



**BC Centre for Disease Control**  
AN AGENCY OF THE PROVINCIAL HEALTH SERVICES AUTHORITY



# TB

Annual Report  
2016

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# Summary of Trends

## Tuberculosis (TB)

- In 2016, provincial TB Data was migrated from the Integrated Public Health Information System (iPHIS) to Panorama. This transition included a significant data translation from the old to the new system. The provincial TB surveillance program has also transitioned to reporting out of Panorama. Numbers in this report should therefore be viewed as a point-in-time estimate as minor changes in provincial surveillance data are expected as we further adapt to this new system.

### Active TB

- In 2016, the rate of active TB in BC was 5.1/100,000 population (241 cases), down from 5.8/100,000 population (273 cases) in 2015.
- Men had a higher active TB rate (5.6/100,000 population) than women (4.7/100,000 population).
- TB rates in men and women were generally greater in older age groups.
- In 2016, 84.6% of cases were among individuals born outside of Canada.

### Latent TB

- Treatment outcomes are reported for cases diagnosed in 2015 owing to the long duration of active TB treatment, with a total of 745 individuals started on latent TB infection (LTBI) therapy that year. Of these, 78.0% successfully completed treatment within 12 months, 2.1% took longer than 1 year to complete treatment, and 19.9% were documented with incomplete treatment.
- In 2015, 40.9% of LTBI treatment starts occurred in those 40-59 years of age, 27.2% in those 20-39 years of age, and 23.8% in those 60 years of age or older.

# Active TB

## Active TB Historical Trends

TB incidence in BC continued a decade-long decrease in 2016, reaching the lowest value on record at 5.1/100,000 population (Table 2; Figure 3). This trend of decreasing incidence mirrors that seen for Canada as a whole, however, active TB incidence in BC remains higher than the Canadian rate.

## Active TB Rates by Health Authority of Residence

In 2016, disease incidence was highest in Vancouver Coastal Health Authority (VCHA; 7.9/100,000 population), followed by Fraser Health Authority (FHA; 7.0/100,000 population), Northern Health Authority (NHA; 2.9/100,000 population), Interior Health Authority (IHA 1.5/100,000 population), and Vancouver Island Health Authority (VIHA; 1.2/100,000 population). Incidence in NHA, VCHA, and VIHA decreased in 2016 compared to 2015, while FHA and IHA showed very slight increases in TB incidence (Table 4, Figure 5). The higher TB incidence in FHA and VCHA may be influenced by the larger numbers of people from high-incidence countries settling in the urban regions.

## Active TB by Age and Gender

TB incidence has historically been higher in men than in women. The rate in men in 2016 was 5.6/100,000 population compared to 4.7/100,000 in women (Table 7; Figure 8). The TB rate in men has generally decreased since 2012. Active disease (or a positive Tuberculin Skin Test) in those <5 years of age indicates recent transmission because of the reduced probability of historic exposure and reactivation. There was one case of active TB diagnosed in those <5 years of age in 2016 (Table 9; Figure 10).

## Active TB by Origin

In BC in 2016, 84.6% of provincial cases occurred in those born outside of Canada, a slight decrease from 85.0% in 2015 (Table 13; Figure 14). Nearly half (45.6%) of the cases born outside of Canada in 2016 were 60 years of age or older, in comparison to 27.5% in those 20-39 years of age, and 23.5% in those 40-59 years of age (Table 17; Figure 18).

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. Active TB among individuals born outside of Canada appears to result largely from reactivation of latent TB infection, and local transmission is generally low.<sup>1</sup> 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 screening.

## Site of Disease

The site of active TB describes the clinical location of TB disease. Respiratory infection is more transmissible than non-respiratory infection. Of the TB seen in BC in 2016, 78.8% were respiratory cases, which is within historic trends (Table 20; Figure 21).

## Treatment of Active Cases

Treatment outcomes are reported for cases diagnosed in 2015 owing to the long duration of active TB treatment, and exclude post-mortem diagnoses (n=1). Of those diagnosed in 2015 (n=272), 264 (97.1%) were documented to have started treatment. Among cases with no treatment documented in 2015 (n=8, 2.9%), 4 died before treatment was initiated and 3 left Canada and were treated in their country of residence.

Among diagnosed cases, 80.9% completed active TB treatment satisfactorily, with the majority (64.0%) completing within 12 months and 16.9% taking longer than 12 months to complete (Tables 23, Figure 24). Drug resistant TB may require longer treatment regimens, however, data on drug resistant TB among these cases is not currently available for reporting.

Among cases with incomplete treatment (n=35), the majority (77.1%) died during treatment, 5.7% were lost to follow-up, 5.7% were non-adherent, and 11.4% had unknown reason (Table 26). Of those who died during treatment, the majority (66.7%, n=18) were documented with TB contributing to, but not being the underlying cause of death, 14.8% (n=4) died for reasons unrelated to their TB infection, 11.1% (n=3) had underlying cause of death related to TB infection, and 7.4% (n=2) had unknown cause of death.

## Active TB Historical Trends

1: Active TB Disease Cases in BC, 2007 to 2016

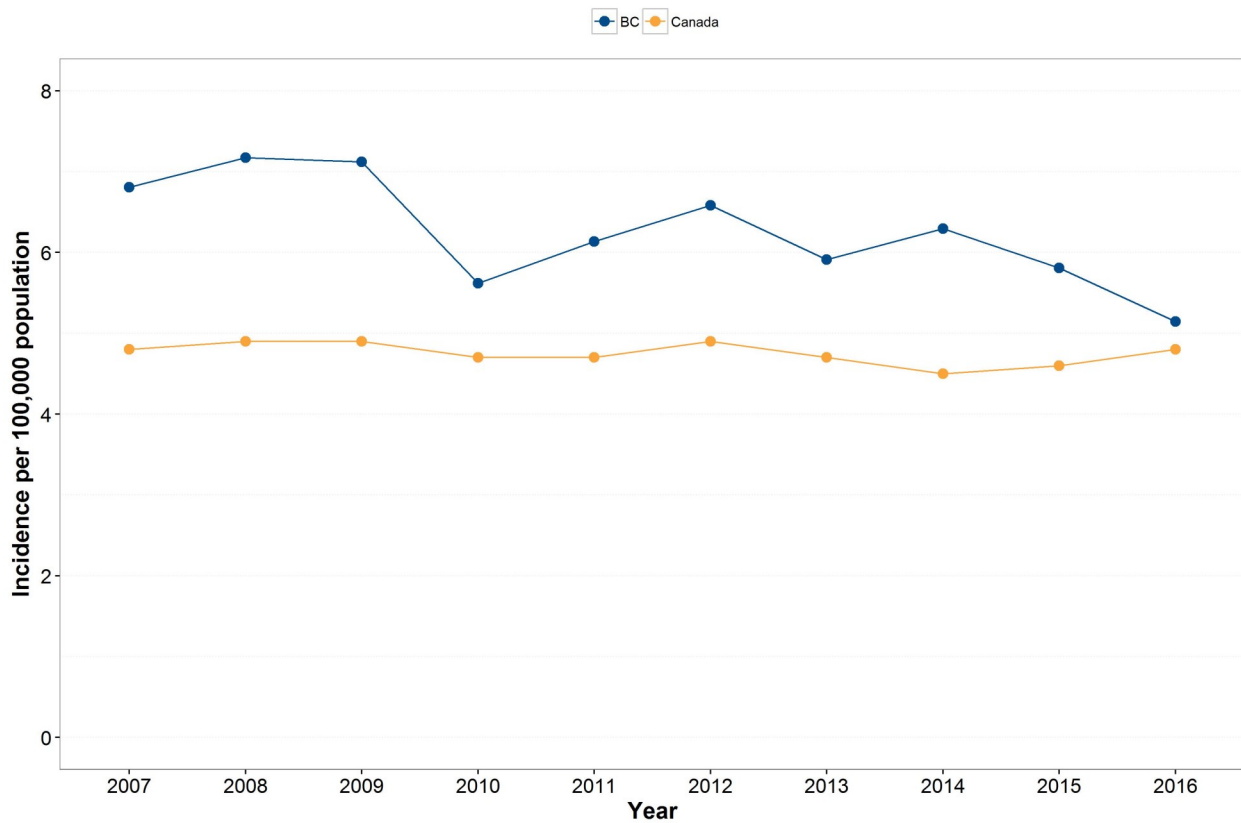
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BC	292	312	314	251	276	299	270	292	273	241

2: Active TB Disease Rates in BC and Canada, 2007 to 2016

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
BC	6.8	7.2	7.1	5.6	6.1	6.6	5.9	6.3	5.8	5.1
Canada*	4.8	4.9	4.9	4.7	4.7	4.9	4.7	4.5	4.6	4.8

\*Canadian rates from the Public Health Agency of Canada<sup>2</sup>

3: Active TB Disease Rates in BC and Canada, 2007 to 2016



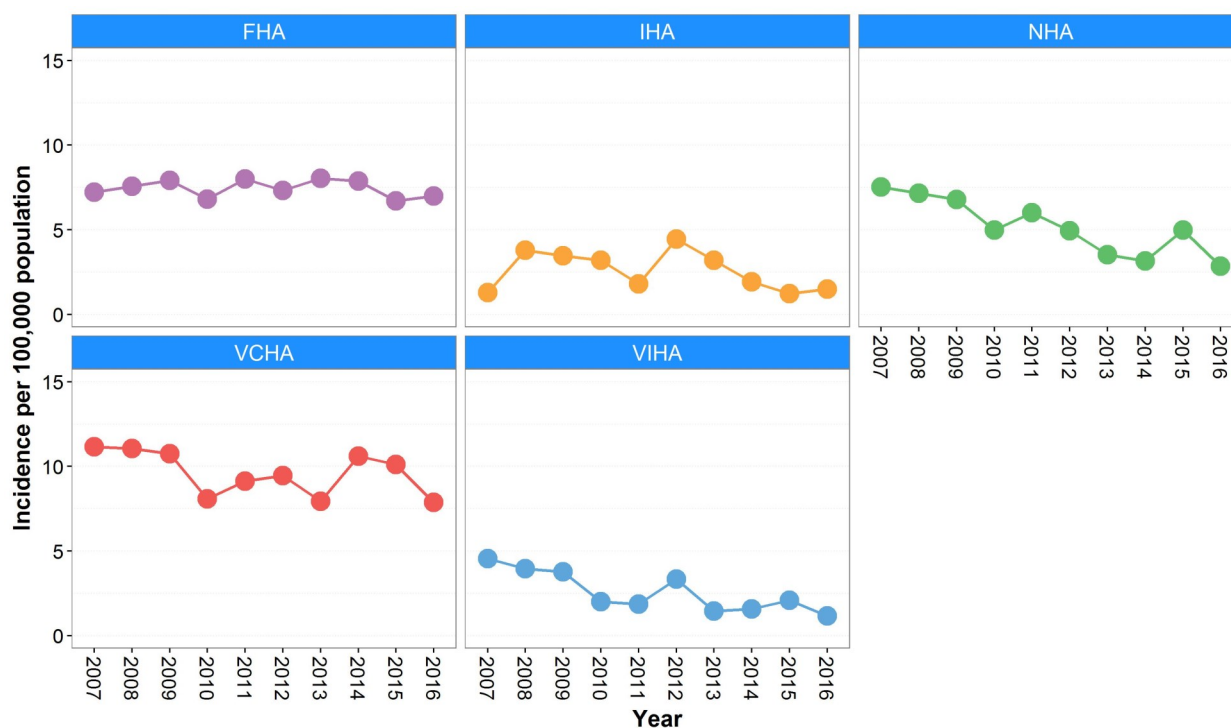
## Active TB Rates by Health Authority of Residence

### 4. Active TB Disease Rates by Health Authority in BC, 2007 to 2016

Health Authority*	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fraser (FHA)	7.2	7.6	7.9	6.8	8.0	7.3	8.0	7.9	6.7	7.0
Interior (IHA)	1.3	3.8	3.5	3.2	1.8	4.4	3.2	1.9	1.2	1.5
Northern (NHA)	7.5	7.2	6.8	5.0	6.0	4.9	3.5	3.2	5.0	2.9
Vancouver Coastal (VCHA)	11.2	11.1	10.8	8.1	9.1	9.4	7.9	10.6	10.1	7.9
Vancouver Island (VIHA)	4.5	3.9	3.8	2.0	1.9	3.3	1.5	1.6	2.1	1.2

\*Residence classified at time of case

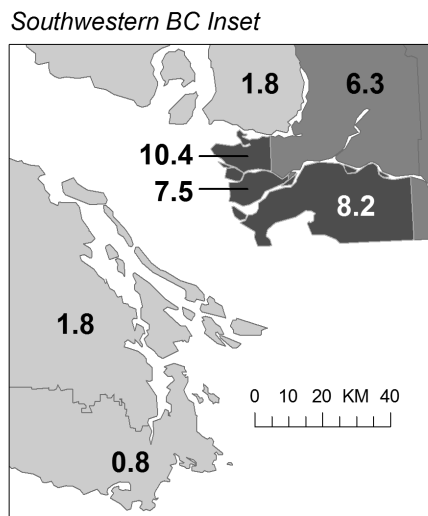
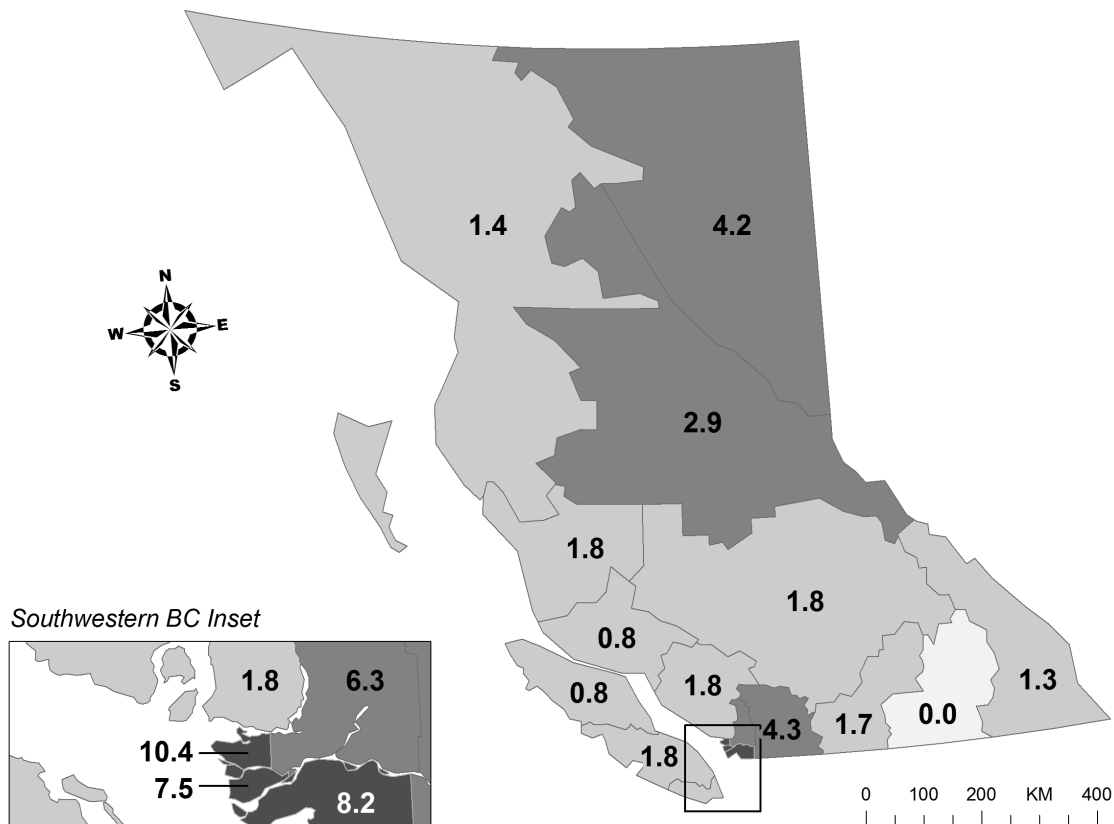
### 5. Active TB Disease Rates by Health Authority in BC, 2007 to 2016



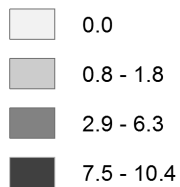


# Active TB Rates by Health Service Delivery Area

6. Active TB Disease Rates by Health Service Delivery Area\*+ in BC, 2016



**Rate per 100,000 population by HSDA**



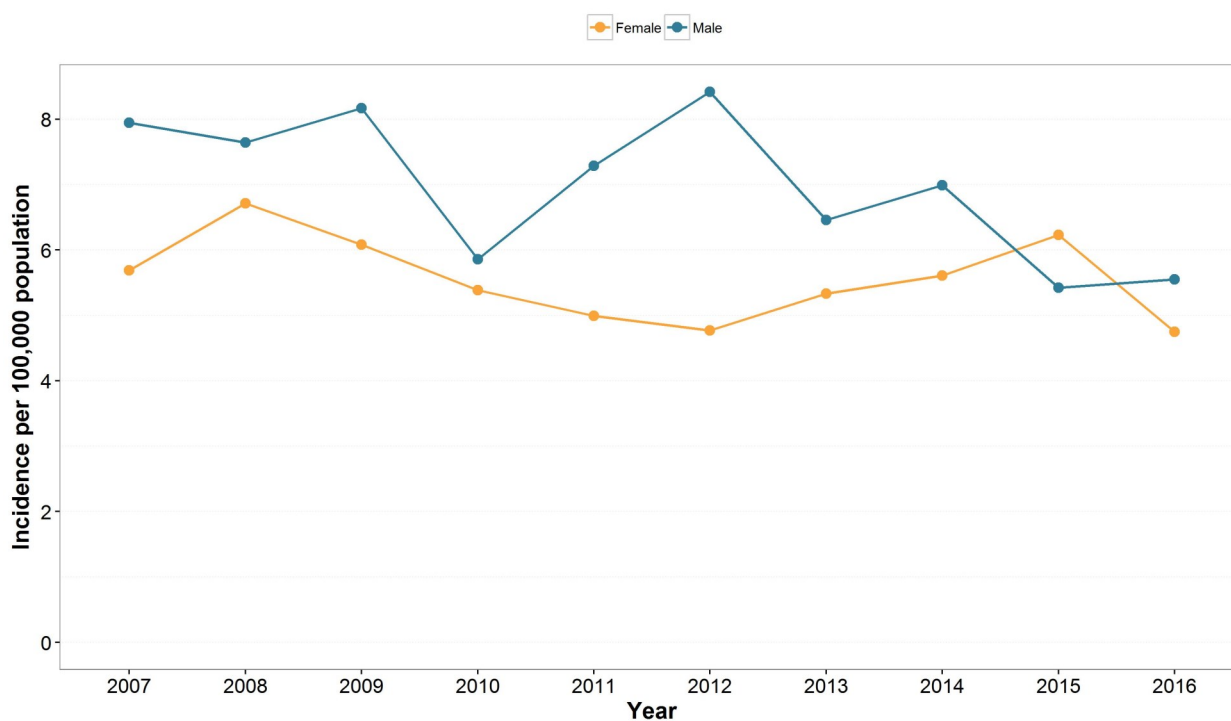
ID	Health Service Delivery Area	Cases	Rate
11	East Kootenay	1	1.3
12	Kootenay Boundary	0	0.0
13	Okanagan	6	1.7
14	Thompson Cariboo Shuswap	4	1.8
21	Fraser East	13	4.3
22	Fraser North	42	6.3
23	Fraser South	67	8.2
31	Richmond	16	7.5
32	Vancouver	70	10.4
33	North Shore/Coast Garibaldi	5	1.8
41	South Vancouver Island	3	0.8
42	Central Vancouver Island	5	1.8
43	North Vancouver Island	1	0.8
51	Northwest	1	1.4
52	Northern Interior	4	2.9
53	Northeast	3	4.2

## Active TB by Age and Gender

### 7. Active TB Disease Rates by Gender in BC, 2007 to 2016

Gender	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Female	5.7	6.7	6.1	5.4	5.0	4.8	5.3	5.6	6.2	4.7
Male	7.9	7.6	8.2	5.9	7.3	8.4	6.5	7.0	5.4	5.6

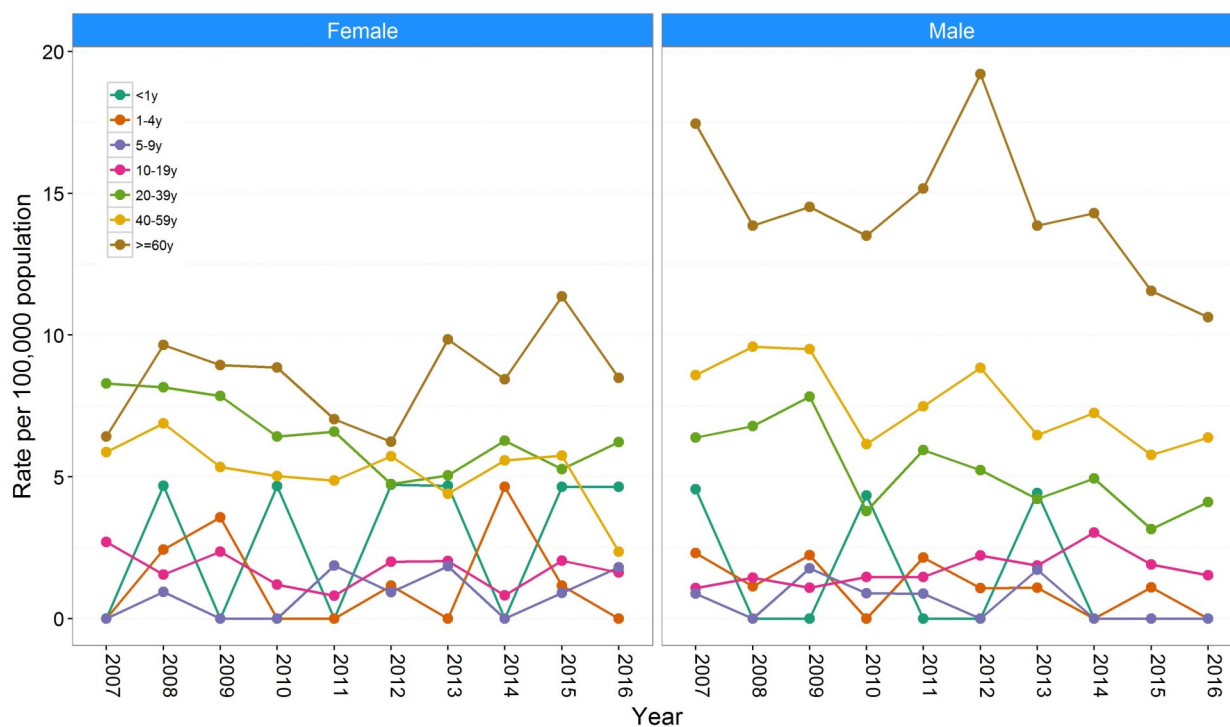
### 8. Active TB Disease Rates by Gender in BC, 2007 to 2016



### 9. Active TB Disease Rates by Gender and Age Group in BC, 2007 to 2016

Gender	Age	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Female	<1 yrs	0.0	4.7	0.0	4.7	0.0	4.7	4.7	0.0	4.7	4.7
	1-4 yrs	0.0	2.4	3.6	0.0	0.0	1.2	0.0	4.6	1.2	0.0
	5-9 yrs	0.0	0.9	0.0	0.0	1.9	0.9	1.8	0.0	0.9	1.8
	10-19 yrs	2.7	1.6	2.4	1.2	0.8	2.0	2.0	0.8	2.0	1.6
	20-39 yrs	8.3	8.2	7.9	6.4	6.6	4.7	5.1	6.3	5.3	6.2
	40-59 yrs	5.9	6.9	5.3	5.0	4.9	5.7	4.4	5.6	5.7	2.4
	≥60 yrs	6.4	9.7	8.9	8.9	7.0	6.2	9.8	8.4	11.4	8.5
Male	<1 yrs	4.6	0.0	0.0	4.3	0.0	0.0	4.4	0.0	0.0	0.0
	1-4 yrs	2.3	1.1	2.2	0.0	2.1	1.1	1.1	0.0	1.1	0.0
	5-9 yrs	0.9	0.0	1.8	0.9	0.9	0.0	1.7	0.0	0.0	0.0
	10-19 yrs	1.1	1.4	1.1	1.5	1.5	2.2	1.9	3.0	1.9	1.5
	20-39 yrs	6.4	6.8	7.8	3.8	5.9	5.2	4.2	4.9	3.2	4.1
	40-59 yrs	8.6	9.6	9.5	6.2	7.5	8.8	6.5	7.2	5.8	6.4
	≥60 yrs	17.5	13.9	14.5	13.5	15.2	19.2	13.9	14.3	11.6	10.6

### 10. Active TB Disease Rates by Gender and Age Group in BC, 2007 to 2016



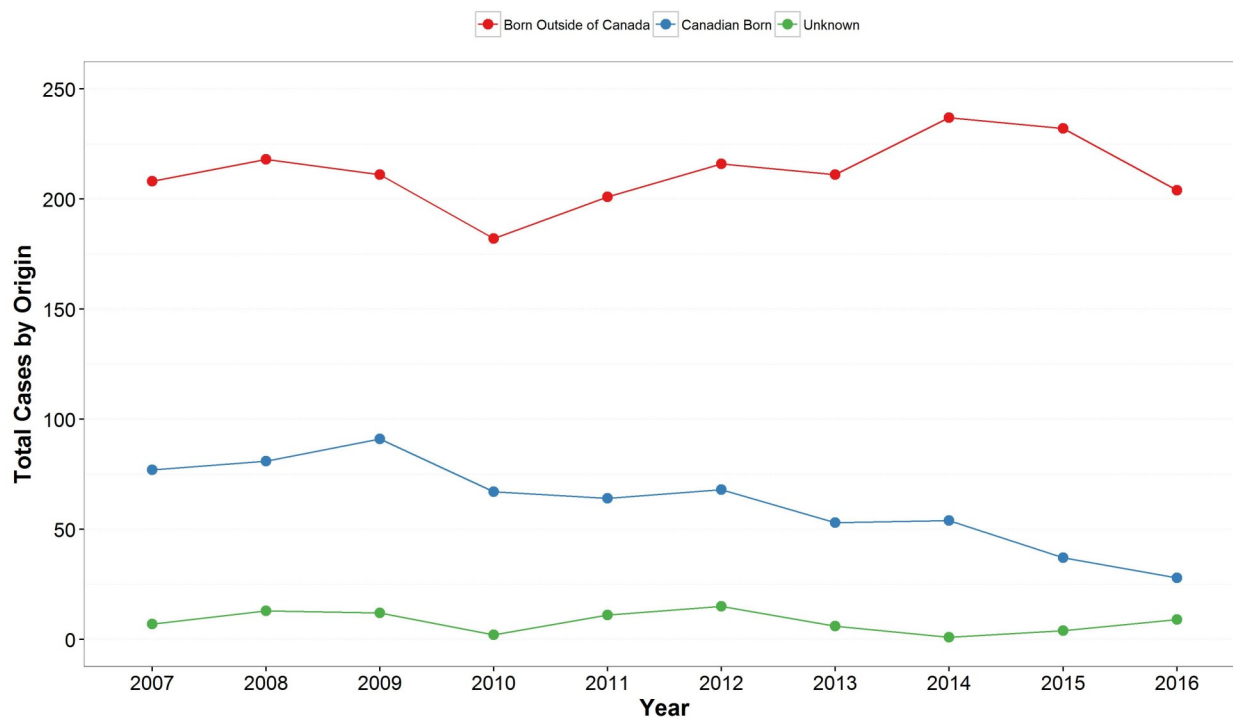
## Active TB by Origin - Case Totals

### 11. Active TB Disease Cases by Origin in BC, 2007 to 2016

Origin	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Born Outside of Canada	208	218	211	182	201	216	211	237	232	204
Canadian Born	77	81	91	67	64	68	53	54	37	28
Missing*	7	13	12	2	11	15	6	1	4	9

\*Unknown or undocumented origin

### 12. Active TB Disease Cases by Origin in BC, 2007 to 2016



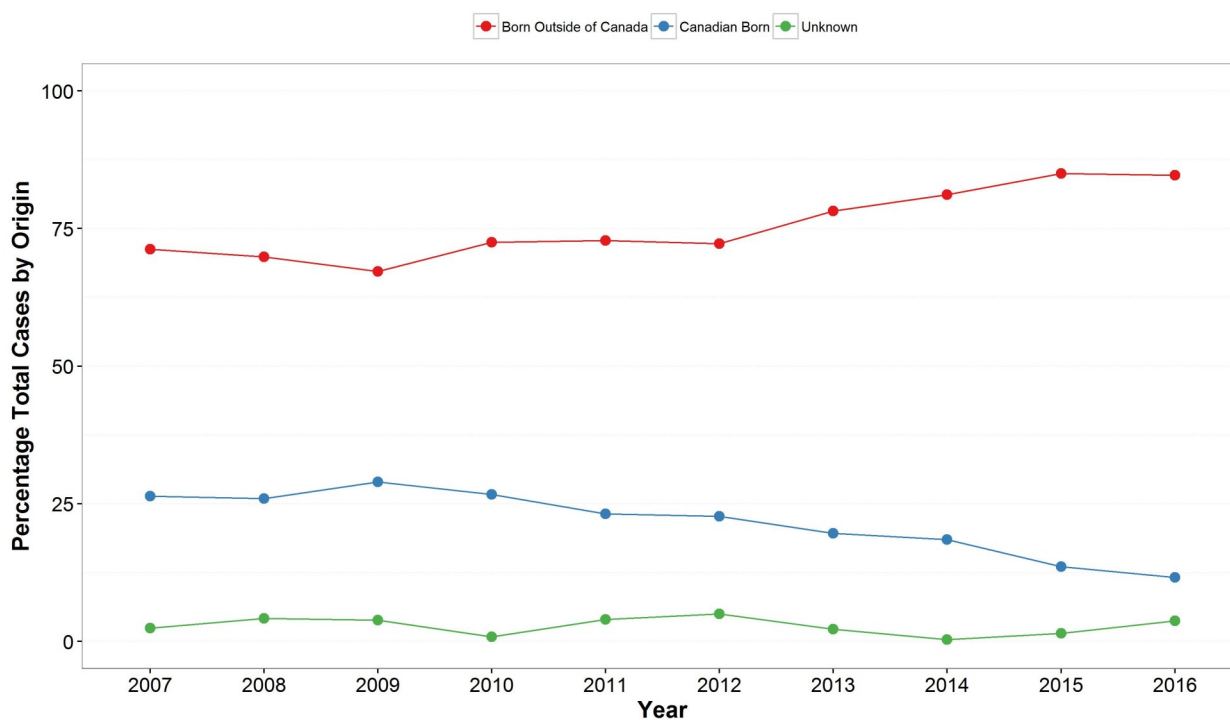
## Active TB by Origin - Percentage Total Cases

13. Percentage of Total Active TB Cases by Origin in BC, 2007 to 2016

Origin	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Born Outside of Canada	71.2	69.9	67.2	72.5	72.8	72.2	78.1	81.2	85.0	84.6
Canadian Born	26.4	26.0	29.0	26.7	23.2	22.7	19.6	18.5	13.6	11.6
Missing*	2.4	4.2	3.8	0.8	4.0	5.0	2.2	0.3	1.5	3.7

\*Unknown or undocumented origin

14. Percentage of Total Active TB Cases by Origin in BC, 2007 to 2016

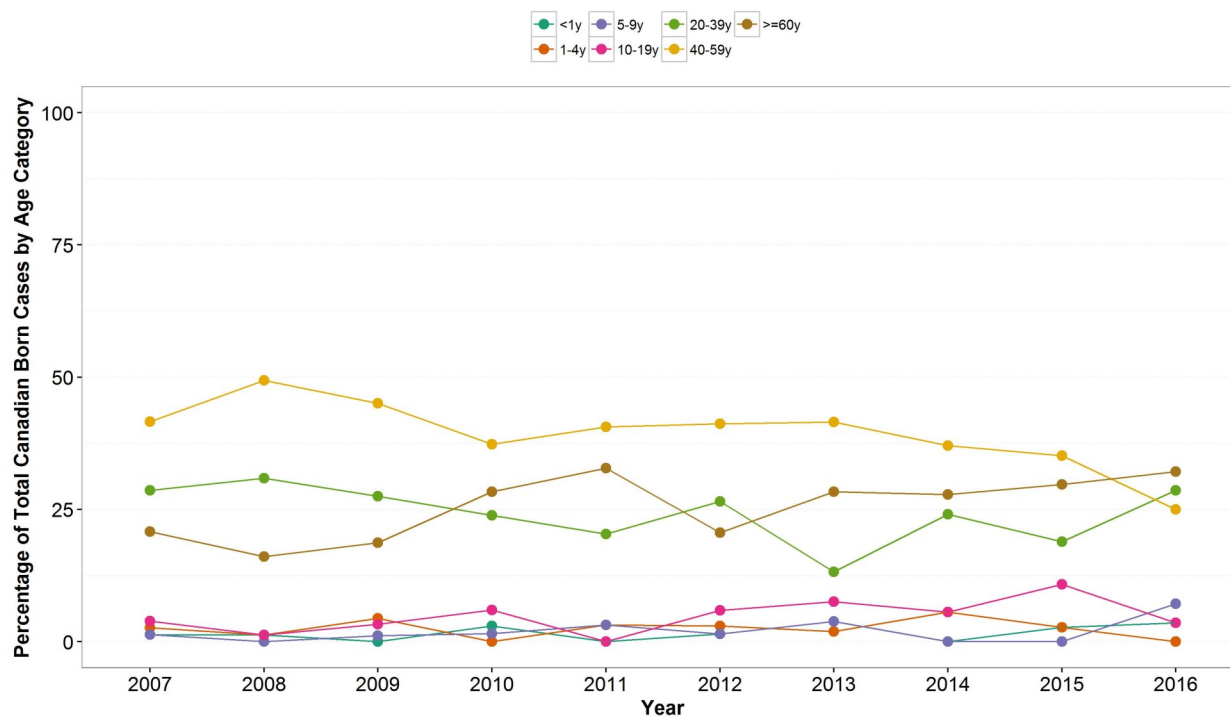


## Active TB Among Canadian Born Populations by Age Group

15. Percentage of Active TB Disease in Canadian Born by Age Group, 2007 to 2016

Age	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<1 yrs	1.3	1.2	0.0	3.0	0.0	1.5	3.8	0.0	2.7	3.6
1-4 yrs	2.6	1.2	4.4	0.0	3.1	2.9	1.9	5.6	2.7	0.0
5-9 yrs	1.3	0.0	1.1	1.5	3.1	1.5	3.8	0.0	0.0	7.1
10-19 yrs	3.9	1.2	3.3	6.0	0.0	5.9	7.5	5.6	10.8	3.6
20-39 yrs	28.6	30.9	27.5	23.9	20.3	26.5	13.2	24.1	18.9	28.6
40-59 yrs	41.6	49.4	45.1	37.3	40.6	41.2	41.5	37.0	35.1	25.0
≥60 yrs	20.8	16.0	18.7	28.4	32.8	20.6	28.3	27.8	29.7	32.1

16. Percentage of Active TB Disease in Canadian Born by Age Group, 2007 to 2016

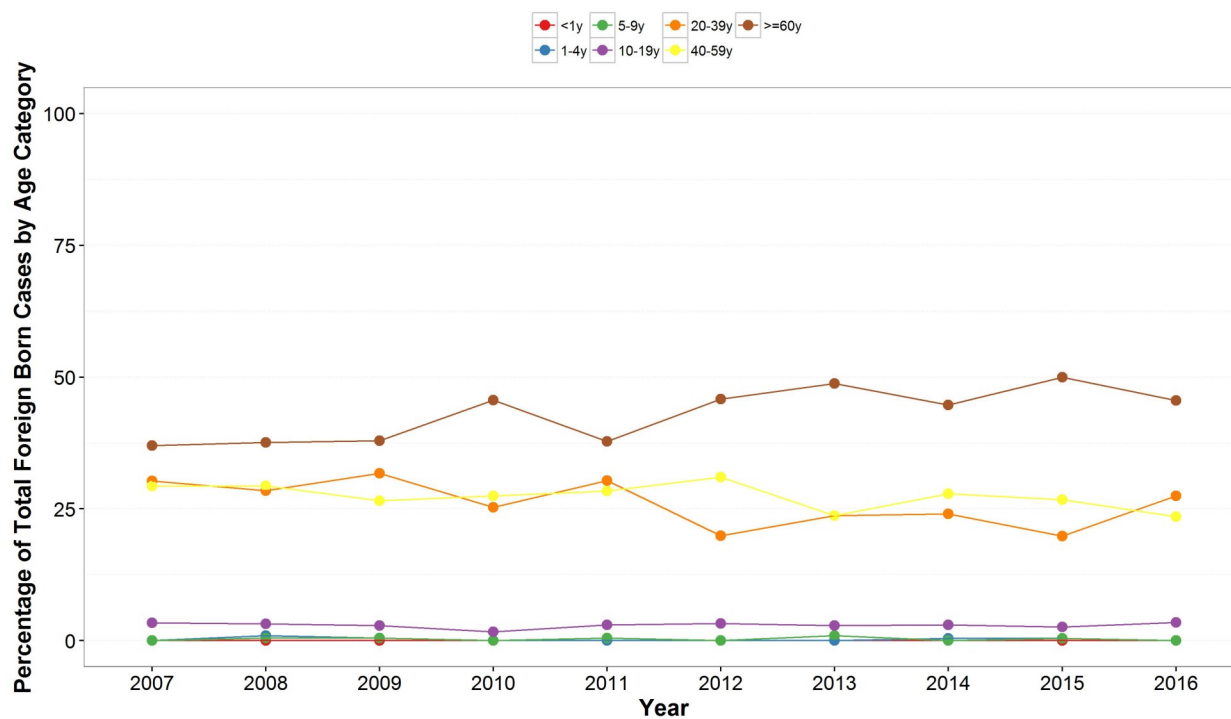


## Active TB Among Populations Born Outside of Canada by Age Group

17. Percentage of Active TB Disease in Cases Born Outside of Canada by Age Group, 2007 to 2016

Age	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<1 yrs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1-4 yrs	0.0	0.9	0.5	0.0	0.0	0.0	0.0	0.4	0.4	0.0
5-9 yrs	0.0	0.5	0.5	0.0	0.5	0.0	0.9	0.0	0.4	0.0
10-19 yrs	3.4	3.2	2.8	1.6	3.0	3.2	2.8	3.0	2.6	3.4
20-39 yrs	30.3	28.4	31.8	25.3	30.3	19.9	23.7	24.1	19.8	27.5
40-59 yrs	29.3	29.4	26.5	27.5	28.4	31.0	23.7	27.8	26.7	23.5
≥60 yrs	37.0	37.6	37.9	45.6	37.8	45.8	48.8	44.7	50.0	45.6

18. Percentage of Active TB Disease in Cases Born Outside of Canada by Age Group, 2007 to 2016



## Active TB by Site of Disease

### 19. Active TB Disease Case Totals by Site of Disease, 2007 to 2016

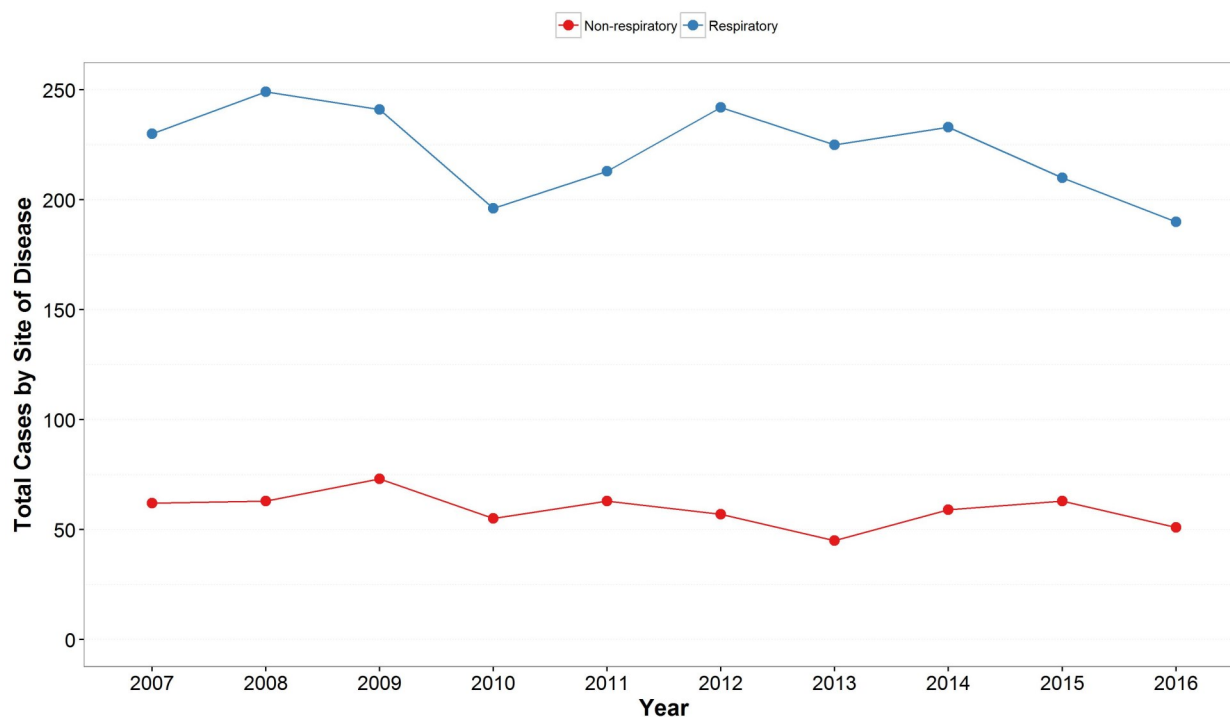
Site of Disease	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-Respiratory	62	63	73	55	63	57	45	59	63	51
Respiratory*	230	249	241	196	213	242	225	233	210	190

\*Respiratory includes all cases defined as pulmonary, primary, miliary, and other pulmonary (see case definition)

### 20. Percentage of Active TB Cases by Site of Disease, 2007 to 2016

Site of Disease	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Non-Respiratory	21.2	20.2	23.2	21.9	22.8	19.1	16.7	20.2	23.1	21.2
Respiratory	78.8	79.8	76.8	78.1	77.2	80.9	83.3	79.8	76.9	78.8

### 21. Active TB Disease Case Totals by Site of Disease, 2007 to 2016





## Treatment Completion of Active Cases

### 22. Active TB Disease by Treatment Completion, 2007 to 2015

Treatment Summary*	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Treatment Completed</b>	<b>219</b>	<b>247</b>	<b>265</b>	<b>205</b>	<b>222</b>	<b>243</b>	<b>231</b>	<b>242</b>	<b>220</b>
— Within 12 Months	181	198	203	172	180	207	202	205	174
— Greater Than 12 Months	38	49	62	33	42	36	29	37	46
<b>Incomplete Treatment</b>	<b>39</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>29</b>	<b>38</b>	<b>20</b>	<b>31</b>	<b>35</b>
<b>Left Province During Treatment</b>	<b>19</b>	<b>15</b>	<b>5</b>	<b>8</b>	<b>12</b>	<b>6</b>	<b>4</b>	<b>11</b>	<b>9</b>
<b>No Treatment Documented</b>	<b>6</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>9</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>8</b>

\*Excluding those diagnosed post-mortem

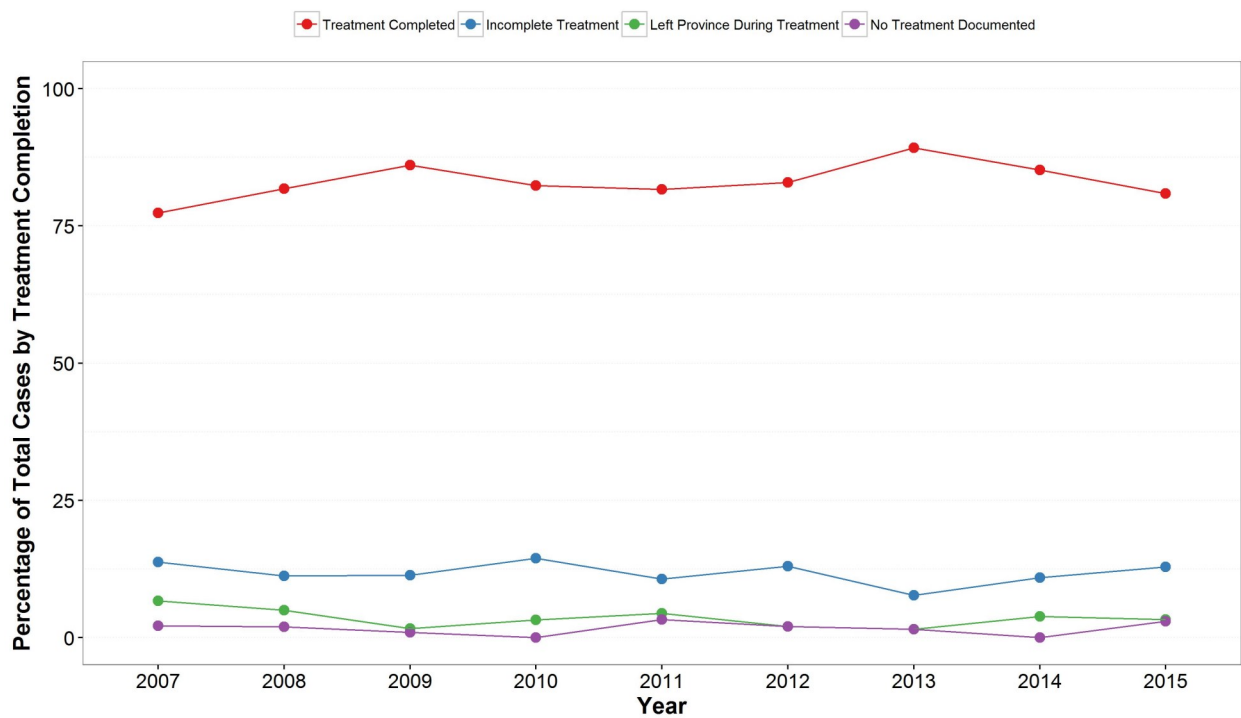
### 23. Percentage of Active TB Disease by Treatment Completion, 2007 to 2015

Treatment Summary*	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Treatment Completed</b>	<b>77.4</b>	<b>81.8</b>	<b>86.0</b>	<b>82.3</b>	<b>81.6</b>	<b>82.9</b>	<b>89.2</b>	<b>85.2</b>	<b>80.9</b>
— Within 12 Months	64.0	65.6	65.9	69.1	66.2	70.6	78.0	72.2	64.0
— Greater Than 12 Months	13.4	16.2	20.1	13.3	15.4	12.3	11.2	13.0	16.9
<b>Incomplete Treatment</b>	<b>13.8</b>	<b>11.3</b>	<b>11.4</b>	<b>14.5</b>	<b>10.7</b>	<b>13.0</b>	<b>7.7</b>	<b>10.9</b>	<b>12.9</b>
<b>Left Province During Treatment</b>	<b>6.7</b>	<b>5.0</b>	<b>1.6</b>	<b>3.2</b>	<b>4.4</b>	<b>2.0</b>	<b>1.5</b>	<b>3.9</b>	<b>3.3</b>
<b>No Treatment Documented</b>	<b>2.1</b>	<b>2.0</b>	<b>1.0</b>	<b>0.0</b>	<b>3.3</b>	<b>2.0</b>	<b>1.5</b>	<b>0.0</b>	<b>2.9</b>

\*Excluding those diagnosed post-mortem

## Treatment Completion of Active Cases

### 24. Active TB Disease Treatment, 2007 to 2015



## Treatment Completion of Active Cases

### 25. Documented Reason for Incomplete Treatment, 2007 to 2015

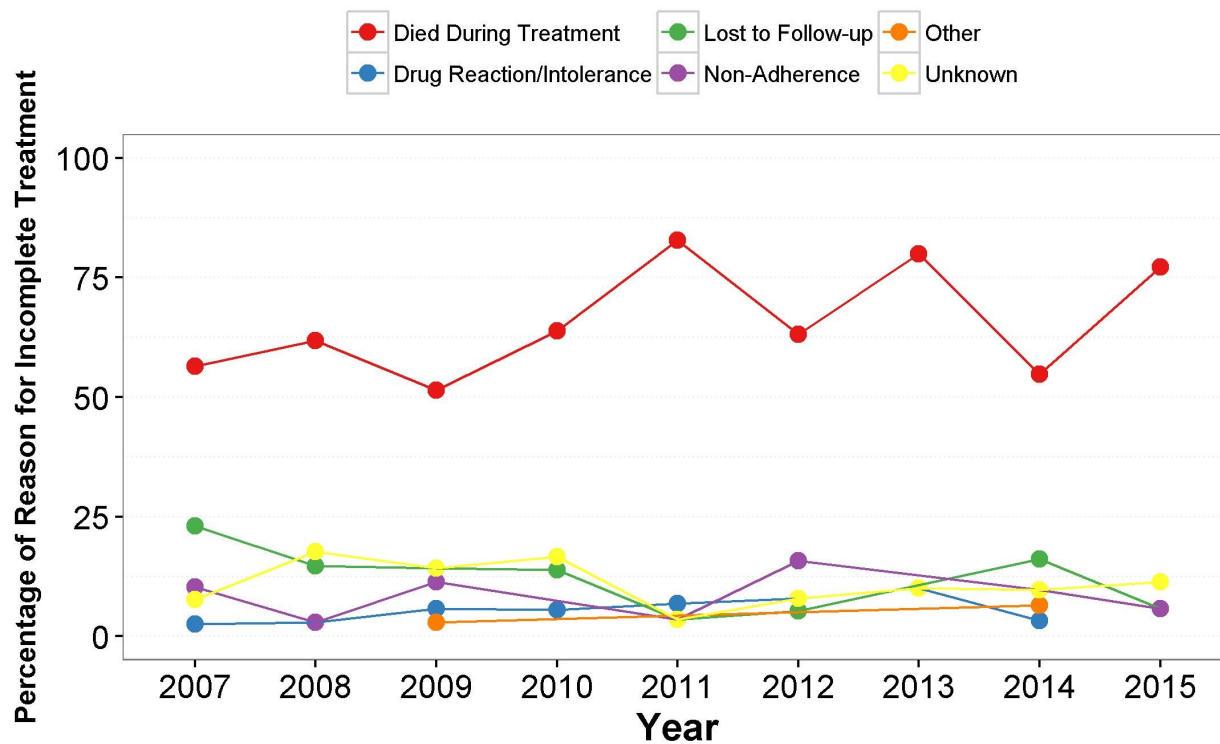
Reason Treatment Ended	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Drug Reaction/Intolerance</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Lost to Follow-up</b>	<b>9</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>2</b>
<b>Non-Adherence</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>2</b>
<b>Other</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>
<b>Unknown</b>	<b>3</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Died During Treatment</b>	<b>22</b>	<b>21</b>	<b>18</b>	<b>23</b>	<b>24</b>	<b>24</b>	<b>16</b>	<b>17</b>	<b>27</b>
— TB Contributed, Not Underlying Cause	8	7	13	6	9	7	7	9	18
— TB Underlying Cause	2	3	1	9	6	4	1	3	3
— TB Unrelated to Death	12	11	4	8	9	13	7	3	4
— Unknown	0	0	0	0	0	0	1	2	2

### 26. Percentage of Documented Reason for Incomplete Treatment, 2007 to 2015

Reason Treatment Ended	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Drug Reaction/Intolerance</b>	<b>2.6</b>	<b>2.9</b>	<b>5.7</b>	<b>5.6</b>	<b>6.9</b>	<b>7.9</b>	<b>10.0</b>	<b>3.2</b>	<b>0.0</b>
<b>Lost to Follow-up</b>	<b>23.1</b>	<b>14.7</b>	<b>14.3</b>	<b>13.9</b>	<b>3.4</b>	<b>5.3</b>	<b>0.0</b>	<b>16.1</b>	<b>5.7</b>
<b>Non-Adherence</b>	<b>10.3</b>	<b>2.9</b>	<b>11.4</b>	<b>0.0</b>	<b>3.4</b>	<b>15.8</b>	<b>0.0</b>	<b>9.7</b>	<b>5.7</b>
<b>Other</b>	<b>0.0</b>	<b>0.0</b>	<b>2.9</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>6.5</b>	<b>0.0</b>
<b>Unknown</b>	<b>7.7</b>	<b>17.6</b>	<b>14.3</b>	<b>16.7</b>	<b>3.4</b>	<b>7.9</b>	<b>10.0</b>	<b>9.7</b>	<b>11.4</b>
<b>Died During Treatment</b>	<b>56.4</b>	<b>61.8</b>	<b>51.4</b>	<b>63.9</b>	<b>82.8</b>	<b>63.2</b>	<b>80.0</b>	<b>54.8</b>	<b>77.1</b>
— TB Contributed, Not Underlying Cause	20.5	20.6	37.1	16.7	31.0	18.4	35.0	29.0	51.4
— TB Underlying Cause	5.1	8.8	2.9	25.0	20.7	10.5	5.0	9.7	8.6
— TB Unrelated to Death	30.8	32.4	11.4	22.2	31.0	34.2	35.0	9.7	11.4
— Unknown	0.0	0.0	0.0	0.0	0.0	0.0	5.0	6.5	5.7

## Treatment Completion of Active Cases

27. Documented Reason for Incomplete Treatment, 2007 to 2015



# Latent TB

## Latent TB Therapy

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 2015 due to the extended duration of LTBI treatment and corresponding delay in reporting. In 2015, 745 clients started LTBI therapy. A total of 80.1% of those starting treatment completed treatment satisfactorily in 2015 (Table 29; Figure 30). Of those starting treatment in 2015, 75.0% of those starting LTBI treatment were born outside of Canada, 23.1% were Canadian born and 1.9% were of unknown origin or had missing data (Table 32; Figure 33). In 2015, 40.9% were aged 40-59 years of age, 27.2% were 20-39 years of age, and 23.8% were 60 years of age or older (Table 35; Figure 36).

### 28. Total Clients Started on LTBI Therapy by Treatment Success, 2011 to 2015

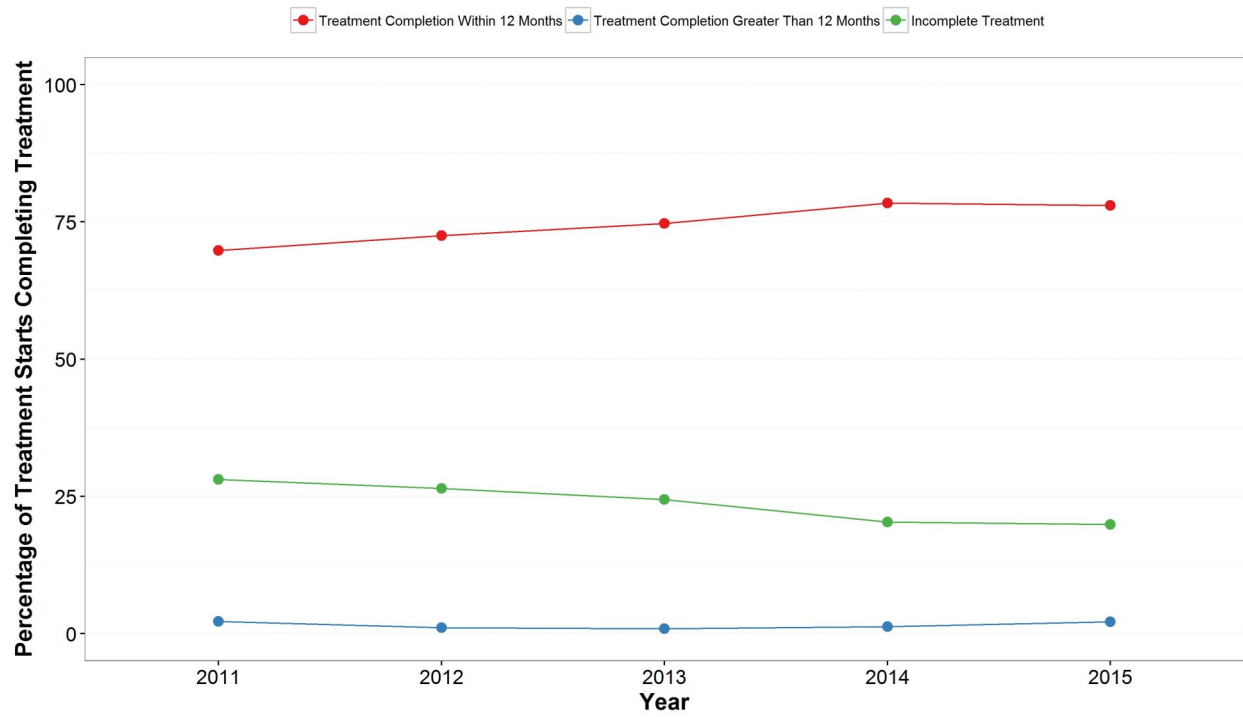
Treatment Summary	2011	2012	2013	2014	2015
Treatment Completion Within 12 Months	542	601	599	626	581
Treatment Completion Greater Than 12 Months	17	9	7	10	16
Incomplete Treatment	218	219	196	162	148

### 29. Percentage of Clients Started on LTBI Therapy by Treatment Success, 2011 to 2015

Treatment Summary	2011	2012	2013	2014	2015
Treatment Completion Within 12 Months	69.8	72.5	74.7	78.4	78.0
Treatment Completion Greater Than 12 Months	2.2	1.1	0.9	1.3	2.1
Incomplete Treatment	28.1	26.4	24.4	20.3	19.9

## LTBI Treatment

### 30. Percentage of Clients Started on LTBI Therapy by Treatment Success, 2011 to 2015



## LTBI Treatment by Origin

### 31. LTBI Treatment Initiation by Origin, 2011 to 2015

Origin	2011	2012	2013	2014	2015
Born Outside of Canada	496	577	571	596	559
Canadian Born	247	228	212	188	172
Unknown*	34	24	19	14	14

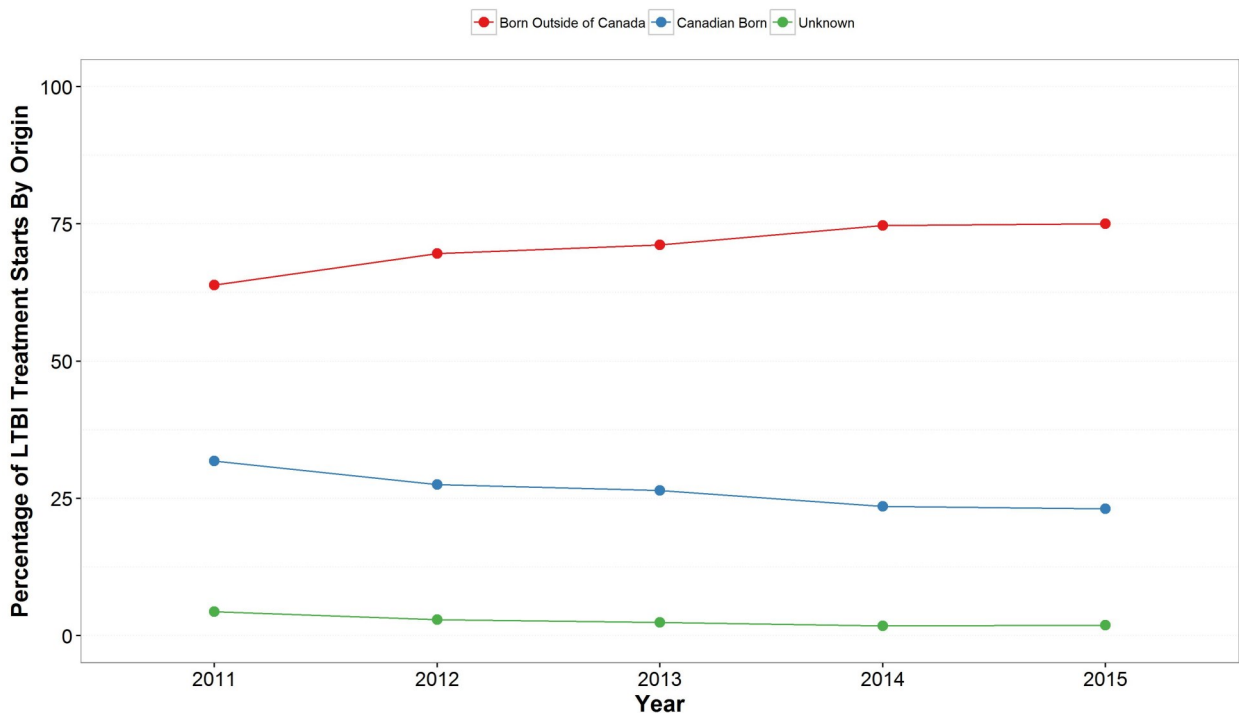
\*Unknown or undocumented origin

### 32. Percentage of LTBI Treatment Initiation by Origin, 2011 to 2015

Origin	2011	2012	2013	2014	2015
Born Outside of Canada	63.8	69.6	71.2	74.7	75.0
Canadian Born	31.8	27.5	26.4	23.6	23.1
Unknown*	4.4	2.9	2.4	1.8	1.9

\*Unknown or undocumented origin

### 33. Percentage of LTBI Treatment Initiation by Origin, 2011 to 2015



## LTBI Treatment By Age Group

### 34. LTBI Treatment Initiation by Age Group in BC, 2011 to 2015

Age Group	2011	2012	2013	2014	2015
<1 yrs	1	1	0	1	1
1-4 yrs	13	3	13	10	10
5-9 yrs	13	9	16	11	13
10-19 yrs	29	32	41	43	36
20-39 yrs	271	245	227	232	203
40-59 yrs	313	384	343	334	305
≥60 yrs	137	155	162	167	177

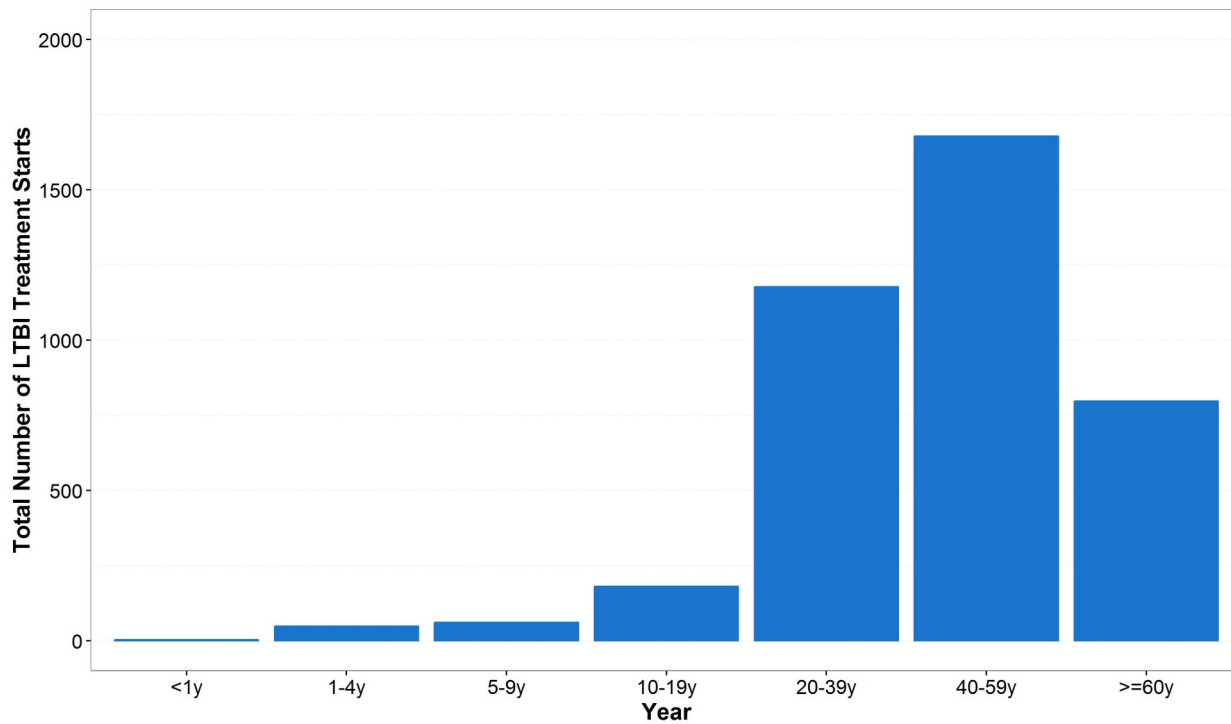
### 35. Percentage of LTBI Treatment Initiation by Age Group in BC, 2011 to 2015

Age Group	2011	2012	2013	2014	2015
<1 yrs	0.1	0.1	0.0	0.1	0.1
1-4 yrs	1.7	0.4	1.6	1.3	1.3
5-9 yrs	1.7	1.1	2.0	1.4	1.7
10-19 yrs	3.7	3.9	5.1	5.4	4.8
20-39 yrs	34.9	29.6	28.3	29.1	27.2
40-59 yrs	40.3	46.3	42.8	41.9	40.9
≥60 yrs	17.6	18.7	20.2	20.9	23.8



## LTBI Treatment By Age Group

36. Total Number of LTBI Treatment Initiation by Age Group in BC, 2011 to 2015



# Endnotes

1. Lönnroth K, Mor Z, Erkens C, Bruchfeld J, Nathavitharana RR, van der Werf MJ, Lange C. Tuberculosis in migrants in low-incidence countries: Epidemiology and intervention entry points. *International Journal of Tuberculosis and Lung Disease*. 2017;21(6):624-37.
2. Vachon J, Gallant V, Siu W. Tuberculosis in Canada, 2016. *Canada Communicable Disease Report*. 44(3/4); 2018 Mar 1: 75-81.
3. BC Centre for Disease Control. Chapter 4 – Tuberculosis Manual. Vancouver: BC Centre for Disease Control; November, 2015. Available at: [http://www.bccdc.ca/resource-gallery/Documents/Communicable-Disease-Manual/Chapter%204%20-%20TB/TB\\_Manual.pdf](http://www.bccdc.ca/resource-gallery/Documents/Communicable-Disease-Manual/Chapter%204%20-%20TB/TB_Manual.pdf)

# Contributors

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- Designated public health nurses in the Health Service Delivery Areas for data collection as part of follow-up to persons testing positive for TB.
- Physicians, health care providers, and public health staff in BC for taking the time and effort to complete and submit case report forms.
- TB Services staff for time spent entering provincial data. Specifically, we would like to thank Gloria Mui and Sukhman Thind for their help with case reporting.
- Sunny Mak from the BC Centre for Disease Control for creating the map of active TB rates.
- Surveillance and Epidemiology Division, Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada (PHAC) for providing the national TB rates.

# Technical Appendix

- All TB surveillance data comes from Panorama Public Health Solution for Disease Surveillance and Management. TB Services commenced using Panorama on March 12, 2016, with data conversion from the previous Integrated Public Health Information System (iPHIS) system. Minor differences in the aggregate counts may be seen if comparing annual report data to that found in iPHIS due to iPHIS->Panorama data conversion. Numbers in this report are subject to change due to data clean up and possible late reporting as this new system is being adopted.
- All geographic breakdowns reflect place of residence at time of diagnosis or time of treatment. Subsequent movement is not reflected in this report.
- Active TB case data and LTBI data was extracted from Panorama on April 11, 2018 and March 20, 2018, respectively.
- 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. PHAC excludes cases diagnosed in temporary BC residents (visitors, students, and people granted work permits), while the BCCDC includes these cases in provincial totals.

# Case Definition

## A. Active TB

Detection and confirmation of *Mycobacterium tuberculosis* complex or clinical presentation compatible with tuberculosis 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* or *M. bovis* (excluding *M. bovis* BCG strain).

### Clinically confirmed case

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

- chest x-ray changes compatible with active tuberculosis;
- Clinical symptoms and/or signs of nonrespiratory tuberculosis (meningeal, 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 has current active disease and historic documentation of previous active disease. Where re-treatment commences within 6 months after end of previous active disease's treatment, the re-treatment is not counted as another active case (consistent with Public Health Agency of Canada's approach for within 6 months re-treatment).

## B. Site of Disease

Starting with 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 respiratory if at least one respiratory site is present. Tuberculosis is 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 eosophogeal tuberculosis)
- cavitation of lung tuberculosis
- intrathoracic lymph node tuberculosis
- nose or sinus tuberculosis

# Case Definition

## Non-respiratory sites

- meningeal tuberculosis
- central nervous system tuberculosis
- meningeal or central nervous system tuberculoma
- 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<sup>3</sup>. As a surrogate, we report on clients who have started LTBI treatment in the TB annual report, which is likely an underestimate of the actual number of LTBI cases.

## D. Treatment Completion

For the purposes of this report, treatment completion is defined as the following:

- **Treatment Completed:** A Treatment Start Date is documented and Treatment Status is reported as “Completed-satisfactory”. Length of treatment is calculated based on the Treatment Start Date and Treatment End Date.
- **Incomplete Treatment:** A Treatment Start Date is documented and Treatment Status is a value other than “Completed-satisfactory” (i.e., “Completed-unsatisfactory”, “Incomplete”, “Other”, “Unknown”).
- **Left Province During Treatment:** Includes transfers within Canada and outside of Canada.
- **No Treatment Documented:** No Treatment Start Date is documented.

# Data Sources

## **Panorama**

All data presented in this report is extracted from Panorama. This is the only database used in the creation of this report. TB Services commenced using Panorama on March 12, 2016, with data conversion from the previous Integrated Public Health Information System (iPHIS) system.

## **Population Data**

Population data for 1993-2016 is based on the BC Stats Population Estimates Database:  
<http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx>.

## **Additional Notes**

### **Classification of Health Region**

Cases are assigned to health regions (i.e., Health Authority or 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.