BC Centre for Disease Control
PROVINCIAL HEALTH SERVICES AUTHORITY

TB

Annual Report 2024

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2024

List of Abbreviations

3HP – Once-weekly Isoniazid-Rifapentine for 3 months
4R – Daily Rifampin for 4 months
BC – British Columbia
BCCDC – British Columbia Centre for Disease Control
FNHA – First Nations Health Authority
HIV – Human Immunodeficiency Virus
IGRA – Interferon-Gamma Release Assay
iPHIS – Integrated Public Health Information System
TB – Tuberculosis
TBI – Tuberculosis Infection
TPT – Tuberculosis Preventative Treatment
TST – Tuberculin Skin Test

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Introduction and Land Acknowledgement

The presented data includes people in British Columbia who have been diagnosed with Tuberculosis (TB) disease and TB Infection. The pathogen that causes these conditions is transmitted among populations as a result of a complex mix of social, cultural, economic and structural factors. We recognize that the presentation of public health data, including TB data, has historically focused on disparities without an acknowledgement of the colonial and systemic structures that underlie them. This report represents our ongoing commitment toward more respectful, inclusive, and responsible approaches to public health reporting. **All data are preliminary and subject to change.**

We acknowledge the Title and Rights of First Nations in BC who have cared for and nurtured the lands, air and waters for all time, including the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh Úxwumixw (Squamish Nation), and səl̓ílwətaʔ (Tsleil-Waututh Nation) on whose unceded, occupied, and ancestral territory BCCDC is located. As a provincial organization, we also recognize and acknowledge the inherent Title and Rights of First Nations in BC whose territories stretch to every inch of the lands colonially known as "British Columbia".

BC is also home to many First Nations, Métis, and Inuit people from homelands elsewhere in Canada. We recognize the distinct rights of First Nations, Inuit, and Métis people and BCCDC is beginning its work to uphold a distinctions-based approach to Indigenous data sovereignty and self-determination. All Indigenous Peoples who live in BC have rights to self-determination, health and wellness, and respectful use of their data in alignment with Indigenous data governance principles, including but not limited to OCAP®.

BCCDC is working to address the consequences of colonial policies which have had lasting effects on all Indigenous Peoples living in the province. Consistent with the Coast Salish teaching of thee-eat (truth) gifted to PHSA by Coast Salish Knowledge Keeper Sulksun, we recognize that ongoing settler colonialism in BC undermines the inherent rights of Indigenous Peoples who live in BC and significantly contributes to health inequities and data gaps. While the data shown in this report represent BC residents, there is no stratification by Indigeneity and as such, the results are not reflective of the situation for First Nations, Métis and Inuit Peoples and communities. For public health surveillance indicators pertaining to First Nations/Métis/Inuit Peoples in BC, please see:

- In Plain Sight: Addressing Indigenous-specific Racism and Discrimination in B.C. Health Care
- Taanishi kiiya? Miiyayow Métis saantii pi miyooayaan didaan BC. Métis public health surveillance program-Baseline report, 2021.

Foreword

Tuberculosis (TB) services have a long and complex history in British Columbia. While the province has been home to some of Canada's earliest sanatoria and longstanding TB control programs, these services have not always served all communities equitably. In particular, TB programs—often operating under or alongside federal jurisdiction—have caused deep and lasting harm to Indigenous Peoples, including through coercive screening, forced removal from home communities, and institutionalization. This legacy continues to reverberate today, contributing to stigma and mistrust of health systems. At the BC Centre for Disease Control (BCCDC), we acknowledge this history and are committed to working in partnership to build TB services that are respectful, culturally safe, and grounded in the self-determined priorities of communities most affected by TB.

This year, we are introducing a more concise and timely TB annual report that covers key data from both 2023 and 2024. In support of improved accessibility and responsiveness, we have moved detailed tables and figures to our interactive TB surveillance dashboard, allowing this report to focus on high-level findings, key indicators, and areas of emerging concern. This transition supports our goal of delivering more relevant and timely insights for public health action.

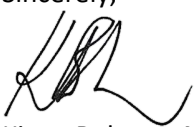
Several findings from this year's report highlight the ongoing need for coordinated and sustained efforts. Although the provincial rate of TB disease has declined to its lowest level in seven years, the burden remains unequally distributed — concentrated in regions and communities experiencing higher levels of structural vulnerability, including residential instability and social exclusion. These patterns reinforce the importance of embedding equity into all aspects of TB care and prevention and aligning our work with broader social and health system reforms.

This report aligns with the goals of BC's Provincial TB Elimination Plan and the World Health Organization's End TB Strategy, both of which emphasize integrated, people-centred care and address the social determinants that drive TB risk. As part of this commitment, this year's report introduces data related to housing stability as key structural determinant of health. In the coming year, we plan to expand our reporting to include other social determinants of health indicators and TB pathogen genomics to support precision public health responses.

We are also working toward a more responsive reporting cycle. Our goal for 2026 is to align the release of this report with World TB Day (March 24), reinforcing the importance of global and local accountability in TB elimination. Finally, we are transitioning to a two-tiered approach: an annual summary report, such as this one, for routine monitoring, complemented by focused reports that take a deeper dive into specific topics of concern—such as TB among young people or individuals experiencing homelessness.

Thank you for your continued partnership as we work toward the elimination of TB in British Columbia.

Sincerely,



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Summary of Trends

TB Disease

- In 2024, the rate of tuberculosis (TB) disease in BC was 5.8 per 100,000 population, the lowest rate observed in the past seven years.
- Regional rates of TB disease in 2024 were greatest in the Fraser Health (8.5/100,000 population) and the Vancouver Coastal Health (7.1/100,000 population) regions.
- Over one third of TB disease cases (n=118) resided in neighbourhoods with the highest levels of residential instability.
- Rates of TB disease among males and females were generally greater among young adults (20-39 years) and seniors (60 years and above).
- In 2024, the rate of TB disease was higher among people born outside of Canada (17.1 per 100,000 population). This is consistent with historical trends.
- In 2024, 82.4% (272 cases) of TB cases had known HIV status (either through laboratory report or self-report of HIV diagnosis). Of those with known HIV status, only 2.2% of TB cases were co-infected with HIV in 2024.
- The majority of TB cases (80.3%) had at least one respiratory site as part of their diagnosis in 2024.
- The majority (75%; 274 cases) of TB cases diagnosed in 2023 completed their treatment within 12 months.
- Overall, the rates of isoniazid-resistant TB had been increasing in BC since 2017, rates of rifampin and multi-drug resistance have remained low. In 2024, 5.8% (19 cases) of all TB cases had isoniazid resistance, down from 8.7% (28 cases) in 2021. Four cases (1.2%) of multi-drug resistant TB were seen in 2024.

Contact Tracing

- In 2024, a total of 1,438 contacts were reported to BCCDC with a corresponding mean of 5.4 contacts per respiratory TB case.
- In 2023, among all contacts of respiratory TB cases aged 5 years and older (1,661 total contacts) reported to BCCDC, 88.3% (1,457 contacts) completed an initial assessment, 0.8% (14 contacts) were diagnosed with TB disease (i.e. secondary cases), 19.9% (331 contacts) screened positive, and 6.3% (105 contacts) successfully completed TB infection (TBI) treatment.

TB Infection Treatment

- A total of 1,000 individuals were started on TBI treatment in 2023, an increase of 31% from the prior year.
- 70.3% (703 clients) successfully completed treatment within 6 months and only 0.3% (3 clients) took longer than 12 months to complete treatment.
- Of those that started TBI treatment, 15.6% (156 clients) were documented with incomplete treatment in 2023.

TB Disease

Background

Tuberculosis (TB) disease is a preventable and curable disease that is caused by Mycobacterium tuberculosis. It is spread through the air following prolonged contact with an infectious person, typically via coughing, sneezing, or speaking.

Despite decades of global public health efforts, TB remains a global health challenge. After being replaced by coronavirus disease (COVID-19) for three consecutive years, TB reclaimed its position as the world's leading cause of death from as single infectious pathogen in 2023 (1). This highlights the need for continuous surveillance, strengthened TB management, and research to advance efforts toward TB elimination.

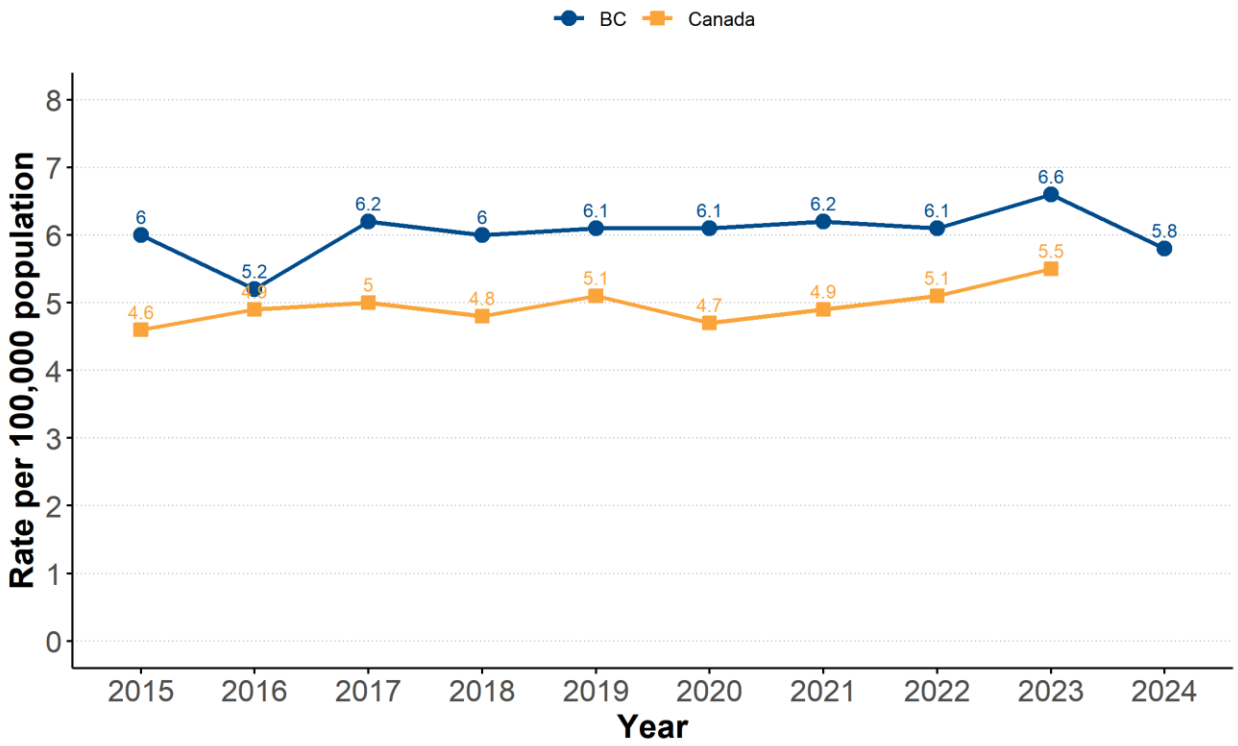
This report includes all people diagnosed or treated for TB in BC – including Indigenous Peoples in Canada, non-Indigenous Canadians, permanent residents, and temporary residents.

In 2014, stewardship of First Nations health data transitioned to First Nations Health Authority (FNHA), which coordinates all TB-related activities within First Nations communities in BC. Year-round, BCCDC works in partnership with FNHA to provision provincial TB disease and TB infection treatment data to support TB services including routine surveillance, program planning, advocacy, and reporting. FNHA TB Services provides a range of services tailored to First Nations communities and enhanced TB reduction strategies in areas with the highest incidence. This includes, but is not limited to, expanding TB screening and treatment access, and increasing outreach to decrease barriers to TB screening. For additional information on TB among First Nations people, see FNHA Tuberculosis Services.

TB Disease Historical Trends

In 2024, the rate of TB disease in BC was 5.8 per 100,000 population (330 cases), signaling a slight decrease compared to historical rates (since 2017) (Figure 1; S1-A). Although the rate of TB disease in BC has remained relatively stable over the past decade, crude case counts have continued to increase as the BC population continues to grow, with the highest number recorded in 2023 (367 cases)(2). This underscores the need for sustained and enhanced surveillance to support public health action delineated in the provincial TB elimination plan.

Figure 1. TB Disease Rates*+ in BC and Canada, 2015 to 2024**



*All rates are per 100,000 population. +Population denominators from 2024 BC Statistics' Population Estimates.
**Canadian rates from the Public Health Agency of Canada (3). Data for 2024 is not publicly available at the time of this report.

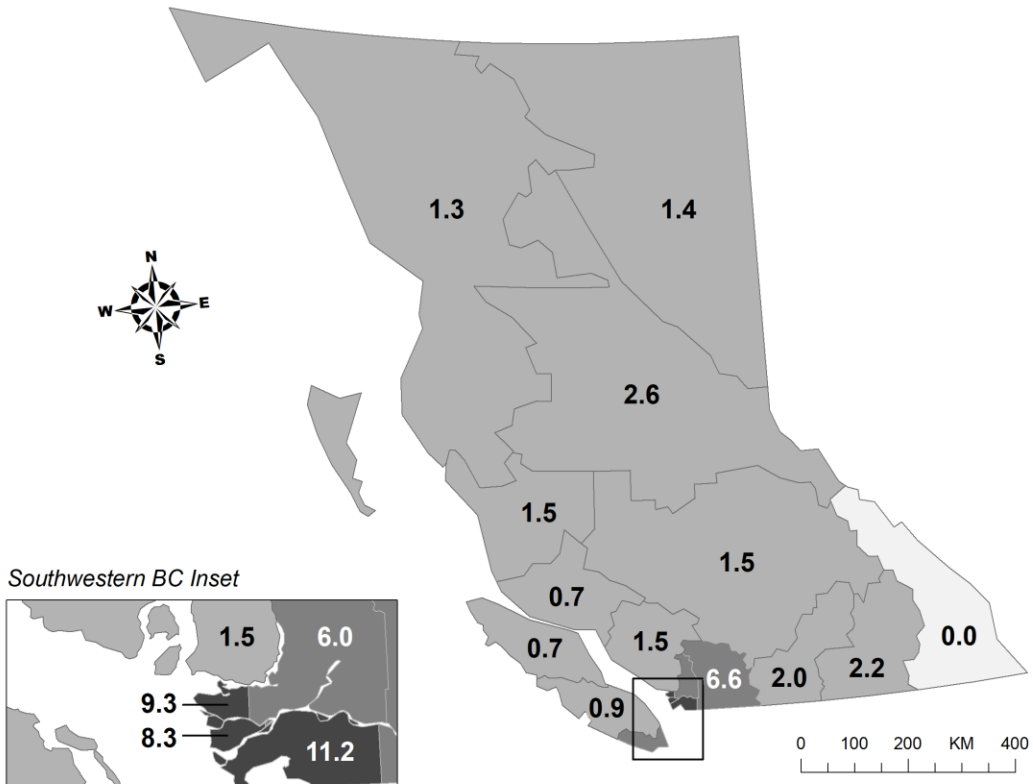
TB Disease by Region

The highest TB disease rates were in the two most populous health regions: Fraser Health (8.5 cases per 100,000 population) and Vancouver Coastal Health (7.1 cases per 100,000 population) in 2024 (2). These regions also receive the greatest number of newcomers to Canada in BC including those from high TB burden countries (4).

In 2024, TB disease rates varied between and within health authorities. Within the Fraser Health region, Fraser South (11.2 cases per 100,000 population) recorded the highest rate of TB disease in 2024. This was followed by Vancouver (9.3 cases per 100,000 population) and Richmond (8.3 cases per 100,000 population) both within the Vancouver Coastal Health region (Figure 2). Overall, TB disease rates were most stable in Fraser Health, recording no change in rates between 2023 and 2024; whereas a general decline was observed in other regions (2).

Many TB disease cases (37%; 118 cases) resided in neighbourhoods with the highest levels of residential instability (Table 1). Each case was assigned a level of residential instability (Quintiles 1-5) based on British Columbia's Index of Multiple Deprivation for Community Health Service Areas (see data sources for details). Residential instability is notably observed in neighbourhoods with increased urbanization (5).

Figure 2. TB Disease Rates by Health Service Delivery Area*+ in BC, 2024



ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	0	0.0
12	Kootenay Boundary	2	2.2
13	Okanagan	9	2.0
14	Thompson Cariboo Shuswap	4	1.5
21	Fraser East	24	6.6
22	Fraser North	48	6.0
23	Fraser South	116	11.2
31	Richmond	20	8.3
32	Vancouver	72	9.3
33	North Shore/Coast Garibaldi	5	1.5
41	South Vancouver Island	19	4.1
42	Central Vancouver Island	3	0.9
43	North Vancouver Island	1	0.7
51	Northwest	1	1.3
52	Northern Interior	4	2.6
53	Northeast	1	1.4

*Health Service Delivery Area determined at time of case; cases with a client address outside of BC are excluded (n=1). [+]Population denominators from 2024 BC Statistics' Population Estimates.

Table 1. TB Disease Cases* by Neighborhood-level of Residential Instability in BC, 2024**

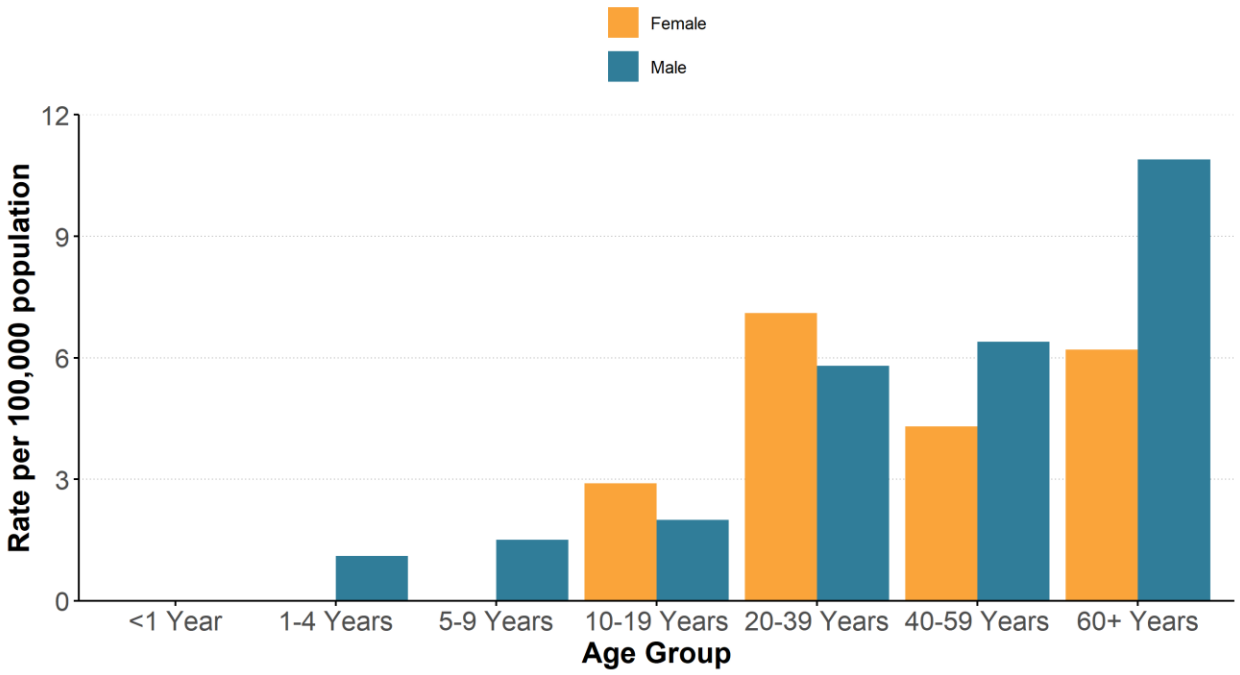
Residential Instability***	Born Outside of Canada	Canadian Born	Total
Q1 (Least deprived)	46 (16%)	4 (13%)	50 (16%)
Q2	20 (6.8%)	0 (0%)	20 (6.2%)
Q3	70 (24%)	2 (6.7%)	72 (22%)
Q4	55 (19%)	7 (23%)	62 (19%)
Q5 (Most deprived)	101 (35%)	17 (57%)	118 (37%)

* 8 cases were excluded due to unknown postal code. For further details, see data sources in appendix. ** Residential Instability is defined as the tendency of neighborhood inhabitants to fluctuate over time, considering both housing and familial characteristics (5).
*** British Columbia's Index of Multiple Deprivation for Community Health Service Areas data (5).

TB Disease by Sex and Age Group

Consistent with historical trends, the 2024 rate of TB disease was greater in older age groups, and generally, higher in males than in females (2). Accordingly, the rate of TB disease was highest among males aged over 60 years at 10.9 cases per 100,000 population (77 cases) (Figure 3; S1-B; S1-C). Among adults, the rate of TB disease was higher in females aged 20-39 years compared to males in the same age group. The rate of TB disease among children under 5 years of age remains very low. The overall Canadian rates show similar trends among younger adults and seniors (3).

Figure 3. TB Disease Rates by Sex and Age Group* in BC, 2024

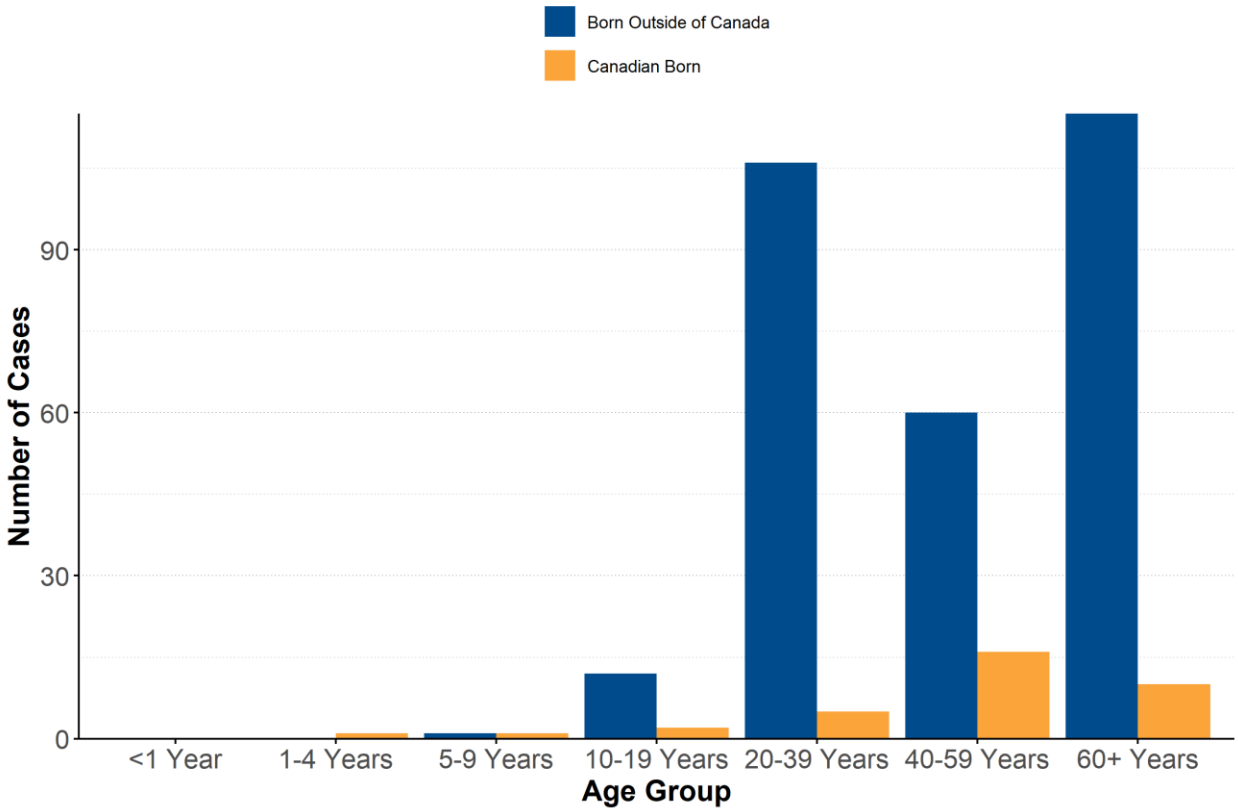


*Age at time of diagnosis. See supplementary data (S1-B & S1-C) for 10-year trend by age group and sex.

TB Disease by Country of Birth and Age Group

Most TB cases observed in 2024 occurred in people born outside of Canada aged 20-39 years (106 cases) and over 60 years (115 cases) (Figure 4). Among cases born in Canada, people aged 40-59 years accounted for 45.7% of cases (16 cases), followed by those aged 60 and above (28.6%; 10 cases) (S2-A – S2- B).

Figure 4. TB Disease Cases* Among Populations Born in Canada and Outside of Canada by Age Group, 2024**



*1 case excluded due to unknown country of birth. **Age at time of diagnosis.

TB Disease by Country of Birth and Health Authority

Similar to historical trend, the 2024 rate of TB disease in people born outside of Canada was greater than among people born in Canada (17.1 per 100,000 population compared to 1.0 per 100,000 population, respectively) (Table 2). The rate of TB disease was higher among people born outside of Canada across all health authorities. Within this group, Fraser Health recorded the highest rate of TB disease (21.5 per 100,000 population). Though TB disease counts among people born outside of Canada remain relatively low in Northern Health, the region saw its greatest increase in incidence over the past decade in 2023, reaching 44.9 per 100,000 population (14 cases), compared to 6.3 per 100,000 population (2 cases) in 2024 (Table 2; S2-C). Wide fluctuations in rates observed in Northern Health are likely due to its relatively small population size.

Table 2. TB Disease Rates by Country of Birth and Health Authority in BC, 2015 to 2024

Health Authority*	Country of Birth	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Interior Health	Born Outside of Canada	9.1	11.2	13.0	13.6	10.2	10.9	11.5	13.1	15.5	12.4

Health Authority*	Country of Birth	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
	Canadian Born	0.2	0.3	0.2	0.8	0.2	0.6	0.7	0.1	0.4	0.1
Fraser Health	Born Outside of Canada	18.5	18.3	20.3	21.5	20.7	20.3	21.5	21.8	21.0	21.5
	Canadian Born	0.9	0.8	1.7	1.7	1.8	2.1	1.1	0.8	1.0	0.9
Vancouver Coastal Health	Born Outside of Canada	21.5	15.1	20.1	17.4	16.0	17.0	14.7	12.9	18.7	14.4
	Canadian Born	2.2	2.2	2.2	0.7	1.8	1.8	1.5	2.7	2.1	1.8
Island Health	Born Outside of Canada	7.9	4.6	6.0	10.3	9.4	6.4	7.6	10.9	13.3	9.1
	Canadian Born	1.0	0.5	1.1	0.3	1.5	0.6	1.6	1.7	1.3	1.3
Northern Health	Born Outside of Canada	14.5	7.1	0.0	10.3	27.2	3.3	26.4	16.3	44.9	6.3
	Canadian Born	3.6	2.8	2.0	1.2	2.4	2.8	4.1	3.3	0.8	1.6
BC Total	Born Outside of Canada	**17.9**	**15.1**	**18.1**	**18.2**	**17.4**	**16.9**	**17.3**	**17.1**	**19.6**	**17.1**
	Canadian Born	**1.2**	**1.0**	**1.4**	**1.0**	**1.4**	**1.5**	**1.4**	**1.4**	**1.1**	**1.0**

*Residence at time of diagnosis. Cases with a client address outside of BC are excluded.

TB Disease and HIV Status

In 2024, 82.4% (272 cases) of TB cases had known HIV status (through laboratory report or self-report of HIV diagnosis), marking the highest percent of folks reporting on HIV status since 2017 (Table 3). Consistent with historical trends, only 2.2% of TB cases with known HIV status were co-infected with TB/HIV.

Table 3. TB Disease Cases by HIV Status, 2015* to 2024

HIV Status	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
HIV Positive	10	5	2	4	4	3	4	0	6	6
Known HIV Status**	215	220	253	214	227	238	243	209	275	272

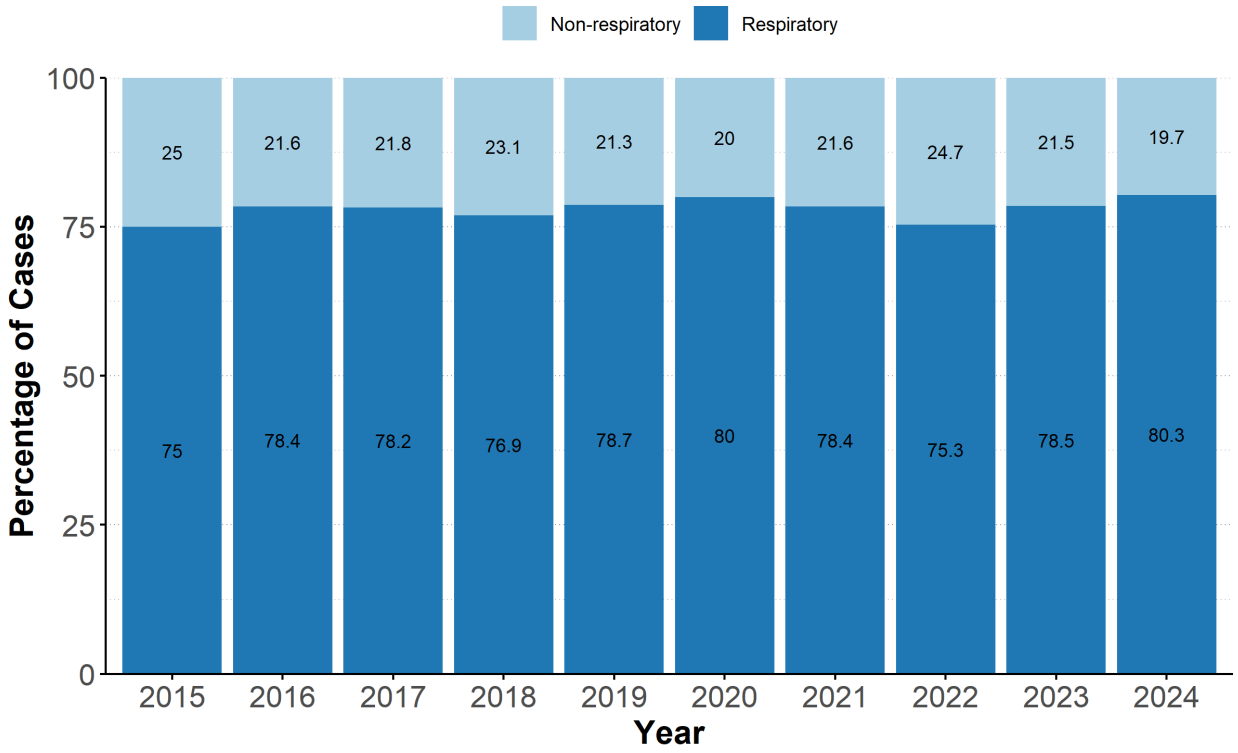
HIV Status	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Missing HIV Status***	73	35	55	89	87	77	81	119	92	58

*Data from 2015 are from iPHIS. Historical case counts have changed slightly over time. **TB cases with known HIV status (either through lab report or self-report of HIV diagnosis reported in Panorama). ***TB cases where HIV status was unknown at the time of TB diagnosis. For further details, see HIV screening and co-infection under case definitions in appendix.

TB Disease by Site of Disease

Respiratory TB disease is the most prevalent and transmissible form of TB, posing a greater public health risk compared to non-respiratory TB. In 2024, 80.3% of cases were diagnosed with respiratory TB disease, consistent with trends over the past decade (Figure 5).

Figure 5. Percentage of TB Disease Cases by Site of Disease*, 2015 to 2024



*Respiratory includes all cases with at least one respiratory site present (i.e. defined as pulmonary, primary, miliary, and other pulmonary) (see case definitions in appendix). Non-respiratory only includes cases with no documented respiratory site present but at least one non-respiratory site present (see case definitions in Appendix).

Treatment Outcomes of TB Disease

Treatment outcomes are reported for cases diagnosed in 2023 to account for the duration of treatment and reporting delays. Post-mortem diagnoses are excluded (1 case in 2023).

Of TB disease cases diagnosed in 2023, 96% (351 out of 366 total cases) are documented to have initiated treatment.

82% (300 cases) of TB disease cases diagnosed in 2023 successfully completed TB treatment, most within 12 months since diagnosis (Table 4; S4-A). A total of 16 cases (4%) did not complete treatment due to various factors including drug reaction/intolerance (5 cases), loss to follow up (2 cases), and other or unknown reasons (9 cases) (Table 4; S4-B). TB disease contributed to death in 74% of cases who died during treatment (19 cases) and was the underlying cause of death of 1 person (2.9%) (Table 5).

Table 4. TB Disease Cases by Treatment Outcome, 2015 to 2023

Treatment Outcome*	2015	2016	2017	2018	2019	2020	2021	2022	2023
Treatment Completed	**234**	**198**	**250**	**241**	**250**	**264**	**269**	**271**	**300**
- Within 12 Months	187	162	214	215	204	210	244	242	274
- Greater Than 12 Months	47	36	36	26	46	54	25	29	26
Incomplete Treatment	**8**	**8**	**17**	**9**	**21**	**16**	**9**	**10**	**16**
Left Province During Treatment	**9**	**18**	**5**	**15**	**17**	**6**	**10**	**13**	**16**
Died During Treatment	**28**	**26**	**19**	**24**	**20**	**20**	**27**	**28**	**19**
No Treatment Documented**	**8**	**2**	**13**	**12**	**4**	**4**	**8**	**6**	**15**

*Excluding those diagnosed post-mortem. See case definitions in the appendix. **Cases without documented treatment may include individuals for whom follow-up is ongoing, individuals who were not treated, and/or instances where treatment information was not adequately captured within Panorama; data remediation is routinely ongoing.

Table 5. Causes of Death during TB Disease Treatment, 2015 to 2023

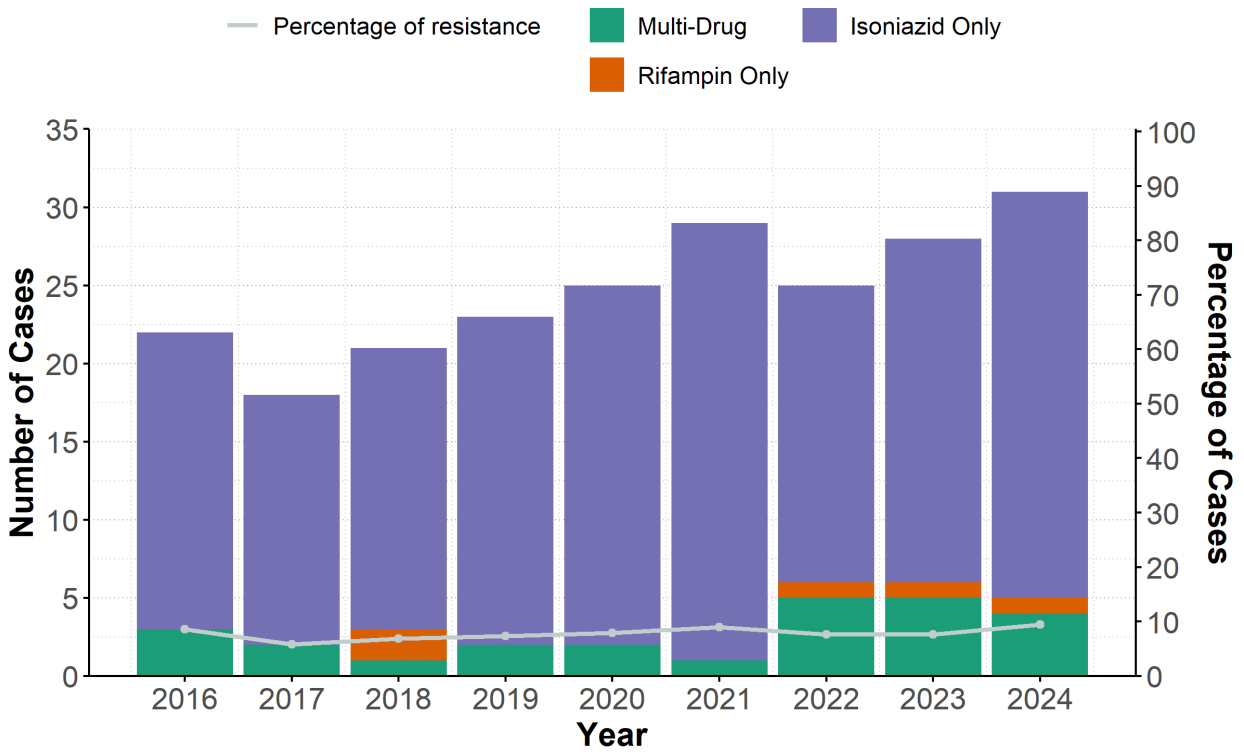
Died During Treatment	2015	2016	2017	2018	2019	2020	2021	2022	2023
TB Underlying Cause	3	5	3	1	1	1	0	2	1
TB Contributed, Not Underlying Cause	18	9	13	12	9	10	24	17	14
TB Unrelated to Death	5	9	3	5	9	9	2	9	3
Unknown	2	3	0	6	1	1	1	0	1

Drug Resistant TB Disease

Globally, drug resistant TB continues to pose a substantial burden on healthcare systems. While incidence rates of drug-resistant TB gradually declined between 2015 and 2020, they have since remained relatively stable (1).

In BC, most TB isolates are tested for susceptibility/resistance to TB treatment (S5-A; S5-B) and, since 2016, fewer than 10% of those tested were found to be resistant. In 2024, 7.9% of cases (n = 26) were resistant to the most common drug, isoniazid, compared with 6.0% in 2023 (n = 22) (Figure 6). Multi-drug resistant TB, defined as resistance to both isoniazid and rifampin, was identified for 4 cases (1.2%) in 2024.

Figure 6. TB Disease Cases with Drug Resistance*, 2016 to 2024**



*Multi-drug resistance is defined as resistance to both isoniazid and rifampin. **iPHIS data before 2016 was not available for reporting.

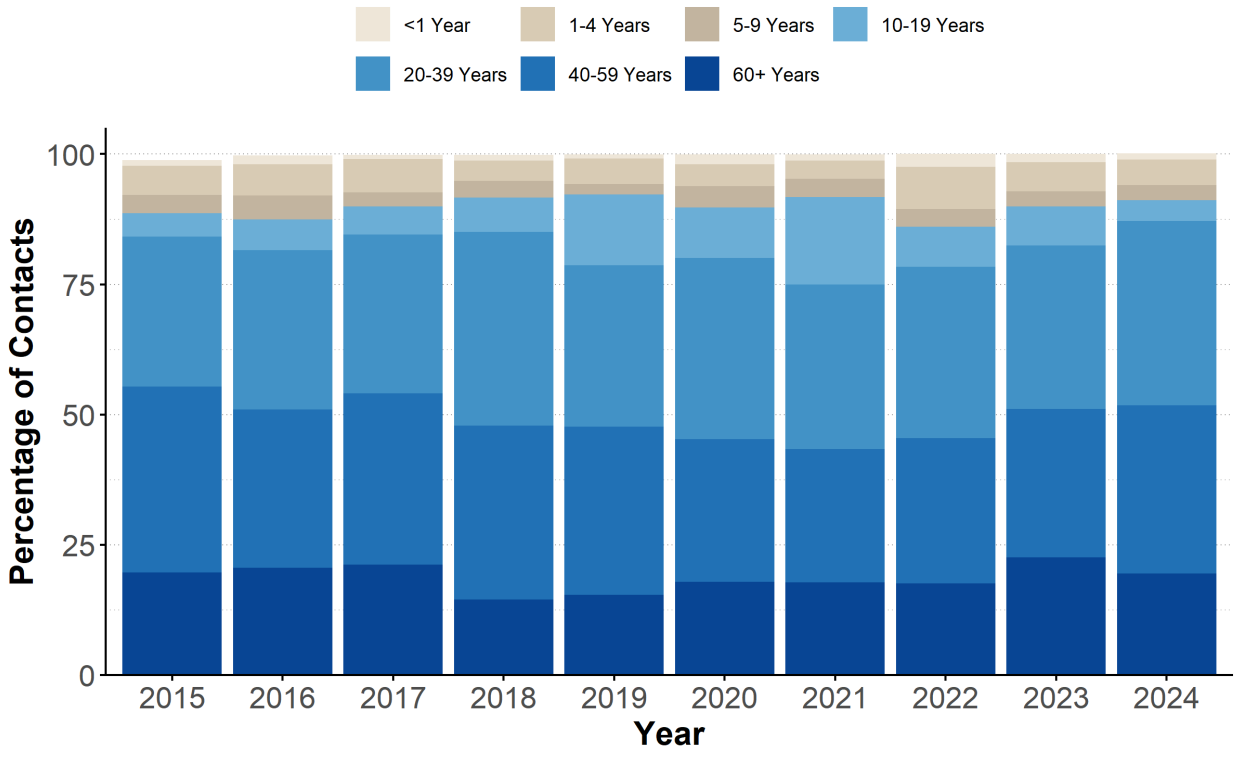
TB Contact Tracing

TB contact tracing is a key public health tool used to prevent further transmission of disease. It involves the identification and evaluation of individuals who may be at risk of developing TB infection (TBI) or TB disease following long exposure to a person who has TB disease (i.e. TB case or source case).

This section presents only contacts of TB cases diagnosed in BC, who were residing in BC at time of investigation, and linked to a source case in Panorama. Contact information available in Panorama does not reflect the full scope of contact tracing efforts in the province due to varying data collection, data entry, and reporting practices across regional health authorities. Thus, the following data must be interpreted with caution (see technical appendix for more information).

In 2024, a total of 1,438 unique contacts were reported in BC for 265 cases of respiratory TB disease, averaging 5.4 contacts per case. The maximum number of contacts identified for a single case was 271, the largest recorded in the past decade (S7-A). The majority of contacts were aged 20-39 years (34.5%), followed by those aged 40-59 years (32.3%), and 60 years and older (19.5%) (Figure 7; S7-B; S7-C).

Figure 7. Percentage of Contacts of Respiratory TB Disease Cases in BC by Age Group*, 2015 to 2024**

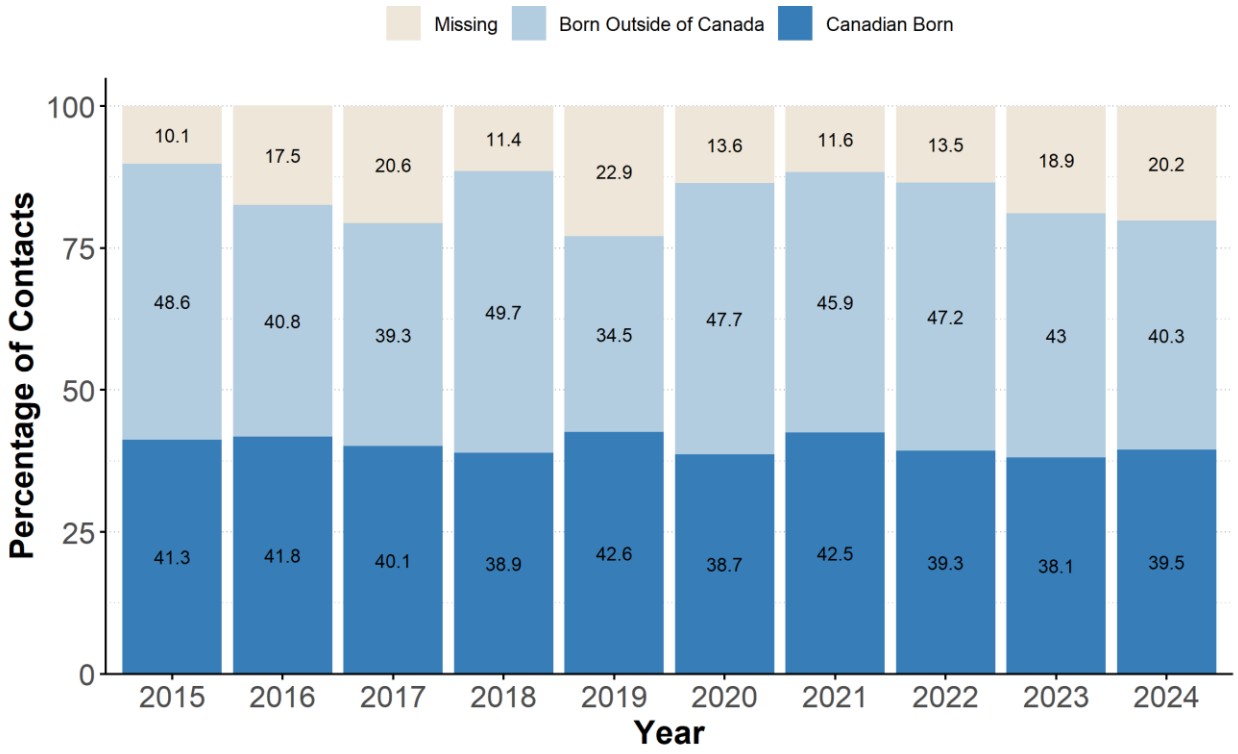


*Age of contact at time of source TB case diagnosis. **Data before 2016 are from iPHIS (8).

Contacts by Country of Birth

Over the past decade, the proportion of identified contacts by country of birth has remained relatively stable. In 2024, 40.3% (n=580) of contacts were born outside of Canada, while 39.5% (n=568) were Canadian born. 290 contacts (20.2%) had missing information on country of birth (Figure 8; S8-A; S8-B).

Figure 8. Percentage of Contacts of Respiratory TB Disease Cases in BC by Country of Birth*, 2015 to 2024**



*Missing represents unknown or missing country of birth. **Data before 2016 are from iPHIS (8).

Contact Tracing Cascade of Care

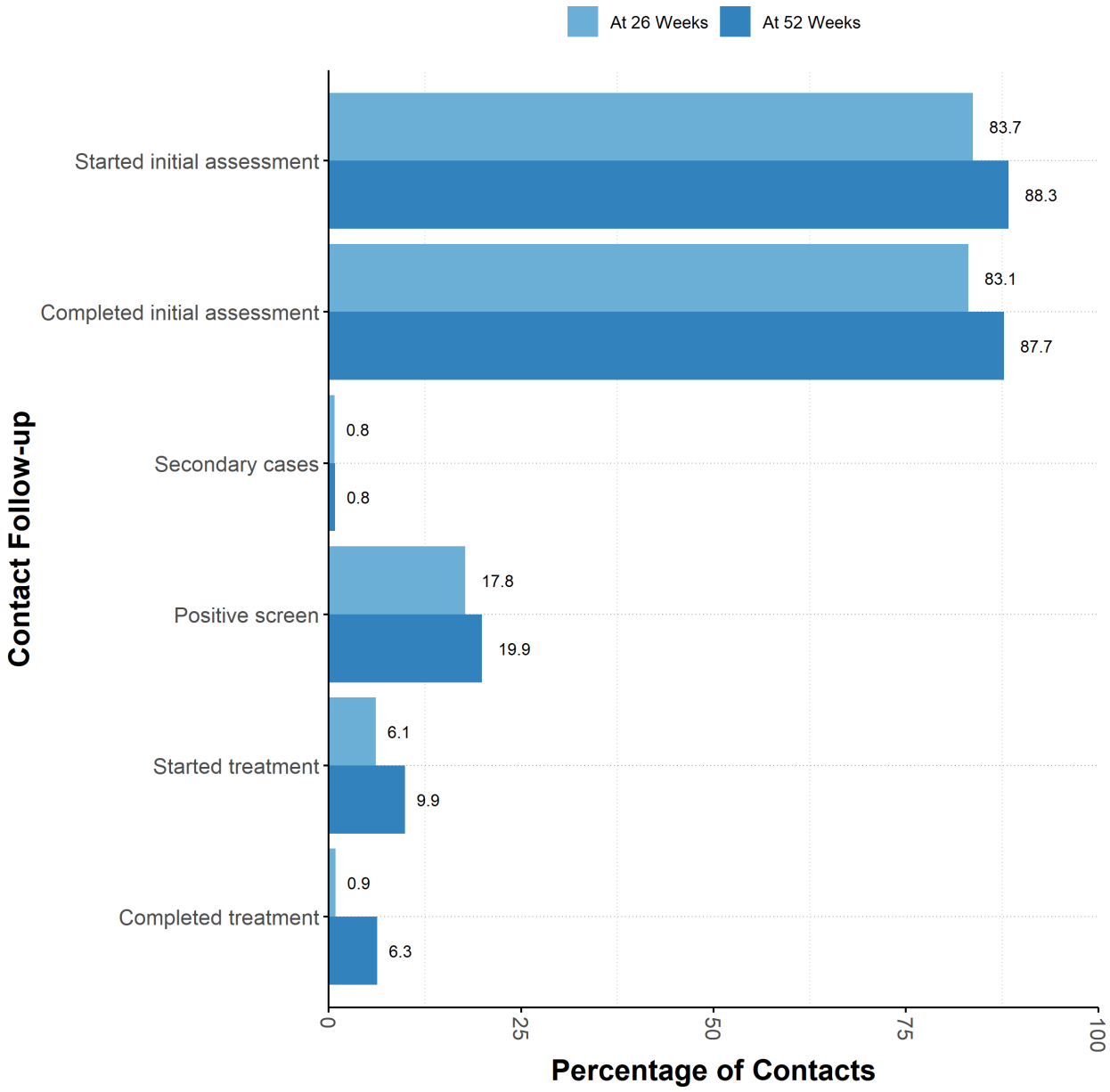
The contact tracing cascade of care outlines each step along the continuum of care provided to persons potentially exposed to TB. Its structure allows public health programs to identify points along the pathway where losses occur during follow-up activities and to target interventions accordingly to improve outcomes. See case definitions for indicator definitions.

This section presents the cascade of care for reported contacts of respiratory TB cases in BC aged 5 years and older. TB cases under 5 years of age and their associated contacts were excluded as they typically represent primary infection from recent transmission and are followed up through reverse contact investigation (i.e. identifying the source case for the child's infection). The contact cascade of care is presented for cases diagnosed in 2021, 2022, and 2023 at a follow-up time of 52 weeks from source case diagnosis to account for duration of

treatment regimens and reporting delays. See S9-S11 for data at 12 weeks, 26 weeks, and 2 years post source case diagnosis.

In 2023, a total of 1,661 reported contacts were associated with respiratory TB disease cases in individuals aged over 5 years. At 52 weeks post source case diagnosis, 1,457 contacts (87.7%) had completed an initial assessment, 331 contacts (19.9%) had a positive IGRA or TST screen (indicative of TBI; see case definitions in Appendix), and only 14 contacts (0.8%) were diagnosed with TB disease (i.e. secondary cases) (Figure 9; Table 6). Among contacts with a positive screen, 105 (31.7%) initiated and completed tuberculosis preventative treatment (TPT) within 52 weeks since source case diagnosis. In BC, TPT is administered to clients with TBI, with a particular focus on people at elevated risk of progressing to TB disease (6).

Figure 9. Contact Tracing Indicators Among Contacts of Respiratory TB Disease Cases* in BC Aged 5 Years and Older at 26 weeks and 52 weeks After Source Case Diagnosis, 2023



*Percentage of total contacts reported.

Table 6. Contact Tracing Indicators Among Contacts of Respiratory Cases* in BC Aged 5 Years and Older by Completion at 52 weeks Post Source Case Diagnosis, 2021 to 2023

52 Weeks Post Source Case Diagnosis	Count		
Indicator	**2021**	**2022**	**2023**
Number of contacts	**1528**	**992**	**1661**
Started initial assessment	**1283**	**884**	**1467**

52 Weeks Post Source Case Diagnosis	Count		
Indicator	**2021**	**2022**	**2023**
Completed initial assessment*	**1277**	**880**	**1457**
- IGRA	387	43	42
- TST	541	551	1096
- XRay	349	286	319
Secondary cases	**13**	**10**	**14**
Positive screen**	**195**	**221**	**331**
- IGRA	106	45	46
- TST	89	176	285
Started treatment	**107**	**125**	**165**
Completed treatment	**58**	**76**	**105**

*Using earliest screening date. **For contacts with both IGRA and TST positive results, the IGRA date and result was used.

TB Infection Treatment

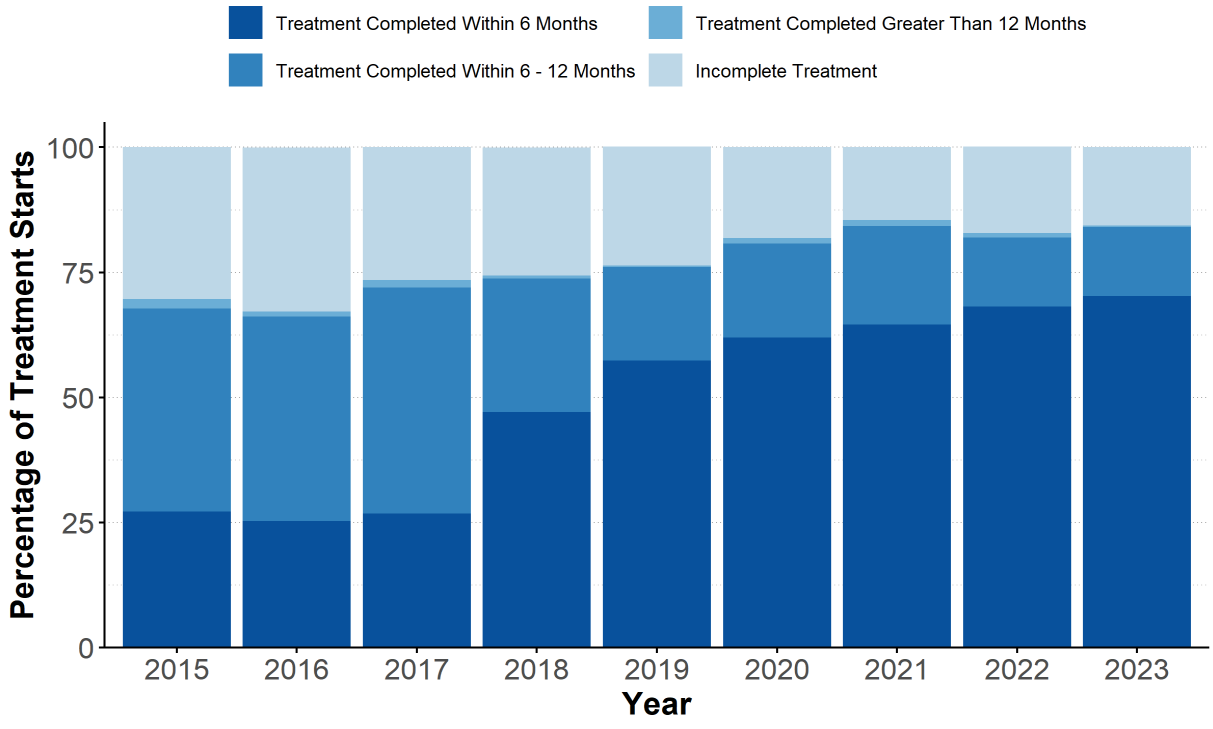
In this section, reporting on TBI outcomes is limited to treatment started in 2023, to allow sufficient time for follow-up, treatment completion, and reporting delays. This report does not include TBI treatment initiations that are not recorded in Panorama (e.g. treatment given in federal or provincial correctional facilities) or among clients receiving primary prophylaxis. This section highlights clients who initiated TBI treatment in 2023 following a positive screen in 2023 or earlier.

TBI Treatment

There were 1,000 documented TBI treatment initiations in 2023, an increase of 31% from the previous year (2). In 2023, clients aged 40-59 years accounted for most treatment initiations (34.9%), followed by 34.7% among those 20-39 years, and 26.1% in clients aged over 60 years.

Most clients successfully completed treatment, the majority (70.3%) within 6 months of treatment initiation (Figure 10). Since 2017, the proportion of treatment completed within 6 months has increased, which is likely attributed to the introduction of newer regimens (e.g. 3HP, 4R) that provide shorter yet effective treatment (7).

Figure 10. Percentage of TBI Treatment Initiation by Treatment Outcome, 2015 to 2023



TBI Treatment by Country of Birth

Overall, TBI treatment initiations has predominantly occurred among clients born outside of Canada. Of people starting treatment in 2023 (n=1,000), 71.9% (n=719) were born outside of Canada, 15.3% (n=153) were Canadian born, and 12.8% (n=128) had an unknown country of birth or had missing data (Table 7).

Table 7. TBI Treatment Initiation by Country of Birth, 2015 to 2023

Country of Birth	2015	2016	2017	2018	2019	2020	2021	2022	2023
Born Outside of Canada	647	506	487	637	523	427	453	535	719
Canadian Born	195	149	154	148	160	103	102	125	153
Unknown or missing country of birth	17	20	45	45	82	112	109	103	128

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- The BCCDC Data & Informatics team for modelling TB data to the Communicable Disease Data Mart and making it accessible for reporting.
- Tuberculosis Section, Centre for Communicable Disease and Infection Control, Public Health Agency of Canada (PHAC) for providing the annual rates of TB disease in Canada.

Appendix

Technical Appendix

- All TB surveillance data comes from Panorama Public Health Solution for Disease Surveillance and Management, unless otherwise noted. The BCCDC TB Services commenced using Panorama on March 12, 2016, with data conversion from the previous Integrated Public Health Information System (iPHIS). Minor differences in the aggregate counts may be seen if comparing annual report data to that found in iPHIS due to data conversion from iPHIS to Panorama. Numbers in this report are subject to change due to data clean up and delay in reporting.
- All geographic breakdowns reflect place of residence in BC at time of diagnosis or time of treatment (including temporary residence). If residence is unknown, the case is assigned to the health region where the individual was diagnosed or screened. Subsequent movement is not reflected in this report.
- Sex values are reported as they appear on a client's Government ID or health card and does not reflect gender. We recognize that gender identity is a complex social construct with real health impacts. We are actively working to improve our systems to better reflect gender identity.
- All TB disease, TB infection, contact tracing, and laboratory data were extracted from Panorama on March 26, 2025.
- TB disease is rare in BC. Rates or percentages over time for some indicators may reflect minor differences in small numbers and not meaningful changes in the underlying disease process.
- TB disease case totals may differ from those reported by PHAC. Among temporary residents (visitors, students, and people granted work permits) and undocumented foreign nationals who are in Canada, PHAC includes only those cases that started treatment in BC in the provincial totals. However, BCCDC reports on cases who have been diagnosed or received treatment in BC in provincial totals – regardless of where the treatment initially began.
- This report includes HIV status and co-infection reliant on testing or self-reporting done at time of TB disease diagnosis. Accordingly, TB cases living with HIV that were not tested for HIV or did not self-report their HIV diagnosis at the time of TB diagnosis would not be represented in this data. For that reason, the percentage of TB cases living with HIV is believed to be an underestimate due to incomplete ascertainment of screening tests and HIV/AIDS case reports.
- For TB cases, HIV status data for 2015 were not readily accessible for reporting out of Panorama. Thus, case counts and proportions for this period were obtained from static

historical iPHIS data (8) to enable assessment of trends. Historic case counts and proportions should be interpreted with caution as they have changed slightly over time.

- The contact information presented in this report includes only contacts of TB cases (i.e. source cases) identified in BC, who were residing in BC at time of investigation, and who were linked to a source TB case in Panorama. The data does not include contacts identified as part of federal airplane screening, contacts of source cases not identified in BC, or anonymous contacts. Regions have separate databases for contact investigations that may not be reported in Panorama. As a result, the data presented does not reflect the full workload of contact tracing teams within the health authorities. For instance, contacts and negative screening results are underreported in Panorama due to varying data entry practices. Trends in the number of contacts are affected by the circumstances of each case and differences in the collection, entry and reporting of contact data. Provincial workflows for contact tracing and contact data entry changed in 2016 with the implementation of Panorama and should be considered when interpreting the provincial surveillance TB contact data presented here.

- Contact data for 2015 were not readily accessible for reporting out of Panorama. Thus, counts and proportions for this period were obtained from static historical iPHIS data (8) to enable assessment of trends. Historic counts and proportions should be interpreted with caution as they may have fluctuated over time.

- The contact tracing cascade of care indicators are based on screening, diagnosis, and treatment completed after the source case was diagnosed, and does not capture contact tracing activities initiated before the source case was diagnosed. Total completion is reported at 2 years post source case diagnosis for all indicators except for secondary case identification (Indicator 3), which may be reported up to the date of data extraction (i.e. any time after source case diagnosis). Each indicator (i.e. step along the cascade of care) is a subset of the previous step, except for secondary cases (Indicator 3) which is derived from all contacts (i.e. denominator).

- TBI treatment data presented in this report is from Panorama only. Any TBI treatment data not documented in Panorama (e.g. treatment given in federal and provincial correctional facilities) would not be represented here.

Supplementary Appendix

Additional tables and figures are available in the supplementary file published alongside this report.

Case Definitions

A. TB Disease

Detection and confirmation of *Mycobacterium tuberculosis* complex or clinical presentation compatible with active tuberculosis disease, excluding tuberculosis re-treatment within 6 months.

Laboratory confirmed case

- cases with *Mycobacterium tuberculosis* complex (excluding *M. bovis* BCG strain), isolated by culture from a clinical specimen; OR
- cases with laboratory detection of *Mycobacterium tuberculosis* complex by nucleic acid amplification (NAAT) and with clinical findings with current active tuberculosis disease.

Clinically confirmed case

In the absence of culture or NAAT proof, cases clinically compatible with active tuberculosis. For example:

- chest x-ray changes compatible with active tuberculosis;
- clinical symptoms and/or signs of non-respiratory tuberculosis (e.g. meningeal, bone, kidney, peripheral lymph nodes, etc.);
- pathologic evidence of active tuberculosis (e.g. compatible histopathology, positive AFB staining);
- post-mortem evidence of active tuberculosis;
- favorable response to therapeutic trial of anti-tuberculosis drugs.

Re-treatment exclusion:

A re-treatment case of tuberculosis is a case that has both current active tuberculosis disease and historic documentation of previous active disease. Where re-treatment commences within 6 months after the end of treatment for previously active tuberculosis, the re-treatment is not counted as a new case of active tuberculosis. This is consistent with the Public Health Agency of Canada's case definition of re-treatment.

HIV Screening and Co-infection

HIV co-infection

- TB cases with a positive HIV test result at the time of TB disease diagnosis;
- TB cases with self-reported HIV diagnosis at the time of TB disease diagnosis.

Known HIV status

- TB cases with a positive or negative HIV test result at the time of TB disease diagnosis;
- TB cases with self-reported HIV diagnosis at the time of TB disease diagnosis.

Drug Resistance

TB cases are classified as resistant to isoniazid, rifampin, or both (i.e. multi-drug resistant). Resistance to other TB medications is not reported here.

B. Site of Disease

Since the implementation of Panorama, tuberculosis sites of disease were rationalized into a list of body sites used and recognized by tuberculosis clinicians. The new tuberculosis sites are similar to many sites in ICD-9 tuberculosis disease coding.

This report divides tuberculosis into respiratory and non-respiratory based on site of disease. Tuberculosis is classified as respiratory if at least one respiratory site is present. Tuberculosis is considered non-respiratory if no respiratory site is present but at least one non-respiratory site is present.

Respiratory sites

- bronchiectasis tuberculosis
- bronchus tuberculosis (excluding isolated tracheal or bronchial tuberculosis)
- cavitation of lung tuberculosis
- fibrosis of lung tuberculosis
- infiltrative of lung TB
- intrathoracic lymph node tuberculosis
- isolated tracheal or bronchial tuberculosis
- laryngitis tuberculosis (excluding esophageal tuberculosis)
- miliary tuberculosis
- nodular of lung tuberculosis
- nose or sinus tuberculosis
- pleurisy tuberculosis
- pneumonia tuberculosis
- pneumothorax tuberculosis
- primary tuberculosis
- primary progressive tuberculosis
- pulmonary tuberculosis

Non-respiratory sites

- adrenal gland tuberculosis
- bone tuberculosis (including mastoid, dactyl tuberculosis)
- bone and joint tuberculosis
- central nervous system tuberculosis

- ear tuberculosis
- erythema nodosum tuberculosis
- epididymis tuberculosis
- eye tuberculosis
- gastrointestinal tuberculosis (including lymph nodes)
- genital tuberculosis
- genitourinary tuberculosis
- hip tuberculosis
- joint tuberculosis
- kidney tuberculosis
- knee tuberculosis
- lymph node tuberculosis (peripheral)
- meningitis of brain and/or spine tuberculosis
- meningeal or central nervous system tuberculosis
- meningeal tuberculoma
- other organ tuberculosis (excluding respiratory)
- peripheral lymph node tuberculosis
- peritoneal tuberculosis
- skin and subcutaneous tuberculosis
- spinal column tuberculosis
- spleen tuberculosis
- thyroid gland tuberculosis
- urinary tuberculosis

C. Tuberculosis Infection (TBI)

The clinical definition for TBI is based on a complex mix of demographic characteristics and the presence of co-morbidities. As a surrogate, we report on clients who have documentation of TBI treatment initiation in Panorama, which is likely an underestimate of the actual number of persons with TBI.

D. Treatment Completion

For the purposes of this report, treatment completion for TB disease and TBI documented in Panorama excludes TB cases diagnosed post-mortem and is defined as the following:

Treatment Completed: A treatment start date, treatment end date, and treatment status reported as “Completed-satisfactory”. The length of treatment is calculated based on the treatment start date and treatment end date.

Incomplete Treatment: A treatment start date, treatment end date, and treatment status other than “Completed-satisfactory” (i.e. “Completed-unsatisfactory”, “Incomplete”, “Other”, “Unknown”), or no treatment end date is documented.

Left Province During Treatment: Includes transfers within Canada and outside of Canada.

No Treatment Documented: No treatment start date is documented.

E. TB Contact Tracing Cascade of Care Indicators

Each indicator (i.e. step) in the cascade is a subset of the previous, except for secondary cases (Indicator 3) which is derived from all contacts (i.e. denominator). Indicators are reported based on the year the source case was diagnosed.

Denominator - Number of contacts: Number of unique contacts linked to respiratory TB cases aged 5 years and older in BC, excluding contacts residing outside of BC at time of investigation. For contacts who were exposed to more than one source case in the reporting year, the earliest exposure for the contact (i.e. based on source case diagnosis date) was used.

Indicator 1 - Started initial assessment: Number of contacts who started any of the following after the source case diagnosis date: Tuberculin Skin Test (TST) planted, Interferon-Gamma Release Assay (IGRA) test, or X-ray. For contacts who received more than one type of screen, the earliest screening date was used.

Indicator 2 - Completed initial assessment: Number of contacts who completed any of the following after the source case diagnosis date: TST read with valid result, IGRA test with valid result, or X-ray. For contacts who received more than one type of screen, the earliest screening date was used.

Indicator 3 - Secondary cases: Number of total contacts (i.e. denominator) diagnosed with confirmed or clinical TB disease after the source case diagnosis date.

Indicator 4 - Positive screen: Number of contacts – who are not secondary cases – with any of the following after the source case diagnosis date: a reactive IGRA, or a positive TST (without a subsequent non-reactive IGRA). For contacts with multiple TST or IGRA results, the earliest screening date was used. For contacts with both IGRA and TST positive results, the IGRA date and result was used. This is a measure for clients with TBI.

Indicator 5 - Started treatment: Number of contacts with a positive screen and a treatment start date after the source case diagnosis date.

Indicator 6 - Completed treatment: Number of contacts with a treatment start date, treatment end date, and treatment status reported as “Completed-satisfactory” after the source case diagnosis date.

Data Sources

Panorama

Data presented in this report was extracted from Panorama on March 26, 2025. The BCCDC TB Services commenced using Panorama on March 12, 2016, with data conversion from the previous Integrated Public Health Information System (iPHIS). Some iPHIS-converted data could not be readily extracted for reporting in Panorama (e.g. drug resistance, HIV status and co-infection, contact follow-up), and these data were obtained from iPHIS using the 2015 TB Annual Report (8) to produce trend lines for this reporting period (this is indicated throughout the report in footnotes). Historic case counts may have changed since the data was reported in 2015 (due to data cleanup and late reporting); therefore, these trends should be interpreted with caution.

Population Data

Population data and associated rates for the general BC population, age, gender, regional health authority, and health service delivery area were based on the Population Estimates released by BC Stats on February 9, 2025.

Population data and associated rates for people born outside of Canada and people born in Canada were estimated from the 2011, 2016, and 2021 Census Program, conducted by Statistics Canada. Estimates for people born outside of Canada were calculated as the sum of "immigrant" and "non-permanent resident" counts, while Canadian born estimates were obtained from the "non-immigrant" counts. For population estimates for the years between the census, this method assumes proportional annual changes in the population until the following census.

British Columbia's Index of Multiple Deprivation (BCIMD) for Community Health Service Areas

The BCIMD replicates the Canadian Index of Multiple Deprivation (CIMD) method used by Statistics Canada to derive ecological indicators of deprivation at the Community Health Service Area. The index comprises of four dimensions of deprivation: residential instability, economic dependency, ethno-cultural composition, and situational vulnerability.

This report focuses on residential instability which speaks to the tendency of neighborhood inhabitants to fluctuate over time, taking into consideration both housing and familial characteristics. The component scores are ordered from smallest to largest and then divided into five equally sized groups, or quintiles, and categorized from 1 through 5. Quintile 1 represents the most privileged/least deprived and 5 represents the most deprived.

TB disease cases were assigned to a quintile of residential instability based on their residential postal code to assess neighborhood-level of deprivation.

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