



Tuberculosis Elimination in Rhode Island

Center for HIV, Hepatitis, STD, and Tuberculosis Epidemiology (CHHSTE)

Division of Preparedness, Response, Infectious Disease, and Emergency Medical Services (PRIDEMS)

Rhode Island Department of Health (RIDOH)

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Executive Summary

Tuberculosis (TB) disease is still one of the top causes of death globally, despite public health interventions and efforts. It is caused by the bacterium *Mycobacterium tuberculosis* and can be spread from one person to another through the air. When someone with active TB disease in the lungs or throat coughs, sings, or even speaks, TB bacteria can be released as particles and stay in the air for hours. Active TB can occur within the lungs (pulmonary) or outside the lungs (extrapulmonary). Latent TB infection (LTBI) is the presence of *M. tuberculosis* in the body without signs or symptoms, radiographic, or bacteriologic evidence of TB disease. While not everyone with LTBI will develop active TB disease, about 5-10% of infected people will develop TB disease if not treated; progression of LTBI to active disease accounts for approximately 80% of active TB cases in the United States. HIV infection, injection drug use, low body weight, and other medical conditions are risk factors associated with progression from LTBI to TB disease.

Rhode Island is a low-incidence state with a minimal rate of person-to-person transmission and no recent outbreaks. Most active TB disease cases in RI stem from re-activation of LTBI, mostly acquired outside the state. To reach total interruption of transmission and complete elimination of MTB in Rhode Island, the following must occur:

1. Target high priority groups to determine barriers to testing and/or treatment
2. Maximize screening for active TB and LTBI by local providers seeing vulnerable populations
3. Ensure access to high-quality clinical care for all cases of TB infection and disease; identify and assure adherence to treatment in persons to prevent re-activation and/or render their condition non-infectious; prioritize treatment completion of all suspect and confirmed MDR cases; prevent the spread of complicated disease requiring complex drug regimens
4. Support global TB elimination efforts; collaborate with GTBI, Migrant Clinician's Network, CureTB, DGMQ as needed; attend national TB elimination conferences; participate in regional and national TB webinars and calls

The definition of TB elimination is 1.0 persons with active TB per one million population. In 2019, the TB case rate in Rhode Island was 13.3 per one million population.

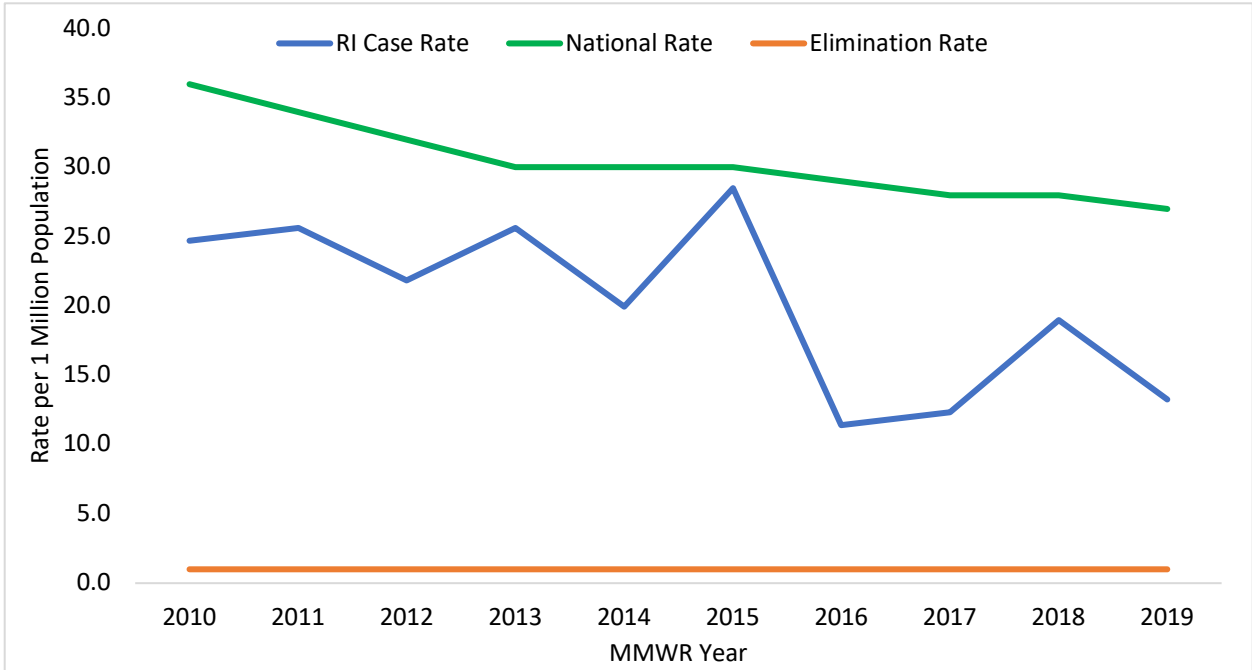
The TB Program, housed within the Center for HIV, Hepatitis, STD, and TB Epidemiology (CHHSTE) at the Rhode Island Department of Health, in conjunction with the Rhode Island State Health Laboratories, uses the most recent technologies in testing and treatment for active/latent disease and drug resistance detection, including but not limited to: QuantiFERON®-TB Gold blood assay, Cepheid GeneXpert® nucleic acid amplification test (NAAT), video directly observed therapy (VDOT), and 12-week treatment courses of Isoniazid and Rifapentine.

This report will focus on the four (4) priority strategies for controlling and preventing TB

mentioned above. Goals and activities for each of the four (4) strategies are based on current TB epidemiology in Rhode Island and the Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE)'s National TB Indicators Project (NTIP).

Data Overview

Incidence of Active TB Disease, 2010-2019



Over the last ten years, the number of reported cases of active tuberculosis has remained relatively low, ranging from 12 to 30 cases. Over the last five years, the rate of active TB in Rhode Island has remained under 3 cases per 100,000 population.

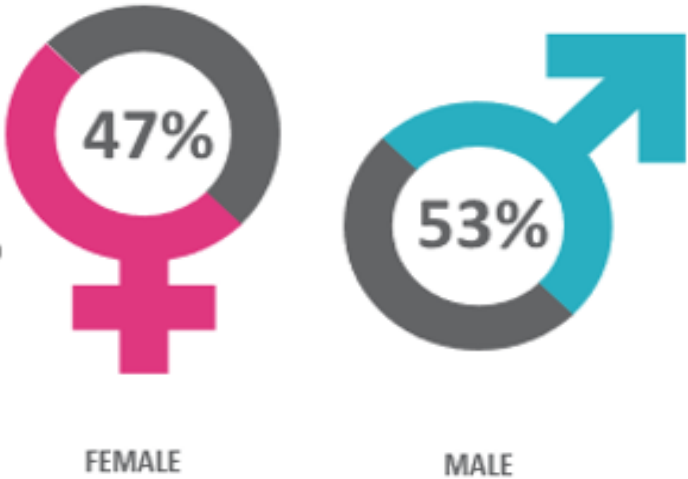
In recent years, all but one case of active TB in Rhode Island has been the result of LTBI-reactivation, versus evidence-based person-to-person transmission in the state. This claim is supported by local TB GIMS data, which does not routinely show linked cluster and/or spoligotype between confirmed cases of active TB.

Demographics, Active TB Disease, 2010-2019

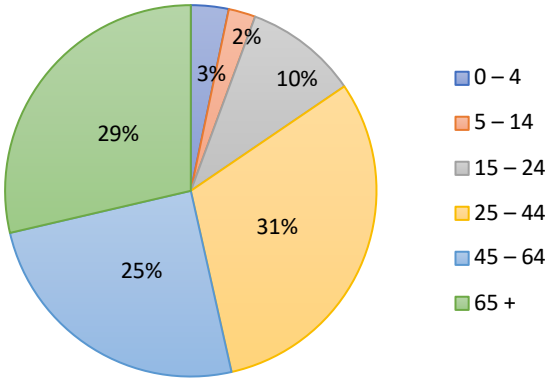
Sex		
Female	101	47.4%
Male	112	52.6%

Since 2010, the average yearly number of cases diagnosed among females is 10; among men, the average is 11 cases per year.

Over the last ten years, more cases have been diagnosed in men (52.6%) than in women (47.4%).



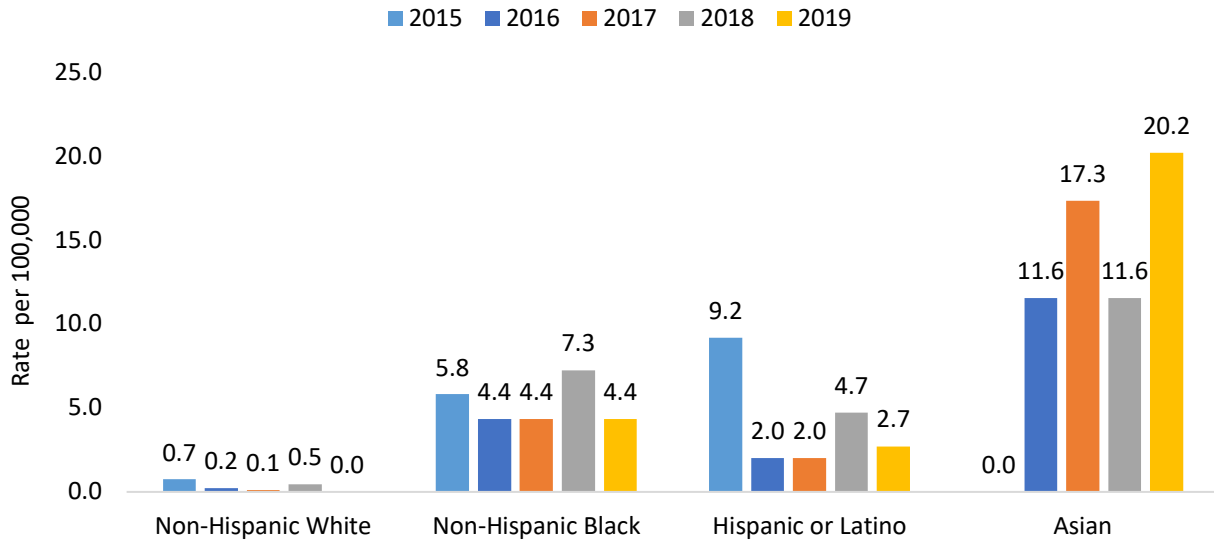
Age Group		
0-4	7	3.2%
5-14	5	2.3%
15-24	21	9.9%
25-44	66	31.0%
45-64	53	24.9%
65+	61	28.6%



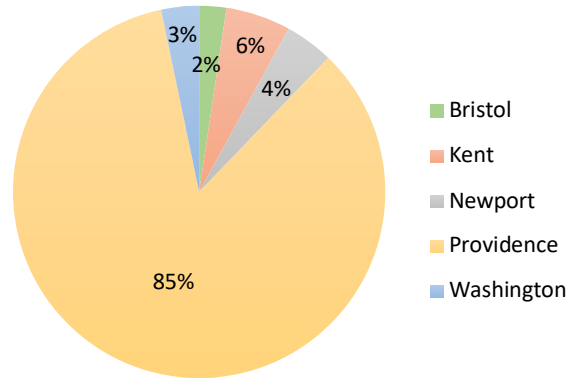
Between 2010-2019 in Rhode Island, yearly most cases were diagnosed in the 25-44-year-old age group, followed by those 65 and older. Over the last ten years, about a quarter of cases have been diagnosed among the 45-64-year-old population. On average, approximately 3% of patients diagnosed with TB in RI are <5 years of age and 2% are between the ages of 5 and 14 years.

Race/Ethnicity		
Non-Hispanic White	32	15.0%
Non-Hispanic Black	47	22.1%
Hispanic or Latino	69	32.4%
Asian	65	30.5%
Am Indian/AK Native	<5	NA
Native Hawaiian/Other Pacific Islander	<5	NA

In Rhode Island, TB disproportionately affects minority populations. Over the last ten years the average case rate per 100,000 population in non-Hispanic Black persons was 47% higher than in non-Hispanic white persons. Non-Hispanic Asian persons accounted for 31% of all diagnoses, compared to 15% among non-Hispanic white persons.



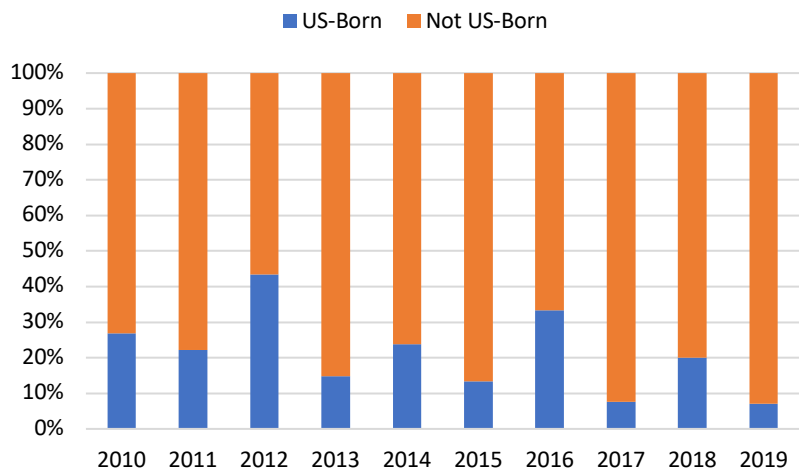
County of Residence		
Bristol	5	2.3%
Kent	12	5.6%
Newport	9	4.2%
Providence	180	84.5%
Washington	7	3.2%



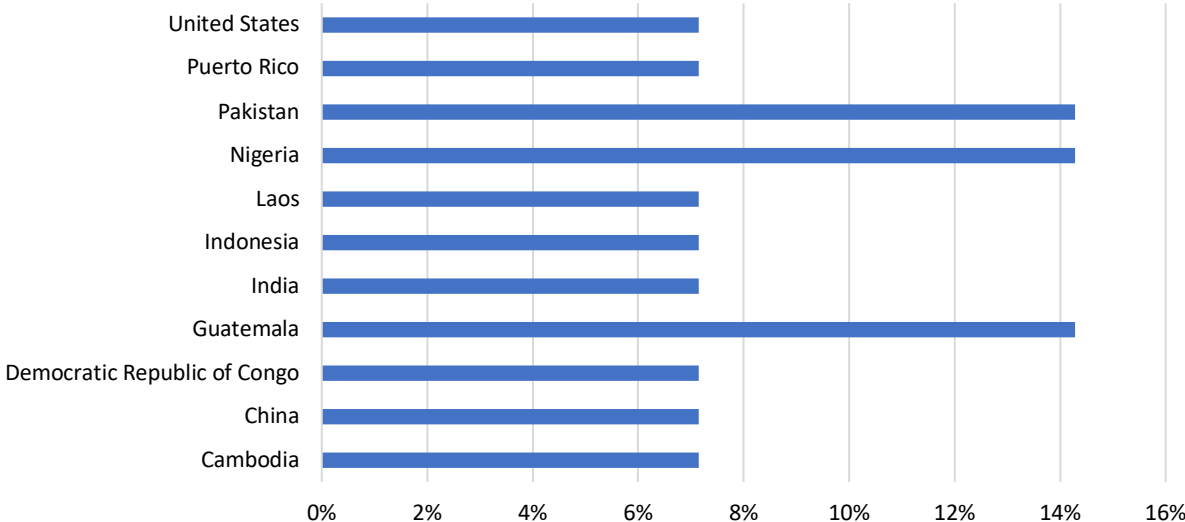
Over the last ten years, nearly 85% of all diagnosed cases of active TB were among residents of Providence County.

Country of Origin		
United States	46	21.6%
Not United States	167	78.4%

Every year, more cases of active TB disease are diagnosed in those foreign-born compared to those born in the United States. Overall, since 2010 over three-quarters of all reported cases were among foreign-born individuals.

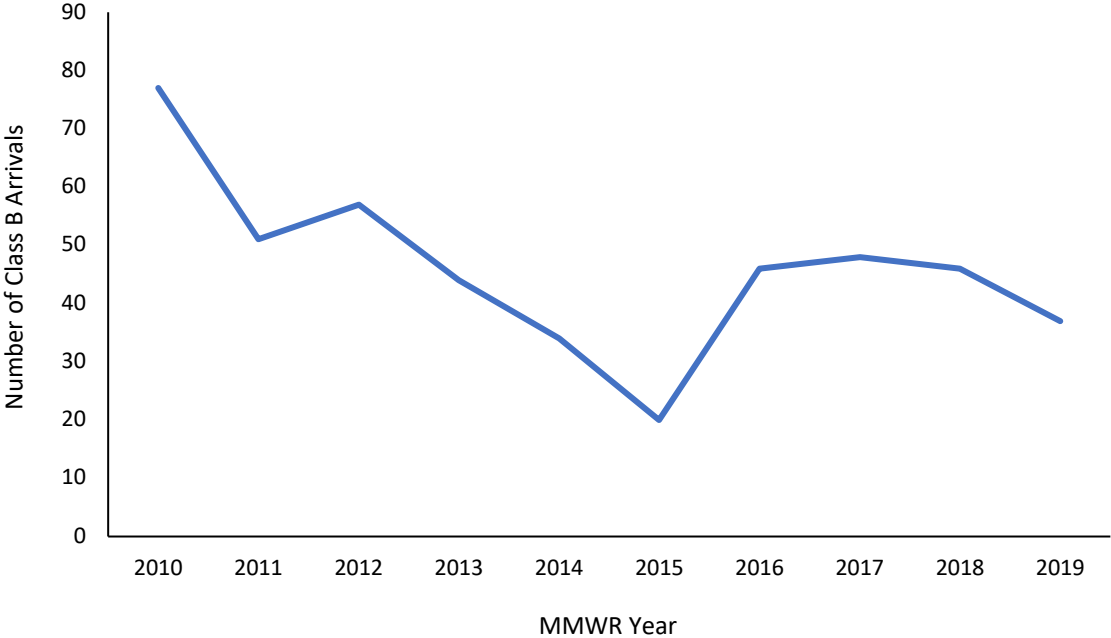


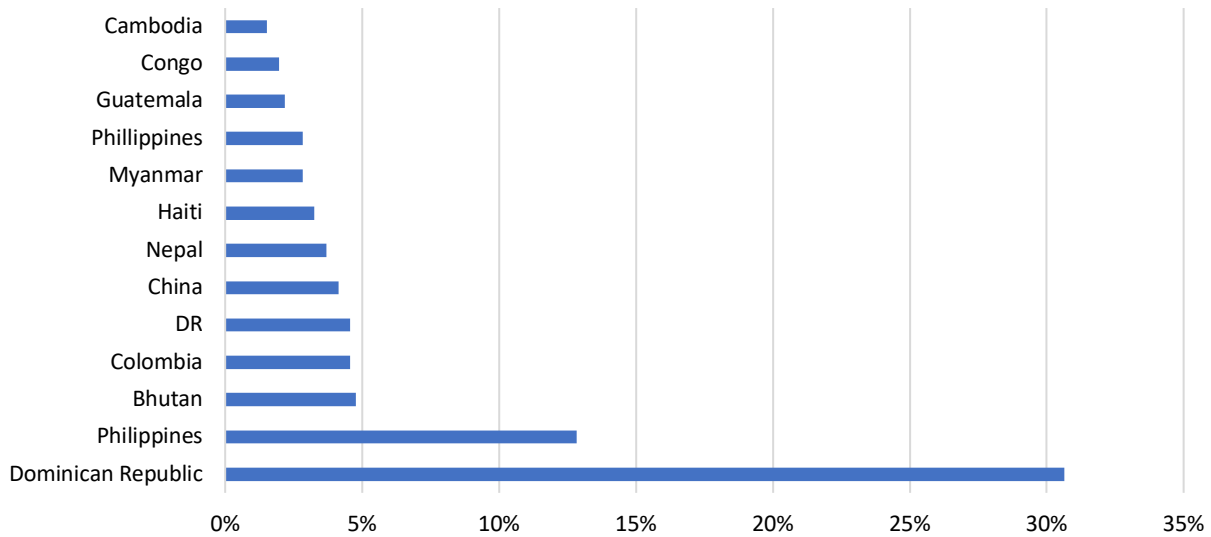
In 2019, all but one case was born outside of the continental United States. Among them, 50% were born in Asia, 21% were born in Africa, and 21% were born in the Caribbean (includes Puerto Rico).



Immigrants and Refugees, 2010-2019

Between 2010-2019, 460 immigrants and refugees arrived in Rhode Island from 46 countries. When comparing all countries of birth, most immigrants and refugees arrived from the Dominican Republic (36%) and the Philippines (17%).





Diagnostic Data

Site of disease		
Pulmonary	129	60.6%
Extra-pulmonary	67	31.5%
Both	17	8.0%

Other		
Sputum Smear (+)	67	31.5%
HIV (+)	<5	NA
MDR-TB	<5	NA

TB Diagnoses Over 10 Years

- 60%** Pulmonary disease
- 32%** Extra-pulmonary disease
- 8%** Both

- 32%** Sputum smear (+)
- 5%** Average yearly HIV infection %
- 4%** Average yearly MDR-TB %

Drug Resistance

TB resistance occurs when people are infected with a drug resistant strain, receive suboptimal TB medication regimens, or receive incomplete treatment.

Multi-drug resistant TB (MDR-TB) and extensively-drug resistant TB (XDR-TB) are rare and more severe kinds of TB that are also resistant to first and second-line medications such as TB appropriately to prevent further transmission of drug-resistant disease. In 2019, 57% of cases were confirmed by culture; of them, 0% were resistant to only one drug and 25% were MDR.

Elimination Plan Goals

Target high priority groups to determine barriers to testing and/or treatment.

High priority groups include but are not limited to immigrants and refugees (Class B's) born in TB-endemic countries, contacts to active TB cases, and patients of federally qualified health centers. CHHSTE TB Program staff work closely with local TB champions to promote testing and treatment in these groups, and to determine the social, economic, health, and other barriers to continuous access to care. Whenever a new case of infectious TB disease is diagnosed, a contact investigation is immediately started. Household members are often the most-at risk, followed by friends, healthcare workers, coworkers, etc.; most contact investigations span the duration of several months, as contacts are recommended to go through two-step testing to ensure non-infectiousness. Contacts diagnosed with active disease or LTBI are placed on treatment themselves and monitored for the duration of therapy. Additionally, TB Program staff work closely with the Rhode Island Department of Corrections and federal Wyatt Detention Center when there is suspect or confirmed cases of LTBI/TB disease amongst incarcerated persons in the state of Rhode Island. A main objective in Rhode Island is to increase the capacity to diagnose and treat high-risk populations in a culturally sensitive manner, with use of community supportive services such as the local international institute, in-service training sessions, and Centers of Excellence contact investigation courses for clinical and state TB Program staff.

Maximize screening for active TB and LTBI by local providers seeing vulnerable populations.

Local providers that commonly see vulnerable populations include federally qualified health centers (Providence Community Health Centers, Thundermist Health Centers, Blackstone Valley Community Health Centers, etc.) and non FQHC-community-health-centers serving at-risk populations. At these locations, high-priority persons may be screened by PPD or IGRA, followed by chest x-ray or CT and/or referral to the Miriam Hospital RISE TB Clinic for further evaluation. Rhode Island has recently implemented TB-Project-ECHO, headed by local TB champion Dr. Daria Szkwarko. The main objective of Project ECHO in 2020 is to bring together community clinicians from primary care, OB/GYN, specialized infectious disease, etc. via webinar to learn more about latent TB infection and the populations most at-risk of transitioning from LTBI to active TB disease. The series is the length of seven hour-long webinars; content typically includes presentation of key clinical information related to LTBI/TB disease, followed by case presentation, question and answer discussion, and final thoughts. One primary goal for all ECHO webinar participants is increased knowledge and comfort identifying, diagnosing, and or referring their patients as it relates to latent and/or active tuberculosis.

Ensure access to high-quality clinical care for all cases of TB infection and disease; identify and assure adherence to treatment in persons to prevent re-activation and/or render their condition non-infectious. Prioritize treatment completion of all suspect and confirmed MDR cases; prevent the spread of

complicated disease requiring complex drug regimens. Clinical monitoring and oversight, including initiation of therapy, adherence to therapy, and laboratory monitoring, are done in close coordination with the Miriam Hospital RISE TB clinic. Currently all active TB and high risk LTBI patients are placed on Directly Observed Therapy (DOT) to ensure adherence to treatment and prevent further transmission. All patients receiving DOT are discussed at weekly case management meetings to ensure that each person adheres and is responding appropriately to therapy. The RIDOH TB program, in conjunction with the RISE TB clinic, utilizes asynchronous video to monitor patients' adherence to treatment; medication doses are recorded by the patient and submitted to RIDOH for review and approval to ensure adherence to treatment. The TB program also has an incentive fund when deemed appropriate to aid in clients' adherence to TB treatment. To optimize the elimination of TB, clinicians at the RISE TB Clinic utilize drug level monitoring of anti-tuberculosis medications for infectious patients and adjust accordingly to ensure therapeutic levels.

Support global TB elimination efforts; collaborate with GTBI, Migrant Clinician's Network, CureTB, DGMQ as needed; attend national TB elimination conferences; participate in regional and national TB webinars and calls.

Every year, CHHSTE TB Program staff collaborate with regional and national colleagues with the overarching goal of supporting TB elimination efforts in Rhode Island, New England, the United States, and across the globe. Prior to the COVID-19 pandemic, TB Program staff attended national TB conferences yearly (NTCA, TB ETN/PEN, etc.) and have participated in the organization of regional in-person meetings and trainings. The TB Program at RIDOH works in close collaboration with the Miriam Hospital RISE TB Clinic, whose clinicians, in conjunction with the RIDOH TB Nurse, contact GTBI with complicated cases of MDR or coinfection as needed. The TB Program epidemiologist collaborates with DGMQ as required, when patients must be put on a no-fly-list or are otherwise monitored regarding international travel. Finally, when cases of active TB disease are set to be referred to another country for completion of treatment and final reporting back to RIDOH, the TB Program nurse and epidemiologist are responsible for contacting the TB Program country of interest via the Migrant Clinician's Network and/or organizations such as CureTB.