



## CHAPTER 16: PROGRAM EVALUATION AND RESEARCH

### INTRODUCTION

The New York City (NYC) Bureau of TB Control (BTBC) uses data from the tuberculosis (TB) clinics and the TB surveillance registry to develop program indicators, analyze and improve data collection processes, and inform general knowledge regarding the treatment and care of patients with active TB disease and latent TB infection (LTBI). Indicators are evaluated by comparisons with local and national goals.

### DATA SOURCES AND ROUTINE ANALYSIS

Through its public health activities, including surveillance, case management, contact investigation, and direct clinical care, BTBC collects data that can then be used for analysis, program evaluation, and research activities. BTBC staff diligently work to collect a vast amount of data on every TB patient diagnosed

in NYC. These data are analyzed strategically to maximize programmatic impact. While there are many potential data sources, the primary mechanisms for managing and accessing these data are BTBC's electronic TB surveillance and case management system and the clinic electronic medical record (EMR). The TB surveillance and case management system contains data relevant to public health activities on all persons reported to BTBC with signs and symptoms consistent with TB disease, confirmed TB cases, and children younger than five years of age who are reported with LTBI. The EMR contains clinical data for any person who accesses BTBC's clinics for medical care.

Routine analysis of surveillance data occurs on an ongoing basis to monitor trends, describe and understand local TB epidemiology, and monitor progress toward TB elimination. Each year, BTBC publishes an annual summary of the surveillance data for the previous year. Routine data analysis also includes monitoring "sentinel populations" to ensure that groups at increased risk for TB are monitored for changes in trend. Ad hoc analyses are also conducted to inform real-time programmatic decision-making.

Data is also used to inform, monitor, and evaluate investigations of TB including contact investigations, expanded contact investigations, cluster investigations, and outbreak investigations.

## PROGRAM EVALUATION

BTBC's cross-cutting evaluation initiatives are designed to assess the effectiveness of current practice and new interventions, and to assess program performance against local and national targets. To optimize resource allocation and impact of program activities, interdisciplinary staff across BTBC collaborate to conduct program evaluation and quality assurance (QA).

## COHORT REVIEW

The cohort review process consists of quarterly meetings for all staff responsible for patient care and case management. The cohort review is BTBC's most important method of program evaluation; developed by BTBC and implemented in 1993, cohort reviews provide a multi-disciplinary forum to review the management of each patient and ensure accountability at all levels of TB care. They allow clinicians, managers, and other staff to discuss challenging management issues, especially patients who are non-adherent, have drug-resistant TB (DR-TB), have numerous contacts, or require assessment in multiple congregate settings. Cohort reviews allow the Bureau Director to assess the coordination of units across BTBC.

Objectives of the cohort review process are to:

- Ensure the comprehensive case management of all patients with active TB disease
- Promote effective supervision and teamwork
- Uphold the case management team's accountability for TB patients and all persons exposed to infectious TB
- Improve timeliness of appropriate patient management interventions
- Maintain reliability of the TB registry as a surveillance and epidemiology data resource

- Provide outcome analysis, as measured against previous cohorts, other regions, and local and national targets
- Identify, track, and follow up on any patient-specific clinical and case management issues
- Motivate staff by highlighting their accomplishments in managing patients and challenging them to exceed or maintain previous achievements

Cohort reviews take place three to five months after the patient is diagnosed with TB disease, a point in the case management process where most patients will be approaching the completion of therapy and contact evaluations are finalized.

Each cohort review meeting consists of three distinct sections:

1. A review of the epidemiology of NYC with a focus on the region/patients being presented that quarter
2. Individual case presentations
3. A review of the cohort performance indicators

During the epidemiologic overview, an analysis of the patients in the cohort is given for the city as well as the patients in the region being presented. Certain patients are highlighted, such as those with DR-TB or patients under the age of 18. In addition, outcomes of source case investigations, expanded contact investigations, and cluster investigations that involve patients from that quarter are presented.

Following the epidemiologic overview, all patients confirmed to have active TB disease who reside in NYC and were diagnosed within a specific quarter are presented to the Bureau Director in a standardized format. The Bureau Director reviews each patient, verifying details such as the patient's clinical status, appropriateness of the treatment regimen, treatment adherence, treatment completion, and outcome of the contact investigation. Staff familiar with the patient, including physicians, nurses, and Public Health Advisors and supervisors involved in case management efforts, provide additional information as necessary. The Bureau Director identifies potential clinical, case management, and contact investigation issues. As each patient is presented, issues or problems identified during the meeting are documented. After the meeting, individual staff are assigned to follow up on all issues identified.

Following the case presentations, an assigned BTBC staff member presents indicator data for patients discussed at the meeting including preliminary treatment completion, sputum culture conversion, directly observed therapy (DOT) adherence, and timeliness of case management activities. Final results of cohort patients and contacts from the same quarter of the prior year are presented including a review of patients who did not complete treatment and the reasons for non-completion.

The cohort review process is a fundamental program evaluation and QA mechanism designed to ensure all patients diagnosed with TB disease who reside in NYC receive high quality care and treatment. Cohort reviews have been adopted nationally (and internationally) as a necessary program evaluation process and are part of BTBC's Cooperative Agreement with the Centers for Disease Control and Prevention (CDC).

## PROGRAMMATIC INDICATORS

BTBC uses national and local indicators to assess program impact and success. To ensure BTBC can appropriately evaluate progress, all indicators utilized are clearly defined, ambitious but feasible to accomplish, and routinely reviewed with leadership and disseminated to staff.

Some of BTBC's key performance indicators include:

- Completion of treatment
- Acid-fast bacilli (AFB) sputum culture conversion within 60 days
- Susceptibility testing for drugs
- Human immunodeficiency virus (HIV) testing
- Submission of isolates for genotyping
- Proportion of infectious cases with contacts identified

While indicators are being calculated and reviewed on an ongoing basis, data is shared on a quarterly basis with BTBC leadership and other stakeholders. Indicator results are compared against previous quarters and years, as well as the national average, to determine where improvements are needed.

## NATIONAL INDICATORS

### NATIONAL TUBERCULOSIS INDICATORS PROJECT

CDC's National Tuberculosis Indicators Project (NTIP) is a monitoring system for tracking progress toward national objectives by TB control programs. The national targets are updated every five years to ensure that programs continue to improve performance. NTIP uses data it receives from CDC-funded TB programs across the country through various reporting mechanisms including Report of Verified Case of TB (RVCT) forms, Aggregate Reporting for Program Evaluation (ARPE) on contacts and the Electronic Disease Notification (EDN) System.

The NTIP categories by which BTBC and other programs are evaluated include:

- TB case rates
- Treatment and case management of persons with active TB disease
- Contact investigations
- Evaluation of immigrants and refugees (new arrivals)
- Completeness of data reporting to the CDC

NTIP also allows TB programs to monitor the elements informing the CDC's calculation of the funding formula for states, territories, and large cities receiving direct financial assistance through a Cooperative Agreement. The funding formula is a calculation based on the burden of TB and program performance influencing the allocation of federal aid by the CDC. Monitoring these variables also allows BTBC to monitor program performance in comparison to other jurisdictions.



Performance indicators also directly impact funding so completeness and accuracy of data reported to the CDC and other funders is vital. A full list of NTIP indicators can be found at: [www.cdc.gov/tb/programs/evaluation/indicators/default.htm](http://www.cdc.gov/tb/programs/evaluation/indicators/default.htm).

**AGGREGATE REPORTING FOR PROGRAM EVALUATION:** While many TB indicators focus on the burden, diagnosis, and treatment of patients with active TB disease, the ARPE reports on the outcomes of contact investigation efforts in aggregate. (See *Chapter 11: Contact Investigation*.) The ARPE report is submitted to the CDC annually.

Indicators reported by the ARPE include:

- Number of cases with contacts identified
- Number of contacts identified
- Number of contacts evaluated
- Number of secondary TB cases identified
- Number of contacts infected with LTBI
- Number of contacts started on treatment for LTBI
- Number of contacts that completed treatment for LTBI
- Reasons treatment not completed

**REPORTING TO FUNDING ENTITIES:** Reporting of BTBC indicators and activities to stakeholders is a necessary step in program evaluation. Stakeholders include BTBC leadership, NYC Health Department Division of Disease Control, NYC Commissioner of Health, NYC Mayor, New York State Department of Health (NYS DOH), and CDC. The frequency of reporting depends upon the stakeholders and type of report. Key reports include NYC Quality and Performance Review (QPR), NYS report, and CDC Annual Performance Report. Collectively, these reports represent highlights of the extensive amount of work performed by BTBC staff in the treatment, care, and prevention of TB in NYC.

## RESEARCH

BTBC staff routinely engage in research to better understand the epidemiology of TB in NYC, to identify populations at increased risk for TB, and to study treatment interventions and patient outcomes.

### OBSERVATIONAL STUDIES

BTBC staff are most frequently engaged in descriptive and observational studies using data from the TB registry. These studies tend to focus on surveillance trends, identifying and describing populations at increased risk for TB infection and disease, clinical treatment outcomes, outcomes of contact investigations, and other public health activities. BTBC frequently collaborates with students, fellows, and academic partners on research projects.

## CENTERS FOR DISEASE CONTROL AND PREVENTION TUBERCULOSIS TRIALS CONSORTIUM

For the last 20 years, BTBC has participated in the Centers for Disease Control and Prevention (CDC) TB Trials Consortium (TBTC). TBTC is a federally funded research consortium focused on improving TB diagnostics, modalities for treatment, and length of TB treatment for persons with TB infection and disease. The purpose of TBTC is to conduct research that will improve the knowledge surrounding the diagnosis, management, treatment, and care of TB patients. As one of a number of institutions TBTC partners with, NYC Health Department TB clinics have worked in close collaboration with Columbia University as a clinical study site for TBTC.

## NEW YORK CITY TUBERCULOSIS RESEARCH CONSORTIUM

BTBC actively seeks out partners for research collaboration and, in 2012, founded the NYC TB Research Consortium, which brings together BTBC, academia, laboratories, and other researchers to collaborate on projects focusing on TB in NYC. The group's activities include the following:

- Conducting research projects to inform TB prevention, care, and management policies and practices
- Collaborating on epidemiologic and clinical studies to advance TB research
- Pursuing funding opportunities
- Mentoring new researchers and students to develop research skills for future public health careers

For more information or to join the NYC TB Research Consortium, contact [TB-epi@health.nyc.gov](mailto:TB-epi@health.nyc.gov).

## SUMMARY

Program evaluation and research are fundamental aspects of BTBC's activities and functions. BTBC's various program evaluation mechanisms ensure continuous improvement and accountability with TB prevention and care activities. BTBC's involvement in research, both clinical and programmatic, improves the TB knowledge base and provides evidence for various interventions that can be employed by other TB programs and medical institutions. Together, multi-disciplinary staff, partners, and funders contribute to these activities in order to improve patient outcomes and experience.

## KEY SOURCES

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