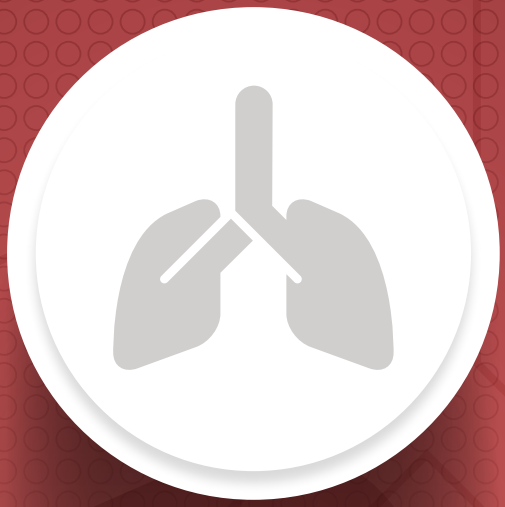
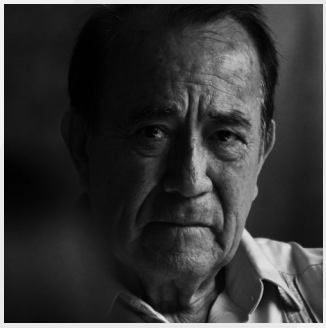


TUBERCULOSIS FACT SHEET

& Calls to Action for 2021

A resource for TB advocates in Canada

Stop TB Canada



CONTENTS

TB TODAY **01**

WHAT IS TB? **01**
Latent TB infection (LTBI): *01*
Active TB disease: *01*

HOW IS TB TRANSMITTED? **01**

THE SOCIAL DETERMINANTS OF TB **01**

BOX 1: TB IN CANADA **02**

ARE THERE VACCINES FOR TB? **04**

HOW IS TB DIAGNOSED? **04**
Screening for active TB: *04*
Diagnosing active TB disease: *04*
Diagnosing latent TB Infection: *05*
Diagnostic challenges: *05*

HOW IS ACTIVE TB TREATED? **06**
Drug-sensitive TB: *06*
Drug-resistant TB: *06*
Treatment challenges: *06*

HOW CAN TB BE PREVENTED? **07**

BOX 2: CANADA'S ROLE IN ENDING TB AT HOME AND ABROAD **08**
Global goals and commitments for ending TB: where does Canada stand? *08*
TB IN THE SUSTAINABLE DEVELOPMENT GOALS: 08
THE END TB STRATEGY: 08
THE UNITED NATIONS HIGH-LEVEL MEETING ON TB: 09

DOMESTIC CALLS TO ACTION FOR CANADA IN 2021: **09**

THE STOP TB CANADA NETWORK. **10**

GLOBAL CALLS TO ACTION FOR CANADA IN 2021: **10**

COVID-19 AND TB **11**

ACKNOWLEDGEMENTS **12**

CONTRIBUTORS **12**

Stop TB Canada

TB TODAY

WHAT IS TB?

Tuberculosis (TB) is an infectious disease caused by the bacteria Mycobacterium tuberculosis. It most commonly affects the lungs (pulmonary TB) but can also affect other parts of the body (extrapulmonary TB). Prior to COVID-19, TB killed more people than any other infectious disease in the world, having caused 1.4 million deaths globally in 2019.

Latent TB infection (LTBI):

- Latent TB infection is when someone is infected with TB bacteria but has no symptoms of the disease and cannot spread TB to others. Latent TB can progress to active TB disease (see below), but only about 5-10 % of people with LTBI will develop active TB in their lifetime. Some individuals are at higher risk of progression to active TB, including those with other conditions such as HIV and diabetes, particularly if not optimally managed. Although progression to active disease can occur any time, the highest likelihood of progression is within the first 2 years of first exposure. Approximately one quarter of the world's population is estimated to have LTBI.

Active TB disease:

- Active TB disease is when an individual has symptoms of TB and can transmit TB to others. Symptoms of TB can include fever, night sweats, chills, persistent coughing, weight loss, loss of appetite, and fatigue. Ten million people are estimated to have had active TB disease globally in 2019.

HOW IS TB TRANSMITTED?

TB is an airborne infectious disease, transmitted through particles in the air called droplet nuclei. These are expelled when a person with active TB coughs, sneezes, shouts, or sings, and can then infect others.

THE SOCIAL DETERMINANTS OF TB

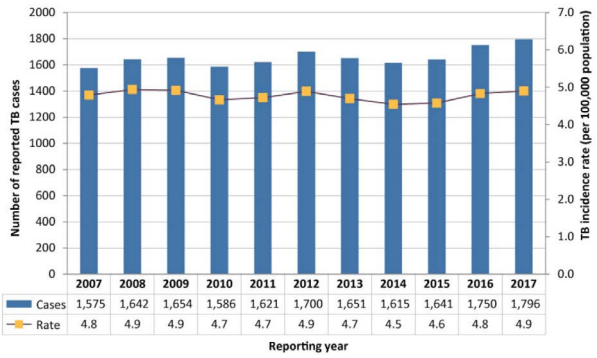
TB is strongly linked to social determinants of health. Inadequate or crowded housing conditions, undernutrition, and poverty put communities at increased risk of TB. Delays in diagnosis due to accessibility barriers or stigma, as well as lack of access to primary health care also contribute to poorer TB outcomes.

BOX 1: TB IN CANADA

At the time of confederation in 1867, TB was the leading cause of death in Canada. Although the overall incidence of TB in Canada today is low (4.9 per 100,000 people in 2017, see ***Figure 1***), it is much higher in newcomer, First Nations, and Inuit communities (see ***Figure 2*** for a breakdown of cases by origin). Alarmingly, the prevalence of TB is more than 290 times higher in Inuit communities than among the non-Indigenous Canadian-born population. This exemplifies deep inequities in social determinants of health, particularly in relation to housing, access to care, and the prevalence of comorbidities that increase the risk of TB.

Unfortunately, national-level TB data for Canada are outdated, with the latest report presenting data from 2017. Updated data are urgently needed to shape an effective response to TB in Canada.

Figure 1. *Trend in TB case notifications and incidence rates, Canada, 2007 to 2017*



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cases	1,575	1,642	1,654	1,586	1,621	1,700	1,651	1,615	1,641	1,750	1,796
Rate	4.8	4.9	4.9	4.7	4.7	4.9	4.7	4.5	4.6	4.8	4.9

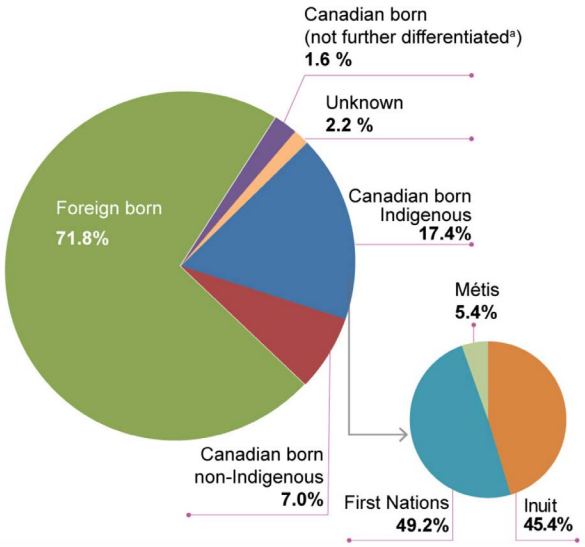
Source: *Tuberculosis in Canada Report, 2017*

Newcomer Canadians with TB generally became infected with latent TB overseas in places with a much higher prevalence of TB than Canada, reflecting our strong connection to the global TB epidemic. There is little transmission of TB in Canada from this group, even though they make up the majority of Canadians falling ill with TB (see ***Figure 2***). Newcomer communities also face challenges with regards to the social determinants of health mentioned above, including stigma, barriers to healthcare access, and poverty.

BOX 1: TB IN CANADA – CONTINUED

The history of TB in Canada with regard to Indigenous communities is one of inequity and mismanagement. In the 1940s to 1950s, members of Indigenous communities who had TB were forced to board ships that would take them to TB sanitoria in the south, often without knowing where they were being taken. Many died in the south without their families ever knowing what happened to them. The consequences of this trauma persist to this day.

Figure 2. *Distribution of TB cases in Canada by origin, 2017*



[a] *Could not be differentiated into Indigenous / Non-Indigenous*

Source: *Tuberculosis in Canada Report, 2017*

Efforts to address TB in Inuit communities are ongoing. Inuit Tapiriit Kanatami (ITK) has developed an Inuit-specific TB Strategy emphasizing community education, addressing the social determinants of health, and the use of Inuit-centered approaches to TB prevention, care, surveillance, and research. Furthermore, the Canadian government has committed to eliminating TB across Inuit Nunangat by 2030 (explained further in ***Box 2***).

For more on Canada's role in ending TB at home and abroad, see ***Box 2*** below.

ARE THERE VACCINES FOR TB?

There is currently only one vaccine available for TB: the Bacille Calmette-Guérin (BCG) vaccine, which was developed in 1921. Unfortunately, it is of limited effectiveness, primarily being effective at preventing severe forms of TB in children (such as TB meningitis), but ineffective at preventing pulmonary TB (the most common form of TB) in adults. We therefore urgently need a new and effective TB vaccine. The fact that no effective vaccine has been rolled out in the last 100 years is a stark example of neglect to address this disease and a continued lack of adequate political and financial commitment to ending TB.

While BCG continues to be routinely administered to newborns in high TB incidence countries, many low-incidence countries that had prior mass vaccination policies have now instead adopted targeted vaccination strategies of specific high-risk groups.

In Canada, the BCG vaccine continues to be given to newborns in some high-incidence communities today. See the BCG Atlas for further details on past and current BCG vaccination policies in Canada and other countries.

HOW IS TB DIAGNOSED?

Screening for active TB:

- Screening tools are those that cannot confirm whether an individual has TB, but instead are used to determine whether someone should be further evaluated for TB. These include symptom screening and chest X-rays.

Diagnosing active TB disease:

- ***Microscopy:*** This involves using a microscope to look for TB bacteria in a person's sputum (the mucus they cough up). This method, however, has limitations given that, for example, it is difficult to collect sputum from children. In addition, this method may yield false negative results in some individuals that do have TB, particularly among people living with HIV and in children. Other types of mycobacteria being present in the sputum can also lead to false positive results in individuals who don't have TB.
- ***Culture:*** This involves trying to grow TB bacteria from a person's sputum sample. This is the "gold standard" for TB diagnosis in the sense that it can identify TB more accurately than other methods. It can also be used to determine whether the strain of TB in question is resistant to certain TB treatments. Unfortunately, it takes a long time to get results with this method (ranging from 2 weeks to 2 months), because TB bacteria grow slowly. Culture also requires laboratory facilities, which may not be available in remote or low-resource areas.
- ***Molecular tests:*** These tests look for the presence of genetic material (DNA or RNA) from TB bacteria in a sample and can also identify resistance to TB treatments. Molecular tests provide results much faster than culture (for example, the molecular test GeneXpert provides results within 2 hours), but cannot identify whether the TB bacteria are alive or dead, and have storage and electricity requirements that may be challenging in settings with frequent power outages.

Diagnosing latent TB Infection:

- ***Tuberculin skin test (TST):*** LTBI can be detected using a skin test, such as the TST, which involves injecting a small amount of a substance called tuberculin purified protein derivative into the skin of the arm. Because the reaction to the test is read 48-72 hours later, this test requires 2 visits to the testing location. A positive reaction is indicated by a small bump appearing at the injection site, suggesting that the person has been exposed to TB. However, positive reactions also occur in individuals who have received the BCG vaccine, making the test less useful in settings where BCG is routinely administered. Also, the test is less sensitive in people living with HIV, meaning that these individuals may have a negative test result even if they have been exposed to TB.
- ***Interferon-Gamma Release Assays (IGRA):*** These are blood tests which measure an individual's immune response to TB bacteria. These tests have several advantages over the TST in that they do not cause false positive results in people who have been vaccinated with BCG, they provide results faster, and do not require multiple visits to the testing site. However, unfortunately they are not as widely used as the TST in low-resource settings, as they are expensive.

Diagnostic challenges:

- As mentioned above, there are limitations to each method of TB testing.
    - *Microscopy can, in some cases, provide negative results even if a person does have TB, or provide positive results when they do not have TB. It also requires laboratory facilities and trained staff.*
    - *While culture is the most accurate way of identifying TB, it takes a long time to produce results and requires laboratory facilities and trained staff.*
    - *Molecular tests are expensive, require stable sources of electricity and do not confirm viability of the bacteria.*
- TB is particularly difficult to diagnose in children and in people living with HIV or other causes of immune compromise (this is a growing diagnostic challenge in Canada, for older individuals living with severe comorbidities, including those receiving dialysis or cancer treatment).
- Because of the high cost of IGRAs, testing for LTBI continues to rely on the TST, particularly in low-resource settings, despite the fact that it can lead to false positives in those vaccinated with BCG.
- TSTs and IGRAs do not indicate an individual's risk of progressing from LTBI to active TB disease.

For more information on TB diagnostics, see this guide on TB diagnostic tools by Treatment Action Group (TAG).

HOW IS ACTIVE TB TREATED?

Drug-sensitive TB:

- Drug-sensitive TB is treated over a period of 6-9 months with first-line antibiotics specific to TB (first-line refers to the initial, standard set of drugs used to treat a disease). The first 2 months of treatment are known as the intensive phase, in which the patient receives a combination of 4 drugs, taken daily or 5 days/week. The remaining 4-7 months make up the continuation phase, in which the patient receives a combination of 2 drugs, taken daily or 3 days/week. The efficacy of a shorter 4-month regimen is being investigated in an effort to reduce the duration of drug-sensitive TB treatment.

Drug-resistant TB:

- It is possible to have TB that is resistant to one or more of the first-line drugs used to treat drug-sensitive TB, in which case different drugs are needed (referred to as second-line). Drug-resistant TB treatment can take up to 18 to 20 months to complete, and can be associated with more side effects. It is often more expensive, and there remain regulatory barriers to accessing drug-resistant TB treatment in many countries.
    - *There are different categories of drug-resistant TB, including multidrug-resistant TB (MDR-TB, which is resistant to Isoniazid and Rifampin, the two most powerful first-line drugs for treating TB), and extensively drug-resistant TB (XDR-TB, which is resistant to Isoniazid, Rifampin, any fluoroquinolone (another type of antibiotic), and at least one injectable second-line drug.)*
    - *For other categories of drug-resistance, see this WHO list.*

Treatment challenges:

- The standard drugs for the treatment of TB are now over 50 years old. In 2012, Bedaquiline, a drug for the treatment of drug-resistant TB, became the first new TB drug developed in half a century, but the lack of regulatory approval remains a barrier to its implementation in many countries. Other drug-resistant TB treatments, such as Delaminid, face similar barriers to access.
- The treatment of TB in children is complicated by the lack of access to child-friendly TB drug formulations, which continues to be hindered by a lack of incentives for manufacturers to register their products in some countries, notably in Canada. This is a critical barrier to access to treatment for children with TB, particularly in Canadian Indigenous communities.
- The long treatment times for TB make adherence challenging. The challenge is even greater for drug-resistant TB, which takes much longer than standard drug-sensitive TB treatment. (Up to 18-20 months for some types of drug-resistant TB, compared to the 6-9 months for drug-sensitive TB).
- Canada has faced regular shortages of key tuberculosis drugs such as Rifampin, thereby jeopardizing TB care.
- Some TB drugs can have serious side effects, including hearing loss and kidney damage.

For more information on TB treatments, see this guide on TB treatments by TAG.

HOW CAN TB BE PREVENTED?

- Adopting a human-rights-based and patient-centered approach to TB prevention and care that is non-stigmatizing, free, and accessible to all.
- Providing appropriate and community-led health care to communities affected by TB.
- Creating and providing culturally sensitive and multi-lingual information and services.
- Facilitating non-stigmatizing health promotion and health education.
- Addressing the social determinants of health that increase the risk of TB, including inadequate housing and nutrition.
- Taking appropriate infection control measures in healthcare settings, and improving ventilation.
- Vaccinating infants in high-risk communities with BCG, to prevent severe forms of TB in childhood.
- Testing for LTBI among high-risk populations, and providing preventive treatment to those with LTBI who are at high risk of developing active TB.
    - *This is a key component of the End TB Strategy, and is particularly important for effectively addressing TB in specific risk groups in settings that are otherwise low-incidence (such as Canada), in order to reach TB elimination.*
    - *Preventive treatment involves shorter regimens compared to those for treating active TB; however, access to certain drugs that allow shorter LTBI treatment times is still restricted in many countries, including in Canada, which poses barriers to treatment completion.*
    - *In low TB incidence countries, the WHO recommends systematic testing for and treatment of LTBI in the following risk groups (see **Figure 3**):*

Strongly recommended in:	Conditionally* recommended in:
» People living with HIV	» Newcomers from countries with a high burden of TB
» Contacts of pulmonary TB cases	» People experiencing homelessness
» Patients initiating anti-tumour necrosis factor treatment, receiving an organ or haematologic transplant, those on dialysis, or those with silicosis	» Prisoners
	» People who use illicit drugs
	» Health-care workers

Figure 3. *Risk groups in which testing for and treatment of LTBI is recommended (or should be considered) in low-incidence settings:*

**** dependant on risk-benefit balance with respect to local epidemiological context***

Source: *Towards TB elimination: an action framework for low-incidence countries, WHO. COVID-19 and TB*

Learn more: **You can read further about TB epidemiology, surveillance, prevention, diagnosis, and treatment in Canada in the Canadian TB Standards.**

BOX 2: CANADA'S ROLE IN ENDING TB AT HOME AND ABROAD

Global goals and commitments for ending TB: where does Canada stand?

TB IN THE SUSTAINABLE DEVELOPMENT GOALS:

Goal 3 of the Sustainable Development Goals (SDGs) includes TB-related targets to be achieved by 2030, including to:

- Reduce TB deaths by 90% (compared to 2015)
- Reduce new TB cases by 80% (compared to 2015)
- Ensure that no households experience catastrophic costs due to TB

THE END TB STRATEGY:

The WHO's End TB Strategy, adopted by member states in 2014, set goals to be achieved by 2035, including to:

- Reduce TB deaths by 95% (compared to 2015)
- Reduce new TB cases by 90% (compared to 2015)
- Ensure that no households experience catastrophic costs due to TB

SPOTLIGHT ON CANADA:

In the context of these global goals, the government of Canada has also made domestic commitments to ending TB in the country. This includes a commitment to ending TB across Inuit Nunangat by 2030, a goal that was reaffirmed by ITK and the Canadian government on World TB Day this year. Relevant milestones in these efforts include ITK's launch of an Inuit-specific TB elimination strategy in 2013, and the establishment of a Task Force in 2017 for TB elimination in Inuit Nunangat.

Unfortunately, we can see from Box 1, Figure 1, that there has not been a large reduction in the burden of TB in Canada in the past years (although the outdated nature of the data limits our understanding of the current situation). To honour our commitments to ending TB, we need to measure our progress by making updated data available.

BOX 2: CANADA'S ROLE IN ENDING TB AT HOME AND ABROAD – CONTINUED

THE UNITED NATIONS HIGH-LEVEL MEETING ON TB:

The first-ever United Nations General Assembly High-Level Meeting (UNHLM) on ending TB was held in September 2018. A key output of this meeting was a political declaration in which member states committed to specific efforts to end TB, which included dedicating 2 billion USD to funding TB research annually. Unfortunately, there is a large divide between commitments made and actual political and financial investments in TB, as underlined in the Deadly Divide Report. For example, the global TB research funding target was missed by more than half, with only 900 million USD actually committed to TB research in 2019.

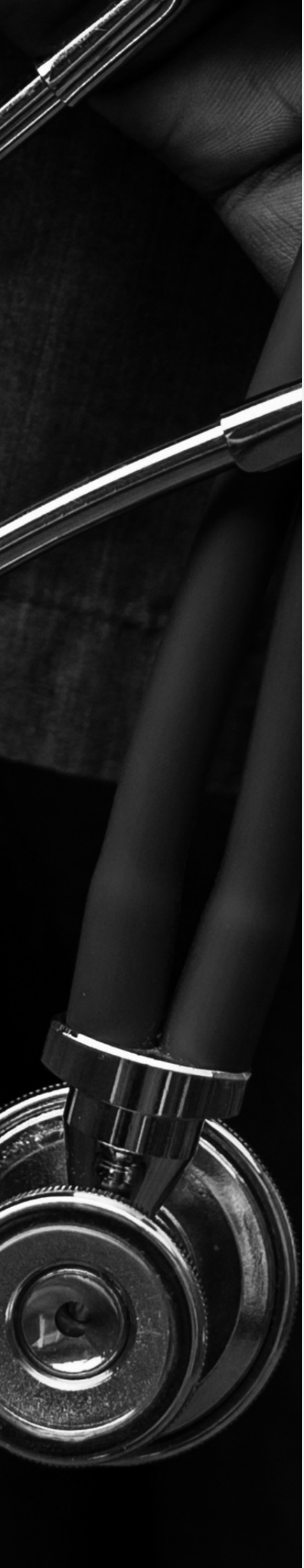
SPOTLIGHT ON CANADA:

Canada itself fell short of dedicating its own "fair share" to TB research, spending only 75% of its target amount in 2019 (see global calls to action section). You can read more about how Canada should step up its political and financial support for ending TB here.

DOMESTIC CALLS TO ACTION FOR CANADA IN 2021:

To work towards ending TB in Canada, we need:

- Updated epidemiological data on TB in Canada.
  - *The last TB in Canada report was released in 2019 but reported data from 2017. This urgently needs to be updated, especially in light of COVID-19-related disruptions to TB services. If we are to proactively address TB, we need up-to-date data to inform action, and to leverage information systems put in place to track COVID-19.*
- To collectively assess the impact of COVID-19 on TB, and collaborate on mitigation strategies for impacted programs.
- To address health inequities, particularly with respect to newcomer and Indigenous health.
  - *A Parliamentary Survey has been suggested to assess needs in collaboration with the Parliamentary Health Committee.*
- To incentivise the registration of child-friendly TB drug formulations in Canada, and to prevent shortages and facilitate access to other TB drugs through mechanisms, such as the Global Drug Facility.



GLOBAL CALLS TO ACTION FOR CANADA IN 2021:

For Canada to contribute meaningfully to global efforts to end TB, we need to:

- Support the Global Plan to End TB - a plan that outlines the costs and resource needs to reach the UNHLM and SDG targets.
- Meet the TB research funding targets to which Canada committed at the UNHLM on TB.
    - *The 2 billion USD goal for TB research funding could be achieved if countries contributed their "fair share" to TB research (defined as dedicating 0.1% of their total research spending to TB), however, Canada fell short of this target in 2019, having contributed only 75% of its fair share.*
    - *Areas that are particularly under-funded include TB vaccine development (which is alarming considering the limited effectiveness of the current TB vaccine), drugs, and diagnostics, which received the lowest share of Canadian funding in 2019.*
- Renew financial support for initiatives such as TB REACH, which are even more crucial now that COVID-19 is jeopardizing progress on TB elimination.

THE STOP TB CANADA NETWORK

Stop TB Canada is a network of Canadians committed to ending TB at home and abroad. This is a diverse group including TB advocates, researchers, practitioners, and members of affected communities supporting the above calls to action to end TB.

If you are interested in being involved with Stop TB Canada, you can sign up for our newsletter, or join our directory. Follow us on Twitter @StopTBCanada.

Are you a person affected by TB, a TB survivor, or a family member of someone affected by TB looking for a safe space to share resources and experiences? Join our newly launched Facebook group to connect with a community of people affected by TB in Canada.

Follow us on Facebook

COVID-19 AND TB

The COVID-19 pandemic is having a major impact on all aspects of healthcare, including TB. A global survey on the impacts of COVID-19 on TB showed significant disruptions in TB services during the COVID-19 pandemic, including the diversion of TB program staff to COVID-19 work, patients experiencing barriers to accessing TB services, reduced access to necessary protective equipment for healthcare workers, stockouts of medications, and reduced case notifications.

Once COVID-19 is under control, we will be dealing with excess morbidity and mortality from other health issues that have gone under-addressed during the pandemic. Based on case notification data from 84 countries, the WHO estimates that 1.4 million fewer people accessed TB care in 2020 compared to 2019. The Global Fund to Fight Aids, Tuberculosis and Malaria estimates that over 500,000 additional deaths from TB occurred in 2020, setting back progress on TB elimination by a decade.

What about the impact of COVID-19 on TB in Canada?

Stop TB Canada is currently doing a survey of TB program leads, staff, and those affected by TB to collect data on disruptions to TB services during the pandemic (results expected Autumn of 2021).

Although the pandemic has had devastating impacts on TB, it also provides valuable lessons to apply to TB elimination efforts. Health systems are adapting to the realities of the pandemic through digital revolutions and more patient-centered approaches. This provides opportunities to re-imagine TB care and to build stronger health systems, leveraging lessons from the COVID-19 response. For Canada, opportunities include integrating TB testing and prevention into the COVID-19 response, and making real-time TB data as available as they have been for COVID-19.

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