropriate management alternatives. Health authorities monitor for viral activity in people and other hosts. Larvae should be found, sampled, and identified (at least to genus, usually to species) and recorded in a GIS mapping system. Adult mosquito surveillance should be carried out to determine species distribution, relative population densities using special mosquito traps. Vector species surveillance may involve the collection of live female mosquitoes for virus isolation. Coincident with mosquito surveillance, virus surveillance should be carried out.

### **Mosquito Control Methods**

To control mosquitoes effectively and long-term, vector management officials need to use several complementary, integrated mosquito management techniques including:

- Sanitation – removing the mosquito’s food, water, and shelter.
- Habitat disruption – draining the water where mosquitoes breed, especially in backyard breeding sites.

- Biological control – using bacteria, including *Bacillus thuringiensis israeliensis* (BTI) and *Bacillus sphaericus* (BS).
- Mechanical control – maintaining window screens and altering building designs.
- Personal protection – wearing light-colored, loose-fitting clothing, using repellents, and avoiding activities in areas when mosquitoes are active.
- Insecticide application – using insecticides against larval and adult mosquitoes, including methoprene, chlorpyrifos, and malathion.

Integrated mosquito management is an ecologically-based strategy that relies heavily on natural mortality factors and seeks out control tactics that are compatible with or disrupt these factors as little as possible. IMM uses pesticides, but only after systematic monitoring of pest populations indicates a need. Ideally, an IMM program considers all available control methods and materials, including no action, and evaluates the interaction among various control practices, cultural practices, weather, and habitat structure. Thus, this approach uses a combination of resource management techniques to control mosquito populations with decisions based on surveillance.

### **Tick-borne Disease Management**

Avoidance of tick-infested areas and personal protection (using repellents and protective clothing) should be encouraged. Landscape alterations may significantly reduce tick populations in some cases. Widespread tick control is not recommended. Specific applications of acaricides may occasionally be warranted where large numbers of people must be present in an area when ticks are active and there is a perceived risk of disease transmission (e.g., scout jamboree in a recreational area known to be infested with tick vectors).

### **Vector-borne Disease Prevention Programs**

- **Public Education** – The Public Health Agency of Canada assessed the public education efforts of the Ontario Ministry of Health and Long-term Care regarding WNV through a survey of Hamilton residents. The Agency’s findings were “both reassuring and instructive”. The public education program included brochures and television, radio, and newspaper advertisements dealing with personal protection and removing backyard larval breeding sites. OMHLC also posted fact sheets on its websites. Most of the respondents to the questionnaire indicated that they were aware of the WNV problem and were taking or planning to follow provincial advice on personal protection and yard clean-up.
- **Mosquito Management Programs** – From an economic view-point, the indirect and direct costs associated with mosquito-borne disease out-weigh the costs associated with public health interventions, including vector surveillance and control. The current weight of scientific evidence indicate that human-health risks from residential exposure to mosquito insecticides are low and are not likely to exceed levels of concern. Malathion, as used in mosquito control programs, does not pose an unreasonable risk to people, wildlife, or the environment. Malathion degrades rapidly in the environment, especially in moist soil. It displays low toxicity to birds and mammals. Further, results indicate that, based on human-health criteria, the risks from WNV exceed the risks from exposure to mosquito insecticides.

**Conclusion**

Integrated vector management programs — based on a careful assessment of surveillance data and an analysis of risk factors — can be used by public health authorities to break disease transmission cycles, whether the disease organisms involved are mosquito- or tick-borne organisms. Public education programs and personal protective measures are critical components in the defence against these, as other, diseases. Vector management is used when necessary to prevent the build-up of known disease vector populations. The judicious use of pesticides may be a necessary response when there is a risk of an incipient epidemic.

## **APPENDIX 5: THE EVIDENCE BASE FOR PUBLIC HEALTH MEASURES BASED ON INFECTION PREVENTION AND CONTROL**

**Taken from:** *Evidence or Best Practice for Public Health Measures Based on Infection Prevention and Control and Supported by Legislation (2007)*, by L. Yuan, S. Peck, and B. Henry, for the Ministry of Health, Population Health and Wellness

The focus of this paper is public health measures which are used to prevent and control outbreaks in the community and within facilities. These include quarantine and isolation, restriction on public gathering, school and facility closures, patient and healthcare worker (HCW) screening, and cohorting of patients and HCW. Some of these measures are controversial and highly unpopular. As seen in the severe acute respiratory syndrome (SARS) outbreak, quarantine of large numbers of people was instituted quickly because of incomplete information about disease transmission (National Advisory Committee on SARS 2003).

This paper does not review infection control, which is defined by the Centers for Disease Control and Prevention as “measures practiced by healthcare personnel in healthcare facilities to decrease transmission and acquisition of infectious agents.” Important aspects of outbreak prevention and control such as hand washing and immunization are also not covered since they have been reviewed in other core program papers. For an assessment of disinfection and environmental cleaning, readers are referred to Health Canada’s *Infection Control Guidelines: Handwashing, Cleansing, Disinfection and Sterilization in Health Care*, available at: <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/98pdf/cdr24s8e.pdf>.

An effective public health response requires adequate public health infrastructure. The National Advisory Committee on SARS and Public Health (2003) states that this includes organizational capacity, an adequate public health workforce, optimal business processes and information/knowledge systems. Coordinated efforts are also required by all levels of governments and partner agencies involved in managing the outbreak.

In British Columbia, the legal authority for public health action rests mostly with the Medical Health Officer and the Provincial Health Officer whose powers are described under the *Health Act* and Regulations. The Medical Health Officer also has the authority to control communicable diseases under the *Venereal Disease Act* and Regulations, as well as the *School Act*.

Legal authority to protect public health also exists within municipalities, regional districts and many other organizations such as BC Ambulance Service, Ministry of Agriculture, Ministry of Attorney General (police services). The *Hospital Act* and Regulations give regional health authorities legislated responsibilities for infection control in health care institutions. In addition, federal acts (e.g., the *Quarantine Act*) enable the federal government to take action or require action to be taken by provinces or territories.

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A summary of key evidence discussed in the paper is presented below:

| <b>Public Health Measure</b>  | <b>Level of Evidence</b> |
|---|--------------------------|
| <b>Quarantine and Isolation:</b> <ul style="list-style-type: none"> <li>Moderate evidence of effectiveness demonstrated during SARS outbreak</li> <li>Weak evidence of effectiveness during 1918 influenza pandemic</li> </ul>                                    | 2-                       |
| <b>Compliance with quarantine:</b> <ul style="list-style-type: none"> <li>Good evidence of voluntary compliance during SARS outbreak</li> </ul>   | 3                        |
| <b>Exclusion of Sick Children from Child Care Facilities and Schools:</b> <ul style="list-style-type: none"> <li>Recommendation is based on expert opinion</li> </ul>   | 4                        |
| <b>Daycare and School Closures</b> <ul style="list-style-type: none"> <li>Weak evidence of effectiveness</li> </ul>   | 2-                       |
| <b>Exclusion of Infected Workers:</b> <ul style="list-style-type: none"> <li>Good evidence of effectiveness</li> </ul>  | 2-                       |
| <b>Restrictions on Public Gatherings:</b> <ul style="list-style-type: none"> <li>Weak evidence of effectiveness</li> <li>Recommendation is based on expert opinion</li> </ul>   | 4                        |
| <b>Simultaneous Use of Multiple Community-based Interventions</b> <ul style="list-style-type: none"> <li>Moderate evidence of effectiveness</li> </ul>  | 2-                       |
| <b>Personal Protective Equipment</b> <ul style="list-style-type: none"> <li>Good evidence of effectiveness of gloves</li> <li>Weak evidence of effectiveness of gowns</li> <li>Good evidence of effectiveness of eye protection but compliance is poor</li> </ul> | 4                        |
| <b>Patient and Staff Cohorting</b> <ul style="list-style-type: none"> <li>Moderate evidence of effectiveness</li> </ul>   | 2-                       |
| <b>Patient screening for multidrug resistant organisms</b> <ul style="list-style-type: none"> <li>Equivocal evidence – some studies show effectiveness while others do not</li> </ul>   | 2-                       |
| <b>Staff screening for MRSA</b> <ul style="list-style-type: none"> <li>Weak evidence of effectiveness</li> </ul>  | 2-                       |
| <b>Staff screening for TB and influenza</b> <ul style="list-style-type: none"> <li>Recommendation is based on expert opinion</li> </ul>   | 4                        |
| <b>Visitor screening for influenza</b> <ul style="list-style-type: none"> <li>Recommendation is based on expert opinion</li> </ul>  | 4                        |
| <b>Restriction of admissions or transfers</b> <ul style="list-style-type: none"> <li>Recommendation is based on expert opinion</li> </ul>   | 4                        |
| <b>Facility Closure</b> <ul style="list-style-type: none"> <li>Has only been studied as part of multiple intervention strategies during SARS outbreak</li> </ul>  | 3                        |

## **APPENDIX 6: THE EVIDENCE BASE FOR SECONDARY PREVENTION OF COMMUNICABLE DISEASES**

**Taken from:** *The Evidence Base for Secondary Prevention of Communicable Diseases (2006)*, by M. Steinberg, for the Ministry of Health, Population Health and Wellness

The focus of the Ministry core functions framework for prevention is mainly concerned with primordial prevention and primary prevention, and to a much lesser extent, early secondary prevention. This latter prevention strategy is seen by the Ministry to be the task of preventive primary care medicine, whereas the first two prevention strategies are understood to fall into the area of public health policy and health promotion (primordial prevention) and be the task of public health (primary prevention). While secondary prevention is critical for a comprehensive approach to communicable diseases it is especially important for those instances where vaccines, as a major method of primary prevention, are not available. Early detection and management of individuals with communicable diseases provide not only secondary prevention at the individual level, but also primary prevention at the population level by preventing further transmission.

The Ministry framework concurs that secondary prevention includes a set of measures available to individuals and communities for the early detection and prompt intervention to control disease and minimize disability and views screening as the core detection strategy for achieving these goals. While contact tracing or partner notification, and preventive treatment, including post exposure prophylaxis as an aspect of this, are not specifically mentioned in the Ministry reference document, these strategies are important secondary prevention measures. Active follow up of those exposed to communicable diseases is critical to prevent re-infection of the index case and reduce ongoing transmission from the index case (in the event of chronic disease or incomplete treatment) to the contact(s) and/or from the contact(s) to further susceptible individuals. Likewise, where preventive treatment is possible, prophylaxis of individuals identified through screening and/or partner notification is an important secondary prevention measure.

Generally accepted criteria for screening programmes include that the screened condition be an important health condition; that the proposed screening test be acceptable to the population; and that an effective intervention be available. These criteria impact on approaches to weigh the evidence for these interventions.

The characteristics of a screening test include accuracy, estimates of yield, precision, reproducibility, sensitivity and specificity, and validity. This paper will not dwell on these aspects but instead focus on issues of application and coverage. The latter is a measure of the extent to which screening services for any particular communicable disease cover the potential need for these services in a community. Coverage is expressed as a proportion in which the numerator is the number of individuals actually screened from a target population and the denominator is the total number of individuals in the target population.

## **APPENDIX 7: THE EVIDENCE BASE FOR COMMUNICABLE DISEASE SURVEILLANCE**

**Taken from: *The Evidence Base for Communicable Disease Surveillance* (2006), by L. Yuan and A. Vogel, for the Ministry of Health, Population Health and Wellness**

Communicable disease surveillance is the ongoing, systematic collection, analysis, interpretation and dissemination of infectious disease data for public health action. It acts as an early warning system for outbreaks and identifies infections that are the most important causes of illness and death, so prevention and control activities can be prioritized.

Many sources of data can be used for monitoring. Some, like reportable diseases, are legally mandated. Others, like health utilization data and school or work absenteeism information, are not. More recently, informal data from public internet sites and media sources have been used. The type of information collected depends on the purpose of the surveillance system.

Information is usually transmitted by telephone, fax or mail. More recently, data transfer has been by electronic means. Advances in information technology have led to automated data extraction and analysis of routinely collected information. Other innovations include integrated public health information networks.

With growing concerns about emerging infections and bio-terrorism, surveillance networks have been developed to share data across different sectors and countries. Examples include the global communicable disease surveillance network and the international surveillance of pathogens in animals.

## **APPENDIX 8: THE EVIDENCE BASE FOR PUBLIC HEALTH LABORATORIES IN BRITISH COLUMBIA**

**Taken from: *The Public Health Laboratories in British Columbia: Evidence Paper #1 (2006)*, by the BC Provincial Health Services Authority Laboratories.**

There is an increasing need for a strong and responsive public health system. To this end, core functions in public health have been established by BC's Ministry of Health. With respect to public health laboratories in particular, the purpose of this report is to provide an evidence base for the core functions of public health laboratories and their networks.

As distinct from regional acute care or private laboratories, public health laboratory programs are specialized in population-focused ways. They are required to be responsive to outbreaks and their investigations; they must respond to change quickly, e.g., react to new pathogens; they must have experts that lead, coordinate, train, and perform surge capacity services; they must be nodes for the province's microbiology network, acting as the link to the National Microbiology Laboratory (NML); they must carry out clinical and environmental testing for surveillance and outbreak management, responding to special requests for unique testing and follow-up; and they must be skilled in biosafety, biohazard containment, and bioterrorism response.

A public health laboratory must be in top form at all times, employing a Quality Management System (QMS) to ensure competent performance. Structured planning, continuous review and analysis, and ongoing process improvements mean that evolving "Best Practices" are adopted. Originally resulting from system-wide failures in public health laboratories in the United States, recent expert opinion derived core functions of public health laboratories are considered to be Best Practices for the unique roles of public health laboratories, including:

1. Communicable disease surveillance, prevention, and control
2. Outbreak and emergency response to communicable diseases
3. Environmental health and food safety
4. Reference testing, specialized screening, and diagnostic testing
5. Biosafety, biocontainment, and biohazard response
6. Integrated data management
7. Policy development and evaluation
8. Laboratory improvement and regulation (quality assurance)
9. Training and education of health care and public health workers
10. Public health related research and development.

This report presents the evidence behind the development of the 10 core functions for public health laboratories. Indirect evidence for the importance of meeting and sustaining these core functions is provided through specific examples of successes and failures. Many will be very familiar to the reader through media exposure, e.g., SARS, West Nile virus, Walkerton water contamination, and anthrax bioterrorism.

As new public health challenges arise, the effectiveness of response of the public health system will depend in part on the ability of BC's public health laboratory network to work to Best Practice standards. Based on the evidence, the authors recommend that Best Practices in public health laboratories be sustained by:

- Strengthening the public health laboratory network through enhanced partnerships with other types of microbiology laboratories within the jurisdiction by building on current networking.
- Strengthening specific provincial public health laboratory core functions and specific nodes/functions in the national public health system.
- Enhancing efficiencies and effectiveness through clearly defined roles and responsibilities regarding service/program core functions within laboratory networks.
- Supporting the need for leadership in fundamental areas, particularly in information management and QMS development.

**Taken from: *The Public Health Laboratories in British Columbia: Evidence Paper #2 (2006)*, by Amhurst Healthcare Consultants in collaboration with BCCDC Laboratory Services.**

If British Columbia as a province is to remain competitive and thrive in the global knowledge economy, then it is incumbent upon the province to embrace the topography of innovation and excellence in all sectors of its economy. The Public Health care sector in general and the Public Health Laboratories (PHL) in particular, must continue to develop its strong position as a responsive and leading-edge system that many other healthcare jurisdictions will continue to emulate.

PHL's have a much broader mandate to promote health and quality of life—their strong presence with an ethos of immediacy, is critical in determining the level of responsiveness to a population's needs.

Building on the successes that have been achieved within the current PHL system and leveraging its strengths for the health system as a whole, is a good business decision as well as a good decision for quality patient care delivery and public safety. There being no scientific literature in this area, this report was carried out to address some BC Health Authorities request to expand the Evidence Paper for examples of public health laboratories beyond Canada. By seeking experiences of others and building on a common language, common science and evidence spanning across existing silos) we can only enhance the quality of care provided and the oversight role of the PHL.

The key objectives to undertaking this additional jurisdictional assessment were:

- To ensure that the PHL operates within a framework of excellence and innovation in the global knowledge economy (better health/better solutions).

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- To draw on lessons learned/scope of services in other primarily international jurisdictions with respect to PHL's, and assess the various operating structures within those jurisdictions.
- To validate the role of the Canadian Public Health Laboratory system nationally and the BCCDC Laboratory Services (BCCDC Labs) in this province, as the steward/oversight organization that continues to provide leadership with a primary accountability role for public health laboratory needs, ensuring expeditious and appropriate crisis response.

As part of this review, an environmental scan of a cross section of various national and international jurisdictions was conducted (Canada, UK, and Australia).

This report builds on the Evidence Paper #1 and the Model Core Programs Papers on the Prevention and Control of Communicable Diseases. It articulates the key elements for a strong foundational base for BC's Public Health System - one that:

- Is responsive to outbreaks and their investigations in a timely way.
- Can act as the link to the National Microbiology Laboratory.
- Can carry out clinical and environmental testing for enhanced surveillance analysis and outbreak management.
- Can respond expeditiously to special requests for testing and follow up.

The findings from the review indicated the following:

- That the challenges facing BC are no different than those facing other jurisdictions; that we are all grappling with the same issues-human resources shortages and the maintenance and housing of key competencies, the definition of structures and how best to ensure that the oversight role and key functions are housed in PHLs.
- • That solutions must be quality driven, community and patient focused, evidence based and in the national interest.

In an attempt to ensure system oversight for public health, various jurisdictions have made different attempts to ascertain that those elements that make up a responsive, coordinated, public health system remain intact. In this way, a solid foundational base for system oversight, which includes some or all of the critical elements of the core functions identified by the CPHLN, has been retained. Structures at the service delivery level have varied. Those elements of the laboratory system that can be provided by alternate service providers have been decentralized through purchase service agreements or other similar arrangements, to acute care facilities or private laboratories/practitioners. Each jurisdiction has customized its approach based on geography, clinical expertise, technology, demographics, economies of scale, transport capability and other similar variables.

In summary (and consistent with the findings of Evidence Paper #1), programs at public health laboratories, as distinct from regional acute care or private laboratories are:

- Population focused.

- Networked to allow provision of comprehensive services, including specialized reference testing.
- Established with capacity to respond to outbreaks and investigations.
- Partnered with stakeholders to create new knowledge using an appropriate health lens.
- Capable of leading, coordinating, training, and performing services in a surge capacity situation.
- Capable of carrying out clinical and environmental testing for surveillance and outbreak management.
- Capable of responding to special requests for unique testing and follow-up.
- Capable of biosafety and biohazard containment, including bioterrorism response.
- Capable of long-term biological sample storage and biosecurity of dangerous pathogens.
- Able to respond to change quickly, e.g., to react to new emerging pathogens or bioterrorism agents.
- Largely microbiology focused with competence in the areas of infection control and biosafety.

BC's PHL system has been built and developed over many decades, with an infrastructure that ensures that the provinces' oversight role is fulfilled. It is emulated in many jurisdictions and continues to enjoy a reputation world-wide. Building on this system strength, which transcends existing silos, and ensuring that it maintains its expertise and competencies can only enhance the quality of care in BC and its ability to ensure the prevention and control of communicable diseases. Quantifying the impact of doing otherwise, would be too high a price to pay.

## **APPENDIX 9: CANADIAN NATIONAL PUBLIC HEALTH LABORATORY SYSTEMS PERFORMANCE MEASUREMENT TOOL**

**Taken from:** *Canadian National Public Health Laboratory Systems Performance Measurement Tool* (2008), by the Canadian Public Health Laboratory Network [DRAFT, November 2008].

A recent draft of the Canadian National Public Health Laboratory Systems Performance Measurement Tool has recently been completed through the cooperative efforts of the Canadian Public Health Laboratory Network and the Public Health Agency of Canada. It discusses performance and related indicators on the following topics:

- Surveillance information system.
- Monitoring of community health status.
- Appropriate and state of the art testing.
- Collaboration and networks.
- Continuity of operations plan and surge capacity.
- Outreach and communication with partners.
- Public information.
- Education.
- Constituency development.
- Communication.
- Resources.
- Role in laboratory related policy making.
- Partnership in public health planning.
- Dissemination and evaluation.
- Revision of laws and regulations.
- Encouragement for compliance.
- Enforcement of laws and regulations.
- Assuring laboratory workforce.
- Staff development.
- Workforce competencies.

- System mission and purpose.
- System effectiveness, quality and stakeholder satisfaction.
- Public health laboratory system collaboration.
- Planning and financing research activities.
- Implementation, evaluation and dissemination.

## APPENDIX 10: COMMUNICABLE DISEASES – PROVINCIAL AND REGIONAL ROLES

| Function  | Ministries of Health (MoH) <sup>9</sup> and Provincial Health Officer (PHO)  | Provincial Health Services Authority (PHSA)/ BC Centre for Disease Control (BCCDC)  | Health Authority  |
|---|--|---|---|
| <b>General (Planning, Policy Analysis, Program Expertise, Scientific Support)</b> | <ul style="list-style-type: none"> <li>• MoH ‘stewardship’ role in prevention of communicable disease involves vision and direction, collection and use of intelligence, and influence to promote health, specifically:               <ul style="list-style-type: none"> <li>- Advises the Minister on policies and legislation.</li> <li>- Undertakes provincial-level planning, policies and legislation.</li> <li>- Provides resources to health authorities and works with them to establish accountability.</li> <li>- Coordinates development of plans and strategies with health authorities to enhance communicable disease prevention and control.</li> <li>- Leads and facilitates development of provincial networks and coalitions.</li> <li>- Collaborates with federal and international governments.</li> </ul> </li> <li>• PHO’s role is based on legislated authority and powers<sup>10</sup>:               <ul style="list-style-type: none"> <li>- Advises ministers and senior government officials, and members of the MoH on health issues and related legislation, policy and practice.</li> <li>- Monitors health status and provides information and analysis on health issues.</li> <li>- Makes reports to government and the public on health issues.</li> <li>- Establishes and monitors MHO professional standards.</li> <li>- Receives all reportable communicable disease reports (delegated to BCCDC).</li> <li>- Monitors, reports and makes recommendations related to the protection of drinking water quality</li> <li>- Intervenes where appropriate to protect the public (based on statutory responsibilities).</li> </ul> </li> </ul> | <p>The following responsibilities are undertaken on behalf of the PHO and/or the ministry unless the PHO and/or the ministry specifically takes the lead:</p> <ul style="list-style-type: none"> <li>• BCCDC maintains state of the art scientific knowledge capacity in order to provide ongoing support to the PHO and the Ministry:               <ul style="list-style-type: none"> <li>- Provides research evidence and scientific analysis.</li> <li>- Provides technical analysis and recommendations concerning communicable disease, vaccination and harm reduction.</li> <li>- Advises on development and choice of best practices and tools.</li> <li>- Provides input and support for policy and legislative development.</li> <li>- Develops and maintains data repositories and information management capacity.</li> </ul> </li> <li>• BCCDC provides program expertise and ongoing support to the PHO and the ministry, and to the health authorities, for:               <ul style="list-style-type: none"> <li>- Communicable disease prevention and control.</li> <li>- Environmental health protection and promotion.</li> <li>- Public health emergency preparedness.</li> <li>- Public health laboratory services.</li> </ul> </li> <li>• PHSA Public Health Laboratory provides state of the art scientific and medical microbiological resources including reference testing, specialized screening, diagnostic analysis, biocontainment and biohazard response, outbreak detection and response, integrated information analysis, and laboratory quality leadership.</li> <li>• The role of BCCDC has been formalized in a memorandum of understanding with the BC Ministry of Health Services.</li> </ul> | <ul style="list-style-type: none"> <li>• Provides regional communicable disease strategic planning, policy development, needs assessment and prioritization.</li> <li>• Participates in province-wide collaborative planning.</li> <li>• Coordinates and collaborates with regional partners and stakeholders including local councils, service organizations and interest groups.</li> <li>• Manages and delivers communicable disease programs including:               <ul style="list-style-type: none"> <li>- Prevention programs (immunization, harm reduction and screening).</li> <li>- Control of communicable disease outbreaks (case management, outbreak management, and emergency management).</li> <li>- Health promotion.</li> <li>- Health protection initiatives.</li> </ul> </li> <li>• The roles of MHOs and EHOs are based on legislative authority and powers defined in legislation including the <i>Health Act</i> and Regulations.</li> </ul> |

<sup>9</sup> Ministries of Health (MoH) refers to the roles of both the Ministry of Healthy Living and Sport and the Ministry of Health Services, as there is some overlap and the roles are currently evolving.

<sup>10</sup> For a list of provincial legislation that governs prevention and control of communicable diseases, see Section 2.7 of this model core program paper.

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| <b>Function</b>              | <b>Ministries of Health (MoH)<sup>9</sup> and Provincial Health Officer (PHO)</b>   | <b>Provincial Health Services Authority (PHSA)/ BC Centre for Disease Control (BCCDC)</b>  | <b>Health Authority</b>   |
|------------------------------|---|--|---|
| <b>Surveillance</b>          | <ul style="list-style-type: none"> <li>PHO has senior statutory responsibility for the health assessment and disease surveillance core function in BC. (The PHSA, including BCCDC, supports the PHO, the ministry, and health authorities in this function for communicable disease prevention and control, environmental health protection and hazard management).</li> </ul>  | <ul style="list-style-type: none"> <li>BCCDC receives communicable disease reports from MHOs.</li> <li>Collects provincial and national data from multiple sources.</li> <li>Provides provincial epidemiological analysis including data linkage and analysis for health assessment and disease surveillance functions, such as tracking disease processes, hazard and disease effects, detection of outbreaks, identification of health risks, and assessing the effectiveness of interventions.</li> </ul> | <ul style="list-style-type: none"> <li>Collects and manages data on specific regional and local communicable diseases.</li> <li>Gathers and manages relevant provincial and national data (provided by BCCDC and MoH) on related health, social and economic factors.</li> <li>Conducts epidemiological analysis and interpretation to detect regional outbreaks, emerging pathogens and trends.</li> </ul>   |
| <b>Surveillance (Cont'd)</b> | <ul style="list-style-type: none"> <li>MoH leads, directs and coordinates the planning, development and overall evaluation of new province-wide public health information systems (delegates operation of communicable disease components to PHSA/BCCDC).</li> </ul>  | <ul style="list-style-type: none"> <li>Operates provincial public health information system.</li> <li>Public Health Laboratory Services provide specialized investigation and real-time laboratory surveillance.</li> </ul>  | <ul style="list-style-type: none"> <li>Disseminates timely communicable disease surveillance information to health care officials, health care providers, partners, and the public.</li> <li>Utilizes common data standards for surveillance with other public health jurisdictions in BC.</li> </ul>   |
| <b>Immunization</b>          | <ul style="list-style-type: none"> <li>MoH and PHO provide policy analysis and, in collaboration with health authorities, strategic directions.</li> <li>Delegate responsibility for managing the provincial immunization program and technical aspects of communication disease prevention to PHSA/BCCDC.</li> </ul>   | <ul style="list-style-type: none"> <li>Manages and oversees provincial-level aspects of vaccine program implementation, manages vaccine supplies, coordinates new vaccine introduction and major vaccine program changes, monitors and evaluates program performance, and conducts applied vaccine research.</li> <li>Operates the provincial-level components of immunization information systems and databases.</li> </ul>   | <ul style="list-style-type: none"> <li>Promotes immunization to the public and to health providers within the region.</li> <li>Provides regional immunization services including: <ul style="list-style-type: none"> <li>- Ensures access to services.</li> <li>- Provides quality services and trained providers.</li> <li>- Provides an immunization registry.</li> <li>- Provides a stable, safe and affordable vaccine supply.</li> </ul> </li> </ul>   |
| <b>Harm Reduction</b>        | <ul style="list-style-type: none"> <li>MoH and PHO provide leadership in policy analysis, planning, priority setting, development of best practices, research, innovative practices and knowledge exchange</li> <li>Develop, in consultation with health authorities, strategic directions for the province.</li> <li>Delegate responsibility for provincial-level technical initiatives and supplies to PHSA/BCCDC.</li> </ul> | <ul style="list-style-type: none"> <li>Manages provincial-level support for harm reduction initiatives such as supplies and related support to health authorities consistent with priority activities identified by the Harm Reduction Policy Committee.</li> </ul>  | <ul style="list-style-type: none"> <li>Leads regional needs assessment, planning, policies and priorities in harm reduction.</li> <li>Delivers regional programs including health promotion, public education, systematic screening and outreach in order to: influence risk and protective factors; prevent, delay and reduce problematic substance use, and reduce risky substance use.</li> <li>Community development/capacity building to promote coordinate partnerships and action on the local level.</li> </ul> |
| <b>Screening</b>             | <ul style="list-style-type: none"> <li>MoH and PHO provide leadership in planning, policy analysis and legislation.</li> </ul>  | <ul style="list-style-type: none"> <li>Develops guidelines and provides advice to health authorities on communicable disease screening.</li> <li>Delivers screening programs for conditions where provincial delivery makes sense.</li> </ul>  | <ul style="list-style-type: none"> <li>Establishes regional policies and guidelines on communicable disease screening.</li> <li>Coordinates screening through public health clinics or coordination with primary care providers.</li> </ul>   |

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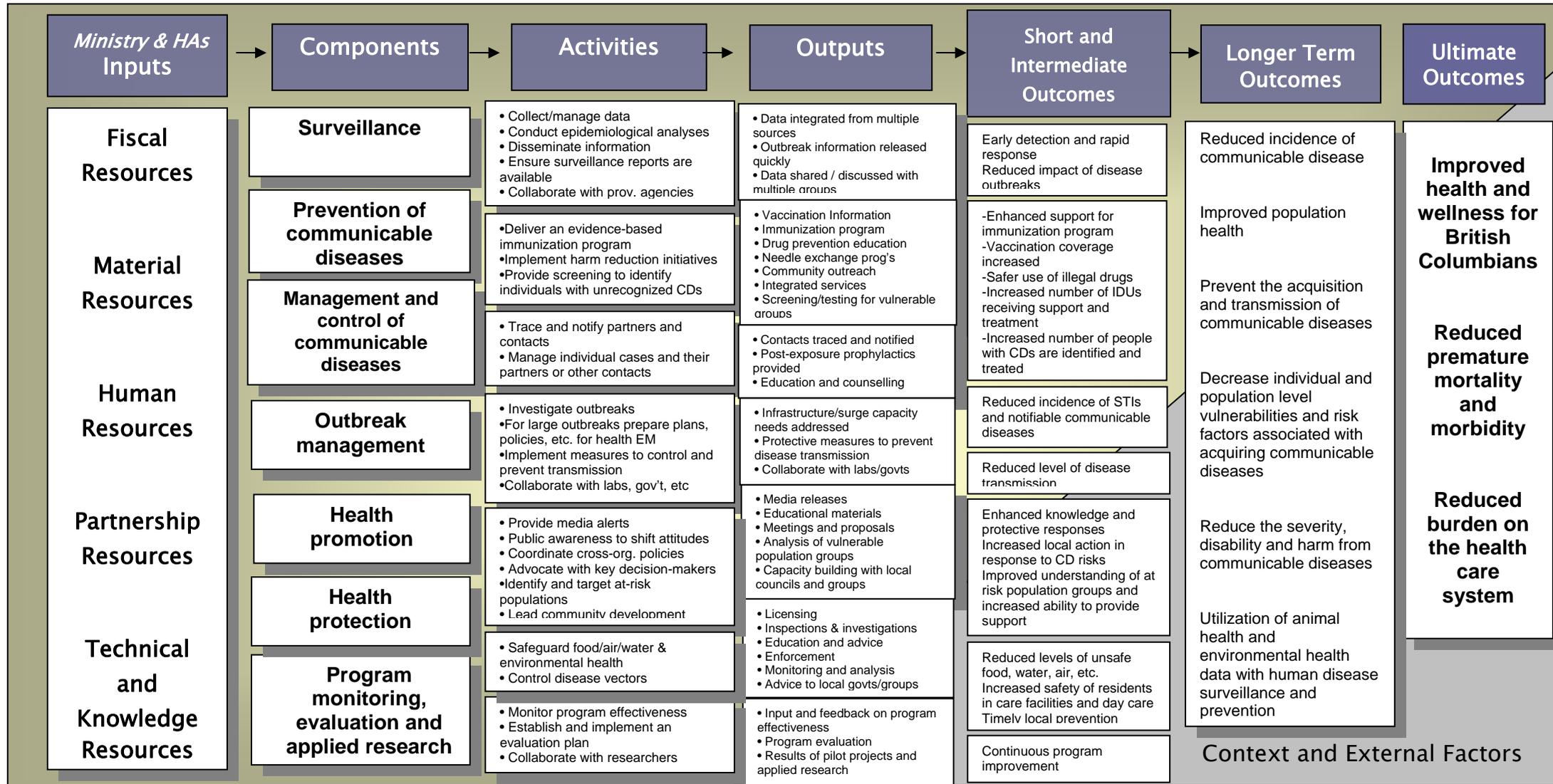
| Function                           | Ministries of Health (MoH) <sup>9</sup> and Provincial Health Officer (PHO)   | Provincial Health Services Authority (PHSA)/ BC Centre for Disease Control (BCCDC)  | Health Authority  |
|------------------------------------|---|---|---|
| <b>Case Management</b>             | <ul style="list-style-type: none"> <li>MoH and PHO provide leadership in planning, policy analysis and legislation.</li> </ul>  | <ul style="list-style-type: none"> <li>Works with health authorities to implement best practices for secondary prevention of communicable diseases.</li> <li>Recommends approaches for contact management for communicable diseases (guidelines for partner notification for sexually transmitted infections are provided by the Public Health Agency of Canada).</li> <li>Provides guidelines on the use of post-exposure prophylaxis.</li> <li>Delivers some clinical services (e.g., for TB, HIV).</li> </ul>  | <ul style="list-style-type: none"> <li>Applies BCCDC guidelines for post-exposure prophylaxis (PEP) as well as the Canadian STD guidelines for PEP.</li> <li>Traces and notifies partners and contacts.</li> <li>Manages individual cases and their partners/contacts.</li> </ul>   |
| <b>Outbreak Management /</b>       | <ul style="list-style-type: none"> <li>PHO has oversight, investigative, expert advice and coordination role. (Delegation of technical analysis and support and coordination of outbreak planning and response is delegated to PHSA/BCCDC).</li> <li>PHO liaises with other provincial and federal counterparts for national or international outbreaks.</li> <li>MHO and PHO brief ministers and other government officials.</li> </ul>  | <ul style="list-style-type: none"> <li>Provides knowledge translation, communication and logistical support related to the PHO responsibilities for the management of communicable disease threats or outbreaks.</li> <li>Leads and coordinates cross-regional outbreak planning and response (unless PHO takes the lead).</li> <li>Supports health authorities when requested in dealing with regional outbreaks.</li> <li>Leads and coordinates BC planning and response to national or international outbreaks (unless PHO takes the lead).</li> <li>Leads and coordinates or develops strategies and response plans for emerging infectious diseases. Detects and investigates new or unknown disease phenomena.</li> <li>PH Laboratories provide outbreak investigations.</li> </ul> | <ul style="list-style-type: none"> <li>Investigates regional disease outbreaks based on: <ul style="list-style-type: none"> <li>Surveillance, data collection and epidemiological analysis.</li> <li>Collaboration with public health laboratories.</li> <li>Collaboration with BCCDC.</li> </ul> </li> <li>Implements response measures to control and prevent transmission of infectious diseases: <ul style="list-style-type: none"> <li>Provides vaccines to priority groups.</li> <li>Implements protective measures in health care and community care facilities to reduce transmission of disease.</li> <li>Implements community controls (e.g., exclusions, restrictions, closures, as well as quarantine or isolation as required).</li> </ul> </li> </ul> |
| <b>Health Emergency Management</b> | <ul style="list-style-type: none"> <li>MoH and PHO provide communicable disease emergency-related direction and advice to the health authorities and BC Ambulance Service.</li> <li>MoH integrates ministry resources with those of the provincial integrated response structure.</li> <li>PHO is the primary provincial-level public health spokesperson.</li> <li>MoH and PHO are responsible for the planning, preparedness and response coordination for the public health aspects of emergencies or threats that are provincial in scope.</li> </ul> | <ul style="list-style-type: none"> <li>Provides communicable disease and environmental health expertise, including provision of laboratory services to support the MoH, PHO and health authority roles in the event of a public health emergency.</li> <li>Identifies potential public health emergency risks, and provides technical advice to MoH, PHO and health authorities on planning, preparedness and response.</li> <li>In specific issues or events, the PHO may delegate the response coordination role to PHSA/BCCDC.</li> <li>Procures emergency response biologicals and medications.</li> </ul>  | <ul style="list-style-type: none"> <li>Develops regional emergency response and business continuity plans.</li> <li>Integrates local/regional emergency health plans with those of First Nations, the Ministry of Health and other health authorities.</li> <li>Fulfills the emergency management role set out in BC Emergency Response Management System.</li> <li>Liaises with the provincial emergency structure during an emergency.</li> <li>Cooperates and provides assistance to other health authorities when resource sharing is required.</li> </ul>  |

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| Function   | Ministries of Health (MoH) <sup>9</sup> and Provincial Health Officer (PHO)   | Provincial Health Services Authority (PHSA)/ BC Centre for Disease Control (BCCDC)   | Health Authority   |
|--|---|--|--|
| <b>Health Promotion</b>                                    | <ul style="list-style-type: none"> <li>Develops provincial health promotion strategies to prevent and control communicable diseases in collaboration with PHSA/BCCDC, regional health authorities and other provincial ministries and agencies.</li> </ul>  | <ul style="list-style-type: none"> <li>PHSA/BCCDC, on behalf of the PHO and/or the ministry, acts as a spokesperson regarding public health implications of specific issues, and provides public and professional information.</li> <li>BCCDC and PH Laboratories have a training role and an expert knowledge transfer role to support health promotion by health authorities.</li> </ul> | <ul style="list-style-type: none"> <li>Delivers multi-component regional health promotion strategies to prevent communicable diseases including:               <ul style="list-style-type: none"> <li>Media alerts, educational resources, public awareness and small media campaigns.</li> <li>Integration of prevention policies/practices into other health authority programs.</li> <li>Advocacy with other organizations for health protection policies/practices.</li> <li>Targeting high-risk groups to address their specific needs.</li> <li>Community development/capacity building to enhance expertise and collaboration among local groups.</li> </ul> </li> </ul>  |
| <b>Health Protection</b>                                   | <ul style="list-style-type: none"> <li>MoH and PHO ensure accountability in fulfilling the legal requirements for communicable disease reporting, investigation, treatment, quarantine, isolation and other actions that may be required.</li> </ul>  | <ul style="list-style-type: none"> <li>Coordinates provincial-level communicable disease control activities with infection control activities.</li> <li>Prepares and distributes health alerts.</li> </ul>   | <ul style="list-style-type: none"> <li>Coordinates regional initiatives to avert the spread of communicable diseases. For example:               <ul style="list-style-type: none"> <li>Outreach to prevent the spread of TB.</li> <li>Work with health facilities to support infection control measures to minimize healthcare-acquired infections.</li> <li>Enforces food safety and drinking water quality standards.</li> <li>Enforces health standards in community care facilities.</li> </ul> </li> <li>Takes action or supports others to take action to control disease vectors that may carry or transmit infectious diseases to humans:               <ul style="list-style-type: none"> <li>Identifies, tracks and monitors disease.</li> <li>Advises local government/community organizations on prevention and control plans.</li> </ul> </li> </ul> |
| <b>Program Monitoring, Evaluation and Applied Research</b> | <ul style="list-style-type: none"> <li>MoH and PHO evaluate the overall effectiveness of communicable disease programs, policies and legislation.</li> <li>The PHO publicly reports on specific health issues that are of major concern.</li> <li>Assure availability of useful government administrative data to other levels for consistent surveillance purposes.</li> </ul> | <ul style="list-style-type: none"> <li>Develops, interprets and disseminates evidence-based best practice knowledge on the prevention and control of communicable diseases.</li> <li>Conducts applied research.</li> <li>Conducts quality assurance and evaluation in order to provide ongoing support to the PHO and ministry.</li> </ul>   | <ul style="list-style-type: none"> <li>Monitors regional programs for effectiveness.</li> <li>Conducts program evaluation, especially for new programs.</li> <li>Collaborates with researchers to test and apply new technologies and enhance quality management.</li> </ul>   |

## APPENDIX 11: PREVENTION AND CONTROL OF COMMUNICABLE DISEASES – LOGIC MODEL

**Goal:** To reduce and maintain at the lowest achievable level, the incidence, prevalence and complications from communicable diseases in British Columbia.



Note: Draft document – October 2008.

**APPENDIX 12: INDICATORS FOR COMMUNICABLE DISEASE**

**Disease Incidence**

| <b>Indicator</b>  | <b>Rationale for Indicator</b>   | <b>Type</b> | <b>Data Source</b>  | <b>Barriers to Use</b>   |
|---|--|-------------|---|--|
| Incidence of lab-confirmed enteric diseases, food and waterborne diseases.  | Control of these diseases a public health responsibility <ul style="list-style-type: none"> <li>• Campylobacteriosis</li> <li>• Cryptosporidiosis</li> <li>• Giardiasis</li> <li>• Hepatitis A</li> <li>• Salmonellosis</li> <li>• Others as appropriate</li> </ul>  | Outcome     | BCCDC<br>PARIS  |  |
| Incidence of vaccine-preventable diseases.<br><br>* the more explicit measure may be of cases not completely immunized for age, with the specific vaccine agent.                                  | By definition, preventable and an unnecessary burden on the health care system. Includes: <ul style="list-style-type: none"> <li>• <i>Haemophilus influenzae</i> type b</li> <li>• Acute Hepatitis B</li> <li>• Influenza*</li> <li>• Measles</li> <li>• Meningococcal disease</li> <li>• Mumps</li> <li>• Pertussis</li> <li>• Pneumococcal disease* tetanus, diphtheria</li> <li>• Rubella</li> <li>• others as appropriate</li> </ul> | Outcome     | Data for influenza, measles, invasive meningococcal disease, and invasive group A streptococcal disease are collected through enhanced surveillance systems through BCCDC.  |  |
| Incidence of vectorborne and other zoonotic diseases.   | Control of these diseases a public health responsibility <ul style="list-style-type: none"> <li>• Hantavirus</li> <li>• Lyme disease</li> <li>• Malaria</li> <li>• Rabies</li> <li>• West Nile virus</li> </ul>  | Outcome     | BCCDC   |  |
| Incidence of STI and bloodborne pathogens <ul style="list-style-type: none"> <li>• HIV</li> <li>• Hepatitis C</li> <li>• Chlamydia</li> <li>• Gonorrhea</li> <li>• Infectious Syphilis</li> </ul> | Promoting STD prevention is a primary public health responsibility. High-risk populations may be defined as needed.  | Outcome     | BCCDC. Data for HIV and AIDS are collected separately through the HIV and the AIDS Surveillance Systems.<br>Data for other sexually transmitted infections (STI) are collected through the STI Surveillance System. | Will be difficult to estimate HIV incidence for some health authorities due to small numbers.<br><br>Limitation: Accountability is very low—many factors out of the public health’s control affect these outcomes. |

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| Indicator                                | Rationale for Indicator   | Type    | Data Source | Barriers to Use |
|--|---|---------|-------------|-----------------|
| Incidence of active pulmonary TB disease | Most cases are reactivation and acquired in foreign countries. This indicator should measure burden of disease. | Outcome | BCCDC       |                 |

**Timeliness**

| Indicator  | Rationale for Indicator  | Type    | Data Source   | Barriers to Use   |
|--|--|---------|---|---|
| Mean/median delay between diagnosis and receipt of lab reports by the HACDC.   | Timely provider reporting of preventable communicable diseases is important to reduce the burden of disease.   | Process | Case sampling using investigation forms and provider records.   | May need to await PLIS.   |
| Percent of communicable diseases reported by the health authority to BCCDC, within the timelines established by BCCDC (these have been developed for enterics and agreed to by CD Policy).   | Timely provider reporting of preventable communicable diseases is important to reduce the burden of disease. These measures are based on diseases actually reported and not on new case findings. If the information is available, use the hours between diagnosis and report. | Process | Disease case and outbreak investigation records; provider records<br><br>This would be measured in iPHIS (or similar system) by subtracting the date/time the case report was received by the health authority from the date/time the case report was created in iPHIS (a system-generated variable). | The fields required for this are available currently in iPHIS but there needs to be some work with the health authorities to ensure that the right information is being entered into the appropriate variables. |
| Mean/median delay between receipt of report at HACDC and initiation of public health follow-up.  | Timely provider reporting of preventable communicable diseases is important to reduce the burden of disease.   | Process | Case sampling using investigation forms and provider records.   |   |
| Outbreak control: The time period from when a facility identifies an outbreak (based on established criteria) and contacts public health.  | Investigating, confirming and undertaking necessary closures in a timely manner is important in mitigating the spread of disease.  |         | Outbreak investigation reports.   |   |
| The proportion of identified close contacts to a sputum smear positive tuberculosis case who are clinically evaluated and offered preventive therapy within two weeks of identification.     | Screening and therapy services for close contacts of active cases prevent disease progression and the further spread of tuberculosis. Identified contacts are persons reported to be exposed to the TB case who are reached for assessment by the health authority.            | Process |   |   |
| Proportion of TB cases for whom the period (from the time of first presentation of symptoms to the care giver time of diagnosis and treatment) exceeded two weeks or the recommended period. | This indicator estimates the efficiency and awareness of the system for early and speedy case identification to assist with TB control.  | Process | Patient notes.  |   |

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**Completeness**

| Indicator   | Rationale for Indicator   | Type                        | Data Source  | Barriers to Use   |
|---|---|-----------------------------|--|---|
| <p>Percentage of communicable disease case reports where complete information exists for 1) onset date; 2) immunization history (if vaccine preventable disease); 3) occupation (to allow appropriate exclusion); and 4) travel status.</p>   | <p>This information is required for appropriate case or outbreak management and to evaluate program effectiveness.</p>  | <p>Process</p>              | <p>Fields exist in iPHIS to capture all but occupation and can be queried for completeness; occupation is captured on standard provincial interview forms.</p> | <p>Not all regions are currently inputting this information into iPHIS; standards for entry would either need to be developed or health authorities can evaluate this through a review of paper records.</p>  |
| <p>Rate of immunization coverage:</p> <ul style="list-style-type: none"> <li>• Percentage of children receiving every dose of recommended vaccines by their second birthday.</li> <li>• Percentage of targeted school-aged children (K, Grade 6, 9) immunized at school clinics and up-to-date for age.</li> <li>• * Percentage of children up to date at 6 years of age measured by the end of calendar year.</li> </ul> <p>(* change to agent/vaccine-specific rates, not single cumulative % measure)</p>                                | <p>Completing immunizations in a timely manner will lead to a reduction in vaccine-preventable diseases.</p>  | <p>Intermediate outcome</p> | <p>iPHIS, BCCDC PARIS, or aggregate reporting by health authorities</p>  | <p>Limitation: Immunization decisions are under individual provider and patient control.</p> <p>Limitation: Immunization is voluntary and both physicians and public health providers offer services.</p>   |
| <p>The proportion of infants born to HbsAg-positive mothers who are case managed by the Immunization Program that complete the 3-dose hepatitis B series.</p>   | <p>Between 70–90 per cent of infants infected perinatally with hepatitis B will become chronically infected; of these, 25 per cent will ultimately die of chronic liver disease or liver cancer as adults. Maximizing timely completion of the hepatitis B immunization series in perinatally exposed infants will reduce chronic liver disease and liver cancer.</p> | <p>Process</p>              | <p>iPHIS and PARIS</p>   | <p>Limitation: Immunization decisions are under individual provider and parent control.</p> <p>Limitation: Both public health and physicians provide immunization services in BC; most infants born to carrier mothers are in geographic areas in which physicians provide immunization services.</p> |
| <p>A. The proportion of adults ages 65 years and older who have received an influenza vaccination in the past year.</p> <p>B. The proportion of adults ages 65 years and older who have ever received a pneumococcal vaccination.</p> <p>C. * Percentage of LTC residents who have received pneumococcal vaccination.</p> <p>* The percentage of:</p> <ol style="list-style-type: none"> <li>1. residents of long-term care facilities</li> <li>2. staff in long-term care facilities</li> <li>3. staff in acute care facilities</li> </ol> | <p>These rates are used to monitor health care quality and the achievement of immunization objectives. The link between vaccination and disease prevention is well established.</p>   | <p>Intermediate outcome</p> | <p>iPHIS, CCHS, Web-based Influenza Coverage Application, WHITE system</p> <p>*BCCDC database</p>  | <p>Limitations: The medical system and personal behaviour largely affect vaccination rates.</p>   |

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| Indicator   | Rationale for Indicator  | Type                 | Data Source  | Barriers to Use  |
|---|--|----------------------|--|--|
| The proportion of patients with newly diagnosed active tuberculosis, (for whom 12 or fewer months of therapy are indicated), that complete recommended therapy within 12 months.  | Reduced disease prevalence depends on treatment completion. Surveillance and assurance of treatment completion is a public health goal. Cases include newly diagnosed drug sensitive cases, but exclude multi-drug resistant cases.<br><br>Limitations: delays in treatment completion are often due to patient noncompliance. | Intermediate outcome | BCCDC  | VCH does not follow tx of clients.                             |
| The proportion of infected contacts to sputum AFB-smear positive tuberculosis cases who complete the recommended therapy for latent infection.  | Reduced disease prevalence depends on treatment completion. Surveillance and assurance of treatment completion is a public health goal.<br><br>Limitations: delays in treatment completion are often due to patient noncompliance.   | Intermediate outcome |  | Too many variables, therefore cannot measure adequacy of care. |
| The proportion of newly reported, culture positive tuberculosis cases for whom drug susceptibility tests are reported.<br><br>* The proportion of those started on TB treatment for active disease who do develop drug resistance during treatment. | Drug susceptibility testing is important to treat and monitor multi-drug resistant cases of tuberculosis.<br><br>Limitation: providers may not obtain specimens before treatment is initiated.<br><br>* The wording has been changed so the indicator reflects proportion of drug resistance not testing.                      | Process              |  |  |
| The proportion of all pregnant women who have prenatal HIV screening  |  |                      |  |  |
| Proportion of HIV-positive individuals who are accessing antiretroviral therapy.  | Antiretroviral medications are effective in the spread of HIV.   |                      | Centre of Excellence<br>BCRCP data base?<br>ITRACK<br>MTRACK<br>Other surveillance studies |  |

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**Short-term Outcomes**

| <b>Indicator</b>   | <b>Rationale for Indicator</b>   | <b>Type</b>           | <b>Data Source</b>  | <b>Barriers to Use</b>  |
|--|--|-----------------------|---|---|
| <p>A. The proportion of persons who used condoms during their last episode of sexual intercourse among sexually active adolescents ages 14–17 years.</p> <p>B. The proportion of persons using condoms all or most of the time among persons 18 years and older with more than one partner in the past year.</p> | <p>Condom use reduces the spread of STDs and HIV. Educational efforts by health departments affect the use of condoms.</p>   | Intermediate outcomes | <p>A. Adolescent Health survey * McCreary Adolescent Health Survey.</p> <p>B. Data available in CCHS (not sure if sample big enough to discriminate performance at health authority level).</p>   | <p>Most cases followed by community physicians, not PH</p> <p>*Do not currently access or report on these data.</p>   |
| <p>Number of Health Service Delivery Areas providing:</p> <ul style="list-style-type: none"> <li>• needle distribution/collection services.</li> <li>• condom distribution.</li> <li>• outreach programs for those who use illegal drugs.</li> </ul>   | <p>Promoting the prevention of HIV transmission is a public health responsibility. These are recognized harm reduction strategies.</p>   | Process               | Health Authority  | <p>This indicator needs further work as we do not have an understanding of optimal coverage to compare to. Number of locations does not indicate volume or coverage, and may mean different things in urban versus rural areas. Also, what is meant by outreach programs.</p> |
| <p>A. The proportion of persons seen at STD and TB community health clinics who are offered an HIV test.</p>   | <p>HIV is more common in persons presenting with STDs and TB, and testing them for HIV is an opportunity for early detection and prevention.</p>   | Process               | <p>How do we currently measure clinical interventions?</p> <p>STI Information System can provide data for A for STI only (but not representative of all HA equally).<br/>For B. Could get at this through linkage of STD case and HIV test database</p> | <p>Unable to assess who was offered an HIV test (can only see who was tested for HIV at an STD visit, which is not the same thing). This is missing the larger physician office component; may need a modified indicator to capture this</p>                                  |
| <p>A. The proportion of persons who used condoms during their last episode of sexual intercourse among sexually active adolescents ages 14–17 years.</p> <p>B. The proportion of persons using condoms all or most of the time among persons 18 years and older with more than one partner in the past year.</p> | <p>Condom use reduces the spread of STDs and HIV. Educational efforts by health departments affect the use of condoms. The Behavioral Risk Factor Surveillance System (BRFSS) categorizes sexual activity risk by one versus more than one partner in the past year.</p> | Intermediate outcome  | <p>A. Adolescent Health Survey</p> <p>B. Data available in CCHS but do not know if sample size is large enough to discriminate performance at health authority level</p>  | <p>Limitation: Accountability is very low—the health authority has limited influence on personal sexual behaviour.</p>  |