INUIT-SPECIFIC TUBERCULOSIS (TB) STRATEGY

March 2013

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Inuit Tapiriit Kanatami

Table of Contents

Executive Summary

Substantial progress has been made in Canada toward reaching tuberculosis (TB) elimination targets set by the World Health Organization (WHO) and the *Global Plan to Stop TB (2011-2015)*. In 2010, the reported overall incidence rate of TB disease in Canada reached an all-time low of 4.6 cases per 100 000 population. However, that same year, the incidence of TB disease among Inuit reached a 10-year high of 195.2 cases per 100 000.

Inuit carry a strikingly disproportionate burden of TB disease in Canada. In 2011, the reported incidence rate of TB disease for Inuit was almost 254 times the rate reported for Canadian-born non-Aboriginals and roughly 38 times the rate reported for Canada overall. This disparity is believed to be the result of a number of influences that are unique to Inuit Nunangat and the Inuit experience of TB. Some of these influences include relatively recent epidemics of TB disease, impacts of early TB control efforts in Inuit Nunangat, and consequences of the rapid transition Inuit have made from a traditional society to a modern, industrialized society (acculturation).

Despite ongoing and substantial investment and effort to control TB in Inuit Nunangat, the disparity in incidence rates of TB disease between Inuit and other Canadian-born populations has been increasing and recurrent TB outbreaks are being experienced in some Inuit communities. These circumstances point to a need for more effective approaches to TB prevention, control, and care for Inuit.

ITK has collaborated with a subcommittee of the National Inuit Committee on Health (NICoH), the Inuit Public Health Task Group (IPHTG), to develop the ***Inuit-specific Tuberculosis (TB) Strategy*** to increase awareness of the need for more effective approaches to TB prevention, control, and care for Inuit, and to present a path forward for reducing the incidence of TB disease in Inuit Nunangat.

The Strategy provides a framework and process for stakeholders and partners to develop and implement an ***Inuit-specific TB Action Plan***. The proposed core TB Action Plan components include: community education and mobilization, intersectoral partnerships towards addressing the social determinants of Inuit health, evidence-based and Inuit-appropriate TB prevention, control and care programs, surveillance and research, and evaluation and reporting.

It is intended that the TB Action Plan be informed by principles that include Inuit involvement, respect, commitment to health equity, transparency and accountability, and collaboration. Valuing the input and involvement of youth, and appreciating the importance of tailoring approaches to meet the needs of Inuit rather than vice-versa is also key. The TB Action Plan will also be informed by an ITK position on the social determinants of Inuit health.

The TB Action Plan will be developed through an expanded consultation process and will build on existing strengths, support other initiatives for improving Inuit health, and incorporate promising practices based either on research relevant to Inuit (e.g., the TAIMA TB project) or on extensive experience and improved outcomes for populations faced with similar challenges.

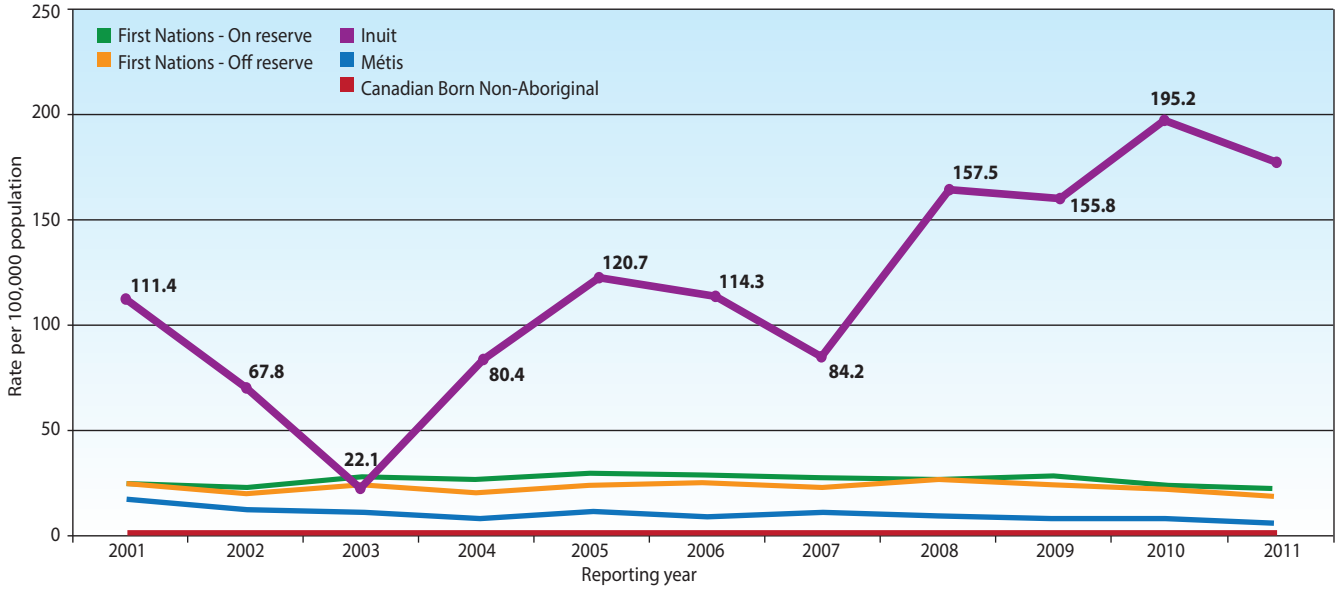
Background

The Public Health Agency of Canada (PHAC) has reported that the overall incidence rate of tuberculosis (TB) disease in Canada was 4.7 cases per 100 000 population in 2011. [1] The rate was almost unchanged from 2010, when an all-time low of 4.6 cases per 100 000 was reported. [1,2] These rates are evidence of Canada's progress toward reaching TB elimination targets set by the World Health Organization (WHO) and the *Global Plan to Stop TB (2011-2015)*. [3] However, closer examination of data from the Canadian Tuberculosis Reporting System (CTBRS) reveals that while the overall incidence of TB disease in Canada has been trending steadily downward, the incidence of TB disease among Inuit has been increasing, and at an alarming pace (See Figure 1). [4]

As a population, Inuit continue to carry a strikingly disproportionate burden of the TB disease in this country. CTBRS data indicate the incidence rate of TB disease for Inuit reached a 10-year high of 195.2 cases per 100 000 population in 2010. [2] The rate fell slightly in 2011 to 177.6 per 100 000. [1] Still, the 2011 rate for Inuit was roughly 38 times the reported incidence rate of TB disease for Canada overall. The disparity becomes even more pronounced when the incidence rate of TB disease for Inuit is compared to that of Canadian-born non-Aboriginals. In 2011, Inuit experienced an incident rate of TB disease that was almost 254 times that of Canadian-born non-Aboriginals. [1]

Figure 1 illustrates the substantial and growing disparity in the incidence rate of TB disease between Inuit and other Canadian-born populations. Data for 2012 has not yet been released but it is anticipated that incidence rates of TB disease for Canadian Inuit will remain high due to outbreaks of TB disease in Inuit Nunangat communities that year.

Figure 1: Incidence rate of TB disease by Aboriginal group compared with Canadian-born non-Aboriginals, 2001 – 2011*



*Note: 2011 date provisional until release of Tuberculosis in Canada, 2011
Source: Canadian Tuberculosis Reporting System, 2013 [4]

Addressing the disparity in the incidence rate of TB disease between Inuit and other Canadian-born populations will require a better understanding of the drivers of high rates of TB disease in Inuit, and action to minimize the inequities that are contributing to the current state of TB in Inuit Nunangat. Renewed commitment, increased investment and ongoing collaboration among Inuit, Inuit organizations, government and other partners in Inuit health will be critical.

The vision of the ***Inuit-specific Tuberculosis Strategy*** is a future in which TB is no longer a public health concern in Inuit Nunangat[1]. The Strategy has two purposes. One is to increase awareness of the need for more effective approaches to TB prevention, control, and care for Inuit. The other is to present a path forward for stakeholders and partners to work together to reduce the incidence rates of TB disease through an ***Inuit-specific TB Action Plan***. Collaborative development and implementation of a holistic TB Action Plan will ensure the root causes of TB and other health disparities[2] experienced by Inuit are attended to in ways that are culturally safe, epidemiologically appropriate, and sustainable.

Approval of the Strategy was received from the National Inuit Committee on Health on March 13, 2013.

1 In 2000, the World Health Organization (WHO) endorsed the establishment of a global partnership to accelerate social and political action to stop the spread of TB around the world; the Stop TB Partnership. In 2006, the Stop TB Partnership launched the *Global Plan to Stop TB 2006—2015. The Global Plan* set a long term goal of reducing rates of TB to less than one case per million population and eliminating TB as a public health concern by 2050. Commitment to reaching the 2050 target was reiterated when the Global Plan was updated in 2011 (*The Global Plan to Stop TB 2011—2015*). Canada supports the WHO 2050 TB elimination target and has adopted TB reduction targets consistent with it. [5]

2 Health disparity is defined as a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion. [6]

Introduction

ITK has collaborated with the Inuit Public Health Task Group (IPHTG), a sub-committee of ITK's National Inuit Committee on Health (NICoH), to develop and implement a coordinated plan to reduce incidence rates of TB disease across Inuit Nunangat. The IPHTG includes the Chief Medical Officers of Health from each region (or designate) and representatives from: the four Inuit land claim organizations, Pauktuutit Inuit Women of Canada, Health Canada, and the Public Health Agency of Canada. The diverse areas of expertise and combined knowledge of the IPHTG has been integral to the development of this Strategy.

The intended audience for this document includes Inuit, Inuit organizations, provincial and territorial health departments, federal government and other partners in Inuit health, the research community and other interested parties within Canada and beyond.

The Strategy begins with an explanation of what TB is, how the bacteria that cause TB disease are transmitted, and what can be done to protect people from developing TB disease. The Strategy goes on to outline the current state of TB in Inuit Nunangat and to review some key historical and present-day influences that underlie and perpetuate the current high incidence rates of TB disease. This information is intended to explain why holistic, Inuit-specific approaches to TB prevention, control, and care are needed, and to provide a context for the Strategy's goal: to provide a framework and process for stakeholders and partners to develop a concrete and detailed ***Inuit-specific TB Action Plan***. Five core TB Action Plan components are proposed and their objectives are described. The Strategy concludes with suggested next steps, including consultation with an expanded group of stakeholders and partners in Inuit health, along with leading academic, scientific, public health, and TB experts.

The development of an ITK position paper on the social determinants of Inuit health is underway. It is anticipated that the position paper will contribute to the development of the TB Action Plan while also advocating for continued progress toward improving health in Inuit Nunangat.

1. Tuberculosis (TB)

What is TB?

Tuberculosis, also known as “TB”, is an infectious disease caused by tiny germs (bacteria). TB bacteria usually attack the lungs but they can also cause problems in other parts of the body, including the spine, lymph nodes and kidneys.

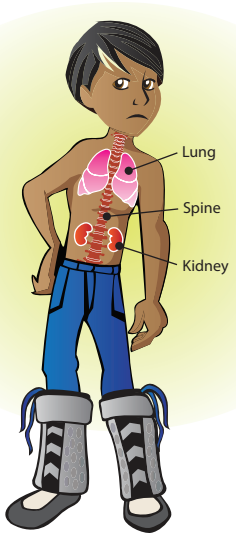
How do TB Bacteria Spread?

TB bacteria spread when people who have TB disease in their lungs or airways cough, sneeze, laugh, or sing. These actions cause TB bacteria to be released into the air. Under the right conditions, TB bacteria can stay suspended in the air for hours.

People become infected by breathing air that has TB bacteria in it. Crowding and poor indoor air quality (inadequate ventilation, mould, smoke) can make it easier for people to become infected with TB bacteria.

Who is at Risk for TB Disease?

On average, about one out of ten people who are infected with TB bacteria will eventually develop TB disease. The risk of developing TB disease is much higher for young children and people with weakened immune systems. Poor nutrition, other health problems such as diabetes or kidney failure, and smoking (or exposure to second-hand smoke) can also increase the risk that people who are infected with TB bacteria will develop TB disease.



What are the Symptoms of TB Disease?

People with TB disease often notice they feel more tired than usual. They might have a fever and wake up sweating at night. It is also common for people with TB disease to not feel like eating and to lose a lot of weight.

Some symptoms of TB disease depend on which part of the body the TB bacteria are attacking. People with TB disease in their lungs or airways tend to cough a lot. They might complain about having chest pain and notice streaks or spots of blood in the phlegm (sputum) they cough up.

How is TB Disease Diagnosed?

Chest x-rays can help diagnose TB disease. Tests on sputum or other body fluids are needed to confirm the diagnosis and which medications should be used for treatment.

It is important to diagnose people with TB disease quickly. The longer TB disease goes untreated, the more damage it can do. Delays in diagnosing and treating people with TB disease can also lead to more people becoming infected with TB bacteria and to outbreaks of TB disease.

Can TB Disease be Cured?

Yes. The vast majority of people who develop TB disease in Canada can be cured when treated with TB medication for 6 months.

Can TB Disease be Prevented?

Yes. There are medications that can safely prevent people who are infected with TB bacteria from developing TB disease.

BCG vaccine is used in some communities in Inuit Nunangat. The vaccine does not prevent people from becoming infected with TB bacteria, but it can help to protect babies and young children from developing more severe forms of TB disease such as TB meningitis.

The best way to prevent TB disease is to protect people from becoming infected with TB bacteria. Diagnosing people with TB disease quickly and making sure they complete proper treatment is the most effective way to protect communities against TB disease. Raising awareness about the symptoms of TB disease and the importance of early diagnosis and treatment can help keep everyone safe from being infected with TB bacteria.

2. Incidence Rates of TB Disease In Inuit Nunangat, 2001-2011

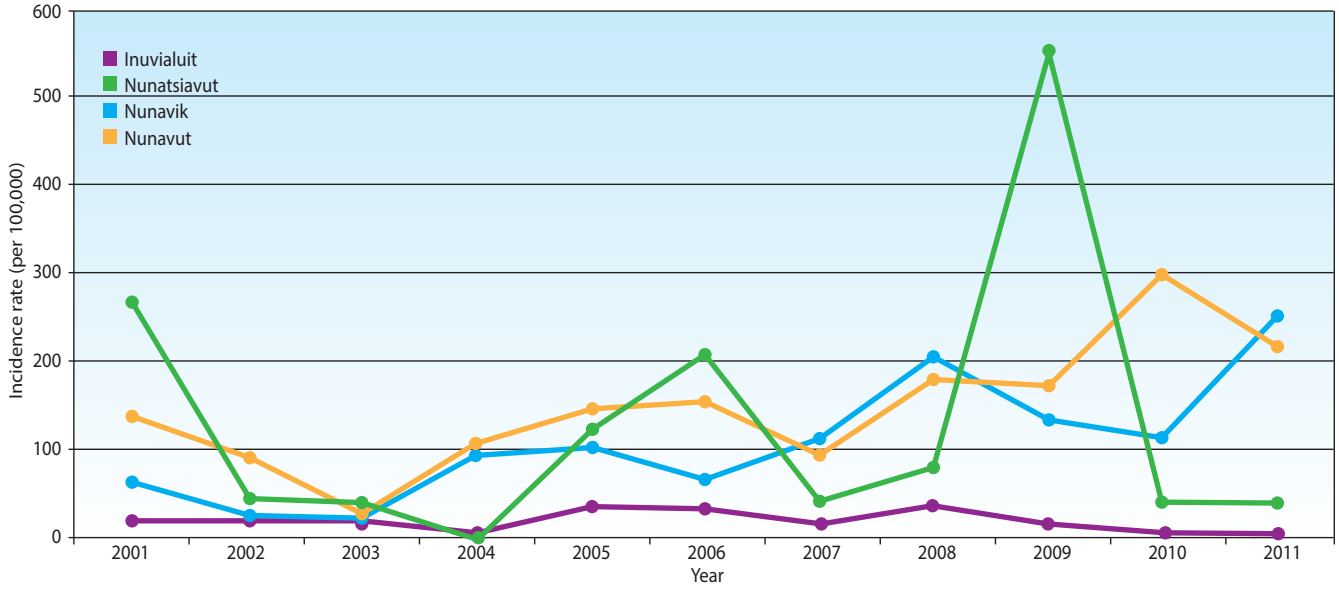
This section describes the incidence rates of TB disease in the four Inuit regions from 2001 - 2011. The rates have been calculated from yearly population estimates based on the 2001, 2006 and 2011 Census. Both the number of cases and population data include all ethnicity (i.e., not only Inuit-specific) as it was not possible to obtain the Inuit-specific populations in the Inuit Nunangat regions.

Brief descriptions of the location, geographic size and populations are provided in **Appendix A** for readers unfamiliar with the four Inuit regions.

Incidences Rates of TB Disease across Inuit Nunangat

The incidence rates of TB disease vary among the Inuit regions (See Figure 2). Incidence rates by region and year are provided in Table 1.

Figure 2: Incidence rates of TB disease among Inuit regions, 2001-2011



Source: Canadian Tuberculosis Reporting System [7]

Table 1: Incidence rates of TB disease by year and Inuit region, 2001-2011 [7]

	Inuvialuit**	Nunatsiavut‖	Nunavik‡	Nunavut*
2001	19.0	265.8	62.3	142.2
2002	18.7	38.6	20.3	93.7
2003	18.3	39.3	19.8	23.9
2004	0.0	0.0	96.7	107.2
2005	35.2	121.8	103.9	148.4
2006	34.7	207.1	64.9	155.8
2007	17.3	40.7	111.2	99.1
2008	34.7	80.1	203.8	186.5
2009	17.3	551.6	129.6	173.7
2010	0.0	38.8	111.0	304.6
2011	0.0	38.2	249.7	222.1

* Source: Statistics Canada, Demography Division; Annual population estimates by age and sex for July 1, 1971 to 2011, Canada, provinces and territories. Updated 2012.02.24

** Source: Statistics Canada. 2007. Inuvialuit, Northwest Territories (Code640004) (table). Aboriginal Population Profile. 2006 Census. Statistics Canada Catalogue no. 92-594-XWE. Ottawa.

‖ Source: Statistics Canada. 2007. Nunatsiavut, Newfoundland and Labrador (Code640001) (table). Aboriginal Population Profile. 2006 Census. Statistics Canada Catalogue no. 92-594-XWE. Ottawa. Released January 15, 2008.

‡ Source: Statistics Canada. 2007. Nunavik, Quebec (Code640002) (table). Aboriginal Population Profile. 2006 Census. Statistics Canada Catalogue no. 92-594-XWE. Ottawa. Released January 15, 2008.

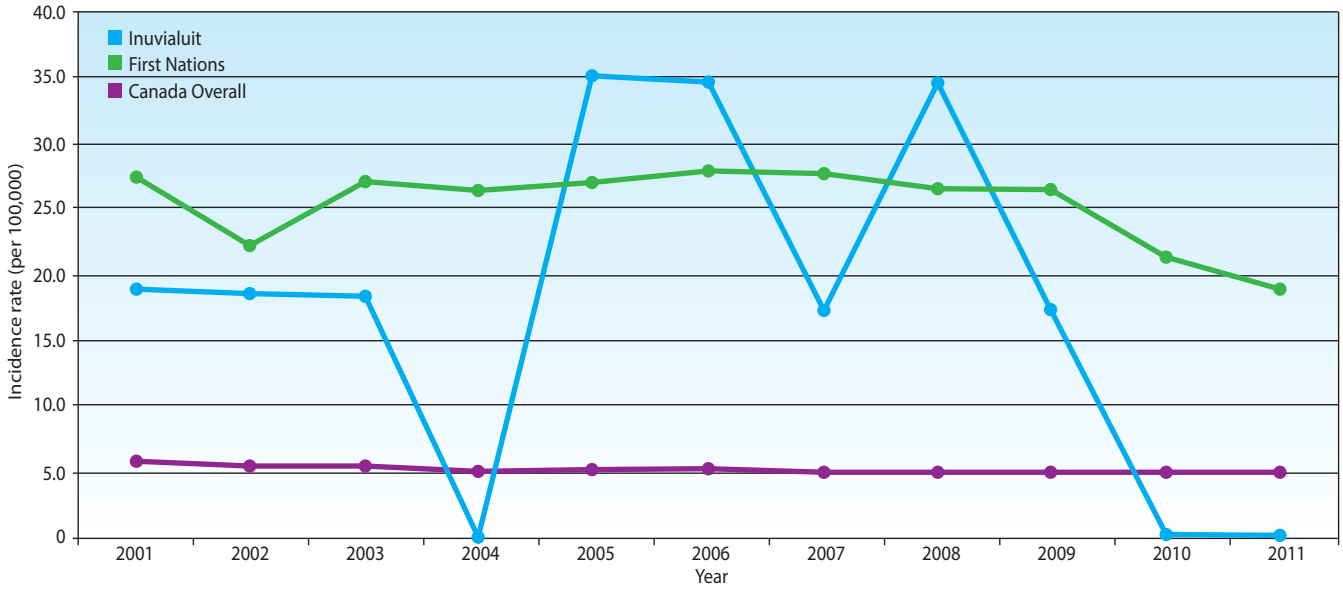
Incidence Rates of TB Disease by Inuit Region

When considering the information illustrated in the graphs that follow, it is important to keep in mind that the incidence rate of TB disease in Canadian Inuit in 1997 was 31 per 100 000 population. [8] The only region with an incidence rate of TB disease within that range presently is the Inuvialuit Settlement Region (ISR).

Comparisons against incidence rates of TB disease with Canada overall and First Nations are provided on the regional TB incidence graphs. As the population of Inuit is small, even a relatively small increase or decrease in TB cases can cause a substantial variation in the yearly incidence rate. In larger populations such as that of Canada overall, rates are expected to remain more stable. Please note that the scale of the y-axis differs among graphs.

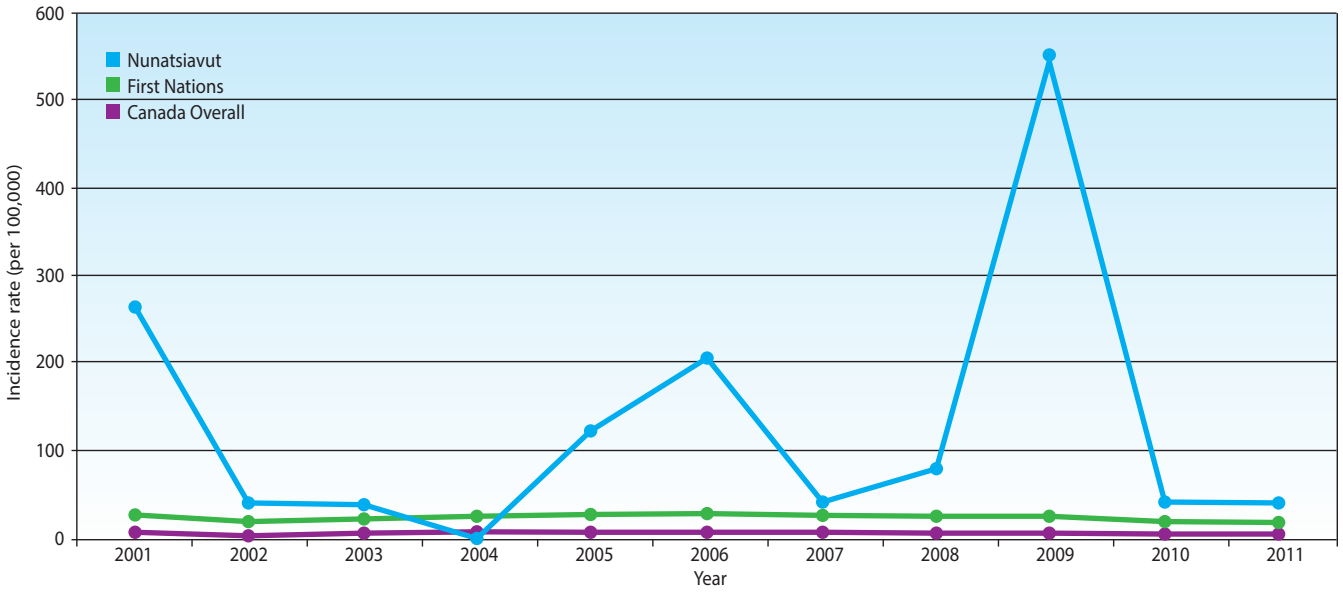
The data represented in the graphs, along with anecdotal reports from local public health experts, underscore the need for additional analysis and research. Further information is needed on the similarities and differences of TB cases among and within the regions, and patterns of TB transmission. Such findings would contribute to the development of evidence-based approaches that could be targeted towards populations at highest risk for TB disease in Inuit Nunangat.

Figure 3: Incidence rates of TB disease in Inuvialuit Settlement Region (ISR), 2001-2011



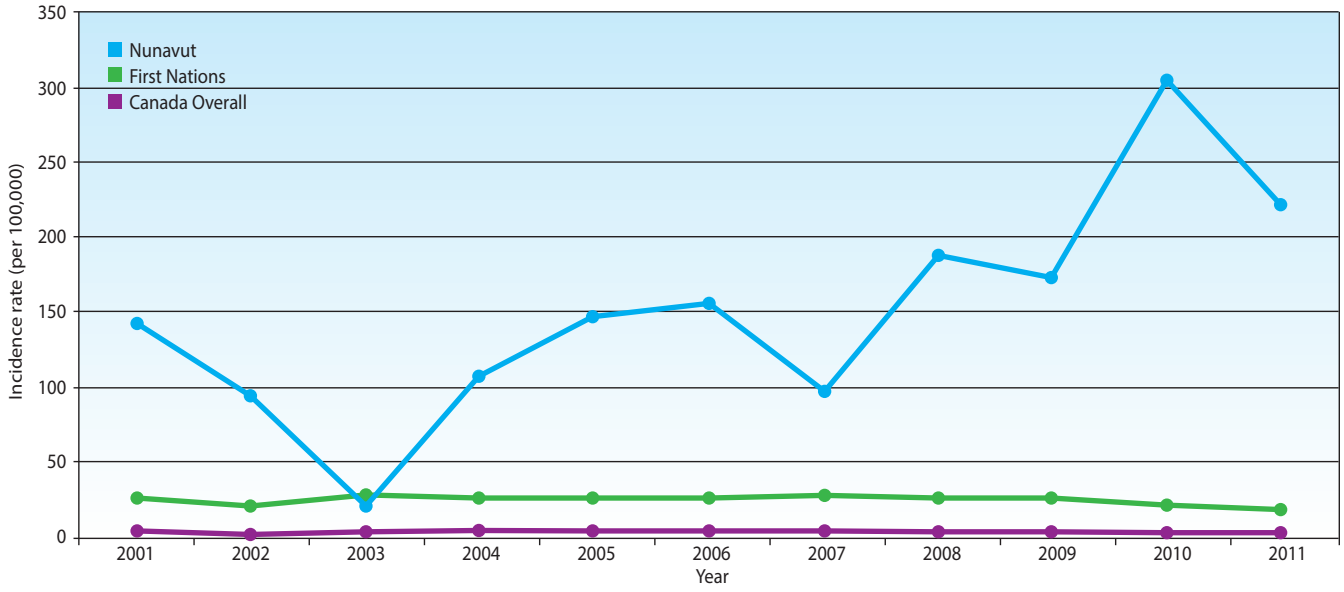
Source: Canadian Tuberculosis Reporting System [7]

Figure 4: Incidence rates of TB disease in Nunatsiavut, 2001-2011



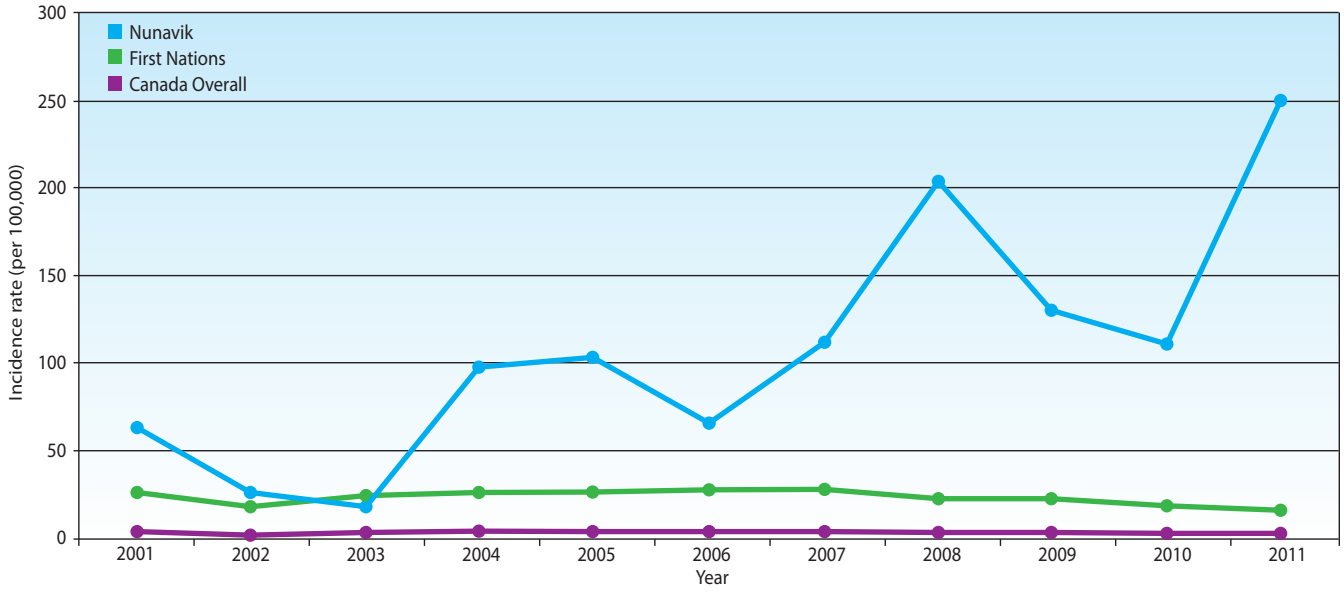
Source: Canadian Tuberculosis Reporting System [7]

Figure 5: Incidence rates of TB disease in Nunavut, 2001-2011



Source: Canadian Tuberculosis Reporting System [7]

Figure 6: Incidence rates of TB disease in Nunavik, 2001-2011



Source: Canadian Tuberculosis Reporting System [7]

3. Context of TB in Inuit Nunangat

The current incidence rate of TB disease among Canadian Inuit is believed to reflect a number of influences that are unique to Inuit Nunangat and the Inuit experience of TB. This section discusses the effects of post-colonization TB epidemics, early efforts to control TB disease in Inuit Nunangat, and acculturation on incidence rates of TB disease. A number of factors believed to influence transmission of TB bacteria and incidence rates of TB disease in the Inuit regions are also reviewed, specifically: housing, food security and nutrition, mental wellness, and access to health care services. The section concludes with a review of tobacco addiction and other risk factors associated with the development of TB disease that are important to the context of TB in Inuit Nunangat.

A. Post-colonization TB Epidemics

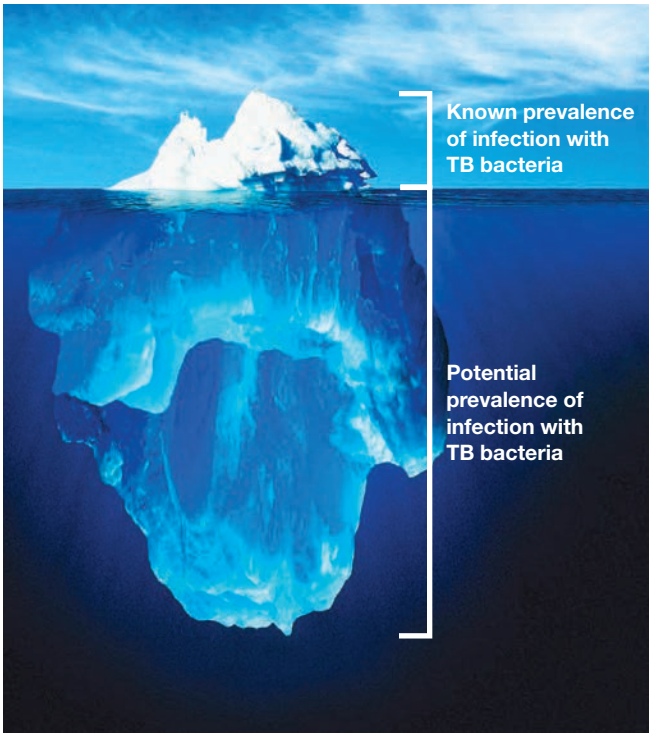


Image source: http://www.bing.com

Figure 7: Illustration of identifed versus potential prevalence of infection with TB bacteria after a TB epidemic or outbreak

TB was among many infectious diseases that ravaged Inuit communities after the arrival of early European explorers and whalers. There are accounts from the late 1800s that suggest consumption (another name for TB disease) had killed more Inuit than all other diseases put together. [13] The extent of the problem and impact of TB disease on Inuit communities began to garner more attention in the 1920s, when physicians started coming to the Arctic more regularly. High incidence rates of TB disease and TB epidemics were reported by most medical officers throughout the 1930s. Formal requests and proposals for the construction of health care facilities that specialized in TB care (TB sanatoriums) at various locations throughout the Arctic followed, although none were ever built. In February of 1945, a report by Dr. G.J. Wherrett, an influential TB expert of the time, identified TB disease as the number one health problem for Inuit. [13] Wherrett's description of the problem as "staggering" was not an exaggeration; At the time Canadian Inuit had the highest reported incidence rate of TB disease in the world. [14]

Controlling TB can be challenging in populations where epidemics or outbreaks of the disease were experienced relatively recently. Without widespread testing and treatment to eradicate TB bacteria in those found to be infected, the risk for ongoing cases of TB disease remains. Figure 7 illustrates how the number of people known to be infected with TB bacteria after a TB epidemic or outbreak can pale in comparison to the actual number infected, and at risk for developing TB disease.

Although testing for infection with TB bacteria is available throughout Inuit Nunangat, the actual proportion of Inuit infected with TB bacteria is unknown. Public health experts from the Inuit regions believe the distribution of TB cases might reflect communities where infection with TB bacteria is most prevalent. Because TB is a contagious disease, even a small outbreak can increase the number of people infected with TB bacteria exponentially. This might explain why some Inuit communities have experienced prolonged or repeated TB outbreaks, despite considerable control efforts.

B. Early Efforts to Control TB Disease in Inuit Nunangat

A plan for addressing the TB epidemic in Inuit Nunangat was set in motion during the mid-1940s. The core components of the plan included a survey of the whole population by chest x-ray to identify cases, removal of cases from the community to lessen the spread of the disease, and immunization of as much of the rest of the population as feasible with BCG vaccine. [9]

In the years after the plan was initiated, Government medical services began summertime visits to communities and camps along Arctic coastlines with ship-board medical clinics like the *C.D. Howe* (See Figure 8). [9] Inuit went aboard the ships for chest x-rays and symptom screening. Those found to have TB disease were detained on the ship and evacuated south to hospitals and TB sanatoriums. By the 1950s, it was estimated that at least one-third of the Inuit population was infected with TB bacteria and one in seven Inuit was in a southern TB sanatorium. [9]

Inuit evacuated for treatment were separated by thousands of kilometers from their families, support systems and culture, often for years. Families typically had no idea where their loved ones had been taken to and when—or if—they would return. The plight of Inuit with TB disease during the 1950s era was described in the 2008 film directed by Benoît Pilon, *The Necessities of Life*. The film follows the physical and emotional journey of an Inuk with TB disease evacuated from Baffin Island to a TB sanatorium in Quebec City.

Figure 8: Inuit watching arrival of the Eastern Arctic patrol vessel *C.D. HOWE* near Pangnirtung, NWT, July 1951. [11]

To this day, Inuit are searching for records of where their relatives were sent, and if they died, where they were buried. A project was initiated by Nunavut Tunngavik Inc. (NTI) in 2008 to help locate Inuit sent to southern communities during the time when evacuations to TB sanatoriums were occurring. The project is called Nanilavut. A Nanilavut collaboration is currently underway between Aboriginal Affairs and Northern Development Canada (AANDC) and the Nunatsiavut Government to look further into what became of Inuit evacuated from Labrador.

The evacuation programs resulted in severe social and mental trauma for Inuit with TB disease and for the families and communities they left behind. Despite this, a collection of stories from Inuit who survived having TB disease and returned to their communities featured in the March/April 2012 issue of the periodical *above & beyond* describe a sense of gratitude. In telling her story, one Inuk stated, "Many of us believe that if we weren't treated for TB in southern hospitals there would be a lot fewer Inuit. TB was so rampant, contagious and we had no way to treat it up North, so our gratitude is huge." [12]

Although well-intentioned and ultimately, effective, the trauma associated with early efforts to control TB in Inuit Nunangat might continue to inform what Inuit know about the disease and influence the decisions they make with regard to TB-related health care services. The impacts of early TB control efforts on how and when Inuit choose to engage with health care providers about TB have not been established. However, fear and stigma are believed to contribute to missed opportunities for TB screening and prevention and delays in detection and treatment of TB disease in Inuit Nunangat. [8]

C. Acculturation

'Acculturation' refers to the rapid transition from a traditional society to a modern industrialized society. During the period when efforts to control TB in northern Canada were intensified, monumental changes to the Inuit lifestyle were also underway. Many Inuit were relocated during the 1950s and 1960s by government programs intended to "provide them with a better quality of life, and to provide a physical presence in areas of the Arctic that were not occupied", often with catastrophic results. [9] Formal schooling requirements followed, and usually involved removal of children to residential school programs hundreds or thousands of kilometers away from their communities, causing further disruption for Inuit families, society, and culture.

Prior to the government relocation and residential school programs, most Inuit lived on the land with their extended family in small camps that moved with the seasons and followed wildlife migrations. For Inuit, the effects of the relocation and residential schooling programs and acculturation have included changes in: gender roles, roles between generations, relationship with the land, coping mechanisms, and loss of language and cultural identity. [13]

Some manifestations of Inuit acculturation include food insecurity and malnutrition, challenges related to obtaining and maintaining adequate housing, and mental wellness and addictions issues. These factors independently and collaboratively impact Inuit health and well-being. Although substantial effort and investment has been made to improve food security and nutrition, housing, and mental wellness in the four Inuit regions, these and other consequences of acculturation are believed to continue to drive incidence rates of TB disease in Inuit Nunangat.

D. Social Determinants of Health

> "Tuberculosis is a social disease with a medical aspect."
>
> – Dr. Sir William Osler, Canadian born and trained physician, (1849-1919)

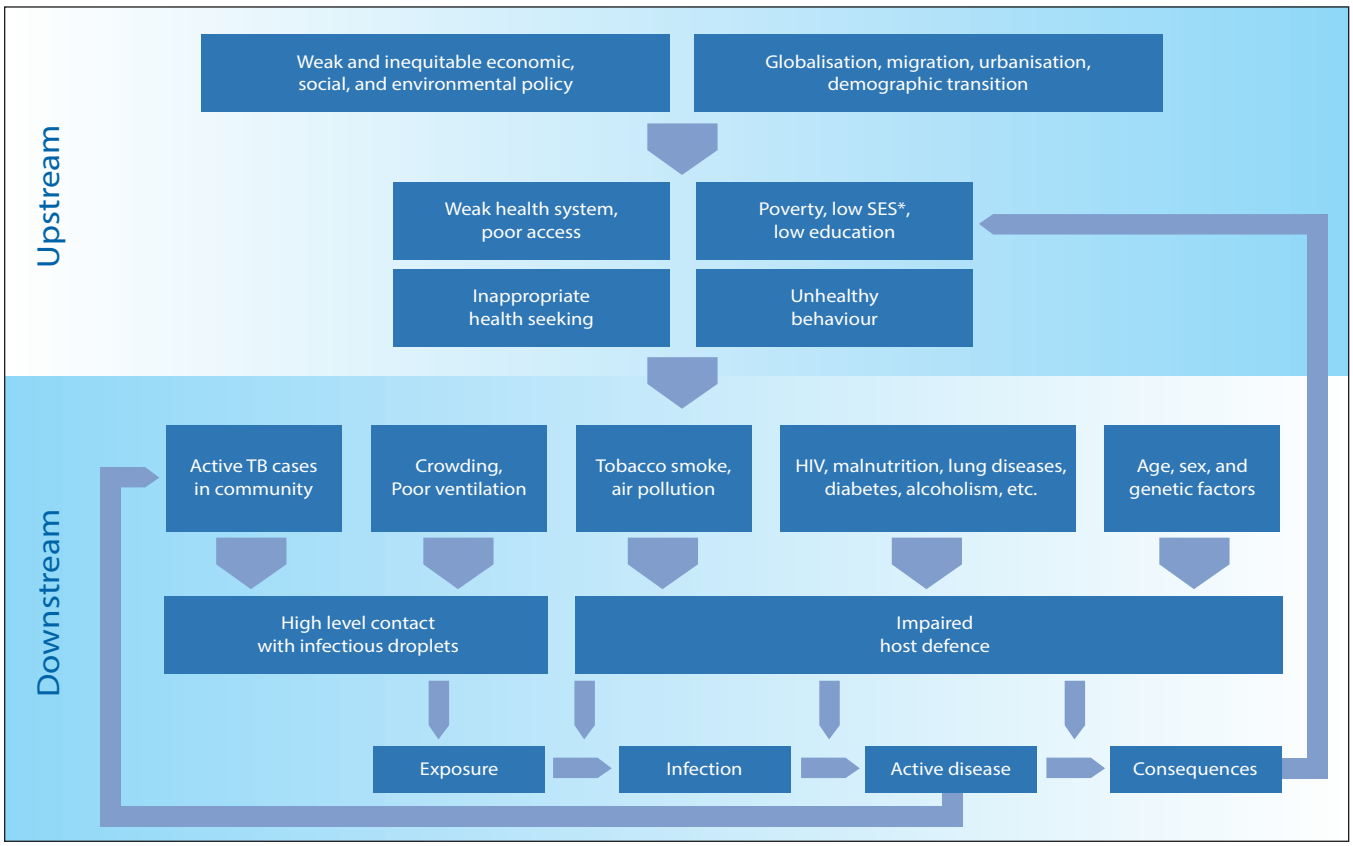
The present disparity between Canada's overall incidence rate for TB disease and that of Inuit is believed to reflect inequity in social determinants of health (SDOH) between Inuit and other Canadians. The World Health Organization (WHO) defines 'social determinants of health' as the social and economic conditions in which people are born, grow, live, work and age, including the health system. [14] SDOH are tied to money, power and resources at global, national and local levels. Areas that have more money, power, and resources tend to have better social and economic conditions than areas with less. Populations with better social and economic conditions tend to enjoy better health and well-being, and consequently, lower incidence rates of TB disease.

A Canadian expert in SDOH, Raphael Dennis, theorizes that social and economic conditions influence the health of not only individuals but also communities and jurisdictions as a whole. Further, that SDOH, "affect the extent to which an individual possesses physical, social and personal resources to identify and achieve personal aspirations, satisfy needs and cope with the environment". [15]

Recognition of an increasing and inequitable distribution of TB cases among disadvantaged groups globally has stimulated interest in frameworks for strengthening TB prevention and care that attend to SDOH. In 2005, the WHO established the *Commission on Social Determinants of Health* (CSDH) to provide advice on how to reduce persisting and widening inequities in health and well-being globally. Findings from the CSDH have helped provide "a platform from which to launch a new era of action on the social determinants of TB", specifically: poor housing and environmental issues, food insecurity and malnutrition, and financial, geographic and cultural barriers to health care access. [16]

Figure 9 is an example of a model that uses a SDOH framework to illustrate how improvements to social and economic conditions can improve health and reduce incidence rates of TB disease in a population. [16] For the purposes of this discussion, "inappropriate health seeking" (third box down on the left-hand side) should be interpreted as referring to the behavior of *not* seeking health care when it would be appropriate to do so. The arrows along the bottom of the figure describe the cycle of TB for individual persons: 1) exposure to a contagious case, 2) infection with TB bacteria, 3) eventual development of TB disease, 4) perpetuation of TB transmission in the community, and 5) potential consequences of TB disease including new or additional impairments to income, socioeconomic status, and education level.

Figure 9: Potential links between social determinants of health and TB [16]



*SES= socioeconomic status

Public health experts from the Inuit regions believe the development of a model similar to the one described in Figure 9 but reflects the context of TB in Inuit Nunangat could facilitate improved understanding of the complex relationship between SDOH and incidence rates of TB disease among Inuit. Development of such a model could support the conceptualization and implementation of innovative, sustainable, culturally safe, and epidemiologically appropriate approaches and interventions.

To provide insight and to emphasize the importance of addressing inequities in housing, food security and nutrition, mental wellness, and access to health care services for Inuit, these four SDOH are examined briefly in the pages that follow.

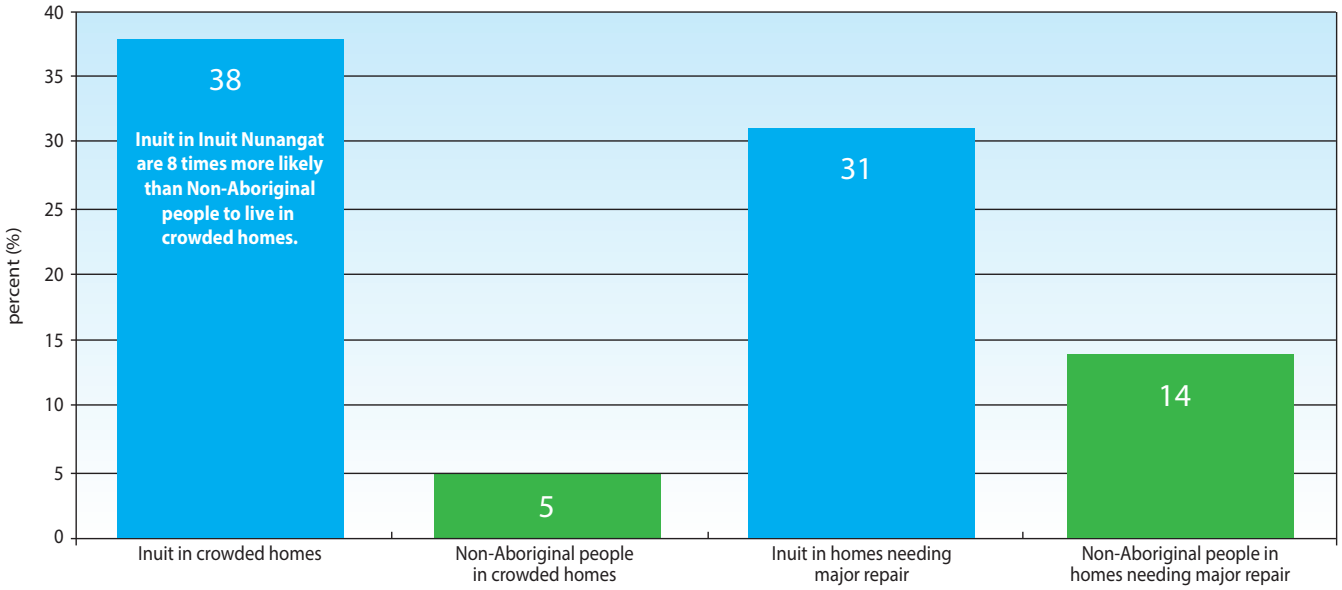
1. Housing

> "The Government of Canada recognizes the significant association between poor indoor air quality (e.g., high humidity, poor ventilation) and respiratory illnesses, including TB."
>
> – Government of Canada. Response to the Standing Committee on Health report, The Way Forward: Addressing the Elevated Rates of Tuberculosis Infection in On-Reserve First Nations and Inuit Communities. October 6, 2010.

The government promise of housing for relocated Inuit resulted in a dependence on social housing programs that continues today. Limited employment opportunities, coupled with lower levels of educational attainment, predispose Inuit to poverty which further entrenches this dependence.

As a result of an ongoing housing crisis in Inuit Nunangat, Inuit are nearly eight times more likely than non-Aboriginal Canadians to live in crowded ("more than one person per room") homes. [17] Inuit have the highest birth rate in Canada, a demographic reality that will continue to exert pressure on an already markedly insufficient supply of affordable housing. In the most populous Inuit region, Nunavut, 3,300 housing units would be required to address the immediate housing need. [18] Quality of available housing is also an important issue. In 2006, over 30 per cent of Inuit were living in homes in need of major repair (See Figure 10).

Figure 10: Percent of crowded homes and homes in need of major repair in Inuit Nunangat, 2006 [17]



Residential crowding is a critical public health issue in Inuit Nunangat for many reasons, including the perpetuation of high incidence rates of TB disease. [19, 20, 21, 22] In residential settings and other spaces, transmission of TB bacteria is influenced by a number of factors including crowding and the adequacy of ventilation. [20] Low outdoor temperatures and high energy costs in Inuit Nunangat make it difficult to assure adequate household ventilation.

In addition to facilitating transmission of TB bacteria, inadequate ventilation can lead to:

- **High concentrations of indoor air pollution (e.g., tobacco smoke).** Exposure to tobacco smoke has been associated with transmission of TB bacteria to children. [20] Tobacco addiction has been described as epidemic in Nunavut. [23] Rates of tobacco addiction in Nunavut and the other Inuit regions are provided in **Subsection D.**
- **Household mould.** The presence of household mould has been linked to increased susceptibility to other respiratory infections, asthma and allergies among Canadian children and associated with suppressed T-cell production. [20] Suppressed T-cell production can slow recovery from TB disease.

Reductions in household crowding (e.g., through initiatives to increase the number of housing units and reduce under-housing) and improvements in household ventilation could have a substantial impact on improving Inuit health and reducing the number of Inuit who develop TB disease.

2. Food Security and Nutrition

People infected with TB bacteria are more likely to develop TB disease if they do not have adequate access to nutritious food. Thus, food insecurity[3] and malnutrition likely have a direct influence on incidence rates of TB disease in Inuit Nunangat.

Inuit face unique challenges to obtaining adequate supplies of safe, nutritionally balanced and culturally acceptable foods. When considering food security in the Inuit context, it is important to consider access, availability, utilization, and stability of supply for both market food and country foods. It is also important to recognize that food obtained from traditional food systems[4] is key to cultural identity, health, and survival for Aboriginal people. Thus, it might be appropriate to place at least equal, if not greater emphasis on country food when establishing and determining food security levels for Inuit. [24]

Some barriers to harvesting and consuming nutrient-dense country foods include: [24]

- Climate change, including changes to the stability of ice for travel and animal migratory and birthing patterns
- Contaminants in the animals and the environment
- Extinction or decreased density of plant and animal species
- Rising costs (e.g., fuel, ammunition, equipment)
- Less time to hunt and harvest due to schooling or paid employment
- Decreased transfer of knowledge from elders to young people
- Loss of taste for traditional foods due to uptake of market food

Bans on certain species and tagging of game can also interfere with access to country food.

Market foods can be difficult to obtain or afford in Inuit Nunangat. Although Aboriginal Affairs and Northern Development Canada (AANDC) works with Northern communities to make nutritious perishable foods more affordable, the cost of market food remains substantially higher in the North than in other parts of the country (See Table 2).

3 The Canadian Government has endorsed the following definition of food security that was developed at the World Food Summit in 1996: *Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.*

4 All food from a particular culture that is available from local resources and culturally accepted. [24]

Table 2: Weekly cost of Revised Northern Food Basket for a family of four in southern centres compared to northern isolated communities, 2009 unless otherwise specified*

Region	Community	Cost
Kivalliq Region, Nunavut	Winnipeg	$243
	Coral Harbour	$457
Kitikmeot Region, Nunavut	Edmonton	$254
	Taloyoak	$471
Baffin Region, Nunavut	Ottawa	$224
	Iqaluit	$382
	Resolute	$422
Nunavik Region, Quebec	Montreal	$229
	Kuujjuaq	$341
	Kangirsuk	$400
Inuvialuit Settlement Region, NWT**	Edmonton	$251
	Inuvik	$348
	Paulatuk	$476
Nunatsiavut	Montreal	$229
	Happy Valley-Goose Bay	$253
	Nain	$337

* The Revised Northern Food Basket is a group of foods that meet most nutrient requirements and food serving recommendations in Canada's Food Guide for a family of four. Reference: Aboriginal Affairs and Northern Development Canada. Regional Results of Price Surveys; 2008. Available from http://www.aadnc-aandc.gc.ca/eng/1100100035986/1100100035987#ntr

** Represents data from 2008

The cost of market food for Inuit becomes even more prohibitive when viewed in the context of income levels. Table 3 reflects the most current data available for average and median incomes across the different provinces and territories at the time the ***Strategy*** was prepared.

Table 3: Average* and median individual incomes ($) for adults in selected provinces and territories, 2001 [17]**

	Group			
	All Canadian adults		Inuit adults	
	Average ($)	Median ($)	Average ($)	Median ($)
Geography				
Newfoundland and Labrador	22,620	16,050	17,809	13,148
Quebec	27,125	20,665	19,054	14,311
Northwest Territories	35,012	29,030	21,459	15,104
Nunavut	26,924	17,270	19,686	13,090
Canada	**29,769**	**22,120**	**19,878**	**13,699**

* Average income is the amount obtained by adding up the total income of all individuals and dividing this sum by the number of individuals with income.

** Median income is the midpoint of the range of income of individuals.

Market foods with a higher nutritional value (e.g., fresh fruits and vegetables) tend to cost more than less nutritious options. However, even foods with low nutritional content can be priced higher than many families can afford without sacrificing elsewhere. The cost and availability of particular market foods and stability of the supply can also be highly variable, especially in winter months when inclement weather can interfere with delivery of food to retailers. There is also growing concern about the impact of nutrient poor market foods on Inuit health.

Over the past several decades Inuit have gone from consuming a diet comprised entirely of nutrient-dense country food to a diet that is predominantly market food-based. Some reasons less nutritious market food might be chosen over more nutritious options could include lower cost, greater availability, taste preferences, ease of preparation, or familiarity. Whatever the reason, the transition to the consumption of energy-dense, highly processed foods has likely resulted in a poorer overall diet quality for many Inuit, and could be contributing to micronutrient deficiencies (e.g., Vitamin D, iron) associated with development of TB disease, and increasing rates of obesity, and "lifestyle diseases" such as heart disease and type II diabetes.

Food security was among several issues examined during the recent *International Polar Year (IPY) 2007-2008 Inuit Health Survey* of Inuit adults aged 18 years and older from 36 communities in three jurisdictions (ISR, Nunavut, Nunatsiavut Region). [25] The *IPY Inuit Health Survey* and others including the *Nunavut Inuit Child Survey 2007-2008* [26] and the *2004 Nunavik Inuit Health Survey* [27] confirmed generally high levels of food insecurity across Inuit Nunangat, although regional differences were noted.

Some sobering findings from the *IPY Inuit Health Survey* and *Nunavut Inuit Child Survey* include:

- Prevalence of food insecurity for adult Inuit in Nunavut, ISR and Nunatsiavut Region were 5 to 6 times higher than the Canadian national average. [25]
- **Nearly 70 per cent** of Inuit preschoolers were residing in food insecure households [26]
- Average yearly household costs for groceries ($19,760) that were nearly equivalent to the annual earnings of 49.6 per cent of adults surveyed (less than $20,000). [25]
- **24.5 per cent** of respondents indicated an adult in the household had been hungry but did not eat because they could not afford enough food. [25]
- **23.1 per cent** indicated that a child in the house had gone hungry when they could not afford enough food. [25]
- **17.6 per cent** indicated that an adult in the household did not eat for a whole day because there was not enough money for food. [25]
- **13.1 per cent** indicated that a child in the household did not eat for a whole day because there was not enough money for food. [25]

Food security and nutrition can be threatened further for Inuit with TB disease and for their families when symptoms or treatment interferes with patients' or other family members' ability to harvest country food or contribute to household finances.

Nutrition education programs, food subsidy programs, and harvester support programs are in place to help Inuit improve their level of food security and nutrition but there is a desperate need to do more, especially in regions with high incidence rates of TB disease and communities experiencing a TB outbreak.

Improvements to food security and nutrition for Inuit could have a substantial impact on improving Inuit health and reducing the number of Inuit who develop TB disease.

3. Mental Wellness

Local public health experts believe high rates of unemployment, underlying mental health issues, and chemical or behavioral addictions (e.g., tobacco, alcohol, gambling) might also be directly or indirectly contributing to high incidence rates of TB disease and transmission of TB bacteria in Inuit Nunangat. These circumstances can impact peoples' ability to be productive, to contribute to household food security or finances, and to obtain or maintain adequate housing. Choices about health and wellness (including when and how to seek health care) might also be influenced. Delays in seeking health care can result in poorer outcomes for people infected with TB bacteria or who have TB disease, extensive transmission of TB bacteria in Inuit communities, and TB outbreaks.

Changing and unexpected patterns of TB transmission and more rapid progression to TB disease after infection with TB bacteria are also being observed in some Inuit communities. For example, anecdotal evidence from a recent TB outbreak in Nunavik suggests use of addictive, illegal substances could be contributing to higher than anticipated rates of transmission and accelerated progression to TB disease among people exposed to contagious cases while frequenting so-called "smoking shacks" or other closed-environment gathering places. High rates of transmission and rapid progression to TB disease in HIV-negative persons engaged in marijuana smoking have been described elsewhere. [28,29] TB contact investigations involving illicit activities are often hampered by cases' and contacts' reluctance or inability to name others who might be at risk, or to identify locations where exposures occurred. Rapid development of TB disease in people exposed to contagious cases, and delayed or ineffective contact investigations can lead to extensive transmission of TB bacteria in Inuit communities and TB outbreaks.

These relatively new challenges in TB prevention and control have led local public health experts to question whether traditional approaches should be reinvented in ways more applicable to present-day regional TB epidemiology and operational realities. A number of initiatives have been proposed to focus and build on strengths, empowerment, preventive strategies, and protective factors to address mental health issues and addictions within the Inuit regions, including those described in the *Alianait Inuit Mental Wellness Action Plan* [30], the *Nunavut Suicide Prevention Strategy* [31], and the *Nunavut Tobacco Reduction Framework for Action (2011-2016)* [23]. Such approaches are supported by recent global research and recommendations for improving TB prevention and control in Canada. [16, 32, 33, 34]

Exploring new opportunities and novel approaches by those involved in the care of Inuit at increased risk for TB disease, mental health and addiction issues could result in substantial improvement to TB disease and mental wellness outcomes.

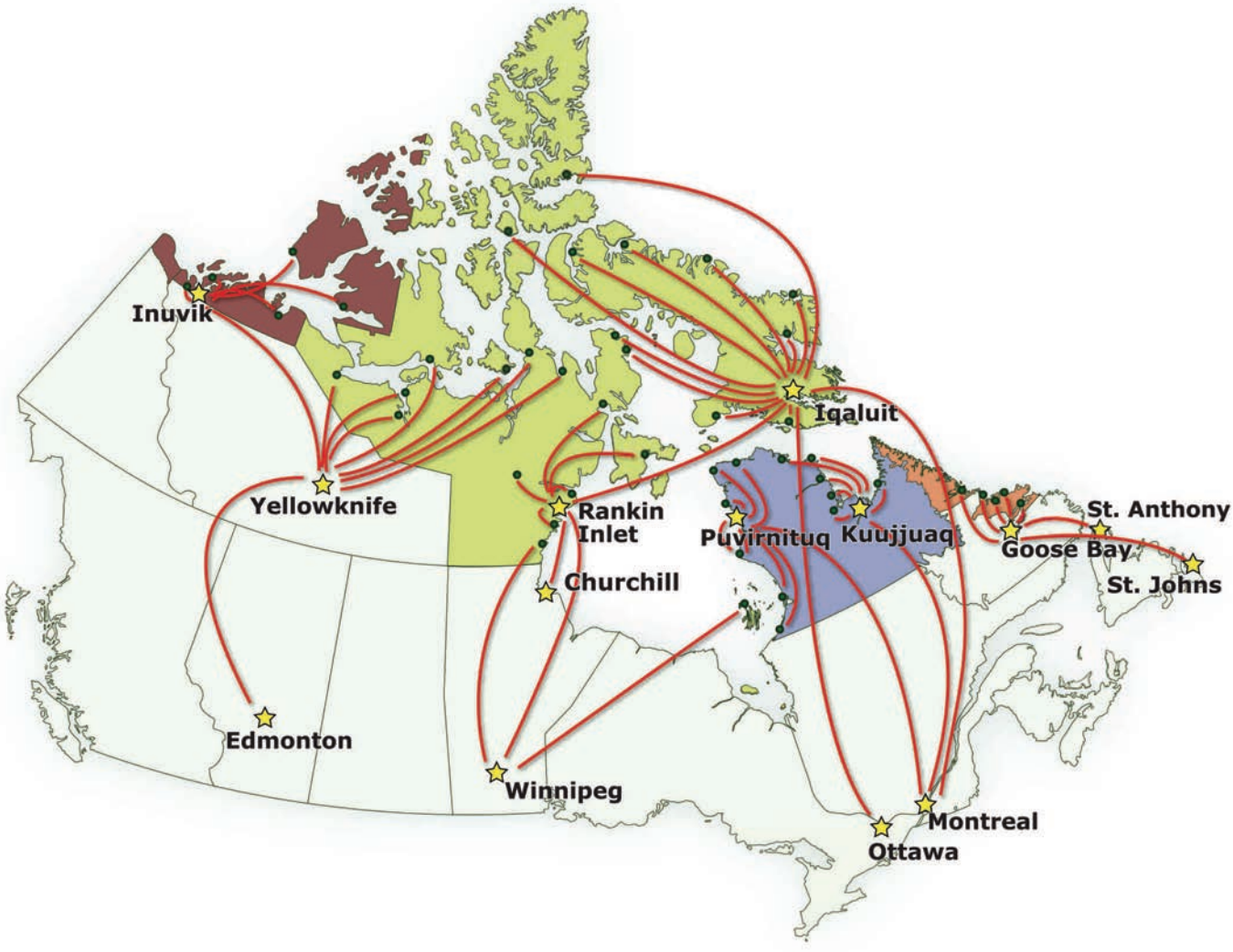
4. Access to Health Care Services

Adequate health systems and Inuit engagement with TB detection, prevention and care programs are essential for preventing, detecting and controlling TB. Unique barriers to timely and quality health care services experienced across the four Inuit regions include those related to geography, culture and language, and health human resourcing. Barriers such as these could be substantially influencing the degree to which Inuit are benefiting from current TB prevention and care services, and consequently the incidence rates of TB disease in Inuit Nunangat.

Geographic Barriers

The geography and distribution of Inuit communities in Inuit Nunangat pose unique challenges to providing routine and urgent access to TB-related services. Figure 11 depicts travel routes between outlying Inuit communities and regional "hubs" (starred) where Inuit must travel to access health care services that are integral to TB care, such as chest x-rays. When consultation with a specialist is needed or infection control requirements for cases with contagious TB disease cannot be met, Inuit must travel to centres outside of Inuit Nunungat such as Happy Valley-Goose Bay, Ottawa, Montreal, Winnipeg, or Edmonton.

Figure 11: Inuit Medical Travel Map



When Inuit are evacuated from their home communities for TB-related care, costs to the health care system include not only those associated with the medical services themselves but also those related to travel and accommodation. In a recent review, Nunavut's per capita health care expenditures were the highest in the world, with health care alone consuming nearly 30% of the territories gross domestic product. [35] In 2010-2011, over one-quarter of the $290,020,000.00 operational budget for the Nunavut Department of Health and Social Services was spent on costs associated with medical travel and treatment provided in facilities outside of the territory. [36]

The collateral costs and impacts to Inuit are also substantial. For example, although obtaining a chest x-ray in southern Canada is usually a simple and relatively quick process, for some Inuit it can require several days away from family and work. Time out of a community can be longer during the winter months when travel can be delayed by inclement weather. Evacuation for assessment or medical follow-up can cause extreme disruptions in the lives of Inuit and their families. Loss of income and time out of community can interfere with food security, especially when seasonal opportunities to obtain country food are missed. During winter months, essential home maintenance might be left undone.

Improving in-community access to critical TB-related health care services such as chest x-rays could help to minimize disruptions currently experienced by Inuit, improve engagement with TB prevention and care services, and substantially reduce health system costs associated with travel to health care hubs and southern health care centres.

Cultural and Language-related Barriers

Providing culturally safe care for Inuit can be challenging, particularly in southern health care centres. Language barriers can jeopardize quality of care and patient safety, particularly for Elders and others who communicate exclusively in Inuit dialects. Negative experiences with health care can create reluctance to engage with the health system, missed opportunities for TB screening and prevention, and delays in detection and treatment of TB disease.

Enhanced access to culturally safe health care could help to: improve engagement with TB prevention and care services, minimize delays in detection and treatment of TB disease, improve outcomes for patients, interrupt transmission of TB bacteria in Inuit communities, and prevent TB outbreaks.

Health Human Resource-related Barriers

Sustaining a consistent and adequate level of human resources in the health field is a serious issue in all Inuit regions, as is supporting initiatives to increase the number of Inuit nurses, physicians, and mental health workers and improve cultural competence in health care providers. Current efforts, including those outlined in the *Inuit Health Human Resources Framework and Action Plan* (IHHRFAP), are aimed at increasing the numbers of care providers and strengthening the overall health care system. [37]

Successful implementation of the IHHRFAP should lead to improved patient outcomes, increased opportunities for TB screening and prevention, and earlier detection and treatment of TB disease.

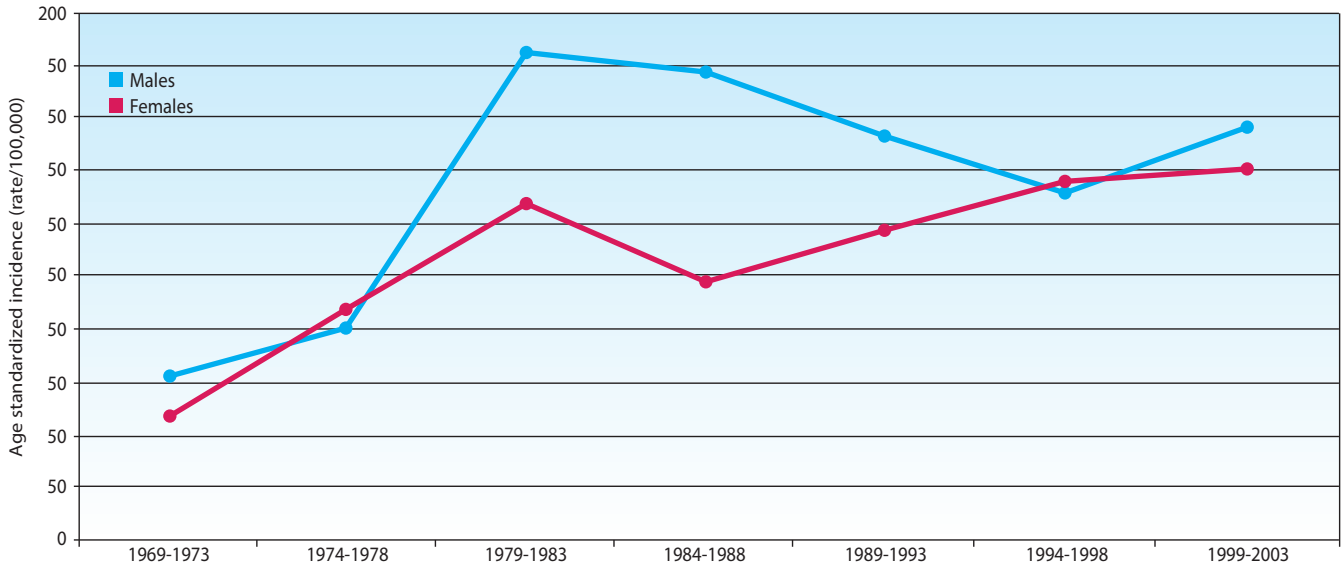
Identifying and minimizing barriers to health care services for Inuit could have a substantial impact on improving Inuit health, reducing the number of Inuit who develop TB disease, reducing delays in detection and treatment of TB disease, and preventing TB outbreaks.

E. Other Influences: Medical Risk Factors for Development of TB Disease and Tobacco Addiction among Inuit

Medical Risk Factors for Development of TB Disease

There are a number of risk factors known to increase the likelihood that someone who is infected with TB bacteria will develop TB disease, such as chronic medical conditions (e.g., diabetes, kidney failure) and diseases or treatments that impair the immune system (e.g., HIV/AIDS, cancer). [38] The degree to which chronic medical conditions and immune system impairments among Inuit could be contributing to incidence rates of TB disease in Inuit Nunangat is not known. However, local public health experts suspect there could be correlations, particularly with prevalent medical conditions and diseases such as lung cancer. In 2006, lung cancer death rates for Inuit in Canada were the highest in the world (See Figure 12). [17]

Figure 12: Inuit lung cancer death rates, 2006



Tobacco Addiction among Inuit

Findings from the *International Polar Year (IPY) 2007-2008 Inuit Health Survey* indicated tobacco addiction (smoking) among 73% of respondents in Nunavut [39], 65% of respondents in Inuvialuit Settlement Region [40], and 55% of respondents in Nunatsiavut [41]. Similar rates were identified in the Nunavik Inuit Health Survey in 2004, where 77% of the general population and nearly 90% per cent of Inuit aged 18 to 29 years smoked either daily or occasionally. [27]

Not only does smoking and exposure to second-hand smoke increase the risk of lung cancer, it also increases the risk for development of TB disease in those infected with TB bacteria. Collaboration among cancer detection programs, smoking prevention/cessation programs, and TB prevention, control, and care programs could identify synergies and opportunities to accelerate progress toward improving and protecting Inuit health.

Increased awareness among Inuit and health care providers in Inuit Nunangat about the importance of early detection and treatment of medical risk factors associated with the development of TB disease and the benefits of smoking cessation could have a substantial impact on improving Inuit health and reducing the number of Inuit who develop TB disease.

4. Overview of Current TB Prevention, Control, and Care in Inuit Nunangat

For the most part, TB programs across Canada are administered by provincial or territorial departments/ministries of health. These programs function in accordance with provincial/territorial TB guidelines, policies and protocols which are informed by the *Canadian* (national) *Tuberculosis Standards*. As each Inuit region is under the jurisdiction of a different province or territory, public health infrastructures and practices among the regions vary somewhat as do TB program capacities (e.g., health human resourcing, access to x-ray and laboratory services, availability of airborne infection isolation rooms).

A number of key organizations are involved in TB prevention and care for Inuit including:

- Provincial/territorial governments
- Inuit organizations (Regional and National level)
- Federal government departments (e.g., Public Health Agency of Canada, First Nations Inuit Health Branch – Health Canada)
- University-affiliated health care centres with TB expertise (outside of Inuit Nunangat)

This section provides an overview of current regional TB prevention, control, and care programs and introduces a selection of promising new and evolving tools for TB detection, treatment, and prevention that might contribute to reducing incidence rates of TB disease in Inuit Nunangat. A comparison table of a selection of current regional TB-related primary prevention, case detection, and management practices is provided in Appendix B.

A. Regional TB Prevention and Care Programs

Inuvialuit Settlement Region (ISR)

TB detection and management in the ISR falls under the authority of the Chief Public Health Officer (CPHO) for the Northwest Territories (NWT) through the Communicable Disease Program and Population Health Division of the Department of Health and Social Services (DHSS). There is a general Communicable Disease (CD) Specialist who is also the TB Program Coordinator within the DHSS Population Health Divisions' Health Protection Unit. This individual reviews TB assessments and TB reporting/documentation. The TB Coordinator also serves as a liaison between field staff, patient services and specialist services. A centralized TB Registry exists within the unit and is staffed by a Disease Registry Officer who is primarily responsible for TB reporting and data entry. Each Regional Authority is responsible for the delivery of programs and services at the Community Health Centres within their regions.

Strategic support, standards and guidelines, education and field support and program delivery to all 33 communities in NWT is provided by an interdisciplinary team comprised of the CPHO, the TB Program Coordinator, Regional Medical Officers of Health (MOHs), Infectious Disease and Internal Medicine Specialist and Regional TB providers.

Health care provider education on TB is available through the communicable disease orientation program of the Health Protection Unit. TB education can also be accessed in person or via teleconference during biweekly TB Rounds, Physician Rounds, TeleHealth Inservices, site visits by the CD Specialist and one-on-one consultations with the TB Program Coordinator. TB resource materials, such as the *NWT TB Manual* and the *Canadian Tuberculosis Standards*, are provided as primary reference materials to healthcare facilities by the Health Protection Unit in consultation with the Office of the Chief Public Health Officer.

Nunavut

TB detection and management is under the authority of the Office of the Chief Medical Officer of Health, working with the Health Protection Unit. At the territorial level, an interdisciplinary team provides: strategic support; standards and guidelines; education and advice to the Regional Communicable Disease Coordinators (Regional CDCs). Regional CDCs are responsible for the overseeing delivery of TB programs and services at the Community Health Centres within their regions.

Permanent staff are given an orientation by clinical nurse educators. Regional CDCs provide an orientation (usually by phone) to temporary TB nurses going in to communities. There are some TB-related pamphlets for clients/ community.

A project to increase community awareness of TB in Nunavut, TAIMA TB, is currently underway. TAIMA TB is the translation of Stop TB in the local dialect of Inuktitut. TAIMA TB began in Iqaluit as a pilot project in January 2011. In addition to increasing community awareness of TB, TAIMA TB also set out to provide in-home screening for infection with TB bacteria for people living in areas of the community with a high incidence of TB disease, and to provide treatment to those who were at high risk for developing TB disease.

Unique features of the TAIMA TB project include:

- An approach specifically tailored to Inuit, with strong community engagement and active participation from the community in the development and delivery of the program (TB champions);
- An awareness campaign using present day social media strategies including web based material, as well as YouTube videos and a Facebook page;
- The introduction and determination of feasibility of a new diagnostic test for infection with TB bacteria [interferon-gamma release assays (IGRA)];
- A proactive approach to screening and treatment that targeted residential areas where community members may be at high risk for developing TB disease;
- Strong community engagement at every level and stage of the program.

During the general awareness campaign in Iqaluit, there was an increase in the number of people who presented to public health to get tested for infection with TB bacteria. Four hundred and forty- four people received TB education in their homes delivered by an Inuktitut-speaking community member (TB champion) and a TB nurse. One-third of people visited were not eligible for screening because of previous TB treatment. The remaining two-thirds were screened for infection with TB bacteria. Approximately one-third of people screened were recommended for treatment to prevent TB disease because of positive tests. Three participants were identified as having TB disease by the TAIMA TB team and another five cases were identified through contact tracing of those cases by the local TB program. These eight TB cases were identified earlier than under normal program conditions thus breaking the infectious cycle at an earlier point and preventing further transmission within the community. Residential areas of high risk for TB disease were identified accurately using the TAIMA TB approach as evidenced by the fact that 82% (14/17) of the TB cases that occurred in Iqaluit prospectively during the 6 month door-to-door campaign occurred within the identified areas. IGRA was also shown to be feasible in Iqaluit as a result of the TAIMA TB project. The TAIMA TB team recently went to Pangnirtung and Clyde River to carry out a Youth Initiative using the knowledge and techniques gained from the original program of study. [42]

Nunavik

TB detection and management is under the authority of the Nunavik Regional Board of Health and Social Services (Nunavik RBHHS). Public health is responsible for all services related to TB case detection, treatment, prevention, and surveillance. Services are delivered and coordinated by each health centre for their respective areas.

Nunavik has experienced two large outbreaks of TB disease recently. In response to this, a regional TB action plan is under development and will include initiatives to address TB education and training needs for health care providers and communities in the region.

Nunatsiavut Land Claim Area of Labrador

The delivery of TB health services are shared between the Nunatsiavut Government Department of Health and Social Development (NGDHSD) and the provincial health authority Labrador-Grenfell Regional Health (LGH). Surveillance and reporting are the responsibility of the MOH and the Health Protection Services branch of LGH. Health Canada provides funding to the Government of Nunatsiavut to complement the TB prevention and control services provided by the province of Newfoundland and Labrador.

TB services for detection, management and follow up of active cases and latent infection is a collaborative effort between the NGDHSD Public Health Department and the LGH Primary TB physician and Communicable Disease Control Nurse (CDCN) under the direction of the MOH. TB clinics provide a regular collaborative opportunity for case management and discussion of pressing issues, emerging trends, and best practices. Communication and collaboration continues between TB meetings primarily between the TB CDCN and community public health nurses.

Staff TB education and training needs are met through a variety of means. Staff attend TB conferences to avail the latest information and subject matter experts when they are available. Teleconferences with physicians, CDCN's and other experts have also been used successfully. Community education and health promotion is led by NGDHSD Public Health. A number of methods are utilized including radio spots on the local radio station, OKalaKatiget, which broadcasts in English and Inuktitut, brochures, and displays and booths around the community at various venues and events.

Promising regional TB prevention and care practices include innovative partnerships to improve access to and enhance TB screening and management services. Regularly scheduled TB clinics (for clients with TB disease or latent TB infection) are coordinated by the LGH TB CDCN in collaboration with Nunatsiavut public health staff in the communities, and attended by the LGH primary TB physician. Using the PACS system, the LGH physician and a radiologist in St. Johns can simultaneously view and discuss x-rays from clients seen at the clinic, greatly reducing delays in diagnosis. On the day of the clinic the physician, TB CDCN, and Nunatsiavut Community Health Nursing Coordinator meet to discuss client-specific issues and concerns, which supports a client-centered approach to care.

More recently, pilot partnership among the Government of Newfoundland and Labrador, LGH, NGDHSD, First Nations and Inuit Health Branch, and Health Canada brought x-ray services to a community where they are not usually available. Over the course of two clinics, more than 300 people were screened for TB disease without having to leave their families, jobs and other responsibilities and at a tremendous savings to the health system compared to having to evacuate those in need of x-rays to southern health care centre.

B. New and Evolving Tools for TB Detection, Treatment and Prevention

A number of important scientific advances have been made toward TB detection, treatment, and prevention in recent years. These include tools that support:

- Improved understanding of the patterns of TB transmission in populations and communities (e.g., social network analysis, geographic information systems, TB genotyping);
- More reliable diagnosis of TB infection (e.g., IGRA)
- More rapid diagnosis of TB disease (e.g., GenXpert®); and
- Shortened regimens for treating TB infection to prevent the development of TB disease.

The use of TB genotyping and current regional availability of IGRA and GenXpert® are described in Table 4. A substantially shorter regimen for treating TB infection in adults (once a week therapy for 3 months versus daily or twice a week therapy for 4 to 9 months) is underway in the United States. The shortened regimen had not been approved for use in Canada at the time the Strategy was finalized.

Table 4: Current use and availability of TB genotyping, IGRA, and GenXpert in Inuit Nunangat

	TB Genotyping	IGRA	GeneXpert®
Nunavut	Done for all TB cases	In Iqaluit only – by special order	In Iqaluit only – specific criteria
Northwest Territories	Done for all TB cases	By order of Chief Public Health Officer only	Not available
Nunatsiavut	Done for all TB cases	HappyValley-Goose Bay only	Not available
Nunavik	Discretionary	No	Kuujjuaq and Puvirnituq only

5. Toward an Inuit-Specific Approach to TB Prevention, Control, and Care

The goal of this document is to provide a framework and process for stakeholders and partners to develop and implement a concrete and detailed action plan for reducing incidence rates of TB disease in Inuit Nunangat. This section describes the principles through which five potential core components for an ***Inuit-specific TB Action Plan*** were identified. The proposed core TB Action Plan components are introduced and their objectives are described, and some anticipated challenges are put forward. The section concludes with suggested next steps.

A. Principles

Reducing incidence rates of TB disease in Inuit Nunangat will require innovation and solutions that are culturally safe, epidemiologically appropriate, and sustainable. Ideally, these solutions will:

- Build on the strengths and commitment of individuals, communities and existing health systems;
- Support other initiatives for improving social determinants of Inuit health;
- Incorporate promising practices that are based either on research relevant to Inuit or on extensive experience and improved outcomes in Inuit Nunangat or jurisdictions and populations faced with similar challenges.

The principles that guided decisions about the proposed core action plan components include efficient and strategic use of resources and:

- Involvement of Inuit and Inuit communities;
- Respect for Inuit values, language, knowledge, culture, and the historical context of TB in Inuit Nunangat;
- Commitment to health equity for Inuit, and recognition that this will require both biomedical interventions and improvements to the social determinants of health in Inuit Nunangat;
- Valuing youth perspectives and the potential for youth to lead and champion meaningful change;
- Appreciation of the importance of tailoring TB prevention and control approaches to meet the needs of Inuit rather than vice-versa;
- Transparency and accountability;
- Collaboration.

B. Proposed Core TB Action Plan Components

The five proposed core TB Action Plan components are:

1. Community education and mobilization
2. Intersectoral partnership towards addressing social determinants of Inuit health
3. Evidence-based, Inuit-appropriate TB prevention, control and care programs
4. Surveillance and research
5. Evaluation and reporting

1. Community Education and Mobilization

The objective of community education and mobilization is to engage and empower the local people and structures to inform and take lead roles in efforts to reduce incidence rates of TB disease in Inuit Nunangat.

2. Intersectoral Partnership towards Addressing Social Determinants of Inuit Health

Intersectoral partnerships will synergize efforts to target root causes of health inequity for Inuit and support a holistic approach for reducing incidence rates of TB disease in Inuit Nunangat.

3. Evidence-based, Inuit-appropriate TB Prevention, Control, and Care Programs

Evidence-based, Inuit-appropriate TB prevention, control, and care programs will ensure realistic, appropriate and sustainable approaches to reducing incidence rates of TB disease in Inuit Nunangat.

4. Surveillance and Research

Surveillance and research will increase understanding of: the current state of TB in Inuit Nunangat, the impact of TB infection and disease on Inuit, Inuit who are at the highest risk for TB disease, and factors that contribute to high incidence rates of TB disease in the four Inuit regions. This understanding can be used to develop evidence-based approaches for TB prevention, control, and care that will have the greatest benefit.

5. Evaluation and Reporting

Evaluation and reporting processes enable and ensure routine monitoring and reporting on outcomes, performance indicators, and progress.

C. Ensuring Success

There are a number of challenges ahead. Nevertheless, the time to confront the high rates of TB disease in Inuit Nunangat has come. Moving forward, it is recognized that:

- Meaningful and sustainable reductions in incidence rates of TB disease in Inuit Nunangat will require long-term commitment and sustained financial investment;
- Successful development and implementation of an ***Inuit-specific TB Action Plan*** that acknowledges valuable local experience, makes the best use of new tools, and supports appropriate diversity among regions and public health programs will require involvement, collaboration, and support from an expanded group of stakeholders and partners;
- Changes to the approach of TB prevention, control, and care for Inuit should proceed strategically, beginning with an improved understanding of the current state and impact of TB disease and social determinants of health in the Inuit regions;
- Care must be taken to secure and maintain adequate support for development and implementation of a TB Action Plan, otherwise it might be abandoned before progress can be made or measured;
- Present-day SDOH in Inuit Nunangat have evolved over decades and will likely require medium- to long-term strategies and sustained financial investment for meaningful and measurable improvements to be achieved;
- Strategies to evaluate progress must take into account the pathogenesis of TB; improvement could take years and substantial additional investment;

- Implementation of a TB Action Plan should not be tied to a particular group of individuals or political circumstances;
- New partners should be identified and new sources of funding should be explored;
- Ethnic identifiers, accurate population data, standardized data sets and performance targets, and improved access to TB data are needed to support effective, evidence-based TB prevention, control, and care programs for Inuit;
- Coordinated planning, and sometimes, coordinated clinical and public health management of TB treatment, prevention and outbreaks, is vital to ensure an effective and seamless continuum of care;
- There is a need to reduce tobacco addiction in Inuit Nunangat; taking advantage of synergies among cancer detection programs, smoking prevention/cessation programs, and TB prevention, control, and care programs could accelerate progress toward improving and protecting Inuit health.

Renewed political, financial, and community commitment to identifying and addressing factors that contribute to high rates of TB disease in Inuit Nunangat is not only possible, but certain.

D. Suggested Next Steps

Development of an ITK Position Paper on the Social Determinants of Inuit Health

At the time this Strategy was finalized, ITK was in the process of developing a position paper on the social determinants of health (SDOH) for Inuit. It is anticipated that the position paper will serve to inform dialogue with stakeholders and partners about SDOH, and influence goals and objectives within the TB Action Plan.

Expanded Consultation toward an Inuit-specific TB Action Plan

Consultation with an expanded group of organizations, communities and individuals is needed to support a process to develop an Inuit-specific TB Action Plan. Discussions will be needed to:

- Describe with as much detail as is possible, the current state of TB in Inuit Nunangat;
- Create an inventory of current promising practices for TB prevention, control, and care in Inuit Nunangat;
- Confirm the core components of the TB Action Plan;
- Define goals, objectives, strategies, actions, participants, timeframes, and potential indicators to support the proposed core components;
- Determine activities, metrics and methods to evaluate outcomes and indicators over time;
- Identify additional partnerships and other resources that will be required to support the TB Action Plan;
- Determine an implementation plan.

Ideally, the TB Action Plan should reflect diverse experiences and perspectives, and be strengthened by the combined wisdom of community stakeholders, local public health experts and health care providers, and leading academic, scientific, public health, and TB experts.

Conclusion

The ***Inuit-specific Tuberculosis (TB) Strategy*** provides a context for understanding why an ***Inuit-specific TB Action Plan*** is needed to reduce incidence rates of TB disease in Inuit Nunangat.

Better housing conditions, improved access to nutritious food, enhanced mental wellness, and reduced barriers to health care services through innovative programs such as the in-community x-ray clinics piloted in Nunatsiavut and the TAIMA TB project in Nunavut could have substantial impact on improving Inuit health and protecting Inuit communities from TB disease. Expanding partnerships, reducing tobacco addiction, and incorporating new and evolving tools for TB detection, treatment, and prevention might also be part of the solution.

The path forward is clear. Consultation with an expanded group of stakeholders and partners in Inuit health toward the development and implementation of a TB Action Plan will ensure the root causes of TB and other health disparities experienced by Inuit are attended to in ways that are culturally safe, epidemiologically appropriate, sustainable, and ultimately, effective. Renewed and enduring political, financial, and community commitment will be critical.

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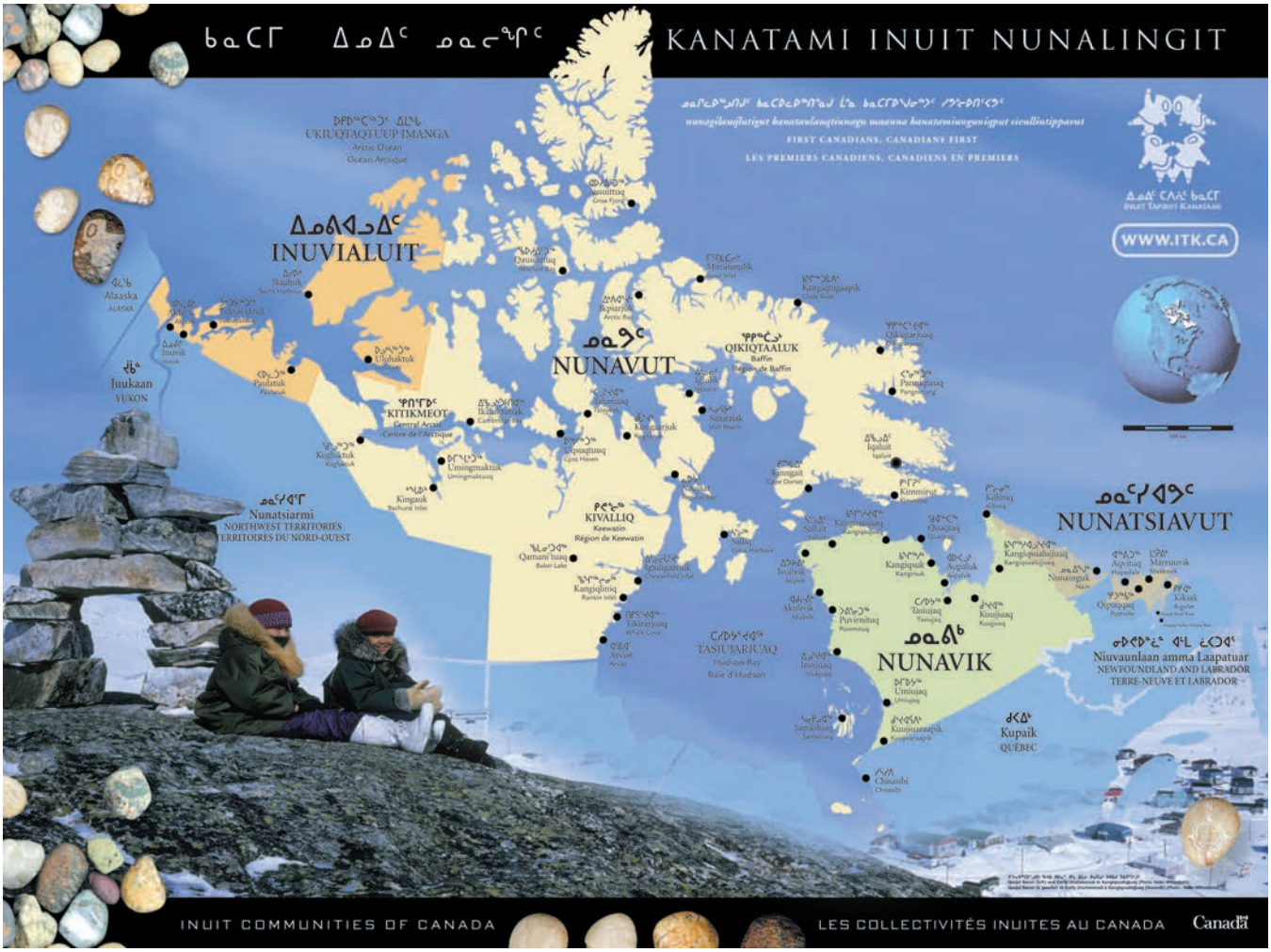
Appendix A:
The Four Inuit Regions



i) Inuvialuit Settlement Area

The Inuvialuit Settlement Region (ISR) is approximately 91,000 sq km, and runs across the northern-most section of the Northwest Territories (NWT). Communities in the ISR include Aklavik, Inuvik, Paulatuk, Sachs Harbour, Tuktoyaktuk, and Ulukhaktok. According to 2006 Census data, the Inuit population of the Inuvialuit settlement area at that time was approximately 3115. [43]

ii) Territory of Nunavut

The Territory of Nunavut is approximately 1.9 million sq km in size. 2006 Census data indicate approximately 24,653 of the 29,500 people who were living among Nunavut's 25 municipalities at that time were Inuit. [43] The largest community in Nunavut is the Capital City, Iqaluit. Approximately 6,200 people (Inuit and non-Inuit) were living in Iqaluit in 2006.

iii) Nunavik Settlement Area

The Nunavik settlement area is comprised of approximately 660,000 sq km across northern Quebec. 2006 Census data indicate there were 11,000 residents including 9565 Inuit, living among 14 communities located along the coasts of Hudson's Bay and Ungava Bay at that time.[43] Kuujjuaq, the regional headquarters, is the largest community in Nunavik and was home to a combined Inuit and non-Inuit population of 2132 in 2006.

iv) Nunatsiavut Land Claim Area of Labrador

The Nunatsiavut land claim area covers 72,520 sq km of land and water across northern Labrador. Major coastal communities include Hopedale, Makkovik, Nain, Postville and Rigolet. In 2006, approximately 2400 people were living in these coastal communities, 2160 of whom were Inuit. [43] The largest community in Nunatsiavut is Nain, which had a combined Inuit and non-Inuit population of 1034 according to 2006 Census data.

Appendix B: Overview of a Selection of Current Regional TB-Related Practices

	Primary Prevention Programs				Case Detection			Management	
	Routine Surveillance	Systematic Follow-up: Untreated TB Infection	Systematic Follow-up: Treated TB Disease	BCG	Physician Access	X-Ray	Specimen Examinations	Observed Treatment Programs	Access to Airborne Isolation Rooms
Nunavut	School screening (Kindergarten, Grades 6 & 9)	Yes; every 6 months for 2 years	Determined on a case-by-case basis	Available to all newborns	Regional capitals (Iqaluit, Rankin Inlet, Cambridge Bay); monthly elsewhere	X-ray films can be taken in all communities, films are sent out of territory for radiologist review; Baffin: Ottawa Kitikmeot & Kivalliq: Edmonton	Specimens sent to Ottawa or Alberta Provincial Lab (Edmonton)	Universal Provided by public health nurses and DOT workers	Baffin: Iqaluit Kivalliq: Winnipeg Kitikmeot: Yellowknife
Northwest Territories	School screening, selected populations at risk	Yes; contacts every 6 months for 2 years, others according to risk	Yes; timing and frequency based on individual patient risk for relapse	Available to newborns living in TB-endemic regions or communities	Centralized physician and specialist services in Yellowknife, Inuvik, Fort Smith and Hay River TB expert access via consultation with Alberta	Digital films (PACS) can be taken in all communities; read by radiologist in Yellowknife or Calgary	Initial testing (AFB smears) done in Yellowknife or Edmonton Follow-up tests (cultures and drug sensitivity testing) done by Alberta Provincial Lab Samples from Fort Liard are sent to B.C. Provincial Lab for smear/culture and drug sensitivity testing	Universal Provided by community health nurses, public health nurses, community health workers, community health representatives, home support workers	Yellowknife and Inuvik; overflow are sent to Edmonton (rare)
Nunatsiavut	No	Yes; timing and frequency according to risk	Discretionary	Universal program until 1979; no longer used.	Happy Valley-Goose Bay. Consults available by telehealth TB expert access at St. Johns	Happy Valley-Goose Bay only (digital films–PACS); read by radiologist in St.John's	Specimens sent to Public Health Laboratory in St. John's	Universal Provided by public health nurses and community health aides	Happy Valley-Goose Bay and St. Johns
Nunavik	No	Yes; every 6 months for 2 years	No	Discontinued in 2004; reintroduced in one community in 2012 for children < 2 years of age after a large TB outbreak in 2012	Available in each community via Synapse (computer-based program) TB expert access via email/phone	Permanent access (digital films-PACS) in Kuujjuaq and Puvirnituq, 1 day per week in Kangiqsualujjuaq, 1 day every 2 months in Salluit, Inukjuak, Kuujjuaraapiq	Specimens sent to Montreal	Universal for TB disease, discretionary for treatment of TB infection Provided by nurses, pharmacist, interpreters	Kuujjuaq and Puvirnituq; overflow patients are sent to Montreal

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