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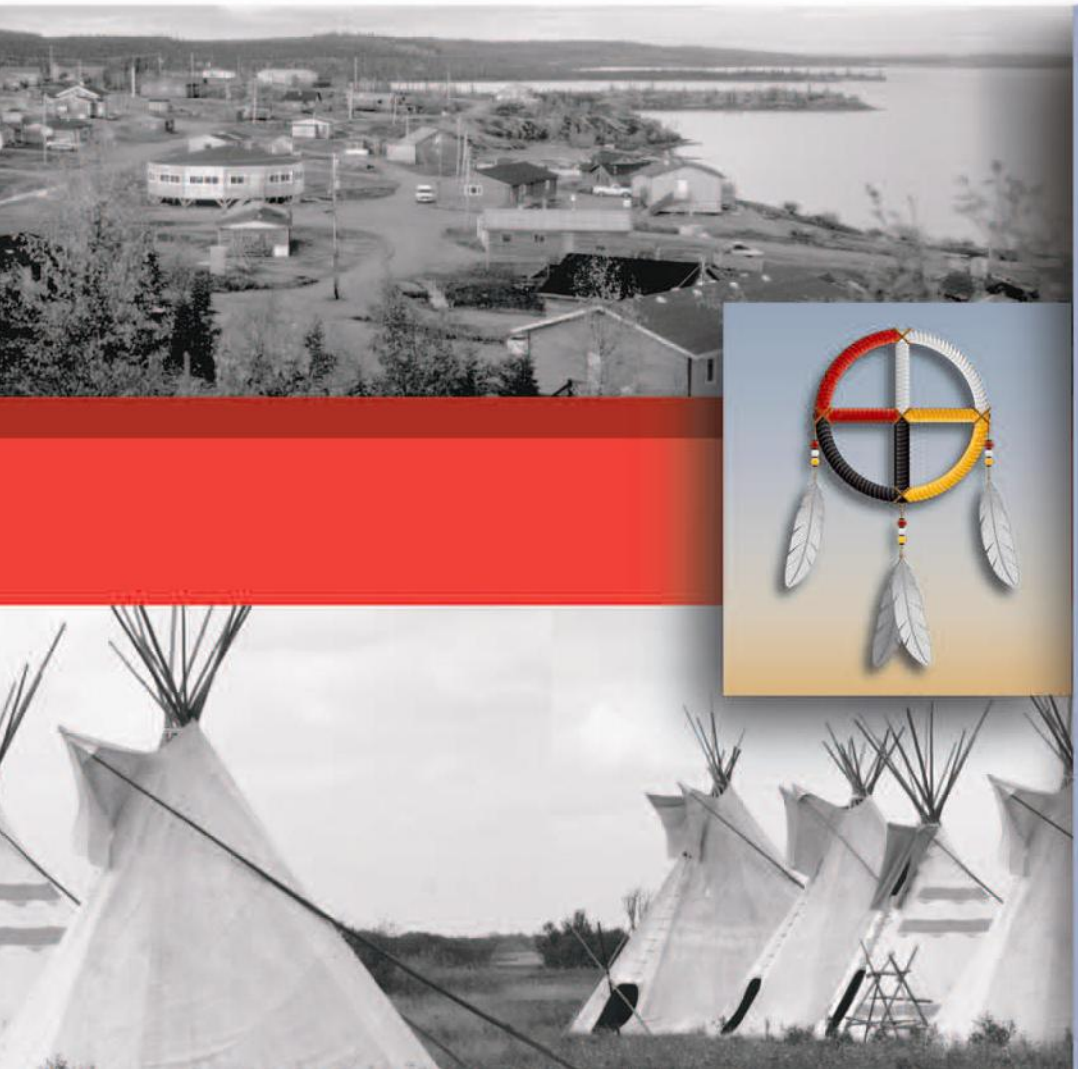
Health Canada's Strategy Against Tuberculosis for First Nations On-Reserve



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The renewal of *Health Canada's Strategy Against Tuberculosis for First Nations On-Reserve* was developed by a committee of experts from the following organizations and/or sectors:

- Aboriginal Affairs and Northern Development Canada (AANDC)
- Assembly of First Nations (AFN)
- Canadian Tuberculosis Committee's Aboriginal TB Scientific Subcommittee
- Chief Medical Officer of Health, Nunavut
- First Nations and Inuit Health Branch (FNIHB), Health Canada
- Health Canada's Regional Programs
- Inuit Tapiriit Kanatami (ITK)
- Provincial TB programs
- Public Health Agency of Canada (PHAC)
- University of Alberta

The members of this committee were selected for their professional expertise. Their participation in this group and the resulting Health Canada's Strategy Against TB should not necessarily be construed as support or endorsement by their affiliated base organizations.

The purpose of this document is to inform TB prevention and control programs that service the First Nations on-reserve, including provincial and Health Canada's regional TB programs, and community leadership.

Preface

In 1992, the Medical Services Branch of Health Canada released the National Tuberculosis Elimination Strategy[1]. Its goal was the elimination of tuberculosis (TB) among Canada's Aboriginal peoples by the year 2010.

In 2005, a panel of TB experts found that despite the considerable efforts of all levels of government and stakeholders, elimination of this disease among Aboriginal peoples in Canada would not be possible by 2010[2], [also see 3]. In addition to continuing disparities in TB, this review made it evident that a renewed focus and new approaches were needed to further reduce TB in First Nation communities. For Health Canada, this led to the renewal of its 1992 Strategy, resulting in *Health Canada's Strategy Against Tuberculosis for First Nations On-Reserve*.

The persistence of tuberculosis in Aboriginal populations is the result of a complex set of factors. From a public health perspective, these include the existence of high-risk sub-populations such as people with HIV-TB co-infection, diabetes or mental health issues, or people living in high incidence communities and areas with a high prevalence of latent TB infection (LTBI). Examples of challenges that can result from TB in these sub-populations include complications resulting from the need to treat more than one disease or adherence to antibiotic treatment that can last up to a year[e.g. 4, 5, 6, 7].

There are also critical social factors, such as overcrowding and poverty that can create significant health disparities in diseases, including TB. Although the social determinants of health do not cause TB, they can significantly increase the risk of transmission, infection and progression from latent infection to active disease through factors such as overcrowding, smoking or poor nutrition[7, 8].

The multi-jurisdictional nature of the health system serving Aboriginal populations further complicates the fight against TB. While provinces and territories have the legislated authority for TB prevention and control within their jurisdictions, First Nation and Inuit organizations and communities also play an important role in TB prevention and control. At the same time, Health Canada works to assure that appropriate and effective TB prevention and control services are available to First Nations on-reserve.

As First Nations people are a relatively mobile population, a lack of collaboration among these health systems can hinder case and contact management. This can result in delayed diagnosis and a lack of continuity of care. Delayed diagnosis prolongs the length of time a contagious case is left untreated and thus may increase disease transmission within a community. Lost cases often lead to interrupted or incomplete treatment, and incomplete treatment can lead to renewed infectiousness and/or the development of drug- resistant TB[9]. These and other factors contribute to increased morbidity and mortality associated with TB as well as increased program costs.

The multitude of factors that influence TB rates in First Nation populations clearly demonstrates that fighting this disease is a responsibility shared by many jurisdictions and partners. All levels of government and First Nations leadership must renew and strengthen their partnerships in order to address not only the disease itself, but also the underlying factors that influence the spread of TB.

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List of Acronyms

AANDC — Aboriginal Affairs and Northern Development Canada

AFB — acid fast bacteria

AFN — Assembly of First Nations

BCG — Bacille-Calmette-Guérin vaccine

CTBRS — Canadian Tuberculosis Reporting System

DOPT — Directly Observed Preventive Therapy

DOT — Directly Observed Therapy

FNIHB — First Nations and Inuit Health Branch

HRSDC — Human Resources and Skills Development Canada

IGRA — interferon-gamma release assay

ITK — Inuit Tapiriit Kanatami

LTBI — latent tuberculosis infection

MDR-TB — multidrug-resistant tuberculosis

PHAC — Public Health Agency of Canada

RHA — Regional Health Authorities

SCRAP-TB — Strategic Community Risk Assessment and Planning for Enhanced Tuberculosis Programming

SES — socioeconomic status

TB — tuberculosis

Executive Summary

Health Canada works to assure that appropriate and effective tuberculosis (TB) prevention and control services are available to First Nations on-reserve. This is the population identified under Health Canada's TB prevention and control mandate. Health Canada provides TB services directly or funds communities, provinces and/or regional health authorities to provide these services, or assures that appropriate and effective services are accessible to these populations.

For populations that fall outside its mandate, including First Nations living off reserve and Inuit, Health Canada participates in discussions of best practices and issues relating to TB prevention and control with provincial/territorial governments and First Nation and Inuit organizations, when requested.

In developing *Health Canada's Strategy Against TB for First Nations On-Reserve*, Health Canada worked closely with communities, First Nation organizations, the Public Health Agency of Canada (PHAC), Aboriginal Affairs and Northern Development Canada (AANDC), TB experts and provincial authorities. This work involved the review of evidence from literature, program evaluations and case analyses to inform the development of the themes and elements of the Strategy. As a result, the Strategy is a reflection of current knowledge, best practices and lessons learned over the past two decades. The components of TB prevention and control described in the Strategy will provide strategic direction to support national, regional and community efforts to reach our goals.

Health Canada's Strategy Against Tuberculosis for First Nations On-Reserve is designed to be used in conjunction with the *Canadian Tuberculosis Standards*[9] and the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10] and aligns with the *Global Plan to Stop TB*[11,12]. From 1990 to 2000, reported TB rates in First Nations on-reserve fell from 74.1 cases per 100,000 to fewer than 30 cases per 100,000. Since 2000, however, the rates have not shown any significant further decline[13].

The Strategy is divided along three themes:

1. Preventing, Diagnosing, and Managing TB:

Focuses on high quality, effective TB programming at the community and regional levels, including activities such as primary prevention; latent TB infection (LTBI) identification and management; early case finding; contact identification; treatment compliance; surveillance; targeted screening; professional education and training; and community awareness initiatives.

2. Targeting Populations at Greatest Risk for TB:

Takes into account health issues relevant to First Nations that have been recognized by the *Canadian Tuberculosis Standards*[9] as contributors to an increased risk of contracting, developing and transmitting TB. These issues include: communities or populations experiencing ongoing high incidence or outbreaks of TB; difficulty in accessing services and TB expertise in remote and isolated communities; TB clients co-infected with HIV; elevated rates of chronic medical conditions such as diabetes; renal failure and malnutrition; and challenges in providing TB care to those with mental health issues and addictions.

3. Developing and Maintaining Partnerships:

Focuses on the necessity of establishing and maintaining effective partnerships at all levels of authority to increase the ability of communities to prevent and control TB and to strengthen the alignment of the federal, provincial and community health systems. In an effort to achieve a seamless approach to TB prevention and control programming, partners must work together to develop well-defined roles and responsibilities. This is especially important given the mobility of cases on and off-reserve. This theme also outlines the need for partners to support timely data sharing and address the impact that social determinants of health, such as housing, employment, income and education, have on TB.

Each theme includes a set of elements that was developed by a committee of experts, partners and stakeholders. The elements are based on the *Canadian*

Tuberculosis Standards[9] and align with the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10]. Successful implementation of these elements will be assessed through a program evaluation process. This process will be outlined in an evaluation framework that will be developed during the implementation phase of this Strategy.

National and regional programs will report on elements relevant to their programming. Through reporting, TB programs will be able to regularly assess their program's effectiveness and adjust programming based on circumstances and needs. Currently, regions collect surveillance and programmatic data as needed to support program delivery. This Strategy supports continued efforts to achieve a comprehensive approach across regions that will inform TB programming in a relevant and timely manner. This may include the development of additional data sharing agreements between regions and their partners. At a broader level, this Strategy requires that reporting be standardized across jurisdictions in order to provide a cohesive national picture of TB prevention and control.

This Strategy promotes sharing data with the population being served in a fashion that respects both individual needs for privacy and optimal governance. Sharing data among communities and regions will promote and provide greater transparency and accountability.

Part I: INTRODUCTION

Tuberculosis is an airborne communicable disease that can be cured after a course of antibiotics that lasts several months[9]. In cases where the bacteria have developed extensive drug-resistance, treatment options are seriously limited and for the rare case, the disease cannot be cured[9, 14]. Exposure to tuberculosis and becoming infected with TB does not always lead to active TB disease as the immune system is often able to kill or suppress the TB bacteria. Suppressed or quiescent TB is called latent TB infection (LTBI) and is not infectious. LTBI can become active at any time with the risk of activation being highest in the first two years following initial infection. About 10% of people with LTBI will develop TB disease at some point in their lives. This risk is increased in people with HIV/AIDS or other chronic conditions that weaken the immune system[9].

TB in First Nations in Canada

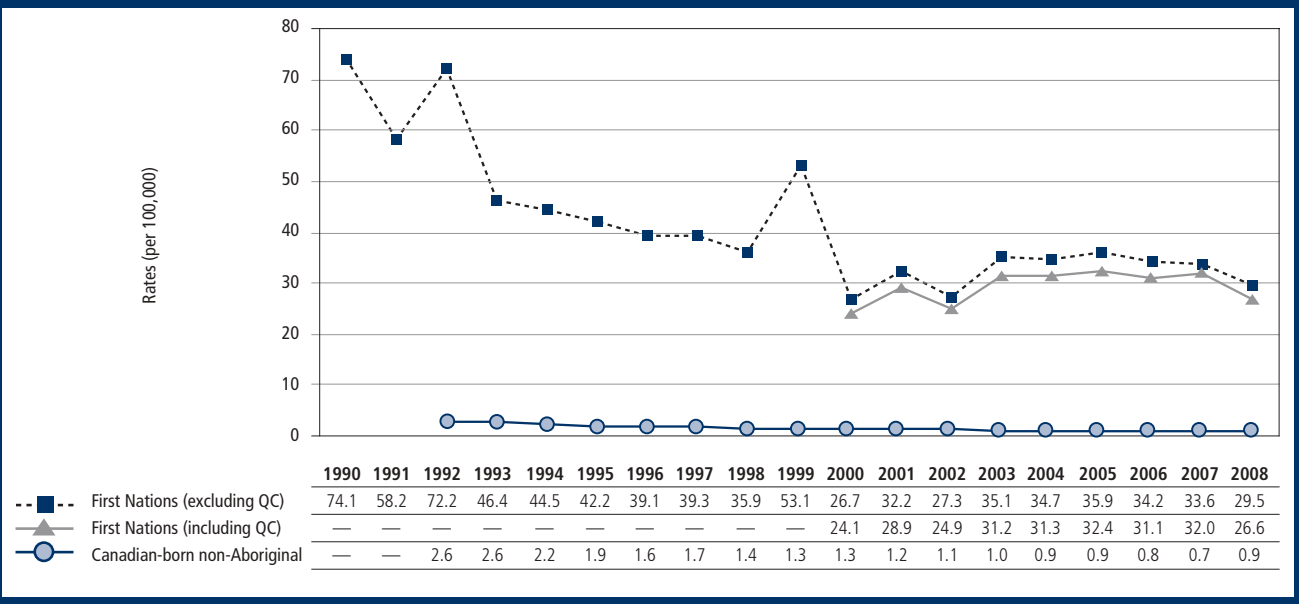
Today's TB programs need to be aware of the history of TB in Aboriginal populations in Canada in order to increase community awareness, decrease stigma and discrimination against those with TB, and to provide program activities in a culturally sensitive and effective manner. The process of building trust is paramount to the success of TB programs that provide services to First Nation populations in Canada.

The history of TB for most Canadian Aboriginal peoples is one of loss, separation from family and community, and suffering. Before treatment was available in communities, patients were sent to sanatoria where many passed away far from their communities and families. While this occurred in many Canadian communities, Canada's Aboriginal population was disproportionally affected by TB, which had a dramatic impact on individuals, families and communities. This experience continues to influence perspectives and attitudes towards the disease and at times, the health care system. This residual effect can often impede the process of case identification and treatment of TB [14, 15,16]. For example, clients may delay seeking medical attention or they may turn to trusted community members rather than a health care professional.

From 1990 to 2000, reported TB rates in First Nations living on-reserve fell from 74.1 cases per 100,000 to fewer than 30 cases per 100,000. Since 2000, however, the rates have not shown any significant further decline (see Figure 1) [13,17, 18].

For more detail on the epidemiology of TB in First Nations in Canada, please see Appendix A.

Figure 1: Crude reported active tuberculosis (new and re-treatment) incidence rates by year, First Nations living on-reserve, Canada, 1990-2008 *



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
First Nations (excluding QC)	74.1	58.2	72.2	46.4	44.5	42.2	39.1	39.3	35.9	53.1	26.7	32.2	27.3	35.1	34.7	35.9	34.2	33.6	29.5
First Nations (including QC)	—	—	—	—	—	—	—	—	—	—	24.1	28.9	24.9	31.2	31.3	32.4	31.1	32.0	26.6
Canadian-born non-Aboriginal	—	—	2.6	2.6	2.2	1.9	1.6	1.7	1.4	1.3	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7	0.9

Source: Health Canada, First Nations and Inuit Health Branch, 2010[13].
Note: At time of publication, only data up to 2008 were available for analysis.
*Cells with a dash (—) indicate years for which data were not available

Providing Health Care for TB to First Nations in Canada

Provinces and territories have the legislated authority for TB prevention and control within their jurisdictions. Territories are solely responsible for TB prevention and control for their entire populations, while in the provinces, the responsibility is shared among partners. Health Canada is mandated to either provide TB services or assure they are accessible to First Nations living on-reserve.

For First Nations on-reserve, TB prevention and control is a shared responsibility that varies across Health Canada's regions based on each region's level of collaboration with provincial governments and transferred organizations/communities. These partnerships are influenced by the respective provincial public health acts, the burden of TB disease in communities, geographic circumstances and local public health program structures.

Health Canada's National TB Program promotes access to equitable, culturally appropriate and timely diagnosis, treatment, follow-up care and health promotion activities through regional tuberculosis programs in seven regions (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec and Atlantic). In addition, Health Canada also provides funding to the Government of Nunatsiavut to complement the TB prevention and control services provided by the province of Newfoundland and Labrador.

For more detail on the partnerships involved in TB prevention and control for First Nations on-reserve in Canada, please see Appendix B.

Vision, Goal and Principles

Health Canada's Strategy Against TB was developed to guide Health Canada TB programs in improving program delivery and performance measurement, as well as assure that standardized, culturally appropriate TB prevention and control services are available to First Nations on-reserve. It is a technical document developed by experts and based on the most current evidence, best practices and lessons learned and is designed to be used by Health Canada TB programs. It can also serve as a reference document to guide health care professionals working with First Nations and Inuit anywhere in Canada.

VISION: Sustainable, Equitable and Effective TB Control

Health Canada, the provinces and communities will continue to work together to support TB prevention and control in a sustainable, equitable and effective way.

GOAL: Significantly Reduce the Incidence and Burden of TB in First Nations On-Reserve

In 2005, Canada adopted the goal of halving its 1990 rate of TB by 2015 based on the *Global Plan to Stop TB*, which was developed by the WHO [11,12]. Health Canada will contribute to this goal of 3.6 cases per 100,000 by working with First Nations to reduce the rates of TB in First Nations on-reserve.

Principles:

The Strategy is based on the following principles that underlie effective TB prevention and control and public health practices.

Practice

- Achieve seamless TB prevention and control on and off reserve.
- Adopt evidence-based approaches and best practices
- Address staffing and capacity issues.
- Adhere to public health principles and principles of patient rights and confidentiality.
- Align with the *Canadian TB Standards* [9], the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10], and the *Global Plan to Stop TB* [11,12].

Process

- Ensure First Nations on-reserve share control of health policies affecting them.
- Engage communities in developing and maintaining culturally appropriate TB program activities.
- Evaluate and assess on a regular basis to maintain effective programming.

Partnership

- Collaborate with First Nations on TB prevention and control for their communities.
- Communicate with all partners and stakeholders.
- Cooperate to address issues that cannot be addressed by one program alone.

Part II: STRATEGIC THEMES AND ASSOCIATED ELEMENTS

To provide strategic direction, *Health Canada's Strategy Against TB* is divided into three themes that represent the key areas of importance for TB prevention and control for First Nations on-reserve. These themes are:

1. Preventing, Diagnosing and Managing TB
2. Targeting Populations at Greatest Risk for TB
3. Developing and Maintaining Partnerships

Included under each theme is a set of required elements that were identified or developed to address issues and needs at the national, regional and community levels of TB programming for First Nations on-reserve. These elements were developed by a committee of experts, partners and stakeholders tasked with renewing the 1992 Strategy[1] through a review of relevant literature, best practices, and lessons learned from regional program evaluation and case analyses. A number of elements listed under these themes could be identified under more than one theme; however, to avoid repetition, each element is identified only once under the theme that best captures its primary focus.

The Elements identified in this Strategy are intended to support not only program goals and objectives, but also the implementation of all essential components of TB programming in a way that is relevant to the target population and is aligned with *the Canadian Tuberculosis Standards*[9] **and the** *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10]**.**

Elements are identified as either **required** or **optional**. Required elements are those that must be implemented while optional elements are those that can be adopted by TB programs if they are deemed relevant to addressing each program's specific circumstances and needs. At the same time, it is recognized that due to the specific nature and structure of each TB program, individual programs may identify and implement elements not covered in this Strategy.

Elements are also identified as relevant to one or any combination of the following:

- National program (Health Canada's National TB Program)
- Regional programs (Health Canada's Regional TB Programs)
- Communities with front line health care services
- Communities or populations with ongoing high incidence or recurring outbreaks[i]

Health Canada's regional programs will support the implementation of these elements for all communities, including transferred communities.

THEME 1: Preventing, Diagnosing and Managing TB

Health Canada's TB programs work to reduce the incidence and burden of TB by supporting effective TB prevention and control activities for First Nations on-reserve. High quality programming includes activities such as early case finding, LTBI identification, treatment compliance (achieved through methods such as Directly Observed Therapy [DOT]), surveillance (data collection, analysis and dissemination), and education, training and awareness campaigns, all of which align with the *Canadian Tuberculosis Standards*[9] and the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10]. Programming also includes development, application and evaluation of program strategies, activities and policies relevant to First Nations.

i Ongoing high incidence will be defined as part of the development of the Evaluation Framework

To reduce the burden and incidence of TB in its mandated population through effective prevention, diagnosis and management of TB, Health Canada's programs will strive to meet the following objectives through the implementation of the elements outlined below.

Objectives of Theme 1:

- **To promote the provision of TB care in alignment with the *Canadian Tuberculosis Standards*[9]**
- **To decrease the transmission of TB in and across communities, while underscoring the importance of cultural competency**
- **To collect, analyze and manage data on TB in a consistent and standardized manner in order to assess progress towards goals and to evaluate program performance**
- **To work collaboratively with provincial health authorities in all regions to create a more seamless system to prevent, diagnose and manage TB in First Nation communities**
- **To investigate possible solutions to address professional staff shortages and high staff turnover rates**

Elements for Theme 1

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
1.1	Programs will follow the *Canadian Tuberculosis Standards*[9] and adopt evidence-based approaches.	Required	Required	Required	Required
1.2	Programs will align with the recommendations made in the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10].	Required	Required	Required	Required
1.3	The implementation of this Strategy will be sufficiently flexible to enable Health Canada's regions, provinces and communities to explore quality improvement measures without compromising the essential elements of TB programming.	Required	Required	Required	Required
1.4	Programs will adhere to the principles of public health practice to support the protection of communities from TB while respecting the rights of patients, such as confidentiality.	Required	Required	Required	Required

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
1.5	All active TB cases will be reviewed at least monthly by public health and/or clinical experts.		Required (if involved in case management)	Required (if involved in case management)	Required (if involved in case management)
	The following issues are to be included in the review process:				
	1.5a) Identify challenges and implement corrective actions as necessary for treatment interruptions and failures, patient mobility and seamlessness of services, disease relapse and drug resistance.		Required (if involved in case management)	Required (if involved in case management)	Required (if involved in case management)
1.6	Program managers will work with partners and stakeholders to address general issues of staffing and capacity for TB prevention and control activities.	Required	Required	Required	Required
	Specific relevant activities will include the following:				
	1.6a) Supporting professional development, community awareness and community engagement to increase awareness of TB and decrease stigma and misconceptions associated with this disease.	Required	Required	Required	Required
	1.6b) Working with provinces and communities to assure access to and completion of TB training that is relevant for health care providers working with First Nation populations. Topics of consideration include: • the understanding of TB in the First Nation context; • the need for a high index of suspicion for TB when symptoms associated with the disease are presented • the ability to test for LTBI and TB disease • the ability to manage cases of TB and LTBI • the knowledge on recommended treatment for both LTBI and TB disease • cultural competency around TB program delivery for non-First Nations health care providers • understanding reporting requirements.		Required	Required	Required

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
	1.6c) Collaborating with national, provincial and community leaders, educators and health care workers to develop relevant community-based TB education/ awareness campaigns through the development and use of targeted materials such as radio, print and/or video products.	Required	Required	Required	Required
	1.6d) Addressing challenges relevant to the delivery of Directly Observed Therapy (DOT) and Directly Observed Preventive Therapy (DOPT).		Required	Required	Required
	1.6e) Assessing family and community support structures/systems and identifying possible solutions to enhance these structures where applicable.			Optional	Optional
1.7	Programs will continue to engage communities and other stakeholders to review and guide TB programming at the regional and community levels.		Required	Required	Required
	Activities can include the following:				
	1.7a) Developing enhanced action plans for program implementation.		Required	Optional	Optional
	1.7b) Promoting community-based TB projects. Examples include the Strategic Community Risk Assessment and Planning for Enhanced Tuberculosis Programming (SCRAP-TB) or Band council resolutions to participate in TB screening programs.		Required	Required	Required
1.8	Programs will promote the use of standard or enhanced DOT for all TB cases, especially cases with TB-HIV co-infections.		Required	Required	Required
	1.8a) DOT workers will be provided with access to training that supports the provision of quality service and includes recognition of the importance of impartial and respectful approaches to build trusting relationships.		Required	Required	Required
	1.8b) Enhanced DOT will include the use of incentives and enablers that are flexible, relevant to the community and age appropriate.		Optional	Optional	Optional

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
1.9	Programs will work with partners and stakeholders to address various program issues.	Required	Required	Required	Required
	Specific issues include the following:				
	1.9a) Accessibility of care and diagnostic services.		Required	Required	Required
	1.9b) Availability of transportation to access health services.			Required	Required
	1.9c) Ability to isolate infectious TB patients, either within or outside of the community, as per the *Canadian Tuberculosis Standards*[9] and guidance from public health expertise.		Required	Required	Required
	1.9d) Seamless service delivery when patients move between communities and urban centres and across jurisdictions and health systems (e.g., federal to provincial).		Required	Required	Required
1.10	Regional TB program performance will be evaluated through analysis of TB program data. The evaluation will include: • Review of case and contact management against best practice recommendations including the standards for TB care outlined in the *Canadian Tuberculosis Standards*[9].		Required		
1.11	Collected data will be analyzed and disseminated accordingly at the community, regional and national levels.	Required	Required		
1.12	Information collected through the CTBRS which pertains to First Nations receiving TB services through Health Canada will be analyzed and disseminated through annual reports.	Required	Optional		

THEME 2: Targeting Populations at Greatest Risk for TB

Across all populations, certain factors and conditions increase the risk of contracting, developing and transmitting TB and can impact treatment compliance, thus creating sub-populations that are at greater risk of the effects of this disease. For example, individuals are at a greater risk of contracting, developing and transmitting TB in communities with a continuing high incidence of TB or where repeated outbreaks are occurring. Examples of conditions that put individuals at a greater risk for TB include: HIV/AIDS, diabetes, and mental health issues and addictions. Independent of their link to TB, these conditions are also recognized as significant health issues in some First Nation communities.

For more detail on populations at greatest risk for TB, please see Appendix C.

To reduce the burden and incidence of TB in populations at greater risk for TB, Health Canada will strive to meet the following objectives through the implementation of the elements outlined below.

Objectives of Theme 2:

- **To identify sub-populations that are at greatest risk of contracting, transmitting or suffering from more serious forms of TB and develop strategies for these sub-populations that align with local epidemiology**
- **To work with communities to provide targeted, enhanced TB programming to populations that are identified as having prolonged high rates of TB or as being at a higher risk of contracting or experiencing complications from TB.**

Elements for Theme 2

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
2.1	Programs will work with provinces and communities to develop tailored approaches to reduce the incidence of TB where there is evidence of ongoing high incidence or repeated outbreaks.		Required		Required
	Approaches can include:				
	2.1a) Developing enhanced approaches to further support early identification of cases of active TB and LTBI.		Required	Optional	Required
	2.1b) Prioritizing program activities so that activities reflect the rate of TB regionally and at community levels.		Required	Optional	Required

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
	2.1c) Developing long-term programs and infrastructure to address identified community/social network specific issues.		Required	Optional	Required
	2.1d) Developing tools that will support tracking of TB-like symptoms in community populations so as to reduce delays in diagnosis and the number of smear positive pulmonary cases.		Optional	Optional	Optional
2.2	Programs will develop and implement TB screening strategies based on local/regional epidemiology while assuring that case and contact identification and management remain effective.		Required	Required	Required
	Relevant activities will include:				
	2.2a) Working with partners and stakeholders to promote testing of all people with active TB for HIV and testing of all HIV positive cases for active TB or LTBI.		Required (only if Region has communities with clinical care services)	Required	Required
	2.2b) Promoting preventive treatment when appropriate in people with LTBI-HIV co-infection.		Required (only if Region has communities with clinical care services)	Required	Required
	2.2c) Targeted screening of individuals identified in the *Canadian Tuberculosis Standards*[9] as being at high risk (e.g., those with HIV/AIDS, end stage renal disease, etc). While diabetes mellitus is not considered to be a high risk factor for development of active disease in the *Canadian Tuberculosis Standards*,[9] individuals with this condition should nevertheless be considered for targeted screening.		Required (only if Region has communities with clinical care services)	Required (only if clinical care provided)	Required

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
	2.2d) Offering treatment when appropriate to high-risk patients diagnosed with LTBI.		Required (only if Region has communities with clinical care services)	Required (only if clinical care provided)	Required
	2.2e) Identifying, evaluating and implementing approaches to screen for and treat LTBI in young children in high incidence communities, when appropriate.		Required (only if Region has communities with clinical care services)	Required (only if clinical care provided)	Required
2.3	TB programs will investigate opportunities to link with other programs and organizations working on TB, HIV, mental health/addictions and other high-risk chronic conditions and develop strategies and activities that will build more effective and integrated programs, policies and awareness.	Required	Required	Required	Required
2.4	There will be ongoing analysis to determine the impact of BCG discontinuation by monitoring TB in areas where BCG has and has not been discontinued.	Required	Required	Required	Required
2.5	Program evaluation will identify populations at greatest risk for TB and inform targeted actions to support program quality improvement.	Required	Required		
2.6	Communities, especially those with: • high incidence or part of a known cluster of TB; • outbreaks • identified as being at risk for high incidence or outbreaks will be given opportunities to meet with provincial, regional and community TB program partners and stakeholders, to receive reports relevant to the community and to collaborate on strategies to improve TB prevention and control activities.		Required	Required	Required

THEME 3: Developing and Maintaining Partnerships

Federal departments/agencies, experts, First Nation organizations and communities, and the provinces are all essential partners in a comprehensive and effective TB program for First Nations on-reserve. Partnerships need to be perpetually evolving in order to respond to changing regional and community needs and circumstances. Examples of benefits from such partnerships include the development of community-relevant TB programming based on local epidemiology and a continuum of care for patients moving on- and off-reserve.

To develop relevant and effective partnerships, sustained efforts will be required to clarify roles and responsibilities in order to ensure seamless access to comprehensive TB services at all times. Partnerships are also crucial in addressing broader issues, such as the social determinants of health that have an impact on TB prevention and control.

For more detail on partnerships involved in TB prevention and control for First Nations on-reserve in Canada, please see Appendix B.

For more detail on TB and the social determinants of health, please see Appendix D.

To reduce the burden and incidence of TB by strengthening partnerships, Health Canada TB programming will strive to meet the following objectives through the implementation of the elements outlined below.

Objectives of Theme 3:

- **To foster community involvement and shared ownership of TB prevention and control activities**
- **To clarify roles and responsibilities for TB prevention and control through stronger partnerships and collaborations with the provinces and communities in order to maximize the contribution of each partner**
- **To increase awareness of TB and related issues through education and public health messaging for health workers, communities and other relevant stakeholders**
- **To align TB programming with other public health programs and related activities in order to increase the effectiveness of program delivery and public health messages**
- **To address the link between TB and the social determinants of health through partnerships and collaboration with departments, programs and organizations that focus on issues such as housing, food, education, employment and air quality**

Elements for Theme 3

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
3.1	Partnerships and collaborations will be strengthened with provincial health authorities and other partners and stakeholders in order to achieve the mutual goal of seamless TB prevention and control.		Required	Required	Required

ELEMENTS		National Program	Regional Programs	Communities with Front Line Health Care Services	Communities or Populations with Ongoing High Incidence or Recurring Outbreaks
3.2	First Nations will be engaged in developing and implementing TB prevention and control policies and activities as they relate to their population, while meeting the regional and provincial program requirements.	Required	Required	Required	Required
3.3	Health Canada will continue to support cultural and community values and governance when engaging communities in developing and maintaining TB program activities.	Required	Required	Required	Required
3.4	Programs will support international efforts to reduce TB both in Indigenous populations and around the world through initiatives such as the Global Plan to Stop TB[11, 12].	Optional	Optional	Optional	Optional
3.5	Health Canada will clarify and negotiate roles with partners and stakeholders to promote timely sharing of relevant TB information.	Required	Required		
3.6	TB programs will be accountable to the population they serve by being transparent, sharing data and developing partnerships that promote involvement of all partners in proactively addressing the burden and incidence of TB in First Nation populations.	Required	Required		
3.7	Reporting to appropriate partners and stakeholders on emerging public health issues related to TB will occur more rapidly than is supported through the Canadian Tuberculosis Reporting System (CTBRS) process.		Required	Required	Required
	Specific issues to be included are:				
	3.7a) Immediate notification of TB clusters or outbreaks.		Required	Required	Required
	3.7b) The occurrence of drug-resistant cases.		Optional		
3.8	Meeting annually with program partners (federal, provincial, regional, community leadership/ membership) to review evaluation data and to propose/discuss/ implement recommendations for improvement.	Required	Required	Required	Required
3.9	TB programs will explore links between the social determinants of health and TB and identify potential solutions through research and partnerships with federal departments, Aboriginal organizations and other groups such as international organizations.	Required	Required	Optional	Optional

Part III: MOVING FORWARD

From Elements to Action

Each province has a unique approach to TB prevention and control based on the prevalence of TB within their jurisdiction and the structure of the overall provincial health system. Since Health Canada aligns its regional TB programs with their respective provincial program structures and activities, it is recognized that implementing this Strategy will require an individualized approach for each region that is respectful of jurisdictional structures and population needs.

In many regions, a number of the elements are already in place as part of regular community and regional programming. However, elements that are not currently in place will be identified and implemented by regional programs based on regional and community priorities and available resources, as well as through a collaborative process with communities and provincial health authorities.

To support the implementation of the elements outlined in Health Canada's Strategy Against TB, the following will occur:

1. Assessment of Current Programming

National and regional TB programs will assess their current TB programming against the elements of the Strategy in order to identify gaps, if any exist, and approaches to address these gaps.

2. Development of National, Regional and Community Action Plans

Based on the gap analysis, action plans for Health Canada's National and Regional TB Programs will be developed to implement the elements not already in place. Engagement of partners is essential for this process at all levels. The development of community-based plans is also encouraged in order to help build community capacity, ownership and awareness, as well as sustainable and quality programs with good governance.

Based on best practices, standards and evidence, the following areas are recognized as priorities for implementation:

- Assuring seamless access to TB services through enhanced collaborations and partnerships;
- Prioritizing timely surveillance
- Targeting populations at greatest risk for TB (e.g., high incidence communities)

Quality Improvement

Health Canada's Strategy Against TB aims to assist Health Canada's regions and communities in maintaining lower rates of TB where they already exist and reducing rates in areas of high incidence. To achieve this aim, this Strategy has focused on quality improvement by aligning with the *Canadian Tuberculosis Standards*[9] and the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10] as well as including best practices and lessons learned since the release of Health Canada's 1992 National Tuberculosis Elimination Strategy[1].

Health Canada's Strategy Against TB also aims to align with the approach outlined in Health Canada's *Building Quality Healthcare*[19] by emphasizing the need for effective and efficient programming.
In order to ensure continuous quality improvement through the implementation of this Strategy, it is essential that all TB programs recognize the importance of staying current on the following issues:

1. Adopting Evidence-Based Approaches and Best Practices

Quality programming is achieved through the adoption of evidence-based approaches and best practices, which are dependent on strong and sound research. This Strategy is flexible in that it recognizes that as new discoveries related to TB occur, programs will need to adjust accordingly. It also recognizes that each region may vary in how it adopts and integrates new evidence into its programs. For example, programs receive guidance from regional and provincial TB experts who take into account their provincial population needs and health system structures.

Although TB policies and programs developed and administered by Health Canada are evidence-based, research on TB is not directly undertaken by Health Canada. However, Health Canada does remain current on emerging evidence and supports research by experts in government and academic settings. This support includes working with other groups within the Health Portfolio such as PHAC and the Canadian Institutes of Health Research.

The following are research topics that are of current interest to TB programs that serve First Nation populations in Canada:

- Community driven research
- Community participant research on community engagement
- The impact of the social determinants of health on TB rates
- The link between LTBI and TB rates
- Effective incentives
- Community educational/awareness campaigns
- The use of social networking analysis
- The utility of interferon-gamma release assays (IGRAs) to diagnose LTBI

2. Evaluation of TB Programs

Any element (i.e., required, optional or derived external to this Strategy) that is incorporated into programming must be part of the program evaluation process. Program evaluation, which includes both programmatic and surveillance data collection, is essential for assessing program effectiveness and efficiency. Reporting will allow partners to monitor and discuss the current status of each program, thereby fostering continuous quality improvement, transparency and sharing of promising practices.

As part of the implementation of this Strategy, an evaluation framework will be developed to address evaluation and surveillance needs at a national and regional level. A national framework will be developed to standardize the collection of programmatic and surveillance data such that a timely picture of TB can be defined for First Nations accessing TB services through Health Canada. Furthermore, individual frameworks will be developed for and by each region to reflect each program's specific needs, structures and populations. Each framework will also identify the types and frequency of reports to be provided to target audiences.

3. Surveillance

Surveillance is essential to support the program evaluation process. Health Canada's National and Regional TB programs collect data from a variety of sources. For example, all cases of TB are reportable by law to the provincial system, which in turn reports these cases as non-nominal data to PHAC through the CTBRS. These data are published by PHAC and used by Health Canada's TB programs to assess TB at a national level. Some Regions also obtain data directly from provincial sources and some of their communities. This is largely based on whether or not data-sharing agreements are in place.

Variations in data collection create an inability to accurately assess and compare regions and communities in a standardized manner, creating limitations to any in-depth analyses of TB disease trends in First Nations on-reserve. This Strategy emphasizes the need that all those who have a role in TB prevention and control for First Nations must work together in order to collect and analyze standardized data to foster ongoing quality improvement across all TB programs.

Based on recommendations from a group of experts, current evidence and a review of Canadian and international TB programming, the following data have been identified as important for assuring quality TB programming. Their use for Health Canada's TB programs will be validated during the development of the evaluation frameworks.

- Percentage of sputum samples received by the laboratory within 24 hours of collection on newly diagnosed cases
- Percentage of positive sputum smear results are reported back (e.g., verbally) to the ordering staff/facility within 24 hours of receipt of specimen for newly diagnosed cases
- Percentage of new cases whose culture positive sputum converts to culture negative within 60 days of treatment initiation
- Percentage of newly diagnosed cases of infectious TB that remain under isolation while infectious (i.e., in hospital, at home)
- Completion of initial contact list for each infectious TB case within 7 days of the diagnosis of the index case
- All newly identified contacts diagnosed with LTBI start treatment within 28 days, unless contraindicated or refused
- Percentage of people treated for LTBI through DOPT
- Percentage of people with LTBI and who are at high-risk of progression to disease and are not taking treatment, who are being followed for symptom inquiry, chest x-ray, sputum smear and culture at 6, 12, 24 months
- Percentage of high-risk patients who are screened for TB:
  - who are HIV positive
  - who have end-stage renal disease
  - who are transplant candidates/recipients
  - who are undertaking immune suppressive treatment
- with other high-risk conditions

CONCLUSION

Given the complexities and variations in partnerships, health system infrastructure and population needs for TB prevention and control for First Nations in Canada, a phased approach for implementing the Strategy will be adopted. To move forward, the Strategy will be implemented through the initiation of gap analyses, the development and implementation of action plans and the evaluation of on-going and new programming. An evaluation framework, which will be developed as part of the implementation process, will ensure that Health Canada will continue to provide quality TB services or assure they are accessible to First Nations living on-reserve. In conclusion, *Health Canada's Strategy Against TB* outlines a strategic direction that once implemented, will provide guidance for TB programs to reduce the incidence and burden of TB in First Nations on-reserve through working together with all partners.

APPENDIX A: Detailed Epidemiology of TB in First Nations in Canada

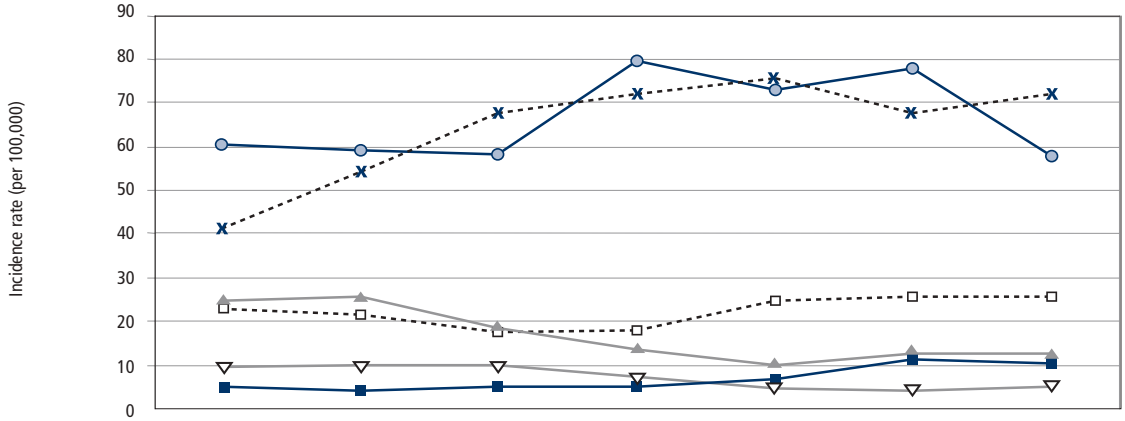
To better understand what is driving the rates of TB in First Nations on-reserve, it is important to discuss the variability across regions. From 2000 to 2008, reported TB incidence rates have varied across Health Canada's regions (see Figure 2). Compared to other regions, higher active TB incidence rates were consistently observed in Manitoba and Saskatchewan over time. Cases of active TB reported from these two regions accounted for more than two thirds of the total cases reported[13].

From 2000 to 2008, most cases of active TB in First Nations living on-reserve were identified on the basis of the presentation of symptoms (57.3%) or via contact investigation (26.5%); the remainder (14.6%) were identified through routine screening, post-mortem findings and other processes. During the same period, pulmonary TB was the most commonly reported presentation of active TB (54.1%). Primary TB (23.0%) was the next most common diagnosis and was particularly noted in Saskatchewan; the proportion among all cases recorded in that region (44.6%) was several times greater than in the other regions. Miliary TB (2.9%) and peripheral lymph node involvement (6.4%) were identified as a relatively small proportion of cases. Other diagnostic sites, including both other respiratory and non-respiratory TB, accounted for the remaining 13.7% of cases[13].

For more information on the epidemiology of TB in First Nations populations in Canada, see:

- Health Canada: *Tuberculosis in First Nations Communities, 1999*[20].
- Health Canada: *Epidemiology of Tuberculosis in First Nations Living On-Reserve in Canada, 2000-2008*[13].

Figure 2: Three-year moving average rates of reported active tuberculosis (new and re-treatment) by region*, First Nations living on-reserve, Canada, 2000-2008



	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008
British Columbia	22.8	21.7	17.5	17.9	24.5	25.5	25.4
Alberta	24.5	25.2	18.3	13.6	10.2	12.4	12.6
Saskatchewan	60.5	59.0	58.2	79.4	72.6	77.5	57.6
Manitoba	41.0	54.3	67.4	72.1	75.3	67.2	71.9
Ontario	9.2	9.9	9.9	7.2	4.7	4.2	4.8
Quebec	5.0	4.3	4.9	4.8	6.7	11.2	10.4

* Data for Atlantic region are not shown because its overall tuberculosis case count is less than 5.
Source: Health Canada, First Nations and Inuit Health Branch 2010 [13].

APPENDIX B: Partnerships for TB Prevention and Control

This Strategy aligns with *Health Canada's Public Health Strategic Framework* and its vision that: "All First Nations Reserve Communities are served by an integrated, comprehensive public health system that assesses and monitors the public's health, promotes and protects health, prevents injuries and disease, and responds to on-reserve public health emergencies"[21]. Strengthened coordination among all levels of government, across departments and programs and with communities will support the process of moving towards an integrated and comprehensive public health system that promotes and protects health in a more holistic manner.

Federal Partnerships

As a key federal partner, the Public Health Agency of Canada (PHAC), in collaboration with experts from federal, provincial and territorial governments and organizations coordinates and supports surveillance, guideline development and capacity building related to the prevention and control of TB in Canada. PHAC is leading the development of the *Guidance for Tuberculosis Prevention and Control Programs in Canada*[10] which will provide an overall framework and guidance for TB-related activities across Canada. *Health Canada's Strategy Against TB* is closely aligned with this document.

Other federal partnerships are also essential to assist First Nation communities in addressing the persistence of TB. For example, the following Health Canada programs with which TB programs are already or could potentially collaborate include programs that address community health, HIV/AIDS, diabetes and substance abuse. Aboriginal Affairs and Northern Development Canada (AANDC) is an essential partner in determining and addressing the impact of social determinants of health on TB as well as providing population based denominator data for the evaluation and analysis of surveillance data.

Regional Partnerships

Comprehensive clinical TB care is rarely available within a First Nation community; therefore, First Nation communities must access provincial health systems for many primary and tertiary care services, such as hospitalization and physician care. Consequently, the services provided within communities must operate in conjunction with provincial health systems. Where there is a lack of integration between systems, there are barriers to accessing services and inefficiencies in maintaining a health care continuum.

All regions have established relationships with their provincial counterparts. Some First Nation communities also have direct relationships with either the province as a whole or with specific provincial health structures such as Regional Health Authorities. However, most jurisdictions would agree that enhanced clarity on roles and responsibilities would benefit the quality of the continuum of care and overall success of TB programs.

This Strategy applies where Health Canada is accountable for TB programming either through provision of services or funding. Examples of services/activities include:

1. TB case identification, treatment and management
2. LTBI identification and management
3. Patient-centered approach
4. TB outbreak management
5. Public health promotion including community awareness
6. Community engagement
7. Increased community capacity through training and education initiatives
8. Recording, reporting and outcome evaluation

The following are specific examples of how TB prevention and control programs can be delivered for First Nations on-reserve:

- Identification and management of cases and contacts are primarily the responsibility of the province and respective regional health authorities, in partnership with the community. In this case, Health Canada's regional TB program works with communities on activities to build community awareness of TB. This collaborative model most closely resembles the way TB prevention and control services are delivered in the Atlantic and Quebec Regions.
- A centralized provincial TB control program is funded by Health Canada to provide TB case and contact management on reserve; Health Canada's regional TB program provides additional community resources, education, awareness, ongoing communication and coordination. This model most closely resembles the way TB prevention and control services are delivered in the Manitoba Region.
- Identification and management of cases and contacts are shared among a centralized province wide TB program including the province, regional health authorities, Health Canada's regional TB program and the front line community health staff. Community awareness building activities are primarily carried out through partnerships between Health Canada's regional office and communities. This model most closely resembles the way TB prevention and control services are delivered in the Alberta Region.

Other models are also used across the regions. In some areas, First Nations may take on additional responsibilities for the provision of TB prevention and control, with the region having more of a supportive role.

APPENDIX C: Examples of Populations at Greatest Risk for TB

In alignment with the Canadian TB Standards[9], the following are examples of sub-populations that are at the greatest risk of TB, but that either are of increasing concern or experience health disparities for First Nation populations in Canada.

High Incidence Communities and Outbreaks[ii]

Communities or populations experiencing a high incidence of TB over a prolonged period of time require special consideration, as do communities experiencing repeated outbreaks. Based on in-house data, Health Canada has identified that TB cases are localized in a limited number of First Nation communities each year which guides the prioritization of activities in TB programs. The challenge in controlling TB in high incidence communities or communities experiencing repeated outbreaks is not only to quickly identify and treat active cases, but also to identify and follow up with all contacts to break the chain of transmission. During an outbreak, as defined by the *Canadian Tuberculosis Standards*[9,22], Health Canada, PHAC and/or provinces may provide resources and can deploy additional personnel as necessary to support communities in early case and contact investigations and management of TB disease and infection. In communities or populations experiencing an ongoing high incidence of TB, there is a need for a targeted sustained commitment for program strategies and activities to reduce the incidence and burden of the disease. These strategies need to also include approaches that will help protect people at greatest risk in these communities, such as young children or severely immunocompromised people. These individuals are most at risk in a high incidence community and are more likely to develop severe forms of the disease (i.e., TB meningitis and miliary TB)[9]. In addition, TB in children is difficult to diagnose as symptoms are not as clearly manifested as in adults and misinterpretation of chest x-rays is not uncommon[23, 24, 25, 26].

ii What constitutes 'high incidence communities' and 'outbreaks' will need to be defined through partner consensus as part of the development of the evaluation framework.

Remote and Isolated Communities

These communities are identified on the basis of their geographical location and ability to access external resources[27]. In terms of health care, challenges for these communities include: their ability to access and use laboratory resources for diagnosis; to access care in a timely and consistent fashion; and to access, attract and retain staff dedicated to TB prevention and control activities. There may also be challenges in accessing TB expertise, a resource that is not usually found in remote and/or isolated communities.

TB-HIV Co-infection

Infection with HIV decreases the body's ability to contain latent TB infection. It is the strongest risk factor for the conversion of latent TB to active TB. TB is not only the most common condition that is comorbid with HIV, it is also the leading cause of death of individuals with HIV[9]. This is of great concern for Aboriginal populations as reported new HIV cases have steadily increased in these populations since 2002[28,29]. In Canada, not all TB cases are tested for HIV, although in some areas this occurs as an "opt-out" option. With this form of testing, individuals with suspected or confirmed TB are briefly informed of HIV's connection to TB and the fact that there is routine testing of TB patients for HIV unless they choose not to be tested[30]. This practice has significantly contributed to improving the understanding of the burden of co-infection, cooperation between TB and HIV programs and ultimately, to the management of the two conditions[30]. However, only 26% of First Nation TB cases reported to PHAC between 1997 and 2006 also reported HIV status. Of these, 18% were HIV positive[31]. Given the under-reporting of HIV status for TB cases, the true rate of TB-HIV co-infection in First Nation populations remains unknown.

Pediatric Population – BCG Discontinuation

Historically, the BCG vaccine has been used to control TB disease within the pediatric population, primarily by preventing TB meningitis and miliary TB. However, it is ineffective in preventing TB infection and, under certain circumstances, places an infant at risk for disseminated BCG disease (i.e., when the infant is severely immunocompromised)[9, 31, 32, 33]. After consultations with stakeholders and experts in 2003, Health Canada determined that BCG be discontinued in First Nation communities on a community-by-community basis as guided by the epidemiology of each community and according to the criteria set forth by the International Union Against Tuberculosis and Lung Diseases[23, 34]. The policy made clear that strengthening the overall TB control program was needed following discontinuation of the vaccine and should include thorough evaluation of all pediatric contacts of infectious TB and enhanced screening. Based on qualitative and quantitative reviews of the impact of BCG discontinuation completed in 2010, no harm from the 2003 policy shift has been detected. Also resulting from this evaluation was the recommendation to continue with the current approach of BCG discontinuation as guided by local epidemiology, TB programming and health systems and consultations/ discussions with First Nation communities[22].

Chronic Medical Conditions

Chronic medical conditions such as diabetes, renal failure or malnutrition are important risk factors for the development of TB disease and can complicate its treatment[35]. Rates of certain chronic conditions are higher among First Nation populations than in the general Canadian population, even when differences in socio-demographic factors are taken into account[36, 37]. The link between these conditions and TB varies depending on the condition in question and in some cases, the social determinants of health. For example, diabetes increases the risk of progressing from latent TB to active disease and can complicate the ability to treat active TB[37, 38]. Specifically, active TB can lead to glucose intolerance while diabetes can weaken the immune system and, consequently, decrease the body's ability to cope with TB[37].

Mental Health and Addictions

In First Nation populations in Canada, mental well-being and addictions represent an increasing concern[37,38,39]. The leading cause of death for Aboriginal populations under the age of 45 is suicide[40]. In terms of TB, psychological distress and disorders, especially substance abuse, tend to interfere with treatment compliance and completion[41]. For example, heavy alcohol use also increases the incidence of and complications from active TB[42]. Smoking is also an important consideration as smokers have a higher risk of being infected with TB and developing active TB. Smoking can also interfere with the treatment of active TB disease[43]. Given the high rates of smoking in First Nation communities, the link between smoking and TB is of particular concern[26], especially considering social determinants of health such as poorly ventilated and over-crowded homes are part of the environmental conditions.

Adults/Older Generations with Untreated LTBI

Although the risk of developing TB disease is greatest within the first two years following infection, there remains a 5% lifetime risk[9]. The effectiveness of the immune system decreases with age[44] and therefore, individuals with LTBI face an increasing risk of developing active TB. At the same time, some communities have been unable to identify or treat prophylactically all contacts of infectious cases that are known to have LTBI. As such, untreated individuals with LTBI represent a possibly significant pool of future cases of active TB, even in a community that has not had active TB cases for many years. Although it may be inappropriate to provide preventive treatment for these untreated cases of LTBI, their existence and potential for future cases underlines the need for health care workers to remain vigilant and retain a heightened awareness/knowledge of TB. This will allow for early identification and the prevention of further transmission should any untreated infected cases begin presenting as cases of active TB.

APPENDIX D: TB and the Social Determinants of Health

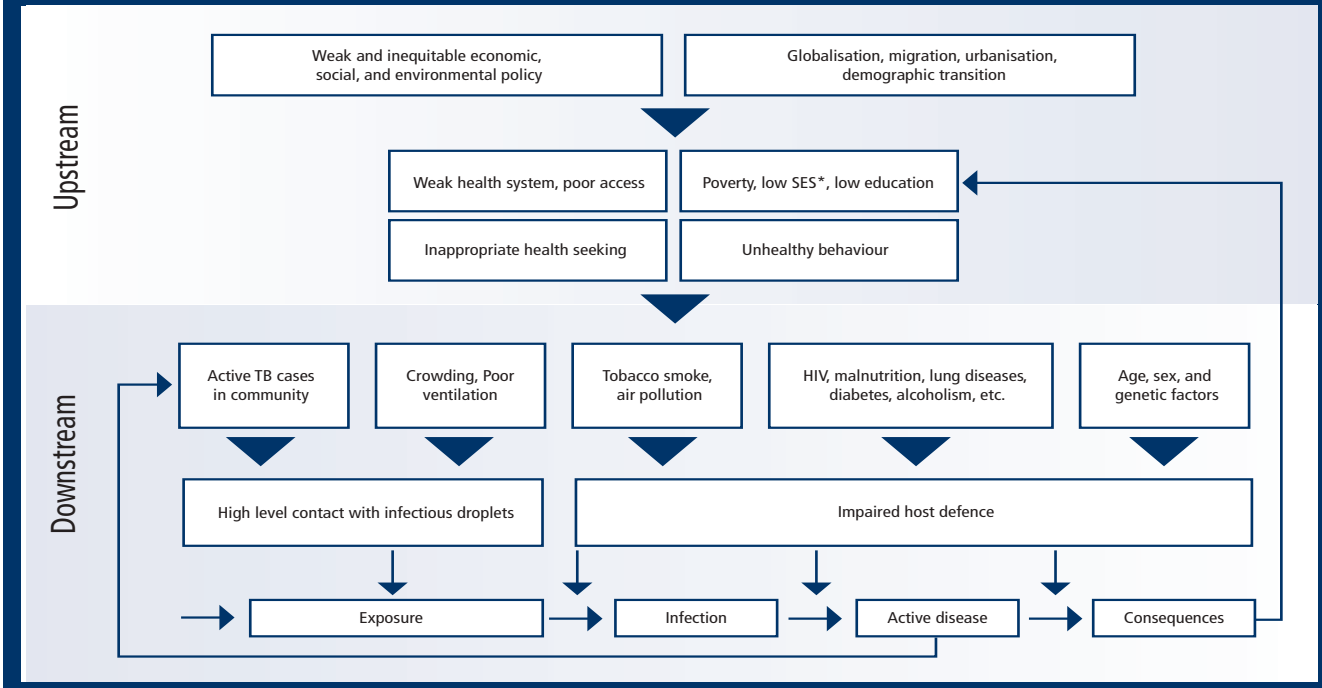
Social determinants of health are social and economic factors that not only influence health and well-being, but also influence disease prevention and health outcomes. They are factors that play a significant role in disparities in the occurrence and presentation of disease and for general measures of health. Social determinants of health do not cause disease, but can increase the risk of contracting and/or developing complications from a disease or illness[7, 45]. For example, TB is caused by bacteria, but its transmission or disease process can be aggravated by conditions such as overcrowding or malnutrition. Furthermore, the presence of these conditions can also put populations at greater risk for contracting TB[7, 44].

The manner in which these socioeconomic factors and TB might interconnect is summarized in Figure 3.

Despite progress in reducing the gap, socioeconomic and health disparities continue to exist in Canada between Aboriginal and non-Aboriginal populations [39, 46, 47, 48, 49]. It is difficult to determine which social determinants of health have the most influence on specific diseases, and thus create the most impact on disease incidence and burden. For TB, evidence suggests that TB rates are higher in communities that are isolated and that experience overcrowded housing[41].

According to the 2006 Census[49], the quantity of housing on First Nation reserves has increased significantly since 1981; however, crowding and quality of housing both remain problematic. In 2006, 15% of First Nations were living in crowded households compared to 3% in the non-Aboriginal population[49]. Crowding is a much more common problem for First Nations living on-

Figure 3: Potential links between determinants of health and TB [7]



* SES = Socioeconomic status

reserve (26%) than off-reserve (7%). At the same time, the proportion of on-reserve First Nation households that are below the adequacy standard is fourteen times more than that of households in the off-reserve non-Aboriginal population (28% versus 2%) and four times more than the off-reserve Aboriginal population (28% versus 6%)[13]. Furthermore, in two First Nation communities, an association has been found between the number of people living in a house and self-reported TB[50].

Health Canada's National TB Program works with other federal programs, committees and departments such as AANDC, Human Resources and Skills Development Canada (HRSDC), and other Health Canada programs that directly focus on issues such as housing, food, education, employment and air quality. Overall, the Government of Canada has made significant investments in the programs that address specific social determinants of health relevant to First Nation populations. However, continued efforts with partners internal and external to the federal government are essential to address the social determinants of health that affect health and disease, including TB.

APPENDIX E: Glossary

Aboriginal Peoples: are descendants of the original inhabitants of North America. The *Constitution Act* of 1982 recognizes three major groups of Aboriginal people in Canada: Indians (Status and non-Status North American Indians), Métis and Inuit.

Active TB Disease: denotes the presence of current active tuberculosis, most often on the basis of positive bacteriology but in approximately 15%-25% of cases on the basis of appropriate clinical and/or radiological and/or pathological presentation as well as treatment response.

Adherence: see *Treatment Compliance*

Assembly of First Nations (AFN): is a national aboriginal advocacy organization and the national representative organization of the First Nations in Canada.

Bacille-Calmette-Guérin (BCG) vaccine: is a live attenuated vaccine derived from *Mycobacterium bovis* used to prevent or moderate tuberculosis disease.

Cluster: is an aggregation of relatively uncommon events or diseases in space and/or time in amounts that are believed or perceived to be greater than could be expected by chance.

Contact: is a person identified as having come in contact with an active case of TB disease. The degree of contact is usually further defined as close household, close non-household, casual and community contacts. The level and duration of contact usually suggests the risk of becoming infected.

Conversion: is a change in the result of a test for *Mycobacterium tuberculosis* infection that is interpreted to indicate a change from being uninfected to infected.

Directly Observed Therapy (DOT): is the process whereby a health care worker or independent observer watches the patient swallow each dose of medication, helping to ensure that higher treatment completion rates are achieved.

Directly Observed Preventive Therapy (DOPT): is the process whereby a health care worker or pill dispenser watches the patient swallow each dose of medication for latent tuberculosis infection, helping to ensure higher treatment completion rates. DOPT is also known as Directly Observed Prophylaxis (DOP).

Disseminated BCG Disease: is the systemic spread of *Mycobacterium bovis* BCG causing multi-organ system, often fatal disease; most cases have been reported following the administration of BCG as a vaccine to infants later determined to be immuno-deficient or as immune modulating therapy to adults with a known underlying condition such as bladder cancer.

Disseminated TB: see *Miliary TB.*

Drug-Resistant TB: is a strain of *Mycobacterium tuberculosis* resistant to one or more of the four first-line drugs: isoniazid, rifampin, pyrazinamide or ethambutol.

Epidemiology: is the study of the distribution and determinants of health-related states or events in specific populations, and the application of this study to control of health problems.

First Nations and Inuit Health Branch (FNIHB): is the branch of Health Canada that supports the delivery of public health and health promotion services on reserve and to Inuit in Nunatsiavut. It also provides drug, dental and ancillary health services to First Nations and Inuit peoples regardless of residence. The Branch also provides primary care services on reserve in remote and isolated areas, where there are no provincial services readily available.

Incidence: is the number of new occurrences of a given disease during a specified period of time.

Incidence Rate: is the rate at which new events occur in a population. 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, sometimes expressed as person-time.

Index Case: is the first or initial active case from which the process of contact investigation begins.

Infectious: is the condition whereby the patient can transmit infection to others by virtue of the production of infectious aerosols. Those with smear-positive cavitary and laryngeal disease are usually the most infectious.

Interferon Gamma Release Assays (IGRAs): are in-vitro T-cell based assays that measure interferon-γ (IFN-γ) production and that have been developed for the diagnosis of latent tuberculosis infection (LTBI). The assays operate on the basis that T-cells previously sensitized to tuberculosis antigens produce high levels of IFN-γ when re-exposed to the same mycobacterium antigens.

Inuit Tapiriit Kanatami (ITK): is the national voice of 55,000 Inuit living in 53 communities across the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (Northern Quebec), and Nunatsiavut (Northern Labrador), land claims regions.

Isolated Community: is a geographical area that has scheduled flights and good telephone services; however, it is without year-round road access.

Latent TB Infection (LTBI): occurs when there is the presence of latent or dormant infection with *Mycobacterium tuberculosis* with no evidence of clinically active disease. The immunocompetent host generally has a lifetime risk of infection progressing to active disease (reactivation) in the range of 10%. Subjects deemed to have LTBI are by definition non-infectious. Depending on their contact history, age, chest radiographic findings and associated medical conditions, they may be candidates for treatment of LTBI.

Miliary TB: is originally a pathologic, and then radiologic, description of the clinical disease caused by the widespread hematogenous dissemination of *Mycobacterium tuberculosis* to most organs of the body. Bacteria enter the bloodstream at the time of primary infection, before the host's immune system has fully responded, or later, during reactivation of latent infection.

Multidrug-Resistant TB (MDR-TB): is due to bacteria resistant to isoniazid and rifampin with or without resistance to other first or second line anti-tuberculosis drugs.

Nunatsiavut: means 'our beautiful land' in Inuttitut and is the homeland of Labrador Inuit and is located in northern Labrador. The Nunatsiavut Government was established in 2005, born out of the Labrador Inuit Land Claims Agreement. The Nunatsiavut Government is a regional Inuit government within the Province of Newfoundland and Labrador.

Outbreak: The following working definition of outbreak has been proposed by the U.S. Centers for Disease Control and Prevention for planning investigations and is used in the *Canadian Tuberculosis Standards, 6th Edition*[9]: a) During (and because of) a contact investigation, two or more contacts are identified as having active TB, regardless of their assigned (contact investigation) priority; or b) any two or more cases occurring (within) less than or equal to one year of each other are discovered to be linked, and the linkage is established outside of a contact investigation (e.g., two patients who received a diagnosis of TB outside of a contact investigation are found to work in the same office, and only one or neither of the persons was listed as a contact to the others). The linkage between cases should be confirmed by genotyping results if isolates have been obtained.

Primary TB: occurs usually, but not always, in a child, and is due to infection within the preceding 24 months with *Mycobacterium tuberculosis* complex.

Pulmonary TB: includes tuberculosis of the lungs and conducting airways, which includes tuberculous fibrosis of the lung, tuberculous bronchiectasis, tuberculous pneumonia, tuberculous pneumothorax, isolated tracheal or bronchial tuberculosis and tuberculous laryngitis.

Remote Community: is a term in federal use that describes a geographical area where a First Nations community is located over 350 km from the nearest service centre having year-round road access.

Remote/Isolated Community: is a term in federal use that describes a geographical area occupied by First Nations people that does not have scheduled flights, has minimal telephone or radio services and no road access.

Respiratory TB: consists of primary tuberculosis (which includes primary respiratory tuberculosis and tuberculous pleurisy in primary progressive tuberculosis), pulmonary tuberculosis, tuberculous pleurisy (nonprimary) and tuberculosis of intrathoracic lymph nodes, mediastinum, nasopharynx, nose (septum) and sinus (any nasal).

Screening: is a process to discover conditions suitable for early preventive or curative intervention. These conditions may not be sufficiently symptomatic to cause individuals to seek medical help on their own. The condition being screened for must be sufficiently prevalent for the screening procedure to be cost-effective, have agreed-upon diagnostic criteria, have a known natural history and be amenable to a definitive intervention.

Social Determinants of Health: are, according to the World Health Organization, the circumstances in which people are born, grow up, live, work, and age, as well as the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics.

Sputum Culture: is the inoculation of one solid and one liquid medium for culturing of acid fast bacteria (AFB). Sputum is a thick fluid produced in the lungs and in the airways leading to the lungs.

Sputum Smear: is a laboratory technique for preparing a specimen that allows bacteria to be visualized microscopically. The results for sputum AFB are reported as numbers. The quantity of stained organisms is associated with the degree of infectiousness.

Surveillance: is an ongoing process of: a) systematic collection of pertinent data; b) orderly consolidation and evaluation of these data; and c) prompt dissemination of the results to those who need to know, particularly those who are in a position to take action.

TB meningitis: is TB of the central nervous system.

Transferred Communities: are communities for which the responsibility for health service delivery has been transferred by the federal government. Only First Nations and Inuit communities situated south of the 60th parallel are eligible to enter into the health services transfer process managed by Health Canada.

Treatment Compliance: is a term that is often used interchangeably with adherence and refers to the patient's and health care provider's ability to follow management guidelines appropriately. It most often refers to the strict adherence by the patient to the prescribed regimen of anti-tuberculosis drug treatment or preventive therapy.

Tuberculosis (TB): is a serious disease caused by a germ, a bacteria called *Mycobacterium tuberculosis*. TB usually infects the lungs. TB can also infect other parts of the body, including the kidneys, spine and brain.

WHO Global Plan to Stop TB: is a comprehensive assessment of the action and resources needed to implement the Stop TB Strategy and make an impact on the global TB burden. The Stop TB Partnership was established in 2001 building upon the Stop TB Initiative that was launched by WHO in 1998 and following a call at the Amsterdam Ministerial Conference in 2000. Its aim is to realize the goal of eliminating TB as a public health problem and, ultimately, to obtain a world free of TB. It comprises a network of international organizations, countries, donors from the public and private sectors, governmental and nongovernmental organizations and individuals that have expressed an interest in working together to achieve this goal.

APPENDIX F: References

1 Health Canada. (1992). National Tuberculosis Elimination Strategy.

2 Yuan, L. (2005). First Nations and Inuit Health Branch: Developing Tuberculosis Goals. Ottawa, Ontario: Health Canada.

3 Clark, M., & Cameron, D. (2009). Tuberculosis elimination in the Canadian First Nations population: assessment by a state-transfer compartmental epidemic model. International Journal of Infectious Diseases, 13, 220-226.

4 El-Sadr, W., & Tsiouris, S. (2008). HIV-associated tuberculosis: Diagnostic and treatment challenges. Seminars in Respiratory and Critical Care Medicine, 29, 525-531.

5 Luetkemeyer, A. (2010). Current issues in the diagnosis and management of tuberculosis and HIV coinfection in the United States. Topics in HIV Medicine, 18, 143-148.

6 Sardar, P., Jha, A., Roy, D., Roy, S., Guha, P., & Bandyopadhyay, D. (2010). Intensive phase non-compliance to anti tubercular treatment in patients with HIV-TB coinfection: A hospital-based cross-sectional study. Journal of Community Health, 35, 471-478.

7 Lonnroth, K., Jaramillo, E., Williams, B., Dye, C., & Raviglione, M. (2009). Drivers of tuberculosis epidemics: The role of risk factors and social determinants. Social Science and Medicine, 68, 2240-2246.

8 Clark, M., Riben, P., & Nowgesic, E. (2002). The association of housing density, isolation and tuberculosis in Canadian First Nations communities. International Journal of Epidemiology, 31, 940-945.

9 Long, R., & Ellis, E. (2007). Canadian Tuberculosis Standards (6th Edition ed.). (R. Long, & E. Ellis, Eds.) Minister of Health.

10 Public Health Agency of Canada. (n.d.). Guidance for Tuberculosis Prevention and Control Programs in Canada (Draft).

11 Stop TB Partnership and World Health Organization. (2006). The Global Plan to Stop TB 2006-2015. Geneva: World Health Organization. Retrieved January 2012, from http://www.stoptb.org/assets/documents/global/plan/TB_GlobalPlanToStopTB2011-2015.pdf

12 Stop TB Partnership and World Health Organization. (2010). The Global Plan to Stop TB 2011-2015. Geneva: World Health Organization. Retrieved January 20, 2012, from http://www.stoptb.org/assets/documents/global/plan/stopTB2011_insert_FINAL.pdf

13 Health Canada. (n.d.). Epidemiology of Tuberculosis in First Nations Living On-Reserve in Canada, 2000-2008 (Draft).

14 Wherrett, G. (1977). The Miracle of Empty Beds: A History of Tuberculosis in Canada. Toronto: University of Toronto Press.

15 Mackenzie, K. (2007, 17 September). Inuit gather in Apex to commemorate TB victims. Northern News Services. Retrieved January 2012, from http://nnsl.com/northern-news-services/stories/papers/sep17_07tb.html

16 CBC. (1989, January 30). TB treatment in south takes Inuit from families. Retrieved January 2012, from http://archives.cbc.ca/health/disease/clips/5325/

17 Public Health Agency of Canada. (2003). Tuberculosis in Canada, 2000. Ottawa, Ontario. Retrieved January 2012, from http://www.phac-aspc.gc.ca/publicat/tbcan00/pdf/tbcan_2000_e.pdf

18 Public Health Agency of Canada. (2009). Tuberculosis in Canada, 2008 – pre-release. Retrieved January 2012, from http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan08pre/index-eng.php

19 Russell, S. (2010). Building Quality Healthcare. Ottawa: Health Canada.

20 Clark, M., & Riben, P. (1999). Tuberculosis in First Nations Communities. Ottawa, Ontario: Health Canada. Retrieved from http://www.hc-sc.gc.ca/fniah-spnia/alt_formats/fnihb-dgspni/pdf/pubs/tuberculos/1999_commun-eng.pdf

21 Health Canada. (2009). Developing a Five-Year Strategic Framework for FNIHB's Public Health Role in First Nations Communities. Ottawa: Health Canada.

22 Samji, H., Wardman, D., & Orr, P. (2010). Perceptions of Tuberculosis Outbreak Definitions in a First Nations Community Context (Draft). Health Canada.

23 Shingadia, D., & Novelli, V. (2003). Diagnosis and Treatment of Tuberculosis in Children. The Lancet, Infectious Diseases, 3, 624-632.

24 Feja, K., & Saiman, L. (2005). Tuberculosis in children. Clinics Chest Medicine, 26, 295-312.

25 Loeffler, A. (2003). Paediatric tuberculosis. Seminars in Respiratory Infections, 18, 272-291.

26 Mandalakas, A., & Starke, J. (2005). Current concepts of childhood tuberculosis. Seminars Pediatric Infectious Diseases, 16, 93-104.

27 Health Canada. (2005). Ten Years of Health Transfer First Nation and Inuit Control – Agreements. Ottawa: First Nations Inuit Health Branch, Health Canada.

28 Wen, S. (2009). Epidemiology of TB-HIV Co-infection – A Review of the Literature. Ottawa: Health Canada.

29 Public Health Agency of Canada. (2005). Understanding the HIV/AIDS Epidemic among Aboriginal Peoples in Canada: The community at a glance. Retrieved January 2012, from http://www.phac-aspc.gc.ca/publicat/epiu-aepi/epi-note/index-eng.php.

30 Sturtevant, D., Preiksaitis, J., Singh, A., Houston, S., Gill, J., Predy, G., et al. (2009). The feasibility of using an 'opt-out' approach to achieve universal HIV testing of tuberculosis patients in Alberta. Canadian Journal of Public Health, 100, 116-120.

31 Yip, D., Bhargava, R., Yao, Y., Sutherland, K., Manfreda, J., & Long, R. (2007). Pediatric tuberculosis in Alberta: Epidemiology and case characteristics (1990-2004). Canadian Journal of Public Health, 98, 276-280.

32 Deeks, S., Clark, M., Scheifele, D., Law, B., Dawar, M., Ahmadipour, N., et al. (2005). Serious adverse events associated with bacilli Calmette-Guerin vaccine in Canada. . The Pediatric Infectious Disease Journal, 24, 538-541.

33 Rodrigues, L., Diwan, V., & Wheeler, J. (1993). Protective effect of BCG against tuberculosis meningitis and military tuberculosis: a meta-analysis. International Journal of Epidemiology, 22, 1154-1158.

34 International Union Against Tuberculosis and Lung Diseases. (1994). Criteria for the discontinuation of vaccination programmes using Bacille Calmette-Guerin (BCG) in countries with a low prevalence of tuberculosis. Tubercle and Lung Disease, 75, 179-180.

35 Dooley, K., & Chiasson, R. (2009). Tuberculosis and diabetes mellitus: convergence of two epidemics. The Lancet Infectious Disease, 9, 737-746.

36 Monsalve, M., Thommasen, H., Pachev, G., & Frohlich, J. (2005). Differences in cardiovascular risks in the aboriginal and non-aboriginal people living in Bella Coola, British Columbia. Medical Science Monitor, 21-8.

37 Health Canada. (2009). A Statistical Profile on the Health of First Nations in Canada: Self-rated Health and Selected Conditions, 2002 to 2005. Ottawa: Health Canada. Retrieved January 2012, from http://www.hc-sc.gc.ca/fniah-spnia/pubs/aborig-autoch/2009-stats-profil-vol3/index-eng.php

38 United Nations Permanent Forum on Indigenous Issues. (2009). State of the World's Indigenous Peoples. New York: United Nations. Retrieved from http://www.un.org/esa/socdev/unpfii/documents/SOWIP_web.pdf

39 First Nations Information Governance Committee (FNIGC). (2005). First Nations Regional Longitudinal Health Survey (RHS) 2002-03: Results for Adults, Youth and Children Living in First Nations Communities. Retrieved January 2012, from http://www.rhs-ers.ca/english/pdf/rhs2002-03reports/rhs2002-03-technicalreport-afn.pdf

40 Adelson, N. (2005). The embodiment of inequity: health disparities in aboriginal Canada. Canadian Journal of Public Health, 96, S45-61.

41 Munro, S., Lewin, S., Smith, H., Engel, M., Fretheim, A., & Volmink, J. (2007). Patient adherence to tuberculosis treatment: A systematic review of qualitative research. PLoS Medicine, 4(7), 1230-1245.

42 Rehm, J., Samokhavalo, A., Neuman, M., Room, R., Parry, C., Lonnroth, K., et al. (2009). The association between alcohol use, alcohol use disorders and tuberculosis (TB). A systematic review. BMC Public Health, 9, 450.

43 Chiang, C., Stama, K., & Enarson, D. (2007). Associations between tobacco and tuberculosis. International Journal of Tuberculosis and Lung Disease, 11, 258-262.

44 Vesosky, B., & Turner, J. (2005). The influence of age on immunity to infection with Mycobacterium tuberculosis. Immunological Reviews, 205, 229-243.

45 Thisted, R. (2003). Are there social determinants of health and disease? Perspectives in Biology and Medicine., 46, S65-73.

46 Frohlich, K., Ross, N., & Richmond, C. (2006). Health disparities in Canada today: some evidence and a theoretical framework. Health Policy, 79, 132-143.

47 Reading, J., Kmetic, A., & Gideon, V. (2007, April). First Nations holistic policy and planning model: Discussion paper for the World Health Organization Commission on Social Determinants of Health. Assembly of First Nations. Retrieved January 2012, from http://ahrnets.ca/files/2011/02/AFN_Paper_2007.pdf

48 Indian and Northern Affairs Canada. (2006). Measuring Well-being: the Community Well-being Index. Retrieved from http://www.ainc-inac.gc.ca/ai/rs/pubs/cwb/index-eng.asp

49 Statistics Canada. (2008). Aboriginal Peoples in Canada in 2006: Inuit, Metis and First Nations 2006 Census. Cat no. 97-588-XIE. Ottawa: Statistics Canada.

50 Larcombe, L., Nickerson, P., Singer, M., Robson, R., Dantouze, J., McKay, L., et al. (2011). Housing conditions in 2 Canadian First Nations communities. International Journal of Circumpolar Health, 70, 141-153.