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Building *Nunavut* Together
Nunavut liuqatigiingniq
Bâtir le *Nunavut* ensemble

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Department of Health
Munaqhiliqiyitkut
Ministère de la Santé

GN File #1029-20-DH34126

January 4, 2022

Kelly Grant
The Globe and Mail

RE: Access to Information and Protection of Privacy Request #1029-20-DH34126

Dear Ms. Grant:

This letter is in response to your request for access to information under the *Access to Information and Protection of Privacy (ATIPP) Act* for the following information:

I am requesting copies of all reports evaluating the community-wide tuberculosis screening programs held in Qikiqtarjuaq and Whale Cove in 2018 and in Cape Dorset, now Kinngait, in 2019.

I am seeking records from January 1, 2018 to today, November. 24, 2021.

Being released to you are 64 pages of records held by the Department. The Qikiqtarjuaq CWS Evaluation Report was written in response to the active Tuberculosis outbreak at the time. The CWS model was also evaluated. Records pertaining to the community-wide screenings in Whale Cove (2018), and Cape Dorset, now Kinngait, (2019), do not exist. As these CWSs were preventative in nature, evaluation reports were not necessary at the time.

As per section 23(1) of the ATIPP Act, information on the following pages has been severed:

24-26

Attached to this letter, you will find the exception sections of the ATIPP Act that led to parts of the records being severed.

Under Section 28 of the Access to Information and Protection of Privacy Act, you may request a review by the Information and Privacy Commissioner. You have 30 days from the receipt of this notice to request a review by writing or emailing the Commissioner at:

Information and Privacy Commissioner
P.O. Box 1000, Station 270
Iqaluit, Nunavut X0A 0H0

Qikiqtarjuaq Community-wide Screening for Tuberculosis 2018
Preliminary Evaluation Report

Submitted to Department of Health on August 10, 2018

Carolyn Pim, MD

Acknowledgements

I would like to thank Rick Pascoe, Andrea Schertzer and Sean Waites for their dedication and assistance in providing information and data for this report, as well as the Office of Patient Relations, which conducted the patient survey.

I would also like to express my sincere appreciation to the individuals who provided candid feedback, through their roles in the ICS committees and/or their participation in the key informant interviews. Their recommendations provide important guidance for future CWS in Nunavut.

The CWS in Qikiqtarjuaq was realized due to the planning and hard work of health professionals from across Nunavut at all levels of the health system and other government departments, with valuable assistance from southern Canadian colleagues. The hospitality and contributions provided by the residents and leaders of Qikiqtarjuaq were also vital and very much appreciated.

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Abbreviations

3HP	A 3 month course of weekly rifapentine and isoniazid for the treatment of LTBI
CDC	Communicable Disease Control
CGS	Department of Community and Government Services, Government of Nunavut
CHEO	Children's Hospital of Eastern Ontario
CHN	Community Health Nurse
CHR	Community Health Representative
CMOH	Chief Medical Officer of Health for Nunavut
CSA	Casual Staffing Action
CWS	Community-wide Screening for Tuberculosis
CXR	Chest X-ray
DCMOH	Deputy Chief Medical Officer of Health for Nunavut
DOH	Department of Health, Government of Nunavut
DOPT	Directly Observed Preventive Treatment
DOT	Directly Observed Treatment
EMR	Electronic Medical Record
GN	Government of Nunavut
HC	Health Centre
HQ	Department of Health headquarters in Iqaluit
ICS	Incident Command System
IGRA	Interferon Gamma Release Assay
INH	Isoniazid
LTBI	Latent Tuberculosis Infection
NESS	National Emergency Strategic Stockpile
NML	National Microbiology Laboratory
NTI	Nunavut Tunngavik Incorporated
OPR	Office of Public Relations, Department of Health
PHA	Public Health Assistant
PHAC	Public Health Agency of Canada
PHN	Public Health Nurse
RCDC	Regional Communicable Disease Coordinator
SCHP	Supervisor of Community Health Programs
TB	Tuberculosis
TBA	Tuberculosis Assistant
TBAF	Tuberculosis Assessment Form
TBN	Tuberculosis Nurse
TST	Tuberculin Skin Test
WPP	Window Period Prophylaxis

Executive Summary

This report provides a summary of the planning and implementation of community-wide screening (CWS) for tuberculosis in Qikiqtarjuaq, Nunavut between January and June 2018. A mobile TB screening and treatment clinic was established in the community hall and operated between early February and mid-June. A team of health professionals was deployed to the community to operate the clinic and conduct the screening and treatment. Community members were also recruited to support TB prevention and care in both the CWS and the health centre.

The report also provides the findings of an evaluation of the CWS based on initial epidemiologic analysis and feedback from health professionals and community members who participated. The evaluation was focused on identifying lessons learned that could be applied to future similar initiatives.

Background

In 2016 and 2017 the number of residents of Qikiqtarjuaq diagnosed with active tuberculosis (TB) was higher than in previous years. By late November 2017, more than 10% of the population was on treatment for either active or latent TB. As a result, health centre staff had increasing difficulty in managing to care for those with TB and perform contact tracing.

In late December 2017, after consultation with experts in tuberculosis at the regional, territorial and federal levels, the Chief Medical Officer of Health made the decision to establish a community wide screening and treatment clinic in Qikiqtarjuaq, to be implemented in February 2018 and targeting all residents of the community. Active planning for the clinic began on January 2, 2018. This would be the first time a community wide screening had been undertaken in such a remote community in a northern territory in Canada in the middle of winter.

Qikiqtarjuaq is a community with approximately 630 residents located on Broughton Island just east of Baffin Island. About one third of the population is under 15 years of age¹.

To establish a TB screening and treatment clinic in Qikiqtarjuaq would require setting up a temporary medical facility, since the small health centre could not accommodate the anticipated large volume of clients and staff. A request was made to the Public Health Agency of Canada (PHAC) to use a portable mini-clinic intended for emergency response.

The goal of CWS in Qikiqtarjuaq was to assess the feasibility and outcome of a community-based screening program as a strategy to control a community tuberculosis outbreak. CWS is one of several elements of the TB program in Nunavut such as case and contact follow-up and TB education. This evaluation is focused on CWS in Qikiqtarjuaq and does not address other aspects of Nunavut's TB program in detail.

The objectives were to:

1. Diagnose and treat all active tuberculosis cases;
2. Diagnose and treat all patients with latent tuberculosis infection;
3. Identify resources required for a community-based screening program;
4. Increase treatment adherence and completion;

5. Increase knowledge of community members about TB transmission, and TB screening and treatment.

Planning and Implementation of CWS in Qikiqtarjuaq

It was recognized early on that the Incident Command System (ICS) would be needed to plan and co-ordinate the logistics required in setting up the screening/treatment clinic in Qikiqtarjuaq in such a short time frame. An ICS structure consisting of an Incident Command with six support committees was implemented.

Throughout January 2018 planning included in-community work (e.g. scouting locations for the clinic, ensuring infrastructure was in place, meetings with the mayor and council, review of patient charts) and work by staff based in Iqaluit (regional communicable disease and Department of Health headquarters staff). The Department of Community and Government Services (CGS) provided leadership for procurement and transport of equipment and supplies required for the clinic. The logistics required for setting up the clinic were extensive and included hiring specialized staff from southern health care institutions.

A community meeting was held to provide the residents with an overview of the clinic operation. The meeting was attended by an estimated 10% of the population and was well received. A community feast was also held to coincide with a tour of the clinic by the Premier and other dignitaries.

The clinic, located in the community hall, opened on February 5. Residents were contacted by household to come to the screening clinic for assessment; screening was voluntary. Clinical assessment was based on algorithms developed during the planning phase. The clinic employed several approaches that have been implemented in Iqaluit but are not yet used widely throughout the territory. These included sputum induction (a procedure that stimulates a person to produce a sputum sample if they are unable to produce a sample spontaneously) and GeneXpert MTB/RIF. The latter is an automated rapid diagnostic test that can identify the TB bacteria DNA. Based on the results of the screening assessment the clinicians determined whether treatment was indicated.

The feasibility of CWS was enhanced due to the use of a shorter regimen for treating latent (sleeping) TB. A once-weekly dose of two medications, taken for 12 weeks (abbreviated as 3HP) would likely have higher acceptance by Qikiqtarjuaq residents and require fewer health care staff to implement and monitor than the 9-month daily treatment which was current practice in Nunavut. 3HP is in wide use in other countries and had been previously studied in Iqaluit. Unfortunately, the first shipment of 3HP to Qikiqtarjuaq was frozen in transit and could not be used, which delayed the initiation of treatment.

The screening clinic continued operating 6 days a week until March 16, 2018. After that date a smaller treatment clinic operated in the community hall until mid-June. The hamlet organized a community feast to celebrate the closure of the screening portion of the clinic.

Evaluation of the Qikiqtarjuaq Community-Wide Screening

This report includes results from preliminary epidemiologic analysis, key informant interviews, feedback from the ICS committees and a patient survey. Additional evaluation, including cost-effectiveness analysis, will be undertaken in the coming months.

Qikiqtarjuaq was a very welcoming community. Local staff and community leaders were very helpful and supportive. Of all Qikiqtarjuamiut eligible for screening, 96% participated. Twelve people (7 adults and 5 children) were newly diagnosed with active TB as a result of the screening. In addition, twenty-four people were newly diagnosed with latent TB infection (LTBI). Although the data have not yet been fully analyzed, reports from health care providers suggest that acceptance of treatment was high. Some people who had declined LTBI treatment in the past agreed to the shorter 3HP regime.

The patient survey reported high levels of satisfaction with the service provided at the CWS clinic but did point to some areas for improvement. However, the interpretation of the survey results is limited by the lower than desired number of respondents.

From the health provider perspective, the screening clinic was a success. The consensus amongst key informants and ICS committees was that the operation went extremely well given the short lead time and lack of prior experience with community-wide screening in the territory. Informants reported excellent teamwork, collaboration and a sense of accomplishment. However, workload was often excessive, resulting in fatigue and burnout due to long hours of the clinic.

In general, after the initial setup and addressing any issues that had come up in the first few weeks, the screening clinic operated relatively smoothly. Nevertheless, there were challenges after the screening clinic closed with the coordination and workload involved in following up all the screened individuals. Many recommendations were made for fine tuning the planning, logistic and clinical processes for future CWS.

Despite the positive assessment by both providers and patients, the CWS created some challenges for the community. The location of the clinic in the community hall necessitated moving or cancelling community events, which was disruptive. The CWS also caused additional workload for health centre staff and deferral or cancellation of some health services.

Recommendations for Future CWS

- Ensure sufficient lead time and resources for planning CWS in another community with a focus on planning at the same level for all phases.
- Use a project management approach, with clear responsibilities and lines of communication, during the planning and implementation phases and with adequate staffing at the CWS, health centre and regional levels.
- Ensure administrative processes are in place to facilitate rapid onboarding and orientation of the additional staff required for a CWS.
- Review and revise clinical pathways based on the Qikiqtarjuaq experience and best practice, including consideration of differences required for outbreak versus non-outbreak settings.
- Develop a strong and adequately resourced community engagement and communications plan that spans the entire length of the CWS.
- Consider the impact of the CWS on the community and the local health centre in all plans and processes.

- Implement a collaborative process for designing future CWS information management and evaluation, balancing the requirements for clinical management, patient flow, epidemiologic analysis and evaluation.
- Distribute the detailed recommendations from the key informant interviews and ICS committees for consideration by those responsible for planning and implementing future CWS.
- Update the community when further results of the CWS are available.

Introduction

This report provides a summary of the planning and implementation of community-wide screening (CWS) for tuberculosis in Qikiqtarjuaq, Nunavut between January and June 2018. A mobile screening clinic was established in the community hall and operated between February 5 and March 16. A smaller treatment clinic continued operating until mid-June. A team of health professionals was deployed to the community to operate the clinic and conduct the screening and treatment. Community members were also recruited to support TB prevention and care in both the CWS and the health centre.

The report also provides the findings of an evaluation of the CWS based on the initial epidemiologic analysis of information collecting during the clinic and feedback from health professionals and community members who participated. The evaluation was focused on identifying lessons learned which could be applied to future similar initiatives.

Background

The Need

In 2016 the number of residents of Qikiqtarjuaq diagnosed with active tuberculosis (TB) was higher than in previous years and in January 2017 there was a death due to TB. Throughout 2017 there was a further increase in the number of residents with TB and by late November 2017, more than 10% of the population was on treatment for either active or latent TB. As a result, health centre staff had increasing difficulty in managing to care for those with TB and perform contact tracing.

In late December 2017, after consultation with experts in tuberculosis at the regional, territorial and federal levels the Chief Medical Officer of Health made the decision to establish a community wide screening and treatment clinic in Qikiqtarjuaq, to be implemented in February 2018. Active planning for the clinic began on January 2, 2018. This would be the first time a community wide screening had been undertaken in such a remote community in a northern territory in Canada in the middle of winter.

This evaluation report is to provide the Department of Health, Government of Nunavut information to benefit the planning and implementation of future CWS in Nunavut.

The Community

Qikiqtarjuaq (pronounced Ki-Kik-TAAK-jo- ahk) is located on Broughton Island, which is located off the eastern coast of Baffin Island. The Hamlet was incorporated in 1979 and changed its name from Broughton Island to its original Inuit name, Qikiqtarjuaq, in 1998. In Inuktitut, Qikiqtarjuaq means “Big Island”.

Qikiqtarjuaq has an arctic tundra climate. There are two main seasons – summer and winter. High winds are common in both seasons. The winters are cold and dark with average temperatures ranging between -22C and -28C. With wind chill factored in the temperatures can dip in excess of -50C. During the summer temperatures rise to an average of 12C.

The population of Qikiqtarjuaq in 2017 was estimated to be 631 persons; about 29% of the population is under 15 years of age¹. Similar to other communities in Nunavut, there is a shortfall in adequate housing: an estimated 30% of homes are overcrowded and 20% are in need of repair². In addition, nearly 70% of Nunavummiut experience food insecurity³. Both overcrowding and poor nutrition contribute to the risk of developing TB.

The most common languages spoken are Inuktitut and English.

Transportation to Qikiqtarjuaq is primarily by air. Some residents travel to other communities by snow machine in winter or by boat in summer. During the summer season deliveries to the community are also made by cargo ship.

The Disease

Tuberculosis is caused by the bacterium *Mycobacterium tuberculosis*. The infection is spread through the air when infected individuals cough, sneeze or sing. A susceptible person who inhales air containing the bacteria may themselves become infected.

Many individuals who become infected do not become ill. These individuals are considered to have latent tuberculosis infection (LTBI) or “sleeping TB”. People with LTBI do not have symptoms and cannot transmit the infection. Some people who become infected become sick – called active TB disease; this can happen soon after they are infected or many years later. Individuals with a weakened immune system, including those living with HIV, malnutrition or diabetes, and tobacco users are at a higher risk of developing active TB disease.

The most common place in the body for active TB is in the lungs - a person with active tuberculosis in the lungs can transmit the infection to another person.

When a person develops active TB, the symptoms (cough, fever, night sweats, weight loss, etc.) may be mild for many months. In the beginning, these symptoms may not be severe enough to prompt the infected person to seek medical care. As a result, an individual may transmit the bacteria to other people before becoming aware that they have active TB. Active TB disease is curable with medication – typical treatment involves taking several antibiotics for 6 months or longer.

The incidence rate of active TB disease in Nunavut is the highest of any province or territory in Canada. Between 2008 and 2017 the, the 10-year average Nunavut TB rate was 218 per 100,000 population⁴, compared to the Canadian average (2008-2015) of approximately 4.4 per 100,000.

Nunavut has a multifaceted TB prevention and control program that follows Canadian TB standards. Active case-finding was a key strategy in eliminating TB in many Western countries, with surveillance activities that included chest radiograph and tuberculin skin testing. Various approaches have been used for active community-based case detection of TB, including use of mobile clinics and door-to-door screening⁵.

National Emergency Strategic Stockpile (NESS) Mini Clinic

To establish a TB screening/treatment clinic in Qikiqtarjuaq would require setting up a temporary medical clinic, since the small health centre could not accommodate the anticipated large volume of clients and staff. In 2017, the Nunavut Department of Health had taken part in a mass casualty mock disaster exercise (Operation Nanook 2017) held in Rankin Inlet. The exercise included setting up a NESS mini-clinic, provided by the Public Health Agency of Canada (PHAC). The clinic is designed to be set up in an indoor space that is at least 1250 square feet in size and has functioning electricity, environmental controls, and plumbing.

The emergency management team for Nunavut Department of Health was impressed with the mini-clinic and how quickly it could be set-up in a community in response to an emergency situation. When the decision was made to do community-wide TB screening in Qikiqtarjuaq, the possibility of using the NESS mini-clinic was explored. In early January 2018 a formal request to PHAC for the use of the mini-clinic was made and was approved by PHAC.

Goal and Objectives of the CWS

The goal of CWS in Qikiqtarjuaq was to assess the feasibility and outcome of a community-based screening program as a strategy to control a community tuberculosis outbreak.

The objectives were to:

1. Diagnose and treat all active tuberculosis cases;
2. Diagnose and treat all patients with latent tuberculosis infection;
3. Identify resources required for a community-based screening program;
4. Increase treatment adherence and completion;
5. Increase knowledge of community members about TB transmission, and TB screening and treatment.

Overview of the Operation

Planning and Oversight

1. Incident Command System

The Department of Health has an All Hazard Health Emergency Response Plan which uses the Incident Command System (ICS) as the primary organizational tool. The health emergency management program is overseen by a Health Emergency Response Committee which meets on a regular basis to review and approve emergency response documents and provide direction to the emergency management program. It was recognized early on that ICS would be needed to plan and co-ordinate the logistics required in setting up the screening/treatment clinic in Qikiqtarjuaq in such a short time frame. On January 4, 2018, a meeting of the Health Emergency Response Committee was held and the Deputy Chief Medical Officer of Health activated the ICS structure for the Qikiqtarjuaq TB screening/treatment clinic (See Appendix 1). During that meeting persons who would be responsible for the key positions within the ICS response were selected. For the first few weeks the Emergency Response committee met on a weekly basis. In mid- February, the meeting frequency was scaled back to once every 2 weeks.

The ICS structure consisted of an Incident Command and six support committees – operations, planning, community engagement, logistics A (staffing, accommodation, travel), logistics B (acquisition of supplies and transport to Qikiqtarjuaq) and logistics C (set-up and maintain phones, computers, Meditech on site). Committee members included staff from Department of Health headquarters and other government departments, Iqaluit Public Health and community-based professionals. Finance representation was available for each committee as needed. Each committee met independently and provided regular updates of its committee activity to the Incident Command. Minutes of committee meetings were forwarded to the Senior Health Emergency Planner for review and filing.

2. ICS Groups and Their Activities

a. Incident Command

The ICS structure is shown in Appendix 1. Whenever possible the Incident Commander or Deputy Incident Commander chaired the meetings. The Deputy Incident Commander travelled to Qikiqtarjuaq for a few days the week of January 8, 2018 to scout out a suitable location in which the clinic could be set up in and to meet with the mayor and council. On January 27, 2018 the Deputy Incident Commander flew back to Qikiqtarjuaq to assist with the set-up of the clinic. He remained in the community until February 17, 2018 to ensure clinic activities were operating smoothly. The On-site Incident Commander for the clinic arrived in Qikiqtarjuaq on February 7, 2018.

b. Planning

The planning committee was the clinical pathway group that set goals, developed algorithms, prioritized screening and oversaw clinical care. They recognized early that the induced sputum would be a bottleneck for clinic flow and took measures to streamline the pathway. This committee also developed a clinical flowsheet attached to each chart so it could be easily determined where in the clinical pathway each patient was. They also prepared information sheets on the side-effects associated with 3HP for clinic physicians as this was a new drug being used in Nunavut.

c. Operations

The operations committee was the group tasked with determining what was needed to meet goals, to oversee policy changes and deal with staff and material requests. This committee worked closely with the Planning committee to solve Meditech problems, to improve the clinical pathway, to revamp the TB assessment form and to minimize the impact that medical travel screening would have on clinical activity. One office manager from Public Health was sent to Qikiqtarjuaq to help organize and assist with the clerical part of the operation. The committee also made sure that there were paper back-up copies for all of the Meditech forms in case of computer failure. They also assured that clinic signs and forms were translated and made available.

Workload for this committee was high. Initially it was thought that one Nurse Practitioner could fulfill all the functions of the on-site director; however, it became clear that two individuals were needed to share the workload. Three sub-committees were needed to keep up with the work flow: Staff coordination; Medication and Patient Scheduling.

d. Community Engagement

The community engagement committee worked with partner organizations (hamlet, NTI, etc.) to facilitate communications with the residents of Qikiqtarjuaq. This group worked closely with the communication department to prepare information releases, and to create talking points for radio updates that the mayor provided to the residents.

The committee organized a community meeting which was held on January 31 to provide the residents with an overview of the clinic operation. The meeting was attended by an estimated 10% of the population. The Deputy Chief Medical Officer of Health described the clinic and answered questions from the audience. The meeting was well received by the community. This committee was also involved in the organization of a visit by the Premier and other dignitaries to Qikiqtarjuaq on February 9, 2018 where they had an opportunity to tour the clinic. Following the tour a feast was held for the community. This event was well attended and all dignitaries spoke highly of the Health Departments clinic response.

e. Logistics A Committee (Staffing)

The logistics A committee (staffing) worked at co-ordinating recruitment, travel, and accommodations for staff hired (including local hires) to work at the clinic. This committee had to co-ordinate transportation of clinic staff into Qikiqtarjuaq and arrange for their accommodations while they were working in the community. Accommodations were in short supply in both Qikiqtarjuaq and in Iqaluit and many of the clinic staff had to share accommodations. In Qikiqtarjuaq, accommodations were obtained from the following: Tulugak Hotel, Siku Hotel, Qik Lodge, Qulliq Energy Corporation and Parks Canada.

This committee also arranged for greeters to be at the airports to welcome clinic staff. Newcomers to the North were provided with information on what to expect when working in a remote Nunavut community. The committee also organized orientation and training sessions for clinic staff.

This committee looked into the legalities of hiring local drivers to assist with transporting residents to and from the clinic. The legal opinion received was that only GN vehicles could be used for this purpose. As all GN vehicles in Qikiqtarjuaq were already in use, the clinic shared the Health Centre vehicle for staff transfers to the airport and other needs.

The work load on this committee was extreme and it soon became apparent that this committee should be divided into three subcommittees: staffing; accommodations; and travel.

f. Logistics B Committee (Material Support)

The logistics B Committee (Material Support) was responsible for co-ordinating the acquisition and transport of supplies to Qikiqtarjuaq and the establishment of the mini-clinic. A CGS emergency management warehouse was used as a marshalling area. The NESS mini clinic arrived in Iqaluit on the weekend of January 20, 2018. The mini clinic and all other equipment and supplies which were bound for Qikiqtarjuaq were sent to the marshalling centre where they were itemized and prioritized. A charter cargo plane capable of landing in Qikiqtarjuaq was used to transport all of the supplies to Qikiqtarjuaq.

The NESS mini-clinic consists of 16 pre-packaged skids of medical equipment and medical supplies that would be typically found in a walk-in clinic. The unit can be shipped on a 53 foot transport trailer. The set-up of the clinic in Rankin Inlet for Nanook 2017 was the first time the clinic had been flown anywhere. The flight to Rankin Inlet was in a large military cargo plane as the runway in Rankin Inlet was large enough to accommodate large planes. To fit into a smaller plane capable of landing in Qikiqtarjuaq the skids had to be broken down and re-arranged.

It was anticipated that medivac air transfer of patients from the clinic might be required either to Iqaluit or Ottawa. As a result, a dedicated medivac plane was on 24 hour stand by in Iqaluit and was intended to only be used for the evacuation of patients from the Qikiqtarjuaq clinic.

g. Logistics C Committee (IT)

The logistics C Committee (IT) was responsible for the set-up and maintenance of phones, computers, and Meditech at the clinic. It was recognized early on that it would be beneficial to have an electrician at the clinic to deal with electrical problems during set-up. In order for Meditech to operate at the clinic, a fiberoptic cable linking the clinic with the health centre needed to be installed. IT staff were sent to Qikiqtarjuaq to look after the set-up of Meditech, and the coordination of computers and printers. In addition, the portable X-Ray machine required a technician at the clinic site to ensure it was set-up and operating properly.

3. ICS Committee Chairs Meetings

From the point at which the clinic arrived in Qikiqtarjuaq, the incident command and the committee chairpersons met by teleconference each morning at 8:30 a.m. to discuss clinic progress and to troubleshoot any problems. Minutes were taken by the Senior Health Emergency Planner. By mid-February these meetings were scaled back to Monday, Wednesday and Friday.

On March 8, 2018 the decision was made to temporarily discontinue the chairpersons meetings. The meetings resumed again on March 21, 2018 to monitor demobilization of the screening clinic and the transition to the treatment portion of the clinic.

Screening and treatment protocols

1. Screening

The target population was all eligible residents of Qikiqtarjuaq. This included people who were frequent visitors to Qikiqtarjuaq in 2017 and temporary residents. Every attempt was made to recommend screening in their (new) home community for residents who lived in Qikiqtarjuaq in 2017 and had recently moved.

While the screening was completely voluntary, residents were encouraged to be seen at the TB clinic. Residents were contacted by household to come to the screening clinic for assessment. Clinical assessment was based on algorithms developed during the planning phase. All people screened were interviewed by a nurse about their TB-related health history and current symptoms if any (using the Nunavut Tuberculosis Assessment Form). Additional investigations varied based on each person's individual health history but could include:

- TB skin test (TST);
- Chest X-ray;
- Sputum samples;
- Physical examination by a nurse practitioner or physician;
- Blood tests.

The clinic employed several approaches that have been implemented in Iqaluit but are not yet used widely throughout the territory. These included sputum induction (a procedure that stimulates a person to produce a sputum sample if they are unable to produce a sample spontaneously) and GeneXpert MTB/RIF. The latter is an automated rapid diagnostic test that can identify the TB bacteria DNA and whether it is resistance to the antibiotic rifampin. The automated unit was kept on site in Qikiqtarjuaq. Three sputum samples were taken from each patient. One sample was analyzed through the GeneXpert and the other two samples were sent to Iqaluit for testing through the standard approach (sputum smear and culture).

Interferon Gamma Release Assay (IGRA) is a blood test for the presence of TB bacteria in the body. It can be used as an alternative to the TB skin test in certain circumstances. It was planned that the CWS would serve as a pilot to assess the feasibility of IGRA as a supplementary test in a mobile clinic situation. For the pilot, eligible persons provided informed consent for the testing. The pilot was initiated, however IGRA testing was discontinued part way through the clinic due to technical problems involving the test control samples.

2. Treatment

Based on the results of the screening assessment the clinicians (nurse practitioner or physicians) determined whether treatment was indicated. The recommended medication regime depended on the age of the person and test results.

Active TB

Individuals diagnosed with active TB through CWS were cared for using the standard Nunavut TB treatment protocols. This included isolation at home or in hospital (until the individual was deemed to be non-infectious), directly observed treatment (DOT) and regular monitoring for side effects of

medication. Care was provided by the Qikiqtarjuaq health centre staff supported by communicable disease nurses and TB physicians based in Iqaluit.

Latent TB (LTBI)

There are several different treatment regimes for LTBI. The goal of treatment is to eliminate the TB bacteria which is dormant in the body, in order to prevent active TB from developing in the future. Throughout Nunavut, the most common regime recommended is daily Isoniazid (INH) for nine months. However, a shorter regime is in wide use in other countries. This regime is a combination of INH and rifapentine taken as a once-weekly dose for 12 weeks (abbreviated as 3HP). It was the focus of a study conducted in Iqaluit and Ottawa, the aim of which was to determine the feasibility of implementing 3HP in Canada. Results of that study are pending.

Rifapentine is not currently available in Canada for widespread use. However, due to evidence of the safety and effectiveness of 3HP in other countries, in 2017 Health Canada authorized the use of rifapentine for use in Canada for urgent public health needs, for example in jurisdictions experiencing TB outbreaks⁶.

The 3HP regime's weekly administration and shorter duration meant that it would be much more feasible to implement in the CWS context than 9 months of daily INH. Therefore, in late January 2018 the Nunavut Chief Medical Officer of Health notified the federal Minister of Health of the urgent public health need for 3HP, namely to respond to the outbreak in Qikiqtarjuaq. Subsequently, steps were taken to procure rifapentine.

Window Period Prophylaxis (WPP)

Some individuals, such as young children or people with weakened immune systems, are at higher risk of developing active TB disease if they breathe in the TB bacteria. However, it can take up to several months (the 'window period') to confirm if an exposed person has been infected. To protect high risk individuals it is recommended they take medication until it has been confirmed that they have not been infected. Because Qikiqtarjuaq was a small community in the midst of a TB outbreak, WPP was recommended for all young children or older people at high risk. 3HP was the regime used for most people in this category.

Screening Clinic Operations

1. Schedule

The screening clinic began operation on February 5, 2018 and continued operating 6 days a week until March 16, 2018. The three priorities of the clinic were physical assessment, sputum induction and chest X-ray. The clinic was structured with these activities in mind and visual privacy was accomplished using tarpaulins. There were two TB registered nurse cubicles, a nurse practitioner cubicle, a respiratory therapist cubicle, two medical doctor cubicles, a resuscitation cubicle, two sputum induction cubicles, a laboratory cubicle and an X-ray cubicle. Data entry and patient chart filing occurred in a separate room (the kitchen).

The clinic was normally open 8:30 – 12:00, 1:00 – 4:30 and 5:30 – 7:30. The usual procedure was to process one family at a time. Appointment times were delivered to the families a day or more in advance of their scheduled clinic time. Families with children under age 5 were prioritized, as young

children are at higher risk of TB if exposed. For the most part, families came to the clinic at their scheduled time. The clinic did their best to accommodate unscheduled residents as well.

In order to encourage people to be screened and to thank them for participating, incentives were provided in the form of gift cards for NorthMart. Each person who completed all screening tests was eligible to receive a \$25 gift card.

For LTBI or WPP treatment, the original intention was to start people on 3HP as soon as their assessment was complete and the recommendation to treat had been made. However, the first shipment of rifapentine that was shipped up to Qikiqtarjuaq in early February was received with an indicator strip indicating it had been exposed to freezing temperatures. As a result, the shipment could not be used. This resulted in a delay in starting LTBI and WPP treatment until replacement rifapentine could be procured. The first individuals started on 3HP began their treatment on March 15, the day before the screening clinic closed. Thus, the CWS was essentially two separate phases: screening and treatment. The exception was for active TB cases diagnosed through CWS – these individuals were started on treatment immediately after diagnosis (rifapentine is not routinely used for treatment of active TB, so its lack of availability did not impact treatment of active cases).

To prevent further problems with freezing of medication, drugs were hand delivered by staff travelling into Qikiqtarjuaq.

2. Location

The location selected for the screening clinic was the new community hall located in the main Hamlet building. This hall had a back-up generator and had a hydro distribution system which was not expected to overload circuits under the power demands of the clinic equipment.

After the screening portion of the clinic had closed the residents began making requests for the use of their community hall especially during the evening. As a result, another location was sought to operate the treatment phase. The existing Health Centre was of insufficient size to handle the treatment phase, so it was decided to move treatment-oriented activities to the community wellness centre. However, it was determined that the wellness centre as configured at the time would not be able to support Meditech. The cost and time to convert the wellness centre services to fibre optic cables to improve internet speed for Meditech use was not seen as a viable option.

The community hall was normally used for youth recreational activities especially in the evening. The long duration of the screening clinic and its subsequent use for treatment purposes raised some concerns in the community that there may be an increase in youth related crimes as there was little to keep the youth occupied in the evenings. When the police were consulted they indicated there had been no increase in crime in the community during the period of clinic operation.

To ensure a space for the treatment portion of the clinic the Hamlet agreed that treatment activities would be operated in one small section of the community hall and the lab room during the day leaving the hall available for community activities in the evening.

3. Human Resources

At any given time, the clinic had the following staff working: Site Commander, 3 TB nurses, a licensed practical nurse, 2 X-ray technicians, 2 lab technicians, 2 or 3 reception staff, from 1 to 3 physicians and 1 epidemiologist. Staff included health professionals from Nunavut (indeterminate

staff seconded from other communities or casual staff who had Nunavut work experience) and professionals from southern organizations. Staff who travelled to Qikiqtarjuaq from southern Canada came from the following organizations:

- Public Health Agency of Canada- 9 laboratory workers from the National Microbiology Laboratory (NML -Winnipeg), 1 Public Health Officer based in Iqaluit and 2 Field Epidemiologists;
- Children’s Hospital of Eastern Ontario (CHEO), Ottawa - four X-ray Technicians and four Respiratory Therapists;
- St. Joseph’s Hospital, London, ON – one Phlebotomist (technician who draws blood);
- Toronto Public Health – two TB nurses;
- London-Middlesex Health Unit – one TB nurse (at Health Centre during treatment phase);
- Manitoba - one Pediatric Infectious Disease specialist physician.

4. Biomedical Waste

The clinic operation generated biomedical waste material that needed to be properly disposed of. The waste was locked in a non-temperature-controlled building and allowed to freeze. The Health Department considered the purchase of a portable incinerator for disposal of the biomedical waste on site. A literature search indicated the portable generators available were too big to be loaded on a cargo charter plane. To preposition an incinerator into a community during shipping season was considered but rejected due to the cost of the incinerator and the logistics required in accomplishing the task. In the end, an environmental company was contracted to remove the biomedical waste during the summer 2018 shipping season. Sharps related waste was packaged and air lifted out with the Health Centre sharps waste.

5. Demobilization

The Deputy Chief Medical Officer of Health went to Qikiqtarjuaq on March 13, 2018 to oversee the closing of the clinic and to organize the equipment and supplies for the demobilization. By March 26 the screening clinic had been dismantled and only treatment related equipment remained in the community centre. Some of the NESS mini clinic supplies were used by the Health Centre in Qikiqtarjuaq. The remainder of equipment and supplies were temporarily stored in Qikiqtarjuaq. A portable cargo scale was purchased and equipment and supplies were weighed and packaged for a cargo charter flight back to Iqaluit.

6. Clinic Closure Community Feast

A hamlet organized community feast took place on March 14, 2018 to celebrate the closure of the screening portion of the clinic. The feast was attended by dignitaries including the Deputy Chief Medical Officer of Health. More than half the community attended the feast and the general feeling in the community was that the screening clinic was considered a success.

Treatment Clinic

After the screening clinic closed, a smaller clinic remained in the community centre. Its focus was on monitoring and providing treatment to individuals who had been started on medication for either LTBI or WPP. This clinic was operational from mid-March to mid-June, 2018, after which follow-up and monitoring of treatment was assumed by the health centre staff.

Evaluation Methods

Quantitative Analysis of Screening Data

Tuberculosis assessment forms (TBAFs) were completed using a combination of paper records and input into Meditech in Qikiqtarjuaq. TB history and risk factors were recorded during the chart review stage by the RCDC and PHNs and documented on paper records. These records were included with the patient “sleeve” that was transported to the mobile screening clinic. The TB nurses assessing community members then used this summary of client TB and health history and completed the Nunavut TBAF on Meditech. The TBAF is a form capturing risk information, signs and symptoms, past TB diagnosis and treatment history and is used in the routine TB assessment in all health centres in Nunavut.

Screening details were entered into a line list using Excel 2010, by the Public Health Officer/Epidemiologists working at the community screening centre in Qikiqtarjuaq for further evaluation and analysis. Screening details included demographic details, tests ordered by clinicians, tests completed and samples returned by community members, as well as screening outcomes as determined by the Regional TB Case Manager. Treatment details such as medication type, treatment acceptance and completion were recorded on a separate Excel line list to assist with epidemiologic analysis as well as to help front line staff track number of patients needing treatment, schedules for patients to return for treatment, and doses taken or missed. Treatment data collection is ongoing.

Paper records (the sleeves) were filed at the community screening centre and transported to the Population Health Information Unit in Iqaluit at the end of the community screening. The Public Health Officer, epidemiologists and data analysts extracted data directly from Meditech in Iqaluit and matched this to data collected in the community screening and treatment line lists. New cases of active TB, LTBI, as well as any patient placed on LTBI re-treatment, WPP or surveillance were entered into a tuberculosis specific database that is currently maintained for all territorial TB cases. The tuberculosis database is continuously updated from headquarters on a regular basis.

Ethical considerations regarding data collection and analysis are described in Appendix 2.

Key Informant Interviews

A priority of the CMOH was to obtain in-depth feedback on the CWS from key players involved in the initiative, as well as recommendations for modifications and improvements should CWS be undertaken in other communities in the future. It was felt that individual interviews conducted by an independent consultant who was not involved in the CWS was most appropriate method to obtain frank and confidential feedback. A list of potential interviewees (with an emphasis on individuals who had mainly clinical rather than administrative functions during the CWS) was developed based on consultation with public health managers. The final list was validated with the CMOH and DCMOH and interviewees were contacted by either phone or email to determine their willingness to participate. Participation was voluntary.

Interview questions were developed under the categories:

- Leadership and Organization (including administration);
- Communications/Community Engagement;
- Logistics and Human Resources;
- Clinical Pathways;
- Case Management and Care;
- Screening Clinic Operations;
- Impact of CWS on Health Centre Operations;
- Information Management.

The emphasis on each of the above components varied based on the CWS role of each interviewees. Participants were provided with the questions and information on the interview process in advance of the interview. The semi-structured interviews were conducted with nineteen (19) individuals either in person or by telephone between May 3 and June 21, 2018. Participants included:

- front-line physicians and nurses who worked at either the CWS clinic or Qikiqtarjuaq health centre;
- Health Department staff (emergency planner, epidemiologist, public health officer, TB educator, director population health, health promotion specialist, CMOH, DCMOH, human resources, IT);
- Baffin regional staff (public health manager, communicable disease coordinators, Qikiqtarjuaq clinic staff and health centre staff); and
- the mayor of Qikiqtarjuaq.

A list of participants is found in Appendix 3.

Interviews ranged in length from 45 to 90 minutes. All participants except one were provided with an edited summary of the notes taken during the interview and asked to provide corrections and additional comments if they wished. The remaining participant was not available to review the notes; that interview had been recorded so the interviewer could review the conversation if necessary.

Additional informal debrief interviews contributed to this evaluation (see Appendix 3). These meetings occurred with individuals and small groups in May 2018.

Common themes from the interviews were developed for each of the above described categories.

Lessons Learned from ICS Committees and Baffin RCDC

The Senior Health Emergency Planner reviewed the minutes of all ICS committee meetings and summarized lessons learned from the committee deliberations. Chairs of the committees were also contacted and asked to provide additional lessons learned. In addition, a draft report outlining the impact of the screening on the Baffin regional communicable disease team was reviewed. Recommendations were grouped into the categories developed for the key informant interviews and are included in the observations and recommendations in Appendix 3.

Patient Survey

The Office of Patient Relations (OPR) was asked to conduct a survey to learn what Qikiqtarjuamiut thought of the community-wide TB screening that took place in February and March, 2018. Two OPR staff went to Qikiqtarjuaq for the week of April 30- May 4th.

The target population was individuals 18 years of age and older who participated in the community wide screening. A random sample of individuals on the community screening list was selected. In order to allow for estimates with a precision of +/- 10% , 83 respondents were required. The target sample size was increased to 120 to allow for non-response.

During the initial attempts to contact the randomly selected participants, the interviewers found that most people were experiencing high survey/screening fatigue and were unwilling to participate. The random sample methodology of obtaining participants was abandoned in favour of other approaches, including going to households, places of employment and the health centre.

The survey was advertised on the radio and on Facebook and everyone who hadn't already been reached was invited to the Hamlet office to participate.

Additional Evaluation

Additional components of the overall evaluation which are not yet complete include:

- **Additional epidemiologic analysis** - This report presents preliminary findings from this work, but updated results will be reported as the analysis progresses.
- **Cost effectiveness evaluation:** Investigators from the Ottawa Hospital Research Institute have been engaged to assess, in collaboration with Department of Health staff, the yield of screening, costs and cost-effectiveness of the Qikiqtarjuaq clinic. Yield of screening will be assessed by determining the numbers testing positive at each stage in the diagnostic algorithm as well as the numbers initiating and completing treatment for active disease or LTBI. Costs associated with scale-up, training, delivery, program maintenance and subsequent follow-up will all be assessed. Important drivers of cost and cost-effectiveness will be identified to better understand required resources and implications for scale up and implementation in other communities across Nunavut. This evaluation is targeted for completion by December 2018.
- **Staff survey:** An online survey of staff from southern Canada who travelled to Nunavut to support the CWS was distributed in early July 2018. The survey questions focused on the hiring process, orientation and satisfaction with working at the clinic. Results will be available in August 2018.
- **Client survey:** A survey was developed with the aim of better understanding the current knowledge, attitudes and beliefs around TB among Qikiqtarjuamiut. The intent was that this self-administered survey would be provided in the CWS clinic waiting room to all people 16 years and older. The survey questions were all obtained from previously validated questionnaires used in other TB screening programs. However, there were delays in

finalizing and translation of the survey tool and by the time it was available, there were only about 150 individuals left to be screened. Thus, the survey was reframed as a pilot intended to inform future surveys. Forty-nine people completed the survey.

A few issues presented themselves during this pilot. There was poor understanding of the survey instructions (e.g. participants were asked to select one option but several options were selected) and the waiting room was playing a DVD about TB which included answers to some of the knowledge based questions. Lessons learned will be used to modify the survey tool and methods for future implementation.

Evaluation Findings

Quantitative Analysis of Screening Data

At the time of writing this report, calculation of many of the indicators identified in the analysis plan was not yet possible either because validation of the screening data was still occurring or, in the case of treatment outcome data, it was too soon (i.e. too early for some residents to have completed their LTBI treatment). This report provides the initial analysis of indicators for which the data was available. The numbers are accurate as of August 9, 2018 but are subject to minor changes resulting from further data validation.

The master community population list identified 602 potential residents of Qikiqtarjuaq. Table 1 shows the age distribution in categories that aligned with different screening algorithms.

TABLE 1 – AGE DISTRIBUTION OF QIKIQTARJUAQ RESIDENTS

Age (years)	#	%
0-5	81	13.5
6-18	129	21.4
19-25	72	12.0
26-65	290	48.2
>65	28	4.7
Unknown	2	0.3
Total	602	100.0

After excluding individuals who were not in the community during the screening period, had died or were already on some form of TB treatment, 505 people were eligible for screening. Four hundred eighty-seven (487 or 96% of those eligible) came to their initial appointment. There were eighteen (4%) people who declined to participate or did not come to their first appointment (Table 2); two of these were children under 15 years old and sixteen were 15 years or older.

TABLE 2 – SCREENING PARTICIPATION

	#
Residents on community list	602
Not Eligible for Screening:	97
Moved, away for extended period or died	1
On treatment for Active TB	1
On treatment for LTBI	1
On Window Period Prophylaxis	1
Eligible for screening	505
Attended first appointment	487
Declined screening or did not attend first appointment	18

A component of the initial screening assessment was the tuberculin skin test (TST), which determines if someone is infected with the TB bacteria (but does not necessarily mean they have active TB disease). In the CWS TSTs were only indicated for people who either had not previously had a TST, or their prior TSTs were negative. One hundred fifty-four (154) people were eligible to receive a TST and had the test administered (Table 3). All but three (3) returned for the test to be read 48-72 hours later.

TABLE 3 – RESULTS OF INITIAL TUBERCULIN SKIN TEST (TST)

TST ADMINISTRATION		
	#	%
Eligible for TST	152	100.0
TST given and read	23(1)	23(1)
TST given but not read	1	23(1)
TST RESULTS		
	#	%
TST Negative	128	85.9
TST Positive (>5mm induration)	23(1)	14.1
- New LTBI	23(1)	
- New Active TB	1	

The protocol for individuals who had a negative initial TST was for them to have a repeat TST 8-12 weeks after the initial one. The purpose is to rule out very recent infections, because it can take several months for the TST to turn positive after someone has been infected. Six (6) people were positive on their second TST: 23(1) were considered newly acquired or recent infections (also called conversions); 23(1) it was unclear if their infection was recent or not; additional investigation is underway.

In addition to the TST, screening consisted of symptom inquiry, chest x-ray, sputum sample submission for GeneXpert and AFB results, and a visit with a nurse practitioner or physician. Table 4 shows the percentage of participants receiving these services if eligible.

TABLE 4 – COMPLETENESS OF SCREENING ACTIVITIES

Screening Activity	#	%
Eligible for Screening	487	
<i>TBAF completed in Meditech</i>	479	98.4%
Eligible for Symptom inquiry	487	
<i>Symptom inquiry complete</i>	486	99.8%
Eligible for CXR	468	
<i>CXR complete</i>	467	99.8%
Orders for GeneXpert	389	
<i>GeneXpert performed</i>	359	92.3%
Orders for sputum sample submission	396	
<i>Sputum sample collection complete</i>	341	86.1%
Eligible for NP/MD visit	487	
<i>Assessed by NP or MD</i>	474	97.3%

Table 5 summarizes the outcome of screening. In total, twelve (12) new cases of active TB were diagnosed as a result of the CWS. Seven (all adults) were confirmed by culture; 23(1) of these individuals were smear positive (more infectious). The remainder of the new cases were diagnosed clinically, 23(1) based on having abnormal chest X-rays 23(1) and 23(1) 23(1) based on symptoms and history of contact with another case. In addition to identifying the active TB cases, the CWS identified 24 new people with LTBI and 55 individuals who had LTBI diagnosed in the past but who had either no previous treatment or incomplete treatment. Many of these people began LTBI treatment with 3HP.

TABLE 5 – SCREENING OUTCOME

Screening Outcome	#	%
Active TB diagnosis	12	2.5%
LTBI new treatment	79	16.2%
<i>New Diagnosis</i>	24	30.3%
<i>Previous Diagnosis</i>	55	69.6%
LTBI re-treatment	49	10.0%
Surveillance	75	15.3%
Window Period Prophylaxis	27	5.5%
No further follow up/treatment	215	44.0%
Further assessment	22	4.5%
Lost to follow up	10	2.0%
Total	489*	

23(1)

There were 81 children under age 6 in Qikiqtarjuaq at the time of the CWS. Seventy-nine (79 or 97.5%) were assessed at the CWS clinic. Of the 60 children not already taking TB medications prior to the CWS, 72 % started some form of treatment (Active, LTBI or Window Period Prophylaxis - WPP). Of those eligible to start window WPP 70% accepted this preventive treatment.

Key Informant Interviews and ICS Committee Lessons Learned

A. Overall Assessment of the CWS

Those involved in planning and implementing the CWS in Qikiqtarjuaq consistently reported how much was accomplished in the short one-month period of intense planning. The consensus was that the operation went extremely well given the short lead time and lack of prior experience with community-wide screening in the territory. Intense effort was required up front and continued into the screening phase of the operation. Staff overload and fatigue contributed to some gaps in planning and support for the treatment phase. The delay in the availability of rifapentine necessitated a major rethinking of how treatment would be implemented.

Informants reported excellent teamwork, collaboration and a sense of accomplishment. Colleagues were enthusiastic, helpful and everyone worked very hard to make the CWS successful. Since this was the first experience with CWS for virtually everyone involved, approaches and procedures needed to be modified on the fly and the flexibility of all involved to adapt to unanticipated challenges was much appreciated. The involvement and collaboration of health professionals from southern Canada was especially appreciated.

Qikiqtarjuaq was a very welcoming community. Local staff and community leaders were very helpful and supportive and knew the best way to work with community. There was a very high turnout for screening and there was positive feedback from community members and leaders which included their recommending the process to leaders in other communities.

The remainder of this section presents common themes from the ICS committee feedback and the key informant interviews. Each topic area includes observations and recommendations that were made by at least several sources. More detailed recommendations are found in Appendix 3.

B. Leadership and Organization

- There was strong consensus that using the ICS approach and structure contributed substantially to the success of the operation. It facilitated communication, reporting and documentation.
- The extensive preparatory work and planning led by the DCMOH was considered pivotal to the success; however, in future operations much of this work could be delegated.
- Involvement of the SCHP early was important to address the amount of staffing needed, potential locations, housing, community engagement.
- The ultimate objective of the CWS was not clearly articulated initially – was it primarily for active case finding primarily or prevention/elimination? At the beginning it was not clear that everybody had same goals.
- The CGS emergency response team was extremely helpful in taking leadership for procurement, and transport of equipment; their support and responsiveness was very much appreciated by public health staff in the Department of Health.
- ICS meetings were very useful –frequency was adjusted when needed; however, after the screening finished meetings dwindled or stopped, whereas a lot of work was still continuing (especially at RCDC and health centre). Structure and leadership after the screening clinic closure was very unclear. Many of the ICS functions to support this work were still needed but that support dwindled.
- The lack of explicit Epidemiology participation in the ICS structure hindered the processes for identifying indicators and for collecting and managing data.
- Keeping up with documentation (ICS committee minutes) was a challenge
- There were challenges and breakdowns in communication outside of the ICS meetings:
 - between chairs and between working groups; chairs and other members in the ICS structure didn't understand that their roles were to feed back to their committees and constituencies;
 - between Iqaluit-based staff and staff on the ground in the community (sometimes decisions were made in Iqaluit without input from the field);

- some decisions should have come to overall committee rather than individual committees.
- HQ public health staff provided a very large amount of human resources and logistical support, well beyond their roles; this created an excessive workload; for future CWS, recommend outsourcing staffing and logistics functions.
- There was no formal debriefing of the operation.

Leadership and Organization Recommendations

- In a non-urgent situation, there should be a longer lead time allowed for planning.
- Have a contingency plan for increasing staffing rapidly if operations indicate it is needed i.e. have backups/additional staff already identified and available.
- The leadership structure and roles for the CWS should be established as early in the planning as possible. A strong project management approach and clear structure are needed throughout both screening and treatment phases. Adjust the structure and processes for CWS in a non-outbreak (i.e. less urgent) situation i.e. ensure a clear structure and roles but do not necessarily use the emergency response/ICS paradigm. If ICS is used, conduct more training on ICS procedures and principles and develop clear job descriptions and expectations in advance. Clarify respective roles of incident commander and deputy commander. Regardless of what structure used, ensure the leads of each committee report to CMOH; ideally committee chairs are people who already report to CMOH so there is line authority.
- In order to accomplish the substantial workload involved in the set-up of and operation of the clinic, outsource project management as well as logistics for accommodations, travel and staffing.
- Ensure meeting frequency meets the needs of all members, especially after demobilization of the screening clinic.
- Issue a weekly or biweekly situation report - it structures people to gather appropriate data and important tool for communication with stakeholders.
- Have a strategy and resources for addressing stress in staff involved in the response.
- Ensure all work has been completed before ICS stands down.
- Specific recommendations related to membership, structure and committee functioning are found in Appendix 3.

C. Community Engagement and Communications

- The clinic was very well received and appreciated by the community leaders and members. However, a consistent theme from the providers was that communication and community engagement dwindled after the initial weeks of the clinic.
- Both the community meeting and community feast were deemed to be successful and helpful for community buy-in. The community meeting provided people with an opportunity to express concerns prior to the clinic opening.
- Some information or education resources that were developed were not effectively utilized or distributed.
- A communication plan focusing on treatment was developed but the communications staff could not sustain the intensity of involvement they had had in the initial stages, so it wasn't completely implemented.

- In Qikiqtarjuaq there was anxiety about TB. The community and Qikiqtarjuamiut were stigmatized due to the attention created by the screening clinic. Resources developed didn't address this stigma sufficiently. However, inviting the media to come to the community really helped to change their perceptions.

Community Engagement and Communications Recommendations

Community Engagement

- Have a staff member go into the community well in advance of the clinic to begin developing relationships with the community and health centre staff, to determine the community's response to the idea of a clinic and to confirm availabilities.
- Involve the mayor, municipal government and key community members early and at all stages.
- Work through the local health committee to help with messaging. Ensure that community engagement committee members are available for the duration of the initiative to allow for equitable workload and completion of tasks at a community level. Bring in Inuktitut speaking staff to the committee as early as possible.
- Involve Inuit organizations as much as possible, possibly as a lead (if they have the capacity), in engagement of the community.
- Brainstorm ideas for community engagement activities but allow the community to identify what they would like to do and assign a person to support and help co-ordinate those activities at a community level.
- Employ community members as much as possible and ensure adequate training.
- Determine if the clinic will interfere with regularly scheduled community activities (e.g. if set up in the community hall) and make alternative plans e.g. whether these activities can operate at an alternate site or whether other activities that could replace them - determine if staff is needed to help support changes in venues or activities. Support the municipality in applying for funding if required for alternate activities.
- Have a public meeting in advance of the clinic opening to discuss the details of the clinic and answer any questions the residents may have; ensure the meeting lead is fluent in Inuktitut.
- Whenever possible, use staff and clinicians who have been to the community before – this helps with community engagement for the CWS since people are familiar with the providers.
- Debrief with community members - report back on the final results to and thank the community for their participation.

Communications

- Develop a strong communication plan that outlines strategies (multiple modalities) and roles for the entire duration – preparation, screening and treatment phases.
- Recommended strategies include:
 - identifying and utilizing the sources residents usually use to get information (in Qikiqtarjuaq this was through the local radio station and Facebook);
 - effectively utilizing community spokesperson(s);
 - regular updates to the community;
 - proactive engagement with the media;
 - a variety of strategies to distribute educational resources.
- Suggestions for content include:

- Develop messages that address stigma (individual and community);
- Use patient experiences - have stories (positive) to encourage uptake; have elders talk about their experiences with TB;
- Additional recommendations are detailed in Appendix 3.

D. Logistics and Human Resources

Clinic Site and Operations

- In general, the physical set-up of the clinic worked well. After the initial stage during which the clinic processes were being fine tuned, the flow of patients was good. The teamwork amongst all staff at the CWS and between the CWS and health centre was excellent and the work environment was positive, although very busy and stressful at times. Many team members worked very long hours.
- Challenges in the physical set-up of the clinic related to excessive noise, risk to confidentiality and insufficient work stations for maximizing staff productivity.
 - The flow between the different stations in the clinic worked better for patients' first screening visit than for subsequent visits.
 - Due to the use of tarpaulins as dividers between cubicles, conversations could be heard in adjacent stations, so privacy and confidentiality were compromised.
 - Initially there were not enough computer workstations or phone lines and this decreased efficiency and added to staff stress.
 - The area for team meetings and teleconferences was not single-purpose so meeting discussions could be overheard.
 - The location of the Xray station created some awkwardness for staff and client movement.
 - The requirements for cleaning the sputum induction tents (which took up to an hour after each use) limited the number of patients that could be managed.
- It was very helpful to have the CWS clinic in close proximity to the health centre because there was a lot of back and forth of staff and clients between the two sites.
- Having Meditech fully functional at both the health centre and the CWS was critical to the successful running of the clinic and the consensus was that the CWS would not have worked without it. Although IT staff were working onsite prior to the clinic to set up all the equipment, they left the community prior to the first day of operation. In the first days of the clinic there were some significant IT problems and it was difficult and frustrating for clinic staff to obtain IT support from Iqaluit. (In contrast, representatives from the manufacturer of the Xray equipment remained on site until it was clear that the equipment was working as required, and this was much appreciated). There was also insufficient training and support for staff on using Meditech.
- The approach of scheduling all members of a family at the same time worked very well.
- Incentives for people participating in screening worked very well; residents were happy with the gift cards as it gave them the flexibility to buy what they wanted.
- A dedicated plane which would be available for medevacs was, in the end, not needed.
- Due to the delay in implementing the treatment phase of CWS, the use of the community hall by the CWS created more inconvenience for the community and additional work to seek an alternate location.

- The health centre initially struggled with the increased volume of TB patients/clients, having to set-up and equip extra rooms to see clients. There was not enough space or staff at the health centre to manage the initial load, so privacy/confidentiality and quality of care was compromised.

Human Resources

- There were many delays and added burden in human resource paperwork for new hires for the clinic, additionally, headquarters staff were pulled into hiring processes that were cumbersome and took over their day to day roles to ensure the clinic was staffed for the 6 week period.
- There were many challenges with the onboarding of staff for the clinic, especially with staff coming from southern organizations. This resulted in delays in staffing actions, which created stress and inefficiencies both on the ground and in Iqaluit.
- The availability of accommodation in both Qikiqtarjuaq and Iqaluit was a major limiting factor in ensuring that there was adequate staffing on the ground when it was needed. Communication was good with the hotels, however headquarter staff found it challenging to manage this from a distance.
- For various reasons, the timing of staff arrival in the community was not always optimal. For example, most of the initial screening team arrived in the community less than a day before the clinic was to staff, allowing insufficient time for orientation to the clinic and troubleshooting.
- The Clinic Lead was overloaded; there was consensus that there were too many responsibilities for one person and that there needed to be both a clinical lead and an administrative lead on site for effective functioning of the clinic.
- Having Xray techs and respiratory therapists from CHEO worked well and they were very valuable members of the screening team.
- Staffing sometimes was based on the availability of individuals rather than the specific clinic needs; this created some disruption and inefficiencies, including changing clinic scheduling and flow. For example:
 - there were gaps in coverage of particular disciplines (e.g. X ray techs, phlebotomist) which resulted in the need for multiple visits by patients and/or additional burden on the health centre staff (e.g. for drawing blood on children, which needed special skills).
 - when the pediatrician was scheduled to be on-site, the prioritization of appointments for children meant that the optimal approach of seeing all members of a family as a unit was temporarily abandoned.
 - staff lacking TB and/or Nunavut experience had significant learning curves so were not able to function at the same level as those with prior experience
- Having clinicians (physicians or nurse practitioners) on site at the CWS was an advantage, since they could write the prescriptions for TB treatment and thus the TB physicians in Iqaluit only needed to be consulted for complicated cases. However, clinicians were not available in Qikiqtarjuaq after the screening clinic demobilized whereas staff still needed that support.
- The front desk staff were valuable and appreciated members of the team – they knew the community; were helpful as interpreters and for locating people; and were able to teach nurses some Inuktitut and interpretation of nonverbal cues. Interpretation was not needed much (majority of adults spoke English – elders and younger children didn't) but it was essential for the clinic to have this capability.
- The local TB Assistants and Public Health Assistants hired to support the care of the increased number of clients on the TB program have been very helpful in outreach to community members, interpretation and helping with medication administration.

- Qikiqtarjuaq hadn't had a CHR since summer 2017. It would have much better to have had one in place.
- Regional staff (RCDC, TB Case Manager and Iqaluit Public Health Office Manager) all spent time in Qikiqtarjuaq supporting the preparation and initial operation of the clinic. This impacted the ability of RCDC to support TB and other CD management in other communities. Also, pulling of staff from other communities impacted the RCDC as the community would then be short staffed and RCDC may need to train whoever is there regarding TB.
- There was not enough time allocated for TB physicians based in Iqaluit to provide support and consultation to the CWS clinicians and RCDC during both the screening and treatment phases. This sometimes resulted in delays in patient management decisions.
- The rapid and staggered arrival of staff from Nunavut and southern Canada made consistent orientation and training very difficult. Some staff did not get sufficient orientation e.g. some received an orientation to Inuit culture and tradition, which was very helpful, but others did not have this training.

Logistics and Human Resources Recommendations:

Clinic Site and Operations

- Send a representative of the logistics leadership group into the community as soon as possible to build relationships with the health centre, hotels and hamlet.
- Develop contingency plans for plane cancellations due to weather or mechanical issues.
- Have an electrician available at the site during clinic set up and for the first couple of days of clinic operation to trouble shoot any hydro related problems that might arise.
- Change the hours of clinic, starting later in the morning and extending into the evening as well as having regular clinics on Saturdays.

Physical Setup at CWS Clinic and Health Centre:

- Fine tune layout and structures to ensure client confidentiality, noise abatement, infection prevention and control, workstations for all staff roles and effective meeting space.
- Plan the location of the treatment clinic before the screening phase starts i.e. will treatment continue in CWS space or at health centre? If at the health centre, prepare that space in advance.
- Ensure adequate planning for the impact on health centre (details in Appendix 3).
- Secure a location for storage of biomedical waste generated by the clinic and determine logistics for disposal.

Equipment and supplies:

- Review process for transporting medications; consider timelines (time of year) for safe handling and transportation and have better temperature monitoring devices; and maintain close working relationship with pharmacy as well as awareness of pharmacy processes.
- Ensure Meditech is fully operational at both the CWS clinic and the health centre.
- Ensure there is a sufficient number of work stations, printers and phone lines with connectivity to maximize staff productivity.
- After IT equipment is set up, ensure IT staff remain in the community after the initial set-up of equipment, to support and troubleshoot for at least the first few days of clinic operations.

- Ensure that transportation is available (e.g. dedicated vehicle) for the screening clinic at the clinic site and all insurance requirements are complied with.
- Plan for extra equipment and supplies needed at the health centre to manage the increased load of patients on TB treatment and surveillance as a result of CWS.
- Review shelf life of rifapentine and consider buying a stockpile up front (i.e. to cover more than one community) in order to avoid gaps in supply.
- More detailed recommendations for equipment and supplies are found in Appendix 4).

Human Resources:

- Assign a dedicated HR person to support the CWS operation, including accommodation and travel for clinic staff; streamline the HR and hiring process with one point of contact for questions.
- Have conversations with external agencies (e.g. ELORA, St. Joseph’s Hospital) as early as possible to have a pool of staff available, to discuss staffing needs, compensation and ensure all contracts are finalized and secured in advance of clinic operation. Avoid CSAs whenever possible (e.g. keep staff on salary with their organization).
- Arrange for hiring of local staff for clinic tasks such as reception, cleaning and drivers as early as possible.
- Chart review staff should arrive in community at least several weeks before the clinic starts and remain for at least a few weeks after clinic starts.

CWS Staff

- Create and staff two clinic lead positions – a clinical lead and a clinic manager/logistics lead. The leads need to be familiar with the NU health system and the clinical lead must have prior TB experience. Clinic leads should be on the ground well in advance of the clinic starting (e.g. at least a week).
- Ensure there is a professional who can draw blood is present at the CWS site at all times and for both the screening and treatment phases (i.e. phlebotomist or nurse capable of drawing blood from both adults and children); do not rely on the health centre CHNs.
- Ensure RTs are present until there is no longer need for induced sputum.
- Clinician support is required at a minimum from screening through to start of treatment for all patients. Review number and type of clinicians needed.
- Nurses, NPs and physicians must have prior TB experience and ideally would also have NU TB experience.
- For a simultaneous screening/treatment clinic need to have a dedicated team to support treatment.

Regional/territorial staff

- Employ additional staff at regional CDC level during the screening and treatment phases of CWS.
- Build in additional TB physician time prior, during and for up to 6 months after the CWS. Explore locum to backfill for some of TB physician’s other work, paid through CWS budget.

Staff rotation

- Rotations should ideally be 4-6 weeks; however, if this is not feasible in all circumstances, two weeks should be a minimum. Southern staff should be advised when they are needed, rather than making schedule according to their availability.

- There must be overlap between incoming and outgoing staff of a particular discipline or position to ensure appropriate handover and orientation.

Accommodation

- Explore all accommodation options and establish contracts as early as possible.
- Find out about visits to the community by health and non-health groups as well as community events that may affect accommodation availability.
- Communicate with tourism industry from the start.

Orientation/training:

- Ensure that an orientation package is available for clinic staff travelling from the south into remote Nunavut communities.
- Include cultural component in orientation and training of all staff.
- Whenever possible, do respirator fit testing on staff before their arrival in the community; also ensure there is staff in the community capable of conducting fit testing. Do fit testing of community members (especially people cleaning the induction tents) prior to the clinic opening;
- Build in supports for staff rotating in – mental health, team building opportunities, opportunities for social activities with health centre staff, etc..
- Conduct more hands-on training with PHAs/TBAs before the clinic starts. Have PHAs from Qikiqtarjuaq go to next community to mentor, train their counterparts.
- Ensure that all clinicians have been oriented to the NU TB program prior to working in the CWS;
- Ensure sufficient Meditech training support i.e. staff assigned to train and support all incoming staff.
- Conduct more 3HP training with nurses (HC and CWS), RCDC, TB coordinator and 3HP orientation for PHAs.
- Ensure training on hand hygiene for all lay staff.
- Ensure adequate training for housekeepers on proper cleaning.

E. Clinical Pathways

Process

- Nurses, nurse practitioners and physicians found the chart review information very helpful and an essential component for ensuring efficient assessment and flow of the clients through the screening process. However, there was too much work for the chart reviewers for the time available before CWS started.
- Screening by household worked well.
- It worked well to have a prescriber on site at the CWS clinic; it was more efficient as the TB doctors in Iqaluit were only involved with the problems/challenging cases.
- The respective roles between the CWS clinic and health centre for people with pending medical travel were unclear and the screening recommendations for this situation were not always clear. This interfered with CWS flow and there caused delays in the person being assessed.
- IGRA testing was a complicated process – wouldn't be able to do it without specific technician. There was support for doing it again in another community as a feasibility pilot.
- Having rapid analysis of sputum using GeneXpert was a helpful component. It was useful for rapid assessment of cases for which there was a high suspicion of active TB disease. It was also useful for patients who needed rapid screening for medical travel. However, clinicians needed to

be aware of the potential for false negatives and use Xpert in conjunction with all other information to determine likelihood of active TB.

- Digital Xray had higher quality compared to plain film and turnaround was faster. However, since image resolution was so much better, interpretation and comparison with previous images were sometimes challenging (e.g. differences were seen which could be changes since the previous film but may have been there before but not seen because of poorer resolution).
- Radiologists were cautious and frequently reported they could not rule out TB so radiology reports were not always helpful in clinical decision making.
- When people came back for subsequent visits it was not always clear what the purpose of the visit was (e.g. reading TST, induced sputum, etc) and this frustrated some clients and staff. There was also no way to notify more than one provider if a person was waiting for more than one thing.
- Because of delay in 3HP availability, for some children more than 4 weeks had elapsed since their first assessment so some investigations needed to be redone.
- After the CWS clinic demobilized, there was a significant number of people who still required follow-up (e.g. decision regarding further tests and/or treatment); this was left to the RCDC and TB Case Manager and there were no staff on ground dedicated to support this activity. This also contributed to a delay in data validation and reporting of statistics.
- Accountability for follow up of patients was not always clear (e.g. when clinician had left the community or after the screening clinic demobilized).

Clinical Pathways and Algorithms:

- It worked well to have a small group develop the clinical pathways with a very practical focus (i.e. concentration on feasibility in the NU context in addition to evidence).
- Broad inclusion criteria were not helpful because most people ended up receiving all interventions.
- There were mixed reviews of the clinical algorithms (flow sheets) –some said the algorithms worked well (at least for the initial visit) while others said they weren't followed because there were too many situations in which clients didn't fit into the initial categorization; or they were changed frequently; they were also less helpful for subsequent visits.
- Key elements of the screening were history, TST, X ray and, for adults and older children, induced sputum. Collecting on the spot sputum was vital since it ensured that there would be at least one specimen for every person (because sometimes they didn't bring back any more or the specimen was insufficient).
- Providers did not feel induced sputum in young children was helpful in the assessment, the yield was low and it was traumatic for them.
- Physical assessment made very little, if any, contribution to the management of clients/patients and led to incidental findings that required follow-up by the health centre, which created an extra burden.
- Since there are no evidence-based guidelines for retreatment of people who have been fully treated for LTBI in the past, these individuals were reviewed on a case by case basis and decision-making was challenging.
- The clinical pathways developed in Qikiqtarjuaq were in the context of a community outbreak and the screening algorithms may need to be different in a non-outbreak community.

Clinical Pathways Recommendations:

- Assign more staff to do the chart review and allow enough time before the CWS starts to complete this task.
- Keep to assessment of whole household at the same time as much as possible and avoid doing partial assessments (e.g. only CXR) or partial households (e.g. only the children) by ensuring all elements of the screening pathway can be completed (i.e. have all professional disciplines on-site).
- Ensure medication is available at time of decision to treat so that it can be started immediately;
- Articulate a process for making, documenting and communicating changes to clinical pathways before and during the CWS operation. Review the roles and criteria for induced sputum and physical assessment. Other recommendations for review are included in Appendix 3.
- Involve RCDC from the beginning (i.e. orientation on screening protocols, participation in daily clinical meetings between CWS and TB physicians).
- Provide more training for health centre staff on CWS pathways.
- Develop a clear process for screening people with pending medical travel, including clarify the respective roles of the CWS clinic and the health centre. Patients with scheduled medical travel can be screened well in advance to reduce disruption of the screening clinic.
- Develop different clinical pathways for outbreak response and CWS. Specific differences are detailed in Appendix 4.
- Review the rationale and protocol for retreatment of people previously treated for LTBI;
- Clinicians should clearly document their decisions, especially for decisions on deviation from protocols so that other team members can manage them appropriately and respond to client questions.
- Articulate and document processes and accountability for follow-up, including reviewing results, ensuring appropriate follow-up and initiation of treatment, if indicated.
- Coordinate services within the health centre (between CHNs and TB program and between TBNs) that is more client focused and reduces the number of times a patient needs to come to the health centre.
- Have a TB physician or Nurse Practitioner revisit the community 8-12 weeks after the screening phase of CWS is complete to conduct the pre-booked 'Clinical Assessment' and to catch up any individuals missed during the CWS.

F. Case Management and Care

- The process for communication between the CWS and health centre staff about suspect active cases identified at CWS clinic worked very well. All newly identified people with active TB accepted treatment; home isolation of infectious cases was implemented promptly as was initiation of treatment.
- Staff were so busy planning and implementing the screening component that there insufficient advance planning for the treatment phase, including location, determination the number of extra staff required, processes and implementing a new LTBI treatment regime. Securing a location for the treatment clinic was a challenge.
- Support and direction from the regional level was generally very good, but sometimes RCDC or TB physician support didn't come in a timely manner, so this caused delays. The Territorial TB Educator came in person for 3HP training which was very helpful. There is a need to ensure

CHNs are included as people may present to health centre with symptoms that may be erroneously attributed to the medication.

- Health centre nurses found it helpful for one RCDC (also needs admin support) to be responsible for the CWS community alone rather than having other communities/diseases; need a designated TB doctor for that community; this would streamline communication. It was also very helpful that the RCDC sent a single overview email for things to follow up for each patient/client.
- After the CWS clinic demobilized, there was a significant number of people who still required follow-up (e.g. decision regarding further tests and/or treatment); this was left to the RCDC and TB Case Manager and there were no staff on ground dedicated to support this activity.
- The health centre TB nurses divided their responsibilities to increase effectiveness; splitting up caseload by family, regular TBN doing all the contact investigation, one nurse doing all the follow-up TSTs and surveillance.
- The TB assistants have provided added value to the team e.g. because they know the community, they may be able to identify contacts whom the client may not have mentioned.
- Adherence with surveillance is not high.

Acceptance of Treatment

- People were very excited about the 3HP option; the shorter duration was attractive.
- Many who were on INH for LTBI accepted the switch to 3HP.
- Some people with LTBI who had previously declined treatment accepted 3HP.
- The regulatory status of 3HP (i.e. 'new' drug) was not a concern for most patients.
- There has been good adherence to taking the medication.
- Some parents were concerned about WPP since their children were well i.e. they were not clear why their children were on it.
- There were some mild side effects of 3HP treatment (e.g. nausea, abdominal pain); the TB nurses devised approaches that alleviated them (e.g. antinauseants, taking food before the medication) (note: full evaluation of the adverse effects of treatment will be conducted when the treatment phase is complete).

Delay in availability of 3HP

- There was too long a delay between screening and beginning treatment due to treatment drugs being unavailable. Consequences of this delay included:
 - increased patients going to the health centre to ask when they would start;
 - repeat tests or follow-up required (especially children), which was frustrating for families;
 - the need to re-explain the treatment;
 - people changing their minds about accepting treatment;
 - extra work in trying to get many people started at once when the drugs were finally available.

Case Management and Care Recommendations:

- Ensure sufficient TB medications are available so that treatment can start as soon as possible after a patient agrees. Review the shelf life of rifapentine and consider buying a stockpile up front (i.e. to cover more than one community) to avoid supply delays.
- Develop an explicit case management procedure and structure including:

- roles of on-site clinicians, health centre staff, TB physicians, RCDC and Ottawa-based TB consultants;
 - the process for smooth transition/handoff from CWS staff to health centre staff;
 - accountability for follow-up results of investigations;
 - when and how in-community physician support will occur;
 - adequate resourcing (e.g. need clinician on site at least until all treatment is initiated and also to go back periodically to make decisions on clients whose assessment was not completed prior to clinic leaving; build in TB physician time right through to last person finishing treatment).
- Involve RCDC from the beginning (i.e. orientation on screening protocols, participation in daily clinical meetings between CWS and TB physicians).
 - Develop guidelines/parameters for retreatment to minimize the need to consult on every case
 - Have the treatment clinic offsite from the health centre to limit additional traffic at the health centre.
 - Have PHAs from Qikiqtarjuaq go to next CWS community to mentor and do hands-on training;
 - Ensure all involved in the circle of care have training in 3HP, including CWS clinicians, TB nurses, health centre CHNs, TBAs/PHAs, RCDCs and regional TB Case Manager. Provide more information on where 3HP had used previously and efficacy for staff to explain to people who had questions.
 - Roll out 3HP as a treatment option throughout Nunavut – there is demand from communities and practitioners. If this can be done soon, it will make it easier for CWS in another community;
 - Changes recommended for the 3HP guidelines are included in Appendix 4.

G. Impact of CWS on Health Centre Operations

Screening Phase

- There were higher patient volumes at the health centre because clinicians at CWS were doing physical assessments and they identified health issues needing follow-up, which they referred to the health centre.
- Workload increased for CHNs also because they were needed to draw blood in children when a phlebotomist wasn't on-site at the CWS.

Treatment and Follow-up Phase

- Two extra health centre rooms were required for the increased TB workload in the treatment phase of CWS. The dental office and staff lounge were used. This impacted other health programs and made the small health centre even more crowded. The additional staff and clients created privacy/confidentiality issues and pressure on waiting area.
- A lot of time has been required to support people in adhering to the treatment regime (for both active cases and LTBI).
- There has been increased workload such as: SChP had to review all lab reports and ensure they had been acted upon; CHNs needed to draw blood on children seen in the CWS treatment clinic; some CWS participants required 8 week follow-up.
- The workload of the regular community PHN was heavy but once two additional nurses came on board the workload was more manageable

Both Phases:

- Requests for additional staff were supported but the process to actually get the staff was slow at times.
- PHAs and TBAs have been very helpful in follow-up of TB clients but they need more hands-on training and oversight.

Impact of CWS on Health Centre Operations Recommendations

- Involve the health centre in all aspects of the planning, implementation and evaluation.
- Develop a plan to manage the increased volume of patients.
- Engage the community more throughout the CWS and after in encouraging treatment adherence.
- Have clinicians at the CWS make direct referrals to the community physician for non-urgent, non-TB issues (rather than going through the health centre/CHN).

H. Information Management

- Having EMR (Meditech) was a huge advantage and essential for the success of the CWS clinic; however, there were limitations. At times it was slow and this impeded efficient flow of patients through the clinic. In addition, some tasks (e.g. interviewing a whole family at once) did not lend themselves to direct data entry in Meditech, since only one person's chart could be opened at once and paper alternatives were created.
- Initially there were significant problems with managing information with practitioners developing personal tracking strategies and spreadsheets. For example, it was unclear where clients were at in the screening process (e.g. steps they had completed) and each discipline created its own calendar which was inefficient and ineffective. After a few days a scheduling system which all staff in the clinic could use was set up in Meditech and this alleviated most of the problems.
- The summary history form from the chart review was very helpful; it captured a lot of key information in one place. Although it did not eliminate the need for the TB nurse at the CWS to look in Meditech (i.e. to determine if there was any new information since chart review), it sped up the process considerably.
- Some other forms (e.g. clinic flow cover sheet, outcome form, checklist for 3HP eligibility) were extremely helpful and only small revisions were recommended, whereas other forms would need substantial revisions to be functional.
- There were challenges with reliability and accuracy of summary information that was provided while clinic was running.
- Additional information management challenges are detailed in Appendix 4.
- There was no debrief or evaluation regarding the usefulness of the forms.

Information Management Recommendations

- In order to address the identified challenges in information management, implement a collaborative process (involving epidemiology, clinicians, TBNs, TB physicians, RCDC and HQ) for:

- developing information management procedures and expectations for what each member of the clinic team needs to document, mandatory fields in Meditech, etc.;
- determining the information that needs to be collected for clinical management, patient flow, epidemiologic analysis and evaluation;
- developing and revising forms and spreadsheets; and
- QA of data collection.

to ensure that they meet the operational needs of clinicians on the ground, regional CDC and epidemiology and don't lead to unnecessary duplication of documentation.

- Do not do CWS in another community unless Meditech is fully functional.
- Ensure there is a backup/contingency plan if Meditech goes down, including backup paper forms
- Procedures and forms should be put on the intranet for easy access. Ensure there is overlap of leaving and incoming staff to ensure adequate orientation to information management procedures and forms.
- Revise the procedure for confidential chart transfer between the CWS and the health centre.
- Recommendations on revisions to specific forms are found in Appendix 4.

Patient Survey

In total, 69 surveys patient surveys were completed.

The mean age of participants was 43 years, similar to the mean age of the general Qikiqtarjuaq population. Compared to the general population, a greater proportion of females participated (59% of survey respondents were female whereas 43% of the community population is female). Most people visited the screening clinic 1 or 2 times (40% and 38% respectively), while 7% visited 5 or more times.

Care Received

Most people described the overall care they received as Excellent or Good (38.2% and 55.9%, respectively). There was no significant difference between males and females in the responses to these questions. All respondents indicated they were able to access services in one of Nunavut's official languages; however, some respondents provided feedback that only the registration process was available in Inuktitut, but after patients were registered the health staff completing screening tests spoke only English.

Assessment of the care from the TB clinic staff was very positive, with 43% rating the care from staff as Excellent and 54% rating care as Good. Individuals who experienced excellent care with the TB clinic staff were more than 4 and a half times as likely to report that their overall care was excellent than individuals who had experienced less than excellent care with the TB clinic staff. This relationship between overall experience and experience with staff was similar for all types of professionals at the clinic (e.g. nurses, physicians, respiratory therapists, etc.). Despite this overall positive experience with staff, some community members felt as though the southern health staff may have been insensitive to individuals' needs or experiences with TB in the past.

Screening Process

In general, people attending the screening clinic reported they had been well informed about the process: 97% understood why they were at the appointment, 84% were informed about the screening process and step and 88% felt the procedures were clearly explained to them. The majority (85%) felt comfortable asking questions and that all their questions were answered (91%).

However, one quarter (25%) of respondents stated they were not involved with decisions affecting their care and the similar proportions stated they were not informed of their care plan (25%) or given information on follow-up care (24%).

Information about TB

Almost all (94%) of respondents stated they got information about TB, the screening clinic and treatment, but 23% stated they didn't get enough information. Eighty (80) percent stated they were educated about TB at the clinic. The most common sources of general information for respondents were radio (65%), Facebook posts (22%) and information resources (22%). Three quarters (75%) felt they got consistent updates from the mayor regarding the screening clinic.

Impact of the Screening on the Community

Overall, the majority (92.6%) of residents surveyed felt that the screening was positive for their community. However, respondents also indicated that the clinic impacted the community in several ways. Sixty-five (65) per cent stated that the screening clinic disrupted regularly scheduled community events (44% answered Yes and 21% Somewhat). A similar proportion (60%) felt that having the screening clinic changed how people outside the community viewed Qikiqtarjuaq and Qikiqtarjuamiut, but the survey did not ask about the nature of the perceived changes.

Discussion

Achievement of the goal and objectives of the CWS:

The stated goal of the CWS in Qikiqtarjuaq was to assess the feasibility and outcome of a community-based screening program as a strategy to control a community tuberculosis outbreak. The experience clearly demonstrated that CWS was feasible, but it required intense effort and significant resources. Because of the ongoing outbreak of TB occurring in the community there was an urgency to implement the screening clinic. As a result, an immense amount of planning and mobilization were required in a very short period of time (about a month), including securing equipment and supplies, hiring and training staff, developing clinical processes, creating forms and educational resources and engaging the community. The short length of the planning phase and the fact that this type of intervention had not previously been done in Nunavut meant that changes to processes, some larger and others smaller, were frequently required, at least in the initial weeks.

The intensity of up-front work, and the limited staff available to do it, meant that some things weren't planned or implemented optimally including community engagement, which dwindled after the first few weeks, and planning for the treatment phase, which by some accounts hadn't been fully thought through. Operationalizing treatment was also complicated by the freezing of the initial supply of 3HP and the delays in getting replacement medications.

Assessment of whether the specific objectives of the CWS were met is not fully possible at this time since only preliminary data analysis had occurred at the time of writing of this report. However, the findings to date have provided some indicators of success. The first two objectives were to diagnose and treat all cases of active tuberculosis and latent TB infection. Twelve new cases of active TB were diagnosed as a result of the screening; this number was significantly higher than anticipated. It can't be known how long it would have taken for these people to be diagnosed with TB in the absence of the CWS clinic, but the screening clearly accelerated them being identified. Since some of them were infectious, finding them earlier meant that treatment could be started sooner and potential spread to others interrupted. In addition to the people with active TB, 24 new people with newly diagnosed LTBI and 55 people with previously diagnosed but not fully treated LTBI were offered treatment to prevent them from getting TB disease in the future.

The high participation rate (96%) of community members suggests that few, if any, potential cases were missed. Ideally, though, the 18 people who did not participate should be assessed, at least to rule out active TB.

Assessing the third objective, "Identify resources required for a community-based screening program" requires financial and human resources analysis which is beyond the scope of this evaluation. However, key informants and ICS committees provided important feedback on the numbers and types of staff required, in their opinion, to optimize clinic functioning as well as follow-up and treatment of cases. Their recommendations provide valuable guidance so that adequate resourcing at the CWS clinic, health centre and regional levels is in place should CWS be done in another Nunavut community.

The fourth objective, "Increase treatment adherence and completion" cannot be fully assessed until 2019, since some LTBI treatment is 9 months long. However, results for adherence and completion to the shorter 3HP regimen should be available earlier, since most people would have completed their 3HP

treatment by summer 2018. Key informants reported that interest in and acceptance of the shorter 3HP regimen were high among people with LTBI, and that people who had declined LTBI treatment in the past now accepted treatment with the shorter regimen.

Timely analysis of reported adverse effects from 3HP is needed. Anecdotal reports from key informants suggest the regime was generally well tolerated, but quantitative and qualitative review is important, since adverse effects can have a major impact on adherence to treatment.

The final objective of the Qikiqtarjuaq CWS, “Increase knowledge of community members about TB transmission, and TB screening and treatment” cannot be evaluated. A pre-screening survey sought to assess TB knowledge and attitudes but was incompletely implemented.

Health Provider and Patient Assessments of the CWS

From the health provider perspective, the screening clinic was a success. The consensus amongst key informants and ICS committees was that the operation went extremely well given the short lead time and lack of prior experience with community-wide screening in the territory. Informants reported excellent teamwork, collaboration and a sense of accomplishment. However, workload was often excessive, resulting in fatigue and burnout. There were frustrations with the hiring process. Orientation to Nunavut and to the job was not consistent. The involvement and collaboration of health professionals from southern Canada and Qikiqtarjuaq’s mayor were critical.

The structure provided by the Incident Command System was seen as essential. Because this approach was new to many of those involved, there were some challenges with communication and role clarity. In addition, the coordination, support and structure provided by the ICS were not sustained sufficiently in the later screening and treatment phases and there was no formal debriefing of the operation.

The majority of patient survey respondents also felt the screening was positive for the community (93%) and rated their care at the CWS clinic as Excellent or Good (94%). They reported being well informed about the process and having all their questions addressed; however, one quarter indicated they were not involved in decisions involving their care, which may suggest that additional effort is needed to engage patients, as this may affect acceptance and adherence to treatment. It should be noted that the results of the patient survey must be interpreted with caution, since the target sample size wasn’t achieved and respondents were not randomly selected as originally intended.

Despite the positive assessment by both providers and patients, the CWS created some challenges for the community. The location of the clinic in the community hall necessitated moving or cancelling community events, which was disruptive. The CWS also caused additional workload for health centre staff and deferral or cancellation of some health services.

In general, after the kinks were worked out in the first few weeks, the clinic operated relatively smoothly. The team successfully modified original plans as required, but many felt that not enough attention was paid to planning and resourcing the treatment and follow-up, resulting in unclear accountabilities and additional workload for the health centre and regional CDC group.

Many recommendations were made for fine tuning the clinic processes and protocols. The availability of sputum induction and on-site digital radiography were major advantages, but providers questioned the value of some of the other screening components, such as the physical assessment, suggesting the need to revisit the clinical pathways, considering both feasibility and evidence.

Limitations

This report focuses on community-wide screening and does not consider the wider context of the TB program in Nunavut such as case and contact follow-up; TB education for providers and the public; and health promotion activities. A separate review is considering the broader program for TB control in Nunavut. While interviews were conducted with a range of healthcare providers and staff involved in the community-wide screening, it was not possible to interview all individuals. The evaluation is therefore limited to the perspectives of those interviewed and the information available to review.

Recommendations for Future CWS

- Ensure sufficient lead time and resources for planning CWS in another community with a focus on planning at the same level for all phases.
- Use a project management approach, with clear responsibilities and lines of communication, during the planning and implementation phases and with adequate staffing at the CWS, health centre, regional and territorial levels.
- Ensure administrative processes are in place to facilitate rapid onboarding and orientation of the additional staff required for a CWS.
- Review and revise clinical pathways based on the Qikiqtarjuaq experience and best practice, including consideration of differences required for outbreak versus non-outbreak settings.
- Develop a strong and adequately resourced community engagement and communications plan that spans the entire length of the CWS.
- Consider the impact of the CWS on the community and the local health centre in all plans and processes.
- Implement a collaborative process for designing future CWS information management and evaluation, balancing the requirements for clinical management, patient flow, epidemiologic analysis and evaluation.
- Distribute the detailed recommendations from the key informant interviews and ICS committees for consideration by those responsible for planning and implementing future CWS.
- Update the community when further results of the CWS are available.

Conclusion

The 2018 Qikiqtarjuaq screening and treatment clinic marks the first time this type of TB outbreak response clinic has been offered in a remote community in the northern territories. The fact that the clinic idea was conceived, organized, and established in a period of just over one month is remarkable. Also, the fact that it was accomplished successfully during the middle of winter is extraordinary.

The success is attributable to the hard work and dedication of Nunavut health staff at the local, regional and territorial levels, with invaluable contributions from Qikiqtarjuamiut as well as professionals who came from southern Canada to support the operation.

This evaluation focused primarily on the process of implementing the clinic rather than the outcomes and effectiveness of the screening. Additional analysis of the screening and treatment data is planned or underway, with an aim of further exploring the effectiveness of the CWS in contributing to TB control.

References

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3. Nunavut Food Security Coalition <https://www.nunavutfoodsecurity.ca/Rates>
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6. Government of Canada. Access to Drugs in Exceptional Circumstances <https://www.canada.ca/en/health-canada/services/drugs-health-products/access-drugs-exceptional-circumstances.html>

Appendix 1

Incident Command System Organizational Chart



Appendix 2

Ethical Considerations for Data Management and Analysis

Confidentiality

All data collected was securely transported as per the Health Directive (policy number A-001) *“Sending and Receiving Confidential Email and Mail.”* or directly through the core-business network.

Data from the Qikiqtarjuaq health centre being transported from the health centre to the TB clinic at the community centre was transported in a locked storage box with a paper tracking system to log files being moved. Plastic “sleeves” are the files that stayed at the TB clinic; they were stored in binders alphabetically by last name. Sleeves for patients with upcoming appointments were kept at the front desk when TB clinic front desk staff were on duty and were moved to the kitchen and stored in a large lockable storage bin outside of screening hours. Sleeves for patients who were in the process of or had completed screening were kept in the kitchen and stored in a large lockable storage bin. All log books for TB nurses, LPNs, RTs and CXR staff were put into the lockable storage bin in the kitchen during non-clinic hours. The kitchen was locked at the end of the night with a separate key. Any patient charts belonging to the health centre (the green files) were moved over to the TB clinic temporarily using the log transfer system (for the sleeves) and was logged back at the health centre at the end of the day (no official patient chart remained at the TB clinic after screening had finished for the day).

At the end of the community screening all plastic sleeves with screening forms, log books and any other paper information from the screening were transported to the Population Health Information Unit in Iqaluit using Health Directive A-001. Data was securely stored and handled in the Population Health Information Unit. Access to data was restricted. Identifiers are located on the tuberculosis assessment form and maintained in the tuberculosis database. As such, access controls and passwords had been implemented and access was limited to the Population Health Information Unit. Only de-identified and aggregated data were disseminated for use.

Ethical approval

Public health surveillance is the systematic collection, analysis and interpretation of health-related data for the planning, implementation and evaluation of public health practice. The TCPS 2 definition of research¹ is “an undertaking intended to extend knowledge through a disciplined inquiry and/or systematic investigation.” Although public health surveillance may share some methods and techniques with those employed in research (such as data collection and data analysis), the intent and objectives of the data collection, as well as the further use of the collected data, are determining factors for establishing whether it is research as defined in TCPS 2. Activity that is conducted in support of a public health program or under the jurisdiction of a public health authority and that does not have research as a primary goal, does not fall within the TCPS 2 definition of research and does not require REB review. Any secondary research that is conducted on the data collected from the community wide screening will require research ethics board approval and data will only be used in aggregate form with all identifying information removed.

1. Interagency Advisory Panel on Research Ethics. 2001. Tri-Council Policy Statement: Ethical Conduct for Research Involving Human (TCPS). http://www.pre.ethics.gc.ca/pdf/eng/tcps2/TCPS_2_FINAL_Web.pdf

Appendix 3

List of Individuals Consulted

Key Informant Interviews:

Kate Darling, Regional Communicable Disease Coordinator, Baffin Region
Dr. Patty DeMaio, TB Physician
Sandy Finn, Territorial TB Educator
Kristine Hutchinson, Manager, Iqaluit Public Health
Rehannah Khan, TB Nurse, CWS screening clinic
Mary Kiliktee, Mayor, Qikiqtarjuaq
Jessica Kwan, Public Health Nurse, Qikiqtarjuaq Health Centre
Charlene Lavallee, TB Case Manager, Baffin Region
Lilliana Marinko, TB Nurse, Qikiqtarjuaq Health Centre
Lucy Mgonja, TB Nurse, CWS treatment clinic
Dr. Amber Miners, Qikiqtarjuaq Community Pediatrician
Chris Nolan, Nurse Practitioner and CWS Site Commander (Clinic Lead)
Ayodeji Ogunade, TB Nurse, Qikiqtarjuaq Health Centre
Elizabeth Oguntuase, SChP, Qikiqtarjuaq Health Centre
Rick Pascoe, Senior Health Emergency Planner, Department of Health
Dr. Michael Patterson, Deputy Incident Commander, TB Physician
Andrea Schertzer, Public Health Officer, Department of Health
Sakhile Sibanda, TB Nurse, Qikiqtarjuaq Health Centre
Sally Suen, TB Nurse, CWS screening clinic

Debrief Meetings:

Dr. Gonzalo Alvarez, Territorial TB Consultant
Dr. Kim Barker, CMOH
Daman Dhillon, Health Promotion Specialist
Jibril Esak, Health IT
Blake Heffernan, Community and Government Services
Dr Charles Hui, Territorial Pediatric Consultant
Nancy Laframboise, Executive Director, Baffin Region
Tracy MacDonald, Manager Health IT
Sarah Patterson, Communications Officer
Nadine Purdy, Manager of Communications
Malcolm Ranta, Director of Population Health, Baffin Region
Lisa Richter, Director of Human Resources, Department of Health
Kerri Tattuinee, Program Staff, Quality of Life Secretariat
Kareyn Zelikovitz, Territorial Director, Population Health

Appendix 4

Recommendations from Key Informant Interviews and ICS Committees

Leadership and Organization

Planning:

- In a non-urgent situation, there should be a longer lead time allowed for planning
- Have a contingency plan for increasing staffing rapidly if operations indicate it is needed i.e. have backups/additional staff already identified and available
- Need to know about visits to the community by health specialists (e.g. dentists), other groups that may affect accommodation availability. Decide if any of the specialist visits can be deferred.
- Begin the process of obtaining a cost coding for the response as soon as possible; obtain a letter signed by the Deputy Minister of Health indicating equipment required for the response has been pre-approved

Organizational structure

- The leadership structure and roles for the CWS should be established as early in the planning as possible. A strong project management approach and clear structure are needed throughout both screening and treatment phases. Adjust the structure and processes for CWS in a non-outbreak (i.e. less urgent) situation i.e. ensure a clear structure and roles but do not necessarily use the emergency response/ICS paradigm. if ICS is used, conduct more training on ICS procedures and principles and develop clear job descriptions and expectations in advance. Clarify respective roles of incident commander and deputy commander. Regardless of what structure used, ensure the leads of each committee report to CMOH; ideally committee chairs are people who already report to CMOH so there is line authority
- Ensure all work has been completed before standing down
- Recommended improvements or changes to committees were:
 - Representation from IT and Finance should be present on the leadership committee from the beginning
 - Include the Nunavut TB epidemiologist in the leadership structure with a clear role description. Epidemiology input is required for planning, operations and other committees to ensure efficient and effective data collection and management processes
 - strive for one individual to chair each WG throughout for consistency and avoidance of revisiting decisions. Consider designated alternate chair and ensure that one of the two is available throughout the operation. If this isn't feasible have strong briefing and handover to new chair
 - develop guidelines for chairs on how to work with own group, requirements for reporting, communication between WGs
 - additional working groups were recommended:
 - have a working group focused on regional operations (would include management of the region) – how the screening is impacting the health centre and region and how health centre and region are supporting the CWS
 - for the human resources working group, have three subgroups: staffing, accommodation and travel
 - Have three subgroups in the Operations group: clinical scheduling, medication management and clinic operations with Operations chair coordinating them

- have an individual who can move between committees to assist with temporary work overload situations.

Meetings

- The CMOH, DCMOH and Senior Health Emergency Planner must be notified of the date and time of all committee meetings
 - During clinic set-up and early in clinic operation there should be daily meetings with all committee chairpersons to discuss situations as they arise
- Have a scribe (not the Chair) assigned to each committee who ensures documentation before next meeting. Ensure all minutes of all committee meetings are forwarded to SHEP as soon as possible after each meeting
- Ensure meeting frequency meets the needs of all members, especially after demobilization of the screening clinic

Other

- have a strategy and resources for addressing stress in staff involved in the response and encourage staff to watch each other for signs of stress
- Issue a weekly or biweekly situation report - it structures people to gather appropriate data and important tool for communication with stakeholders

Community Engagement and Communication

Community Engagement

- Ensure that community engagement committee members are available for the duration of the initiative to allow for equitable workload and completion of tasks at a community level. Bring in Inuktitut speaking staff to the committee as early as possible
- Involve Inuit organizations as much as possible, possibly as a lead (if they have the capacity), in engagement of the community
- Have a staff member go into the community well in advance of the clinic to begin developing relationships with the community and health centre staff, to determine the community's response to the idea of a clinic and to confirm availabilities
- Employ community members as much as possible and ensure adequate training
- Involve the mayor, municipal government and key community members early and at all stages (Qikiqtarjuaq mayor is willing to travel and/or go on the radio in another community where screening is planned)
- Work through the local health committee to help with messaging – they can help with radio and direct people with questions
- Meet with school, HC staff, businesses and other key stakeholders in addition to the general community to build broad support the CWS
- Brainstorm ideas for community engagement activities, but allow the community to identify what they would like to do and assign a person to support and help co-ordinate those activities at a community level
- Build relationship with radio and community cable staff to facilitate ability to use those channels frequently to talk about changes/updates Determine if the clinic will interfere with regularly scheduled community activities (e.g. if set up in the community hall) and make alternative plans

e.g. whether these activities can operate at an alternate site or whether other activities that could replace them - determine if staff is needed to help support changes in venues or activities. Support the municipality in applying for funding if required for alternate activities

- Have a public meeting in advance of the clinic opening to discuss the details of the clinic and answer any questions the residents may have; ensure the meeting lead is fluent in Inuktitut
- Consider having a community feast close to clinic opening to foster community involvement and help to alleviate any fears the residents may have
- Whenever possible, use staff and clinicians who have been to the community before – helps with community engagement for the CWS since people are familiar with the individuals
- After the clinic has started, meet with the mayor regularly (e.g. biweekly) to update and discuss issues or concerns and update the community regularly
- Engage the community more in understanding and encouraging treatment – a lot of time has been taken in Qik to get people to take their meds, even active cases, and perhaps more community engagement would reduce load on the health centre
- Debrief with community members - someone from territorial level to report back on the final results to and thank the community for their participation. Consider another feast

Communications

- Develop a specific communication plan which outlines strategies (multiple modalities) and roles for the entire duration – preparation, screening and treatment phases. Specific suggestions provided were:

Strategies

- Capitalize on health promotion events (e.g. health fairs) to increase understanding of basic TB prior to CWS
- Distribute a 'what to expect at the screening clinic' through multiple channels before the appointments (e.g. pamphlet given with appointment card) and encourage people to attend at their appointment time
- Ensure availability of community spokesperson(s) throughout the CWS and provide scripts
- Since most residents go to Facebook and the local radio station for information – put messages out on both as soon as possible. Ensure clear and consistent communication paths between GN PSAs and the local radio station and Facebook news page. Consider a call-in show so people can ask questions about TB or the clinic
- Engage media proactively; ensure that there are no surprises for the community by informing community in advance of upcoming media
- Develop a distribution plan for resource delivery in the community

Content

- Reassure general community before screening i.e. regarding general TB
- Develop messages that address stigma (individual and community)
- Continue to address frequently asked questions about treatment e.g 3HP side effects (need to balance message that TB medications are safe with information about side effects), reasons for surveillance and, if applicable, why window period prophylaxis is being used
- Use patient experiences - have stories (positive) to encourage uptake; have elders talk about their experiences with TB

- Include general messaging on respiratory etiquette, e.g. covering cough, putting on mask in waiting room to normalize and encourage these behaviours

Logistics and Human Resources

Physical Setup at CWS Clinic and Health Centre

- Fine tune layout and structures to ensure client confidentiality, noise abatement, infection prevention and control, workstations for all staff roles and effective meeting space
 - Have sputum station before Xray - because Meditech was slow and it took time for order to be logged (needed to be logged before they could actually perform the Xray);
 - Ensure there is a meeting room separate from clinic or other staff space – for meetings and for confidential discussions
 - Need station for data entry/epidemiologist
 - Ensure there is a hand washing sink – hands need to be washed to remove residue after multiple cleanings with hand sanitizer
 - Need private (e.g. screened) area outside clinic for people who can produce sputum
 - Plan location of X-ray machine to minimize disruption to patient flow and shielding/dividers to minimize staff exposure
 - If screening and treatment phases overlap, ensure additional stations and space and determine flow through clinic
- Plan for location of clinic once the screening phase complete i.e. will treatment continue in CWS space or at health centre? If at health centre, need to prepare that space
- Ensure adequate planning for the impact on health centre:
 - chart reviewer needs own office space and computer in the health centre
 - need additional clinic rooms set up and staffing to accommodate increased number of patients
 - Decide if any of the specialist visits can be deferred and potential impact
 - Consider potential support which could be provided by health centre mental health worker (e.g. if traumatic TB history in family)
- Ensure a lockable location (that is not temperature controlled) is available for the temporary storage of biomedical waste generated in the clinic
- Obtain the services of an Environmental company to transfer the biomedical waste from the clinic community to Iqaluit for incineration.

Equipment and supplies:

Transport of equipment and supplies:

- Assemble all materials being shipped by a cargo charter at a marshalling centre so they can be weighed, itemized and prioritized
- Ensure proper protective cases are available for clinic equipment that and that all cases will meet the specifications of the airline

- Review process for transporting medications: Consider timelines (time of year) for safe handling and transportation; need better cooler/packaging, use device that monitors temperature minute by minute, not just a freeze indicator

IT/Phone:

- Ensure Meditech is fully operational at both the CWS clinic and the health centre (need TB assessment form, physicians notes, labs, sputum, Xray all available on Meditech)
- Ensure there is a sufficient number of work stations, printers and phone lines with connectivity to maximize staff productivity (four phone lines for a CWS clinic for a community of similar size) and ensure connectivity. (e.g. phone line between HC and C-hall in Qik doesn't function consistently)
- After IT equipment is set up, IT staff needs to remain in the community for at least the first few days of clinic operations to troubleshoot
- Ensure IT are available 24/7 for response to clinic related problems and ensure contact numbers which are provided are direct access that will be answered after work hours. Ideally, have specific IT staff designated to respond to clinic issues, rather than general help line staff
- Provide satellite phones and/or walkie-talkies for communication in communities without cell phone coverage
- Consider sending printer/photocopier and supplies with the chart review person because the chart review will have impact on health centre

Other equipment:

- Ensure that transportation is available (e.g. dedicated vehicle) for the screening clinic at the clinic site and all insurance requirements are complied with Ensure enough tarps (or alternate materials) and posts are available to provide clinic cubicle walls
- Consider sending a printer/photocopier and supplies with the chart review person because the chart review will have impact on health centre
- Consider a third sputum induction tent (approximately 1 hour down time needed for cleaning) for two RTs to function efficiently
- Consider having a centrifuge at the CWS
- Provide electronic/digital scales; use same model as TB program in HCs use (scales in Qikiqtarjuaq were not optimal)
- BP cuffs from NESS clinic were not ideal - consider purchasing alternatives
- Ensure adequate supply of N95 respirators (of multiple types), gowns (RTs ran out of full length yellow gowns), and hand sanitizer (ran out)
- Provide toys for both reception area and for clinical stations to occupy and distract children
- Ensure Xray machine company rep is involved in machine setup and remains on-site until it is clear it is working properly
- Do not recommend having dedicated plane again
- Plan for extra equipment and supplies needed at the health centre to manage the increased load of patients on TB treatment and surveillance as a result of CWS – need extra scales, office supplies, medication crushers, thermometers, medication baggies (blister packs don't arrive until 2 weeks after treatment initiation) , test tubes, computers, printers, scanners

Supplies:

- Need safety-engineered tuberculin syringes for TSTs (these were not available in Qik)

- Need adequate supplies of backup paper forms in case system goes down so nurses and clinicians can record notes
- Ensure adequate basic stationary supplies
- Need to check stock of INH and other TB drugs to ensure there is enough on hand (they ran out of INH, PZA in Qikiqtarjuaq)
- Review shelf life of rifapentine and consider buying a stockpile up front (i.e. to cover more than one community)
- Buy incentives and nutritious snacks for the registration area locally and give the local store a heads up when purchases will be made so the stores can keep the shelves filled. Provide clear direction for clients on what is required for them to be eligible for the incentive.
- Ensure all necessary signs and information sheets have been translated and are available before clinic begins operation
- Ensure adequate supply on-site of hand sanitizer and all required types of personal protective equipment (gowns, respirators)

Clinic Schedule:

- Change hours of clinic –Contract staff could be advised of the hours of work as a condition of employment
- Schedule Saturday clinics – southern staff were prepared to work; Saturdays could be used for catch-up for family members who were missed during the week, people who were travelling soon and might be otherwise missed

Staffing:

- a. General
 - Develop tools or templates to help capture staffing needs in an urgent situation
 - Assign a dedicated HR person to support the CWS operation; streamline the HR and hiring process with one point of contact for questions
 - Have conversations with external agencies (e.g. ELORA, St. Joseph’s Hospital) as early as possible to have a pool of staff available, to discuss staffing needs, pay, per diem, and to draft any contracts that need to be in place
 - Ensure all contracts are finalized and secured in advance of clinic operation;
 - Consider timelines for southern hiring (March Break interference);
 - Avoid CSAs whenever possible (e.g. keep staff on salary with their organization);
 - If CSAs are used be upfront about what people will get with CSAs and be clear on how this will impact them financially
 - Assign someone to work with the community level partners to ensure information sharing and engagement happens
 - Arrange for hiring of local staff for clinic tasks such as reception, cleaning and drivers as early as possible; SCHK should be consulted in this process. If possible, have all clinic staff to report to the clinic leads so there is a unified line of authority
 - Record all staff’s contact information (non-GN email address, personal/work address), dates of contract, flight information, accommodation information in one place

- Initial screening team needs to all be in the community a minimum of several days prior to the clinic start date to troubleshoot and clarify roles, flow, communication. Need to do test run before clinic starts and/or have IT stay in the community until all up and running smoothly
- b. Chart review staff
 - Need nurse (RN or LPN) to do chart review; consider retired nurses as potential chart reviewers. Must have both NU and TB experience to do chart review: RCDC and/or PHN who has dealt with NU TB previously
 - Need at least two nurses to do chart review: a lead who in addition to chart review would attend meetings and have other planning duties (arising from being in the community early) and a second nurse whose sole role is chart review
 - Should arrive in community at least several weeks before the clinic starts and remain for at least a few weeks after clinic starts
 - Need 6 weeks for community of 600
 - Should also have a dedicated admin person to do photocopying and pull charts at health centre
- c. CWS Clinic Professional Staff
 - Clinic Leads:
 - Create and staff two clinic lead positions – a clinical lead and a clinic manager/logistics lead, one person cannot both roles. Leads need to be familiar with the NU health system. Clinical lead must have prior TB experience.
 - Clinic leads should be on the ground well in advance of the clinic starting (e.g. at least a week)
 - Ideally the manager should be there for the duration of the CWS, to cover logistics, oversee and train support staff, HR, pay, be the single point of contact for community.
 - Phlebotomist:
 - Ensure there is a phlebotomist (who can draw blood from children and adults) at the CWS at all times; cannot ask health centre staff (CHN) to do this; have phlebotomist who can also prepare blood for shipping
 - Clinicians:
 - Review number and type of clinicians needed; clinicians don't have to be MD – could be NP who has taken intensive TB training. Review need for/role of pediatrician – some felt this was essential. If have pediatrician, general pediatrician of more value than ID specialist. CHEO doctors helpful for consult on complicated cases
 - Need clinician support at least from screening through to start of treatment
 - Nurses, NPs and physicians must have prior TB experience and ideally would also have NU TB experience
 - Respiratory Therapists:
 - Ensure RTs are present until there is no longer need for induced sputum
 - Need someone trained to do respirator fit testing present at clinic (RT did some, but need additional trained staff)
 - Epidemiologist needs to be onsite initially; should be there at minimum for the first few weeks of the screening phase to address revisions of forms, preparation of summary numbers to monitor and report on progress. Staff tasked with data entry need to be onsite for the entire screening phase

- Consider an extra CHN assigned to health centre who would see medical travel people – would need to decide what their assessment would entail (the protocol and HR requirement may be different for a non-outbreak community)
- For a simultaneous screening/treatment clinic, once prescription is written, have someone there to pour meds and admin first dose – need to have dedicated staff to support treatment (e.g. one nurse, one LPN and one PHA); need to have team throughout
- TB nurse for 3HP needs to be able to draw blood (in Qikiqtarjuaq, children still go to the health centre which adds extra workload for HC staff)

d. CWS Clinic Support Staff

- Need an administrative support person prior to and during the CB-TBS to handle human resources logistics, train staff (e.g., Meditech)
- Consider having a floating staff who could manage flow of clients (ensure they are getting the right care – e.g. not reweighed if have had screening and only coming in for CXR), ensure they are seen in the proper order, troubleshooting issues
- Need to hire more than one Inuktitut-speaking receptionist to cover if one is ill or otherwise can't work. They are essential to check people in and identify who is missing.
- Consider assigning non-professional staff to clean the sputum induction tent and train appropriately in order to use RTs time more efficiently
- Ensure CHR is in place in the community
- Need someone assigned to pick up people and supplies (this was a daily occurrence) – could be a community person
- Possibly have an additional staff dedicated to data entry; (but difficult to get skilled data entry staff and epidemiologist is still needed to review and validate data entry, so it may be more efficient to hire an epidemiologist for the CWS, supervised and supported by the Iqaluit-based TB epidemiologist)

e. Regional/territorial staff

- For CWS, need additional staff at regional CDC level
 - Dedicate one RCDC to participate in planning, in the CB-TBS and in the 12 months follow-up.
 - Employ casual RCDC staff after the clinic has closed to manage the outcome forms and track the status of follow-up
- Need TB physician with dedicated time on a daily basis to consult on challenging cases; need enhanced TB MD time prior, during and up to 6 months after the CWS. Explorer locum to backfill for some of TB physician's other work, paid through CWS budget
- Need to build in additional TB physician time prior, during and for up to 6 months after the CWS

f. Treatment clinic staff

- 1 RN with two TB Assts, 1 clerk, 1 cleaner is adequate for a community the size of Qikiqtarjuaq

g. Staff rotation

- Having staff staying for the whole duration of the clinic may not be realistic and rotating in and out avoids burnout, but aim for 2-3 week minimum for rotations (ideally 4-6 weeks). Do not allow 1-week rotations. Southern staff should be advised when they are needed, rather than making schedule according to their availability. This should be easier when there is more lead time that there was for Qikiqtarjuaq.

- Staff to the clinic needs rather than available clinicians – e.g. don't change clinic flow if have a pediatrician – rather, ensure there is another clinician who can see the adults, so that families can all be seen at the same visit
- There must be overlap between rotations of staff of a particular discipline – for orientation/handover; definitely no gaps where a particular discipline is absent because this disrupts clinic flow, leads to inefficiencies and inconveniences patients

h. Accommodation

- Explore hotels, bed and breakfast, transient homes and other accommodations and establish contracts as early as possible
- Find out about visits to the community by health specialists (e.g. dentists) and non-health groups as well as community events that may affect accommodation availability
- Ensure all contracts are finalized and secured in advance of clinic operation;
- Communicate with tourism industry from the start
- Formulate a process with finance to ensure hotel invoices are paid in a timely manner
- Arrange for internet accessibility for staff if accommodation does not have internet

Orientation/training:

- Need time built in for on-site orientation of new staff rotating in (at both the CWS and health centre). Staff (other than the initial team) should arrive a minimum of a day, preferably two days in advance of their first shift
- Consider a different model of training i.e. more focus on community workers rather than transient professional staff
- Ensure that an orientation package is available for clinic staff travelling from the south into remote Nunavut communities;
- Include cultural component in orientation and training of all staff
- Include infection prevention and control in the training content
- Whenever possible, do respirator fit testing on staff before their arrival in the community; also ensure there is staff in the community capable of conducting fit testing. Do fit testing of community members (especially people cleaning the induction tents) prior to the clinic opening
- When staff are hired – determine which mask they were fitted to and ensure supply on-site at the CWS clinic
- Build in supports for staff rotating in – mental health, team building opportunities, opportunities for social activities with health centre staff, etc.
- PHAs/TBAs need more hands-on training before the clinic starts – not feasible for nurses to do that training during the fray of the clinic; more oversight is also needed. Have PHAs from Qikiqtarjuaq go to next community to mentor, train
- Need training/guideline for new chart reviewer nurses on what additional relevant information/comments to include on summary sheet information (e.g. special needs)
- Clinicians (including physicians) all need training in NU TB program – should be mandatory for all to maximize consistency of approach
- Recommend training/guideline for clinicians on information to include in radiology requisition to provide more context for radiologist (e.g. 'high risk contact of TB' or 'low level of clinical suspicion for TB')
- The same person can't train nurses and set up clinic/ lead operations

- Ensure sufficient Meditech training support – staff assigned to train and support all incoming staff:
 - A person to do admin support teaching local hires how to do Meditech, scheduling, getting accounts
 - Need more than the 30-minute training provided to clinical staff
 - Identify superusers available for training new staff rotating in, following up
- Need to have a CWS staff trained in performing Xrays as backup for Xray techs
- If Xray techs have down time, have them do informal training/skill development for HC Xray staff
- Need more 3HP training with nurses (HC and CWS), RCDC, TB coordinator and 3HP orientation for PHAs
- Ensure training on hand hygiene for all lay staff;
- Ensure adequate training for housekeepers on proper cleaning

Clinical Pathways

Chart Review

- Assign more staff to do the chart review and allow enough time before the CWS starts to complete this task
- Review the format to determine if more information can be put in tick boxes rather than free text or ensure that all chart reviewers include specific key information in the free text area
- Develop training/guideline for new chart reviewers on what additional relevant information/comments to include on summary sheet information (e.g. special needs)

Prioritization for Screening

- Keep to assessment of whole household at the same time as much as possible and avoid doing partial assessments (e.g. only CXR) or partial households (e.g. only the children) because of availability of X ray tech or pediatrician, respectively.

Clinical Pathways/Algorithms

a. Overview:

- Need a defined process for making, documenting and communicating changes to clinical pathways during the CWS operation
- Coordinate CWS with other TB program activities; e.g. if know CWS is planned then health centre staff should not conduct school screening shortly before – it just confuses the TST and assessment process
- Provide more training for health centre staff on CWS pathways
- Ensure medication is available at time of decision to treat so that it can be started immediately
- Develop a tool to communicate to both patients and CWS staff the reason(s) for second and subsequent appointments (one suggestion: put on reminder card what they are at the clinic for e.g codes for Xray, sputum, etc.)
- Develop a clear process for screening people with pending medical travel, including clarify the respective roles of the CWS clinic and the health centre. Patients with scheduled medical travel can be screened well in advance to reduce disruption of the screening clinic.

- Provide guidelines and training for clinicians on information to include in radiology requisition to provide more context for radiologist (e.g. 'high risk contact of TB' or 'low level of clinical suspicion for TB')
- b. Algorithms:
- Revisit which clients need to be seen by NP/physician
 - Revisit indications for physical assessment
 - Revisit indications for induced sputum if unable to produce, perhaps based on risk (need to decide on age cut-off) unless clinical suspicion for active disease
 - Revisit the recommended frequency of surveillance and have a consistent approach
 - Consider changing the initial criterion (>8 weeks from previous TB screening at top of algorithm) to 4 weeks
 - Include Xpert in CWS in one or a few more communities then reassess its value/contribution
 - Develop different clinical pathways for outbreak response and CWS. Differences may include:
 - priority populations (based on risk stratification – need tool for assessing risk)
 - cut-off for positive TST (5mm vs 10 mm)
 - specific guidelines on retreatment of people previously fully treated for active TB or LTBI
 - protocol people with imminent medical travel (screening components and how to incorporate them into mobile clinic operations)
 - approach to people (community members, health care providers and other workers) who spent a lot of time in community but have since moved away
 - Recommendations for window period prophylaxis
 - Create guidelines for common off-protocol situations that arose in Qikiqarjuaq e.g.
 - Screening for people already on TB program (guidance on this may be different if outbreak response vs CWS with no outbreak)
 - if they've had multiple skin tests that have been both positive and negative
 - recent CXR – pathway said not to repeat if had CXR in last 4 weeks but because quality better at CWS, often the decision was to re-Xray
 - People recently screened (e.g. contacts)- no clear direction on what to do (not clear on how to approach break of contact (BOC) i.e. what date to use: beginning of the clinic or time from when they had their first screening? Or, are they considered a community contact and are now starting with a new BOC date?
 - Review the rationale and protocol for retreatment of people previously treated for LTBI. Consider creating some 'points to consider' guidelines for clinicians to aid decision-making about retreatment. Make sure that the initial education/counseling done by the TB nurse includes the potential for retreatment.
 - Need education for both providers and parents on the rationale for WPP. Need a clear guideline on when to discontinue it e.g. when is outbreak considered over?
 - Clinicians should clearly document their decisions, especially
 - for decisions on deviation from protocols (e.g. putting someone on surveillance when protocol doesn't dictate it so that HC TBNs doing follow-up can manage them appropriately and respond to client questions
 - whether treatment is for WPP or LTBI
- c. Follow-up
- Need explicit processes for follow-up, including:

- accountability for reviewing results, ensuring appropriate follow-up and initiation of treatment, if indicated (both during the CWS clinic and for results arriving after all CWS clinicians have left)
- clarification of timing (i.e. at 8 or 12 weeks)
- clinical reassessment in 12 weeks – who does it and what does that entail ?
- extent and frequency of surveillance (e.g. intensity of surveillance may annoy or alienate people and may impact success of future interactions with the health centre)
- communication to with the health centre for those put on surveillance
- Coordinate services within the health centre (between CHNs and TB program and between TBNs) that is more client focused and reduces the number of times a patient needs to come to the health centre
- Have a TB physician or Nurse Practitioner revisit the community 8-12 weeks after the screening phase of CWS is complete to conduct the pre-booked 'Clinical Assessment' and to catch up any individuals missed during the CWS

Case Management and Care

- Review shelf life of drugs and consider buying a stockpile up front (i.e. to cover more than one community) to avoid supply delays
- Ensure sufficient TB medications are available so that treatment can start as soon as possible after a patient agrees.
- Develop an explicit case management procedure and structure including:
 - roles of on-site clinicians, health centre staff, TB physicians, RCDC and Ottawa-based TB consultants
 - the process for smooth transition/handoff from CWS staff to health centre staff
 - accountability for follow-up results of investigations
 - when and how in-community physician support will occur ()
 - adequate resourcing (e.g. need clinician on site at least until all treatment is initiated and also to go back periodically to make decisions on clients whose assessment was not completed prior to clinic leaving; build in TB physician time right through to last person finishing treatment)
- Have the treatment clinic offsite from the health centre to limit additional traffic at the health centre
- Involve RCDC from the beginning (i.e. orientation on screening protocols, participation in daily clinical meetings between CWS and TB physicians)
- Roll out 3HP as a treatment option throughout Nunavut – there is demand from communities and practitioners. If this can be done soon, it will make it easier for CWS in another community

Staff training

- Ensure all involved in the treatment circle of care have training in 3HP, including CWS clinicians, TB nurses, health centre CHNs, RCDCs and regional TB Case Manager
- Provide more information on where 3HP had used previously and efficacy for staff to explain to people who had questions
- Changes to 3HP guidelines:
 - Ensure clinical guidelines have been signed off by physicians before rolling out to nurses

- Clarify regime for early doses (e.g. if someone will not be available for weekly dose but >72 hours after last dose, can next dose be given early)
- Emphasize need for dose adjustment in children to account for growth during treatment period
- Clarify # of 3HP doses required in people switching from INH LTBI treatment
- Need more nuanced education about actual colour (Nurses were good at explaining dark urine from hepatotoxicity but not urine colour change from rifapentine)
- Develop guidelines/parameters for retreatment to minimize the need to consult on every case
- Clinician training should be mandatory (regardless if they have had prior experience)
- Have PHAs from Qikiqtarjuaq go to next CWS community to mentor and do hands-on training

Information for clients:

- Work through health committee to help with messaging - they can also help with radio, direct people with questions
- Use patient experiences - have stories (positive) to encourage uptake
- Ensure resources balance the message that TB medications are safe with message about vigilance for side effects
- Simple written material (pamphlet, posters) would be helpful

Impact on the Health Centre

- Involve the health centre in all aspects of the planning, implementation and evaluation.
- Develop a plan to manage the increased volume of patients
- Engage the community more throughout the CWS and after in encouraging treatment adherence
- Have clinicians at the CWS make direct referrals to the community physician for non-urgent, non-TB issues (rather than going through the health centre/CHN)
- Should have centrifuge at future CWS clinics to reduce load on health centre

Information Management

Challenges in Information Management

- Not clear at beginning what should be documented or how e.g. there wasn't a form for the physician component (just notes in Meditech), so it was sometimes unclear to the next clinician what had been done or what the next steps should be.
- Some forms were not used or were modified without input of key stakeholders
- There were many forms which were found in different places so it was difficult for new staff to find them
- Real-time data QA added to the already heavy workload of clinic staff.
- Information was in various places, including Meditech – temp staff may not know where to find everything on Meditech (e.g. TBAF, specific dates for TSTs)
- Documentation of TST results: a) results entered in different places and b) created extra work to document both on the immunization card and in Meditech

- Process for managing labels: LPN would retrieve them but there were two sets (one for sputum, one for registration) and there was confusion regarding what they were needed for
- There were problems with logging of sputum
- Challenges with reliability and accuracy of summary information that was provided while clinic was running
- There was no debrief or evaluation regarding the usefulness of the forms.

Overall Information Management Recommendations

- In order to address the identified challenges in information management, implement a collaborative process (involving epidemiology, clinicians, TBNs, TB physicians, RCDC and HQ) for:
 - developing information management procedures and expectations for what each member of the clinic team needs to document, mandatory fields in Meditech, etc.
 - determining the information that needs to be collected for clinical management, patient flow, epidemiologic analysis and evaluation
 - developing and revising forms and spreadsheets and
 - QA of data collection

to ensure that they meet the operational needs of clinicians on the ground, regional CDC and epidemiology and don't lead to unnecessary duplication of documentation.

- Do not do CWS in another community unless Meditech is fully functional
- Ensure there is backup/contingency plan if Meditech goes down, including backup paper forms
- Develop a procedure for sputum logging in Meditech (when clients were given all three containers with labels, this was entered into Meditech as if all specimens had been received; created potential for specimens being logged as received but client hadn't provided them) Ensure there is overlap of leaving and incoming staff to ensure adequate orientation to information management procedures and forms
- Revised the confidential chart transfer procedure. The lockable fishing box worked well to transfer charts from health centre to CWS site but the procedure needs fine tuning
- Procedures and forms should be put on the intranet for easy access.
- Maintain a list of who has been screened each day and forward the list to all those requiring the information
- At the health centre after the CWS is has demobilized, continue to file TB charts for family units together or develop another system to identify members of a household, so all nurses are aware of the care of the whole family

Feedback on Specific Forms

- Each should have a version number, including date
- Summary history form (i.e. from chart review):
 - review to see if more information can be put in tick boxes rather than free text or ensure standardization what information is required in the free text such as number of LTBI treatment doses received and details of contact with TB (e.g. year, type of contact).
- TBAF:

- Public Health Officer created a paper copy of TBAF that included all mandatory fields for note taking for multiple people; when the TB nurse was assessing more than one or two people, she filled in the paper form and then charted in Meditech later. This worked well when seeing large families at once.
- Nurses who came after with less TB experience found the paper form helpful; also it was helpful to use in orientation of new nurses; nurses had the option to use it or not
- Clinic Flow sheet:
 - one suggestion was to have more TB history incorporated on flow sheet – TBN could add information helpful for clinicians (e.g. date of last TST, CXR, sputum, previous history of treatment) so it would be more easily visible to clinician
- Medical Travel form:
 - Revised form didn't work well; both algorithm and form need revision
- Outcome form:
 - no clear flow for the completed forms - i.e. to epi or CDC?
 - eventually was put into Meditech but was not helpful for TBN (follow up was booked in Meditech but this was an electronic step not needed; getting physical copy of outcome form has been more helpful)
 - confusing with respect to TST follow up
 - some of questions on outcome form (e.g. contact with drug resistant case) weren't ones that clinicians could find the information for
 - a lot of notes were added to the outcome form
 - WPP form wasn't used – so it wasn't clear on outcome form whether treatment was for WPP or LTBI; not clear what diagnosis was or why on treatment – important for outcome form and prescription to clearly differentiate between WPP and LTBI treatment
- Additional forms suggested:
 - a template for clinician assessment
 - a subsequent visit form that specifically indicates the reason (e.g. follow-up, specific investigations, etc.) the person was at the clinic
 - a special flow form for prenatal women