

## Inuit research raises concerns about tuberculosis eradication

Although Canada is on track to meet the eradication goals for tuberculosis set by the high-level meeting, Indigenous communities are still disproportionately affected. Paul Webster reports.

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New research on tuberculosis among Inuit people in Canada, Greenland, and Russia indicates that efforts to eradicate a disease that kills 1.6 million people worldwide every year could falter without sustained community-based surveillance and eradication programmes that are rooted in quality-of-life improvements.

In 2016, the tuberculosis incidence among Canada's Inuit people in Ottawa was approximately 300 times higher than among the Canadian-born non-Indigenous population, according to Elaine Kilabuk, an Inuit physician and researcher. A study led by Kilabuk and published earlier this year, which was based on a survey of 295 Inuit people living in 162 households in Iqaluit—the capital of the Nunavut territory in Canada's eastern Arctic—linked overcrowded housing with Nunavut's high incidence of tuberculosis; in recent years, these incidence findings have matched those in some of the countries with association with tuberculosis that we found in our study", Kilabuk says, while noting that poverty, inadequate education, poor food quality, and the consumption of alcohol, cannabis, and tobacco were also found to be associated with tuberculosis in Nunavut. Housing construction costs in Nunavut are three times higher than those in southern Canada. "A possible explanation for crowding being a consistent variable associated with tuberculosis in this part of Canada may be related to the severe climate conditions experienced in the Arctic, where people cannot live outside as they do in southern urban cities", Kilabuk and her co-authors suggested.

Karen Bjørn-Mortensen, a specialist on tuberculosis among Inuit people in Greenland, who is based at the Statens Serum Institut in Copenhagen, says that a notable increase in tuberculosis prevalence in east Greenland in recent years after the near-elimination of

the disease in the 1980s suggests that a tuberculosis strain introduced into the region about a century ago was reactivated and expanded during a period of lowered awareness of tuberculosis in the 1990s. This indicates that the consequences of even small interruptions in the control of tuberculosis in remote settings can be severe, she warns.

It is an important message for Greenland and for other tuberculosis-affected communities worldwide, Bjørn-Mortensen says. "Tuberculosis has proven very enduring in the Arctic, despite efforts to control it", she adds. "Once control efforts were lowered due to the belief that tuberculosis had been successfully fought, tuberculosis simply started to spread again."

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The situation in the Canadian Arctic, Pai stresses, “tells us that addressing social determinants of health is crucial. As in the high-burden countries like India, which accounts for 25–30% of the total global tuberculosis burden, this is a disease of poverty.”

Although Pai is confident that Canada can achieve total tuberculosis elimination by 2030, in keeping with commitments it made at a 2018 UN high-level summit on tuberculosis, he worries that India might not be able to do so, in part because new research from Canada and Greenland suggests that tuberculosis is a disease that can appear to have been eradicated and then aggressively resurface. “Although we know exactly what to do”, says Pai, “complete eradication will not be possible without far greater investment in global control efforts.”

Marcel Behr, a molecular epidemiologist at McGill University in Montreal, says data from a close investigation of a 2012 tuberculosis outbreak in Kangiqsualujjuaq, an Arctic village in Nunavik, QC, suggests a similar pattern to that seen by Bjørn-Mortensen in Greenland. During the 2012 outbreak in Kangiqsualujjuaq, Behr explains, 50 cases of tuberculosis were identified among a total population of only 933 people. This extremely high tuberculosis incidence was driven by an “epidemiologic amplification” of a largely dormant tuberculosis strain, “leading to a multipronged outbreak”, Behr explains.

In a study published in 2015, Behr’s group recommended public health officials in the Canadian Arctic overhaul protocols governing tuberculosis surveillance, diagnosis, and treatment. Like Kilabuk, Behr highlights overcrowded housing as a key driver of tuberculosis. “Why the disease spread so rapidly within the community is still not entirely clear to us”, he adds, “but we think it could be due to delayed diagnosis. And we also think that the force

of the disease epidemic has to do with exposure to multiple infected people. Having a high intensity of the disease in an area of poor housing risks becoming explosive.” Behr and Kilabuk both call for more research.

In Toronto, Anna Banerji, who leads continuing professional development

in Indigenous health at the University of Toronto’s Faculty of Medicine, says training for Inuit health professionals and medical researchers continues to be overlooked by the Canadian Government, which is legally responsible for funding and delivering health services for Indigenous people.

Banerji, who coordinates the world’s largest Indigenous health

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