END TB NYC

New York City Bureau of Tuberculosis Control Annual Summary, **2018**

›› MISSION: The New York City (NYC) Bureau of Tuberculosis Control (BTBC) aims to prevent the spread of tuberculosis (TB) and eliminate it as a public health problem in NYC.

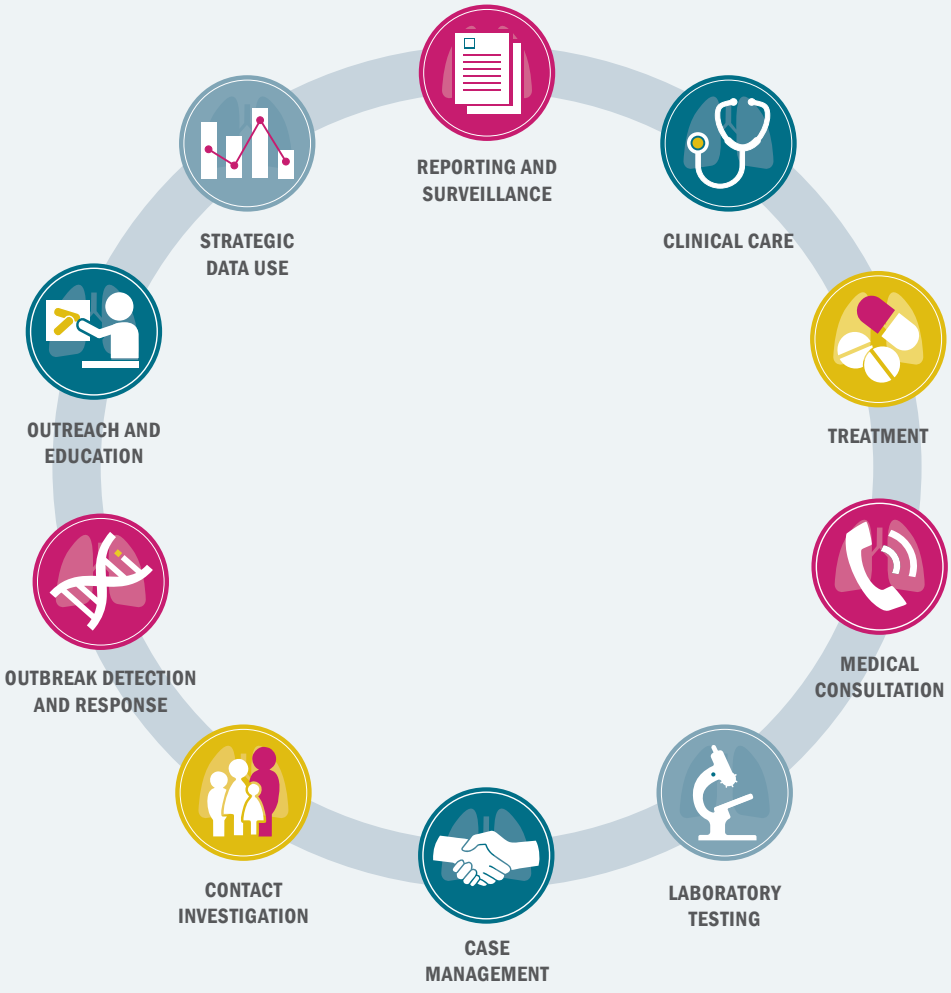
GOALS

1 Identify all individuals with suspected or confirmed TB disease and ensure their appropriate treatment, ideally on directly observed therapy (DOT).

2 Ensure that individuals at high risk for progression from latent TB infection to TB disease complete treatment and do not develop disease.

KEY ACTIVITIES

To fulfill its mission and core goals, BTBC performs a number of integrated activities and provides patient-centered services in collaboration with local health care providers, laboratories, community partners and others. With a focus on public health and the clinical care needs of patients and their families, these activities support effective TB care, prevention and control.



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ABOUT THIS REPORT: This report provides surveillance data and summaries of core program activities for calendar year 2018. The data reflect the most complete information available as of January 22, 2019. For additional details on the use of denominators and definitions in this report, please see Technical Notes (page 37).

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TUBERCULOSIS

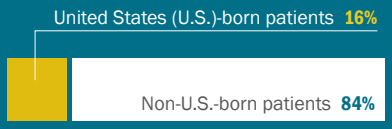
IN NEW YORK CITY, 2018

8% DECREASE
in the number of TB cases from 2017-2018

559 Number of TB cases verified in NYC in 2018

6.8 NYC citywide TB rate per 100,000 people

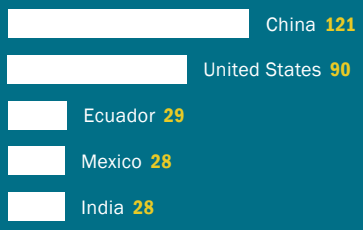
COUNTRY OF BIRTH



62 Number of countries of birth represented among patients with TB disease

13 Median number of years in the U.S. among non-U.S.-born patients

MOST COMMON PATIENT COUNTRY OF BIRTH:



MULTIDRUG RESISTANCE

12 Number of patients diagnosed in 2018 who had multidrug-resistant (MDR)* TB

6 Median number of drugs to which there was known drug resistance among MDR TB cases (range 3-9)

*Defined as resistance to at least isoniazid and rifampin

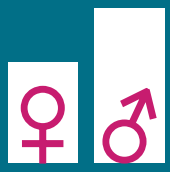
TB IN NYC NEIGHBORHOODS

100% Proportion of NYC neighborhoods* with at least one TB case reported in 2018

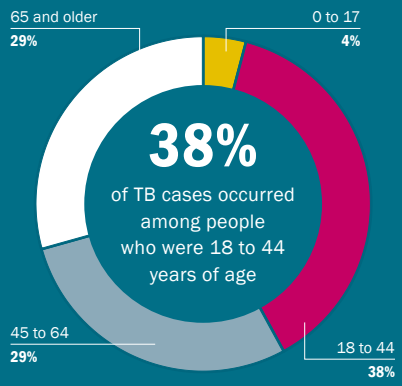
13 Number of NYC neighborhoods* with a TB rate higher than the 2018 NYC citywide rate

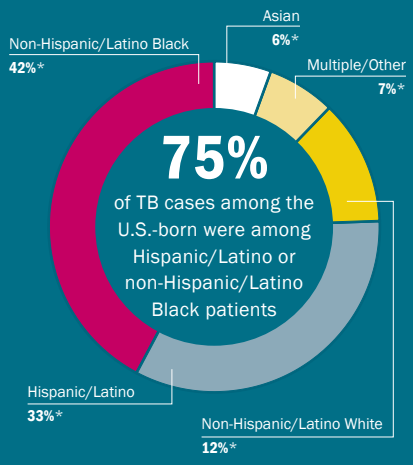
*Defined by United Hospital Fund neighborhood designation (n=42)

PATIENT CHARACTERISTICS



61% of TB cases occurred among males





*Among U.S.-born patients (n=90)

NEW YORK CITY HEALTH DEPARTMENT TB SERVICES AND CORE ACTIVITIES

The New York City Health Department performs a range of TB services and activities in collaboration with local health care providers, laboratories, community partners and others. **All Health Department services are provided free of charge to ALL PATIENTS, regardless of the patient's immigration status, insurance status or ability to pay.**

REPORTING AND SURVEILLANCE | CLINICAL CARE | TREATMENT | MEDICAL CONSULTATION | LABORATORY TESTING | CASE MANAGEMENT | CONTACT INVESTIGATION | OUTBREAK DETECTION AND RESPONSE | OUTREACH AND EDUCATION | STRATEGIC DATA USE

March 2019

DEAR COLLEAGUES,

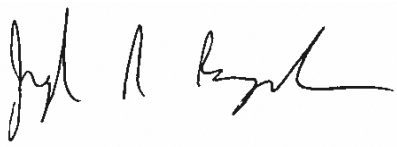
Each day, we are reminded that the fight against TB requires strong partnerships and continued investment and attention. In 2018, the Health Department identified 559 cases of TB, corresponding to an incidence rate of 6.8 per 100,000. The number of TB cases has declined by 8% overall since 2017; however, the NYC rate is more than twice as high as the national rate (2.8 per 100,000), and there were notable increases in the number of cases among certain groups. For example, we saw an increased number of cases among adults older than 65 (164 cases in 2018 versus 146 in 2017), people born in the U.S. (90 versus 81) and U.S.-born Hispanic/Latino New Yorkers (30 versus 22). The Health Department also identified 23 TB cases among pediatric patients and 12 cases of multidrug-resistant (MDR) TB. These data demonstrate that, to end TB in NYC, it's time to accelerate the pace of progress.

We were pleased to see an intensified focus on TB in 2018, both locally and internationally. In June, we hosted a TB Summit to discuss strategies for increasing rapid case detection and improving testing and treatment for TB infection. Over 200 health care providers, laboratories, TB advocates, patients and colleagues from local and federal agencies participated. The United Nations (U.N.) also hosted its first high-level meeting on TB in NYC. Representatives from countries around the world created a resolution to increase funding for TB programs and research, and participants committed to treating 40 million individuals with TB and 1.5 million with MDR TB globally by 2022.

Last year, we also saw advancements in research and technological innovation. The Health Department continued to help patients and their providers gain access to new TB drugs; expanded its use of whole genome sequencing and other molecular-based tests in partnership with local, state and national laboratories; and participated in several research studies focusing on drug resistance, treatment regimens and methods of treatment monitoring. Findings from these studies will help the Health Department provide more effective and patient-centered TB treatment.

Overall, a new optimism for our fight against TB is palpable. We hope to sustain this momentum as we continue our collective efforts to care for patients and their families, protect the public's health and end TB in NYC. Thank you for your ongoing commitment to this goal and for joining our efforts.

Sincerely,



Joseph N. Burzynski, MD, MPH
Assistant Commissioner, Bureau of Tuberculosis Control

CORE ACTIVITIES

›› 2018 BY THE NUMBERS

SURVEILLANCE:

559 Confirmed TB cases were verified by the Health Department.

3,502 People with suspected TB disease were reported to the Health Department.

99 Children younger than 5 years of age with latent TB infection were reported to the Health Department.

94 Facilities reported at least one TB case; nearly half of all cases were reported by **13** facilities.

CLINICAL CARE:

7,875 Patients received TB-related services at Health Department chest clinics during **36,325** encounters.

279 Patients with confirmed TB disease received care at a Health Department chest clinic.

1,672 Immigrants and refugees arriving in NYC with a Class B designation were notified to the Health Department; **1,502** were eligible for evaluation; **1,112** were evaluated as of January 30, 2019.

CORE ACTIVITIES

Tuberculosis (TB) is an airborne infectious disease caused by a bacteria. TB has two stages: active TB disease and latent TB infection. TB is treatable and preventable, but without effective treatment, TB disease may lead to serious illness and death.

BTBC performs a variety of integrated activities and provides services that address both TB disease and latent TB infection. These include surveillance, clinical care and treatment, medical consultation, coordination of laboratory testing (e.g., drug susceptibility testing, genotyping), case management, contact investigation, outbreak detection and response, training, outreach, program evaluation and research. With a focus on public health and the clinical care needs of patients, their families and communities — and by complying with local, state and national laws, regulations and mandates — these activities support effective TB care, prevention and control in NYC.

SURVEILLANCE

Health care providers and laboratories are required to report to the New York City Health Department:

1. All patients with confirmed TB disease
2. Anyone suspected of having TB disease
3. Children younger than 5 years of age with a positive test for TB infection and related chest radiograph findings and treatment information

BTBC reviews all submitted reports for completeness and timeliness and determines whether patients are eligible for case management. BTBC also coordinates with colleagues in other jurisdictions to ensure continuity of care for patients with confirmed TB disease and their contacts who work or live outside of NYC.

The Health Department maintains an electronic TB surveillance registry and case management system (Maven version 5.4.3.1, Conduent Public Health Solutions, Florham Park, NJ) that includes information for all reported patients and individuals exposed to infectious TB patients. These data are used to conduct case management activities; ensure treatment completion; monitor epidemiologic trends; detect, investigate and respond to outbreaks; prepare surveillance reports; report aggregated data to the New York State Department of Health (NYSDOH) and the Centers for Disease Control and Prevention (CDC); identify data quality and reporting issues; and inform programmatic decision-making.

›› *For more information about NYC TB reporting requirements and related data from 2018, see pages 30-32.*

›› NEW IN 2018

UPDATED TECHNICAL INSTRUCTIONS FOR TB EVALUATION OF IMMIGRATION STATUS ADJUSTERS

Effective October 1, 2018, the CDC Division of Global Migration and Quarantine (DGMQ) released updated TB Technical Instructions for evaluating people adjusting their U.S. immigration status.

The updated instructions mandate use of interferon gamma release assays for screening of all status adjusters 2 years of age and older and reporting of all status adjusters with a positive test for TB infection to local health departments, including reporting of chest radiograph results.

In NYC, civil surgeons should report electronically via NYCMED. All reports must include chest radiograph and interferon gamma release assay information.

To create a NYCMED account, visit nyc.gov/health and search for NYCMED.

For additional information about the new TB Technical Instructions for Civil Surgeons, visit cdc.gov and search for Civil Surgeons TB.

CLINICAL CARE AND TREATMENT

The Health Department is a leading provider of TB care in NYC. TB-related services are provided at four chest clinics located in the Bronx, Brooklyn, Manhattan and Queens. Health Department physicians working at the chest clinics are specialists in internal medicine, preventive medicine, pulmonary medicine, infectious diseases, emergency medicine and pediatrics.

The Health Department provides TB diagnostic services, including testing for latent TB infection (using blood-based QuantiFERON-TB Gold Plus [QFT] test and tuberculin skin test [TST]), sputum induction, chest radiographs, medical evaluation, laboratory tests, treatment for TB disease and latent TB infection and directly observed therapy (DOT) services.

The majority of patients evaluated and treated at Health Department chest clinics are referred by NYC health care providers, other health departments and social service providers. Chest clinic staff also refer patients to other medical professionals for further evaluation and for treatment of non-TB related conditions as indicated.

OBTAINING SPECIAL DRUGS FOR THE TREATMENT OF MDR-TB: BTBC can assist with obtaining medications that are available under limited circumstances including clofazimine, delaminid and bedaquiline. Clofazimine requires submission of an Investigation New Device (IND) application to the Food and Drug Administration (FDA). BTBC can also provide guidance on obtaining bedaquiline and delaminid.

For more information about these drugs or for consultation related to the management and treatment of TB, including MDR-TB, please call the **TB HOTLINE** *at* **844-713-0559**.

EVALUATION OF NEWLY ARRIVED IMMIGRANTS AND REFUGEES: People applying for permanent U.S. immigration status and refugee status are screened for TB as part of their overseas medical examination. If the pre-immigration examination finds clinical suspicion of TB, a Class A designation is given and the applicant is not allowed to travel until treatment is completed or the patient is no longer infectious. If findings suggest non-infectious TB (i.e., latent TB infection, chest radiograph with evidence of previous TB disease), the applicant is given a Class B designation and travel clearance and the applicant's destination city is notified by CDC. The destination city then notifies the individual of the need for TB re-evaluation. BTBC follows up with all immigrants and refugees arriving in NYC with Class B status. The majority come to a Health Department chest clinic for evaluation.

HIV TESTING AND COUNSELING SERVICES: BTBC staff provide rapid HIV testing and HIV counseling services at Health Department chest clinics and refer patients with HIV infection to health care providers who specialize in HIV treatment. Anonymous HIV testing and counseling are available at chest clinics independent of need for TB services.

›› 2018 BY THE NUMBERS

TREATMENT:

41 Patients with an MDR TB strain continued to receive treatment, care and case management through BTBC in 2018, including **7** patients initially verified as TB cases outside of NYC.

9 Patients received bedaquiline, **1** was approved to receive delaminid and **12** received clofazimine.

DRUG SUSCEPTIBILITY TESTING AND GENOTYPING:

414 Culture-confirmed TB cases had phenotypic DST results available (97%); molecular DST results were available for **423** (99%) cases.

408 Culture-confirmed TB cases had conventional genotype results available (96%); WGS results were available for **415** (97%) cases.

31 Instances of potential false positive laboratory results were investigated; **10** investigations confirmed a false positive result.

DRUG SUSCEPTIBILITY TESTING AND GENOTYPING

The NYC Health Code mandates that a portion of the initial isolate from all culture-positive TB patients be sent for drug susceptibility testing (DST) and genotyping.

DRUG SUSCEPTIBILITY TESTING: DST identifies drug resistance profiles for TB strains and informs clinical management and treatment for patients with TB disease and their contacts. The NYC Public Health Laboratory (PHL) performs phenotypic DST testing for first-line and select second-line TB drugs. Molecular-based laboratory tests (e.g., nucleic-acid amplification tests) are now being routinely used at PHL and in acute care hospitals, commercial laboratories and public health reference laboratories. These tests can rapidly confirm the presence of *M. tuberculosis* complex and provide information about the presence of mutations in specific genes that are known to predict drug resistance.

GENOTYPING: Genotype results identify whether TB strains are genetically related, which helps the Health Department identify false positive laboratory results, detect outbreaks and identify or disprove TB transmission. Potential false positive laboratory results and possible instances of contamination are promptly investigated to ensure that patients are not placed on anti-TB medications unnecessarily. Cases among patients with similar TB strains are routinely investigated to identify and interrupt TB transmission.

UNIVERSAL WHOLE GENOME SEQUENCING: Whole genome sequencing (WGS) enables identification of *M. tuberculosis* complex and species within it; detection of genetic mutations associated with drug resistance; generation of spacer oligonucleotide typing (spoligotyping) results; and analysis of single nucleotide polymorphisms to support characterization and comparison of TB strains. In 2018, BTBC continued its collaboration with NYSDOH Wadsworth Center and the NYC Public Health Laboratory to conduct WGS for all patients with culture-positive *M. tuberculosis*. NYS currently reports 16 mutations associated with resistance to 9 TB drugs. The CDC began universal WGS for TB in May 2018.

›› *For more information about drug resistance among NYC cases in 2018, see pages 24-25. For more information about genotyping, outbreak detection and cluster investigation, see page 27.*

MEDICAL CONSULTATION

BTBC medical consultants are physicians with years of experience treating TB disease and LTBI. They provide expert consultation to community care providers and others regarding TB diagnostic processes; hospital discharge planning; TB treatment (including treatment of MDR TB, adverse reactions to TB medication and determination of treatment completion); infection

›› 2018 BY THE NUMBERS

CASE MANAGEMENT:

2,549 Patients received case management services, including **559** patients with newly confirmed TB disease, **1,385** patients with suspected TB disease, **486** patients with TB diagnosed before 2018, and **119** patients with TB initially verified outside of NYC.

370 Eligible patients with confirmed TB disease were enrolled in DOT through the Health Department or another health care provider. **135** were enrolled exclusively in face-to-face DOT; **235** received some or all observations through vDOT; In total, BTBC staff provided about **43,557** DOT observations for **766** patients.

3.241 Contacts were identified for **424** potentially infectious patients; **2,449** (76%) were evaluated as of January 17, 2019; **346** (14%) had a new positive TB test result.

control; contact investigation; and other TB-related public health concerns. Recommendations are based on the physicians' professional experience, BTBC policies and national guidelines from the CDC, the American Thoracic Society, the Infectious Diseases Society of America and the National TB Controllers Association. BTBC medical consultants also conduct TB rounds and give medical talks throughout NYC.

CASE MANAGEMENT

The Health Department provides case management for NYC residents diagnosed with or suspected of having TB disease and their associated contacts, regardless of where they receive TB care. TB case management activities include comprehensive patient interviews and TB education, medical chart reviews, contact investigations, DOT and coordination with community providers to ensure optimal TB treatment and care. BTBC staff conduct home assessments to identify contacts and determine whether infectious TB patients can be discharged from the hospital. BTBC staff also coordinate the transfer of patient care between NYC and other jurisdictions. Case managers perform monthly monitoring for adherence to medical appointments and treatment and locate patients who are non-adherent and help them return to medical supervision.

DIRECTLY OBSERVED THERAPY (DOT): DOT is the standard of care for managing patients with suspected or confirmed TB disease in NYC, regardless of where they receive their TB care. During DOT, a patient is observed by a health care worker while ingesting anti-TB medications. The Health Department provides DOT services at all chest clinics and at homes, worksites and other locations as requested by the patient. The Health Department also provides video DOT (vDOT), which is convenient for patients and enables continuity of DOT services outside of traditional business hours and when patients travel. DOT is also available through three NYC Health+Hospitals facilities: NYC Health+Hospitals/Elmhurst, NYC Health+Hospitals/Kings County and NYC Health+Hospitals/Bellevue.

›› *To learn more about the DOT program or to enroll a patient, call **311**.*

CONTACT INVESTIGATION: The Health Department routinely conducts contact investigations in household, social and congregate settings (e.g., worksites, schools). The Health Department identifies and evaluates individuals exposed to infectious TB patients, ensures appropriate treatment among contacts diagnosed with TB disease or latent TB infection, and determines if transmission has occurred to assess whether further testing or other intervention is needed. If a TB exposure occurs in a health care facility, BTBC epidemiologists consult or assist with the contact investigation as needed.

SOCIAL SERVICE REFERRALS: BTBC identifies and addresses obstacles to care and unmet social service needs among patients and their families whenever

›› 2018 BY THE NUMBERS

OUTREACH AND EDUCATION:

15 Community health events were conducted in collaboration with partners, including the Academy of Medical and Public Health Services, the Office of Assembly Member Felix Ortiz, the Charles B. Wang Community Health Center, the Chinese Planning Council, Mixteca, the Philippine Nurses Association, SAPNA NYC, and Queensboro Community College.

313 Individuals were tested for TB infection during community events; **89** (28%) had a positive result and were referred for follow-up care.

300 Attendees joined the Health Department's World TB Day conference.

250 Attendees in 10 countries joined BTBC's annual TB Genotyping Update meeting.

›› *For more information about BTBC community events or conferences, email TBoutreach@health.nyc.gov.*

possible. These include concerns about food security, housing and finances; unstable employment or lack of time off to attend medical appointments; issues accessing health insurance or health care services; language barrier issues; immigration-related concerns; drug and alcohol use; or any mental health concerns. When these situations are identified, patients are referred to a social worker and other health and social service resources.

REGULATORY ACTION: For patients with infectious TB who are not adherent to evaluation, isolation and/or treatment recommendations and pose a risk to the public's health, the Health Department has the authority under the NYC Health Code to legally mandate compliance with TB treatment. This may include compulsory evaluation, mandatory DOT and/or involuntary hospitalization to complete TB therapy.

OUTREACH AND EDUCATION

BTBC engages various stakeholders to advance efforts to detect, treat and prevent TB throughout NYC. BTBC staff provide information and support to patients through treatment completion; provide evidence-based guidance to physicians; and educate communities about TB. Educational materials developed by the CDC, BTBC and others are used to supplement staff training, which is delivered by experts from BTBC and the Northeastern TB Center of Excellence for Training, Education and Medical Consultation.

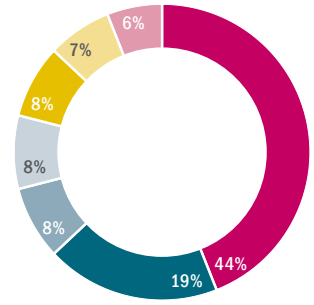
Health care providers collaborate with BTBC in many capacities and are invited to discuss TB testing, diagnosis and treatment through numerous channels. BTBC experts participate in TB presentations, case management conferences and clinical consultation at hospitals and outpatient facilities throughout the city. BTBC also co-sponsors two day-long educational events for healthcare providers and other colleagues: an annual medical conference in honor of World TB Day to discuss best practices and the latest TB care guidelines and recommendations; and an annual genotyping conference—held in NYC and broadcast live by webinar—to discuss advances in and applications of molecular methods for TB care, prevention, epidemiology and research. In addition, BTBC staff regularly consult with colleagues in local, national and international settings on matters related to TB policy, practice and experience.

Communities with high TB burden are engaged as partners in efforts to increase TB knowledge and encourage community members to seek care when needed. Community-based organizations, elected representatives and other partners help deliver culturally and linguistically appropriate educational messaging though community events and via print and electronic media. They also support TB screening efforts for individuals at high TB risk at health fairs and mobile van-based testing events.

›› *For information about educational materials and other resources, see pages 34-35.*

BTBC STAFFING AND FUNDING, JULY 1, 2018 THROUGH JUNE 30, 2019:

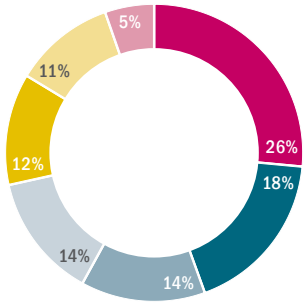
FIGURE 1: Bureau of Tuberculosis Control staff by job function, 2018 (n=226)[1,2]



- Public health advisor 44%
- Data analyst/epidemiologist ... 19%
- Nurse 8%
- Administrative professional 8%
- Other licensed professional 8%
- Other staff 7%
- Physician 6%

1. As of January 13, 2019. 2.Excludes 21 non-Health Department personnel

FIGURE 2: Bureau of Tuberculosis Control funding distribution for other-than-personnel services by type, 2018



- Medications 26%
- Laboratory testing services 18%
- Patient support services 14%
- Electronic medical records 14%
- Supplies/equipment 12%
- Chest radiograph services 11%
- Other 5%

PROGRAM EVALUATION

The Health Department uses a series of local and national performance indicators to assess program impact and success. These indicators help inform planning and policy decisions and help identify programmatic issues and areas for improvement in TB treatment and care, case management and contact investigation. Performance indicators and targets are developed in coordination with Health Department partners and funders, including the NYC Mayor's Office, NYSDOH and the CDC. Key reports include the Health Department's *Quality and Performance Review (QPR)*, a quarterly report to NYSDOH, the CDC's *Annual Performance Report,* the CDC's *Aggregate Reports for TB Program Evaluation (ARPE*) and the *National Tuberculosis Indicators Project (NTIP).*

›› *For the most recent performance indicators, see page 28.*

COHORT REVIEW: One of the Health Department's primary tools for evaluating its TB control program is the quarterly cohort review process. Four to six months after a patient's TB diagnosis, BTBC staff review case management activities, treatment status and data quality for all patients with confirmed TB disease and their contacts. Successes and challenges in patient care and case management are used to inform programmatic changes and identify training needs.

FUNDING AND ADMINISTRATION

BTBC receives City, State, federal and grant funding. The operating budget for the fiscal period of July 1, 2018, through June 30, 2019, is approximately $15.9 million. Of this budget, 88% supports personnel services and 12% supports other-than-personnel services (OTPS). These funds support all TB prevention and control activities, from hiring staff to operating four Health Department chest clinics. BTBC staff work to ensure that funds are allocated, monitored and utilized efficiently.

RESEARCH

The Health Department actively participates in research about TB, including observational studies on TB epidemiology and clinical research through the CDC TB Trials Consortium (TBTC), which conducts national and international studies to develop new treatment regimens for TB disease and latent TB infection. BTBC staff serve on advisory groups, consortia and professional organizations, and coordinate the NYC TB Research Consortium, which brings together New York City Health Department, academic, laboratory and other researchers to collaborate on projects focusing on TB in NYC. The group's activities include epidemiologic and clinical studies and mentoring students to develop research skills for future public health careers.

BTBC MEMBERSHIPS AND STAFF PARTICIPATION IN ADVISORY GROUPS AND CONSORTIA:

- Advisory Council for the Elimination of TB
- CDC/Infectious Disease Society of America/American Thoracic Society National MDR-TB Guidelines Writing Committee
- CDC Report of Verified Cases of Tuberculosis Revision Workgroup
- CDC TB Education and Training Network
- CDC TB Program Evaluation Network
- CDC TB Outbreak Detection Workgroup
- CDC TB Trials Consortium
- Council of State and Territorial Epidemiologists
- Maven Users Group
- National TB Controllers Association: Board of Directors; LTBI Reporting Workgroup; National Society of TB Clinicians; Society for Epidemiology in TB Control and Survey Committee
- Northeastern TB Center of Excellence for Training, Education and Medical Consultation Medical Advisory Board
- International Union Against TB and Lung Disease

CONFERENCES: NYC TB data and expertise are shared at meetings locally, nationally and internationally. In 2018, these included the following: the Twelfth Annual TB Medical Consultant's Meeting • the NYC Annual TB Genotyping Meeting • the NYC Annual World TB Day Medical Conference • the Connecticut TB Update Meeting • the Rutgers Global TB Institute TB Intensive Workshop • the Third Annual Conference of Health, Data Science and Public Action • the Arizona Infectious Disease Conference • the National TB Controller's Association Conference • the Twenty-second Conference of The Union North America Region • Infectious Disease Week • the TB Education and Training Network/TB Program Evaluation Network Conference • the Council of State and Territorial Epidemiologists Annual Conference • the Forty-ninth Union World Conference on Lung Health • the U.N. High Level Meeting on TB • the Third International Conference on Integrated TB Control in Tajikistan • and the 7th Congress of the Bulgarian Respiratory Society.

BTBC STAFF PUBLICATIONS IN PEER-REVIEWED JOURNALS, 2018:

- Collaborative Group for the Meta-Analysis of Individual Patient Data in MDR-TB treatment–2017. Treatment correlates of successful outcomes in pulmonary multidrug-resistant tuberculosis: an individual patient data meta-analysis. *Lancet.* 2018 Sep 8;392(10150):821-834.
- Collaborative Group for the Meta-Analysis of Individual Patient Data in MDR-TB treatment–2017. Comparison of different treatments for isoniazid-resistant tuberculosis: an individual patient data meta-analysis. *Lancet Respir Med.* 2018 Apr;6(4):265-275.
- Collaborative Group for Meta-Analysis of Paediatric Individual Patient Data in MDR-TB. Treatment and outcomes in children with multidrug-resistant tuberculosis: A systematic review and individual patient data meta-analysis. *PLoS Med.* 2018 Jul 11;15(7):e1002591.
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›› *For more information about research at BTBC or to join the NYC TB Research Consortium, email* ***TB-epi@health.nyc.gov****.*

›› SPOTLIGHT ON TB ELIMINATION, 2018

NYC TB SUMMIT: "INFORM, ENGAGE AND INNOVATE FOR TB ELIMINATION"

On June 29, 2018, the Health Department welcomed 200 policy makers, thought leaders, innovators and public health experts to its first-ever summit focusing on strategic efforts for eliminating TB in NYC. Speakers shared perspectives on TB elimination and sparked discussion on innovations in TB prevention and care. The morning session featured speakers representing local, state, national and international organizations. Panel discussions followed, addressing aspects of building a framework for TB elimination in NYC: research and tools; advocacy; and prevention and care. In the afternoon, panelists described approaches to TB elimination in jurisdictions across the U.S. and participants discussed their ideas for implementing these strategies in NYC. Attendees were invited to join the newly formed **COALITION FOR A TB-FREE NYC**, a group of stakeholders across various disciplines who will share resources, develop interventions and advocate for policies to end TB in NYC.

›› *For more information about the NYC TB Summit or to join the Coalition, visit* ***nyc.gov/health/tb***

Jose Luis Castro (International Union Against TB and Lung Disease; Vital Strategies), Jane Coyne (Office of the U.N. Special Envoy for TB), Philip LoBue (CDC Division of TB Elimination) and Margaret Oxtoby (NYS Department of Health) joined BTBC Director Joseph Burzynski and other experts to discuss global, national, state and local perspectives on TB.

Attendees at the NYC TB Summit discussed three core components of a TB elimination strategy: research and tools; advocacy; and TB prevention and care

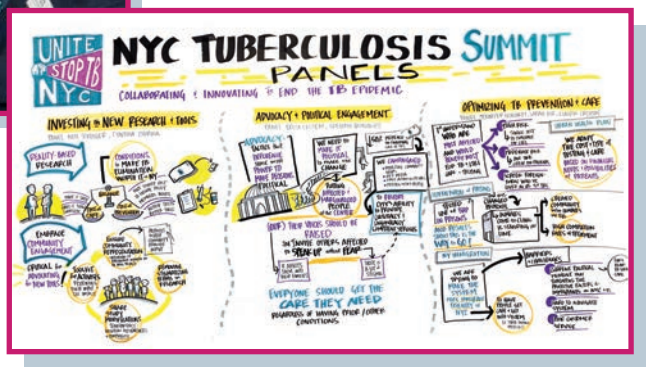


Illustration by Claudia Lopez, On the Right Mind

U.N. HIGH-LEVEL MEETING: "UNITED TO END TB: AN URGENT GLOBAL RESPONSE TO A GLOBAL EPIDEMIC"

On September 26, 2018, the U.N. General Assembly held its first high-level meeting on TB: “United to End TB: An Urgent Global Response to a Global Epidemic.” The meeting resulted in the adoption of a political declaration on TB, through which country leaders recognized TB as a challenge, highlighted the importance of addressing social and economic determinants, acknowledged the vital role of political leadership and committed to taking specific actions to end the TB epidemic globally by 2030. BTBC staff attended additional events that were planned concurrently. These included a TB Innovation Summit, a CDC foundation event entitled “Preventing TB to End TB," a meeting of TB survivors entitled “TB Voices: Surviving the World’s Top Infectious Killer” and an event organized by the Open Society Foundation, the Global Fund to Fight AIDS, Tuberculosis and Malaria, and Stop TB Partnership entitled "TB and Human Rights."

PROFILE OF TB CASES

THE EPIDEMIOLOGY OF TB IN NYC

NYC continues to make progress against TB. Following a single-year increase in 2017, there was an 8% decline in the number of TB cases between 2017 and 2018, and the current case count of **559** is among the lowest in the city's history.

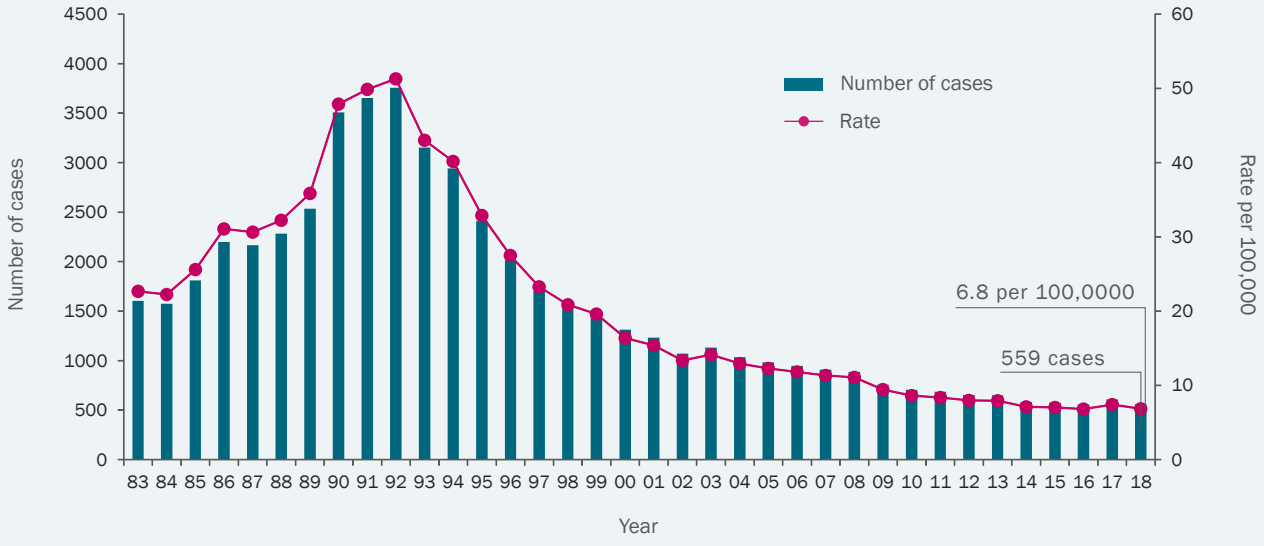
Overall, the number of TB cases in NYC has decreased 85% since 1992. However, the rate of decline has slowed to an average annual decrease of 4% since 2003, and the current NYC TB rate remains more than twice as high as the national rate (6.8 versus 2.8 per 100,000 people, respectively).

559 Number of TB cases verified in NYC in 2018

6.8 NYC citywide TB rate in 2018 per 100,000 people

8% Percent decrease in the number of TB cases between 2017 and 2018

FIGURE 3: Tuberculosis cases and rates,[1] New York City, 1983-2018



1983-1992:
Overall increase: **134%**
Average annual increase: **11%**

1992-2003:
Overall decrease: **70%**
Average annual decrease: **10%**

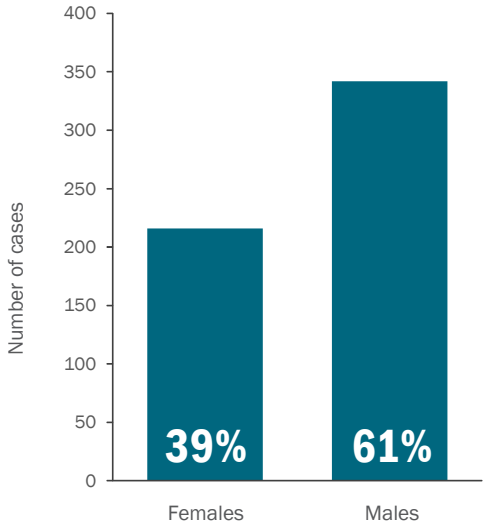
2003-2018:
Overall decrease: **51%**
Average annual decrease: **4%**

1. Rates are based on decennial census data

AGE AND SEX

Between 2017 and 2018, the TB rate increased among the oldest and youngest New Yorkers. Among people over the age of 65, the TB rate increased 12% from 11.8 to 13.3 per 100,000. Among children under the age of 18, the TB rate increased 28% from 1.0 to 1.3 per 100,000. TB also continued to disproportionately affect males, who made up 61% of all patients in 2018.

FIGURE 6: Tuberculosis cases by sex,[1] New York City, 2018



1. Data on patient sex is currently collected and categorized as "Male," "Female" and "Transgender." In future reports, more expansive categories of gender identity will be presented to reflect changes in data collection.

FIGURE 7: Tuberculosis cases by age group in years, New York City, 2018

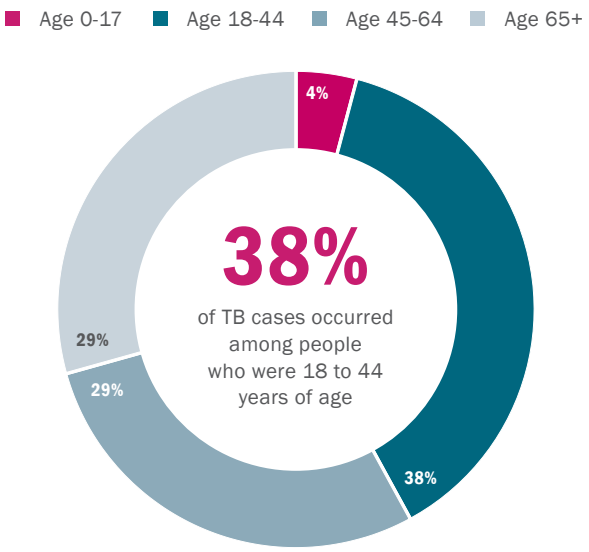
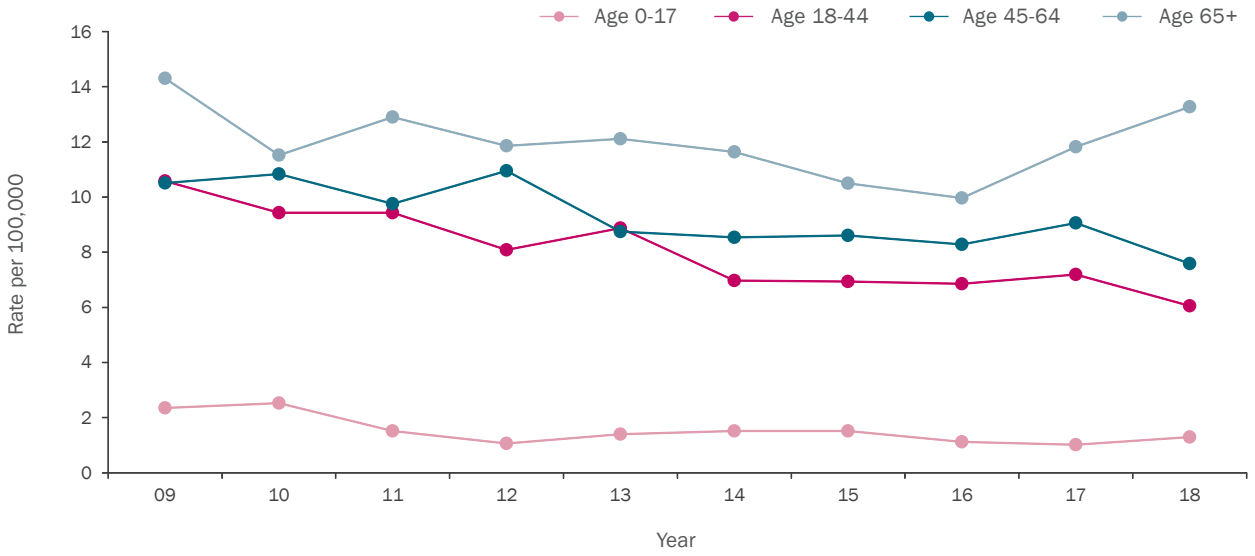


FIGURE 8: Tuberculosis rates[1] by age group in years, New York City, 2009-2018



1. Rates are based on New York City Health Department population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates, 2000-2017. Updated September 2018.

TB AMONG PEDIATRIC AND ELDERLY PATIENTS IN NYC, 2018

While TB rates rose among the elderly and pediatric populations, the increase was not uniform within each group. Among older New Yorkers, the TB rate increased 29% among those 75 to 84 years of age and 33% among those over 85 years of age but decreased 5% among those 65 to 74 years of age. Among children, TB rates dropped 60% for those younger than 5 years of age and more than doubled for those 5 to 17 years of age.

PEDIATRIC TB

FIGURE 9: Tuberculosis rate[1] by age group in years among patients younger than 18 years of age, New York City, 2018

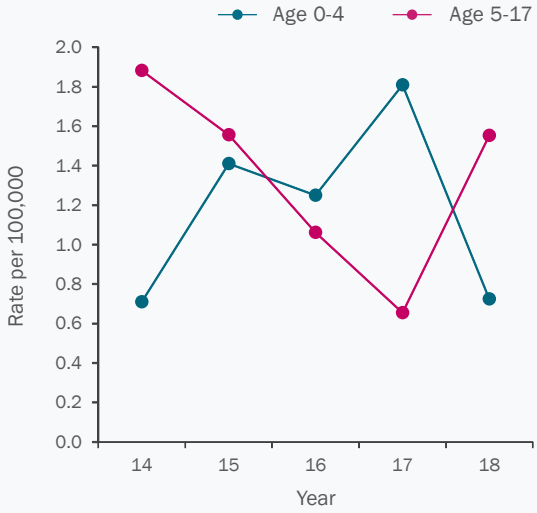


TABLE 1: Select characteristics among patients younger than 18 years of age with tuberculosis, New York City, 2018 (n=23)

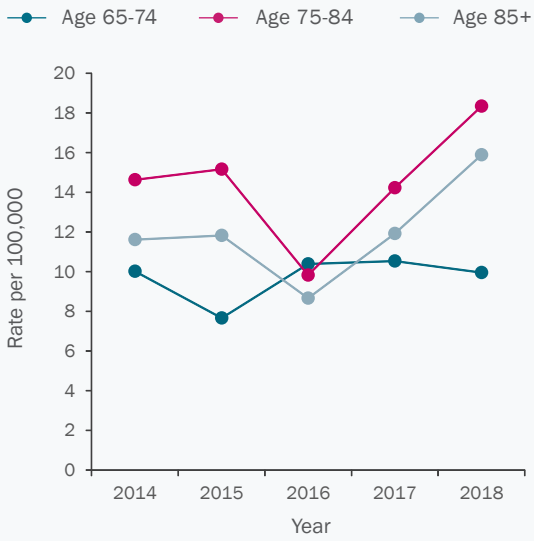
Patient characteristics	n (%)
Born in the United States (U.S.)	12 (52%)
Non-U.S.-born parent (among U.S.-born)	7 (58%)
Non-U.S.-born	11 (48%)
Years in the U.S. among non-U.S.-born:	
< 1 year	4 (36%)
1-5 years	6 (55%)
> 5 years	1 (9%)
Identified in association with another TB case	6 (26%)
Multidrug-resistant disease	2 (9%)
Died prior to or while on TB treatment	1 (4%)

TB IN THE ELDERLY

TABLE 2: Select characteristics among patients older than 65 years of age with tuberculosis, New York City, 2018 (n=164)

Patient characteristics	n (%)
Born in the United States (U.S.)	25 (15%)
Non-U.S.-born	139 (85%)
Years in the U.S. among non-U.S.-born:	
< 10 years	20 (14%)
10-25 years	49 (35%)
> 25 years	63 (45%)
HIV infection	3 (2%)
Immunosuppression (non-HIV)	18 (11%)
Prior history of TB disease	15 (9%)
Died prior to or while on TB treatment	27 (16%)

FIGURE 10: Tuberculosis rate[1] by age group in years among patients older than 65 years of age, New York City, 2018

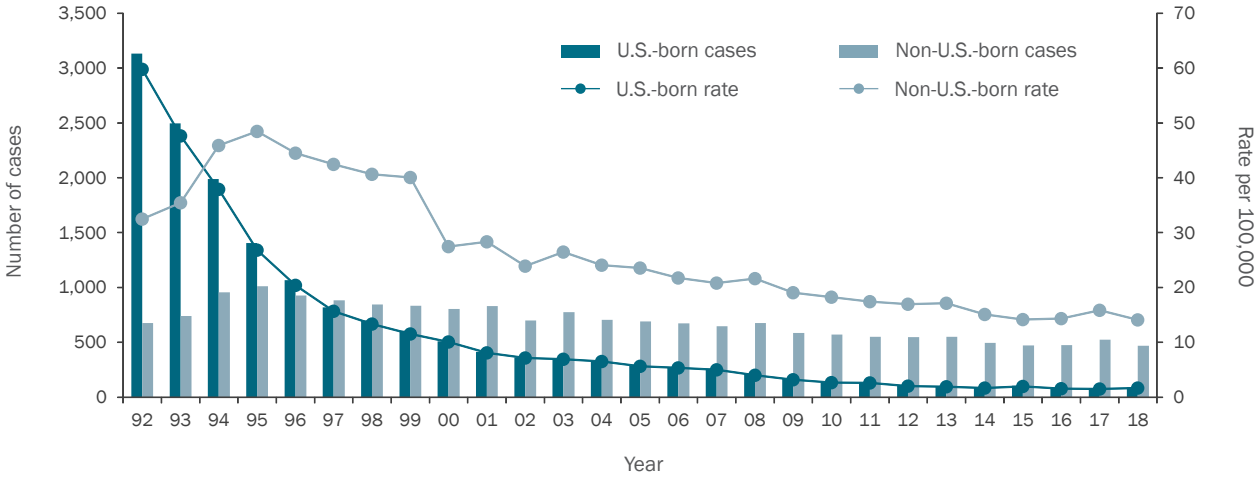


1. Rates are based on New York City Health Department population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates, 2000-2017. Updated September 2018.

BIRTH IN THE UNITED STATES

Despite the overall decrease in TB cases and rates in NYC, some groups remain disproportionately affected. In 2018, 84% of TB cases occurred among non-U.S.-born patients, and the non-U.S.-born TB rate was more than eight times the U.S.-born rate (14.1 and 1.7 per 100,000, respectively). Among the U.S.-born, the rate among patients who were non-Hispanic/Latino Black was six times higher than among those who were non-Hispanic/Latino White (3.0 versus 0.5 per 100,000), while 75% of all TB patients born in the U.S. were non-Hispanic/Latino Black or Hispanic/Latino.

FIGURE 4 Tuberculosis cases and rates[1] by birth in the United States (U.S.),[2,3] New York City, 1992-2018



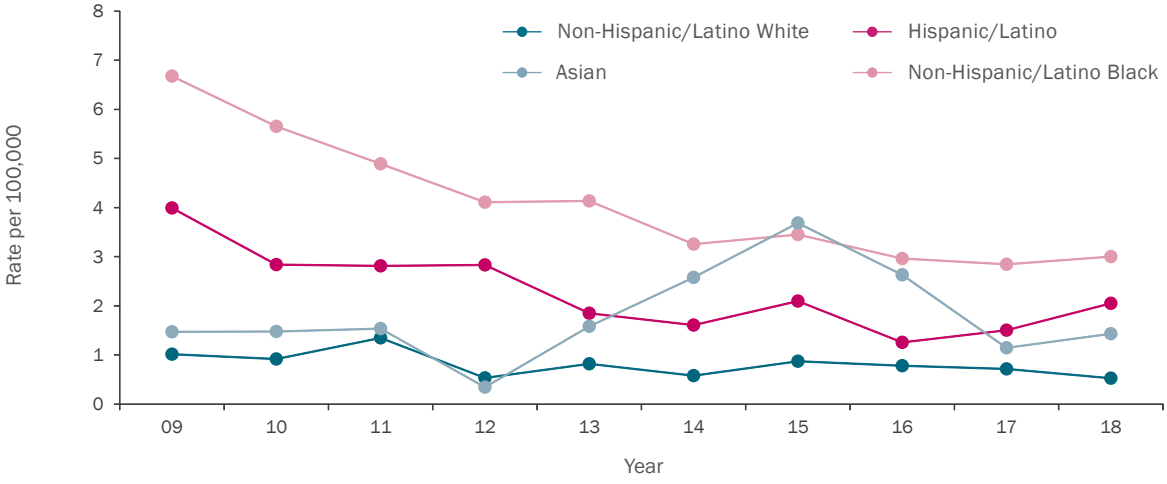
1. Rates prior to 2000 are based on 1990 U.S. Census data. Rates for 2000-2005 are based on 2000 U.S. Census data. Rates after 2005 are based on one-year American Community Survey data for the given year or the most recent available data. 2. U.S.-born includes individuals born in the U.S. and U.S. territories. 3. Excludes cases with unknown country of birth.

84% Proportion of TB patients who were non-U.S.-born

11% Percent increase in the number of U.S.-born TB patients since 2017

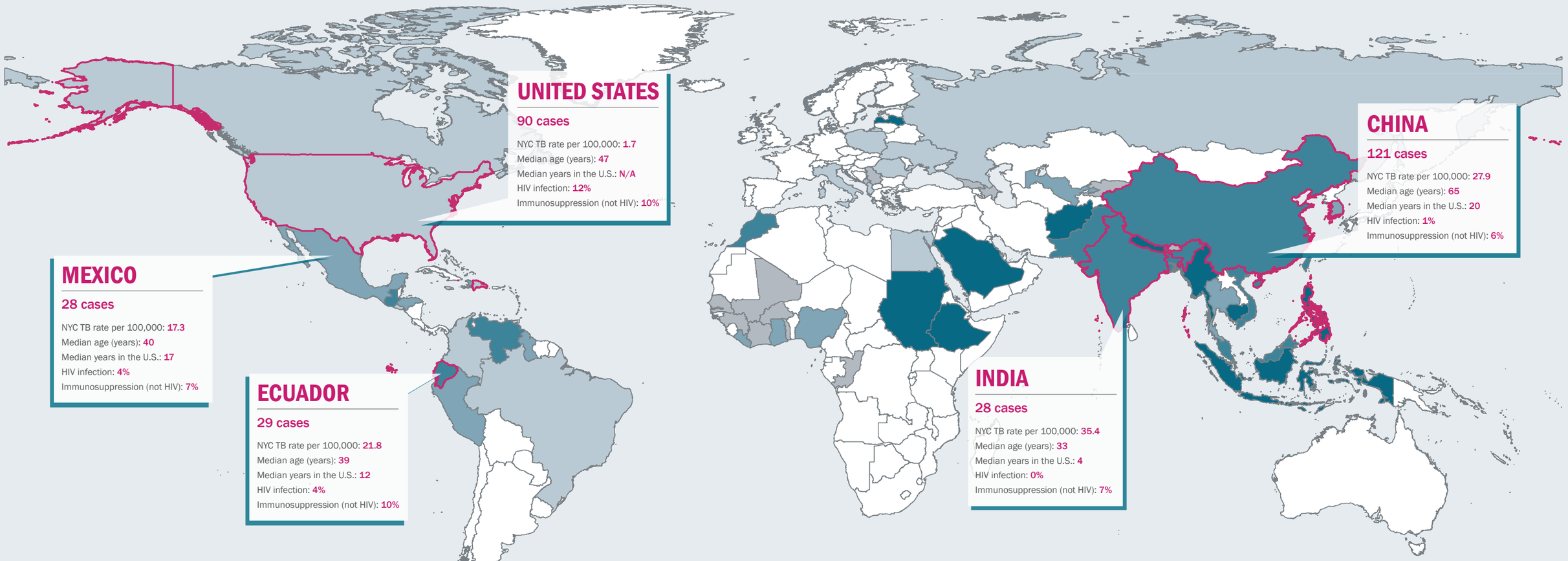
75% Proportion of U.S.-born patients who were Hispanic/Latino or non-Hispanic/Latino Black

FIGURE 5: Tuberculosis rates[1] by race/ethnicity[2] among patients born in the United States (U.S.),[3,4] New York City, 2009-2018



1. Rates are based on one-year American Community Survey Public Use Microdata Sample data for the given year or the most recent available data. 2. Data shown does not include patients with multiple, other or unknown race/ethnicity. 3. U.S.-born includes individuals born in the U.S. and U.S. territories. 4. Excludes cases with unknown country of birth.

FIGURE 11: Tuberculosis cases, rates[1] and select characteristics by patient country of birth,[2-6] New York City, 2018



COUNTRY OF BIRTH

NYC's TB patient population reflects the city's diversity, with 62 countries of birth and 46 primary languages among patients with TB disease in 2018. Patient characteristics and TB risk factors differ substantially by country of birth, and BTBC works in partnership with the communities most affected by TB to understand these differences and develop tailored interventions to reduce TB burden.

62 Number of countries of birth represented among patients with TB disease in 2018

13 Median number of years in the U.S. at time of TB diagnosis among non-U.S.-born patients

46 Number of primary languages spoken among NYC TB patients

TOP 10 COUNTRIES OF BIRTH BY TB BURDEN AND INCIDENCE[1] IN NEW YORK CITY,[2-3] 2018

Country of birth	Number of cases
China[4]	121
United States (U.S.)[5]	90
Ecuador	29
Mexico	28
India	28
Philippines	27
Bangladesh	25
Dominican Republic	21
Guyana	16
Pakistan	15

Country of birth	TB rate per 100,000
Nepal (14 cases)	188
Burma (10 cases)	160
Ethiopia (2 cases)	103
Sudan (1 case)	98
Saudi Arabia (1 case)	86
Afghanistan (2 cases)	65
Latvia (1 case)	59
Cambodia (1 case)	58
Philippines (27 cases)	49
Indonesia (2 cases)	43

1. Rates are based on 2017 American Community Survey one-year sample data.
2. One case in 2018 was in a patient with unknown country of birth.
3. There were 14 countries for which rate could not be calculated due to insufficient population data
4. China includes individuals born in mainland China, Hong Kong, Taiwan and Macau.
5. U.S.-born includes individuals born in the U.S. and U.S. territories.
6. Immunosuppression due to having a medical condition, not including HIV/AIDS, or use of immunosuppressive therapy
7. MDR TB is defined as resistance to at least isoniazid and rifampin.

TB IN NYC NEIGHBORHOODS

TB cases were identified in every NYC neighborhood in 2018. Queens continued to have the highest TB burden with 206 cases and a rate of 8.7 per 100,000 people. The neighborhood with the highest TB rate was Sunset Park, Brooklyn, with a rate of 17.9 per 100,000, more than two times higher than the citywide rate. Thirteen (31%) UHF neighborhoods had TB rates that exceeded the overall NYC rate and 36 (86%) exceeded the national rate. Fifty-five percent of TB patients lived in a neighborhood with high or very high area-based poverty.

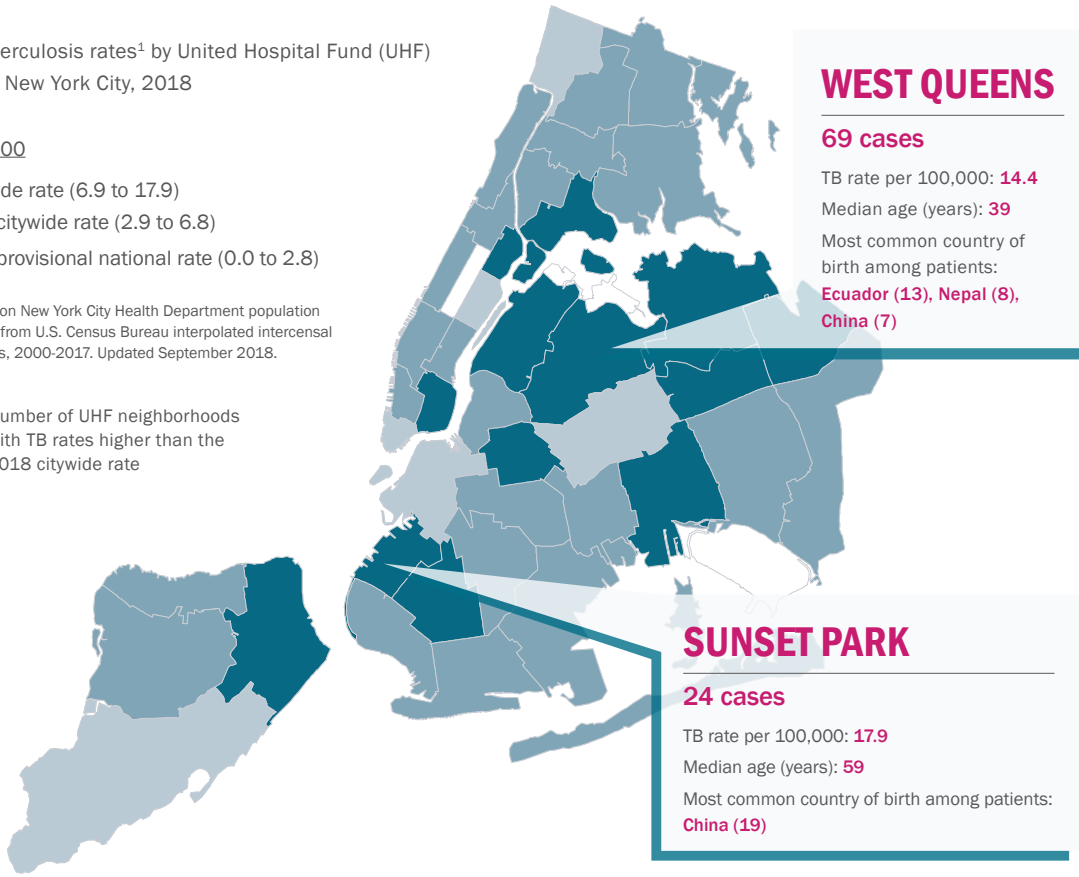
FIGURE 12: Tuberculosis rates[1] by United Hospital Fund (UHF) neighborhood, New York City, 2018

Rate per 100,000

- Above citywide rate (6.9 to 17.9)
- At or below citywide rate (2.9 to 6.8)
- At or below provisional national rate (0.0 to 2.8)

1. Rates are based on New York City Health Department population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates, 2000-2017. Updated September 2018.

13 Number of UHF neighborhoods with TB rates higher than the 2018 citywide rate



WEST QUEENS

69 cases

TB rate per 100,000: **14.4**

Median age (years): **39**

Most common country of birth among patients: **Ecuador (13), Nepal (8), China (7)**

SUNSET PARK

24 cases

TB rate per 100,000: **17.9**

Median age (years): **59**

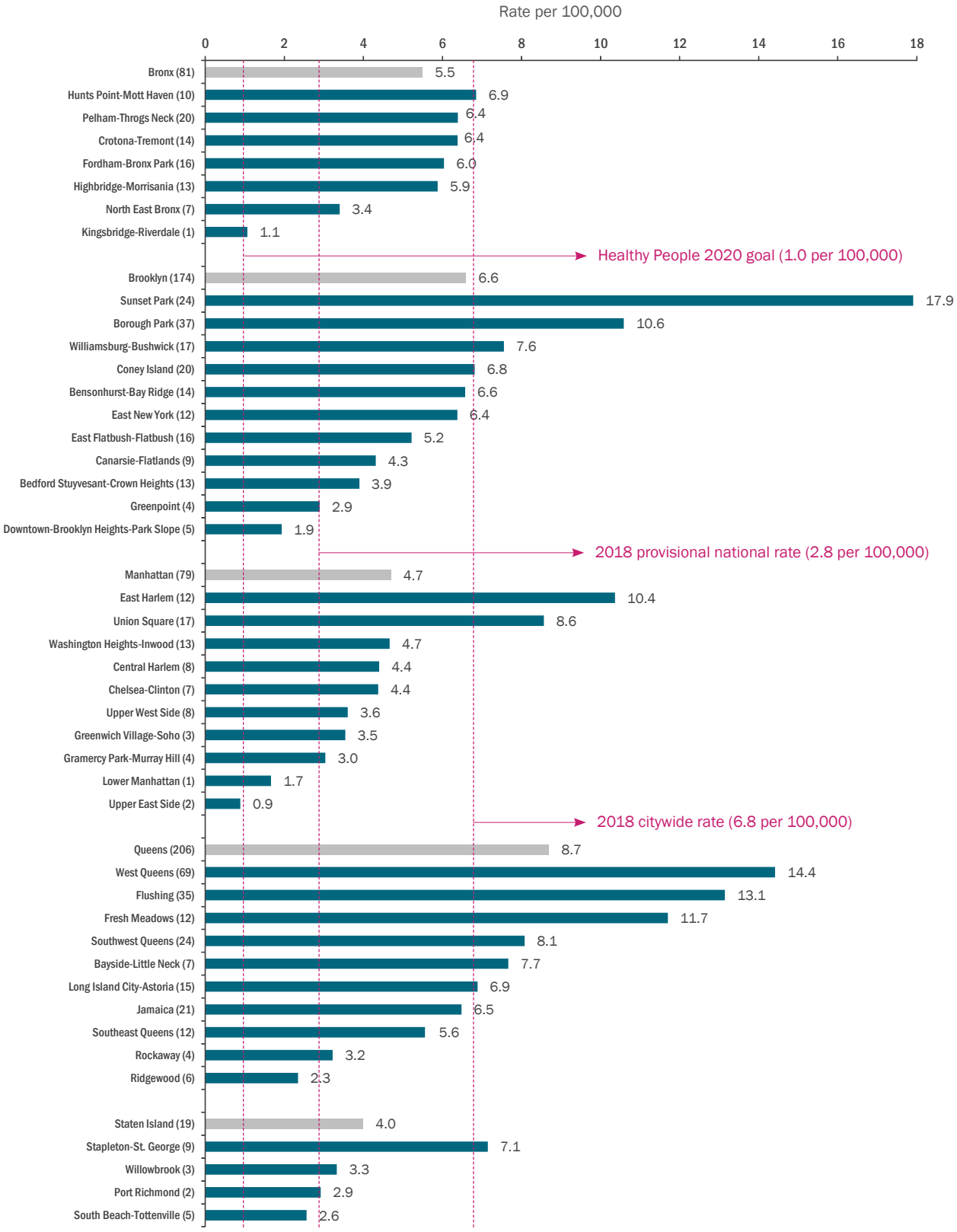
Most common country of birth among patients: **China (19)**

TABLE 3: Proportion of tuberculosis (TB) cases and TB rates[1] by birth in the United States (U.S.)[2-3] and area-based poverty level of patient's residential neighborhood,[4-5] New York City, 2018

Area-based poverty level[4-5]	U.S.-born TB rate	% of U.S.-born patients	Non-U.S.-born TB rate	% of non-U.S.-born patients	Total NYC TB rate	% of all cases
Very high (30 to 100%)	3.2	34%	14.6	18%	7.4	20%
High (20 to < 30%)	2.3	33%	17.4	36%	8.6	35%
Medium (10 to < 20%)	1.0	20%	13.6	39%	6.2	36%
Low (< 10%)	0.8	10%	7.6	7%	2.8	8%

1. Rates are based on 2013-2017 American Community Survey data. 2. U.S.-born includes individuals born in the U.S. and U.S. territories. 3. One case in 2018 was among patients with unknown country of birth. 4. Area-based poverty level is based on 2012-2016 American Community Survey data on the proportion of ZIP code residents living below the federal poverty level. 5. Cases were assigned to a ZIP code based on their residence at TB diagnosis.

FIGURE 13: Tuberculosis cases[1] and rates[2] by borough and United Hospital Fund (UHF) neighborhood, New York City, 2018



1. Parentheses indicate the number of TB cases among patients residing in each neighborhood at time of TB diagnosis. 2. Rates are based on New York City Health Department population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates, 2000-2017. Updated September 2018.

TABLE 4: Select demographic, social and geographic characteristics of tuberculosis cases by birth in the United States (U.S.),[1] New York City, 2017-2018

Characteristics	2017							2018					
	U.S.-born[1]		Non-U.S.-born		Total[2]			U.S.-born[1]		Non-U.S.-born		Total[2]	
	n	%	n	%	n	%		n	%	n	%	n	%
Age group													
0-17	15	19	3	1	18	3		12	13	11	2	23	4
18-44	27	33	224	43	252	42		30	33	181	39	212	38
45-64	22	27	169	32	191	31		23	26	137	29	160	29
65+	17	21	129	25	146	24		25	28	139	30	164	29
Sex													
Female	26	32	195	37	222	37		33	37	183	39	216	39
Male	55	68	330	63	385	63		57	63	284	61	342	61
Race/ethnicity													
White non-Hispanic/Latino	15	19	32	6	47	8		11	12	27	6	38	7
Black non-Hispanic/Latino	36	44	79	15	115	19		38	42	57	12	95	17
Hispanic/Latino	22	27	132	25	155	26		30	33	105	22	136	24
Asian	4	5	262	50	266	44		5	6	256	55	261	47
Multiple/other	4	5	20	4	24	4		6	7	23	5	29	5
Time in the U.S. (at reporting)													
< 1 year	n/a	n/a	68	13	68	13		n/a	n/a	46	10	46	10
1-5 years	n/a	n/a	120	23	120	23		n/a	n/a	96	21	96	21
> 5 years	n/a	n/a	332	63	332	63		n/a	n/a	315	67	315	67
Borough of residence													
Manhattan	9	11	55	10	64	11		22	24	57	12	79	14
Bronx	20	25	84	16	104	17		26	29	55	12	81	14
Brooklyn	34	42	147	28	182	30		28	31	145	31	174	31
Queens	16	20	230	44	246	41		11	12	195	42	206	37
Staten Island	2	2	9	2	11	2		3	3	16	3	19	3
Homeless[3]	9	11	15	3	24	4		7	8	15	3	22	4
Employed[3,4]	31	47	235	45	266	45		29	37	180	39	209	39
Health care worker[3,4]	2	6	16	7	18	7		1	3	14	8	15	7
Drug use[3,4]	16	20	12	2	28	5		16	18	6	1	22	4
Excessive alcohol use[3,4]	2	2	22	4	24	4		6	7	15	3	21	4
Neighborhood poverty[5]													
Very high (30 to 100%)	22	27	113	22	136	22		31	34	82	18	113	20
High (20 to < 30%)	18	22	184	35	202	33		30	33	166	36	196	35
Medium (10 to < 20%)	34	42	186	35	220	36		18	20	181	39	199	36
Low (< 10%)	7	9	40	8	47	8		9	10	34	7	43	8
Total	**81**	**13**	**525**	**86**	**607**	-		**90**	**16**	**468**	**84**	**559**	-

1. U.S.-born includes individuals born in the U.S. and U.S. territories. 2. Column sums may not equal applicable totals due to missing country of birth data. 3. In the 12 months before TB diagnosis. 4. Among patients 18 years of age and older. 5. Area-based poverty level is based on 2012-2016 American Community Survey data on the proportion of ZIP code residents living below the federal poverty level. Cases were assigned to a ZIP code based on their residence at TB diagnosis.

DISEASE SITE, CULTURE STATUS AND HIV INFECTION

FIGURE 14: Tuberculosis cases by disease site, New York City, 2018

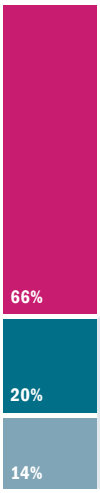


TABLE 5: Disease site among tuberculosis cases with extrapulmonary disease,[1] New York City, 2018 (n=193)

Disease site	Number of cases	Percent
Any extrapulmonary site	193	
Lymphatic	84	44
Pleural	55	28
Bone/joint	25	13
Genitourinary	11	6
Meningeal	5	3
Peritoneal	8	4
Laryngeal	0	0
Other	38	20

1. Categories are not mutually exclusive.

Pulmonary disease only
Extrapulmonary disease only
Both pulmonary and extrapulmonary disease sites

FIGURE 15: Proportion of culture-confirmed tuberculosis cases among all tuberculosis cases, New York City, 2018

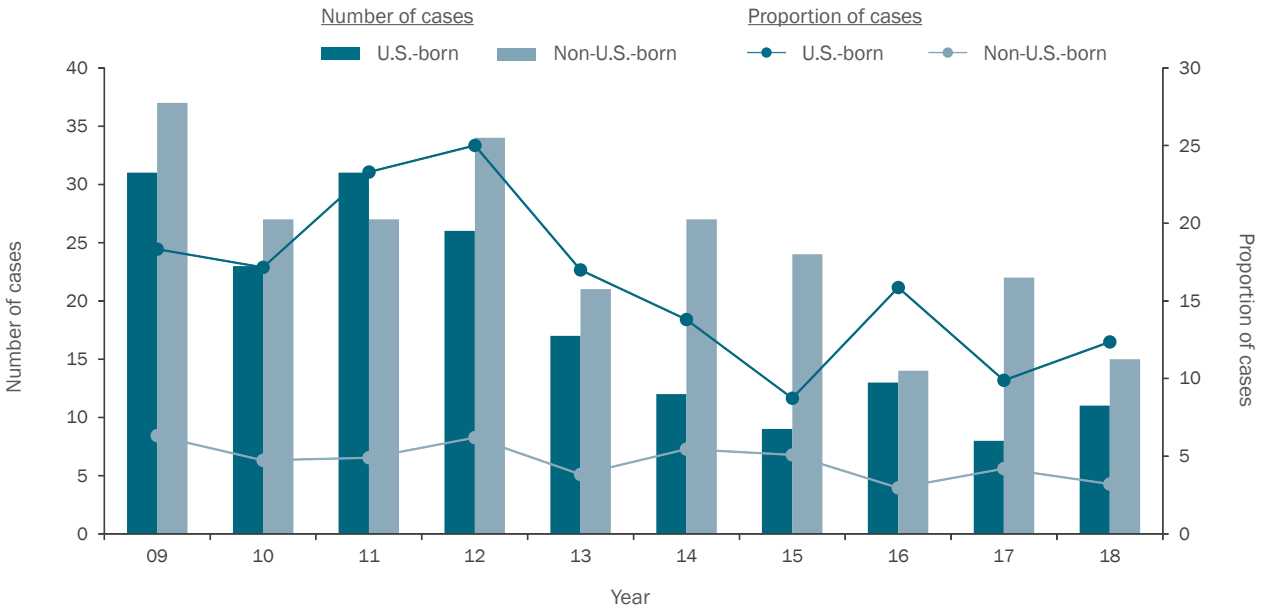
Culture-positive (426)
Clinically-confirmed (133)

80% Proportion of cases with a pulmonary site of disease

66 Median age among patients with a meningeal site of disease

5% Proportion of TB patients with known HIV infection

FIGURE 16: HIV infection among tuberculosis cases[1] by birth in the United States (U.S.),[2,3] New York City, 2009-2018

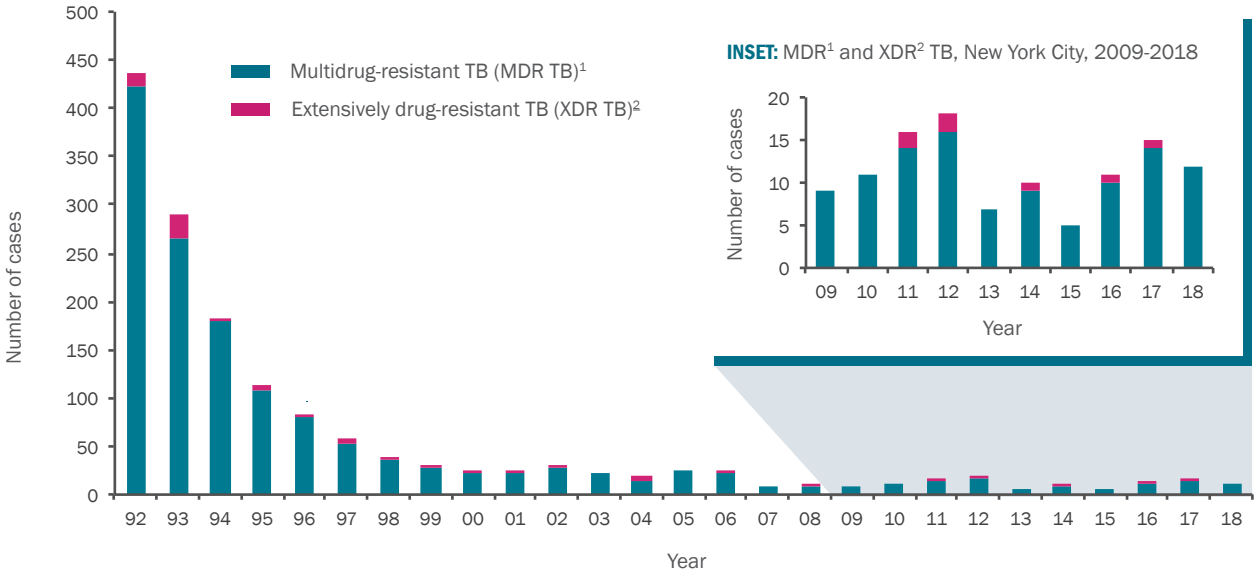


1. Excludes cases with unknown country of birth. 2. U.S.-born includes individuals born in the U.S. and U.S. territories. 3. 120 (22%) patients in 2018 had an unknown HIV status.

DRUG RESISTANCE

Drug resistance continues to be a challenge to TB prevention and care efforts. Seventy-two (31%) patients diagnosed in 2018 had a strain resistant to at least one first-line TB drug. Twelve patients had MDR TB, defined as a TB strain resistant to isoniazid and rifampin, the two most important and effective drugs in the TB treatment regimen. Molecular-based tests are now being used routinely in acute care hospitals, commercial laboratories and public health reference laboratories. These tests can rapidly detect mutations associated with drug resistance, which helps health care providers ensure that patients are placed on effective regimens sooner.

FIGURE 17: Multidrug resistance[1] among tuberculosis cases, New York City, 1992-2018



1. MDR TB is defined as resistance to at least isoniazid and rifampin. 2. XDR TB is defined as resistance to at least isoniazid and rifampin plus a fluoroquinolone and a second-line injectable anti-TB medication.

TABLE 6: Detection of mutations associated with resistance to select tuberculosis medications by molecular test type and gene target,[1,2] New York City, 2018

Test type	Number of patients with test conducted		RIFAMPIN	ISONIAZID		FLOUROQUINOLONES	INJECTIBLES
		GENE(S)	• rpob	• inhA • katG	• oxyR-ahpC PR • mabA-inhA PR • mabA	• gyrA • gyrB	• rrs
Xpert® MTB/RIF	181	NUMBER (%) OF PATIENTS WITH MUTATION(S) IDENTIFIED IN ISOLATE	5 (3%)	-	-	-	-
GenoType MTBDR*plus* (Hain)	38		3 (8%)	5 (13%)	-	-	-
Pyrosequencing	55		11 (20%)	16 (29%)	-	1 (2%)	-
Sanger sequencing	4		3 (75%)	3 (75%)	-	-	1 (25%)
Whole genome sequencing	388		13 (3%)	41 (11%)	9 (2%)	9 (2%)	4 (1%)

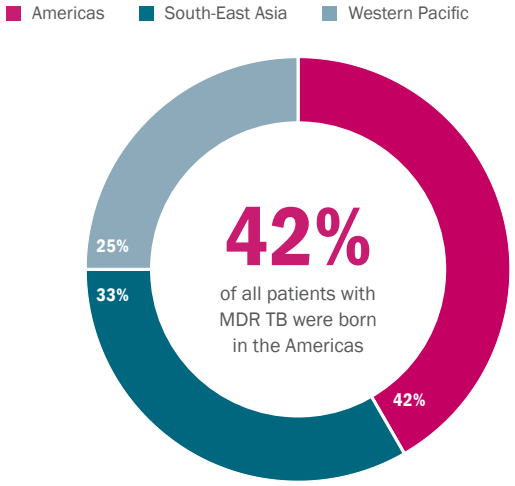
1. Proportions are among patients with specimens tested. 2. Categories are not mutually exclusive.

TABLE 7: Select characteristics among patients diagnosed with multidrug-resistant (MDR) tuberculosis,[1] New York City, 2018 (n=12)

Characteristics	
Median age (range)	32 (0-82)
Number born outside of the United States (U.S.) (%)	10 (83%)
Years in the U.S. among non-U.S.-born patients (%)	
< 5 years	5 (50%)
5-10 years	1 (10%)
> 10 years	4 (40%)
Pulmonary site of disease (%)	10 (83%)
Median number of drugs to which there was known resistance among MDR TB cases[2] (range)	6 (3-9)
Median number of contacts identified around patients with MDR TB (range)	4 (0-56)

1. MDR TB is defined as resistance to at least isoniazid and rifampin.
2. Resistance to any fluoroquinolone was counted once

FIGURE 18: Region of birth[1] among patients diagnosed with multidrug-resistant tuberculosis, New York City, 2018 (n=12)



1. Based on World Health Organization regional definitions

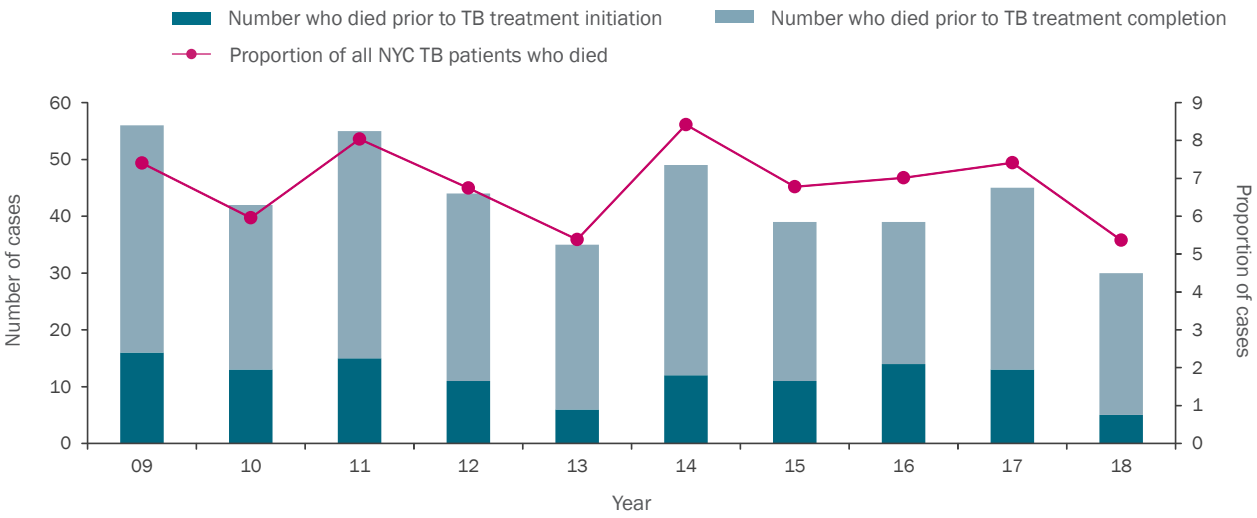
TABLE 8: Select clinical characteristics of tuberculosis cases by birth in the United States (U.S.),[1] New York City, 2017-2018

Characteristics	2017						2018					
	U.S.-born[1]		Non-U.S.-born		Total[2]		U.S.-born[1]		Non-U.S.-born		Total[2]	
	n	%	n	%	n	%	n	%	n	%	n	%
Ever respiratory smear positive[3]	29	48	244	58	273	56	40	56	195	52	236	53
Sputum smear positive[3]	27	90	233	94	260	94	40	95	183	92	224	93
Nucleic amplification assay positive[4]	2	22	2	15	4	18	0	0	14	36	14	29
Culture positive	57	70	445	85	503	83	62	69	363	78	426	76
Pulmonary only site of disease	51	63	329	63	381	63	63	70	302	65	366	66
Extra-pulmonary only site of disease	21	26	102	19	123	20	18	20	94	20	112	20
Both pulmonary and extra-pulmonary	9	11	94	18	103	17	9	10	72	15	81	14
Cavities present on chest x-ray ever[3]	17	28	100	24	117	24	22	31	65	17	87	19
Multidrug (MDR) resistance[5]	2	4	13	3	15	3	2	3	10	3	12	3
Extensive drug resistance (XDR)[6]	1	2	0	0	1	0	0	0	0	0	0	0
Non-MDR isoniazid resistance[7]	3	5	38	9	41	8	7	12	30	8	37	9
Non-MDR rifampin resistance[8]	1	2	1	0	2	0	0	0	3	1	3	1
History of TB disease	4	5	30	6	34	6	3	3	37	8	40	7
HIV status												
Infected	8	10	22	4	30	5	11	12	15	3	26	5
Not infected	57	70	429	82	486	80	52	58	364	78	416	74
Refused testing	11	14	60	11	71	12	18	20	58	12	76	14
Not offered/done or unknown	5	6	14	3	20	3	9	10	31	7	41	7
Non-HIV related immunosuppression	4	5	30	6	34	6	9	10	31	7	40	7
Diabetes	9	11	107	20	116	19	16	18	113	24	129	23
Total	**81**	**13**	**525**	**86**	**607**	-	**90**	**16**	**468**	**84**	**559**	-

1. U.S.-born includes individuals born in the U.S. and U.S. territories. 2. Column sums may not equal applicable totals due to missing country of birth data.
3. Percent is among patients with a pulmonary site of disease. 4. Among patients with negative culture and nucleic amplification assay performed. 5. MDR TB is defined as resistance to at least isoniazid and rifampin. Percent is among patients with susceptibility testing performed for isoniazid and rifampin. 6. XDR TB is defined as resistance to at least isoniazid and rifampin plus a flouroquinilone and a second-line injectable anti-TB medication. Percent is among patients with susceptibility testing performed for isoniazid, rifampin, any fluoroquinolone and any second-line injectable anti-TB medication. 7. Percent is among patients with susceptibility testing performed for isoniazid who did not have MDR TB. 8. Percent is among patients with susceptibility testing performed for rifamipin who did not have MDR TB.

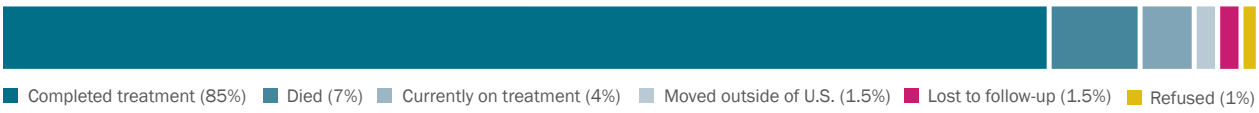
MORTALITY AND TREATMENT COMPLETION

FIGURE 22: Number and proportion of patients with tuberculosis (TB) who died[1] before or during treatment, New York City (NYC), 2009-2018



1. A death is defined as any patient who died prior to or during TB treatment, regardless of the cause of death. This excludes any patient who died after the completion of TB treatment.

FIGURE 23: Treatment outcomes for tuberculosis (TB) cases counted in 2017,[1] New York City (n=607)



1. Treatment outcomes are not reported for the current year to allow sufficient time for follow-up. 2. A death is defined as any patient who died prior to or during TB treatment, regardless of the cause of death. This excludes any patient who died after the completion of TB treatment.

TABLE 12: Select performance measures, national targets[1] and New York City performance outcomes, 2016-2017[2]

Indicator	2016	2017	2020 target
Treatment and case management for persons with active tuberculosis (TB)			
Initiated TB treatment within seven days of specimen collection[3]	91%	92%	97%
Sputum culture conversion within 60 days of treatment initiation[4]	76%	67%	73%
Completed treatment within 365 days of initiation[5]	93%	92%	95%
Contact investigation			
Eligible cases with contacts elicited[6]	96%	95%	100%
Eligible contacts evaluated[7]	82%	83%	93%
Eligible contacts who initiated treatment for TB infection[8]	84%	83%	91%
Eligible contacts who completed treatment for TB infection[9]	81%	63%	81%

1. Definitions for performance measures and national indicators are established by the CDC. The 2020 targets were set in 2015. For additional information, visit: cdc.gov. 2. Performance measures are not reported for the current year to allow sufficient time for follow-up. Data for 2017 are preliminary. 3. Of TB patients with positive acid-fast bacilli (AFB) sputum-smear results who are alive at diagnosis. 4. Of TB patients with positive sputum culture results who were alive at diagnosis and have initiated treatment. Excludes patients who died within 60 days of initiating treatment. 5. Excludes patients who never started on anti-TB medications, those who died or moved outside of the U.S. within 365 days of treatment initiation, those with any rifampin resistance, those with meningeal TB and children 14 years of age or younger with disseminated TB. 6. Of AFB sputum smear-positive TB cases. 7. Of contacts to AFB sputum smear-positive TB cases counted in the year of interest. 8. Of contacts to AFB sputum smear-positive TB cases who have newly diagnosed TB infection. 9. Of contacts to sputum AFB smear-positive TB cases with newly diagnosed TB infection and started treatment.

CONTACT INVESTIGATION IN NON-HOUSEHOLD SETTINGS

The Health Department uses multiple methods to identify and interrupt TB transmission, including contact investigations in non-household settings (e.g., worksites, schools and health care facilities). The Health Department investigates TB exposures at these sites to identify and evaluate contacts, ensure appropriate treatment for contacts with TB disease or latent TB infection, determine if transmission has occurred and assess whether testing of additional contacts may be warranted.

FIGURE 19: Contact investigations in non-household settings[1] by site type, New York City, 2018 (n=55)

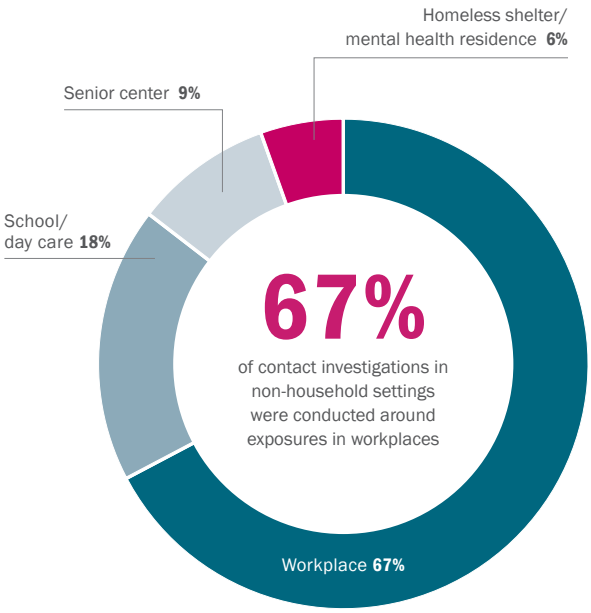


TABLE 9: Contact investigation outcomes in non-household settings[1] by number of exposed contacts, New York City, 2018 (n=55)

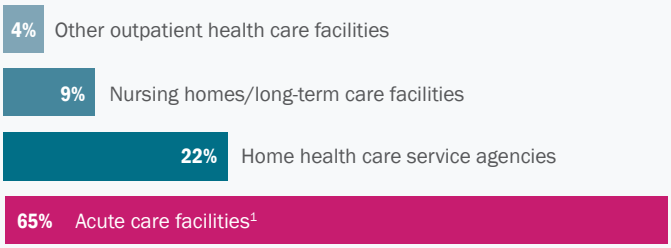
	≥ 15 exposed contacts	< 15 exposed contacts	Total
	n (%)	n (%)	n (%)
Number of sites	25	30	55
Likely transmission[2]	8 (32%)	4 (13%)	12 (22%)
Transmission could not be assessed	0	3 (10%)	3 (5%)
Total number of contacts	1,014	159	1,173
Median contacts per site (range)	27 (16-127)	4 (1-12)	12 (1-127)
Contacts eligible for testing[3]	881 (87%)	156 (98%)	1,037 (88%)
Contacts tested	817 (93%)	144 (92%)	961 (93%)
Contacts with a positive TB test result	57 (7%)	23 (16%)	80 (8%)

1. Excludes health care-associated investigations (n=162).
2. Proportion calculated among investigations where transmission could be assessed.
3. Contacts eligible for testing are defined as contacts without a known history of TB disease or documented positive test for TB infection who were alive subsequent to the diagnosis of the infectious TB case to whom they were exposed.

TB EXPOSURES IN HEALTH CARE-ASSOCIATED SETTINGS IN NYC, 2018

TB exposures in health care-associated settings remain an important concern in NYC, as most individuals with TB disease are diagnosed in acute care facilities. In 2018, the Health Department conducted contact investigations for exposures in 162 health care-associated sites for 129 patients with infectious TB disease. Of these, 65% of investigations occurred in a hospital or acute care clinic.

FIGURE 20: Contact investigations in health care-associated settings by site type, New York City, 2018 (n=162)



1. Includes hospitals and acute care clinics

GENOTYPING AND NYC CLUSTERS

The Health Department uses spoligotyping analysis, 24-loci mycobacterial interspersed repetitive unit–variable number tandem repeat (MIRU-24) analysis, and WGS to characterize TB strains and identify or refute transmission. Cases whose isolates have exact-matching spoligotype and MIRU results are clustered. Cases whose isolates are within 20 single nucleotide polymorphisms (SNP) from each other by WGS are notified to NYC by the NYS Wadsworth laboratory. Cases with similar strains are reviewed, prioritized and assigned for epidemiologic investigation. A difference of five SNPs or less between isolates is considered suggestive of possible transmission and prompts further investigation.

FIGURE 21: Proportion clustered[1] among tuberculosis cases with complete genotype[2,3] by select patient characteristics, New York City, 2018 (n=331)

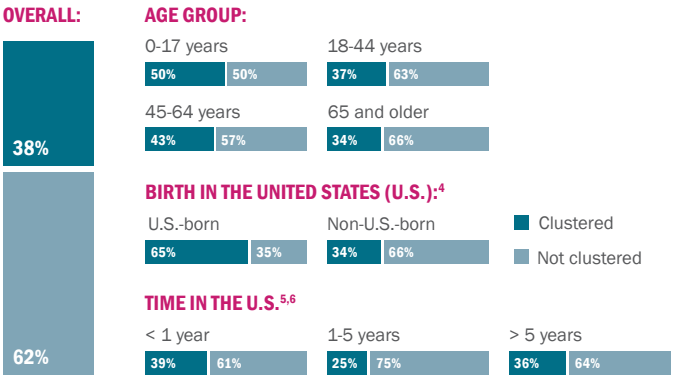


TABLE 10: Whole genome sequencing (WGS) high quality single nucleotide polymorphism (SNP) analysis among culture-confirmed tuberculosis cases, New York City, 2018

	n (%)
NYC cases with high-quality SNP analysis results available[3]	400 (94%)
NYC cases with an isolate reported as having < 20 SNP differences from the isolate of at least one other TB case[7,8]	75 (19%)
NYC cases with an isolate reported as having ≤ 5 SNP differences from the isolate of at least one other NYC TB case[8,9]	30 (8%)

1. Defined as a case with an isolate that has exact-matching MIRU-24 analysis results and spoligotyping results to another NYC case verified since January 1, 2009. 2. Having both spoligotype and MIRU-24 results; 331 (78%) cases verified in 2018 had a complete genotype as of February 13, 2019. 3. Proportion is among culture-confirmed cases. 4. U.S.-born includes individuals born in the U.S. and U.S. territories; one case had unknown country of birth. 5. Among patients born outside the U.S. 6. Time in the U.S. is not available for all patients. 7. May include cases verified outside of New York City with WGS results in the NYS Wadsworth laboratory database. 8. Proportion is among NYC cases in 2018 with WGS results available. 9. Counted between January 1, 2016 and December 31, 2018

TABLE 11: Characteristics of select high-priority tuberculosis (TB) clusters,[1,2] New York City, 2018

	Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F	Cluster G
Number of cases identified between January 1, 2016 and December 31, 2018	9	6	6	4	4	4	4
Proportion of male patients[3]	67%	67%	83%	75%	75%	50%	100%
Proportion of patients born in the United States (U.S.)[3,4]	67%	17%	83%	100%	0%	25%	0%
Median patient age in years (range)[3]	23 (0-53)	27 (17-40)	41 (5-61)	31 (19-59)	36 (35-39)	31 (13-45)	42 (38-50)
Most common borough of residence at time of TB diagnosis (%)[3]	Brooklyn (78%)	Brooklyn (100%)	Brooklyn (83%)	Manhattan (75%)	Brooklyn (75%)	Bronx (100%)	Manhattan (75%)
Proportion of patients reporting history of homelessness[3,5]	0%	0%	0%	0%	0%	0%	100%
Proportion of patients reporting history of drug use or excessive alcohol use[3,5]	22%	17%	67%	100%	0%	25%	100%
Proportion of patients with pulmonary disease[3]	100%	100%	67%	75%	100%	100%	100%
Clusters in which patients reported history of transient work[3,5]		✓			✓		
Clusters in which social networks were identified among patients[3]	✓	✓	✓	✓			✓
Clusters in which patients had links to the same neighborhood[3,6]		✓		✓	✓	✓	

1. Clusters include cases whose isolates have exact-match or similar spoligotyping and MIRU-24 analysis results for whom whole genome sequencing results do not refute transmission as well as cases without available genotyping results but having confirmed epidemiologic links to cluster cases. 2. Defined as clusters with three or more cases identified in three years and evidence of recent, local TB transmission. 3. Among cluster cases identified between January 1, 2016 and December 31, 2018. 4. U.S.-born includes individuals born in the U.S. and U.S. territories. 5. In the 12 months before TB diagnosis. 6. Within a 10-block radius or less

APPENDICES

TABLE 15: Tuberculosis cases and rates[1] by select characteristics, New York City, 1900-2018

Year	Number of TB cases	Rate per 100,000	Cases with positive culture	Cases with positive sputum smear	Sputum smear positive rate per 100,000	Multidrug-resistant cases[2]	Deaths attributable to TB[3]	Death rate per 100,000
1900	11997	349.0					9630	280.2
1910	32065	672.7					10074	211.3
1920	14035	249.7					7915	140.8
1930	11821	170.6					4574	66.0
1940	9005	120.8					3680	49.4
1950	7717	97.8					2173	27.5
1960	4699	60.4					824	10.6
1970	2590	32.8					432	5.5
1971	2572	32.6					316	4.0
1972	2275	28.8					335	4.2
1973	2101	26.6					259	3.3
1974	2022	25.6					215	2.7
1975	2151	27.2					208	2.6
1976	2151	27.2					187	2.4
1977	1605	20.3					175	2.2
1978	1307	16.6					188	2.4
1979	1530	19.4					121	1.5
1980	1514	21.4					143	2.0
1981	1582	22.4					155	2.2
1982	1583	22.4					168	2.4
1983	1603	22.7					151	2.1
1984	1573	22.2	1485				168	2.4
1985	1811	25.6	1756				155	2.2
1986	2197	31.1	2156				186	2.6
1987	2166	30.6	2129				219	3.1
1988	2281	32.3	2205				246	3.5
1989	2535	35.8	2404				236	3.3
1990	3506	47.9	3384				256	3.5
1991	3653	49.9	3462	1826	24.9	385	245	3.3
1992	3755	51.3	3401	1855	25.3	437	200	2.7
1993	3151	43.0	2784	1529	20.9	287	166	2.3
1994	2941	40.2	2433	1280	17.5	183	133	1.8
1995	2408	32.9	1996	1001	13.7	114	94	1.3
1996	2013	27.5	1693	873	11.9	84	67	0.9
1997	1705	23.3	1383	708	9.7	57	55	0.8
1998	1528	20.9	1232	611	8.3	38	52	0.7
1999	1436	19.6	1124	571	7.8	31	49	0.7
2000	1311	16.4	1043	516	6.4	24	44	0.5
2001	1232	15.4	938	454	5.7	24	33	0.4
2002	1071	13.4	819	436	5.4	29	30	0.4
2003	1132	14.1	865	428	5.3	22	34	0.4
2004	1036	12.9	793	395	4.9	19	31	0.4
2005	983	12.3	745	378	4.7	24	21	0.3
2006	947	11.8	705	354	4.4	23	18	0.2
2007	909	11.4	707	379	4.7	9	16	0.2
2008	886	11.1	685	339	4.2	11	18	0.2
2009	757	9.5	539	281	3.5	9	25	0.3
2010	705	8.6	511	265	3.2	11	26	0.3
2011	684	8.4	501	264	3.2	16	32	0.4
2012	652	8.0	495	271	3.3	19	15	0.2
2013	650	8.0	473	258	3.2	7	17	0.2
2014	582	7.1	454	243	3.0	10	31	0.4
2015	575	7.0	444	240	2.9	5	20	0.2
2016	556	6.8	448	225	2.8	11	21	0.2
2017	607	7.4	503	260	3.2	15	Not available	Not available
2018	559	6.8	426	224	2.7	12	Not available	Not available

1. Rates are based on decennial census data. 2. Multidrug-resistant (MDR) TB is defined as resistance to at least isoniazid and rifampin. 3. Data on TB deaths are obtained from the Health Department's Office of Vital Statistics. Deaths recorded in a given year may include cases diagnosed in a previous year.

TB REPORTING REQUIREMENTS

Medical, dental, osteopathic and other health care providers and administrators of hospitals or other institutions providing care and treatment, or their designees, including infection control practitioners, are required by the NYC Health Code §§11.03 and 11.05 to report all patients, alive or deceased, with suspected or confirmed TB disease to the New York City Health Department within 24 hours of diagnosis or clinical suspicion. Medical providers must report these patients even though microbiologists and pathologists are also required to report findings consistent with TB. Note that the reports must be submitted using the Universal Reporting Form (URF) and must be received by the Health Department within 24 hours of diagnosis or clinical suspicion, whether sent electronically, by express or overnight mail, by fax or by telephone.

HEALTH CARE PROVIDERS

Health care providers in NYC are encouraged to submit reports electronically through a NYCMED account. Alternatively, providers may fax a completed URF to BTBC at **844-713-0557**. Information reported on the URF should be as complete as possible. The following essential information must be included when the report is submitted to the Health Department:

- Information needed to identify and locate the individual (e.g., name, telephone, address, date of birth)
- Provider information (e.g., physician's name, reporting facility, phone number, email)
- Results of acid-fast bacilli (AFB) smear (including specimen source, date specimen obtained and accession number)
- Results of radiologic exams (X-ray or imaging)
- Any treatment information
- Quantitative and qualitative results from tuberculin skin test (TST) or blood-based interferon gamma release assay (IGRA) test for children younger than 5 years of age with latent TB infection

MICROBIOLOGY AND PATHOLOGY LABORATORIES

Laboratories are required to report via the NYS Electronic Clinical Laboratory Reporting System (ECLRS). Per the NYC Health Code sections §§13.03 and 13.05, the following results must be reported to the Health Department, whether confirmed or presumptive, for patients alive or deceased, within 24 hours of obtaining test results:

- AFB-positive smears (regardless of anatomic site)
- NAA test results and cultures positive for *M. tuberculosis* complex
- Results of susceptibility tests performed on *M. tuberculosis* complex cultures
- Biopsy, pathology or autopsy findings consistent with TB disease, including but not limited to presence of AFB on smear and caseating and/or necrotizing granulomas that are consistent with TB in the lung, lymph nodes or other specimens
- Any culture or NAA result associated with an AFB-positive smear (even if negative for *M. tuberculosis* complex)
- For patients with a positive TB diagnostic laboratory result, all subsequent TB diagnostic laboratory results (negative or positive) from specimens collected within one year of the most recent positive result

›› Health Code §13.05(a) also mandates that a portion of the initial culture be sent for DNA analysis to the NYC Public Health Laboratory (455 First Avenue, Room 236; New York, NY 10016) within 24 hours of observing growth of *M. tuberculosis* complex in a culture from any specimen. A specimen submitted to the Health Department for drug susceptibility testing meets this requirement unless the Health Department notifies otherwise.

► **Reporting should never be delayed pending identification of *M. tuberculosis* with an NAA test or culture. Patients should be reported whenever TB is suspected, even if bacteriologic evidence of disease is lacking or treatment has not been initiated. If TB treatment is initiated after submitting the initial disease report, the provider is required to submit a corrected report.**

REPORTING PATIENT FOLLOW-UP

Health Code §11.21(a)(3) requires the treating physician to report whether the patient completed treatment and the patient's treatment outcome (i.e., cured, failed, relapsed, lost, moved, refused), or whether treatment was discontinued if the patient was found not to have TB or for another reason. Physicians must assist the Health Department with evaluation and follow-up for persons suspected of having TB. Case managers contact the treating physicians to request updates and ensure that appropriate treatment and monitoring are being conducted. Health care providers must provide access to necessary paper and electronic medical records to authorized Health Department staff as requested. [Health Code §11.03(e)]

Additionally, as per Health Code §11.21(a)(1), the treating physicians or persons in charge of facilities must submit monthly clinical status reports for patients with TB disease, which must include at least:

- Name, address and telephone number(s) of the patient
- Whether treatment is still ongoing
- The clinical status and treatment being provided
- Dates and results of sputum and X-ray exams
- Any other information required by the Health Department

To facilitate mandatory monthly patient status reports, the Health Department created the "Report of Patient Services" form (TB 65). This form, or a report containing the same information, must be submitted to the patient's case manager.

Per Health Code §11.21(b), when requested by the Health Department, medical providers are also required to report all information on the evaluation, testing and treatment of individuals who have been in contact with a person with TB disease.

SUBMITTING HOSPITAL DISCHARGE AND TB TREATMENT PLANS

Health Code §11.21(a)(4) requires health care providers to submit a discharge plan to the Health Department for review and approval prior to discharging infectious TB patients from the hospital. The Hospital Discharge Approval Request Form (TB354) must be submitted 72 hours before the planned discharge date and must be approved by the Health Department prior to discharge.

For more information and to download related forms, call 311 and ask for the BTBC Surveillance Unit or visit nyc.gov and search for TB reporting requirements. To download a URF, search for URF. To create a NYCMED account, search for NYCMED. To download forms related to hospital discharge plans and reporting patient services, search for TB reporting requirements.

IT IS MANDATORY TO REPORT PATIENTS WHO MEET ANY OF THE FOLLOWING CRITERIA:

- Positive NAA test result (e.g., Gen-Probe® Amplified™ *Mycobacterium Tuberculosis* [MTD] test, Cepheid XPert® MTB/RIF, Hain Lifescience GenoType MTBDRplus, Hain Lifescience GenoType MTBDRsl) for *M. tuberculosis* complex
- Positive culture for *M. tuberculosis* complex, including: *M. tuberculosis, M. africanum, M. bovis-BCG, M. caprae, M. canetti, M. microti, M. pinnipedii, M. bovis, M. dassie, M. mungi, M. orygis*
- Biopsy, pathology or autopsy findings consistent with TB disease, including caseating or necrotizing granulomas in biopsy of lung, lymph nodes or other specimens
- Positive smear (from any anatomical site) for AFB
- Clinical suspicion of pulmonary or extrapulmonary TB such that the health care provider has initiated or intends to initiate isolation or treatment for TB disease with two or more anti-TB medications
- Any child younger than 5 years of age (on the day of test administration up to the day of the fifth birthday), with a positive TST or IGRA result, regardless of whether the child has received a bacille Calmette-Guerin (BCG) vaccination. For these patients, providers must also report chest imaging results and any preventive medication initiated for latent TB infection.

TUBERCULOSIS REPORTING DATA

Health care providers and laboratories are required to report all patients with confirmed TB disease, anyone suspected of having TB disease, and children younger than 5 years of age with a positive test for TB infection (e.g., tuberculin skin test or blood-based test) to the Health Department. Universal TB reporting facilitates rapid case identification and case management activities and enables BTBC staff to ensure appropriate TB evaluation and treatment completion, detect and respond to TB outbreaks, identify high-risk groups and identify data quality and reporting issues.

FIGURE 24: Initial reporter of confirmed tuberculosis cases verified in 2018 by reporter type, New York City

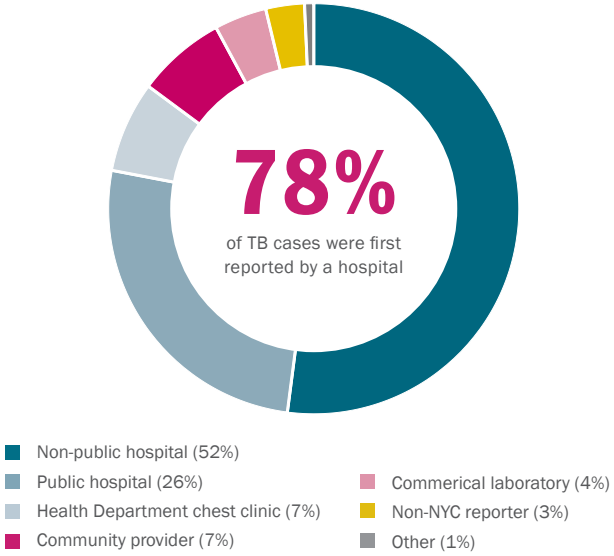


TABLE 13: Most common non-laboratory reporting facilities by number of confirmed tuberculosis cases reported, 2018

Facility	Number of cases
NYC Health+Hospitals/Bellevue	36
NYC Health+Hospitals/Elmhurst	35
Maimonides Medical Center	27
New York Presbyterian Queens	27
NYC Health+Hospitals/Kings County	22
Mount Sinai Hospital	21
New York Univeristy (NYU) Lutheran Medical Center	20
Flushing Chest Medical Associates	16
New York City Health Department Fort Greene chest clinic	16
Long Island Jewish Medical Center	15
NYU Langone Medical Center–Tisch Hospital	14

94 Number of facilities that reported at least one TB case in 2018

21 Number of facilities that reported at least one child younger than 5 years of age with LTBI in 2018

45% Proportion of children younger than 5 years of age with LTBI first reported by a laboratory

REPORTING FOR CHILDREN YOUNGER THAN FIVE YEARS OF AGE WITH LTBI

FIGURE 25: Children younger than 5 years of age reported to the Health Department with a positive test for tuberculosis infection[1] result by reporter type, New York City, 2014-2018

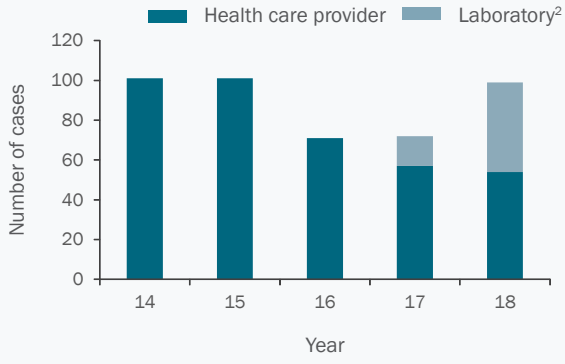


TABLE 14: Select characteristics of children younger than five years of age with a positive test for tuberculosis infection[1] result reported to the New York City Health Department, 2018 (n=99)

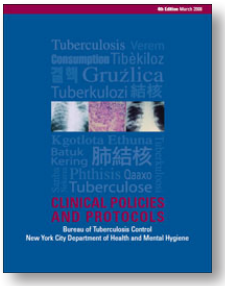
Patient characteristics	n
Median patient age (range)	3 (0-5)[3]
Received a QuantiFERON® test (%)	65 (66%)
Received a tuberculin skin test (%)	54 (55%)
Initiated treatment (%)	64 (65%)

1. Includes tuberculin skin tests, QuantiFERON®-TB Gold tests and T-Spot. TB tests 2. Laboratory reporting was added to the Health Code in 2017. 3. One child was 4 years of age at time of testing but not reported until after their fifth birthday.

RESOURCES FOR PROVIDERS AND THE PUBLIC

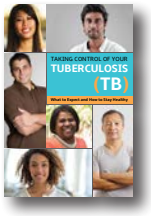
The Health Department offers a selection of culturally, technically and linguistically tailored TB education materials and other resources for patients, the general public and health care providers. To access materials, policy updates, and other information about TB and TB services in NYC, visit **nyc.gov/health** and search for **tuberculosis** or call **311**.

CLINICAL POLICIES AND PROTOCOLS



4th Edition. Describes policies, protocols and recommendations for the prevention, treatment and management of TB. The 5th Edition will be available in 2019.

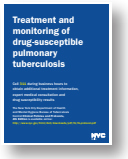
PATIENT BROCHURE



Taking Control of Your Tuberculosis (TB): What to Expect and How to Stay Healthy

General information for patients starting treatment for latent TB infection or active TB disease. Available in 18 languages.

POCKET-SIZED REFERENCE GUIDE FOR PROVIDERS



Treatment and monitoring of drug-susceptible pulmonary tuberculosis

Provides concise information about treatment and monitoring for pulmonary TB.

"YOU CAN STOP TB" EDUCATIONAL POSTERS

Provides basic TB information and includes illustrations with captions. Available in English, Spanish, French, Haitian Creole, Hindu, Urdu, Bengali, Tibetan, Tagalog and Chinese; available in hard copy or digital formats.

"GET TESTED"/"GET TREATED" POSTERS

These 11x17 posters highlight the benefits of TB testing and encourage evaluation and treatment for symptoms of TB disease. These posters are only available in Chinese.

NYC HEALTH EPI DATA BRIEFS

Epi Data Briefs are short publications that highlight data from Health Department programs and projects. For more information and to access recently published reports, visit **nyc.gov/health** and search for **epi data**.

For updates on TB related research, guidelines and events, please sign up for our TB newsletter, ***TB ACTION NEWS****, by emailing* ***TBoutreach@health.nyc.gov****.*

NEW YORK CITY INTERACTIVE HEALTH DATA IS AVAILABLE ONLINE

EPIQUERY is an interactive, user-friendly system designed to guide users through basic data analyses. Reported TB cases and case rates are available by select demographic and geographic characteristics. On a citywide level, select characteristics that are important to TB epidemiology are also available, including country of birth and HIV infection. To access TB EpiQuery, visit: **a816-healthpsi.nyc.gov/epiquery/**

NEW YORK CITY NEIGHBORHOOD HEALTH ATLAS provides data on about 100 measures related to social factors and health, including TB, for 188 neighborhoods. The data provide a comprehensive and granular view of neighborhood health and its potential determinants, serving as a useful resource for the promotion of health and health equity in our neighborhoods, visit **nyc.gov/health** and search for **health atlas**.

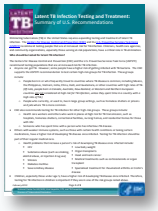
›› ADDRESSING LATENT TB INFECTION IN NYC

Effective TB prevention depends on the timely and appropriate identification and treatment of latent TB infection in high priority groups. The New York City Health Department encourages screening, medical evaluation and treatment for latent TB infection among eligible patients using the latest diagnostic tools and treatment regimens. A variety of resources related to testing and treatment for latent TB infection have been developed locally and nationally for health care providers, patients and the public.

NYC PATIENT TB RISK ASSESSMENT TOOL

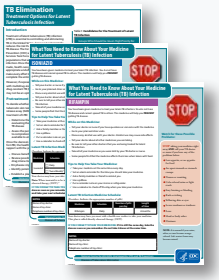
This tool is designed to help health care providers identify asymptomatic individuals at higher risk for TB who should receive a test for TB infection. For more information, please email TB training@health.nyc.gov

CDC GUIDELINES AND THE U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION FOR TB TESTING



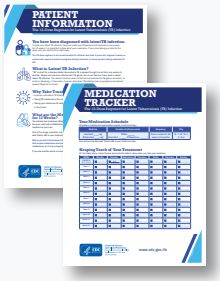
Testing for latent TB infection among adults at increased risk for TB is recommended by the United States Preventive Services Task Force (USPSTF) guidelines at a Grade B level. CDC also recommends TB testing for people at high risk for TB infection. For more information, please visit cdc.gov/tb and uspreventiveservicestaskforce.org

CDC FACT SHEETS FOR SPECIFIC LATENT TB INFECTION TREATMENT REGIMENS



These fact sheets were developed for clinicians to use with patients while discussing options for latent TB infection treatment regimens. Includes tips to help patients take medicine, medicine schedules and information about potential side effects.

CDC PATIENT BROCHURE, MEDICATION TRACKER AND SYMPTOM CHECKLIST FOR 12-DOSE LATENT TB INFECTION TREATMENT REGIMEN



These materials were developed for clinicians to use with patients while discussing the 12-dose regimen for the treatment of latent TB infection. The brochure contains general information on latent TB infection, the 12-dose regimen, and adverse events. The medication tracker includes space to write treatment schedules, medication intake, and clinic contact information and a checklist of signs and symptoms that may develop while using this regimen. Available in English, Spanish, Tagalog and Vietnamese.

NTCA PROVIDER GUIDANCE FOR 12-DOSE LTBI TREATMENT REGIMEN

Using the Isoniazid/Rifapentine Regimen to Treat Latent Tuberculosis Infection (LTBI): A Concise Guide to Best Practices across the United States

This guide was designed for use by clinical providers and includes best practices and evidence-based knowledge about the 12-dose treatment regimen for latent TB infection from TB experts across the U.S. For more information, please visit tbcontrollers.org/resources/3hp/

*For more information and additional resources related to latent TB infection, please visit **nyc.gov/health** and search for **tuberculosis** or visit **www.cdc.gov/tb/publications/ltbi/ltbiresources.htm***

TECHNICAL NOTES

- Data for 2018 are preliminary and reflect the most complete information available as of January 14, 2019.
- Data prior to 2018 have been updated since the release of the 2017 report. Data for these years reflect the final numbers and may differ from official estimates presented in previous reports.
- TB became a reportable disease on January 19, 1897. From 1920-1940, only cases of pulmonary TB were reportable. Beginning in 1978 the TB case definition was amended to consider people who had verified TB disease 12 or more months before their current diagnosis as incident cases of TB disease.
- Data on patient sex is currently collected and categorized as Male, Female, and Transgender. In future reports, more expansive categories of gender identity will be presented to reflect changes in data collection.
- Age groupings have been changed from previous reports; as a result, count data for earlier years may differ from previous reports.
- In all tables presenting data by birth in the U.S, column sums may not equal applicable totals due to missing or unknown data.
- In all tables where data is presented by geography, column sums may not equal applicable totals due to missing or unknown data.
- Reported rates for earlier years may differ from previous reports due to corrected data and changes in the denominators used to calculate rates. The sources of denominator data are indicated throughout the report.
- The Health Department calculates population estimates based on modified U.S. Census Bureau interpolated intercensal estimates. Data are modified to account for population undercounts in northwest Queens and southern Brooklyn because of erroneously deleted housing units and housing units mislabeled as vacant. Population estimates are updated as new data become available. Therefore, rates may differ from previously reported rates.
- U.S.-born refers to patients born in the 50 states, District of Columbia or other U.S. territories and outlying areas, including American Samoa, Baker Island, Guam, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Midway Island, Navassa Island, Northern Mariana Islands, Palmyra Atoll, Puerto Rico, U.S. Minor Outlying Islands, U.S. Pacific Islands, Virgin Islands and Wake Island. All others with a known country of birth are considered non-U.S.-born.
- Area-based poverty is defined using patients' ZIP code of residence at the time of TB diagnosis. Poverty level by ZIP code is based on the most recent American Community Survey five-year sample data on the proportion of census tract residents living below the federal poverty level. Patients with addresses outside of NYC, addresses unable to be geocoded to a ZIP code or located in ZIP codes where poverty level could not be determined were not assigned to a poverty level.
- The definition of excessive alcohol use has been changed from previous reports. The current definition of excessive alcohol use, used in this report, is based on national definitions of binge drinking and heavy alcohol use from the Substance Abuse and Mental Health Services Administration.
- The geographic distribution of cases is presented by the 42 United Hospital Fund neighborhoods. These neighborhoods consist of adjoining ZIP codes that approximate NYC Community Planning Districts and contain an average of 200,000 individuals.
- Data presented on HIV status reflect information as collected by BTBC. Misclassification of HIV status may occur if a patient refused to disclose known status and/or refused to be tested for HIV while under care for TB disease.
- Data on TB deaths are obtained from the NYC Office of Vital Statistics. Deaths recorded in a given year may include cases diagnosed in a previous year.
- Product names are provided for identification purposes only; their use does not imply endorsement by the Health Department.

NEW YORK CITY HEALTH DEPARTMENT CHEST CLINICS

Eligible patients can be referred to one of four Health Department chest clinics located throughout NYC for TB testing, radiography, sputum induction and treatment as needed. All chest clinic services, including medication, are provided at no cost to the patient and regardless of immigration status or insurance status.

WASHINGTON HEIGHTS

600 W. 168th St.,
Third Floor
New York, NY 10032
212-368-4500

MORRISANIA

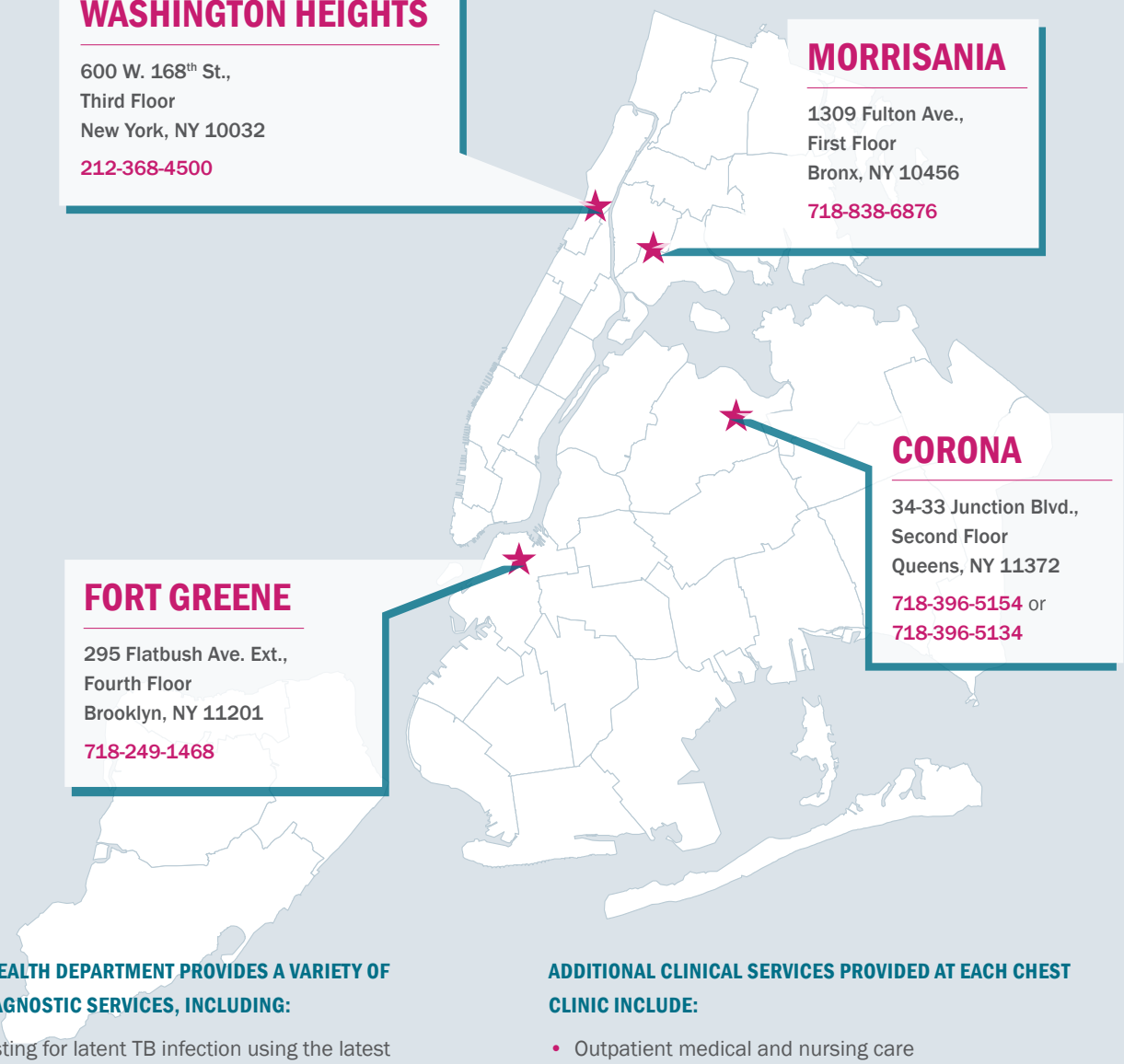
1309 Fulton Ave.,
First Floor
Bronx, NY 10456
718-838-6876

CORONA

34-33 Junction Blvd.,
Second Floor
Queens, NY 11372
718-396-5154 or
718-396-5134

FORT GREENE

295 Flatbush Ave. Ext.,
Fourth Floor
Brooklyn, NY 11201
718-249-1468



THE HEALTH DEPARTMENT PROVIDES A VARIETY OF TB DIAGNOSTIC SERVICES, INCLUDING:

- Testing for latent TB infection using the latest generation blood-based QuantiFERON®-TB Gold test and tuberculin skin tests
- Sputum induction
- Chest radiographs
- Medical evaluation
- Treatment for TB disease and latent TB infection
- DOT services, including vDOT

ADDITIONAL CLINICAL SERVICES PROVIDED AT EACH CHEST CLINIC INCLUDE:

- Outpatient medical and nursing care
- Phlebotomy services
- Social services referrals
- HIV education and testing regardless of person's need for TB care
- TB evaluation for newly arrived immigrants and refugees referred by the CDC

TO MAKE AN APPOINTMENT OR TO REFER A PATIENT, CALL THE INDIVIDUAL CHEST CLINIC OR CALL 311

NYC Health