

BC Strategic Plan
for
Tuberculosis
Prevention, Treatment and Control
2016 Status Report

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Executive Summary

After over a year of discussion and collaboration between community organizations, the Ministry of Health, the BC Centre for Disease Control (BCCDC), the BC Public Health and Microbiology Reference Laboratory, the First Nations Health Authority and the five regional health authorities (HAs), the BC Strategic Plan for Tuberculosis Prevention, Treatment and Control (the TB Plan) was released in June 2012. This policy framework was developed to ensure British Columbians are protected from TB infection, and are provided with state-of-the-art treatment and care if infection should occur. The Strategic Plan supports and guides British Columbia's response to tuberculosis by focusing on five strategic goals over a ten year period: 1) reducing the incidence of active TB; 2) preventing transmission of TB; 3) preventing the progression of latent TB to active TB; 4) ensuring a robust public health response; and 5) ensuring state-of-the-art diagnosis, treatment, and care of active cases.

Achieving the goals of the Strategic Plan requires strong collaborative partnerships. The BC TB Strategic Plan Implementation Committee (the Committee), whose membership consists of representatives from the partner organizations, defined priority actions from the Strategic Plan. Many additional activities that pertain directly to the Strategic Plan, although not identified as priorities by the Committee, have also been initiated, continued or completed by individual partners.

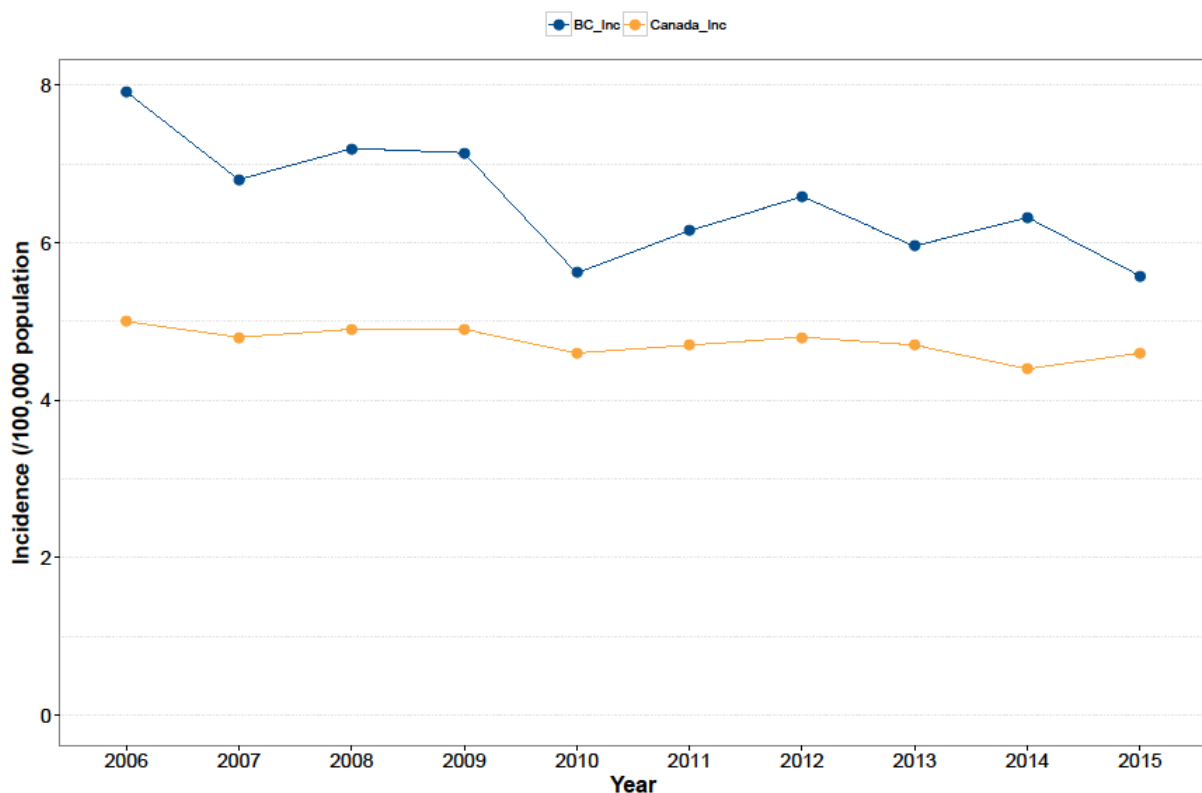
During the **first year**, the Committee established a baseline on which to build the work plan geared towards reaching the goals outlined in the Strategic Plan. Work on service level agreements between partner organizations was begun, a surveillance framework with indicators was designed, and a review identified existing educational materials for nurses. Preliminary work on outbreak planning and ensuring continuity of care began, as did steps towards standardization of contact investigation. During the **second year**, focus continued on the further development of surveillance indicators and revising the annual TB report, developing educational activities and tools, releasing a protocol on outbreak management, continuing work on the service level agreements and implementing the continuity of care protocol. During the **third year**, further progress was made with the service level agreements, the revised Provincial TB Manual was released, mycobacterial diagnostics and access to IGRA was improved, and issues related to low-risk screening activities in long term care were addressed. An update was provided to HOC on October 6th, 2015 on the implementation of the TBSC including a discussion of the strategy in the context of the WHO TB Elimination Strategy for Low Incidence Countries. During the **fourth year**, the committee was engaged in many issues of key importance to TB care both nationally (medication access and shortages, MDR-TB) and provincially (PANORAMA implementation, TB in migrants, NTM care, medical device recalls). Progress was made towards screening upon entry to long-term care and of health care workers. Provincial level programs were formally rolled out - CKD-TB screening and prospective MIRU genotyping. The First Nations Health Authority assumed responsibility for TB Services for Aboriginal Communities.

Plans for the coming year include organizing a mid-point, facilitated face-to-face meeting of the Committee in order to reaffirm the plan, develop concrete and attainable priorities, and assess progress in relation to the goals and milestones.

Introduction

In June 2012, the province's health authorities, BCCDC and the Ministry of Health, through the Communicable Disease Policy Committee, released the *BC Strategic Plan for Tuberculosis Prevention, Treatment and Control* (the Strategic Plan). This document describes an operational strategy developed collaboratively by partners across the health system to reduce the burden of tuberculosis in British Columbia.

Globally, active TB incidence has declined and the level of TB in Canada remains low. In keeping with global trends, the rate in BC has decreased over the past 20 years, yet the provincial rate remains consistently higher than that of Canada based on data up to 2015 (Figure 1). At present, the majority of cases of TB in BC are diagnosed in foreign-born persons from countries with a much higher rate of TB than Canada. Tuberculosis also disproportionately affects some First Nations communities and other marginalized groups such as the homeless.



In October 2012, the BC TB Strategic Plan Implementation Committee was formed and includes senior representatives from all Health Authorities, the BC Centre for Disease Control, the BC Public Health and Microbiology Reference Laboratory, and the Ministry of Health. This committee reports to the BC Communicable Disease Policy Committee and is responsible for coordinating the implementation of actions in the TB Plan and monitoring and evaluating their impact on the health of the population and the health system.¹

The Committee used an iterative process in developing a summary of priority actions taken from the TB Plan to form the basis of the work plan for its' inaugural year, 2012/2013. The Committee initially focused on 10 of the 18 priority actions identified in the TB Plan. In subsequent years, re-prioritization exercises took place to clarify the next actions to address. These selected actions, and the progress made on each, can be seen in Appendix 1. These priority actions provide the framework to measure our progress towards meeting the goals of the TB Plan. The Committee recognizes the need to keep all stakeholders informed of the progress and challenges identified in working towards the goals and milestones of the TB Plan. This report is the fourth in a series of annual formal progress reports. In addition, regularly scheduled updates occur at CD Policy and more recently at HOC in October 2015.

Milestones and Goals

In the TB Plan, Goals have been used to focus and prioritize activities. Milestones are being used to mark the progression of the TB Plan at various stages over the next ten years. The Milestones are used by the Committee to situate broadly the progress toward full implementation of the TB Plan. The three milestones and five goals were gleaned from several documents: the Guidance for Tuberculosis Prevention and Control in Canada (Public Health Agency of Canada), Health Canada's Strategy Against Tuberculosis for First Nations on Reserve, Strategic Planning for Tuberculosis (TB) Elimination in the United States and Prevention and Control of TB Globally (CDC, USA) and the World Health Organization STOP TB strategies. Examples of specific indicators have been defined (*in italics below*) and these indicators have been linked to milestones and goals to establish a baseline and allow consistent measurement of progress.

Three Milestones:

1. By 2022 British Columbia will reduce the incidence of active tuberculosis by 50 per cent.
 - ❖ *In 2011 the incidence of active TB was 6.1/100,000.*
 - ❖ *In 2014 the incidence of active TB was 6.3/100,000.*
 - ❖ *In 2015 the incidence of active TB was 5.6/100,000.*

2. By 2022 British Columbia will reduce the incidence of active tuberculosis in specific high risk and vulnerable groups, by 50 per cent e.g. foreign-born people from TB-endemic countries, HIV-infected people, Aboriginal peoples and homeless and under-housed populations.

¹ The Terms of Reference and Membership of this committee are available for review upon request. These have been updated as of 2017.

- ❖ *Baseline indicators for some of these groups are under development.*
 - ❖ *In 2011 TB incidence in Aboriginal peoples in BC was 19.6 per 100,000 people*
 - ❖ *In 2014 TB incidence in Aboriginal peoples in BC was 16.6 per 100,000 people*
 - ❖ *In 2005-2008 the incidence in foreign-born individuals was 19.2 per 100,000 people*
 - ❖ *In 2014, the incidence in foreign-born individuals was 18.4 per 100,000 people*
 - ❖ *In 2015, the incidence in foreign-born individuals was 16.9 per 100,000 people*
 - ❖ *In 2015, 84.3% of TB cases were in foreign-born people, up from 81.2% in 2014.*
 - ❖ *In 2005-2008 the estimated incidence of TB in HIV positive was 138 per 100,000 people*
 - ❖ *Further updated information on these groups is currently unavailable*
3. By 2017, all performance targets from the [Guidance for Tuberculosis Prevention and Control Programs in Canada](#) will be reached in:
- i) Microbiological diagnosis of tuberculosis
 - ❖ *Specific indicators are under development*
 - ii) HIV serologic testing
 - ❖ *In 2011 78.4% of active TB cases had been HIV tested (self reported or lab confirmed)*
 - ❖ *In 2014 90.0% of active TB cases had been HIV tested (self reported or lab confirmed)*
 - ❖ *In 2015 82.4% of active TB cases had been HIV tested (self reported or lab confirmed)*
 - iii) Treatment of tuberculosis
 - ❖ *In 2011 95.9% of active TB cases had started treatment; 91.1% were successfully treated; 71% were successfully treated within 12 months*
 - ❖ *In 2014 100.0% of active TB cases had started treatment; 83.3% were successfully treated; 69.1% were successfully treated within 12 months*
 - ❖ *In 2015, 97.1% of cases had a treatment start date; of these 82.3% had a successful treatment (95.1% if limited to those with known outcomes); 78.1% of those starting treatment completed treatment within 1-year.*²*
 - iv) Contact follow-up
 - ❖ *In 2011 the average number of contacts per active TB patient was 22. There was wide variation in this number, a minimum of 0 and a maximum of 421.*
 - ❖ *In 2014 the average number of contacts per **respiratory** active TB patient was 10.3 (median=5.0). There was wide variation in this number, a minimum of 0 and a maximum of 97.*
 - ❖ *In 2015, the average number of contacts per respiratory active TB patient was 10.3 (median=6.0). The maximum number of contacts associated with a single respiratory case was 99.*
 - ❖ *Other indicators are under development and will depend on data collection and sharing amongst organizations*

² Data for 2015 treatment completion is derived from data from 2 systems; iPHIS and Panorama. Numbers may change as data quality improves in Panorama.

- v) Targeted screening for active tuberculosis and latent tuberculosis infection
 - ❖ *Indicators are under development.*

- vi) Immigration medical surveillance
 - ❖ *Indicators are under development.*

Five Goals:

1. Reduce incidence of active tuberculosis in British Columbia by 50 per cent by 2022 (to 3.1 per 100,000).
 - ❖ *The baseline (2011) incidence of active TB is 6.1/100,000.*
 - ❖ *The incidence of active TB is 6.3/100,000 (2014)*
 - ❖ *The incidence of active TB is 5.6/100,000 (2015)*

2. Prevent transmission of tuberculosis within BC, in part by addressing social determinants of health such as housing, mental health and addictions treatment.
 - ❖ *Indicators for this goal are under development.*
 - ❖ *Data sources for indicators of social determinants of health need to be identified.*

3. Prevent the development of active tuberculosis in those with latent tuberculosis infection, especially in new immigrants from high prevalence countries.
 - ❖ *In 2011 68% of diagnosed LTBI was in the foreign-born. Only 20% of those diagnosed with LTBI began treatment for it and 71% of those who started treatment completed it.*
 - ❖ *In 2014 73.4% of those **starting** LTBI therapy were in the foreign-born.*
 - ❖ *In 2015 74.5% of those **starting** LTBI therapy were in the foreign-born*
 - ❖ *The proportion of immigrants who are screened for LTBI is unknown. All immigrants are screened for active TB disease.*
 - ❖ *Additional indicators are under development.*

4. Ensure that the public health tuberculosis response is robust, timely and able to meet ongoing and outbreak needs.
 - ❖ *Indicators for this goal are under development.*
 - ❖ *In 2011, an average of 20 contacts identified for each active TB cases when contact tracing occurred; half of these contacts were listed as close (Type 1).*
 - ❖ *In 2014, an average of 10.3 contacts identified for each **respiratory** active TB case when contact tracing occurred; 42.7% of these contacts were listed as close (Type 1).*
 - ❖ *In 2015, an average of 10.3 contacts identified for each respiratory active TB case when contact tracing occurred; 47.1 % of these contacts were listed as close (Type 1).*

5. Ensure state-of-the-art laboratory programs, treatment, and care of people who develop tuberculosis to improve outcomes and reduce the risk of spread.
 - ❖ *Indicators for this goal are under development.*

Priority Actions, Progress to Date and Next Steps

To meet the goals of the Strategic Plan, the Committee identified eighteen priority actions, ten of which were begun during the first year. Over the subsequent years, activities have continued to focus on those priority actions previously initiated and at various stages of completion.

- 1. Priority Action:** Develop service level agreements (SLA) that define service level and resource allocation expectations of each partner organization based on agreed upon roles and responsibilities.

Progress to date: Lead is Noorjean Hassan with additional support provided by Cheryl Prescott. In 2014, a template SLA was created and finalized by representatives from Interior Health and BCCDC. It contains a detailed description of services and roles between BCCDC and Interior Health, and schedules on a data sharing/input, supplies/budget, confidentiality, and privacy. This template has served as the basis for subsequent discussions. The SLA with IH is in its final stages but is on hold due to PANORAMA. The SLAs with Island Health and Northern Health were also in process but placed on hold due to PANORAMA. The SLA with FHA was deferred due to roll out of PANORAMA. However, focused discussions between FHA and BCCDC have led to a shift in roles and responsibilities specific to the TB Travel Clinics. A draft SLA was shared with VCH with an invitation to begin the process. BCCDC and FNHA have finalized a contract agreement with primary deliverables including physician clinical management consultation, TB epidemiology position, data access and a surveillance work-plan. Respective roles and responsibilities have been outlined and a periodic review of the contract agreement defined. Workflow structure for management of TB evaluation, case management and contact investigation between BCCDC and FNHA developed; interface of RHA TB program role in place and to be reviewed.

Next Steps: Clarify leadership and commitment towards this priority action item. Clarify status of the SLA between Interior Health and BCCDC. Re-engage with work on the SLA between BCCDC and Island Health, and BCCDC and Northern Health and BCCDC and Fraser Health. Work to identify representatives from Vancouver Coastal Health and the Provincial Laboratory to initiate the process with each of these stakeholders. Points of contact and notification protocols are informally in place with VIHA, NHA and IHA; FHA and VCH are pending.

Goal addressed by this Priority Action: Goal 4.

- 2. Priority Action:** Develop a Public Health Lab Network to improve testing capacity in HA laboratories.

Progress to Date: Leads are Drs. Mel Krajden (TB/Mycobacteriology culture and molecular diagnosis) and Muhammad Morshed (TB Interferon Gamma Release Assay). The TB/Mycobacteriology Laboratory at the BCCDC Public Health Laboratory continues to offer prospective MIRU genotyping for all new *M. tuberculosis* isolates to assist public health efforts

to identify transmission related events and support the BCCDC and HA partners to control TB in BC. A spread sheet of MIRU clusters has been adapted from the literature and cluster summaries can now be automated. Pro-active investigation of potential laboratory cross-contamination is ongoing using MIRU. The TB/Mycobacteriology Laboratory has implemented new rapid TB identification methods and optimized its algorithm for the identification of Mycobacterium species including *M. tuberculosis*. Whole genome sequencing of TB isolates will be performed on a research basis to assess the utility of genomics to patient care (resistance profiling) and transmission tracking. Extracted nucleic acid from MIRU tested samples from 2015 is now available for WGS. The TB IGRA test is now being offered province wide. This has involved partnerships with the HAs, Medical Microbiologists, TB physicians, the Provincial Renal Agency and BC Transplant. Province wide sample collection and processing for IGRA is available. Testing has expanded to include all new dialysis patients in addition to selected at-risk patients. A validation study of IGRA collection sites (venipuncture, AVF, CVL) is underway. Expansion to transplant patients remains under negotiation. . An investigation, by the TB Laboratory in collaboration with CPS Surveillance, of a potential non-tuberculous mycobacterium contamination event was completed in the context of cardiac surgery patients and heater-cooler devices.

Next Steps: The BCCDC Public Health Laboratory will continue to work with HA partners to improve TB testing and reporting across the province. Linking data between the MIRU clusters and PANORAMA will be investigated. First Nations community-based field IGRA pre-analytic blood collection occurred through the TBSAC program and persons residing in First Nations communities have benefited from increased IGRA blood collection sites. There are planned ongoing discussions with the First Nations Health Authority for IGRA access in community.

Goal addressed by this Priority Action: Goal 5.

3. **Priority Actions (2):** Utilize the BC Centre for Disease Control TB Manual, Canadian TB Standards and ATS Guidelines as resources to implement comprehensive screening for TB and LTBI. Identify existing TB educational programs for health care practitioners that may be adapted for use in BC.

Progress to date: Lead was Manav Gill – future lead is Shaila Jiwa. The focus of these priority items has landed on educational tools and opportunities for TB service providers in BC. A provincial nursing education session was delivered in January 2016 on the updated provincial TB Manual. The TB Screening DST went under thorough review by a provincial working group with BCCDC as the lead. The new TB Screening DST was released in September 2016 with a continuing nursing educational session completed in October 2016. The TST on-line course official launch was March 2016. To date, 319 individuals have completed the course. Educational activities continue to occur annually in recognition of World TB Day, March 24th with the goal of

increasing public awareness of the burden of TB. Translated versions of the “TB Skin Test Fact Sheet” and “LTBI Fact Sheet” are now available on the BCCDC website in Korean, Punjabi, Simplified Chinese, Tagalog, and Vietnamese. Initial BCCDC-FNHA discussions regarding risk factor determination (Aboriginal identity; residence on reserve; residential school attendance) for Indigenous people of BC will inform screening protocols. Initial BCCDC-FNHA discussions regarding post BCG discontinuance evaluation as current screening protocols for on-reserve residents developed as BCG discontinuance surveillance activity.

Next steps: Develop a streamlined a process for updating the Provincial TB Manual. Evaluate the provincial TB online courses and ensure alignment of these courses with the provincial TB manual. Explore the feasibility for a TST preceptorship course. Update the BC HealthLink Files. Explore physician education needs and tools. Address approach to screening in educational institutions. Coordinate provincial World TB Day activities. Review regional approaches to TB testing in elderly and case interview tools. Advocate access to CPS educators to assist with evaluating, reviewing and developing robust HCP TB educational resources. Continue initial discussions between BCCDC and FNHA regarding risk factor determination and BCG discontinuation evaluation. Ongoing FNHA internal revisions for LTBI treatment support interventions based upon prioritization of persons at high risk for progression to TB disease. An evaluation plan is in process for First Nations LTBI treatment cascade through utilization of internal FNHA tracking database.

Goal addressed by this Priority Action: Goals 2 and 4.

4. **Priority Action:** Develop, implement, and evaluate an evidence-based provincial plan for school, volunteer, residential care and occupational health screening.

Progress to date: Lead was Dr. Maureen Mayhew – no current lead identified. Using the previously conducted literature review of low-incidence TB screening programs and analysis of data from the Regional Health Authorities with the most TB cases in BC, this working group proposed changing TB screening guidelines in newly admitted clients to long-term care over 60years of age to include a minimum of a symptom check and a chest x-ray if symptoms are present. This change was endorsed by CD Policy in November 2015 and has been flagged for update in the next version of the provincial manual. The group has also analyzed available data on routine occupational screening for those working in healthcare institutions and recommended base-line health care worker (HCW) screening that would follow a HCW across jurisdictions. In place of annual screening or repeated screening at hire, focus would shift to post-exposure contact investigation and comorbidity. A briefing note outlining prospective changes for HCW and volunteers was reviewed, updated and endorsed by CD Policy in July 2016. Roll-out has been stalled as this update is not currently reflected in the Provincial TB Manual. More importantly, there is no shared database for HCW across the health authorities. Initial discussion between FNHA-BCCDC regarding evaluation of existing screening protocols for on-reserve schools, residential care facilities and occupational health screening.

Next Steps: A new lead of this working group needs to be identified. This work needs to be added to the revised provincial manual. Confirm status of communication and implementation across regions. Screening in educational institutions and correctional facilities was discussed at the TBSC and has been flagged to be addressed next. Clarification of evaluation plans.

Goal addressed by this Priority Action: Goal 2.

- 5. Priority Action:** Ensure that hospitals, correctional facilities, and public health work together to put community follow-up plans in place prior to individuals being discharged or released.

Progress to date: There is currently no lead on this item. A discharge checklist and flow chart was finalized by the Discharge Working Group and received approval for piloting by the Committee. Documents were disseminated to partners in November 2014 and posted on the BCCDC website. Initial feedback after the 6 month pilot phase brought attention to the complexity of the documents as well as responsibility. FHA further adapted the documents based on local feedback in 2016 and these revised documents were again shared with the Committee. FHA continues to work through the checklists with public health, infection control and acute care – this has led to better awareness around the discharge of patients. A specific transfer of care document is available in PANORAMA for improved information sharing between BCCDC and FHA. Workflow structure for discharge coordination between BCCDC and FNHA developed; interface of RHA TB program role in place and to be reviewed.

Next steps: A new lead for this working group needs to be identified. Confirm status of implementation across regions into acute care. BCCDC will partner with regions to facilitate the dissemination and use of these tools at the time of transfer from acute care. Further feedback, revision and evaluation of these tools should be considered but this will require the identification of a new lead and re-convening of the WG. In October 2017, transfer of provincial corrections health services will enable opportunities to review transitions in care between provincial corrections facilities and the community.

Goal addressed by this Priority Action: Goal 5.

- 6. Priority Actions (2):** Establish a framework through which monitoring and evaluation priorities can be established, and develop a mechanism for sharing monitoring and evaluation results with stakeholders. Formalize a process that communicates TB surveillance data between the BCCDC, PHMRL and HAs in a timely manner.

Progress to date: Lead is Dr. Jason Wong, currently delegated to David Roth. The TB Surveillance Working Group has continued to meet every three months. The TB Surveillance Working Group helped guide provincial surveillance through the transition from iPHIS to Panorama (go-live March 2016). The BC TB Surveillance team worked in collaboration with the

Panorama team to convert iPHIS data into Panorama. This converted data was then validated by the BCCDC TB team. In addition, Provincial TB surveillance has worked with the Public Health Analytics group at the BCCDC to implement the TB module of CD Mart which provides Health Authorities with access to case counts, treatment data (both active disease and LTBI treatment), and basic case-contact data. The 2014 TB report was released in 2016. A 2015 TB report is currently under final review by the PHO office (as of June 13th 2017) and will be released in the upcoming weeks. Quarterly reports continue to be shared across all jurisdictions. In addition, the TB surveillance program is working with PHMRL to develop a quarterly case-genotype dataset to facilitate review of potential TB case clusters. Attempts were made to engage a sub-working group looking at minimum data sets for TB (active, latent, contacts, immigration) using the RCD template/framework provided from CD Policy. The datasets could have both surveillance and clinical/public health value. Although co-chairs and representatives were identified, this group did not gain traction. Contract agreement between FNHA and BCCDC has been finalized including TB epidemiology position and surveillance work plan. Data access permissions agreement in place for annual and quarterly report compilation for BC Aboriginal populations, PHSA Aboriginal Data Steward, FNHA and BCCDC. A collaborative process for analysis, interpretation and dissemination of Aboriginal data for TB surveillance has been established involving representatives from BCCDC, FNHA, and the Office of the Provincial Health Officer.

Next steps: Finalize the TB Mart validation. Develop the 2016 TB report off our novel surveillance datasets. Work to incorporate TB Provincial indicators into the TB Mart structure to allow for timely reporting of key indicators. Continue to collaborate with the FNHA to develop FN specific reporting. Clarify the need for and role of the Minimum Data Set WG.

Goal addressed by this Priority Action: Goal 4.

7. **Priority Action:** Develop a protocol to identify clusters and outbreaks; manage and evaluate response to TB outbreaks and ensure a timely and seamless approach to TB outbreak management.

Progress to date: Lead is Dr. James Johnston. The draft outbreak protocol was revised, circulated to the Committee, and completed in January 2015. This version of the Provincial TB Outbreak Protocol was distributed to committee members to pilot over the year. The working group was dissolved after completion of the protocol. More specific criteria on how to determine the end of an outbreak was requested from one HA who was referred to another HA that has been satisfied with use of the document. No further feedback was received. The document has not been modified and remains available on-line with feedback welcome.

Next steps: Determine need for review of pilot implementation of the Provincial Outbreak Protocol and revise/finalize as necessary. Consider outbreak protocol when determining appropriate reporting of genotyping/genomics.

Goal addressed by this Priority Action: Goal 4.

8. **Priority Action:** Increase the use of a standardized contact tracing model.

Progress to date: Co-leads are Drs. Murti, Cook and Gustafson. Contact tracing activities are ongoing in the health authorities. Collaborative team meetings between BCCDC, VCH and FHA at regular intervals are ongoing. The provincial TB manual was released in November 2015 and includes extensive revisions to the contact investigation section. A collaborative contact investigation evaluation has not yet begun. Challenges include the absence of an agreed upon minimum data set for contact investigation, as well as a functioning, shared database that can be used both for contact management and analysis. VCH has completed a contact investigation review and is working on to transfer information to a new database. FHA has completed an evaluation of regional contact investigation between April 2013 and May 2015. Changes to contact follow-up since May 2015 include changes to the FHA nursing team model and more recently, changes to the Panorama TB module that will impact next steps. BCCDC has reviewed the early activities associated with transfer of contact investigation to the lower mainland RHAs. An LTBI specific clinic was trialed and evaluated. An LTBI data quality review was completed. An LTBI cascade of care for contacts referred to the BCCDC from the lower mainland RHAs was also recently reviewed.

Next Steps: Share the results of individual evaluations with the Committee at the mid-point review. Confirm the need to broaden the use of a standardized approach in all regions of BC. Continue to work towards a resolution for contact data management. Consider a collaborative provincial contact investigation report.

Goal addressed by this Priority Action: Goal 4.

Outstanding Items

The following priority items from the provincial TB strategy have not yet been formally addressed by the Committee. In order to support this work in the coming years, consensus needed to be reached on the prioritization of these items, as well as the process for removing, consolidating and/or including new items for consideration. Of note, a number of these items are currently being addressed by activities outside of the Committee led by partner organizations (p. 16-17) and action items will be broadly reviewed at the mid-point planning session.

1. Broaden provincial awareness of TB. Reduce associated stigma through community strategies.
2. Develop, implement and evaluate strategies aimed at improving LTBI screening and treatment uptake and adherence. Describe current state of LTBI and active TB screening and treatment.

3. Develop guidelines for identifying and treating people at high risk for non-adherence and those not adhering to therapy for TB and LTBI. This may include, but is not limited to, expanding the use of DOT and DOPT strategies.
4. Improve management of TB in high-risk populations.
5. Work with the First Nations Health Authority (FNHA) including the FNHA TB Services program to ensure collaborative service planning for the First Nations people in BC within the context of the TB strategic framework.
6. Establish protocols regarding First Nations TB surveillance data management.

The latter 2 items are actively being addressed by the FNHA and content related to progress in these areas is interwoven into the priority items outlined on pages 8 to 13. For example, related to surveillance, a BCCDC Epidemiologist has been hired to conduct TB surveillance among Aboriginal Peoples, through a contract between BCCDC and FNHA. A collaborative process for analysis, interpretation and dissemination of Aboriginal data for TB surveillance has been established involving representatives from BCCDC, FNHA, and the Office of the Provincial Health Officer. The Epidemiologist has obtained access to the PANORAMA Aboriginal identifiers through PHRDW. Validation of Aboriginal information in CD Mart is in process. Production of a TB Annual Surveillance Report for Aboriginal Peoples 2015 and 2016, and reinstate reporting of Aboriginal-specific results in Quarterly Reports for TB is in process.

Challenges and Solutions

The Committee continues to identify a number of challenges to the implementation of the TB Plan. Significant effort has been dedicated to aligning differing expectations of members, facilitating communication pathways to relevant stakeholders, and overcoming logistical constraints including infrastructure and surveillance/clinical systems.

Working without dedicated funding or consistent secretariat support has been difficult, especially given emerging and competing public health priorities over the past years (Ebola, measles, influenza and most recently, the overdose crisis). To date, secretariat support has been provided in-kind by BCCDC. Alternate sources of funding to support the activity of the Committee are not readily available and are also time-consuming when sought.

Strategies to improve communication and engagement have been identified. However, ongoing challenges exist in retaining a consistent, engaged membership which is necessary given the time-frame of the Plan. There has been some fluidity in the co-chair position and significant changes in membership related to competing priorities and/or staff turnover. A formal membership review was completed in 2015, as well as a review of the TOR. The TOR was also more recently updated in early 2017 to reflect the feedback of TBSC members. A template has been developed to guide the formation of new working groups within the TBSC. However, no new working groups were struck in 2016. Recently, the

Committee was supportive of including a representative from the Yukon Territory. Other guest attendees have included representatives from Pharmacy Services and PANORAMA.

The sharing of documents is also a challenge. Currently membership, minutes, working group TORs and draft documents are kept on “sharepoint” but this is limited by access agreements and adequate secretariat support (no access for Yukon or FNHA). The BCCDC website is another repository for tools, documents, and reports.

The ongoing impact of PANORAMA implementation on activities of the TB Strategic Plan must be acknowledged. PANORAMA go-live was in March 2016 and participating agencies continue to struggle with the day-to-day impact on workload, efficiency, and access to data. There are also additional challenges when considering information sharing across health authorities with changing and/or multiple systems.

Laboratory consolidation and changing laboratory leadership across the province makes it difficult to implement large-scale improvements in TB testing. There is a need to clarify the role of the BCCDC Public Health Laboratory in supporting TB testing in BC as part of public health network.

Further effort is required to determine the most effective way for the BCCDC, the Provincial TB Lab and regional health authorities to work together with the First Nations Health Authority to address TB both on- and off-reserve. FNHA has identified a number of challenges including: variation in TB management by the RHAs, particularly in regard to Panorama utilization; awareness and understanding of FNHA’s organizational role in the Province; data access, quality and epidemiology resources required to conduct reviews; and IGRA access. With respect to the latter, there is an interest in the exploration of solutions to increase IGRA blood collection access to First Nations communities in Northern BC and the Northwest Interior region. Field-based IGRA blood collection was a “stop-gap” solution with the potential for opportunistic rather than targeted screening, threats to specimen integrity, and resource limitations. FNHA is creating an IGRA access expansion proposal which will include justification based upon data review of TST-IGRA incongruence and contact investigation TB screening outcomes. Of note, CD protocol agreements are in place between FNHA and the RHAs.

In addition, there are a number of significant actions contained within the TB Plan that were not categorized as “priority actions”; all available efforts are currently focused on the priorities, but the other actions are also crucial to preventing, treating, and controlling TB in British Columbia.

Finally, a number of items that are not directly linked to the original Strategic Plan arise and are important and must be addressed in such a forum, for example the management of non-tuberculous mycobacterial infections. However, they can detract for focus on the original priority items.

Additional Activities

Some additional activities, yet to be prioritized by the Committee, that pertain to specific goals of the TB Plan are currently being addressed by individual organizations and are reported in this section.

Pertaining to Goal 3, some current studies in the foreign-born include describing TB in that population and describing characteristics of those with active TB over a specified period of time, specifically medical

risk factors and risk by country of origin. This involves an analysis of a cohort of over 1 million foreign-born individuals landing in BC between 1985 and 2013. Several provincial and national databases have been linked in order to perform comprehensive epidemiologic analysis of TB risk and TB screening in this population. Eventually, the team will develop an evidence-based TB risk score for migrants. Plans are underway to develop a foreign-born TB report specifically tailored to the TB Strategic Plan with input from committee members. A research project is also underway to identify the most cost-effective screening strategies for LTBI in the foreign born. Pertaining to Goal 1 and 3, TB screening guidelines for those with HIV infection at baseline and ongoing were developed with the CFE.

Pertaining to Goals 3 & 5, evaluating the use of IGRA in several settings - remote, foreign-born and, federal corrections facilities – should enable us to better diagnose LTBI and determine those who require treatment for it. An IGRA incubator has been purchased by the provincial program to ensure enhanced access to testing in the most marginalized populations. Guidelines for use of the incubator are under development and will likely increase use of this tool. Province-wide TB screening of all new dialysis patients using IGRA has been implemented and has been a collaborative effort of the BCCDC, Provincial Renal Agency, and the Provincial Laboratory. An evaluation of this targeted screening program is in the planning stages – with the focus on reporting the process and work done to date, outcome of the screening program as it relates to the diagnosis and treatment of LTBI, and its impact on active TB incidence in this high-risk group. Similar work is ongoing with BC Transplant to develop consistent, systematic and evidence-based screening strategies in solid-organ transplant donors and recipients with special attention to preventing donor-derived TB. Algorithms for evaluating living/deceased donors and recipients (adults and children, organ type) and treating those with LTBI, have been developed that include the appropriate use of IGRA in this patient population. A business case to introduce IGRA is currently with BC Transplant. Initial conversations are underway to address similar issues with the Leukemia/BMT program.

Pertaining to Goal 3, two randomized controlled trials a) the effectiveness of a shorter course of LTBI therapy and b) whether text message reminders are helpful in completing LTBI treatment have completed enrollment and are currently in the analysis phase. The results of these studies should inform shorter course therapy in at-risk individuals and identify additional tools to support treatment of LTBI. Early experience with text messaging has led to the expansion of the study protocol to include a pilot of this service in patient with active TB, and an expansion of mHealth to support care provided by the TB Outreach program (WeTel Outreach). CIHR co-investigator meetings are ongoing to plan the current project: “Evidence to action for Canadian and global mobile health (mHealth) communication to promote patient engagement in care: a rigorous implementation science approach”. Collaborative work with McGill University has now expanded to include the RCT ACT4: "Tackling the two greatest obstacles to Tuberculosis elimination: Treatment of latent infection and drug resistant disease". This work aims to identify the appropriate treatment of INH resistant TB as well as enhancing the public health impact of contact investigation. A detailed review of contact investigation activities at the BCCDC has included an in-depth look at the LTBI cascade of care and interviews of clients and health care providers on their experiences with contact follow-up.

Other types of studies pertaining to Goal 3 include a multi-lingual survey to better understand TB knowledge in all clients, including the foreign-born, in the TB clinic. This survey guided focus group discussions with messaging incorporated into a multi-lingual health promotional video (www.bccdc.ca) that addresses the differences between active TB and LTBI. Survey outcomes including gaps in LTBI knowledge were recently published. An evaluation of the impact of the video has been published with the results confirming that video is the preferred means of knowledge translation in Chinese migrants.

Pertaining to Goal 2 and 4, a spatial and cohort cluster analysis of active TB in BC has been completed. This study, published in 2016, described the differences between spatial and cohort clusters and identified the need for differing public health responses. Analysis of historical genotype clusters in BC is complete and an associated manuscript has been submitted for publication. These results confirm that there is a significant amount of strain diversity in BC and that many large clusters contain both Canadian-Born and Foreign-Born people. A protocol for implementation of TB genomics is ongoing.

Pertaining to Goals 1, 2 and 3, The First Nations Health Authority now leads the Tuberculosis Services for Aboriginal Communities (TBSAC) program and there has been no change to function or activities.

Pertaining to Goals 1 and 3, the feasibility and opportunities for video-assisted therapy for active TB and LTBI is still under investigation. Discussions were held with national (Toronto) and international (San Diego) partners in order to facilitate implementation in BC. TB tele-health services are provided in Island Health, Interior Health (in the context of the dialysis screening program), and in the Yukon. WeITel Outreach has a built in vDOT component to trial this mode of medication adherence in active TB patients at the BCCDC TB clinics. Evaluations of these pilot projects will be conducted.

Summary

The goals of the Strategic Plan are squarely focused on reducing the burden of tuberculosis in British Columbians. This involves the continued rapid diagnosis, appropriate isolation and effective treatment of active cases (Goal 1). However, as case numbers decline the priority shifts to preventing LTBI from becoming TB disease in newly infected persons (recent TB contacts) and in those with a high likelihood of infection (most often migrants) and/or risk factors for progression to disease (CKD, HIV). The first overarching goal of reducing the incidence of active tuberculosis by 50 per cent can only be achieved by preventing and treating TB infections (Goals 2 and 3). Goals 4 and 5, and the objectives and actions supporting them, intend to make BC a world-class jurisdiction for the diagnosis, treatment, and prevention of tuberculosis. Continued collaborative approach to planning and practice, along with regular knowledge exchange opportunities, will help staff and the public work together to provide the best and most efficient TB services possible. Canada is considered a low-burden TB country by the WHO. A formal mid-point review will provide insight into the plan's progress so far and the next steps to move towards TB elimination in BC, which is in support of global expectations.

Status Report: BC Strategic Plan Implementation
July 11th, 2017

Appendix: Strategic Plan Work Plan (updated as of November 2016)

BC Strategic Plan Implementation Priority Action Items																	
BCDC TB Services																	
Reporting Period: To be used in reporting on the Annual TBCC Report																	
Working Group	Priority Action #	Priority Action Description	Component Tasks	Projected Start Year	Planned Completion Date	Year Origin	Lead BCDC/RIA	Is it enabled?	TOR	Deliverable Lead	Work Plan Item Completed	Implementation Status	Implementation Completed	Dissemination Status	Dissemination Completed		
BCDC Priority Actions																	
Infectious	3	Develop the National Lab and the BC CDC evidence based and appropriate (EBA) risk data services and related decision support tools based on agreed upon roles and responsibilities.	Develop and approve templates for service level agreements (popular templates) by MA, Health Agreements	2013	Oct-14	2013	Nancy G/US/PA	Yes	3 Years at 2017	Final Review of documents on	Final Review of documents on						
Mandate/Health				2014-15	2014-15	2014	Nancy G/US/PA	Yes									
Phila				2014-15	2014-15	2014	Nancy G/US/PA	Yes									
VCM				2014-15	2014-15	2017	Nancy G/US/PA	Yes									
Phu				2014-15	2014-15	2016	Nancy G/US/PA	Yes									
NHA				2014-15	2014-15	2014	Nancy G/US/PA	Yes									
Respiratory Nurses Group	9	Identify existing TB educational programs for health care practitioners that may be adapted and made available for use in different communities in BC	Identify Programs, Determine information re health care practitioners	2013-14	TBA	2013	Nancy G/US/PA	Yes	PTSD/WHO subcommittee		Initiated: 0	Completed: 0	Dissemination: 0				
Respiratory Nurses Group	10	Update the BC CDC TB Manual, Canadian TB Standards, ATS and other established guidelines as resources to implement comprehensive TB screening and treatment				2016	Nancy G/US/PA	Yes		Part of Evidence based TB Manual							
Continuity of Care	16	Review the legal, regulatory, policies, and public health work together for continuity of care prior to individuals being discharged or released. (Including completion administrative case management)	Establish process/review and update, establish guidelines	2013	Sept-14	2013	TBA (US/PA/PA)	Yes	O/C planning WG		Documents created	Documents created	Dissemination: 0				
Surveillance	3	Establish a framework through risk monitoring and evaluation process can be established, and develop a mechanism for sharing monitoring and evaluation results with stakeholders	Identify TB cases in each MA	2013	2014	2013		Yes	Surveillance WG		Meetings	Meetings	Dissemination: 0				
	4	Formalize a process that communicates TB surveillance data between the BC CDC, PHU/US, and MA in a timely manner. Consider using existing: FluSurf, DASH, SerVIC?	Establish and share performance metrics and measures. Establish mechanism to publish annual progress report. Establish mechanism to publish: FluSurf, DASH, SerVIC?	2013		2013		Yes	Surveillance WG		Meetings	Meetings	Dissemination: 0				
Outbreak	14	Develop a protocol to identify clusters and outbreak manage and contain response to TB outbreak and contain timely and complete research in TB outbreak management	Develop protocol through all four members, implement and update protocol	2013	Sept-14	2013	US/PA/PA/PA	Yes	Outbreak WG		Plan	Plan	Dissemination: 0				
Contact Tracing	15	Increase the use of standardized contact tracing tools	Develop standardized contact tracing tool including risk assessment tool to be used and communication	2013	2014	2013	Rena, Elizabeth, Susan, Tom, David	Yes	O/WG	RRS documents, tool, templates	Days in PM & O/WG established	Days in PM & O/WG established	Dissemination: 0				
Low Risk Screening	12	Develop, implement and evaluate strategies aimed at improving TB screening and treatment uptake and adherence. Describe outcomes of TB and active TB screening and treatment				2013	TBA	Yes	Healthcare WG	1) LTP 2) HCU 3) O/WG members to discuss and implement	1) LTP 2) HCU	1) LTP 2) HCU	Dissemination: 0				
Low Risk Screening	13	Develop, implement and evaluate an evidence-based protocol plan for school, volunteer and occupational health screening				2017	TBA	Yes	PTSD/WHO	4 Education							
Laboratory	7	Develop a Public Health Lab Network to improve testing capacity in MA laboratories. (US/PA/PA)		2013	Ongoing	2013	High Impact	Yes	High Impact								
Laboratory	8	Establish routine genotyping of TB isolates in BC through molecular typing techniques such as IS6110/INTRA	**May be natural to do on an outbreak response**	2014	2016	2014	High Impact	Yes	High Impact								
Pending or Deferred TBCC Priority Actions																	
Phila	1	Work with the First Nations Health Authority (FNHA) including the TB/CA, TB Services for Aboriginal Co managed program to ensure public health service planning for the First Nations people in BC within the context of the strategic framework.	Engage flexibility with FNHA - Health Services, Health Protection and Health Surveillance units			2014	US/PA/PA/PA	Yes									
Phila	2	Establish protocols regarding First Nations TB surveillance data management	Engage flexibility with FNHA - Health Services, Health Protection and Health Surveillance units			2014	US/PA/PA/PA	Yes									
TB and TB treatment strategies	16, 17	Improve management of TB in high risk populations Develop guidelines for identifying and testing people at high risk for non-adherence and the non-adherence strategy for TB and TB. This may include, but is not limited to, expanding use of DOT and DOTS strategies	**Evidence expressed**					Yes									
TB stigma	6	Breakdown pre-existing stigma of TB. Reduce and end stigma through community strategies	**Evidence expressed in TB/Health**					Yes									
NTM								Yes									
ISB report								Yes									
Legend:																	

