



BC Centre for Disease Control
PROVINCIAL HEALTH SERVICES AUTHORITY

TB

Annual Report
2020

Contact Information

BC Centre for Disease Control
Clinical Prevention Services
655 West 12th Avenue
Vancouver, BC, V5Z 4R4
Phone: 604-707-2400
Fax: 604-707-5604
Email: CPSSurveillance@bccdc.ca



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Summary of Trends

All TB surveillance data comes from Panorama Public Health Solution for Disease Surveillance and Management, unless otherwise noted. 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 possible late reporting.

Active TB

- In 2020, the rate of active TB in BC was 6.1/100,000 population (315 cases), down slightly from 6.2/100,000 population (314 cases) in 2019.
- Regional rates of active TB in 2020 were greatest in the Fraser Health Authority (9.0/100,000 population; 174 cases) and the Vancouver Coastal Health Authority (8.5/100,000 population; 105 cases).
- Males had a higher active TB rate (6.6/100,000 population; 168 cases) than females (5.6/100,000 population; 147 cases) in 2020.
- TB rates among males and females were generally greater in older age groups.
- In 2020, 83.5% (263 cases) of all active TB cases were among individuals born outside of Canada. Among this group, the active TB rate was 17.5/100,000 population.
- In 2020, 75.2% (237 cases) of active TB cases had known HIV status (either through lab report or self-report of HIV diagnosis), an increase from 72.3% (227 cases) in 2019. Of those with known HIV status, 1.3% (3 cases) had HIV infection, down slightly from 1.8% (4 cases) in 2019.
- The majority of active TB cases (80.3%, 253 cases) had at least one respiratory site involved with their active disease in 2020.
- Drug resistant active TB is a concern worldwide, and while rates of isoniazid-resistant TB were generally decreasing in BC since 2015, they began to increase again following 2017. In 2020, 7.3% (23 cases) of all active TB cases had isoniazid resistance, up from 6.7% (21 cases) in 2019. Two cases of multi-drug resistant TB (i.e. resistance to both isoniazid and rifampin) were seen in 2020 (0.6%), similar to 2019.

Latent TB Treatment

- A total of 766 individuals were started on latent TB infection (LTBI) treatment in 2019, of which 75.8% (581 clients) successfully completed treatment within 12 months and 0.3% (2 clients) took longer than 12 months to complete treatment.
- Of those starting LTBI treatment, 23.9% (183 clients) were documented with incomplete treatment in 2019.

- LTBI treatment is more commonly reported among those born outside of Canada and those 40 years of age and older.

Contact Tracing

- In 2020, a mean of 5.1 contacts (median= 3.0) were documented per respiratory active TB case.
- Among contacts of respiratory active TB cases aged 5 years and older in 2019 (2154 contacts), 88.3% (1903 contacts) completed an initial assessment, 0.6% (14 contacts) were identified as secondary cases, 15.5% (334 contacts) screened positive, and 5.8% (125 contacts) successfully completed LTBI treatment.

Active TB

Active TB Historical Trends

In BC, the rate of active TB slightly decreased to 6.1/100,000 population (315 cases) in 2020, down from 6.2/100,000 population (314 cases) in 2019 (Table 2; Figure 1). Overall, the rate of active TB in BC has been between 6.0 and 6.2 per 100,000 population since 2015, with the exception of 2016. Despite the emergence of COVID-19 in 2020 – and the associated public health restrictions – provincial rates of active TB did not appear to have been impacted by the pandemic in BC. Similarly, the rate of active TB in Canada has stayed generally stable over the past decade and in 2020 the national rate was 4.7/100,000 population.¹ Compared to the Canadian rate, the active TB rate in BC has remained consistently higher. Stable rates of active TB highlight the need for ongoing public health strategies to reduce the burden of TB and that support the provincial² and national³ milestones for the reduction of morbidity and mortality related to TB.

Active TB by Health Authority of Residence

In 2020, the rate of active TB was highest in Fraser Health Authority (FHA; 9.0/100,000 population, 174 cases), followed by Vancouver Coastal Health Authority (VCHA; 8.5/100,000 population, 105 cases), Northern Health Authority (NHA; 3.0/100,000 population, 9 cases), Interior Health Authority (IHA; 1.7/100,000 population, 14 cases), and Vancouver Island Health Authority (VIHA; 1.5/100,000 population, 13 cases). The rate of active TB in NHA and VIHA decreased in 2020 compared to 2019, while FHA, IHA, and VCHA all showed an increase (Table 4; Figure 2). Accordingly, the highest rates of active TB at the Health Service Delivery Area level were observed within FHA (Fraser East, Fraser North, Fraser South) and VCHA also (Richmond, Vancouver, North Shore/Coast Garibaldi) (Figure 3).

Active TB by Gender and Age

The rate of active TB has been historically higher in males than in females. In 2020, the active TB rate in males was 6.6/100,000 population (168 cases) compared to 5.6/100,000 population (147 cases) in females (Table 6; Figure 4). Relative to 2019, these rates slightly decreased among males and females in 2020. Active TB rates among females and males were generally greater in older age groups, which has been a consistent trend (Table 8; Figure 5; Figure 6). While rates of active TB have been historically low in the youngest age groups, since 2018 rates increased most notably among females 10-19 years of age up to 5.5/100,000 population in 2020. Active TB disease in those <5 years of age indicates recent transmission because of the

low probability of historic exposure and reactivation. There were two cases of active TB diagnosed in those <5 years of age in 2020 (Table 7).

Active TB by Country of Birth

In BC in 2020, 83.5% (263 cases) of active TB cases occurred in those born outside of Canada, a decrease from 84.1% (264 cases) in 2019 (Table 10; Figure 8). This corresponds to a rate of 17.5/100,000 population in 2020, down slightly from 17.9/100,000 population in 2019 (Table 11; Figure 9). Rates of active TB were greatest among those born outside of Canada across all health authorities (Table 13; Figure 11). Of the cases born outside of Canada in 2020, 40.7% (107 cases) were 60 years of age and older, 33.5% (88 cases) were 20-39 years of age, and 19.8% (52 cases) were 40-59 years of age (Table 17; Figure 13). Of all active TB cases in 2020, 15.6% (49 cases) were born in Canada, a small increase from 15.0% (47 cases) in 2019 (Table 10; Figure 8). In 2020, the rate of active TB among Canadian born cases was 1.5/100,000 population as was seen in 2019 (Table 11; Figure 9). See Data Sources for more information on how rates were calculated.

Many of BC's recent immigrants come from regions with high rates of active TB such as the South East Asia and Western Pacific regions as defined by the World Health Organization.⁴ Active TB among individuals born outside of Canada appears to result largely from reactivation of latent TB infection, and local transmission is generally low.⁵ Immigration, Refugees and Citizenship Canada (IRCC) currently screens immigrants applying for permanent residency for active TB, as well as all students, visitors or workers staying for more than 6 months. Visitors, students, or workers staying less than 6 months do not undergo routine screening mandated by IRCC.

Active TB by HIV Status

In 2020, 75.2% (237 cases) of active TB cases had known HIV status (either through lab report or self-report of HIV diagnosis), an increase from 72.3% (227 cases) in 2019 (Table 19; Figure 14). Over the preceding decade, less than 5% of active TB cases with known HIV status were co-infected with HIV. Of those with known HIV status, 1.3% (3 cases) had HIV infection in 2020, down slightly from 1.8% (4 cases) in 2019.

Active TB by Site of Disease

The site of active TB describes the primary clinical location of TB disease. Respiratory disease is generally more transmissible than non-respiratory disease. Of the active TB reported in BC in 2020, 80.3% (253 cases) were respiratory cases, which is within historic trends (Table 21; Figure 15).

Active TB by Treatment Outcome

Treatment outcomes are reported for active TB cases diagnosed in 2019 owing to the long duration of active TB treatment, and exclude post-mortem diagnoses (2 cases in 2019). Of those diagnosed with active TB in 2019 (312 cases), 98.7% (308 cases) were documented to have started treatment (Table 23; Figure 16). There were 4 cases (1.3%) with no treatment documented in 2019, with three of these cases having died before treatment was initiated and one that was lost to follow-up (Table 22).

Among diagnosed active TB cases, 80.1% (250 cases) successfully completed active TB treatment, with the majority (65.4%, 204 cases) completing treatment within 12 months and 14.7% (46 cases) taking longer than 12 months to complete (Table 23; Figure 16).

Among active TB cases with incomplete treatment (41 cases) – excluding those cases that left BC during treatment – the majority (48.8%, 20 cases) died during treatment, 24.4% (10 cases) were lost to follow-up, 12.2% (5 cases) had an unspecified reason (i.e. “Other”), 9.8% (4 cases) had a drug reaction/intolerance, 2.4% (1 case) were non-adherent, and 2.4% (1 case) had an unknown reason (Table 25; Figure 17).

Of those with incomplete treatment because they died during treatment (20 cases), 9 cases (22.0%) were documented with TB contributing to, but not being the underlying cause of death, 9 cases (22.0%) had a cause of death unrelated to their TB disease, one case (2.4%) had an underlying cause of death related to their TB disease, and one case (2.4%) had an unknown cause of death. Generally, mortality during active TB treatment has decreased from 2011 to 2019.

Active TB Drug Resistance

Drug resistant active TB is an important public health issue globally that can lead to lengthier, more complex, and more expensive treatment regimens.⁶ For this reason, provincial surveillance is essential. In 2020, isoniazid resistance was 7.3% (23 cases), up from 6.7% (21 cases) in 2019 (Table 27; Figure 19). Only 0.6% of cases (2 cases) in 2020 had multi-drug resistance (i.e. resistance to both isoniazid and rifampin), no change from 2019 (Table 26; Figure 18).

Active TB Historical Trends

Table 1. Active TB Cases in BC, 2011 to 2020

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------|------|------|------|------|------|------|------|------|------|------|
| BC | 279 | 299 | 281 | 305 | 288 | 255 | 308 | 303 | 314 | 315 |

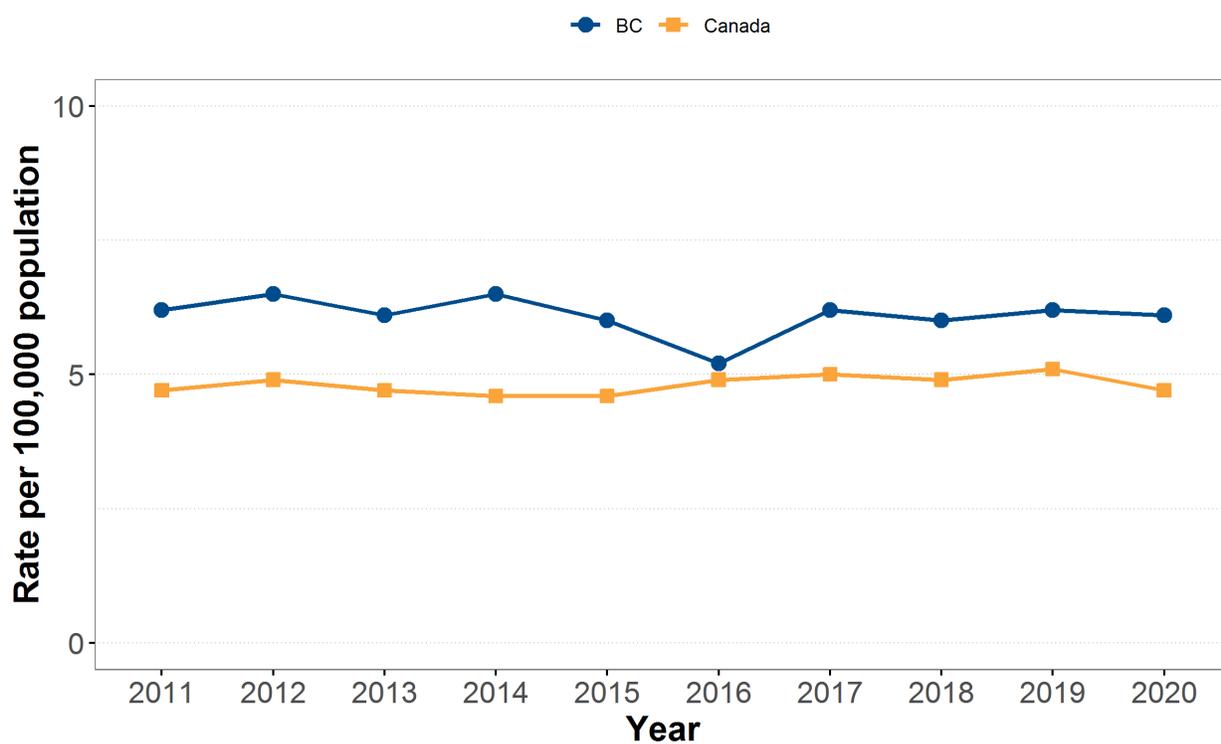
Table 2. Active TB Rates* in BC and Canada, 2011 to 2020

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------|------|------|------|------|------|------|------|------|------|------|
| BC | 6.2 | 6.5 | 6.1 | 6.5 | 6.0 | 5.2 | 6.2 | 6.0 | 6.2 | 6.1 |
| Canada** | 4.7 | 4.9 | 4.7 | 4.6 | 4.6 | 4.9 | 5.0 | 4.9 | 5.1 | 4.7 |

*All rates are per 100,000 population

**Canadian rates from the Public Health Agency of Canada¹

Figure 1. Active TB Rates in BC and Canada, 2011 to 2020



Active TB by Health Authority of Residence

Table 3. Active TB Cases by Health Authority in BC, 2011 to 2020

| Health Authority* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------|------|------|------|------|------|------|------|------|------|------|
| Fraser (FHA) | 134 | 122 | 139 | 143 | 125 | 128 | 152 | 164 | 166 | 174 |
| Interior (IHA) | 13 | 32 | 24 | 15 | 9 | 13 | 13 | 18 | 12 | 14 |
| Northern (NHA) | 17 | 14 | 12 | 10 | 14 | 10 | 5 | 8 | 14 | 9 |
| Vancouver Coastal (VCHA) | 101 | 106 | 96 | 125 | 124 | 95 | 121 | 97 | 99 | 105 |
| Vancouver Island (VIHA) | 14 | 25 | 10 | 12 | 16 | 9 | 17 | 16 | 23 | 13 |

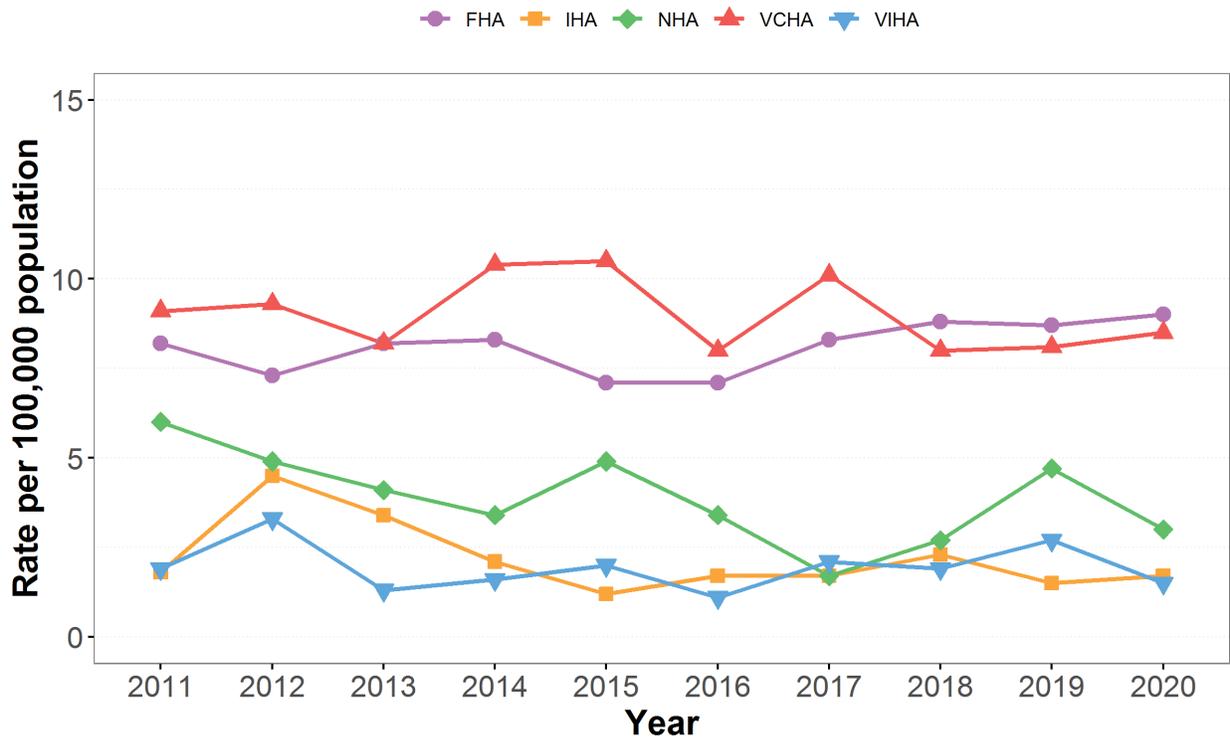
*Residence classified at time of case

Table 4. Active TB Rates by Health Authority in BC, 2011 to 2020

| Health Authority* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------|------|------|------|------|------|------|------|------|------|------|
| Fraser (FHA) | 8.2 | 7.3 | 8.2 | 8.3 | 7.1 | 7.1 | 8.3 | 8.8 | 8.7 | 9.0 |
| Interior (IHA) | 1.8 | 4.5 | 3.4 | 2.1 | 1.2 | 1.7 | 1.7 | 2.3 | 1.5 | 1.7 |
| Northern (NHA) | 6.0 | 4.9 | 4.1 | 3.4 | 4.9 | 3.4 | 1.7 | 2.7 | 4.7 | 3.0 |
| Vancouver Coastal (VCHA) | 9.1 | 9.3 | 8.2 | 10.4 | 10.5 | 8.0 | 10.1 | 8.0 | 8.1 | 8.5 |
| Vancouver Island (VIHA) | 1.9 | 3.3 | 1.3 | 1.6 | 2.0 | 1.1 | 2.1 | 1.9 | 2.7 | 1.5 |

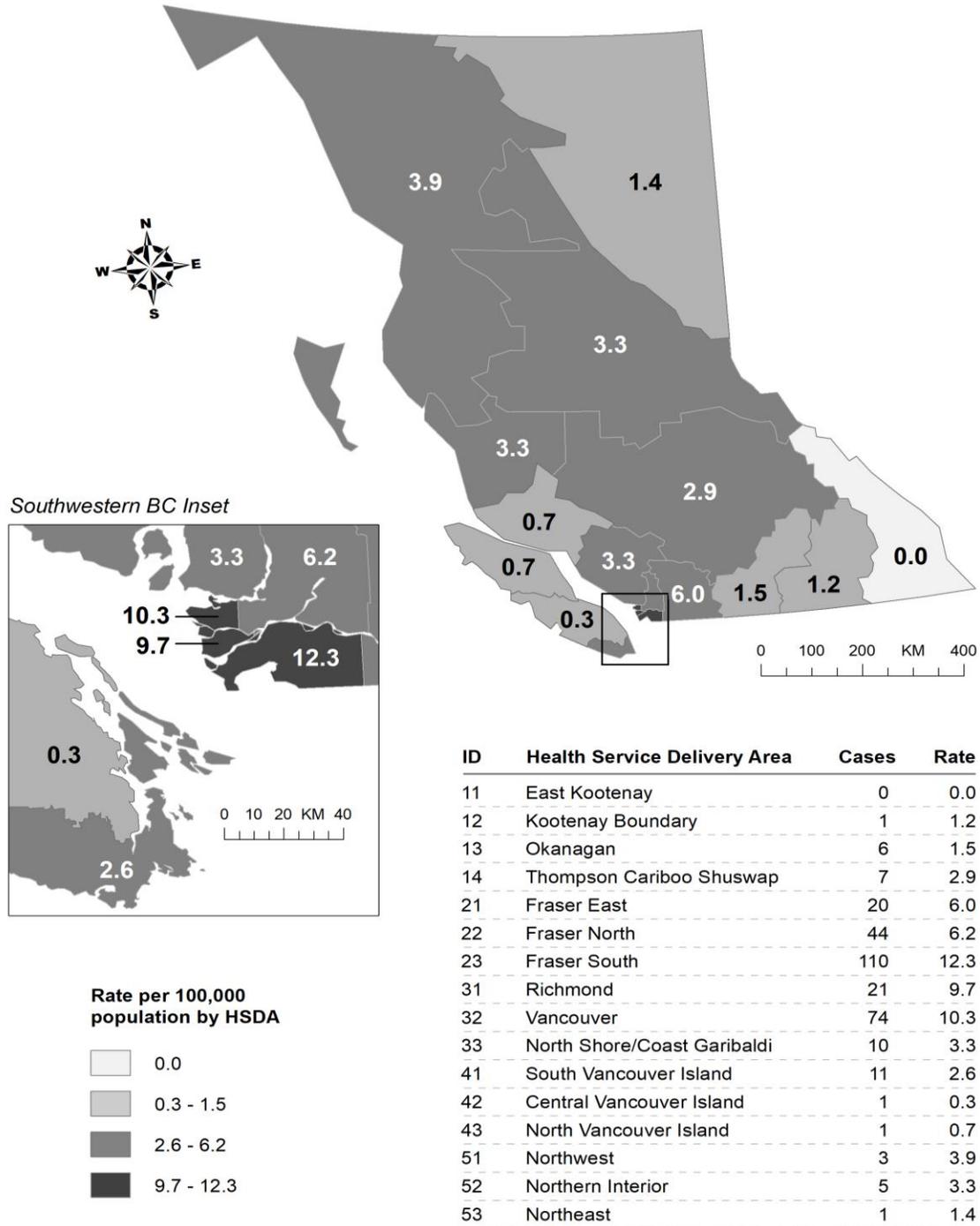
*Residence classified at time of case

Figure 2. Active TB Rates by Health Authority in BC, 2011 to 2020



Active TB by Health Service Delivery Area

Figure 3. Active TB Rates by Health Service Delivery Area*+ in BC, 2020



*Health Service Delivery Area determined at time of case
 +Population denominators come from 2020 Population Estimates from BC Statistics

Active TB by Gender and Age

Table 5. Active TB Disease Cases by Gender in BC, 2011 to 2020

| Gender | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------|------|------|------|------|------|------|------|------|------|------|
| Female | 115 | 109 | 131 | 137 | 153 | 119 | 143 | 139 | 146 | 147 |
| Male | 164 | 190 | 150 | 168 | 135 | 136 | 165 | 164 | 168 | 168 |

Table 6. Active TB Rates by Gender in BC, 2011 to 2020

| Gender | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------|------|------|------|------|------|------|------|------|------|------|
| Female | 5.1 | 4.7 | 5.6 | 5.8 | 6.3 | 4.8 | 5.7 | 5.5 | 5.7 | 5.6 |
| Male | 7.3 | 8.4 | 6.5 | 7.2 | 5.7 | 5.7 | 6.8 | 6.6 | 6.7 | 6.6 |

Figure 4. Active TB Rates by Gender in BC, 2011 to 2020

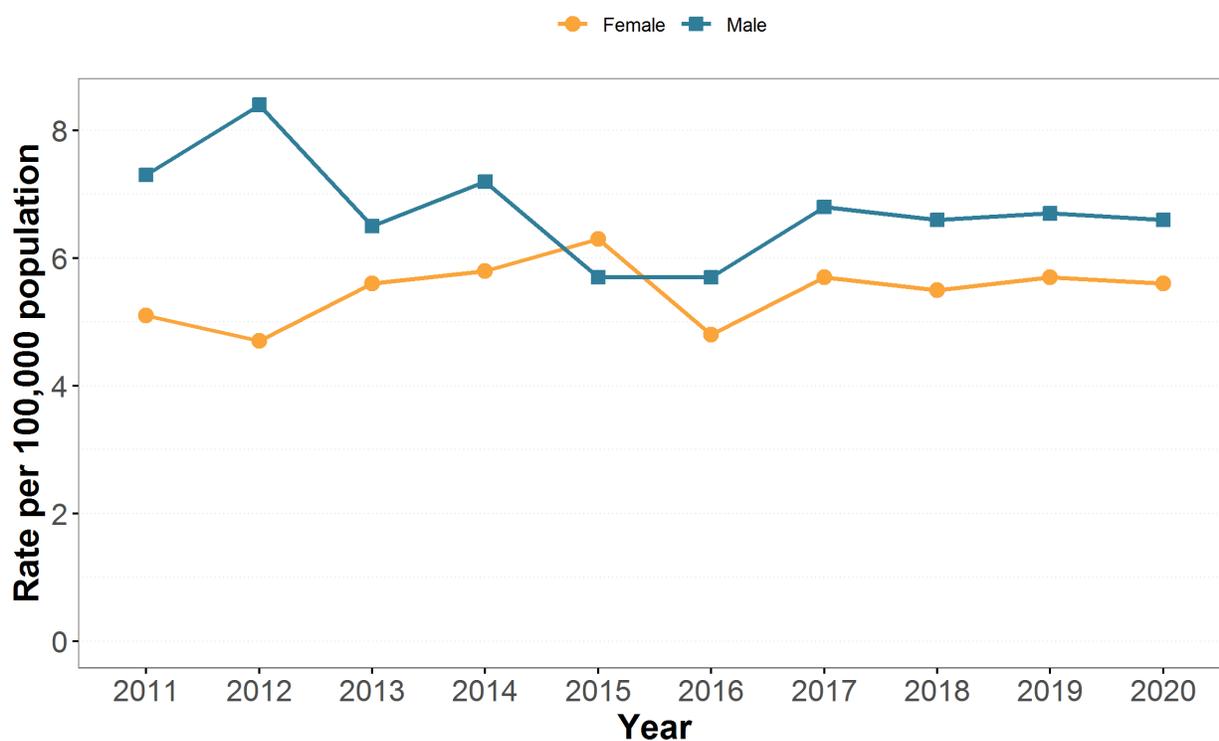


Table 7. Active TB Cases by Gender and Age Group in BC, 2011 to 2020

| Gender | Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Female | <1 Year | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 1-4 Years | 0 | 1 | 1 | 4 | 1 | 1 | 1 | 0 | 1 | 2 |
| | 5-9 Years | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| | 10-19 Years | 2 | 5 | 5 | 2 | 5 | 4 | 7 | 5 | 11 | 14 |
| | 20-39 Years | 40 | 29 | 35 | 40 | 35 | 42 | 45 | 40 | 47 | 48 |
| | 40-59 Years | 33 | 39 | 31 | 41 | 42 | 17 | 30 | 41 | 21 | 27 |
| | 60+ Years | 38 | 33 | 56 | 50 | 68 | 52 | 60 | 53 | 66 | 56 |
| Male | <1 Year | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| | 1-4 Years | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 0 | 0 |
| | 5-9 Years | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
| | 10-19 Years | 4 | 6 | 5 | 8 | 5 | 4 | 8 | 3 | 7 | 7 |
| | 20-39 Years | 36 | 32 | 27 | 33 | 23 | 28 | 32 | 50 | 44 | 51 |
| | 40-59 Years | 51 | 59 | 44 | 50 | 43 | 44 | 41 | 37 | 32 | 43 |
| | 60+ Years | 70 | 92 | 70 | 76 | 63 | 59 | 78 | 72 | 83 | 67 |

Table 8. Active TB Rates by Gender and Age Group in BC, 2011 to 2020

| Gender | Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Female | <1 Year | 0.0 | 4.7 | 4.6 | 0.0 | 4.6 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 1-4 Years | 0.0 | 1.1 | 1.1 | 4.6 | 1.1 | 1.1 | 1.1 | 0.0 | 1.1 | 2.3 |
| | 5-9 Years | 1.9 | 0.9 | 1.8 | 0.0 | 0.9 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 10-19 Years | 0.8 | 2.0 | 2.0 | 0.8 | 2.0 | 1.6 | 2.8 | 2.0 | 4.3 | 5.5 |
| | 20-39 Years | 6.6 | 4.7 | 5.6 | 6.3 | 5.5 | 6.5 | 6.8 | 5.9 | 6.8 | 6.8 |
| | 40-59 Years | 4.9 | 5.7 | 4.4 | 5.8 | 5.9 | 2.4 | 4.2 | 5.8 | 3.0 | 3.8 |
| | 60+ Years | 7.4 | 6.2 | 10.2 | 8.7 | 11.4 | 8.4 | 9.3 | 8.0 | 9.6 | 7.9 |
| Male | <1 Year | 0.0 | 0.0 | 4.4 | 0.0 | 0.0 | 0.0 | 4.3 | 0.0 | 4.5 | 0.0 |
| | 1-4 Years | 2.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 3.1 | 2.1 | 0.0 | 0.0 |
| | 5-9 Years | 0.9 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.8 | 0.0 |
| | 10-19 Years | 1.5 | 2.2 | 1.9 | 3.0 | 1.9 | 1.5 | 3.0 | 1.1 | 2.6 | 2.6 |
| | 20-39 Years | 5.9 | 5.2 | 4.3 | 5.1 | 3.5 | 4.2 | 4.7 | 7.1 | 6.1 | 6.9 |
| | 40-59 Years | 7.6 | 8.8 | 6.5 | 7.4 | 6.3 | 6.5 | 6.1 | 5.5 | 4.8 | 6.4 |
| | 60+ Years | 15.2 | 19.2 | 14.1 | 14.7 | 11.8 | 10.6 | 13.6 | 12.1 | 13.5 | 10.5 |

Figure 5. Active TB Rates Among Females by Age Group in BC, 2011 to 2020

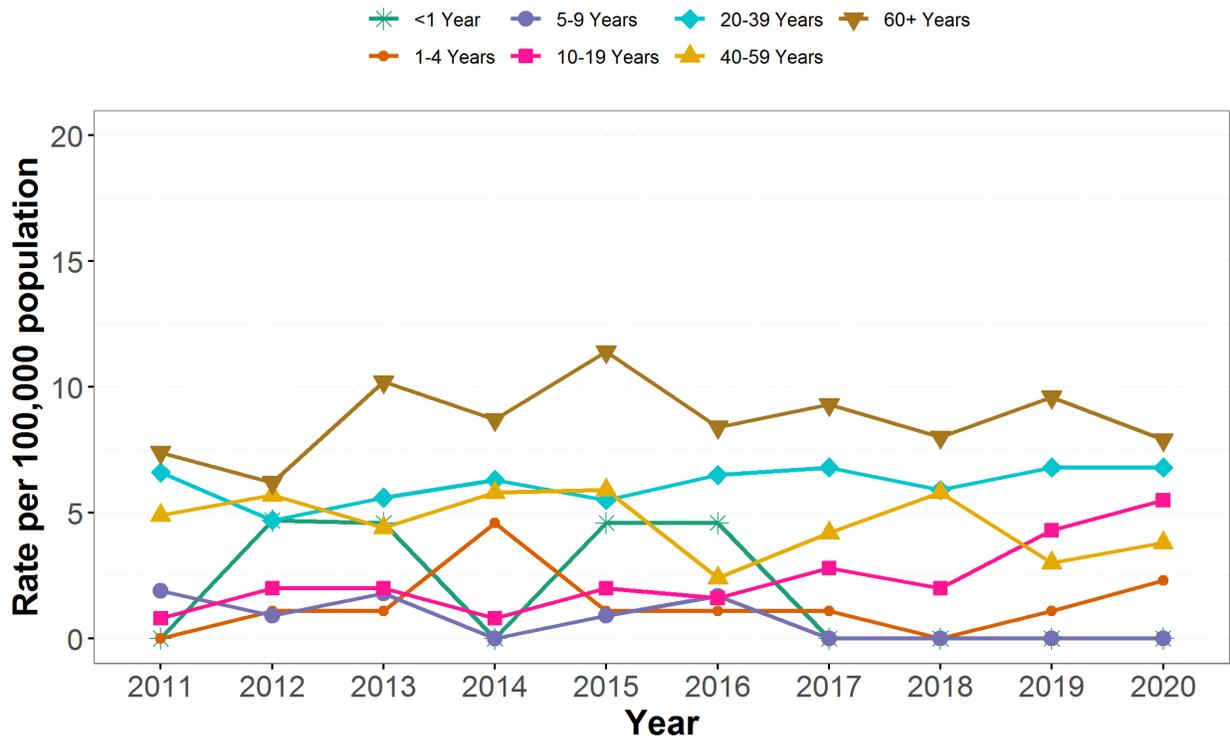
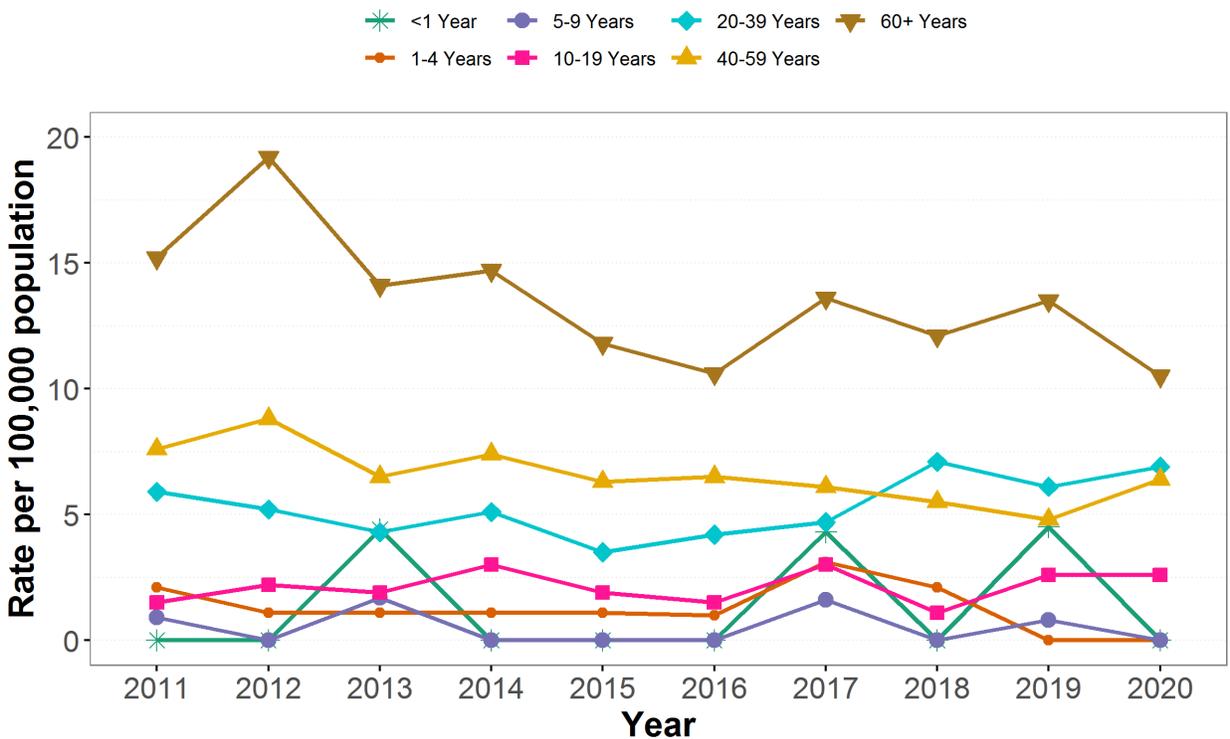


Figure 6. Active TB Rates Among Males by Age Group in BC, 2011 to 2020



Active TB by Country of Birth

Table 9. Active TB Cases by Country of Birth in BC, 2011 to 2020

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 204 | 216 | 221 | 247 | 245 | 211 | 259 | 269 | 264 | 263 |
| Canadian Born | 64 | 68 | 54 | 57 | 39 | 33 | 44 | 32 | 47 | 49 |
| Missing* | 11 | 15 | 6 | 1 | 4 | 11 | 5 | 2 | 3 | 3 |

*Unknown or undocumented country of birth

Figure 7. Active TB Cases by Country of Birth in BC, 2011 to 2020

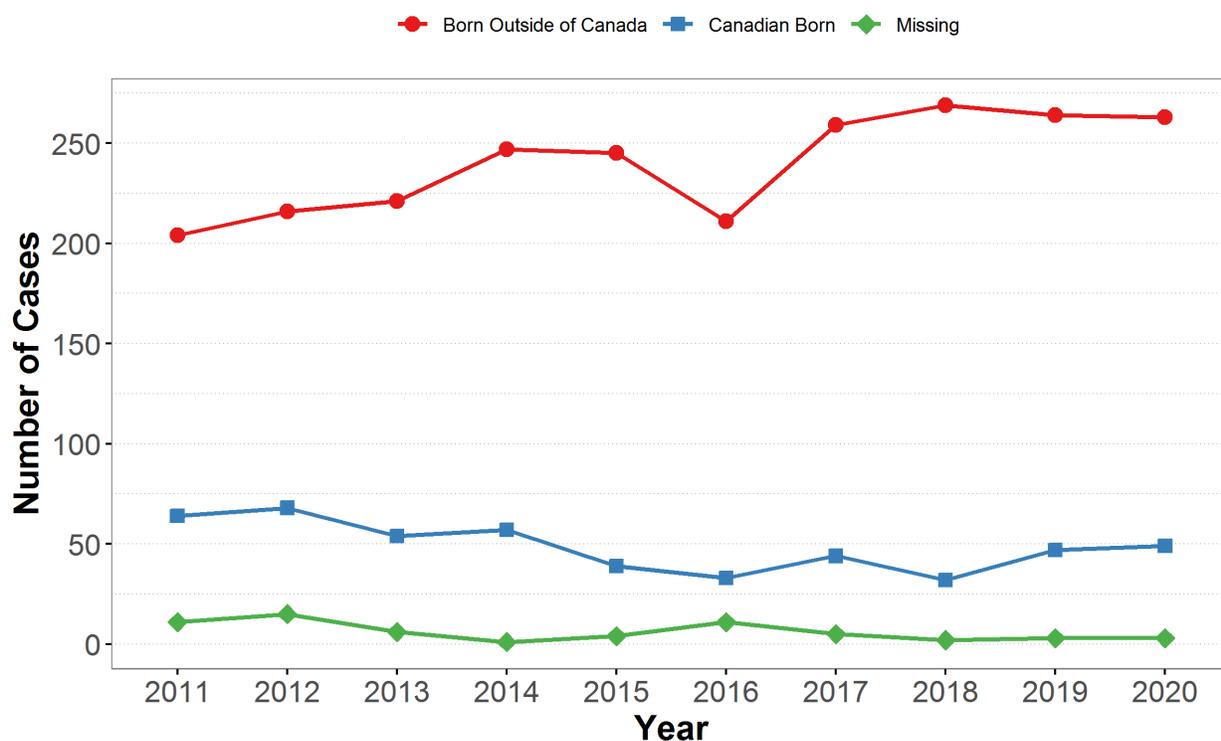


Table 10. Percentage of Active TB Cases by Country of Birth in BC, 2011 to 2020

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 73.1 | 72.2 | 78.6 | 81.0 | 85.1 | 82.7 | 84.1 | 88.8 | 84.1 | 83.5 |
| Canadian Born | 22.9 | 22.7 | 19.2 | 18.7 | 13.5 | 12.9 | 14.3 | 10.6 | 15.0 | 15.6 |
| Missing* | 3.9 | 5.0 | 2.1 | 0.3 | 1.4 | 4.3 | 1.6 | 0.7 | 1.0 | 1.0 |

*Unknown or undocumented country of birth

Figure 8. Percentage of Active TB Cases by Country of Birth in BC, 2011 to 2020

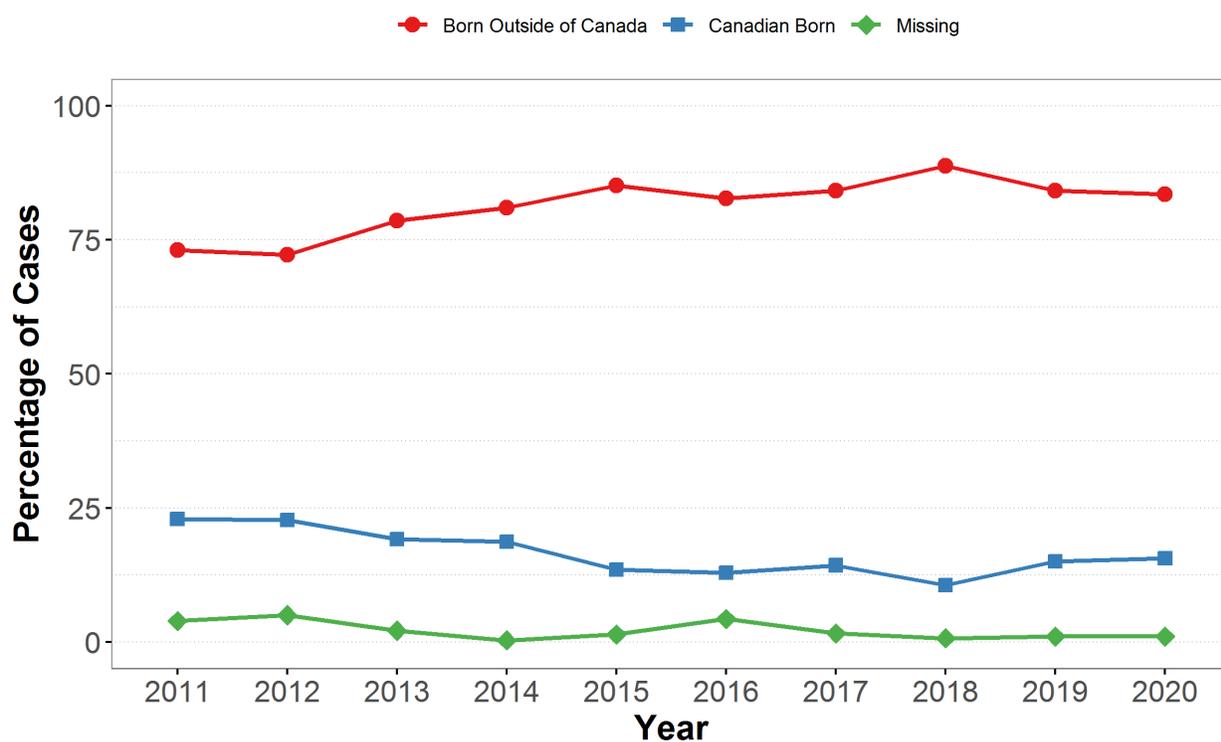
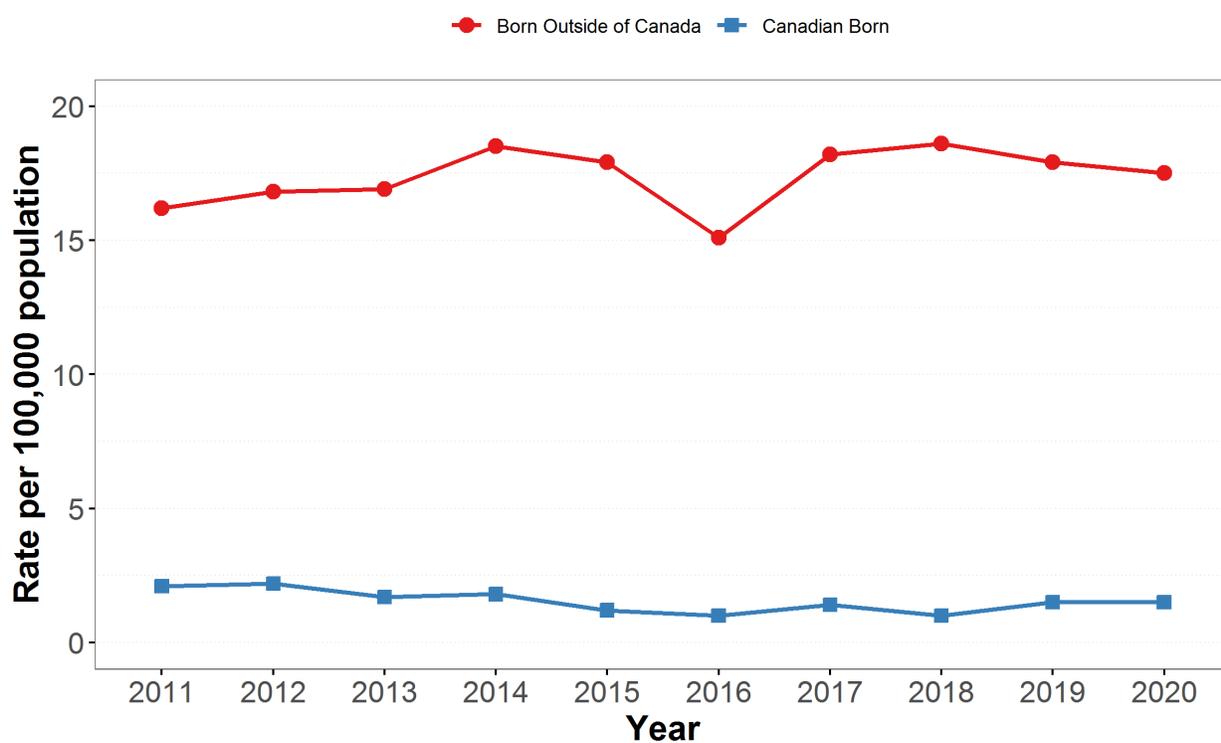


Table 11. Active TB Rates by Country of Birth in BC, 2011 to 2020

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 16.2 | 16.8 | 16.9 | 18.5 | 17.9 | 15.1 | 18.2 | 18.6 | 17.9 | 17.5 |
| Canadian Born | 2.1 | 2.2 | 1.7 | 1.8 | 1.2 | 1.0 | 1.4 | 1.0 | 1.5 | 1.5 |

Figure 9. Active TB Rates by Country of Birth in BC, 2011 to 2020



Active TB by Country of Birth and Health Authority

Table 12. Active TB Cases by Country of Birth and Health Authority in BC, 2011 to 2020

| Health Authority* | Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|
| Fraser (FHA) | Born Outside of Canada | 109 | 103 | 118 | 125 | 113 | 115 | 133 | 146 | 145 | 150 |
| | Canadian Born | 20 | 14 | 18 | 18 | 10 | 8 | 18 | 18 | 19 | 23 |
| Interior (IHA) | Born Outside of Canada | 6 | 6 | 14 | 7 | 8 | 10 | 12 | 13 | 11 | 10 |
| | Canadian Born | 7 | 23 | 8 | 8 | 1 | 2 | 1 | 5 | 1 | 4 |
| Northern (NHA) | Born Outside of Canada | 1 | 4 | 4 | 4 | 4 | 2 | 0 | 3 | 8 | 1 |
| | Canadian Born | 15 | 10 | 8 | 5 | 9 | 7 | 5 | 3 | 6 | 7 |
| Vancouver Coastal (VCHA) | Born Outside of Canada | 82 | 93 | 80 | 103 | 110 | 78 | 106 | 93 | 87 | 93 |
| | Canadian Born | 15 | 6 | 15 | 22 | 13 | 13 | 13 | 4 | 11 | 11 |
| Vancouver Island (VIHA) | Born Outside of Canada | 6 | 10 | 5 | 8 | 10 | 6 | 8 | 14 | 13 | 9 |
| | Canadian Born | 7 | 15 | 5 | 4 | 6 | 3 | 7 | 2 | 10 | 4 |

*Residence classified at time of case

Table 13. Active TB Rates by Country of Birth and Health Authority in BC, 2011 to 2020

| Health Authority* | Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------|------------------------|------|------|------|------|------|------|------|------|------|------|
| Fraser (FHA) | Born Outside of Canada | 20.0 | 18.3 | 20.4 | 21.0 | 18.5 | 18.3 | 20.6 | 22.1 | 21.4 | 21.6 |
| | Canadian Born | 1.9 | 1.4 | 1.7 | 1.7 | 0.9 | 0.8 | 1.7 | 1.7 | 1.7 | 2.1 |
| Interior (IHA) | Born Outside of Canada | 7.4 | 7.2 | 16.6 | 8.1 | 9.1 | 11.2 | 13.1 | 14.0 | 11.6 | 10.4 |
| | Canadian Born | 1.1 | 3.7 | 1.3 | 1.3 | 0.2 | 0.3 | 0.2 | 0.8 | 0.2 | 0.6 |
| Northern (NHA) | Born Outside of Canada | 3.9 | 15.2 | 14.9 | 14.7 | 14.5 | 7.1 | 0.0 | 10.3 | 27.2 | 3.3 |
| | Canadian Born | 6.1 | 4.0 | 3.2 | 2.0 | 3.6 | 2.8 | 2.0 | 1.2 | 2.4 | 2.8 |
| Vancouver Coastal (VCHA) | Born Outside of Canada | 16.8 | 18.9 | 16.0 | 20.4 | 21.5 | 15.1 | 20.3 | 17.6 | 16.3 | 17.2 |
| | Canadian Born | 2.6 | 1.0 | 2.6 | 3.8 | 2.2 | 2.2 | 2.2 | 0.7 | 1.8 | 1.8 |
| Vancouver Island (VIHA) | Born Outside of Canada | 5.1 | 8.4 | 4.1 | 6.4 | 7.9 | 4.6 | 6.1 | 10.4 | 9.5 | 6.4 |
| | Canadian Born | 1.2 | 2.5 | 0.8 | 0.6 | 1.0 | 0.5 | 1.1 | 0.3 | 1.6 | 0.6 |

*Residence classified at time of case

Figure 10. Active TB Rates Among Populations Born in Canada by Health Authority in BC, 2011 to 2020

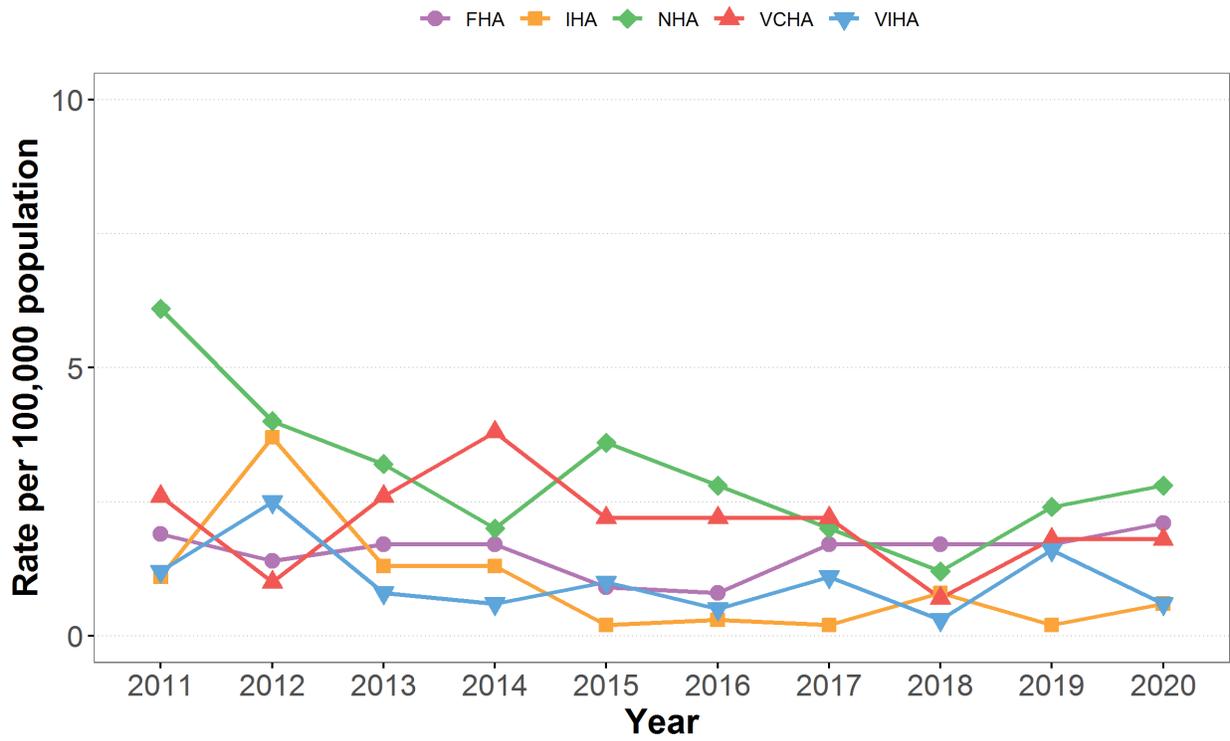
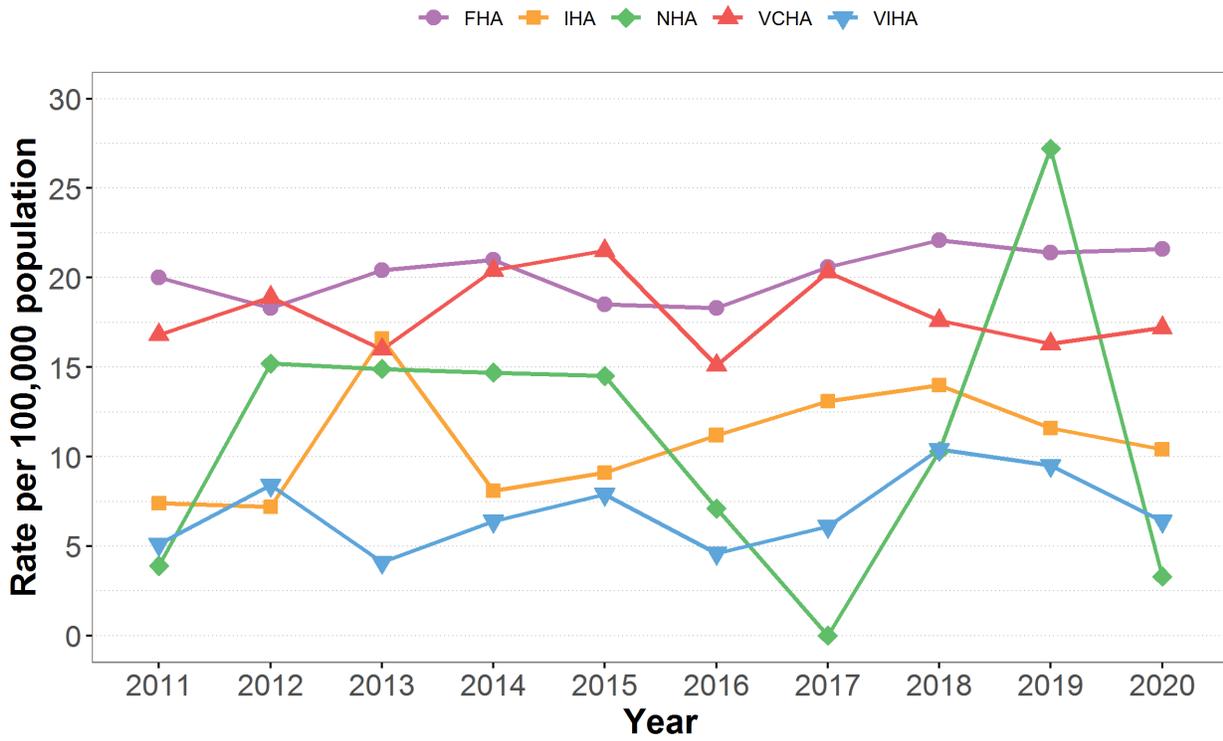


Figure 11. Active TB Rates Among Populations Born Outside of Canada by Health Authority in BC, 2011 to 2020



Active TB Among Populations Born in Canada by Age

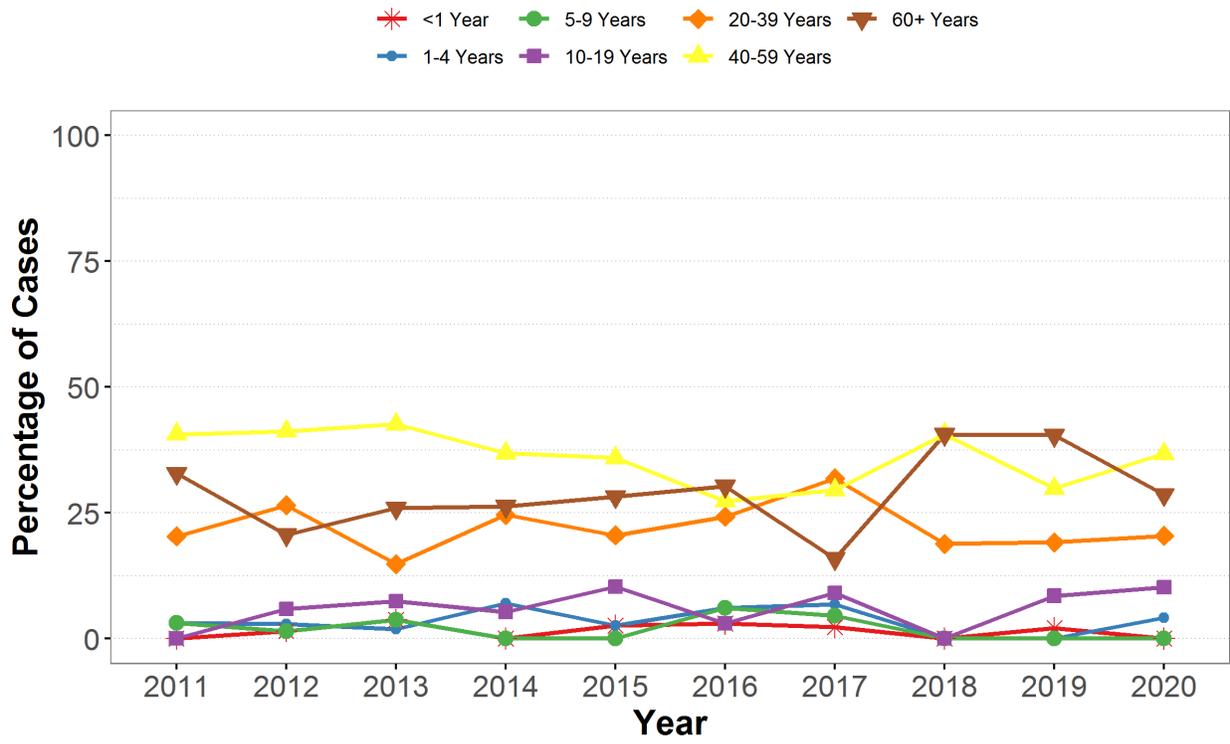
Table 14. Active TB Cases Born in Canada by Age Group, 2011 to 2020

| Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1-4 Years | 2 | 2 | 1 | 4 | 1 | 2 | 3 | 0 | 0 | 2 |
| 5-9 Years | 2 | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 |
| 10-19 Years | 0 | 4 | 4 | 3 | 4 | 1 | 4 | 0 | 4 | 5 |
| 20-39 Years | 13 | 18 | 8 | 14 | 8 | 8 | 14 | 6 | 9 | 10 |
| 40-59 Years | 26 | 28 | 23 | 21 | 14 | 9 | 13 | 13 | 14 | 18 |
| 60+ Years | 21 | 14 | 14 | 15 | 11 | 10 | 7 | 13 | 19 | 14 |

Table 15. Percentage of Active TB Cases Born in Canada by Age Group, 2011 to 2020

| Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0.0 | 1.5 | 3.7 | 0.0 | 2.6 | 3.0 | 2.3 | 0.0 | 2.1 | 0.0 |
| 1-4 Years | 3.1 | 2.9 | 1.9 | 7.0 | 2.6 | 6.1 | 6.8 | 0.0 | 0.0 | 4.1 |
| 5-9 Years | 3.1 | 1.5 | 3.7 | 0.0 | 0.0 | 6.1 | 4.5 | 0.0 | 0.0 | 0.0 |
| 10-19 Years | 0.0 | 5.9 | 7.4 | 5.3 | 10.3 | 3.0 | 9.1 | 0.0 | 8.5 | 10.2 |
| 20-39 Years | 20.3 | 26.5 | 14.8 | 24.6 | 20.5 | 24.2 | 31.8 | 18.8 | 19.1 | 20.4 |
| 40-59 Years | 40.6 | 41.2 | 42.6 | 36.8 | 35.9 | 27.3 | 29.5 | 40.6 | 29.8 | 36.7 |
| 60+ Years | 32.8 | 20.6 | 25.9 | 26.3 | 28.2 | 30.3 | 15.9 | 40.6 | 40.4 | 28.6 |

Figure 12. Percentage of Active TB Cases Born in Canada by Age Group, 2011 to 2020



Active TB Among Populations Born Outside of Canada by Age

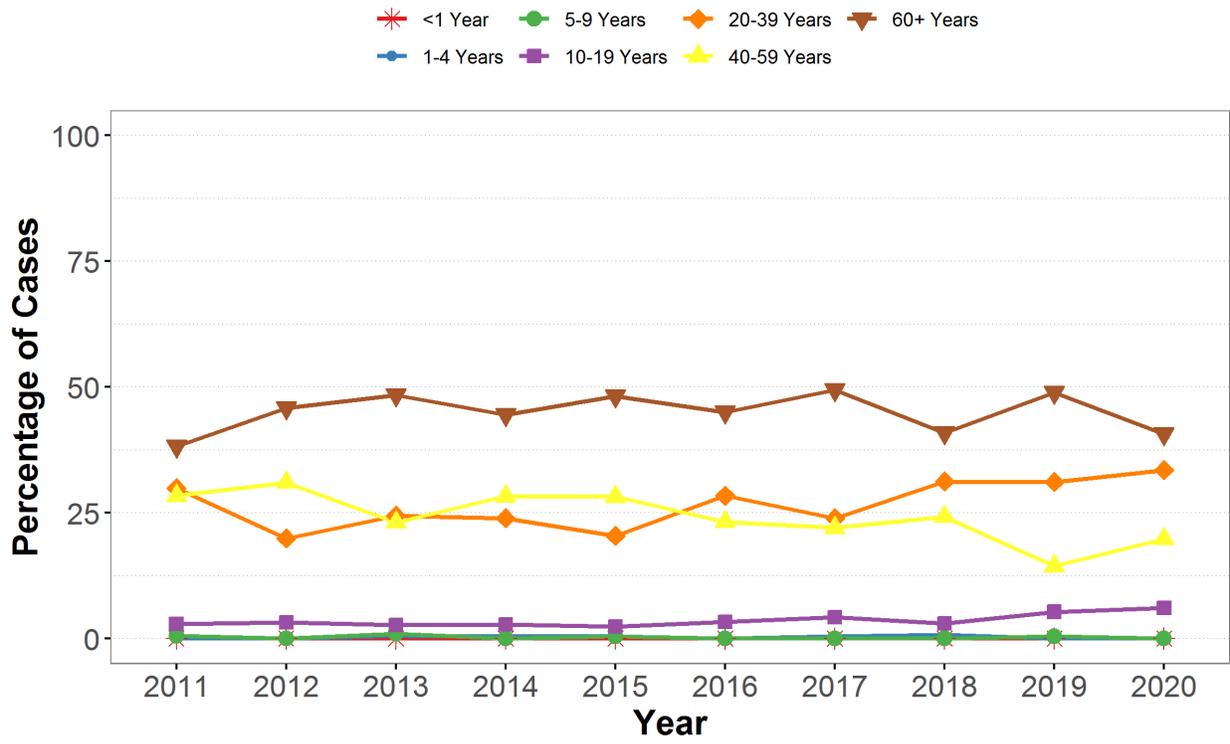
Table 16. Active TB Cases Born Outside of Canada by Age Group, 2011 to 2020

| Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1-4 Years | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| 5-9 Years | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 10-19 Years | 6 | 7 | 6 | 7 | 6 | 7 | 11 | 8 | 14 | 16 |
| 20-39 Years | 61 | 43 | 54 | 59 | 50 | 60 | 62 | 84 | 82 | 88 |
| 40-59 Years | 58 | 67 | 51 | 70 | 69 | 49 | 57 | 65 | 38 | 52 |
| 60+ Years | 78 | 99 | 107 | 110 | 118 | 95 | 128 | 110 | 129 | 107 |

Table 17. Percentage of Active TB Cases Born Outside of Canada by Age Group, 2011 to 2020

| Age Group | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-4 Years | 0.0 | 0.0 | 0.5 | 0.4 | 0.4 | 0.0 | 0.4 | 0.7 | 0.0 | 0.0 |
| 5-9 Years | 0.5 | 0.0 | 0.9 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 |
| 10-19 Years | 2.9 | 3.2 | 2.7 | 2.8 | 2.4 | 3.3 | 4.2 | 3.0 | 5.3 | 6.1 |
| 20-39 Years | 29.9 | 19.9 | 24.4 | 23.9 | 20.4 | 28.4 | 23.9 | 31.2 | 31.1 | 33.5 |
| 40-59 Years | 28.4 | 31.0 | 23.1 | 28.3 | 28.2 | 23.2 | 22.0 | 24.2 | 14.4 | 19.8 |
| 60+ Years | 38.2 | 45.8 | 48.4 | 44.5 | 48.2 | 45.0 | 49.4 | 40.9 | 48.9 | 40.7 |

Figure 13. Percentage of Active TB Cases Born Outside of Canada by Age Group, 2011 to 2020



Active TB by HIV Status

Table 18. Active TB Cases by Known HIV Status, 2011 to 2020*

| HIV Status | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| HIV Positive | 9 | 8 | 8 | 8 | 10 | 5 | 2 | 4 | 4 | 3 |
| Known HIV Status | 210 | 224 | 220 | 262 | 215 | 220 | 253 | 214 | 227 | 237 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

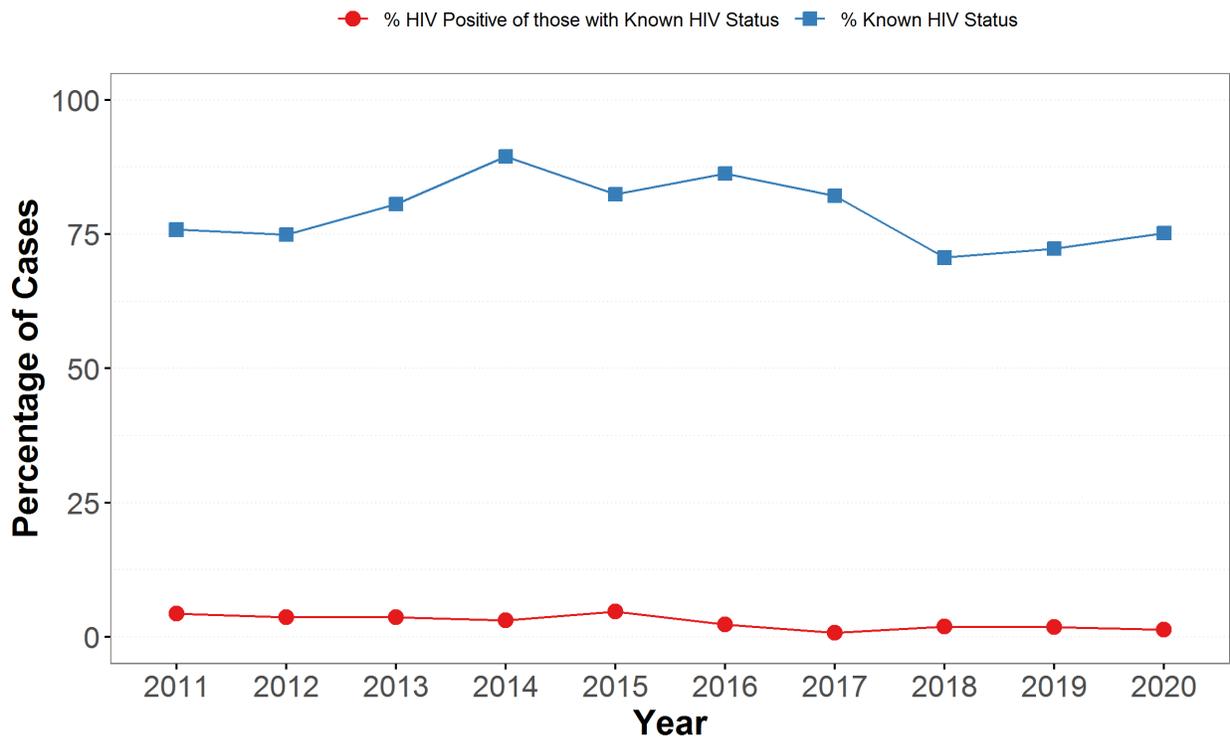
Table 19. Percentage of Active TB Cases by Known HIV Status, 2011 to 2020*

| HIV Status | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------|------|------|------|------|------|------|------|------|------|------|
| % HIV Positive** | 4.3 | 3.6 | 3.6 | 3.1 | 4.7 | 2.3 | 0.8 | 1.9 | 1.8 | 1.3 |
| % Known HIV Status | 75.8 | 74.9 | 80.6 | 89.4 | 82.4 | 86.3 | 82.1 | 70.6 | 72.3 | 75.2 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

**% HIV positive of those with known HIV status

Figure 14. Percentage of Active TB Cases by Known HIV Status, 2011 to 2020



Active TB by Site of Disease

Table 20. Active TB Cases by Site of Disease, 2011 to 2020

| Site of Disease | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Respiratory* | 214 | 242 | 230 | 234 | 216 | 200 | 241 | 233 | 247 | 253 |
| Non-respiratory only** | 65 | 57 | 51 | 71 | 72 | 55 | 67 | 70 | 67 | 62 |

*Respiratory includes all cases with at least one respiratory site present (i.e. defined as pulmonary, primary, miliary, and other pulmonary) (see [Case Definitions](#))

**Non-respiratory only includes all cases with no respiratory site present but at least one non-respiratory site present (see [Case Definitions](#))

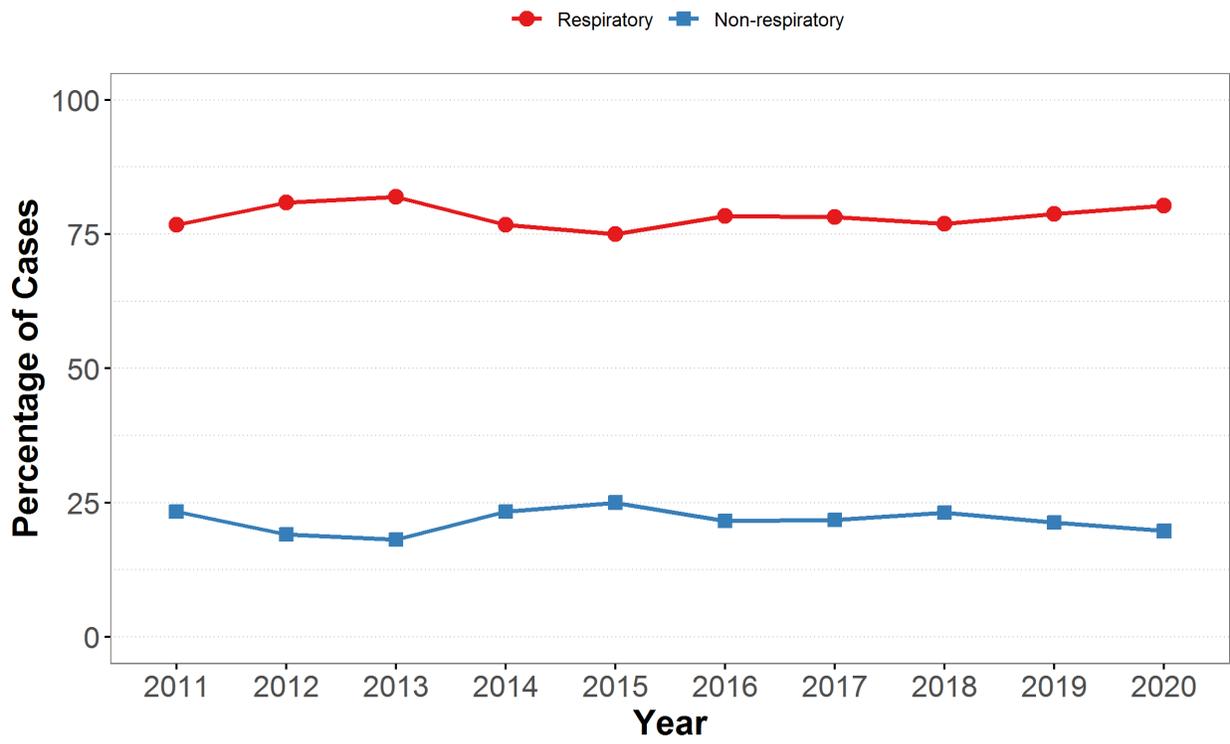
Table 21. Percentage of Active TB Cases by Site of Disease, 2011 to 2020

| Site of Disease | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Respiratory* | 76.7 | 80.9 | 81.9 | 76.7 | 75.0 | 78.4 | 78.2 | 76.9 | 78.7 | 80.3 |
| Non-respiratory only** | 23.3 | 19.1 | 18.1 | 23.3 | 25.0 | 21.6 | 21.8 | 23.1 | 21.3 | 19.7 |

*Respiratory includes all cases with at least one respiratory site present (i.e. defined as pulmonary, primary, miliary, and other pulmonary) (see [Case Definitions](#))

**Non-respiratory only includes all cases with no respiratory site present but at least one non-respiratory site present (see [Case Definitions](#))

Figure 15. Percentage of Active TB Cases by Site of Disease, 2011 to 2020



Active TB by Treatment Outcome

Table 22. Active TB Cases by Treatment Outcome, 2011 to 2019

| Treatment Summary* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Treatment Completed | 224 | 243 | 242 | 252 | 234 | 198 | 248 | 241 | 250 |
| - Within 12 Months | 182 | 207 | 210 | 212 | 187 | 162 | 212 | 215 | 204 |
| - Greater Than 12 Months | 42 | 36 | 32 | 40 | 47 | 36 | 36 | 26 | 46 |
| Incomplete Treatment | 31 | 38 | 20 | 31 | 36 | 34 | 38 | 33 | 41 |
| Left Province During Treatment | 12 | 6 | 4 | 14 | 9 | 18 | 5 | 15 | 17 |
| No Treatment Documented | 9 | 6 | 4 | 0 | 8 | 2 | 13 | 12 | 4 |

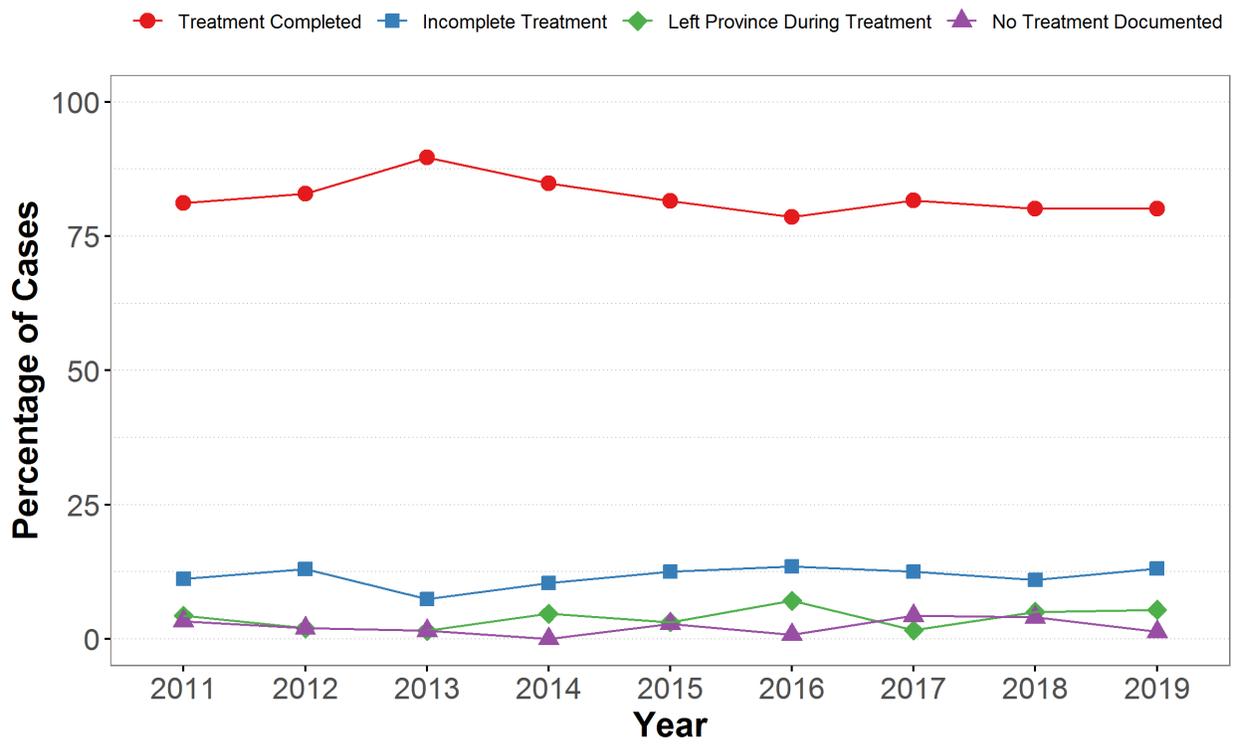
*Excluding those diagnosed post-mortem

Table 23. Percentage of Active TB Cases by Treatment Outcome, 2011 to 2019

| Treatment Summary* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Treatment Completed | 81.1 | 82.9 | 89.7 | 84.9 | 81.6 | 78.6 | 81.5 | 80.0 | 80.1 |
| - Within 12 Months | 65.9 | 70.6 | 77.8 | 71.4 | 65.2 | 64.3 | 69.7 | 71.4 | 65.4 |
| - Greater Than 12 Months | 15.2 | 12.3 | 11.9 | 13.5 | 16.4 | 14.3 | 11.8 | 8.6 | 14.7 |
| Incomplete Treatment | 11.2 | 13.0 | 7.4 | 10.4 | 12.5 | 13.5 | 12.5 | 11.0 | 13.1 |
| Left Province During Treatment | 4.3 | 2.0 | 1.5 | 4.7 | 3.1 | 7.1 | 1.6 | 5.0 | 5.4 |
| No Treatment Documented | 3.3 | 2.0 | 1.5 | 0.0 | 2.8 | 0.8 | 4.3 | 4.0 | 1.3 |

*Excluding those diagnosed post-mortem

Figure 16. Active TB Cases by Treatment Outcome, 2011 to 2019



Active TB by Reason for Incomplete Treatment

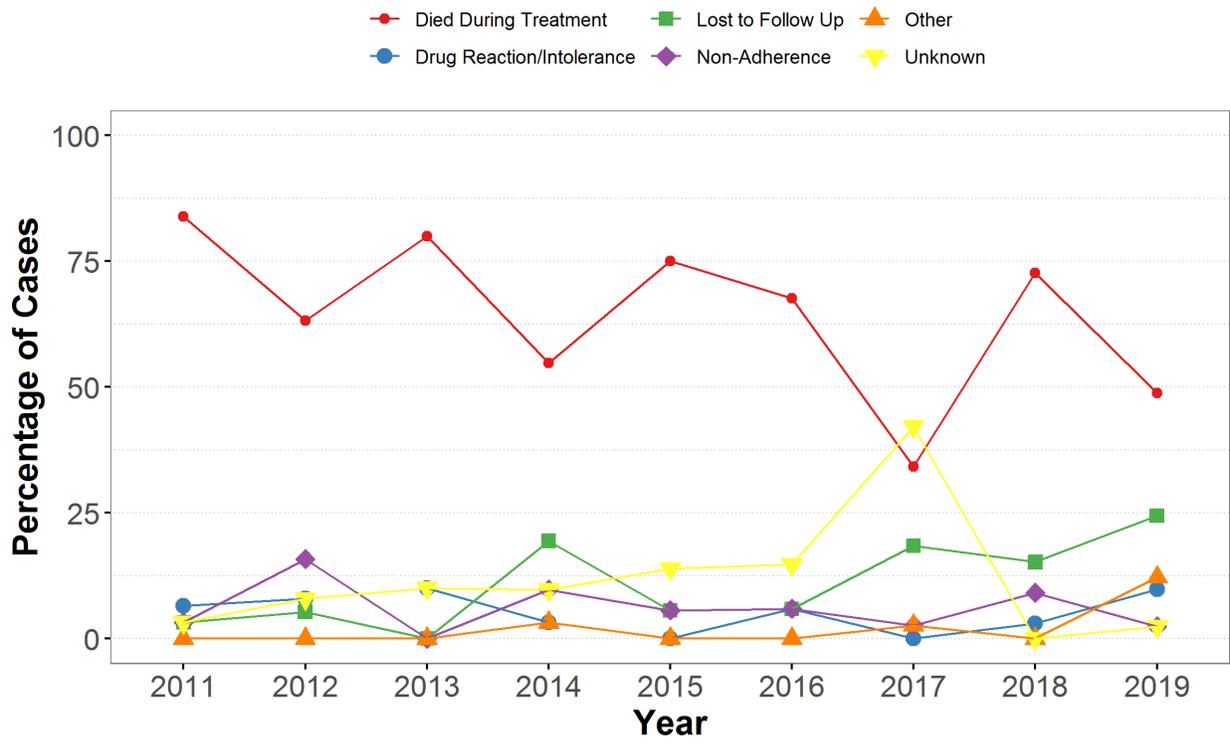
Table 24. Active TB Cases by Reason for Incomplete Treatment, 2011 to 2019

| Documented Reason | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Died During Treatment | 26 | 24 | 16 | 17 | 27 | 23 | 13 | 24 | 20 |
| - TB Underlying Cause | 6 | 4 | 1 | 3 | 3 | 5 | 3 | 1 | 1 |
| - TB Contributed, Not Underlying Cause | 10 | 7 | 7 | 9 | 18 | 7 | 8 | 12 | 9 |
| - TB Unrelated to Death | 9 | 13 | 7 | 3 | 4 | 8 | 2 | 5 | 9 |
| - Unknown | 1 | 0 | 1 | 2 | 2 | 3 | 0 | 6 | 1 |
| Drug Reaction/Intolerance | 2 | 3 | 2 | 1 | 0 | 2 | 0 | 1 | 4 |
| Lost to Follow Up | 1 | 2 | 0 | 6 | 2 | 2 | 7 | 5 | 10 |
| Non-Adherence | 1 | 6 | 0 | 3 | 2 | 2 | 1 | 3 | 1 |
| Other | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 |
| Unknown | 1 | 3 | 2 | 3 | 5 | 5 | 16 | 0 | 1 |

Table 25. Percentage of Active TB Cases by Reason for Incomplete Treatment, 2011 to 2019

| Documented Reason | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Died During Treatment | 83.9 | 63.2 | 80.0 | 54.8 | 75.0 | 67.6 | 34.2 | 72.7 | 48.8 |
| - TB Underlying Cause | 19.4 | 10.5 | 5.0 | 9.7 | 8.3 | 14.7 | 7.9 | 3.0 | 2.4 |
| - TB Contributed, Not Underlying Cause | 32.3 | 18.4 | 35.0 | 29.0 | 50.0 | 20.6 | 21.1 | 36.4 | 22.0 |
| - TB Unrelated to Death | 29.0 | 34.2 | 35.0 | 9.7 | 11.1 | 23.5 | 5.3 | 15.2 | 22.0 |
| - Unknown | 3.2 | 0.0 | 5.0 | 6.5 | 5.6 | 8.8 | 0.0 | 18.2 | 2.4 |
| Drug Reaction/Intolerance | 6.5 | 7.9 | 10.0 | 3.2 | 0.0 | 5.9 | 0.0 | 3.0 | 9.8 |
| Lost to Follow Up | 3.2 | 5.3 | 0.0 | 19.4 | 5.6 | 5.9 | 18.4 | 15.2 | 24.4 |
| Non-Adherence | 3.2 | 15.8 | 0.0 | 9.7 | 5.6 | 5.9 | 2.6 | 9.1 | 2.4 |
| Other | 0.0 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 | 2.6 | 0.0 | 12.2 |
| Unknown | 3.2 | 7.9 | 10.0 | 9.7 | 13.9 | 14.7 | 42.1 | 0.0 | 2.4 |

Figure 17. Percentage of Active TB Cases by Reason for Incomplete Treatment, 2011 to 2019



Active TB Drug Resistance

Table 26. Active TB Cases by Resistance Type, 2011 to 2020*

| Resistance | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| No Resistance | 252 | 279 | 254 | 259 | 233 | 233 | 290 | 282 | 291 | 290 |
| Isoniazid Only | 23 | 18 | 19 | 25 | 27 | 19 | 16 | 18 | 21 | 23 |
| Rifampin Only | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 |
| Multi-Drug** | 1 | 2 | 0 | 7 | 1 | 3 | 2 | 1 | 2 | 2 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

**Multi-drug resistance is defined as resistance to both isoniazid and rifampin

Table 27. Percentage of Active TB Cases by Resistance Type, 2011 to 2020*

| Resistance | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| No Resistance | 91.0 | 93.3 | 93.0 | 88.4 | 89.3 | 91.4 | 94.2 | 93.1 | 92.7 | 92.1 |
| Isoniazid Only | 8.3 | 6.0 | 7.0 | 8.5 | 10.3 | 7.5 | 5.2 | 5.9 | 6.7 | 7.3 |
| Rifampin Only | 0.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Multi-Drug** | 0.4 | 0.7 | 0.0 | 2.4 | 0.4 | 1.2 | 0.6 | 0.3 | 0.6 | 0.6 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

**Multi-drug resistance is defined as resistance to both isoniazid and rifampin

Figure 18. Active TB Cases by Resistance Type, 2011 to 2020

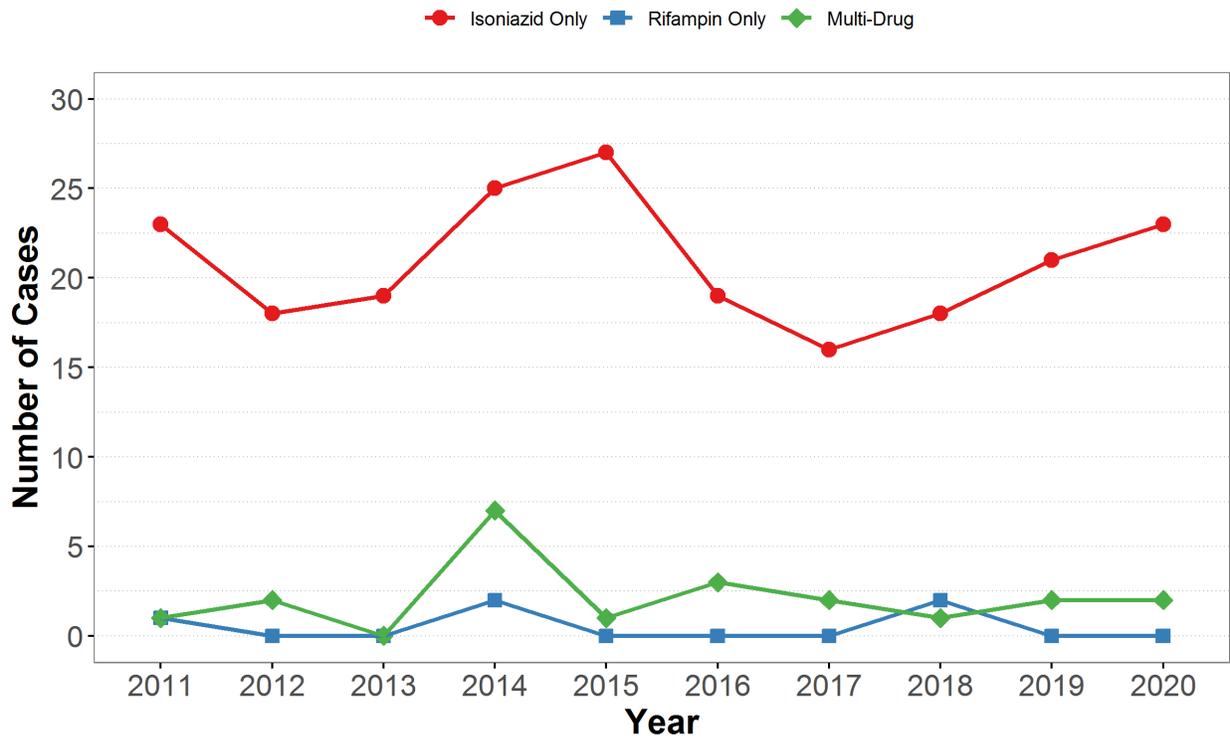
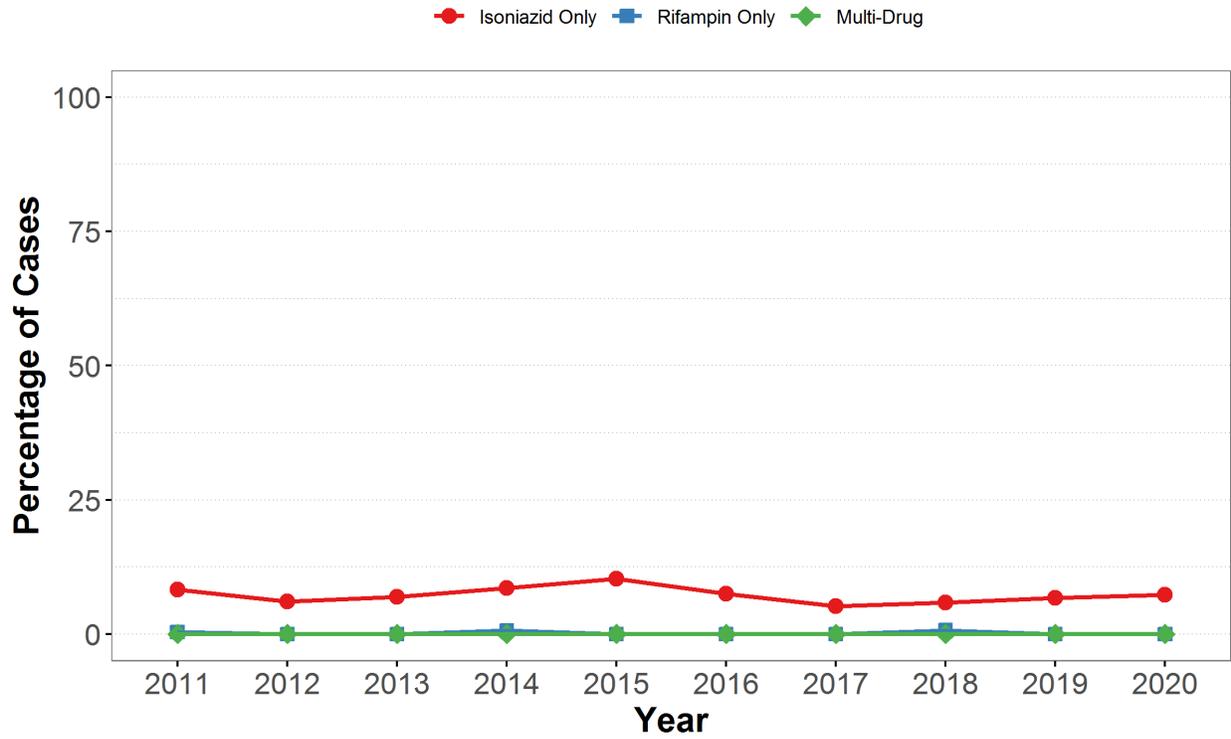


Figure 19. Percentage of Active TB Cases by Resistance Type, 2011 to 2020



Latent TB Treatment

Latent tuberculosis infection (LTBI) is a clinical diagnosis in which an individual is suspected to have the non-infectious or dormant phase of TB. The recommendation to treat LTBI is based on a clinical assessment of the patient balancing the risks for progression to active TB against the risks associated with treatment. Not everyone with LTBI is offered or needs treatment.

Here we report on LTBI treatment outcomes for treatment started in 2019 due to the potential extended duration of treatment and follow up that could contribute to delays in reporting. Any LTBI treatment starts not documented in Panorama (e.g. treatment given in federal and provincial correctional facilities) would not be captured in this report (see [Technical Appendix](#) and [Case Definitions](#)). Note that clients receiving [primary prophylaxis](#) are not reported here.

In 2019, 766 clients started LTBI treatment. A total of 76.1% (583 clients) of those starting treatment in 2019 successfully completed treatment, with 75.8% (581 clients) completing treatment within 12 months and only 0.3% (2 clients) taking more than 12 months to complete treatment ([Table 29](#); [Figure 20](#)). Since 2011, the proportion of clients that have completed LTBI treatment within 12 months has increased.

Of those starting treatment in 2019, 68.4% (524 clients) were born outside of Canada, 20.9% (160 clients) were Canadian born, and 10.7% (82 clients) had an unknown country of birth or had missing data ([Table 31](#); [Figure 21](#)). In 2019, 38.4% (294 clients) were 40-59 years of age, 29.2% (224 clients) were 60 years of age and older, and 27.0% (207 clients) were 20-39 years of age ([Table 33](#)). Overall, LTBI treatment was primarily documented in the three oldest age groups ([Figure 22](#)).

LTBI Treatment

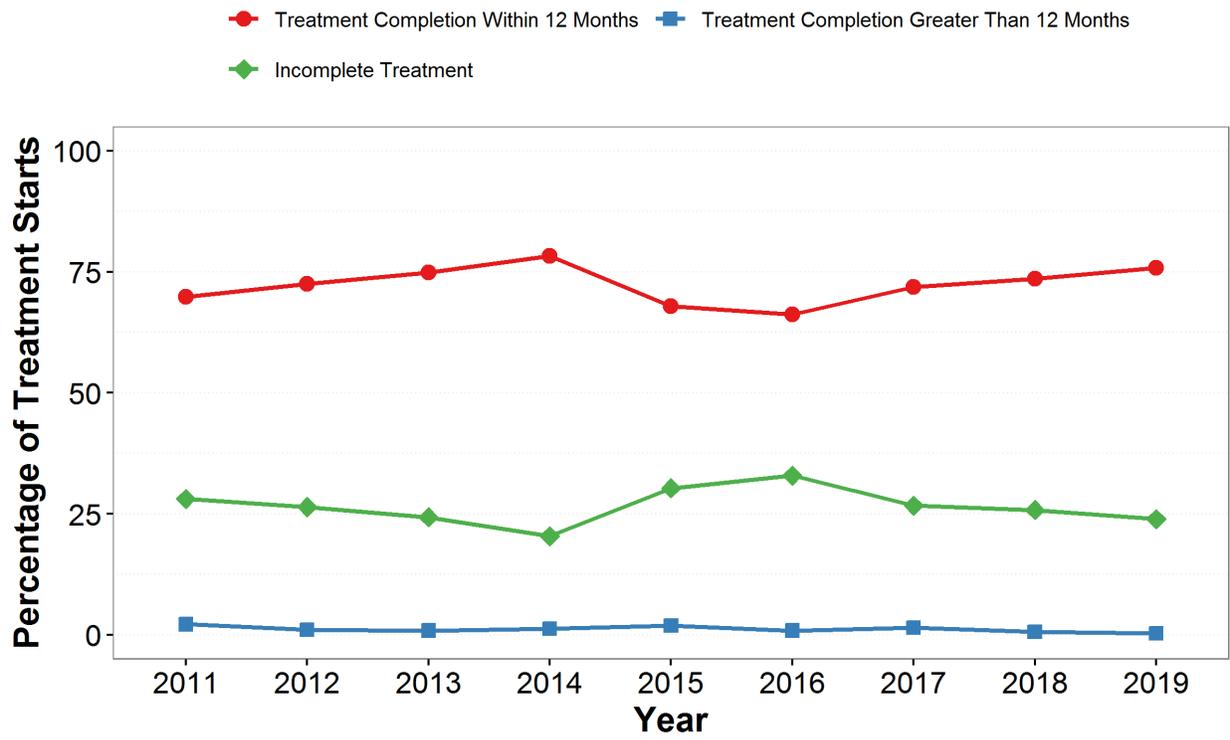
Table 28. Clients Started on LTBI Treatment by Treatment Outcome, 2011 to 2019

| Treatment Summary | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Treatment Completion Within 12 Months | 542 | 601 | 599 | 625 | 583 | 447 | 493 | 611 | 581 |
| Treatment Completion Greater Than 12 Months | 17 | 9 | 7 | 10 | 16 | 6 | 10 | 5 | 2 |
| Incomplete Treatment | 218 | 219 | 195 | 163 | 260 | 222 | 183 | 214 | 183 |

Table 29. Percentage of Clients Started on LTBI Treatment by Treatment Outcome, 2011 to 2019

| Treatment Summary | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Treatment Completion Within 12 Months | 69.8 | 72.5 | 74.8 | 78.3 | 67.9 | 66.2 | 71.9 | 73.6 | 75.8 |
| Treatment Completion Greater Than 12 Months | 2.2 | 1.1 | 0.9 | 1.3 | 1.9 | 0.9 | 1.5 | 0.6 | 0.3 |
| Incomplete Treatment | 28.1 | 26.4 | 24.3 | 20.4 | 30.3 | 32.9 | 26.7 | 25.8 | 23.9 |

Figure 20. Percentage of Clients Started on LTBI Treatment by Treatment Outcome, 2011 to 2019



LTBI Treatment by Country of Birth

Table 30. Clients Started on LTBI Treatment by Country of Birth, 2011 to 2019

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------------------------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 496 | 577 | 570 | 597 | 647 | 506 | 487 | 636 | 524 |
| Canadian Born | 248 | 230 | 212 | 189 | 195 | 148 | 153 | 148 | 160 |
| Missing* | 33 | 22 | 19 | 12 | 17 | 21 | 46 | 46 | 82 |

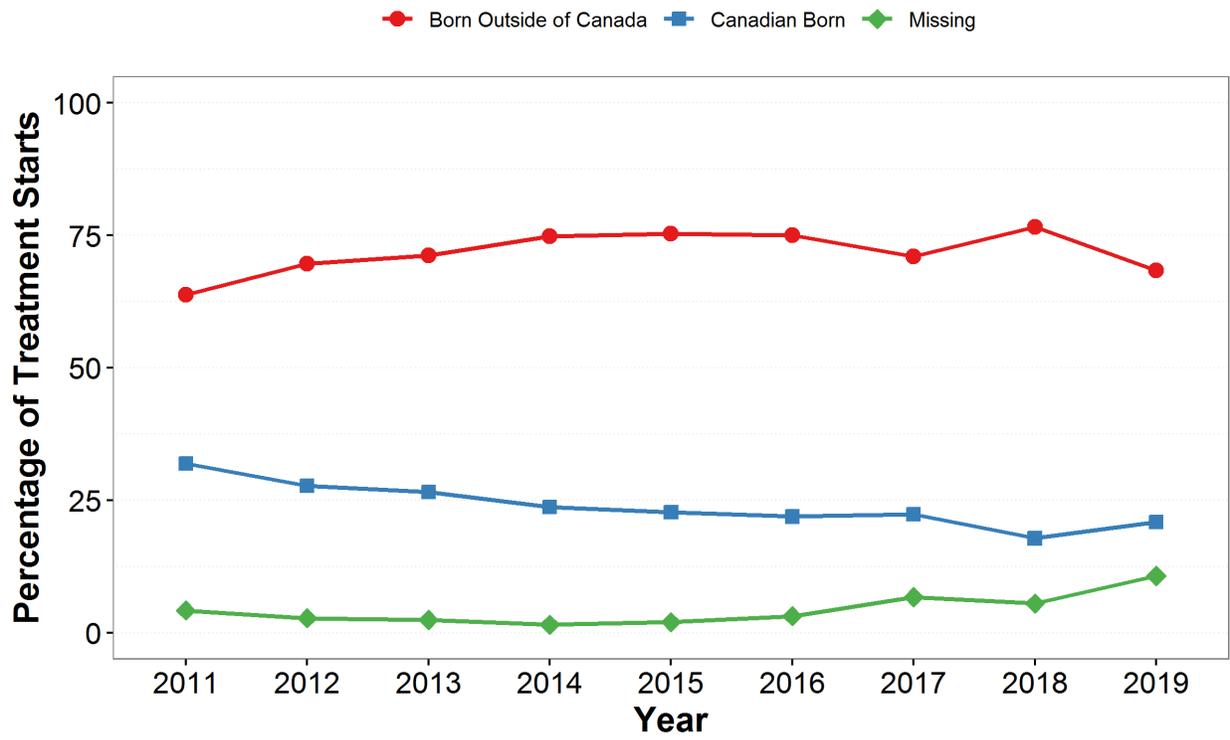
*Unknown or undocumented country of birth

Table 31. Percentage of Clients Started on LTBI Treatment by Country of Birth, 2011 to 2019

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------------------------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 63.8 | 69.6 | 71.2 | 74.8 | 75.3 | 75.0 | 71.0 | 76.6 | 68.4 |
| Canadian Born | 31.9 | 27.7 | 26.5 | 23.7 | 22.7 | 21.9 | 22.3 | 17.8 | 20.9 |
| Missing* | 4.2 | 2.7 | 2.4 | 1.5 | 2.0 | 3.1 | 6.7 | 5.5 | 10.7 |

*Unknown or undocumented country of birth

Figure 21. Percentage of Clients Started on LTBI Treatment by Country of Birth, 2011 to 2019



LTBI Treatment by Age

Table 32. Clients Started on LTBI Treatment by Age Group in BC, 2011 to 2019

| Age Group* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------|------|------|------|------|------|------|------|------|------|
| <1 Year | 1 | 1 | 0 | 1 | 1 | 3 | 1 | 2 | 1 |
| 1-4 Years | 13 | 3 | 13 | 9 | 12 | 8 | 9 | 7 | 9 |
| 5-9 Years | 13 | 9 | 16 | 11 | 13 | 4 | 10 | 8 | 9 |
| 10-19 Years | 29 | 32 | 41 | 43 | 36 | 17 | 13 | 38 | 22 |
| 20-39 Years | 271 | 246 | 227 | 232 | 242 | 199 | 185 | 235 | 207 |
| 40-59 Years | 313 | 382 | 343 | 335 | 342 | 262 | 271 | 300 | 294 |
| 60+ Years | 137 | 156 | 161 | 167 | 213 | 182 | 197 | 240 | 224 |

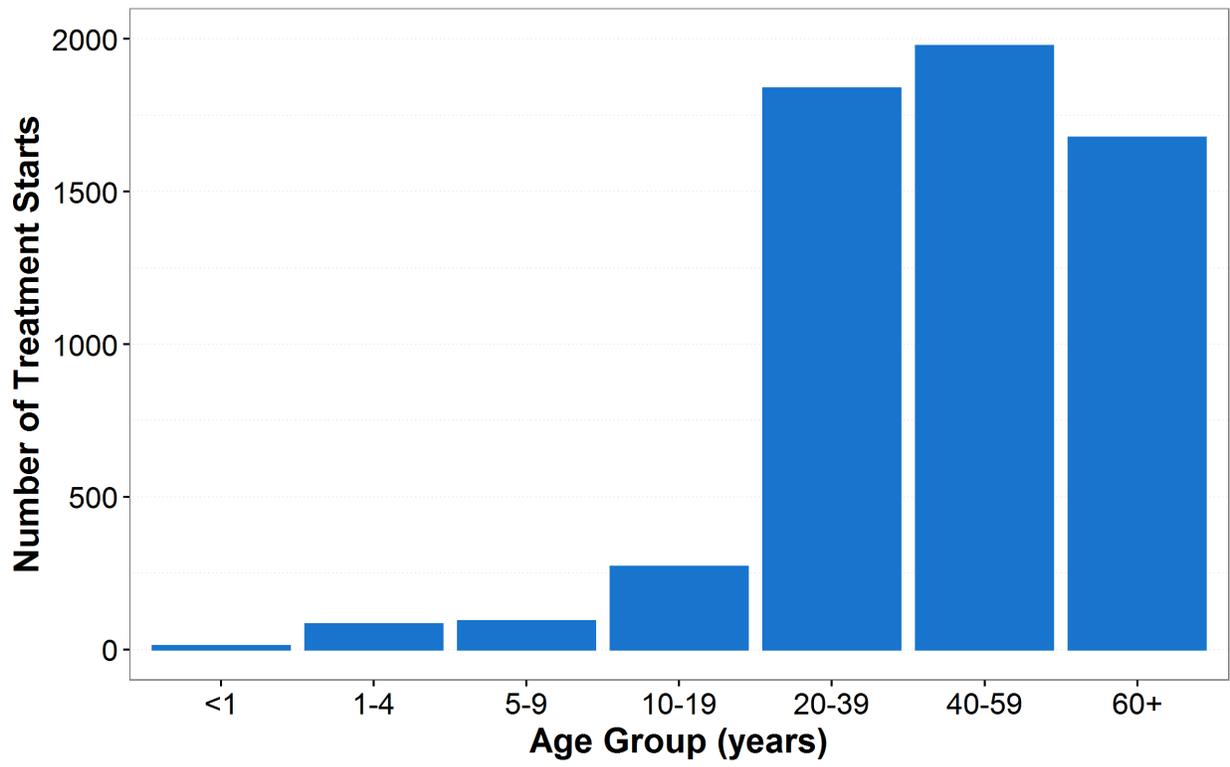
*Age at time of LTBI treatment

Table 33. Percentage of Clients Started on LTBI Treatment by Age Group in BC, 2011 to 2019

| Age Group* | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.4 | 0.1 | 0.2 | 0.1 |
| 1-4 Years | 1.7 | 0.4 | 1.6 | 1.1 | 1.4 | 1.2 | 1.3 | 0.8 | 1.2 |
| 5-9 Years | 1.7 | 1.1 | 2.0 | 1.4 | 1.5 | 0.6 | 1.5 | 1.0 | 1.2 |
| 10-19 Years | 3.7 | 3.9 | 5.1 | 5.4 | 4.2 | 2.5 | 1.9 | 4.6 | 2.9 |
| 20-39 Years | 34.9 | 29.7 | 28.3 | 29.1 | 28.2 | 29.5 | 27.0 | 28.3 | 27.0 |
| 40-59 Years | 40.3 | 46.1 | 42.8 | 42.0 | 39.8 | 38.8 | 39.5 | 36.1 | 38.4 |
| 60+ Years | 17.6 | 18.8 | 20.1 | 20.9 | 24.8 | 27.0 | 28.7 | 28.9 | 29.2 |

*Age at time of LTBI treatment

Figure 22. Total Clients Started on LTBI Treatment by Age Group in BC, 2011 to 2019



TB Contact Tracing

Contact tracing is an important public health intervention that involves identifying individuals who may be at risk of having TB infection or active TB disease as a result of having shared air space with an active TB case. Not all person-to-person contact is equivalent; contacts are classified and prioritized based on the type of TB (in some cases), duration of contact, and contact risk factors. This section of the report provides data on contacts of known active TB cases diagnosed in BC and those contacts residing in BC at time of investigation (i.e. contacts identified as part of federally managed airplane screening, contacts of non-resident cases, or contacts residing outside of BC are not included). Anonymous contacts are not included in this report. Note that contacts and screenings – specifically contacts with negative screening results – are underreported in Panorama.

Among the 253 respiratory active TB cases (primary, pulmonary, miliary, and other pulmonary) in 2020, a total of 1300 unique contacts were identified in Panorama (Table 34). This corresponds to a mean of 5.1 contacts per respiratory active TB case (median=3.0), a decrease compared to a mean of 8.7 (median = 3.0) observed in 2019. The maximum number of contacts associated with a single case in 2020 was 44 – this figure has ranged from 92 to 421 contacts from 2011 to 2019. Of the contacts reported in 2020, 34.8% (453 contacts) occurred in those 20-39 years of age, 27.4% (356 contacts) occurred in those 40-59 years of age, and 17.8% (231 contacts) occurred in those 60 years of age and older (Table 36; Figure 23). In 2020, 47.8% (621 contacts) of contacts were born outside of Canada, 38.5% (500 contacts) were Canadian born, and 13.8% (179 contacts) had no country of birth documented (Table 38; Figure 24).

Overall, a decrease was observed among reported contacts in 2020 which may be due to the COVID-19 pandemic and the reallocation of public health resources. While TB contact tracing was still performed for respiratory active TB cases throughout the pandemic, in many jurisdictions it was primarily focused on high priority contacts before this was expanded, and ultimately returned to normal procedures. As a result, contacts that would have been identified and reported pre-pandemic may not be represented in the 2020 data.

Contacts per Case

Table 34. Mean, Median, Max, and Total Number of Contacts* Reported for Respiratory Active TB Case in BC, 2011 to 2020**

| Measure | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------|------|------|------|------|------|------|------|------|------|------|
| Mean | 21.4 | 22.4 | 19.9 | 10.3 | 10.3 | 9.4 | 10.3 | 10.2 | 8.7 | 5.1 |
| Median | 9.5 | 13.0 | 11.0 | 5.0 | 6.0 | 6.0 | 5.0 | 4.0 | 3.0 | 3.0 |
| Max | 421 | 236 | 182 | 97 | 99 | 92 | 234 | 98 | 203 | 44 |
| Total | 3928 | 5138 | 4184 | 1963 | 1864 | 1890 | 2476 | 2368 | 2154 | 1300 |

*Excludes anonymous contacts

** Data from 2011-2015 are from iPHIS.⁷ Historical counts have changed slightly over time.

Contacts by Age

Table 35. Contacts of Respiratory Active TB Cases by Age Group in BC, 2011 to 2020*

| Age Group** | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 9 | 16 | 29 | 6 | 20 | 31 | 21 | 26 | 18 | 24 |
| 1-4 Years | 71 | 114 | 98 | 69 | 104 | 116 | 157 | 91 | 105 | 55 |
| 5-9 Years | 142 | 164 | 150 | 57 | 66 | 87 | 68 | 76 | 45 | 53 |
| 10-19 Years | 241 | 359 | 337 | 151 | 84 | 111 | 134 | 156 | 298 | 128 |
| 20-39 Years | 1257 | 1599 | 1172 | 624 | 537 | 579 | 756 | 883 | 667 | 453 |
| 40-59 Years | 1402 | 1883 | 1538 | 712 | 665 | 573 | 814 | 792 | 687 | 356 |
| 60+ Years | 758 | 975 | 828 | 318 | 366 | 389 | 526 | 344 | 334 | 231 |
| Unknown | 48 | 28 | 32 | 26 | 22 | 4 | 0 | 0 | 0 | 0 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

**Age at time of source case diagnosis

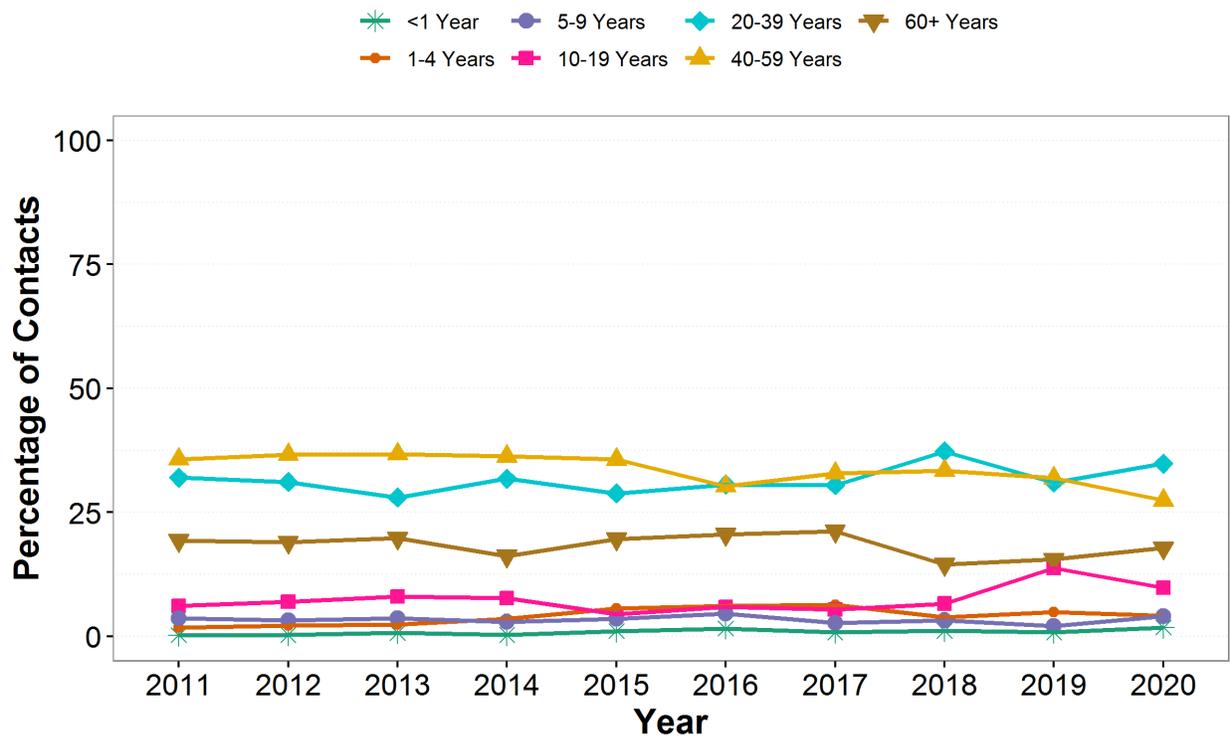
Table 36. Percentage of Contacts of Respiratory Active TB Cases by Age Group in BC, 2011 to 2020*

| Age Group** | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| <1 Year | 0.2 | 0.3 | 0.7 | 0.3 | 1.1 | 1.6 | 0.8 | 1.1 | 0.8 | 1.8 |
| 1-4 Years | 1.8 | 2.2 | 2.3 | 3.5 | 5.6 | 6.1 | 6.3 | 3.8 | 4.9 | 4.2 |
| 5-9 Years | 3.6 | 3.2 | 3.6 | 2.9 | 3.5 | 4.6 | 2.7 | 3.2 | 2.1 | 4.1 |
| 10-19 Years | 6.1 | 7.0 | 8.1 | 7.7 | 4.5 | 5.9 | 5.4 | 6.6 | 13.8 | 9.8 |
| 20-39 Years | 32.0 | 31.1 | 28.0 | 31.8 | 28.8 | 30.6 | 30.5 | 37.3 | 31.0 | 34.8 |
| 40-59 Years | 35.7 | 36.6 | 36.8 | 36.3 | 35.7 | 30.3 | 32.9 | 33.4 | 31.9 | 27.4 |
| 60+ Years | 19.3 | 19.0 | 19.8 | 16.2 | 19.6 | 20.6 | 21.2 | 14.5 | 15.5 | 17.8 |
| Unknown | 1.2 | 0.5 | 0.8 | 1.3 | 1.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |

*Data from 2011-2015 are from iPHIS.⁷ Historical case counts have changed slightly over time.

**Age at time of source case diagnosis

Figure 23. Percentage of Contacts of Respiratory Active TB Cases by Age Group in BC, 2011 to 2020



Contacts by Country of Birth

Table 37. Contacts of Respiratory Active TB Cases by Country of Birth in BC, 2011 to 2020*

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 1143 | 1525 | 1604 | 888 | 906 | 768 | 972 | 1174 | 755 | 621 |
| Canadian Born | 1722 | 2635 | 1701 | 778 | 769 | 790 | 985 | 919 | 922 | 500 |
| Missing** | 1063 | 978 | 879 | 297 | 189 | 332 | 519 | 275 | 477 | 179 |

*Data from 2011-2015 are from iPHIS.⁷ Historical counts have changed slightly over time.

**Unknown or undocumented country of birth

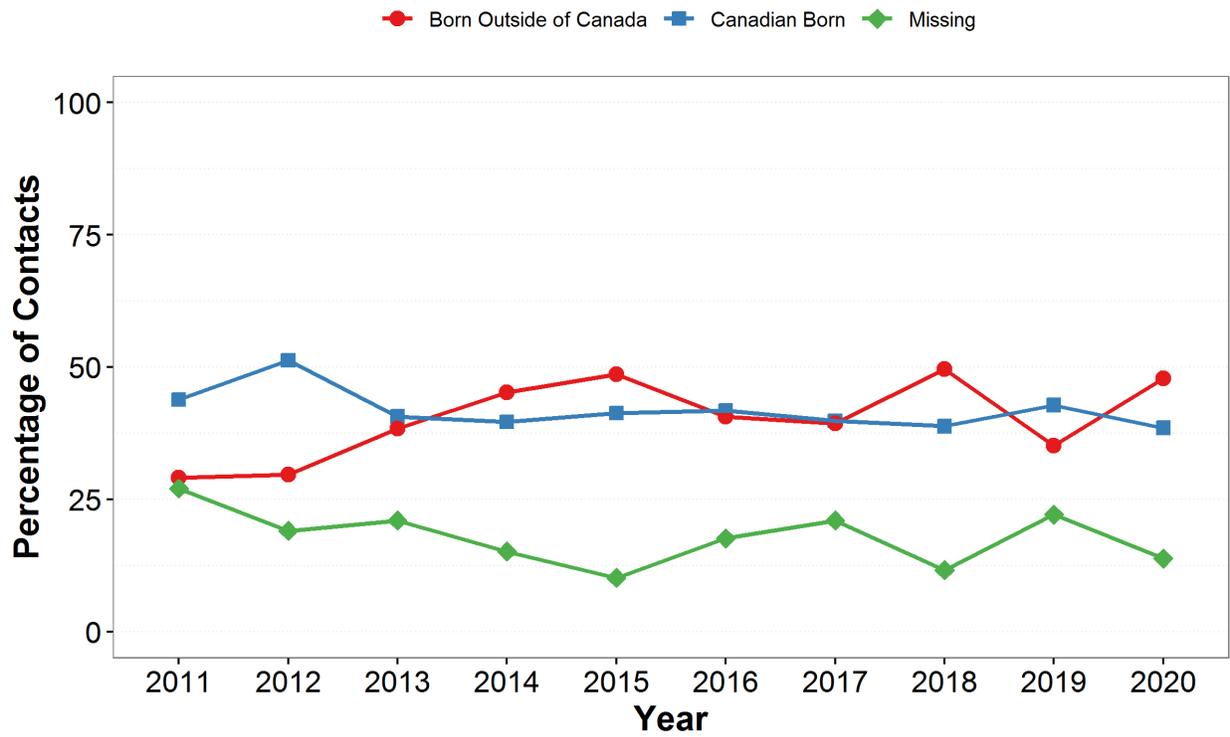
Table 38. Percentage of Contacts of Respiratory Active TB Cases by Country of Birth in BC, 2011 to 2020*

| Country of Birth | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Born Outside of Canada | 29.1 | 29.7 | 38.3 | 45.2 | 48.6 | 40.6 | 39.3 | 49.6 | 35.1 | 47.8 |
| Canadian Born | 43.8 | 51.3 | 40.7 | 39.6 | 41.3 | 41.8 | 39.8 | 38.8 | 42.8 | 38.5 |
| Missing** | 27.1 | 19.0 | 21.0 | 15.1 | 10.1 | 17.6 | 21.0 | 11.6 | 22.1 | 13.8 |

*Data from 2011-2015 are from iPHIS.⁷ Historical counts have changed slightly over time.

**Unknown or undocumented country of birth

Figure 24. Percentage of Contacts of Respiratory Active TB Cases by Country of Birth in BC, 2011 to 2020



Contact Tracing Cascade of Care

The contact tracing cascade of care provides insights on activities aimed to end the cycle of transmission through prompt assessment and treatment of infected contacts. It enables better understanding of where losses are occurring among the follow-up activities and may inform areas where public health interventions can be strengthened. See [Case Definitions](#) for indicator definitions.

This report presents data on the cascade of care for contacts of respiratory active TB cases in BC aged 5 years and older, with indicators stratified by time after source case diagnosis (12, 26, and 52 weeks). Additionally, total completion is reported at 2 years post source case diagnosis for all indicators except for secondary case identification that may be reported up to the date of data extraction (see [Technical Appendix](#)). Active TB cases less than 5 years of age – and any associated contacts – were excluded as they typically represent recent transmission and the approach here is to identify the source case rather than to contact trace (i.e. [reverse contact investigation](#)). Due to the potential extended duration of treatment and follow up that could contribute to delays in reporting, the contact cascade of care is presented for contacts of source cases diagnosed in 2017, 2018, and 2019.

Of respiratory active TB cases aged 5 years and older diagnosed in 2019, there were 2154 contacts identified among whom 88.3% (1903 contacts) completed an initial assessment, 15.5% (334 contacts) had a positive IGRA or TST screen (a proxy for LTBI), and only 0.6% (14 contacts) were identified as secondary cases ([Table 42](#); [Figure 26](#)). The vast majority of contacts (85.9%, 1850 contacts) completed an initial assessment within 26 weeks of the source case diagnosis in 2019, which is consistent with previous years ([Table 40](#); [Figure 25](#)). Of the 334 total contacts who had a positive screen, 37.4% (125 contacts) started and completed LTBI treatment. Across all years, and once contacts with a positive screen have been identified, treatment initiation and completion have been steps where the greatest drops in the cascade were observed. The data has shown that it can take 52 weeks or more post source case diagnosis to get contacts through treatment, underscoring the unique challenges inherent in TB prevention and care.

Table 39. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases Aged 5 Years and Older at 12 Weeks After Source Case Diagnosis in BC, 2017 to 2019

| Indicator | Count | | | Percentage [^] | | |
|--------------------------------------|-------------|-------------|-------------|-------------------------|--------------|--------------|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| Number of contacts | 2470 | 2368 | 2154 | 100.0 | 100.0 | 100.0 |
| Started initial assessment | 1808 | 1729 | 1499 | 73.2 | 73.0 | 69.6 |
| Completed initial assessment* | 1771 | 1651 | 1416 | 71.7 | 69.7 | 65.7 |
| - IGRA | 99 | 60 | 58 | 4.0 | 2.5 | 2.7 |
| - TST | 1332 | 1260 | 1075 | 53.9 | 53.2 | 49.9 |
| - X-Ray | 340 | 331 | 283 | 13.8 | 14.0 | 13.1 |
| Secondary cases | 7 | 2 | 4 | 0.3 | 0.1 | 0.2 |
| Positive screen** | 285 | 249 | 176 | 11.5 | 10.5 | 8.2 |
| - IGRA | 25 | 26 | 22 | 1.0 | 1.1 | 1.0 |
| - TST | 260 | 223 | 154 | 10.5 | 9.4 | 7.1 |
| Started treatment | 24 | 24 | 22 | 1.0 | 1.0 | 1.0 |
| Completed treatment | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |

*Using earliest screening date

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

[^]Percentage of total contacts reported

Table 40. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases Aged 5 Years and Older at 26 Weeks After Source Case Diagnosis in BC, 2017 to 2019

| Indicator | Count | | | Percentage [^] | | |
|--------------------------------------|-------------|-------------|-------------|-------------------------|--------------|--------------|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| Number of contacts | 2470 | 2368 | 2154 | 100.0 | 100.0 | 100.0 |
| Started initial assessment | 2213 | 2160 | 1951 | 89.6 | 91.2 | 90.6 |
| Completed initial assessment* | 2142 | 2108 | 1850 | 86.7 | 89.0 | 85.9 |
| - IGRA | 124 | 78 | 75 | 5.0 | 3.3 | 3.5 |
| - TST | 1630 | 1585 | 1417 | 66.0 | 66.9 | 65.8 |
| - X-Ray | 388 | 445 | 358 | 15.7 | 18.8 | 16.6 |
| Secondary cases | 10 | 7 | 6 | 0.4 | 0.3 | 0.3 |
| Positive screen** | 380 | 369 | 288 | 15.4 | 15.6 | 13.4 |
| - IGRA | 79 | 70 | 70 | 3.2 | 3.0 | 3.2 |
| - TST | 301 | 299 | 218 | 12.2 | 12.6 | 10.1 |
| Started treatment | 77 | 66 | 81 | 3.1 | 2.8 | 3.8 |
| Completed treatment | 4 | 8 | 7 | 0.2 | 0.3 | 0.3 |

*Using earliest screening date

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

[^]Percentage of total contacts reported

Table 41. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases Aged 5 Years and Older at 52 Weeks After Source Case Diagnosis in BC, 2017 to 2019

| Indicator | Count | | | Percentage [^] | | |
|--------------------------------------|-------------|-------------|-------------|-------------------------|--------------|--------------|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| Number of contacts | 2470 | 2368 | 2154 | 100.0 | 100.0 | 100.0 |
| Started initial assessment | 2261 | 2226 | 1992 | 91.5 | 94.0 | 92.5 |
| Completed initial assessment* | 2189 | 2175 | 1891 | 88.6 | 91.8 | 87.8 |
| - IGRA | 129 | 95 | 77 | 5.2 | 4.0 | 3.6 |
| - TST | 1661 | 1609 | 1444 | 67.2 | 67.9 | 67.0 |
| - X-Ray | 399 | 471 | 370 | 16.2 | 19.9 | 17.2 |
| Secondary cases | 13 | 9 | 7 | 0.5 | 0.4 | 0.3 |
| Positive screen** | 416 | 389 | 319 | 16.8 | 16.4 | 14.8 |
| - IGRA | 106 | 88 | 99 | 4.3 | 3.7 | 4.6 |
| - TST | 310 | 301 | 220 | 12.6 | 12.7 | 10.2 |
| Started treatment | 139 | 118 | 132 | 5.6 | 5.0 | 6.1 |
| Completed treatment | 53 | 59 | 82 | 2.1 | 2.5 | 3.8 |

*Using earliest screening date

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

[^]Percentage of total contacts reported

Table 42. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases Aged 5 Years and Older at Total Completion[†] After Source Case Diagnosis in BC, 2017 to 2019

| Indicator | Count | | | Percentage [^] | | |
|--------------------------------------|-------------|-------------|-------------|-------------------------|--------------|--------------|
| | 2017 | 2018 | 2019 | 2017 | 2018 | 2019 |
| Number of contacts | 2470 | 2368 | 2154 | 100.0 | 100.0 | 100.0 |
| Started initial assessment | 2278 | 2237 | 2003 | 92.2 | 94.5 | 93.0 |
| Completed initial assessment* | 2206 | 2187 | 1903 | 89.3 | 92.4 | 88.3 |
| - IGRA | 129 | 98 | 81 | 5.2 | 4.1 | 3.8 |
| - TST | 1673 | 1613 | 1448 | 67.7 | 68.1 | 67.2 |
| - X-Ray | 404 | 476 | 374 | 16.4 | 20.1 | 17.4 |
| Secondary cases | 18 | 13 | 14 | 0.7 | 0.5 | 0.6 |
| Positive screen** | 422 | 398 | 334 | 17.1 | 16.8 | 15.5 |
| - IGRA | 109 | 97 | 112 | 4.4 | 4.1 | 5.2 |
| - TST | 313 | 301 | 222 | 12.7 | 12.7 | 10.3 |
| Started treatment | 158 | 130 | 152 | 6.4 | 5.5 | 7.1 |
| Completed treatment | 111 | 93 | 125 | 4.5 | 3.9 | 5.8 |

*Using earliest screening date

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

[^]Percentage of total contacts reported

[†]Total completion is reported at 2 years post source case diagnosis for all indicators except for secondary case identification, which may be reported up to the date of data extraction.

Figure 25. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases Aged 5 Years and Older by Completion Time After Source Case Diagnosis in BC, 2019

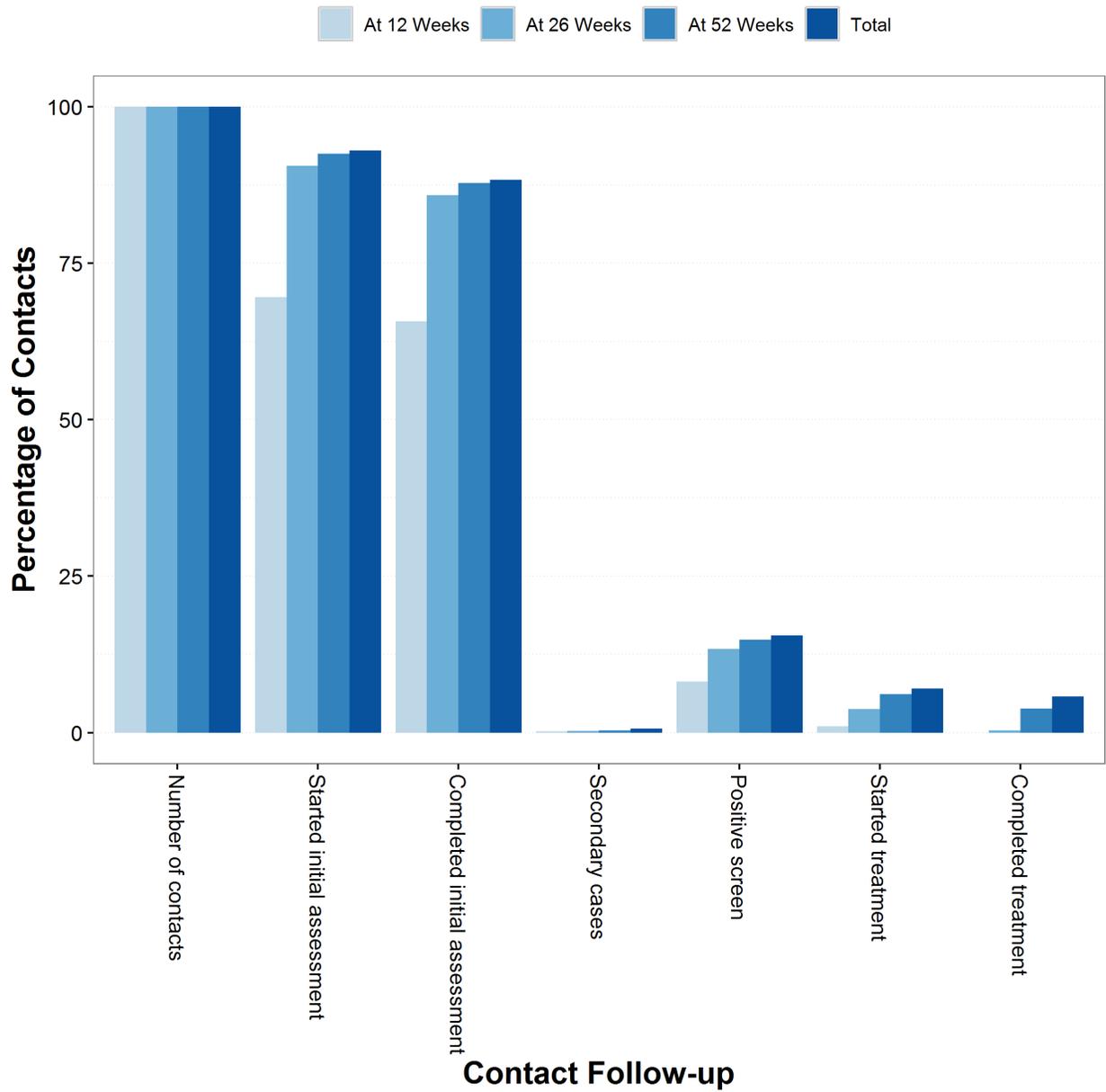
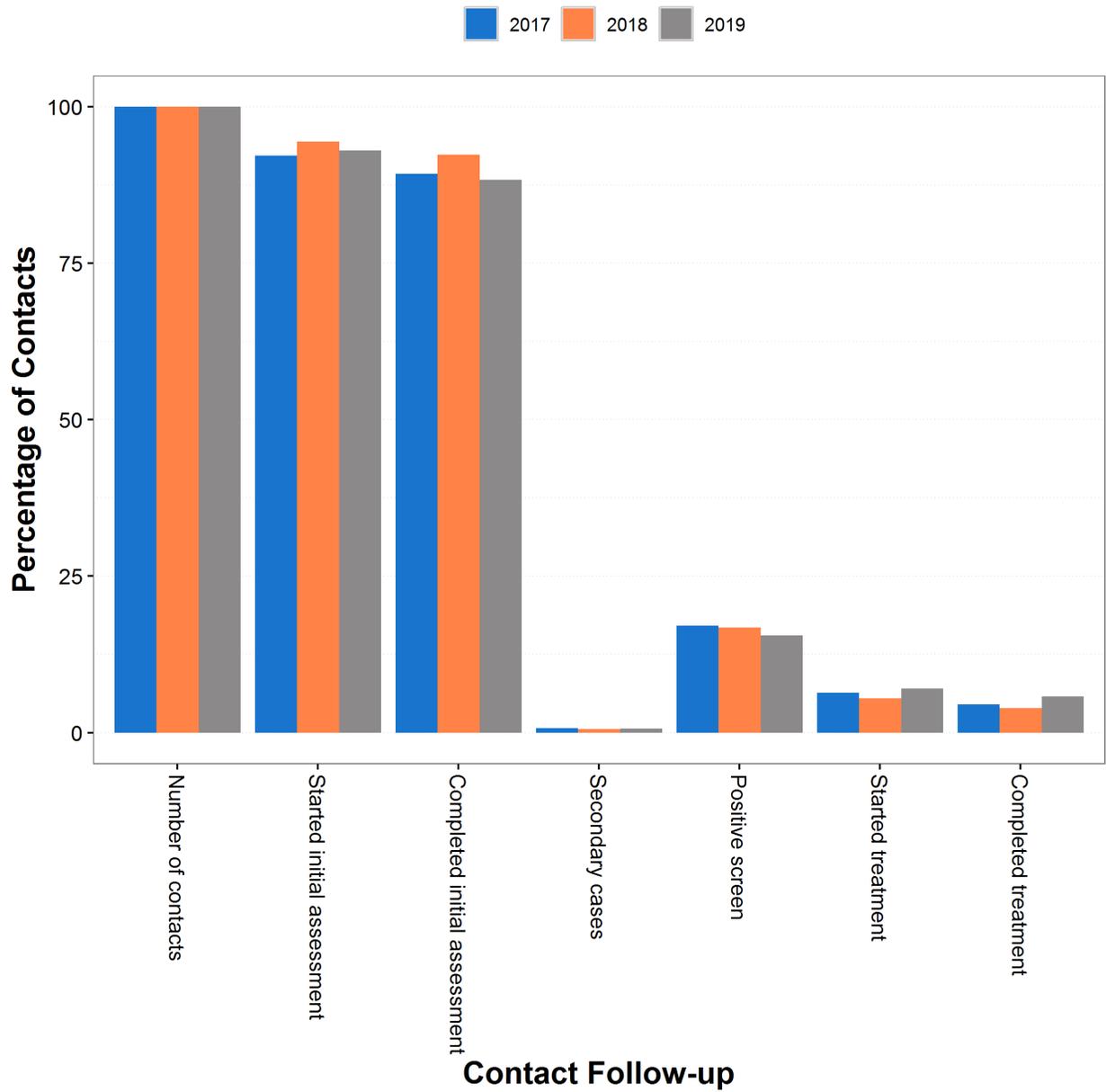


Figure 26. Contact Tracing Indicators Among Contacts of Respiratory Active TB Cases in BC Aged 5 Years and Older at Total Completion After Source Case Diagnosis, 2017 to 2019



Contributors

Epidemiology & Surveillance Team, Clinical Prevention Services

Arina Zamanpour, Epidemiologist
Fay Hutton, Surveillance Analyst
Wrency Tang, Surveillance Analyst
Dr. Jason Wong, Surveillance Lead & Medical Director
Dr. Victoria Cook, Medical Lead

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- The BCCDC Public Health Laboratory staff for collecting and compiling TB and HIV requisition data.
- Designated public health nurses in the Health Service Delivery Areas for data collection as part of follow-up to persons testing positive for TB.
- The BCCDC TB Services Health Registry Clerk and the Island TB Program staff for their help with active TB data entry and remediation.
- Sunny Mak from the BCCDC for creating the map of active TB rates by Health Service Delivery Areas.
- Tuberculosis Section, Centre for Communicable Disease and Infection Control, Public Health Agency of Canada (PHAC) for providing the annual rates of active TB in Canada.

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 possible late reporting.
- All geographic breakdowns reflect place of residence at time of diagnosis or time of treatment (including temporary residence). Subsequent movement is not reflected in this report.
- All active TB, LTBI, contact tracing, and laboratory data were extracted from Panorama on July 21, 2022.
- Active TB 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.
- Active TB 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 provincial totals. However, the BCCDC includes all 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 active TB diagnosis. Accordingly, active 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 known HIV status among TB cases is believed to be an underestimate due to incomplete ascertainment of screening tests and HIV/AIDS case reports.
- For active TB cases, HIV status and drug resistance data from 2011 to 2015 were not readily accessible for reporting out of Panorama. Thus, case counts and proportions for this period were obtained from historical iPHIS data⁷ to enable assessment of trends. Historic case counts and proportions should be interpreted with caution as they have changed slightly over time.

- LTBI treatment data presented in this report is from Panorama only. Any LTBI treatment data not documented in Panorama (e.g. treatment given in federal and provincial correctional facilities) would not be represented here.
- The contact information presented in this report includes only contacts of active 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 case in Panorama. The data does not include contacts identified as part of federal airplane screening, contacts of sources 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. 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 2013, and again in 2016 with the implementation of Panorama, and should be considered when interpreting the provincial surveillance data presented here.
- Contact data from 2011 to 2015 were not readily accessible for reporting out of Panorama. Thus, counts and proportions for this period were obtained from historical iPHIS data⁷ to enable assessment of trends. Historic counts and proportions should be interpreted with caution.
- 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) in the cascade is a subset of the previous, except for secondary cases (Indicator 3) which is based on all contacts (i.e. denominator).

Case Definitions

A. Active TB

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 isolated by culture from a clinical specimen – specifically *M. tuberculosis*, *M. africanum*, *M. canetti*, *M. caprae*, *M. microti*, *M. pinnipedii*, *M. orygis*, or *M. bovis* (excluding *M. bovis* BCG strain).

Clinically confirmed case

In the absence of confirmation by culture proof, cases clinically compatible with active tuberculosis disease such as:

- Chest x-ray changes compatible with active tuberculosis;
- Clinical symptoms and/or signs of non-respiratory tuberculosis (meninges, bone, kidney, peripheral lymph nodes, etc.);
- Histopathologic or post-mortem evidence of active tuberculosis;
- Favorable response to therapeutic trial of antituberculosis 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

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

Known HIV status

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

Drug Resistance

Active cases are classified as resistant to rifampin, isoniazid, 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

- primary tuberculosis
- pulmonary tuberculosis
- pneumonia tuberculosis
- miliary tuberculosis
- pleurisy tuberculosis
- isolated tracheal or bronchial tuberculosis
- laryngitis tuberculosis (excluding esophageal tuberculosis)
- cavitation of lung tuberculosis
- intrathoracic lymph node tuberculosis
- nose or sinus tuberculosis

Non-respiratory sites

- meningeal tuberculosis
- central nervous system tuberculosis
- meningeal or central nervous system tuberculosis
- peripheral lymph node tuberculosis
- spinal column tuberculosis

- hip tuberculosis
- knee tuberculosis
- bone tuberculosis
- joint tuberculosis
- kidney tuberculosis
- genitourinary tuberculosis
- skin and subcutaneous tuberculosis
- erythema nodosum tuberculosis
- eye tuberculosis
- ear tuberculosis
- thyroid gland tuberculosis
- adrenal gland tuberculosis
- spleen tuberculosis
- other organ tuberculosis (excluding respiratory)

C. Latent Tuberculosis Infection (LTBI)

The clinical definition for LTBI 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 LTBI treatment initiation in Panorama, which is likely an underestimate of the actual number of persons with LTBI.

D. Treatment Completion

For the purposes of this report, treatment completion for active TB and LTBI documented in Panorama 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 based on 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 active 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 active TB 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 proxy measure for clients with LTBI.

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. 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 Report⁷ 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.

Population data and associated rates for those born outside of Canada and Canadian born individuals were estimated from the 2011 and 2016 Census Program, conducted by Statistics Canada.⁸ Estimates for those 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 quinquennial censuses, this method assumes proportional annual changes in the population until the following census.

Additional Notes

Classification of Health Region

Cases are assigned to health regions (i.e. Health Authority of Health Service Delivery Area (HSDA)) by residence. If residence is unknown, the case is assigned to the health region where the individual was diagnosed or screened.

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