

**BC Strategic Plan
for
Tuberculosis
Prevention, Treatment and Control**

BC Communicable Disease Policy Advisory Committee

June 2012

In addition to the large number of groups and people listed in Appendix A, the following organizations have played a significant role in the development of the *BC Strategic Plan for Tuberculosis Prevention, Treatment and Control*. The multiple partners highlight the joint ownership of tuberculosis control from a wide cross-section of the health system.



BC Centre for Disease Control
An agency of the Provincial Health Services Authority



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Executive Summary

With more than 8.8 million incident cases and 1.5 million deaths worldwide in 2010, tuberculosis (TB) remains one of the world's deadliest diseases. Great strides in treatment and prevention have significantly reduced the impact of this disease in British Columbia (BC); however, control is far from complete. Over the past five years, approximately 300 people were diagnosed with TB annually, with an average incidence of 7.0 cases per 100,000 people. TB has also become increasingly concentrated among three populations over the past decades: foreign-born Canadians from tuberculosis-endemic countries, Aboriginal peoples, and socially marginalized individuals.

The *BC Strategic Plan for Tuberculosis Prevention, Treatment and Control* is a framework through which we can improve the health of people in BC by guiding and supporting efforts to reduce TB incidence, prevalence, morbidity and mortality. The plan was developed through 36 intensive discussion sessions with a broad range of stakeholders representing numerous health care, social service and advocacy organizations.

The vision of the plan is to greatly reduce TB incidence and transmission in BC. A roadmap for achieving this vision is contained in five strategic goals, which are supported by detailed objectives and strategies. These objectives and strategies are intended to guide decision-makers and service providers in their day-to-day operations.

Achieving the five strategic goals will take considerable effort across the health system and will require comprehensive strategies that engage the public, decision makers, and service providers to ensure TB prevention and treatment remain a priority. This demands the collaborative effort of many groups in BC, including health authorities, physicians, allied health care workers, and community organizations.

With the BC Ministry of Health providing executive stewardship, provincial public health services are provided by the Provincial Health Services Authority (PHSA), First Nations and Inuit Health Branch (which, at the time of this writing, is in the process of being transferred to the First Nations Health Authority) and the five regional health authorities (Vancouver Coastal Health, Fraser Health, Interior Health, Northern Health, and Vancouver Island Health).

Milestones will assess progress at various stages over the course of the plan. To ensure implementation and accountability, a committee comprised of the major stakeholders will be responsible for reaching the milestones, with particular attention on the priority actions, and will provide annual progress reports and updates to the Communicable Disease Policy Advisory Committee.

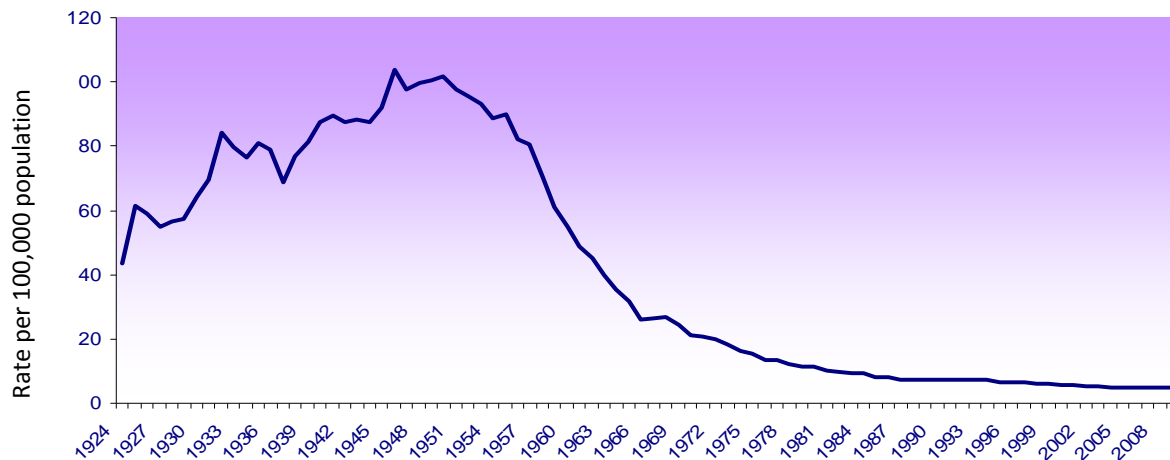
Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, a bacteria spread from person to person through air droplets. TB disease – also known as active TB – usually affects the lungs (pulmonary TB) but can also affect other organs, including the lymph nodes, brain, and spinal cord (extrapulmonary TB) amongst others. Left untreated, a person with infectious pulmonary TB can infect an average of 10 – 15 people every year.¹ When appropriately managed, however, active TB is largely curable and usually preventable.

At the turn of the twentieth century, TB was a leading cause of death and disability in British Columbia (BC). Fortunately, like many other high-income regions, BC has made tremendous progress in TB control over the past century, with the rates decreasing to among the lowest in the world (see Figure 1). Undoubtedly, improved socioeconomic conditions and antimicrobial therapy contributed to this decline, but credit also goes to the dedicated nurses, doctors and public health officials who built, adapted and sustained our robust provincial TB prevention and treatment program.

Despite great strides in treatment and prevention, TB control efforts in BC are far from complete. With more than 8.8 million incident cases and 1.5 million deaths worldwide in 2010, TB remains one of the world’s deadliest diseases. Moreover, drug-resistant strains are proliferating globally, threatening to destabilize current control efforts. For this reason, TB constitutes a global health emergency, and remains a constant threat to provincial TB control.²

Figure 1: Tuberculosis incidence rates – Canada: 1924 – 2009



On a provincial level, considerable regional variation in approaches to TB control have developed over the past 40 years. As the legally responsible officials for TB control in BC, there has been keen interest among the Medical Health Officers to review the delivery of provincial TB prevention and treatment

¹ <http://www.who.int/mediacentre/factsheets/fs104/en/>

² WHO Report 2010: Global tuberculosis control. WHO Global tuberculosis control: a short update to the 2009 report. WHO/HTM/TB/2010.7.

services and to explore opportunities to build on the successful practices currently in place.

The TB Strategic Plan will improve the health of people in BC by guiding and supporting health system efforts to reduce the incidence, prevalence, morbidity and mortality associated with TB. In the following pages, a shared vision serves as a blueprint for strategic leadership on reducing TB transmission in BC through five strategic goals:

1. Reduce incidence of active tuberculosis in British Columbia by 50 per cent by 2022.
2. Prevent transmission of tuberculosis within BC, in part by addressing social determinants of health such as housing, mental health and addictions treatment.
3. Prevent the development of active tuberculosis in those with latent tuberculosis infection, especially in new immigrants from high prevalence countries.
4. Ensure that the public health tuberculosis response is robust, timely and able to meet ongoing and outbreak needs.
5. Ensure state-of-the-art laboratory programs, treatment, and care of people who develop tuberculosis to improve outcomes and reduce the risk of spread.

Three milestones for achievement reflect the commitment to accountability and improving the health of British Columbia.

1. By 2022 British Columbia will reduce the incidence of active tuberculosis by 50 per cent.
2. By 2022 British Columbia will reduce the incidence of active tuberculosis in specific high risk and vulnerable groups by 50 per cent.
3. By 2017, all performance targets from the *Guidance for Tuberculosis Prevention and Control Programs in Canada* will be reached in:
 - Microbiological diagnosis of tuberculosis
 - HIV serologic testing
 - Treatment of tuberculosis
 - Contact follow-up
 - Targeted screening for active tuberculosis and latent tuberculosis infection
 - Immigration medical surveillance

Achieving the five strategic goals will take considerable effort across the health system and will require comprehensive strategies that engage the public, decision makers, and service providers to ensure TB prevention and treatment remain a priority. This demands the collaborative effort of many organizations responsible for health and social services in BC, including health authorities, physicians, allied health care workers, and community organizations.

TB Overview

International Context

The burden of TB is distributed unequally, with the vast majority of cases and deaths occurring in resource-poor regions. While the highest incidence rates of TB occur in African countries, the majority of cases occur in Asia; close to half of all new global cases occur in just six Asian countries: China, India, Philippines, Indonesia, Bangladesh and Pakistan.³

With adequate medical and public health resources, TB control programs can successfully treat most TB cases, while attenuating most community transmission. Indeed, the World Health Organization (WHO) recommended “short course” treatment protocol has been available for over 30 years and is one of the most cost-effective of all public health interventions.⁴ However, poverty and inadequate public health infrastructure have restricted access to TB diagnostics and treatment. According to the WHO, more than two million incident cases are undiagnosed and untreated each year.⁵ Fortunately, there have been recent gains in global TB control; global incidence has decreased by 1.3% per year since 2002, while the absolute number of incident cases has been falling since 2006.

Guided by the WHO Stop-TB Partnership, a Global Plan for TB control has been developed. The Global Plan calls for scaling up of interventions related to the treatment of active TB and latent TB infection (LTBI), encourages addressing multi-drug resistant TB (MDR-TB) and TB-HIV co-infection, and emphasizes the importance of advocacy, care provider engagement and fostering community participation in TB control efforts.⁶

In line with the United Nations Millennium Development Goals, the Global Plan has set a goal to reduce TB prevalence and the number of TB related deaths by 50 per cent in 2015 relative to 1990. The Global Plan also set the ambitious goal of eliminating TB by 2050, with elimination defined as less than one case per million people per year).⁷

National Context

Nationally, the Stop TB Canada initiative is an active part of the global movement to accelerate social and political action to stop the spread of TB. In 2006, the Canadian Tuberculosis Committee reviewed its national goal in the context of targets set by the WHO STOP-TB Partnership and recommended a target reduction of 50 per cent of TB rates by 2015 (3.6 cases per 100,000 people compared to the 1990 rate of 7.0 cases per 100,000 people).⁸ The Public Health Agency of Canada (PHAC), through the Division of

³ WHO Report 2010: Global tuberculosis control. WHO Global tuberculosis control: a short update to the 2009 report. WHO/HTM/TB/2010.7..

⁴ Murray CJ, DeJonghe E, Chum HJ, Nyangulu DS, Salomao A, Styblo K. Cost effectiveness of chemotherapy for pulmonary tuberculosis in three sub-Saharan African countries. *Lancet*. 1991 Nov 23;338(8778):1305-8.

⁵ WHO Report 2010: Global tuberculosis control. WHO Global tuberculosis control: a short update to the 2009 report. WHO/HTM/TB/2010.7.

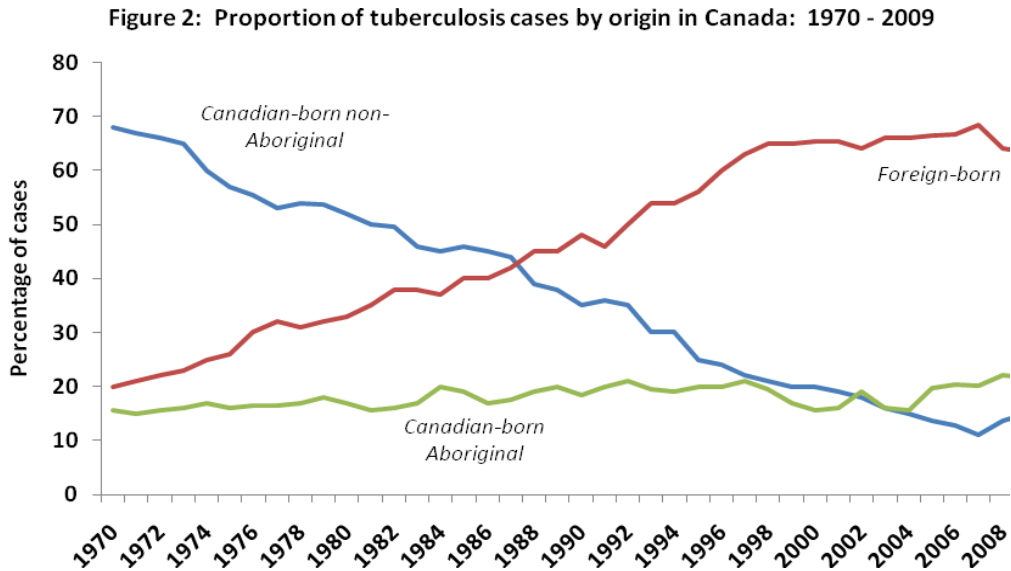
⁶ Stop TB Partnership and World Health Organization. Global Plan to Stop TB 2006-2015. Geneva, World Health Organization, 2006 (WHO/HTM/STB/2006.35).

⁷ Stop TB Partnership and World Health Organization. Global Plan to Stop TB 2006-2015. Geneva, World Health Organization, 2006 (WHO/HTM/STB/2006.35).

⁸ Long R and Ellis E. Canadian Lung Association, Canadian Thoracic Society, Tuberculosis Prevention and Control. Canadian TB standards. 6th ed. Ottawa, Canada: Canadian Lung Association and Government of Canada, 2007.

Tuberculosis Prevention and Control, has endorsed this goal. At the time of this writing, PHAC and the First Nations and Inuit Health Branch of Health Canada (FNIHB) are in the process of renewing their National Tuberculosis Elimination Strategies.⁹

Presently, TB rates in Canada are amongst the lowest in the world. The overall incidence in Canada has decreased from 120 cases per 100,000 people in 1950 to less than five cases per 100,000 people in 2009.¹⁰ In addition, surveillance and treatment programs appear to be functioning well; all known TB cases are reported to provincial TB control programs, there are low levels of drug resistance, and there is universal access to free TB medications.



Provincial Context

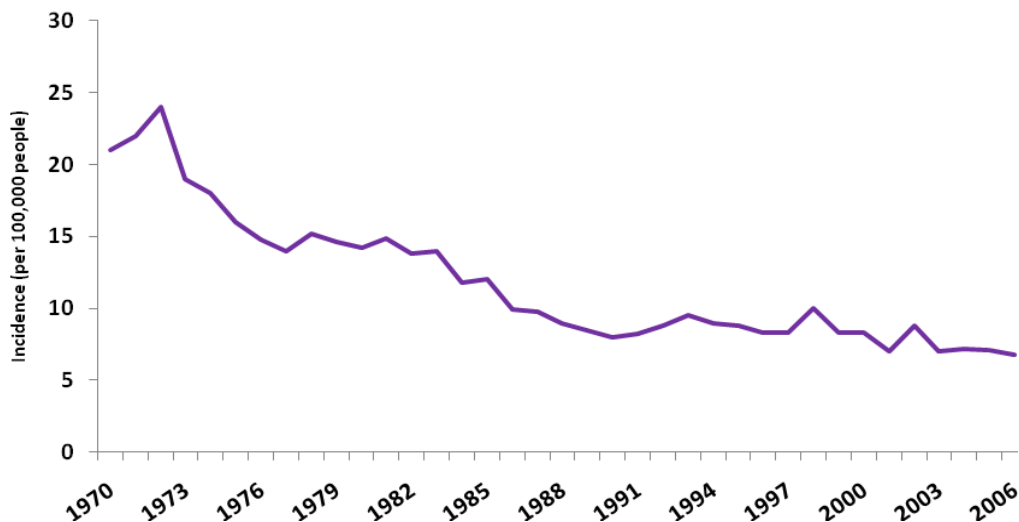
Over the last 50 years, TB rates in BC have decreased to very low levels. In the last 5 years, approximately 300 people were diagnosed annually with TB, with an average incidence rate of 7.0 cases per 100,000 people¹¹. Individuals with TB are diagnosed throughout the province, including remote communities, although more than 70 per cent of cases occur in the Greater Vancouver Region. In the 1980s, TB rates were falling by an average of over 5 per cent annually; however, in the last 5 years, these rates have decreased by less than 2 per cent per year (Figure 3). With the decline in overall incidence, TB has become increasingly concentrated among three populations in BC: foreign-born Canadians from TB-endemic countries, Aboriginal peoples, and socially marginalized individuals.

⁹ Health Canada. National TB Elimination Strategy. <http://www.hc-sc.gc.ca/fnih-spnia/diseases-maladies/tuberculos/intro-eng.php> accessed September 20, 2011.

¹⁰ Long R and Ellis E. Canadian Lung Association, Canadian Thoracic Society, Tuberculosis Prevention and Control, et al. Canadian tuberculosis standards. 6th ed. Ottawa, Canada: Canadian Lung Association and Government of Canada, 2007.

¹¹ BCCDC Provincial TB Elimination Strategy, BC Centre for Disease Control, an Agency of the Provincial Health Services Authority, July 2010, p.11.

Figure 3: Annual Incidence of TB in British Columbia ¹³



TB in people born in high incidence countries

Foreign-born persons account for an increasing proportion of national and provincial TB cases. This likely reflects several phenomena, including the decrease in TB incidence in Canadian born populations, the increase in proportion of foreign-born populations in Canada, and an increasing proportion of immigrants from high incidence countries (defined as a TB incidence rate exceeding 15 cases per 100,000). In 2009, foreign-born populations accounted for 63 per cent of all reported TB cases in Canada and 66 per cent of reported cases in BC. ¹²

TB in Aboriginal Peoples

Despite increased efforts, the rate of TB in Aboriginal peoples remains consistently higher than the rate in foreign-born and Canadian-born non-Aboriginal people (Figure 4). The TB rate in Aboriginal peoples is six times higher than the national average, which is in part related to social, economic and environmental factors affecting Aboriginal communities. ¹³ The rates of TB in Aboriginal peoples have been very slow to decline over the last 20 years. Indeed, in 2008, the rate of TB in BC Aboriginal peoples reached the highest level in over 5 years at 28.2 cases per 100,000 people. ¹⁴

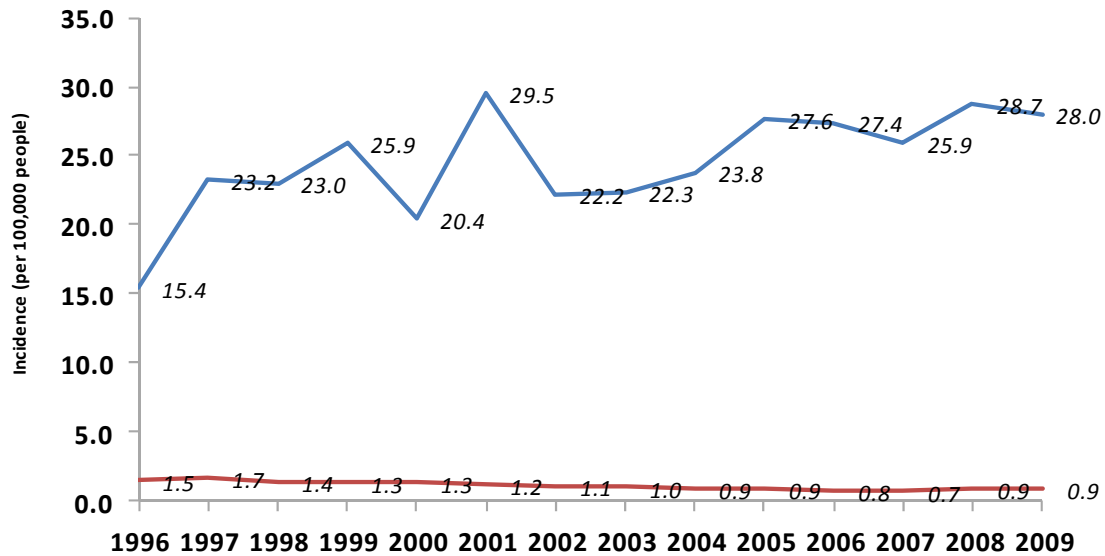
¹² Public Health Agency of Canada, Tuberculosis in Canada 2009 – Pre-release, <http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan09pre/index-eng.php#t3> , cited in BCCDC Provincial TB Elimination Strategy July 2011, p.10.

¹³ Public Health Agency of Canada, Tuberculosis in First Nations Communities, 1999. http://www.hc-sc.gc.ca/fniah-spnia/pubs/diseases-maladies/tuberculosis/1999_commun/index-eng.php#a5. Accessed September 21, 2011..

¹⁴ Public Health Agency of Canada, Tuberculosis in Canada 2008 – Pre-release.

<http://www.publichealth.gc.ca/tuberculosis>, in BCCDC TB Elimination Strategy, July 2010, p. 10.

Figure 4: Annual incidence of TB in BC among Aboriginal and Non-Aboriginal Canadian-born People



Health Canada first implemented a national strategy to eliminate TB among Aboriginal peoples in 1992.¹⁵ The original goal of this strategy was to reduce TB incidence to less than one new case per 100,000 people by the year 2010.

TB in marginalized individuals and other groups at high risk

Those who are marginalized in society, for reasons that may include mental illness, problematic substance use, poverty, and homelessness, are at an increased risk of TB exposure and disease. Exacerbating risk in this population is the inability of health care services to engage and meet the needs of marginalized people.¹⁶ Other high risk groups include recent contacts of infectious TB cases, and those with immunosuppressive co-morbidities such as diabetes mellitus, chronic kidney disease, HIV infection, therapeutic immunosuppression and structural lung disease. High risk groups account for over 30 per cent of TB cases in BC annually, with HIV co-infection present in six percent of all active TB cases¹⁷. Table 1 describes the relative risk of developing TB for various cohorts.¹⁸

¹⁵ Medical Services Branch Working Group on Tuberculosis. National tuberculosis elimination strategy. Ottawa: Medical Services Branch; 1992.

¹⁶ Ivanova, Iglia (2011). The Cost of Poverty in BC. Vancouver: Canadian Centre for Policy Alternatives.

¹⁷ Estimate based on iPHIS review of TB cases in 2009.

¹⁸ Long R and Ellis E. Canadian Lung Association, Canadian Thoracic Society, Tuberculosis Prevention and Control, et al. Canadian tuberculosis standards. 6th ed. Ottawa, Canada: Canadian Lung Association and Government of Canada, 2007.

Table 1: Risk Factors for the Development of TB Disease among Persons Infected with Mycobacterium tuberculosis

Risk Factor	Estimated Risk of TB Relative to Persons with No Known Risk Factor
HIGH RISK	
Acquired immunodeficiency syndrome (AIDS)	110 – 170
Human immunodeficiency virus (HIV) infection	50 – 110
Transplantation (related to immunosuppressant therapy)	20 – 74
Silicosis	30
Chronic renal failure requiring hemodialysis	10 – 25
Carcinoma of head and neck	16
Recent TB infection (≤ 2 years)	15
Abnormal chest x-ray – fibronodular disease	6 – 19
INCREASED RISK	
Treatment with glucocorticoids	4.9
Tumor necrosis factor (TNF) – alpha inhibitors	1.5 – 4
Diabetes mellitus (all types)	2.0 – 3.6
Underweight (< 90 percent ideal body weight; for most persons this is a body mass index ≤ 20)	2 – 3
Young age when infected (0 – 4 years)	2.2 – 5.0
Cigarette smoker (1 pack/day)	2 – 3
Abnormal chest r-ray – granuloma	2
LOW RISK	
Infected person, no known risk factor, normal chest x-ray	1

TB Services in British Columbia

Roles and Responsibilities

With the BC Ministry of Health providing executive stewardship, provincial public health services are provided by the Provincial Health Services Authority (PHSA) and the five regional health authorities (Vancouver Coastal Health, Fraser Health, Interior Health, Northern Health, and Vancouver Island Health Authorities). The First Nations and Inuit Health Branch of Health Canada also funds TB-related services as well as on-reserve public health, home care, environmental health, and problematic substance use services.

Individuals and families

Individuals and families play an important role in helping to stop TB. Ongoing reductions in TB depend in part on individuals and families having the knowledge, skills and ability to manage their health. Ongoing effective, responsive TB policies and programs depend on individuals and families having opportunities to provide input into them.

Communities

While not directly involved in providing TB services, local governments, community agencies, and business and employer organizations can play an important role in helping the health care system manage TB. Actions can range from local governments developing policies around crowded conditions in congregate settings to community agencies conducting TB education and screening activities.

First Nations Health Authority

On October 13, 2011, the federal and provincial ministers of health, along with the BC First Nations Health Council and BC First Nations Health Society signed the British Columbia Tripartite Framework Agreement on First Nations Health Governance that will ensure BC First Nations have a major role in the planning and management of health services for First Nations through a new First Nations health governance structure. The new governance structure includes the First Nations Health Authority, Tripartite Committee, First Nations Health Directors Association, and First Nations Health Council. These groups will be responsible for the leadership, coordination, planning, management, funding and service delivery of health programs for BC First Nations.

Frontline Health Care Providers

Primary care providers

Primary care providers, such as family physicians and nurse practitioners, support British Columbians to stay healthy, recover from illness, live with disease and cope with end of life. In general, a high capacity to access and understand health data is an extremely important skill for primary care providers to possess. This allows for the translation of health information into practical treatment plans for their patients. With regards to TB, primary care providers perform screening, arrange for follow-up diagnostic tests to confirm an infection, and support ongoing care and treatment. They can assess the impact of TB therapeutic intervention from a holistic perspective (e.g., consider how TB treatment may affect co-morbid conditions), and help to coordinate specialist care when it must be sought elsewhere. Please refer to Table 2 for more information on TB treatment responsibilities.

Respiratory and Infectious Disease specialists

Respiratory and infectious disease specialists have extensive training in TB diagnosis and treatment. They order and interpret diagnostic tests, and can initiate and refine appropriate therapies to treat TB and LTBI. They address complicated diagnostic and treatment issues, such as drug resistance or medication interactions. They work in close collaboration with primary care providers and public health practitioners (e.g., public health nurses and medical health officers) to ensure the best care for the individual and the safety of the public.

Table 2: People Responsible for Various Types of TB Treatment

Treatment Function	Person or Group Responsible
Primary Care	Physicians (local or at TB Prevention and Control), Nurse Practitioners, Nurses (public health or community health nurses), Directly-observed Therapy (DOT) Workers
Secondary Care	Physicians (local or at TB Prevention and Control), Local Hospitals
Tertiary Care	Dedicated Ward at Vancouver General Hospital for TB patients managed by on-site respirologists.
Patient Follow-up	Physicians (local or at TB Prevention and Control), Nurse Practitioners, Nurses (public health or community health nurses), Directly-observed Therapy Workers
Enforcement for Non-Adherent Patients (if necessary)	Regional Health Authority Medical Health Officers

Regional Health Authorities/ Treatment and Care

Regional Health Authorities, Medical Health Officers and Public Health Nurses

BC's regional health authorities play a central role in TB program delivery. In collaboration with BCCDC-TB Prevention and Control (see below), regional health authorities are actively involved in surveillance, contact investigation, and supervision of treatment of both TB disease and LTBI within their health regions under the direction of MHO's. Historically, the involvement in TB management and contact investigation varies by regional health authority and individual circumstances. Currently, the BCCDC-TB Prevention and Control clinics in Vancouver and New Westminster support direct public health services for the Vancouver Coastal health authority and some parts of Fraser Health. The remainder of Fraser, Interior and Northern health authorities, as well as Vancouver Island (except for Victoria), are supported through outreach from BCCDC Field-Operations (see below). In addition, regional health authorities address patient and worker infection and prevention control.

Medical Health Officers

Medical health officers are physicians who have specialty training in Public Health and Preventative Medicine. They use population health knowledge and skills to play leading and collaborative roles in the maintenance and improvement of the health and well-being of their communities. They are responsible, in collaboration with the public health team, for monitoring, preventing and controlling communicable and chronic diseases, investigating disease outbreaks and hazards to health, and coordinating public health responses to health threats. Medical health officers carry out legislated requirements of a number of public health statutes which pertain to communicable disease prevention and control, environmental health, tobacco harm prevention, drinking water protection and community care facility licensing. They are responsible for the prevention and control of TB in their region by maintaining awareness among clinicians of tuberculosis trends in the community, carrying out public health follow-up of TB, responding to clusters and outbreaks of TB, and guiding front line public health practice and research.

Public Health Nurses and Community Health Nurses

Public health nurses promote and protect the health of populations in diverse settings, such as community health centres, schools, street clinics, youth centres and nursing outposts, to meet the health needs of the whole or specific populations. They work with many partners in communities to implement maternal and child health promotion programs; disease and injury prevention programs; school health programs; sexually transmitted infection prevention programs that include treatment, education and outreach; immunization clinics; and communicable disease surveillance and control. They will often work closely with primary care providers, specialists, medical health officers and other regional health authority staff to ensure a coordinated response to TB case reports and outbreaks. Community Health Nurses provide the same functions as Public Health Nurses, with added responsibility for more general community development.

Provincial Health Services Authority (PHSA)

The PHSA is responsible for managing provincial agencies including the British Columbia Centre for Disease Control (BCCDC), the BC Cancer Agency, and other organizations that provide province-wide specialized health care services.

Provincial Public Health Microbiology & Reference Laboratory (PHMRL)

The Provincial Public Health Microbiology & Reference Laboratory (PHMRL) is the primary public health and reference diagnostic testing facility for British Columbia. The laboratory is also nationally recognized for its public health leadership, regularly conducting nationally funded scientific evaluation, and playing a leadership role in many areas including drinking water, molecular microbiology, influenza and health care acquired infections. It works closely with acute care laboratories in its BC Public Health Laboratory Network and its national counterparts across Canada in the Canadian Public Health Laboratory Network.

BC Centre for Disease Control (BCCDC)

The BC Centre for Disease Control (BCCDC), an agency of the PHSA, provides health systems leadership and supports regional health authorities to monitor, prevent and control communicable disease and promote environmental health in BC. It provides surveillance and response, applied scientific evaluation,

disease prevention and control, and infrastructure and training. The BCCDC is responsible for TB prevention and management through TB Prevention and Control (BCCDC-TBC) as described below.

TB Prevention and Control (BCCDC-TBC)

Organized in 1935 to provide TB services to people of BC, TB Prevention and Control (BCCDC-TBC) underwent a shift in mandate in 1944 from a sanatorium-based care model to providing services primarily in an outpatient setting (prior to 1944, there were no medications available to treat TB). BCCDC-TBC now lies within the Clinical Preventative Services Division of the BCCDC, and is the provincial centre of excellence for TB. BCCDC-TBC provides central coordination for TB surveillance, control and prevention efforts including family-centred care at its TB Control Clinics.

BCCDC-TBC works with regional health authorities to establish and maintain policies, standards and procedures for the control of TB in BC. This includes the provision of free medications for treatment of active disease and latent infection, administration of the centralized provincial TB registry database, Integrated Public Health Information System (iPHIS), and reporting of cases nationally.

BCCDC-TBC provides staffing for two clinics: Vancouver TB clinic in Vancouver Coastal Health Region and New Westminster TB clinic in Fraser Health Region.

BCCDC-TBC Field-Operations

The nurse led field-operations program works in collaboration with BCCDC-TBC physicians. The program provides remote technical support, clinical consultation and co-ordination of contact investigations throughout the province. Direct patient care is provided by local physicians. Active cases are typically assigned to a regional public health nurse who works with the physicians, BCCDC and the client to facilitate care. Depending on the available resources of the local public health unit, patients may receive outreach DOT support.

TB Services for Aboriginal Communities (TBSAC)

The TB Services for Aboriginal Communities (TBSAC) program at the BCCDC-TBC, funded by the BC Region of the First Nations and Inuit Health Branch of Health Canada, provides consultative services to physicians and nurses providing health care to First Nations individuals living on reserve. Services include technical support, physician & nursing clinical consultation, planning, coordinating screening efforts, education, surveillance, and scientific evaluation.

BC Ministry of Health and other Provincial Ministries

As stewards of the provincial health system, the Ministry of Health provides leadership and support to health system partners, including health authorities, physicians, and other care providers. The Ministry sets the overall strategic direction for the health system, provides the appropriate legislative and regulatory frameworks to allow it to function smoothly, and plans for the future supply and use of health professionals, technology, and facilities. The Ministry, particularly through the Office of the Provincial Health Officer, also monitors and reports on the health of the population and plans for and coordinates responses to major public health risks and emergencies.

The Ministry works to ensure a consistent level of service quality across the regions with no significant service gaps. It also evaluates health system performance, and takes corrective action where necessary to ensure the population's health needs are being met.

In addition to the Ministry of Health, other provincial ministries have an important role to play in the prevention and treatment of TB. For example, the Ministry of Public Safety and Solicitor General, through BC Corrections, is responsible for managing TB in provincial correctional institutions. Broader efforts across government and society address the systemic issues of poverty, literacy, and food security that effect where people live, work, and play.

Federal Government

At the national level, the Public Health Agency of Canada (PHAC) works with the provinces and territories to promote and protect the health of Canadians. A significant part of its mandate is to decrease the transmission of infectious diseases and to improve the health status of those infected.

PHAC is responsible for the overall management of tuberculosis Prevention and Control in Canada. This national prevention and control programme includes central coordination, monitoring and evaluation, with each province and territory being responsible for developing and implementing control plans that are consistent with Canadian guidelines and protocols.

Through the Centre for Infectious Disease Prevention and Control, surveillance and epidemiology, risk management, scientific evaluation including laboratory science, health promotion, public health policy development and prevention and care programs are delivered.

Citizenship and Immigration Canada (CIC) is responsible for assessing the health status of refugees and immigrants prior to their arrival in Canada. The Post-Landing Immigration Surveillance (PLIS) program is federally mandated to require people with evidence of LTBI on a chest x-ray to present to public regional health authorities for evaluation following arrival in Canada.

Correctional Services Canada (CSC), pursuant to the *Corrections and Conditional Release Act* (Section 86, Inmate Health), must provide every inmate with essential health care that conforms to professionally accepted standards. In 1997, in collaboration with Health Canada's Division of Tuberculosis Prevention and Control and Occupational Health and Safety Agency (now Workplace Health and Public Safety Programme), CSC developed an infrastructure for surveillance of TB in Canadian federal correctional institutions.

Figure 5 Key Roles and Responsibilities

Primary Care Providers

- Clinical suspicion of TB or LTBI warranting treatment
- Reporting TB cases and relevant clinical information to medical health officer
- Primarily responsible for treatment, or referral to specialist (e.g. TB Control) for treatment
- Monitor response to treatment; adjust as necessary in consultation with specialist
- Liaise with public health service regarding treatment compliance
- Recommend screening for latent tuberculosis

Regional Health Authority Medical Health Officers and Public Health Staff

- Responsible for surveillance, prevention and control of TB in their region
- Maintain index of suspicion and awareness of tuberculosis as a differential diagnosis in area physicians
- Determine and carry out appropriate course of public health actions and follow-up around each case, including contact tracing (TBC often provides support in outbreak situations)
- Report cases to the provincial TB Control program (acting on behalf of the Provincial Health Officer)
- Primary management of clusters and outbreaks
- Advise on and participate in development of locally relevant scientific evaluation
- Provide TB education to staff involved in TB prevention and control services
- Take lead role with media on local RHA TB issues

First Nations Health Authority

- Responsible for program delivery, management and funding for First Nations communities in BC

BCCDC-TBC and PHMRL

- Coordinate and lead provincial LTBI testing
- Ensure the diagnostic capacity in the province sufficiently meets demand
- Provide individual clinical consultation and medication management with local primary attending physician of each TB case
- Consult with MHO or assigned RHA public health staff on local course of public health actions around infectious TB cases
- Support RHA management of local TB cases, clusters and outbreaks
- Coordinate development of and maintain provincial TB guidelines
- Maintenance of provincial TB registry on behalf of the Provincial Health Officer
- Conduct ongoing provincial TB surveillance, epidemiologic analysis and scientific evaluation e.g., provide quarterly reporting of cases to each health authority and produce an annual report on TB for BC
- Share relevant and up-to-date information on the BCCDC website
- Provide public awareness and education on TB prevention and treatment to assist with early diagnosis, early treatment and stigma reduction
- Provide appropriate reporting of BC data to the Public Health Agency of Canada and other stakeholders
- Liaise with PHAC and CIC Canada regarding policies, international air travel cases, and migrants
- Take media lead on multi-regional or provincial TB issues, including bus conveyances
- Dedicated nurse coordinates contact tracing activities for Vancouver, Richmond, and the North Shore. Contact tracing for FHA is handled out of the New Westminster clinic. This position also is responsible for lower mainland hospitals and all airline contacts

TB Services Review

The TB Strategic Plan was developed through 34 intensive discussion sessions with a broad range of individuals and organizations. Discussion sessions were conducted with the five regional health authorities, the Provincial Public Health Microbiology and Reference Laboratory, BC Centre for Disease Control, immigrant serving organizations, agencies that support persons with HIV/AIDS, Aboriginal, First Nations and Métis organizations, health care professionals, organizations that support workplace health and safety, federal and provincial correctional services, and a patient advocacy organization.

This Strategic Plan reflects the input from the discussion sessions as well as a review of the BC Centre for Disease Control Provincial TB Elimination Strategy, the FNIHB TB Program Performance Indicators and Targets (draft), and the United Nations Millennium Development Goals regarding TB. Major themes derived from this input are presented in the strengths, weaknesses, opportunities and challenges analysis below (Table 3).

As discussions across the province were carried out to inform this plan, a number of recurring and longstanding issues became apparent. Such issues included inconsistent responses to TB outbreaks; screening programs that differed from jurisdiction to jurisdiction; patient follow-up and contact investigation procedures that differed with procedures in other areas, even within the same health authority; uncertainty of roles for service provision to First Nations communities; and uncertainty of responsibility for clinical and public health service provision between TB Control and the regional health authorities. Overall, these issues reflect the effects of a series of major health system reorganizations on the tuberculosis program. These and other issues will be addressed through the goals, objectives, and actions of this strategic plan.

A list of organizations that participated in the TB Discussion Sessions is provided in Appendix A.

Table 3: Analysis of Tuberculosis Service Delivery in British Columbia

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Centralized expert TB services that provide provincial surveillance, medication management, patient and provider education, reference laboratory, and field consultative support. 2. Well-established partnerships with other public health laboratory services and FNIHB. 3. Robust public health legislative framework. 4. Connected and coordinated communicable disease expertise through the regional health authorities. 5. Non-government partners who are willing to support and assist with provision of TB services. 	<ol style="list-style-type: none"> 1. Regional differences in public health response across BC create variation in prevention, testing, and care, which can contribute to inconsistency in outbreak response and general service provision. 2. Lack of coordinated effort for high quality TB surveillance. 3. Delayed reporting of centralized surveillance data to regional health authorities. 4. Uncertainty about allocation of screening resources, including possible misallocation to low-risk groups. 5. Inconsistent engagement of new Canadians from high-prevalence countries for LTBI therapy
Opportunities	Challenges
<ol style="list-style-type: none"> 1. Increase spread and depth of education and TB literacy activities (e.g. through social marketing). 2. Develop consistent approach to outbreak management. 3. Redirect screening resources towards people at high risk of TB. 4. Apply new laboratory technologies such as IGRA, genomics, and PCR-based drug resistance testing. 5. Articulate and align roles and responsibilities of BCCDC and each RHA, and within RHAs. 6. Improve engagement with First Nations in the context of the Tripartite Agreement. 7. Linkages with other governmental and non-governmental social service agencies to address health inequities. 8. Improve linkages with Citizenship and Immigration Canada to strengthen surveillance, extend reach, and enhance engagement of new Canadians. 9. Improve linkages with correctional health services to improve continuity of care for admitted and released inmates. 10. Enhance surveillance and reporting activities. 11. Develop consistent infection control and occupational health process in health care settings. 12. Develop a coordinated and collaborative scientific evaluation and evaluation plan. 13. Engage new partners in TB service delivery (e.g. Directly Observed Therapy, health promotion, advocacy). 14. Integrate TB services into relevant chronic disease services. 	<ol style="list-style-type: none"> 1. Rising prevalence of people with chronic disease that predispose to TB reactivation (e.g. diabetes, cancer, renal disease, HIV). 2. Endemic spread of drug resistant TB (MDRTB) elsewhere in the world. 3. Increasing immigration from countries with high rates of TB and drug resistant TB. 4. Financial constraints.

Strategic Plan

A roadmap for reducing the incidence and impact of TB in BC is contained in five strategic goals, which are supported by detailed objectives and strategies. Their implementation is, in turn, guided by seven principles and values that are the foundation on which this Strategic Plan is built, and are intended to guide decision-makers and service providers in their day-to-day operations.

Principles and Values

Collaboration

TB service providers must collaborate in order to ensure seamless, low-barrier service delivery. Collaboration supports information sharing, communication and relationship building. Collaboration with and among community partners is essential to meet the needs of people with specific vulnerabilities. All TB service providers must have a clear understanding of their roles and responsibilities in achieving TB service delivery goals.

Patient-centered holistic care

TB service delivery must be patient-centred through ensuring multiple points of access, removing barriers and delivering services in a culturally competent manner. Patients can also assist in generating knowledge with respect to TB, and promoting awareness by teaching the general public. All partners will continue to not only improve access, but meaningfully engage patients into a health care system that supports and promotes a holistic vision of health.

Embracing innovation

To expand the reach of its programs and optimize TB service delivery, BC must be creative and innovative. This can occur through the use of new technology or implementing new strategies for reaching people with specific vulnerabilities.

Best evidence

Both the general public and health care professionals must be confident that the management of TB is based on the best available data and subjected to rigorous standards of analysis. A strong TB delivery services system must be supported by policies and procedures based in evidence and best practices.

Building capacity

Building capacity means developing, fostering, and supporting both the resources and the relationships required for TB service delivery at individual, organizational, inter-organizational, and systems levels. It also includes reporting on the collaborative processes developed, and sharing lessons learned.

Accountability, efficiency, and cost-effectiveness

TB services must be delivered efficiently and make the best use of limited resources by seeking all opportunities to achieve the best value. Services should also support community action initiatives.

Ethical, fair, and equal access and engagement

Directly addressing poverty, access and health care engagement, overcrowding and inadequate housing combined with supporting health literacy and an improved system of care for TB will result in further reductions in the TB burden.

Healthy public policy

Advocating for the health of patients and developing policy to increase health literacy among the general public as well as health care professionals will create a supportive environment where optimal TB-related outcomes can be achieved.

Plan at a Glance—Vision, Mission and Goals

VISION				
Tuberculosis incidence and transmission in BC will be greatly reduced.				
MISSION				
Improve health in British Columbia by continuing to reduce the incidence of tuberculosis and its effects on individuals, families and communities through collaboratively delivered TB services, based on the best evidence and in a culturally competent manner.				
Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
Reduce incidence of active tuberculosis in BC by 50 per cent by 2022.	Prevent transmission of tuberculosis within BC, in part by addressing social determinants of health such as housing, mental health and addictions treatment.	Prevent the development of active tuberculosis in those with latent infection, especially in new immigrants from high prevalence countries.	Ensure that the public health tuberculosis response is robust, timely and able to meet ongoing and outbreak needs.	Ensure state-of-the-art laboratory programs, treatment, and care of people who develop tuberculosis to improve outcomes and reduce the risk of spread.

Priority Actions

The following priority actions link to the plan's goals and objectives (pages 25 – 31) and outline the areas where immediate attention is needed. They reflect two important aspects of moving forward: responding to immediate, pressing needs, and taking steps that will lay a solid foundation for future activities. They are not intended to be ranked, rather they are to be acted upon concurrently; action on some are already underway, with the remainder to be initiated by February 2013.

Articulate and align roles and responsibilities

- Work with the Primary Care and Public Health Tripartite Strategy Council to ensure collaborative service planning for First Nations in the context of the Framework Agreement and the Tripartite First Nations Health Plan. *(Goal 2, Objective 1.3)*
- As a tool to achieve many of the action and goals within the plan, each regional health authority and the BCCDC will develop service level agreements that define service level and resource allocation expectations of each party, including lab efficiencies. *(Goal 4, Objective 4.1)*

Enhance surveillance capacity

- Formalize a TB surveillance network that enables assessment of performance targets. *(Goal 4, Objective 1.1)*
- Formalize a process that communicates TB data between the BCCDC, Provincial Health Labs and regional health authorities in a timely manner. *(Goal 4, Objective 1.1)*
- Establish a TB surveillance lead in each regional health authority. *(Goal 4, Objective 1.3)*
- Establish tripartite protocols regarding Aboriginal TB surveillance data management. *(Goal 4, Objective 1.4)*

Improve monitoring and evaluation

- Develop monitoring and scientific evaluation priorities and review them biannually. *(Goal 4, Objective 5.1)*
- Develop a mechanism for sharing monitoring and evaluation results with stakeholders. *(Goal 4, Objective 5.3)*

Improve occupational health screening

- Reassess the occupational health and safety screening policy to identify workers or volunteers that warrant screening. *(Goal 2, Objective 2.1)*
- Improve the recording and monitoring of occupational safety screening results. *(Goal 2, Objective 2.3)*

Increase engagement, screening and treatment in high risk populations

- Utilize the BC Centre for Disease Control TB Manual, Canadian TB Standards and ATS Guidelines as resources to implement comprehensive screening for TB and LTBI. *(Goal 2, Objective 2.6)*
- Improve TB screening and identify and implement strategies to improve LTBI therapy adherence in high risk populations through active scientific evaluation, engagement and input from community stakeholders. *(Goal 3, Objective 1.3)*

Improve laboratory capacity

- Develop the BC Public Health Lab Network to empower work with regional health authority microbiology labs on better testing (for both TB and LTBI cases). *(Goal 5, Objective 2.1)*
- Support improvements needed to provide an appropriate level of enhanced molecular testing. *(Goal 5, Objective 2.2)*

Improve health literacy activities

- Broaden provincial awareness of TB and reduce associated stigma through community strategies including the promotion of regular events such as World TB Day (March 24th), Aboriginal-specific events and annual health/services fairs for new immigrants put on by MOSAIC and SUCCESS. *(Goal 4, Objective 3.2)*
- Identify existing TB educational programs for health care practitioners that may be adapted for use in BC. *(Goal 4, Objective 3.4)*

Improve contact tracing and outbreak investigation

- Develop a protocol to identify clusters versus outbreaks; manage and evaluate response to TB outbreaks and ensure a timely and seamless approach to TB outbreak management. *(Goal 4, Objective 2.1)*
- Increase the use of the standardized contact tracing approach outlined in the BCCDC TB Control Manual. *(Goal 4, Objective 2.2)*

Improve the management of active tuberculosis

- Develop guidelines for responding to people at high risk for non-adherence. *(Goal 5, Objective 3.1)*
- Expand DOT (directly observed therapy) TB treatment programs
 - Incorporate DOT TB treatment into other drug treatment platforms, e.g. for HCV, HIV, STIs, and the provision of methadone. *(Goal 5, Objective 3.2)*
- Explore the feasibility of including TB in provincial Chronic Disease Management Initiative. *(Goal 5, Objective 3.4)*
- Allocate resources to improve management of TB in high risk populations *(Goal 5, Objective 3.6)*
- Ensure that hospitals, correctional facilities, and public health work together to put community follow-up plans in place prior to individuals being discharged or released. *(Goal 5, Objective 4.1)*

Milestones

Milestones will help to mark progress at various stages over the course of the next 10 years. These milestones will serve as indicators of success and will be a component of the accountability framework to ensure that the objectives and actions set out below are achieving the goals set out in the plan.

1. By 2022 British Columbia will reduce the incidence of active tuberculosis by 50 per cent.¹⁹

- From 2005 - 2008, the overall incidence rate of TB in the province was 7.1 per 100,000 people.²⁰

2. By 2022 British Columbia will reduce the incidence of active tuberculosis in specific high risk and vulnerable groups by 50 per cent:

- Foreign born people from TB-endemic countries
- People with HIV infection
- Aboriginal peoples
- Homeless and under-housed populations

From 2005 - 2008, the incidence rate of TB in Aboriginal peoples was 32.2 per 100,000 people; the rate in foreign-born individuals was 19.2 per 100,000 people; the estimated rate of TB in HIV positive populations is 138 per 100,000 people.

The achievement of this milestone will limit secondary spread from these groups and consequently decrease the overall incidence of TB in British Columbia.

3. By 2017, all performance targets from the Canadian TB Strategy will be reached in:

- Microbiological diagnosis of TB
- HIV serologic testing
- Treatment of TB
- Contact follow-up
- Targeted screening for active tuberculosis and latent tuberculosis infection
- Immigration medical surveillance

¹⁹ In 2006 the Canadian TB Committee reviewed the national goal in the context of targets set by the STOP TB Partnership and recommended targeting a reduction in TB incidence 50 per cent by 2015 compared to 1990 levels (targeting 3.6/100,000 by 2015). The Public Health Agency of Canada has endorsed these goals. This was a 9-year goal. The BC Strategic Plan allows 10 years to reach this goal.

²⁰ BC Centre for Disease Control. Tuberculosis Control Annual Report. Accessed November 21, 2011:

http://www.bccdc.ca/NR/rdonlyres/4E5E68CC-12CD-42A5-88DC-7CE57E31FEAE/0/2005_2008MultiAnnualTBReport_LowResAmended_Nov10.pdf

Implementation and Evaluation

Successful implementation and measurement requires establishing targets, benchmarks, and standards associated with system-wide progress and success. A mechanism to ensure accountability for everything described in this strategic plan, especially the specific actions, will be established to guarantee meaningful action is taken. This mechanism will take the form of a committee comprised of the major stakeholders that will be responsible for reaching the milestones, with particular attention on the priority actions.

The committee will provide annual progress reports and updates to the Communicable Disease Policy Advisory Committee, construct a work plan, and develop an evaluation protocol among key partners, designed to complement existing monitoring activities and answer key questions. For instance, over time, are more at-risk people engaged in seeking and receiving treatment for TB? Has TB literacy improved? Has the capacity of the service delivery system been improved?

This plan has been developed to serve as a guide. Formal public progress reporting will be completed each year, beginning in 2013. Information gathered through program evaluation and surveillance will be provided as part of a continuous feedback loop to assist policy makers, managers, and service providers to make sound program decisions, and ensure public accountability. Information will also be distributed more broadly to encourage changes in attitudes and behaviours at the individual, family, and community level.

Over the long-term, progress reports will track advancement on attaining the plan's outcomes by answering the following questions:

- Have the plan's goals and milestones been attained?
- Are there improvements in program and policy to reach these milestones?
- Specifically, are there improvements in program and policies that address high risk populations?
- Are we on track to greatly reduce the transmission of TB in BC?

Goals, Objectives and Actions

Strategic Goal 1 - Reduce incidence of tuberculosis in BC by 50 per cent by 2022.

Strategic Goal 2 - Prevent transmission of tuberculosis within BC, in part by addressing social determinants of health such as housing, and mental health and addictions treatment.

OBJECTIVES and ACTIONS:

1. Reduce the transmission of tuberculosis by addressing determinants of disease spread.

- 1.1 Improve collaboration between the health system and social service agencies concerned with the social determinants of TB and promotion of patient wellness (e.g. shelter, housing and food security) by creating a mechanism to ensure ongoing and regular communication and information sharing between regional health authorities, TB Control, Ministry of Health, and relevant non-governmental agencies. *(Lead agency: BCCDC)*
- 1.2 Ensure that the systemic issues that affect where people live, work, and play are addressed in government plans on chronic diseases. *(Lead agency: Ministry of Health)*
- 1.3 Work with the Primary Care and Public Health Tripartite Strategy Council to ensure collaborative service planning for First Nations in the context of the Framework Agreement and the Tripartite First Nations Health Plan. *(Lead agency: Ministry of Health)*
- 1.4 Improve engagement of vulnerable people at risk for TB, and the organizations that support them, by establishing collaborative relationships that include promoting patient wellness, linking people to appropriate care, and ensuring follow-up. *(Lead agencies: Regional Health Authorities)*
- 1.5 Scientifically evaluate the role of social determinants in spreading disease, and identify areas of intervention to prevent TB transmission. *(Lead agency: BCCDC)*

2. Prevent transmission of tuberculosis in the workplace.

- 2.1 Reassess the occupational health and safety screening policy to identify workers or volunteers that warrant screening. *(Lead agency: BCCDC)*
- 2.2 Make recommendations to amend the Occupational Health and Safety Act regulations if needed. *(Lead agencies: Office of the Provincial Health Officer and the Ministry of Health)*
- 2.3 Improve the recording and monitoring of occupational safety screening results

- establish a clear process for communication between Infection Control, Occupational Health and Safety, and Public Health (example: reciprocal database access) (*Lead agencies: Regional Health Authorities*)
- 2.4 Improved understanding by employees to adhere to infection control precautions when a person with infectious TB is on a ward. (*Lead agencies: Regional Health Authorities*)

3. Employ screening programs using suitable methods (e.g., x-ray, sputum screening, symptom screening) at appropriate locations to enable early identification of TB cases among high risk groups.

- 3.1 Utilize the BC Centre for Disease Control TB Manual, Canadian TB Standards and ATS Guidelines as resources to implement comprehensive screening for TB and LTBI.

4. Reduce the transmission of tuberculosis in healthcare settings.

- 4.1 Create appropriate algorithms to triage, manage, and reduce TB transmission in health care settings. (*Lead agencies: Regional Health Authorities*)
- 4.2 Engage with the local infection control and clinical experts regarding the enhancement of infection control measures. (*Lead agency: BCCDC*)

Strategic Goal 3 - Prevent the development of active tuberculosis in those with latent infection, especially in new immigrants from high prevalence countries.

OBJECTIVES and ACTIONS:

1. Improve tuberculosis screening and treatment of populations who are at highest risk.

- 1.1 With input from community stakeholders, review and update the current TB screening policy and determine circumstances in which to introduce targeted screening for those at high risk or with specific vulnerabilities, e.g.
- persons with renal failure on dialysis
 - persons receiving anti-TNF therapy
 - persons receiving organ transplant
 - persons with diabetes mellitus
 - immigrants from high-incidence countries
 - marginalized hard-to-reach people, e.g. people who are homeless or who use psychoactive substances
 - people with HIV infection
 - Aboriginal peoples
- (*Lead agency: BCCDC*)
- 1.2 Identify the most effective venues for TB service delivery by population groups. (*Lead agencies: Regional Health Authorities*)

- 1.3 Identify and implement strategies to improve LTBI therapy adherence in high risk populations through active scientific evaluation, engagement and input from community stakeholders.

2. Improve follow-up of immigrants post-landing.

- 2.1 Improve linkages with Citizenship and Immigration Canada to strengthen surveillance, extend reach, and enhance engagement of new Canadians. *(Lead agency: Ministry of Health)*

3. Improve the identification and screening of contacts of infectious cases.

- 3.1 Increase the use of the standardized approach to contact investigations outlined in the BC Centre for Disease Control TB Manual. *(Lead agencies: Regional Health Authorities)*
- 3.2 Develop a standardized data collection protocol for contact investigation of TB. *(Lead agencies: Regional Health Authorities and BCCDC)*

Strategic Goal 4 - Ensure that the public health tuberculosis response is robust, timely and able to meet ongoing and outbreak needs.

OBJECTIVES and ACTIONS:

1. Improve tuberculosis surveillance.

- 1.1 Formalize a TB surveillance network. Issues to be addressed will include, but are not limited to:
 - assessing performance targets
 - describing TB and LTBI characteristics in each regional health authority
 - clarifying what data is acquired and analyzed
 - formalizing communication of TB data between the BCCDC, Provincial Health Labs and regional health authorities in a timely manner*(Lead agency: BCCDC)*
- 1.2 Develop provincial epidemiology capacity at BCCDC for TB. *(Lead agency: BCCDC)*
- 1.3 Establish a TB surveillance lead in each regional health authority. *(Lead agencies: Regional Health Authorities)*
- 1.4 Establish tripartite protocols regarding Aboriginal TB surveillance data management. *(Lead agencies: Ministry of Health, FNIHB, and BCCDC)*
- 1.5 Improve access for health care providers to data about people at risk for TB, including: people with HIV/AIDS, individuals on dialysis, transplant recipients, people with cancer, and people prescribed immunosuppressives. *(Lead agency: BCCDC)*

2. Improve outbreak management.

- 2.1 Develop a protocol to identify clusters versus outbreaks; manage and evaluate response to TB outbreaks and ensure a timely and seamless approach to TB outbreak management. *(Lead agencies: Office of the Provincial Health Officer and BCCDC)*
- 2.2 Increase the use of the standardized contact tracing approach outlined in the BCCDC TB Control Manual. *(Lead agencies: BCCDC and Regional Health Authorities)*

3. Improve tuberculosis literacy.

- 3.1 Develop TB literacy programs targeted towards foreign-born Canadians from TB-endemic countries, Aboriginal peoples, socially marginalized people, and those at high risk for TB who are under clinical care. *(Lead agencies: Regional Health Authorities)*
- 3.2 Broaden provincial awareness of TB and reduce associated stigma through community strategies including the promotion of regular events such as World TB Day (March 24th), Aboriginal-specific events and annual health/services fairs for new immigrants put on by MOSAIC and SUCCESS. *(Lead agencies: Regional Health Authorities)*
- 3.3 Work with organizations that support or represent at-risk groups to identify the most effective communication tools. *(Lead agencies: Regional Health Authorities)*
- 3.4 Identify existing TB educational programs for health care practitioners that may be adapted for use in BC, including:
 - developing an annual brief TB newsletter (electronic or hard copy) for physicians
 - leveraging a broad range of communication tools, e.g. Clinical practice guidelines, CME opportunities, posters, appropriate reminders/prompts on lab requisitions and lab results
 - developing a process whereby a physician is contacted after a TB diagnosis to review TB treatment protocol and resources, and
 - developing an online occupational health and safety TB course.*(Lead agency: BCCDC)*
- 3.5 Identify existing TB information toolkits for patients, their caregivers, and communities to:
 - Increase knowledge about TB, the link between TB and other chronic diseases, TB treatment, and TB transmission
 - raise awareness that TB is a serious but treatable disease
 - promote appropriate screening, testing and intervention
 - give patients confidence that they can complete TB treatment and be cured
 - educate caregivers and families about how to support TB patients
 - promote an accepting attitude for people who have TB to reduce stigma attached to TB
 - eliminate the fear that they may be deported (if they are an immigrant or refugee)*(Lead agency: BCCDC)*
- 3.6 Collaborate with provincial corrections to develop client-centred education for inmates. *(Lead agencies: Regional Health Authorities and BCCDC)*

- 3.7 Work with the University of BC to develop a module about TB for the Intercultural Online Network (iCON). *(Lead agency: BCCDC)*
- 3.8 Where possible, integrate TB education into existing material or programs for associated diseases, e.g. the Advocacy for Hepatitis Care and Support Workbook. *(Lead agencies: Regional Health Authorities)*
- 3.9 Ensure that written materials are available in a variety of languages that reach new immigrants. *(Lead agencies: Regional Health Authorities)*
- 3.10 Engage in discussions with the Métis Nation to include information about TB in the National Métis Nation Health Action Plan. *(Lead agency: BCCDC)*
- 3.11 Offer information sessions to Aboriginal and immigrant-serving organizations on new scientific evaluations, treatments, diagnostics, best practices and the provision of medication. *(Lead agencies: Regional Health Authorities)*
- 3.12 Set up educational opportunities in areas frequented by socially marginalized people, e.g. social service agencies, soup kitchens and street level clinics. *(Lead agencies: Regional Health Authorities)*
- 3.13 Leverage the use of existing web-based and telephone services (e.g. #8-1-1) to communicate and educate broadly about TB. *(Lead agencies: Regional Health Authorities)*
- 3.14 Finalize and disseminate the TB program background papers that were developed to inform this strategic plan (see list in Appendix D). *(Lead agency: BCCDC)*

4. Align roles and responsibilities of the BCCDC and the regional health authorities with respect to service delivery within each region.

- 4.1 Using the BCCDC TB Manual and the roles and responsibilities described on page 11 as a starting point, each regional health authority and the BCCDC will develop service level agreements that define service level and resource allocation expectations of each party, including lab efficiencies. *(Lead agencies: Regional Health Authorities and BCCDC)*

5. Establish a tuberculosis scientific evaluation agenda that includes the socio-cultural aspects of TB service delivery and uptake.

- 5.1 Develop monitoring and scientific evaluation priorities and review them biannually. *(Lead agencies: Regional Health Authorities and BCCDC)*
- 5.2 Identify the direct health costs and indirect costs of TB in BC to inform decisions regarding planning for TB. *(Lead agency: BCCDC)*
- 5.3 Develop a mechanism for sharing monitoring and evaluation results with stakeholders. *(Lead agency: BCCDC)*
- 5.4 Identify sources of funding and opportunities for TB related scientific evaluation e.g. BC Lung Association, Michael Smith Foundation, and universities. *(Lead agency: BCCDC)*

- 5.5 Review how outreach is currently done to determine if it is effective. *(Lead agencies: Regional Health Authorities and BCCDC)*
- 5.6 Review public health capacity to deal with TB in rural and remote communities. *(Lead agencies: Regional Health Authorities)*
- 5.7 Enhance the molecular and genomic-based infrastructure, as well as other resource requirements, to enable the scientific evaluation and evaluation capacity of the Provincial Public Health Labs. *(Lead agency: Provincial Public Health Microbiology and Reference Laboratory)*

Strategic Goal 5 - Ensure state-of-the-art public health laboratory and clinical programs for the diagnosis, treatment and prevention of tuberculosis.

OBJECTIVES and ACTIONS:

1. Maintain a strong, centralized resource of tuberculosis expertise in BC.

- 1.1 Recruit, support, and retain clinical and laboratory experts in TB. *(Lead agencies: BCCDC and Provincial Public Health Microbiology and Reference Laboratory)*

2. Improve diagnosis of active and latent tuberculosis.

- 2.1 Develop the BC Public Health Lab Network to empower work with regional health authority microbiology labs on better testing (for both TB and LTBI cases). *(Lead agency: Provincial Public Health Microbiology and Reference Laboratory)*
- 2.2 Support improvements needed to provide an appropriate level of enhanced molecular testing. *(Lead agency: Provincial Public Health Microbiology and Reference Laboratory)*
- 2.3 Assess the provincial diagnostic laboratory system related to TB to determine if services for public health, surveillance, infection control and patient care are optimal. *(Lead agency: Provincial Public Health Microbiology and Reference Laboratory)*
- 2.4 Link to existing methods of systematically approaching new technology assessments, their application to screening and diagnostics, and making recommendations (e.g. Canadian Agency for Drugs and Technologies in Health). *(Lead agency: Provincial Public Health Microbiology and Reference Laboratory)*
- 2.5 Develop a business case for broader implementation of interferon gamma release assay (IGRA) and make recommendations to support policy development. Issues to be considered include, but are not limited to:
 - how IGRA testing will be used to screen populations with specific vulnerabilities,
 - the use of IGRA for the general population,
 - the use of IGRA if there is a tuberculin skin test (TST) cluster in an institution,
 - the point in the clinical pathway at which IGRA testing should be used, and
 - funding for IGRA testing.

(Lead agency: BCCDC and Provincial Public Health Microbiology and Reference Laboratory)

- 2.6 Implement the use of tests which detect drug resistance early in diagnosis *(Lead agency: BCCDC and Provincial Public Health Microbiology and Reference Laboratory)*

3. Improve treatment of tuberculosis.

- 3.1 Use, develop or update guidelines for TB treatment adherence, including:
- when to use DOT
 - guidelines for responding to people at high risk for non-adherence
 - the use of cell phones, email, and social media
 - the appropriate use of family, friends or peers
- (Lead agency: BCCDC)*
- 3.2 Incorporate DOT TB treatment into other drug treatment platforms, e.g. for HCV, HIV, STIs, and the provision of methadone. *(Lead agencies: Regional Health Authorities)*
- 3.3 Expand the use of lay community health workers as liaisons between the nurse and the patient to do confidential outreach for Aboriginal people who live off-reserve. *(Lead agencies: Regional Health Authorities)*
- 3.4 Explore the feasibility of including TB in the provincial Chronic Disease Management Initiative. *(Lead agency: Ministry of Health)*
- 3.5 Ensure that the information supporting the management of multi-drug resistant TB (MDRTB) is up to date and that the information is communicated and clearly understood by health care practitioners. *(Lead agency: BCCDC)*
- 3.6 Explore opportunities to allocate resources to improve management of TB in high risk populations *(Lead agency: BCCDC and Regional Health Authorities)*

4. Improve continuity of care for hospitalized patients and inmates of correctional institutions.

- 4.1 Ensure that hospitals, correctional facilities, and public health work together to put community follow-up plans in place prior to individuals being discharged or released. *(Lead agencies: Regional Health Authorities)*

Glossary

Aboriginal: Aboriginals are considered all Indigenous people of Canada, including Status and Non-Status Indian, Métis and Inuit people. Indigenous has been interchanged with Aboriginal, Native, Native Peoples and First Peoples, and is generally used internationally. The term Aboriginal should always be capitalized.

Active TB: Refers to TB infection in any part of the body that has become symptomatic, but does not imply whether there is any risk of transmission. This is also known as TB disease.

Cluster: an unexpected grouping in time, place or population of disease; also refers to an outbreak in a defined group.

Control: in context of when an outbreak is under control, control means returning to the baseline incidence (normal) for that population.

Directly Observed Therapy (DOT): Directly Observed Therapy (DOT) is the process whereby the ingestion of every dose of medication is directly observed in order to improve a patient's ability to adhere to a complex or challenging medication regimen.

First Nation(s): The term First Nations came into common usage in the 1970s to replace band or Indian, which some people found offensive. Despite its widespread use, there is no legal definition for this term in Canada. The term First Nation should always be capitalized.

First Nations People - Many people prefer to be called First Nations or First Nations People instead of Indians. The term is not a synonym for Aboriginal Peoples because it doesn't include Inuit or Métis. The term First Nations People generally applies to both Status and Non-Status Indians.

First Nation - Many bands started to replace the word band in their name with First Nation in the 1980s. It is a matter of preference by individual First Nations/bands.

Health Promotion: the process of enabling people to increase control over, and improvement of their health.

Incidence rate: the rate of new events occurring in a population of a given size. The numerator is the number of new events that occur in a defined period, the denominator is the population at risk of experiencing the event during this period.

Infection Control: the discipline concerned with preventing infection in health care settings.

Infectious TB: An active TB infection that is transmissible to others.

Latent TB: TB infection that persists in a host without evidence of clinically active disease or transmission risk.

Outbreak: a higher incidence of a disease than normally expected in specified timeframe, place and or population.

Prevalence: the number of people with disease in a given population at a specified time.

Primary Prevention: actions aimed at reducing the incidence of disease in a population

Public health surveillance: ongoing and systematic collection, analysis and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice. [WHO]

Pulmonary TB: a TB infection of the lungs and conducting airways; the only site of infection that is commonly infectious and transmissible to others.

Screening: the identification of unrecognized disease risk in apparently well persons by the application of tests and or examinations.

Sensitivity: is the proportion of truly diseased persons in a screened population who are identified as diseased by the screening test, true positive rate.

Specificity: is the proportion of truly non-diseased persons who are identified by the screening test; true negative rate.

Surveillance: ongoing observations to detect changes in trend or distribution of a health/disease/death issue in order to initiate investigation and or control measures.

TB Disease: see Active TB.

Appendices

APPENDIX A: LIST OF TB CONSULTATION SESSIONS

APPENDIX B: HIGH LEVEL OUTLINE OF AN OUTBREAK IDENTIFICATION, MANAGEMENT AND REVIEW PROTOCOL

APPENDIX C: AREAS OF SCIENTIFIC EVALUATION IDENTIFIED DURING THE TB CONSULTATION SESSIONS

APPENDIX D: LIST OF TB STRATEGIC PLAN BACKGROUND PAPERS

Appendix A: List of TB Consultation Sessions

During the spring of 2011, 34 TB discussion sessions were held with health authority front-line and management staff, and representatives from governmental and non-governmental organizations including the Aboriginal community, Health Canada, immigrant serving organizations, organizations engaged with HIV/AIDS and federal and provincial corrections. In total over 100 individuals participated in the discussion sessions.

Discussion session participants provided the project team with numerous ideas and suggestions. Feedback was recorded and common themes were incorporated into the strategic plan and stakeholders had an opportunity to review the draft strategy.

The project team wishes to extend its sincere appreciation to all those who participated in the discussions and shared their commitment, energy, and enthusiasm.

Federal and Provincial Government

Health Canada - First Nations Inuit Health Branch
BC Ministry of Health
Office of the Provincial Health Officer
Citizenship and Immigration Canada
Correctional Service of Canada
Ministry of Public Safety and Solicitor General, British Columbia Corrections Branch

Provincial Health Services Authority

BC Centre for Disease Control – TB Prevention and Control
BC Public Health Microbiology and Reference Laboratory
BC Cancer Agency
BC Children's Hospital and Sunny Hill Health Centre for Children
BC Women's Hospital & Health Centre
BC Provincial Renal Agency
BC Transplant
BC Mental Health & Addiction Services

HIV/AIDS

BC Centre for Excellence in HIV/AIDS
Pacific AIDS Network (PAN)
Positive Living North

Immigrant Serving Agencies

MOSAIC
SUCCESS
Progressive Intercultural Community Services

Health Authorities

Fraser Health Authority
Vancouver Island Health Authority
Interior Health Authority
Northern Health Authority
Vancouver Coastal Health Authority

Aboriginal Organizations

BC Association of Aboriginal Friendship Centres
Métis Nation of BC
Inter Tribal Health Authority
Nuu-chah-nulth Tribal Council

Other Stakeholders

University of BC – School of Population and Public Health
BC Lung Association
Patient Voices Network
Public Health Association of BC
WorkSafe BC

Appendix B: High-level Outline of an Outbreak Identification, Management and Review Protocol

The Outbreak Identification, Management and Review Protocol will include but is not limited to the following:

- Principles that are the foundation of the approach, e.g.
 - Integrated case management.
- Definitions that explain the difference between an emergency, a cluster, and an outbreak, what it means to 'control' an outbreak.
- The triggers/red flags for when to initiate a phone call or meeting because of a possible outbreak.
- Whose responsibility it is to declare an outbreak.
- The triggers for when to start outbreak control.
- Key processes/steps in an outbreak, e.g.
 - The regional health authority staff and the BC PHMRL to CDC for a briefing and planning session.
 - Identify any new partners specific to the outbreak, e.g. employers of migrant workers if outbreak concentrated in that population; immigrant serving societies if outbreak concentrated in a particular group.
- Clearly defined and documented roles and responsibilities of all stakeholders (use BC Emergency Response Management System as a possible model).
- Expected costs/areas of cost
 - How funding will be handled when costs are beyond the base budget.
- Resources/capacity
 - How to assemble and outbreak team [*Nuu-chah-nulth Tribal Council has an example*]
 - How to ensure clinical, public health, and laboratory surge capacity
 - Key aspects of flexible resourcing for outbreaks.
- Challenges in an outbreak, e.g.
 - Finding possible contacts for testing purposes – the use of network analysis to find the 'nodes' where people go where there is not TB presence, i.e. soup kitchens
- Outbreak control for cluster outbreaks
 - Note: Cluster implies the same organism (genotyping; molecular genotyping) and showing recent transmission. This shows importance of early contact tracing.
 - Define and support the role of the BC-PHMRL and its networks in the epidemiological aspect of detecting and characterizing TB.
 - Define the need to provide molecular characterization of all TB strains.
 - Define how BC-PHMRL can use GIS to communicate laboratory molecular epidemiology data.
 - Epidemiological support for mapping transmission.
- Communication channels including:
 - Clarifying who interacts with the media

- Communication between the Lab and others
 - Communication with partners, e.g. emergency room doctors
- Data sharing
 - Developing a database for the purposes of the outbreak; use outbreak software if available
 - What data is shared, when, and by/to, whom
- Statement of criteria for determining that an outbreak is over, e.g. returning to the background level is not necessarily a good criteria
- Clear process for gathering 'lessons learned' at the end of the outbreak, including:
 - Meetings to de-brief including a discussion as to why the smear positive cases were missed.
 - Written documentation of the outbreak, issues, and lessons learned
 - Process to modify the template for next time
- Final outbreak documentation
 - All outbreaks should be written up and shared

Appendix C: Areas of scientific evaluation identified during the TB Consultation Sessions

The following ideas were identified during the TB Discussion Sessions as possible areas for scientific evaluation:

- scientific evaluation on the value of conducting baseline screening for entire groups of workers
- what lessons can we learn from the First Nations communities whose incidence of TB is now much closer to the incidence for non-First Nations people
- focused study on which people reactivate in the first five years after emigrating to Canada to identify risk factors and help support targeted screening
- qualitative scientific evaluation on how to improve adherence to the TB treatment
- review scientific research on populations at high risk for non-compliance in order to ensure that the treatment approach is based on the best evidence
- scientific evaluation to develop a cost-effective TB test with high levels of specificity and sensitivity
- support ongoing work around rapid quantitative molecular tests for TB that have the potential to replace traditional acid-fast smears
- scientific evaluation into modelling the utility of implementing decentralized rapid molecular testing (Cepheid Gene Xpert) for TB across BC (in progress)
- scientific evaluation into molecular tests for detection of MDR-TB and other drug resistant forms of TB
- evaluate the usefulness of universal genotyping of all TB isolates and sharing of data with other provincial and national partners
- applying genomics-based methods for tracking TB transmission within outbreaks
- support analysis of new tools for surveillance
- participating in multi-centre scientific research, nationally and internationally, to address the question of the role of IGRA testing in paediatric TB
- ethical issues associated with TB treatment
- what type of health promotion is most effective
- scientific evaluation on effective methods to reduce stigma
- undertake epidemiological and laboratory scientific research on TB in each regional health authority in partnership with necessary partners (Provincial Public Health Laboratory, community workers, etc) to inform program delivery
- evaluate whether the current TB Control program is having an effect among overall prevalence rates in immigrants
- evaluate the effectiveness of integrated service delivery including the provincial laboratory network
- review how outreach is currently done to determine if it is effective
- review the Public Health capacity to address these public health issues in rural and remote communities
- Enhance the capacity of the Provincial Public Health Microbiology & Reference Laboratory to undertake scientific evaluations

Appendix D: List of TB Strategic Plan Background Papers

The following background papers are available upon request from the BCCDC:

Background paper #1 – Overview of current TB situation: Globally, in Canada, and in BC

Background paper #2 – Organization of TB Service Delivery in BC: Partnerships and Integrated Responsibilities

Background paper #3 – Active Case Management: Prompt Diagnosis and Effective Treatment

Background paper #4 – Surveillance; Outbreak Detection and Management; Infection Control; and Contact Tracing

Background paper #5 – Targeted Testing and Treating of LTBI

Background paper #6 – Enhanced Strategies for Vulnerable Demographic Groups

Background paper #7 – Contributing to Global TB Control Efforts

Background Paper #8 – Role of the British Columbia Public Health Laboratory and Its Networks for the Diagnosis, Management, Prevention and Control of TB