



# Addressing tuberculosis among Inuit in Canada

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## Abstract

The average annual rate of tuberculosis (TB) among Inuit in Canada is now more than 290 times higher than Canadian born non-Indigenous people. How did this happen? Using the Territory of Nunavut as a case example, the roots of this situation can largely be traced back to social determinants of health and challenges in access to health care. Half (52%) of all Nunavut residents live in social housing, often under overcrowded conditions. Many experience food insecurity, with food prices in Nunavut that are twice those in southern Canada. Sixty percent of Nunavut residents smoke. Challenges in health care delivery include the small isolated communities, with few roads and difficult weather conditions during the long winters, which impede the ability to reach or provide healthcare, staff that arrive with little TB experience or cultural knowledge, multiple competing health care demands, limited resources and high staff turnover. The housing shortage is not only a social determinant of health, it also impacts the ability to hire new staff or mount an effective response in the event of an outbreak.

Yet despite these challenges, progress has been made. Tuberculosis care in Nunavut includes active case finding, contact tracing for all cases of infectious TB, and screening of school age children. Rapid testing with the GeneXpert<sup>®</sup> platform has resulted in a quicker diagnosis of active TB, earlier treatment (preventing progression of disease) and less transmission. Progressively, there has been a switch from plain film to digital x-rays reducing x-ray turnaround time from as long as two to three weeks to one or two days. Standard treatment protocols include quadruple therapy until sensitivities are known, the use of home isolation for active cases and directly observed treatment (DOT) for both latent and active TB. Special access to rifapentine (Priftin), and its use in combination therapy (3HP), requires only once weekly treatments that can be completed in 12 visits instead of 78 visits for isoniazid (INH) or 120 visits for rifampin, which increases adherence and greatly reduces the health care resources needed to treat TB.

In October 2017, the Honourable Jane Philpott, then Minister of Health and now Minister of Indigenous Services, and Natan Obed, president of Inuit Tapiriit Kanatami (ITK) announced the establishment of a Task Force to develop an Inuit TB Elimination Action Framework, accompanied by regional action plans. It is hoped that the task force, and current efforts in Nunavut, will lead to the long term changes needed to ultimately eliminate TB among Inuit in Canada.

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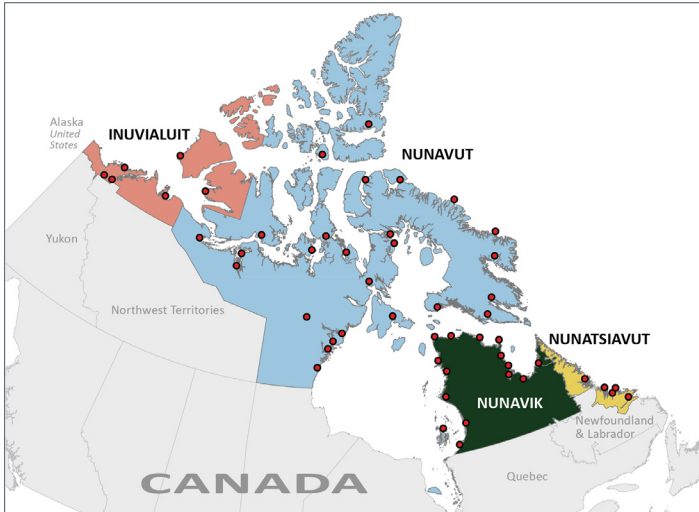
## Introduction

Tuberculosis (TB) is an ongoing problem for the Indigenous peoples of Canada, especially among Inuit. The average annual rate of TB among Inuit in Canada is now more than 290 times higher than Canadian born non-Indigenous people (1). This is clearly reflected in the Territory of Nunavut, which is 85% Inuit and has a population of approximately 38,000 people. The number of cases in 2017 is likely to surpass the annual number of cases since 2010 (when the number of cases peaked at 100). Preliminary data for 2017 show that there were 100 newly diagnosed cases of active TB, at least 300 cases of latent TB and two deaths, out of a population of approximately 38,000 individuals. Sixty-eight per cent (n=17) of the 25 communities in Nunavut reported at least one case of latent or active TB (M Patterson, unpublished data, 2017).

The traditional homelands of Inuit in Canada (Inuit Nunangat) are currently divided into four regions: Nunatsiavut, Nunavik, Nunavut and Inuvialuit (**Figure 1**). Nunavut represents the only portion of Nunangat that, as a territory within Canada, is entirely self-governing. Nunavut accounts for approximately 20% of Canada's land mass and 0.01% of the population. All full time residents live in one of 25 communities. Although there are some significant differences in health status throughout Nunangat there are also some common themes in all four regions: life expectancy is lower than the Canadian average; there is a lack of housing; food insecurity is widespread; and unemployment is higher than the national average.



**Figure 1: Four regions of the traditional homelands of Inuit in Canada (2)**



## Background

Previous attempts to eradicate TB in Inuit Nunangat failed, as they were plagued by health care measures that were neither culturally appropriate nor sustainable. In the 1950s, for example, the focus of TB care was on transporting individuals with active TB to the south to sanatoria, usually for years, and many never returned (3). Most Inuit are aware of relatives who disappeared in this process and even now are unable to find out exactly when or where they died or, in some cases, even where they were buried (4). Starting in the 1970s, there was a mass treatment campaign involving healthcare providers who visited communities, undertook mass screening and offered treatment to all who were found to have TB (3). When rates of TB decreased, these efforts were abandoned. Within one or two decades of discontinuing community-based screening and treatment intervention campaigns, rates of TB for all Canadian Inuit began to rise again. Thus, there is a history of exerting a significant effort to combat TB when rates are elevated then retreating when rates decline. For this reason, a sustained decline in TB rates among Inuit has remained elusive.

Because Nunavut has the highest rate of TB in Canada, and the majority of the population is Inuit, this paper will focus on Nunavut as an illustrative case example. We will describe the root causes of the high TB rates in Nunavut and describe the ongoing efforts to improve TB care. This reflects in part what is occurring in other regions of Inuit Nunangat and elsewhere in Canada.

## Understanding the root causes

The high rates of TB among Inuit are rooted in social determinants of health and inequitable access to health care.

## Social determinants

In terms of social determinants of health, life expectancy of Inuit (also called Nunavummiut in their language, Inuktitut) is approximately 10 years shorter than the Canadian average. For residents of Nunavut especially Inuit, inadequate housing

and food insecurity remain significant problems. Half (52%) of all Nunavummiut live in social housing and, depending on the community, up to 72% of those are living in overcrowded housing (5). Housing can be so crowded that some residents sleep in shifts, as it is all too common for more than 20 people to call a 4-bedroom house a home (5). Many Nunavummiut experience food insecurity. Food prices in Nunavut are, on average, twice those in southern Canada (6). Food is also limited in terms of choice, and occasionally further limited by the inevitable difficulties of transporting food long distances by air.

Unlike many other Indigenous groups in Canada, tobacco use was not a significant part of Inuit culture prior to contact with European cultures. Since that time, smoking has increased to the point where at least 61% of Nunavummiut smoke cigarettes (7), a statistic which alone increases the risks for respiratory tract infections, including TB.

## Access to health care

Health care delivery in Nunavut faces many challenges. Most Inuit live in small, remote, coastal communities. There are no road connections within Nunavut, creating what has been called the "tyranny of distance" (8), which affects all aspects of health care. Furthermore, the long, severe winters during which some communities experience several weeks or more of continuous darkness make reaching or offering health care services that much more difficult. Most health care staff have been trained in southern Canada where they may have never seen a case of TB. When the southern health care workers first arrive, they are often unfamiliar with the language and culture, making effective communication with Nunavummiut difficult.

There are many pressing health problems among the Inuit that are managed with finite health care resources. Thus, although it is imperative that TB prevention and control be addressed, it is important that TB efforts do not take away from other health care efforts, as shifting existing staff to TB efforts would lead to vulnerabilities in other areas of health. Lack of adequate space, both work and housing, also present challenges to improving the delivery of TB care in Nunavut. The housing shortages in many communities affect Nunavut's ability to hire new staff and to mount an effective surge response in the event of an outbreak.

## Current situation in Nunavut

Despite the challenges, Nunavut has made some progress in improving TB care. Current practices for TB care in Nunavut include use of home isolation for active cases, and directly observed therapy (DOT) for all aspects of TB treatment (both latent and active TB). There is active case finding (including contact tracing) for all cases of infectious TB and screening for school age children (kindergarten to grade six).

Current treatment regimens for active TB includes quadruple therapy (rifampin, isoniazid [INH], pyrazinamide and ethambutol) for most cases until sensitivities to these TB drugs are confirmed. The reasons for this is there have been few cases of INH resistance in Nunavut, and during most outbreaks, many infected individuals have had multiple contacts identified as potential sources, making it impossible to guarantee who was their actual source case.



## Recent progress

In April 2017, a full time TB nurse educator was hired. This has increased our ability to train new staff in TB care. Providers new to TB care have the opportunity to spend several days in Iqaluit participating in both didactic learning on TB and getting exposure to the Nunavut TB program.

In the fall of 2017, Health Canada announced approval for adding rifapentine (RPT) to the List of Drugs for Urgent Public Health Need. Prior to this, research was conducted in Ottawa and Iqaluit on a 12-dose regimen of weekly RPT plus INH (3HP) administered by DOT for the treatment of latent TB infection (9). The advantage of 3HP to both patients and the health care system is that 3HP requires one weekly visit for only 12 weeks, instead of the 78 visits required for INH or 120 visits for rifampin. This will likely be better accepted and easier to complete for individuals with latent TB infection, and will also greatly reduce the health care resources needed to treat TB.

A rapid TB diagnostic test, the Xpert MTB/RIF test<sup>®</sup> (Cepheid Inc, Sunnyvale, CA), a cartridge-based automated, nested, real-time polymerase chain reaction (PCR) test utilizing the GeneXpert<sup>®</sup> platform, has been in use in Nunavut since 2012. Initially part of a research program, this test has now become widely available to test sputa for many residents of eastern Nunavut for the presence of TB. It has been shown that quicker diagnosis of active TB results in earlier treatment (preventing progression of the disease) and less transmission of TB (10). These results have the potential to translate into significant benefits for patients and the health care system.

Other efforts underway to improve the overall health care system in Nunavut have also resulted in improvements to TB care. The most obvious example of this is related to the implementation of digital x-ray. Until relatively recently, most communities in Nunavut relied on plain film x-rays. After development in the community, films were shipped to radiologists in southern Canada for interpretation. This simple switch from film to digital has decreased x-ray turnaround time from as much as two to three weeks to one or two days. It is hoped that by the end of 2018 all 25 communities in Nunavut will have completed the transition to digital x-ray machines. In addition, Nunavut Health has an established nicotine cessation program that focuses on education and support to encourage all Nunavummiut to quit smoking.

## Discussion

Tuberculosis rates are high among Inuit in Canada, and this is clearly illustrated in Nunavut. There is a long history to this, and social determinants of health and challenges with access to health care continue to contribute to this. But progress is being made. Advances in detection, diagnosis and treatment have all been integrated into TB care in the North. It is possible that the recent increase in TB rates is in part due to increased detection. With continued efforts these rates should then begin to drop.

## Next steps

In light of the high rates of TB in Nunavut, and throughout Inuit Nunangat, a meeting was held October 4–6, 2017 in Ottawa,

to discuss the issues (11). The meeting was jointly hosted by the Government of Nunavut and Inuit Tapiriit Kanatami (ITK), a national organization representing all Canadian Inuit. The work of ITK includes research, advocacy and education that affect Inuit living in Canada (12). The meeting brought together representatives from federal, provincial and territorial governments, clinical TB experts and researchers to exchange ideas and strategies on improving TB care for all Inuit.

At the conclusion of this joint ITK-Nunavut-hosted meeting, the Honourable Jane Philpott, then Minister of Health and now Minister of Indigenous Services, and Natan Obed, President of ITK, announced the establishment of a Task Force to develop an Inuit TB Elimination Action Framework, accompanied by regional action plans.

Regional planning is important. Although the root causes of increased rates of TB are very similar throughout Nunangat, there are significant differences between regions in terms of the challenges faced and the solutions needed to address TB. The health care systems of each region reside in very different regulatory environments, and face a variety of logistical challenges. The result is that although each region has the same end goal of eliminating TB, the regional programs will have significant differences in their approaches.

## Conclusion

With the current rates of TB in Nunavut and Nunangat, a robust, enduring territorial-wide TB program is needed. There is a history of putting in significant effort to improve numbers when TB flares, then backing off when the number of cases decline. For a sustained decline in TB rates, dedicated TB staff are needed; not just for now but for years to come. It is hoped that the current efforts in Nunavut, and those undertaken by the TB Task Force, will lead to the long term changes needed to ultimately eliminate TB among Inuit in Canada.

## Conflict of Interest

None.

## Acknowledgements

We wish to thank all those who have worked hard to address TB in the Inuit population.

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