



New York City
Department of Health and Mental Hygiene



Annual Tuberculosis Summary **2023**

Mission: The New York City (NYC) Department of Health and Mental Hygiene (Health Department) aims to prevent the transmission of tuberculosis (TB) and eliminate it as a public health problem in NYC.

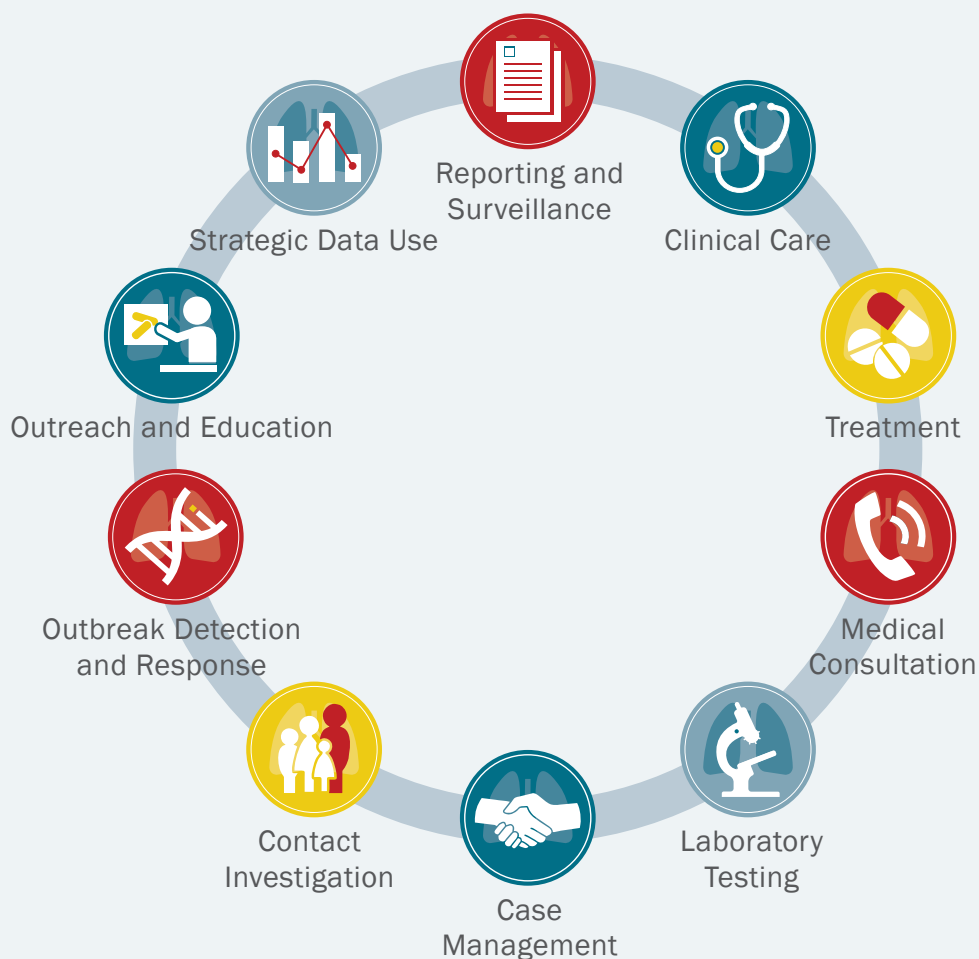
Goals

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

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

Core Activities

To fulfill its mission and goals, the Health Department collaborates with health care providers, laboratories, community partners, City and state agencies, and others to ensure effective TB care and prevention in NYC through an integrated, dynamic model of core activities and services.



About This Report

This report provides TB surveillance data and summaries of core Health Department TB program activities for calendar year 2023. These data reflect the most complete information available as of January 16, 2024. For additional details on the use of population data and definitions in this report, see the Technical Notes (Page 36).

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Tuberculosis in NYC, 2023



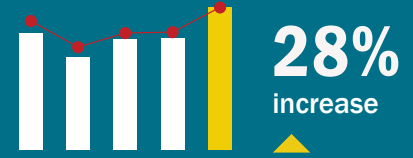
There were **684** confirmed tuberculosis (TB) cases identified in New York City (NYC) in 2023, an increase of 28% from 2022. This represents the highest number of cases confirmed in NYC since 2011.

684

Number of TB cases confirmed

7.8

TB rate per 100,000 people



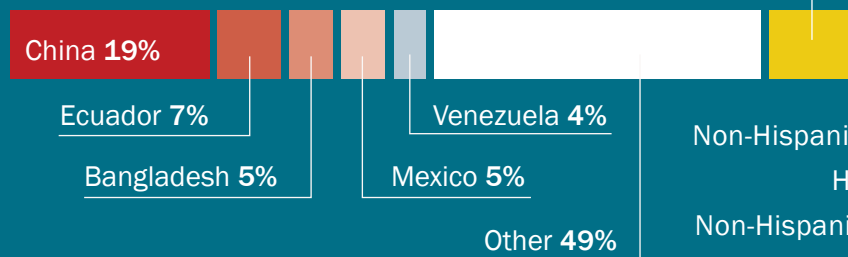
68

Number of countries of birth represented among people with TB

89%

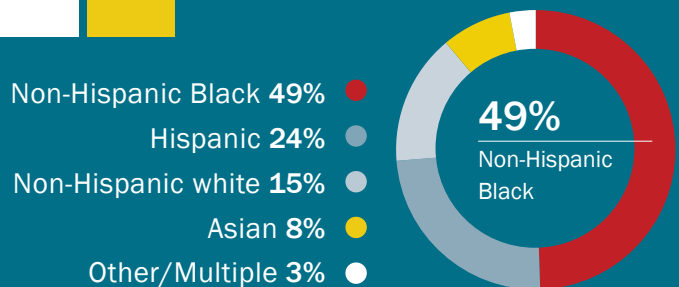
Percentage of TB cases among people born outside the U.S.

Most common country of birth among people with TB:



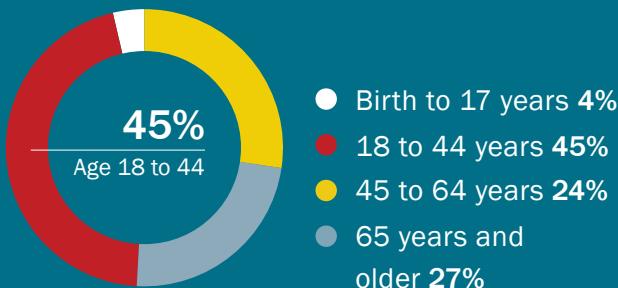
U.S. **11%**

Race and ethnicity among people born in the U.S.¹:



1. Does not include people of multiple, other or unknown races or ethnicities.

Age in years among people with TB:



13

Number of people diagnosed with a multidrug-resistant (MDR) TB³ strain



13%

Percentage of TB cases among people with history of homelessness⁴

19

Number of NYC neighborhoods⁵ with a TB rate higher than the 2023 citywide rate⁶

TB cases by gender²:



2. People for whom gender identity was listed only as transgender are excluded from this figure.

3. Defined as resistance to at least isoniazid and rifampin. One person was diagnosed with extensively drug-resistant (XDR) TB in 2023, defined as resistance to at least isoniazid and rifampin plus a fluoroquinolone and either a second-line injectable anti-TB medication, bedaquiline or linezolid. 4. In the 12 months before TB diagnosis. 5. Defined by United Hospital Fund neighborhood designation (42). 6. Rates are per 100,000.

Dear Colleagues,

Each year, we use World TB Day and the release of our Annual TB Summary as an opportunity to reflect on the challenges faced, strategies implemented and progress made in our fight against TB.

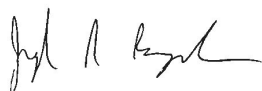
In 2023, there were 684 confirmed cases of active TB disease in NYC, representing a 28% increase compared with 2022 and the highest number of cases since 2011. Increases were seen among various populations, including young children, people with a history of homelessness, people born in the U.S. and people born in another country. Among those with TB, there was an increase in patients with a drug-resistant strain, including strains resistant to rifampin. These increases serve as both a sobering reminder of the impact of this devastating disease and a galvanizing call to action.

This year we continued to face a number of challenges, including global shortages of key TB medications, an influx of people from countries with a high burden of TB and the resonating impact of the COVID-19 pandemic. The upward trend in TB cases in NYC is consistent with an overall rise in the number of cases nationally, and we must be prepared — globally, nationally and locally — to redouble our efforts through innovation, collaboration and intensified investment.

In 2023, the NYC Health Department continued to pioneer advancements in TB care and treatment. We worked closely with other agencies, health care providers and community-based organizations to expand access to TB testing, treatment and care. Our core public health infrastructure enabled us to quickly detect and respond to TB cases, interrupt TB transmission and ensure access to state-of-the-art TB services, including video directly observed therapy (vDOT), telehealth and new treatment options. Improvements in laboratory methods allowed us to identify drug resistance more quickly, while new medications have greatly improved the treatment of drug-resistant TB, allowing for shorter and better-tolerated treatment regimens. In response to the rise in cases, we are increasing our capacity to provide TB services and are strengthening collaborations to detect, treat and prevent TB.

Together, we can again bring TB rates to record lows and change the trajectory of TB in NYC. Together, we can end TB.

Sincerely,



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

Core Activities

Core Activities

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

The Health Department performs a variety of integrated activities to address and prevent TB disease. These include surveillance, clinical care and treatment, medical consultation, case management, directly observed therapy (DOT), contact investigation, coordination of laboratory tests, outbreak detection and response, outreach and education, program evaluation, and research. These activities support effective, patient-centered TB care, response and prevention in NYC.

Surveillance and Reporting

Health care providers and laboratories are required to report to the 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
4. Results of any blood-based test for TB infection, regardless of patient age (laboratories only)

Medical providers in NYC must report these patients even though pathologists and microbiologists are also required to report findings consistent with TB. 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, fax or telephone.



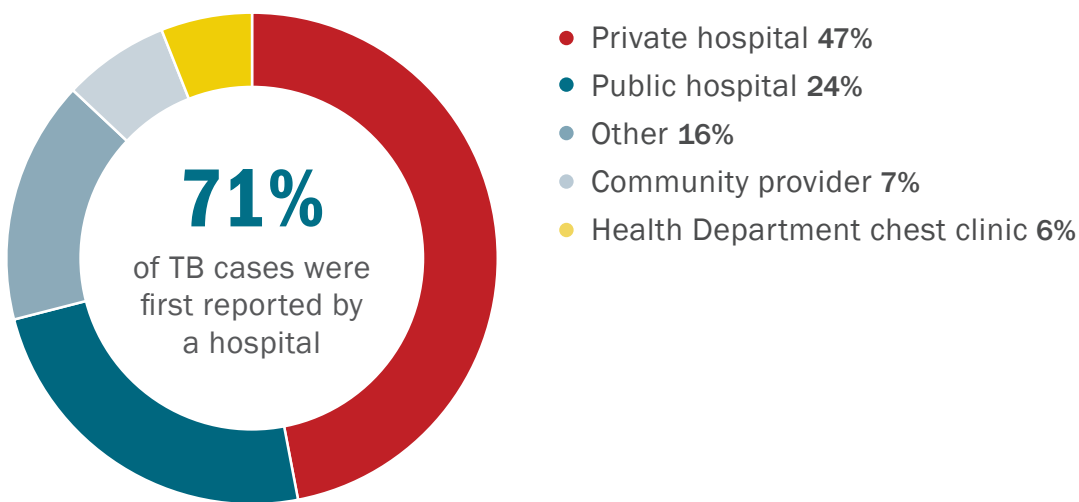
*For more information about TB reporting requirements in NYC and to download related forms, visit [nyc.gov](https://www.nyc.gov) and search for **TB reporting requirements**. To download a URF, visit [nyc.gov](https://www.nyc.gov) and search for **URF**. For assistance, call **311** and ask for the Health Department Bureau of Tuberculosis Control Surveillance Unit.*

The Health Department reviews all submitted reports for completeness and timeliness and determines whether patients are eligible for case management. The Health Department maintains an electronic TB surveillance registry and case management system (Maven version 6.3.1, Conduent Public Health Solutions, Florham Park, NJ) that has information for all reported patients and individuals exposed to TB. These data are used to conduct case management; ensure treatment completion; monitor trends; detect 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 reporting and data quality issues; and inform programmatic decision-making.

TB Surveillance and Reporting in 2023:

- **684** TB cases were confirmed by the Health Department.
- **3,019** people with suspected TB disease were reported to the Health Department.
- **112** children younger than 5 years of age with TB infection were reported to the Health Department.
- **105** facilities reported at least one TB case; nearly half of all cases were reported by one of 13 facilities.

Figure 1: Initial reporter of confirmed TB cases verified in NYC by reporter type, 2023



Clinical Care and Treatment

The Health Department is a leading provider of TB care in NYC. TB services are available at three Health Department chest clinics located in the Bronx, Brooklyn and Queens. Physicians working at the chest clinics are specialists in internal, preventive and pulmonary medicine, and infectious disease.

The Health Department provides TB diagnostic services, including testing for TB infection (using blood-based QuantiFERON-TB Gold Plus [QFT-Plus] test and tuberculin skin test [TST]); sputum induction; laboratory tests; medical evaluation and chest radiographs; treatment for TB disease and LTBI; and DOT for patients of all ages. Most patients evaluated and treated at Health Department chest clinics are referred by NYC health care providers, other health departments or social service providers. Health Department staff also refer patients to other medical professionals for further evaluation and treatment of non-TB related conditions.

Obtaining medications with limited availability for the treatment of multidrug-resistant (MDR) TB: Health Department staff can assist with obtaining certain medications that are available under limited circumstances, including pretomanid, bedaquiline, clofazimine and delamanid. Clofazimine and delamanid require the submission of a Single Patient Investigational New Drug application to the Food and Drug Administration (FDA) and to the Health Department's Institutional Review Board for approval.



*For more information about these drugs or for help obtaining them, call the **TB Provider Hotline** at **844-713-0559**.*

HIV testing services: Health Department staff provide opt-out rapid HIV testing services to every eligible patient at Health Department chest clinics and refer patients who have HIV infection to health care providers who specialize in HIV care. The Health Department offers rapid HIV testing to contacts in household settings. Anonymous HIV testing services are available at all chest clinics independent of need for TB services.

Evaluation of refugees and immigrants applying for permanent status: People who are 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 a clinical diagnosis 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.

The CDC notifies local jurisdictions of any immigrants and refugees who have been deemed at risk of having TB but have been cleared for travel to that U.S. jurisdiction. The local jurisdiction then reaches out to the individual to schedule an initial evaluation for TB in the U.S. (within 30 days, as recommended by the CDC), and the clinical team endeavors to complete domestic evaluations within 120 days. The majority of these individuals come to a Health Department chest clinic for evaluation after arriving in NYC.

TB Clinical Care and Treatment in 2023:

- **325** (48%) patients confirmed with TB disease in 2023 received care at a Health Department chest clinic.
- **25** patients with an MDR TB strain received treatment, care and case management through the Health Department, including **13** patients newly diagnosed with an MDR TB strain in NYC and **3** patients initially confirmed with TB outside NYC.
 - **23** patients received bedaquiline; **1** patient received clofazimine.
- **1,646** immigrants and refugees arriving in NYC with a Class B designation were notified to the Health Department; **1,611** (98%) were eligible for evaluation; **915** (57%) were evaluated as of January 30, 2024.

Medical Consultation

Health Department TB medical consultants are physicians with many years of experience treating TB disease and LTBI. They provide expert consultation to community providers and others regarding TB diagnosis; hospital discharge planning; TB treatment (including treatment of MDR TB, management of adverse reactions to TB drugs and treatment completion); contact investigation; infection control; and other TB-related public health concerns.

Recommendations are based on these physicians' professional experience and Health Department policies, which are informed by guidelines from the CDC, American Thoracic Society (ATS), Infectious Diseases Society of America (IDSA), National TB Coalition of America (NTCA) and the World Health Organization (WHO). TB medical consultants also conduct TB rounds and give medical talks throughout NYC.



To get expert medical consultation about TB and LTBI, call the **TB Provider Hotline** at **844-713-0559**.

Case Management

The Health Department provides case management activities for NYC residents diagnosed with or suspected of having TB disease and their contacts, regardless of where the patient receives their TB care.

Case management includes patient interviews, TB education, chart reviews, contact investigation, DOT and coordination with community providers to ensure optimal TB treatment and care. Health Department staff conduct home assessments to identify contacts and to determine whether patients with infectious TB can be discharged from the hospital. Health Department staff also coordinate with colleagues in other jurisdictions to ensure continuity of care for patients with confirmed TB disease and contacts who work or live outside NYC. Case managers perform monthly monitoring for treatment adherence and locate patients who have significant lapses in medical appointments or medication and help them return to medical supervision.

DOT: DOT is the standard of care for patients with suspected or confirmed TB disease in NYC, regardless of where they receive TB care. During DOT, a health care worker observes a patient ingesting their anti-TB medications. The Health Department provides face-to-face 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 facilitates continuity of DOT outside traditional business hours and when patients travel. DOT is also available through NYC Health + Hospitals Elmhurst, Kings County and Bellevue facilities.



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

Contact investigation: The Health Department conducts TB contact investigations in households, congregate settings (for example, worksites and schools) and other site types. During contact investigations, Health Department staff identify and evaluate individuals who were exposed to patients with infectious TB, ensure appropriate treatment for contacts diagnosed with TB disease or LTBI, determine whether transmission occurred and assess whether testing of additional contacts or other intervention is needed. When TB exposures occur in health care facilities, epidemiologists at the Health Department provide technical guidance and assist with contact investigation at the site as needed.

Social service referrals: Health Department staff identify and address obstacles to care and unmet social service needs among patients and their families whenever possible. These include concerns about finances, housing, food security, employment, school, health insurance eligibility, access to health care services, immigration status, language barriers, drug and alcohol use, and mental health issues. Patients are referred to a social worker who facilitates referrals to social service resources.

Regulatory action: The Health Department has authority under the NYC Health Code to require TB evaluation, DOT or involuntary hospitalization for patients with infectious TB who are not adherent to evaluation, isolation or treatment recommendations and for patients who pose a public health risk.

TB Case Management in 2023:

- **2,644** patients received case management services, including **684** patients with newly confirmed TB disease, **1,499** patients with suspected TB disease, **351** patients with TB diagnosed before 2023 and **110** patients with TB initially confirmed outside NYC.
- **429** eligible patients with confirmed TB disease were enrolled in DOT through the Health Department or another health care provider; **47** were enrolled exclusively in face-to-face DOT and **382** received some or all observations through vDOT.
- **1,911** contacts were identified for **451** patients who were potentially infectious; **1,031** (54%) were evaluated as of January 25, 2024, and **265** (26%) had a new positive TB test result.

Drug Susceptibility Testing and Whole Genome Sequencing

The NYC Health Code mandates that a portion of the initial isolate from all patients with culture-positive TB be sent for drug susceptibility testing (DST) and whole genome sequencing (WGS), performed at local, state and national public health laboratories.

DST: DST identifies drug resistance in 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 are also used routinely at PHL, hospitals, commercial laboratories and other public health reference laboratories. These tests rapidly confirm the presence of *Mycobacterium tuberculosis* (*M. tuberculosis*) complex and can provide

information about the presence of mutations in specific genes that are known to predict drug resistance, enabling earlier treatment of MDR TB and decreasing the amount of time the patient is infectious.

Universal WGS: In NYC, WGS enables identification of the *M. tuberculosis* complex and species within it; detection of genetic mutations associated with drug resistance; and analysis of single nucleotide polymorphisms to characterize and compare TB strains. The Health Department collaborates with the NYSDOH Wadsworth Center, PHL and CDC to conduct WGS for all patients with a positive culture for *M. tuberculosis*.

NYS currently reports 19 mutations associated with resistance to 10 TB drugs. WGS also helps the Health Department identify false positive laboratory results, assess TB transmission and detect outbreaks. Possible instances of contamination and potential false positive results are promptly and systematically investigated to ensure patients are not placed on anti-TB medications unnecessarily. Cases among patients with similar TB strains are investigated to identify and interrupt TB transmission.

TB Drug Susceptibility Testing and Whole Genome Sequencing in 2023:

- **539** out of **563** culture-confirmed TB cases had phenotypic DST results available (96%); among culture-confirmed cases, molecular DST results were available for **558** (99%) cases.
- **524** (93%) culture-confirmed TB cases had WGS results available.
- **16** instances of potential false positive laboratory results were investigated; **7** (44%) investigations confirmed a false positive result.

Outreach and Education

The Health Department engages diverse stakeholders to advance efforts to detect, treat and prevent TB throughout NYC. Educational materials developed by the Health Department, the CDC and others are used to supplement staff training, which is delivered by experts from the Health Department and at the Global TB Institute (GTBI) at Rutgers.

Health care providers: The Health Department conducts outreach to and collaborates with health care providers and public health professionals throughout NYC, particularly those serving in high TB burden neighborhoods. Health Department experts discuss TB epidemiology, screening, testing, diagnosis and treatment through medical talks, case management conferences and webinars. Health Department staff also provide clinical

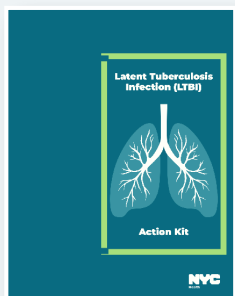
consultation for health care providers across NYC. The Health Department co-sponsors an annual medical conference in honor of World TB Day for health care providers and other colleagues. Quarterly trainings on tuberculin skin testing are offered to physicians and nurses from various organizations. In addition, Health Department staff regularly meet with colleagues locally, nationally and internationally on matters related to TB policy and practice.

Community partners: Communities with a high burden of TB are engaged as partners in efforts to increase TB knowledge and inform TB care-seeking behavior. In partnership with elected officials, community-based groups and others, the Health Department delivers culturally and linguistically appropriate educational messaging through community events and print and electronic media. Community partners also support TB screening and testing efforts at health fairs and other testing events.

The Health Department also co-chairs the Coalition for a TB-Free NYC. The Coalition meets on a quarterly basis to promote collaboration with partners to develop and implement strategies that will lead to the prevention and elimination of TB in NYC. These partners include TB patients and survivors, health care providers, government and nongovernmental organizations, advocacy groups, schools of public health, educational organizations, policy groups and community engagement groups.



For more information about TB community events and conferences and to sign up for our TB newsletter, **TB Action News**, email tboutreach@health.nyc.gov.



> **LTBI Action Kit:** In 2023, the Health Department launched an LTBI Action Kit promoting evidence-based best practices for the diagnosis and treatment of LTBI. In conjunction with this launch, Health Department staff educated more than 370 community health care providers in high TB burden and TRIE (Taskforce on Racial Inclusion and Equity) neighborhoods.

The toolkit contains provider- and patient-oriented resources to help support identification, testing and treatment of LTBI. To access the kit, visit nyc.gov/health and search for **LTBI Action Kit**.

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

Outreach and Education in 2023:

- The Health Department tested **1,340** people for TB infection during **24** community health events conducted in collaboration with community partners. Individuals with positive test results and those with TB symptoms were connected to care in Health Department chest clinics and community health care settings.
- The Health Department tested **3,232** people for TB infection in **65** shelter settings in partnership with City and state agencies, social service agencies and clinical service providers. People with positive test results and those with TB symptoms were connected to care in Health Department chest clinics, public hospitals and community health care settings.
- Health Department staff partnered with colleagues in top TB reporting facilities to conduct Grand Rounds presentations across NYC.
- The Health Department hosted **4** meetings of the TB Coalition and launched a multidisciplinary workgroup to discuss and address emergent clinical and care access challenges among populations with high TB risk.
- The Health Department partnered with the Stop TB Partnership to host a United Nations High-Level TB Meeting Watch Party for community stakeholders and others, including TB survivors and advocates.

> Ongoing TB detection, care and prevention among newly arrived New Yorkers:

Since Spring 2022, NYC has experienced a sustained influx of individuals arriving from other parts of the world, including individuals migrating through the U.S. southern border, individuals arriving in conjunction with humanitarian parole programs and individuals arriving with an overseas TB classification. Throughout 2023, the Health Department continued to partner with health care providers, City and NYS agencies, social service providers and community-based organizations to enhance and expand access to TB testing, evaluation, treatment and care for these groups and to coordinate referrals to medical care and other resources.

Funding and Administration

The Health Department receives City, state and federal funding for TB care and control. These funds support all TB prevention and control activities, from hiring staff to operating Health Department chest clinics. Staff ensure that funds are allocated, monitored and utilized efficiently.

Research

Health Department staff actively participate in research, including epidemiologic studies, implementation science and clinical research. This includes collaboration with the CDC TB Trials Consortium, which conducts national and international studies to support the development of TB treatment regimens. Health Department staff also participate in professional organizations and TB advisory groups.

Conferences: NYC TB data and staff expertise are shared at meetings locally, nationally and internationally. In 2023, these included: the National TB Coalition of America (NTCA) Annual Conference; TB Medical Consultants Meeting; NYC Annual World TB Day Conference; Conference of The Union North America Region; Council of State and Territorial Epidemiologists (CSTE) Conference; American Public Health Association Conference; CDC TB Trials Consortium (TBTC) Meeting; Mailman School of Public Health NYC Epi Forum.

Advisory groups: TB program staff participated in the following groups in 2023: Advisory Council for the Elimination of TB; CDC/IDSA/ATS National MDR TB Guidelines Writing Committee; CDC TB Education and Training Network; CDC TB Program Evaluation Network; CDC TB Outbreak Detection Workgroup; CDC TBTC; CSTE; Maven Users Group; NTCA Board of Directors; NTCA LTBI Reporting Workgroup; NTCA National Society of TB Clinicians; NTCA Society for Epidemiology in TB Control; NTCA Survey Committee; International Union Against TB and Lung Disease TB Contact Studies Consortium



Publications in peer-reviewed journals by Health Department TB program staff, 2023: For a complete list of staff publications from 2023, please scan the QR code to the left.

Program Evaluation

The Health Department uses local, state and national performance indicators to assess program impact. These indicators inform planning and policy decisions and help identify

programmatic issues and areas for improvement. Performance indicators and targets are developed in coordination with Health Department partners and funders, including the CDC, NYSDOH and the NYC Mayor’s Office.

Reports include the quarterly report to NYSDOH, the CDC’s Annual Performance Report, the CDC’s Aggregate Reports for TB Program Evaluation and the CDC’s National Tuberculosis Indicators Project.

Cohort review: One of the Health Department’s primary tools for evaluating its TB program is the quarterly cohort review process. Staff review case management activities, treatment status and data quality for all patients with confirmed TB disease and their contacts four to six months after TB diagnosis. Successes and challenges related to patient care and case management are used to inform programmatic changes and identify training needs.

Table 1: Select TB performance measures, national targets¹ and NYC outcomes for the year 2022

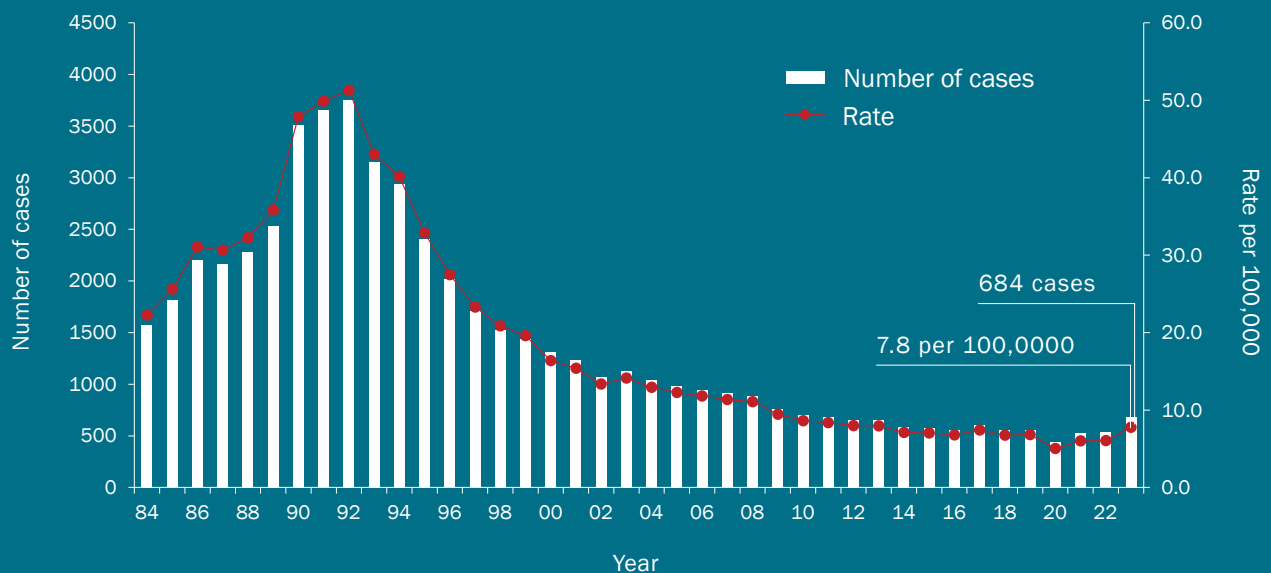
Indicator	2022	2025 target
Treatment and case management for persons with active TB		
Initiated TB treatment within 7 days of specimen collection ²	88%	96%
Sputum culture conversion within 60 days of treatment initiation ³	64%	83%
Completed treatment within 365 days of initiation ⁴	88%	95%
Contact investigation		
Eligible cases with contacts elicited ⁵	89%	100%
Eligible contacts evaluated ⁶	70%	94%
Eligible contacts who initiated treatment for TB infection ⁷	88%	92%
Eligible contacts who completed treatment for TB infection ⁸	78%	93%

1. Definitions for performance measures and national indicators are established by the CDC; the 2025 targets were set in 2020. For details, visit cdc.gov/tb/programs/evaluation/indicators. Performance measures are reported for 2022 instead of 2023 to allow sufficient time for follow-up. 2. Of TB patients with positive acid-fast bacilli (AFB) sputum-smear results who were alive at diagnosis. 3. 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. 4. Excludes patients who never started on anti-TB medications, those who died or moved outside 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. 5. Of AFB sputum smear-positive TB patients. 6. Of contacts to AFB sputum smear-positive TB patients counted in the year of interest. 7. Of contacts to AFB sputum smear-positive TB patients with newly diagnosed TB infection. 8. Of contacts to sputum AFB smear-positive TB patients with newly diagnosed TB infection who started treatment.

Profile of TB Cases

There were **684** confirmed cases of active TB disease identified in NYC in 2023, a 28% increase from 2022. The NYC TB incidence rate was 7.8 per 100,000, more than two and a half times higher than the national TB rate.

Figure 2: TB cases and rates,¹ NYC, 1984-2023



1984-1992

Overall increase: **139%**
 Average annual increase: **12%**

1992-2013

Overall decrease: **83%**
 Average annual decrease: **7%**

2013-2023

Overall increase: **18%**
 Single-year increase 2022-2023: **28%**

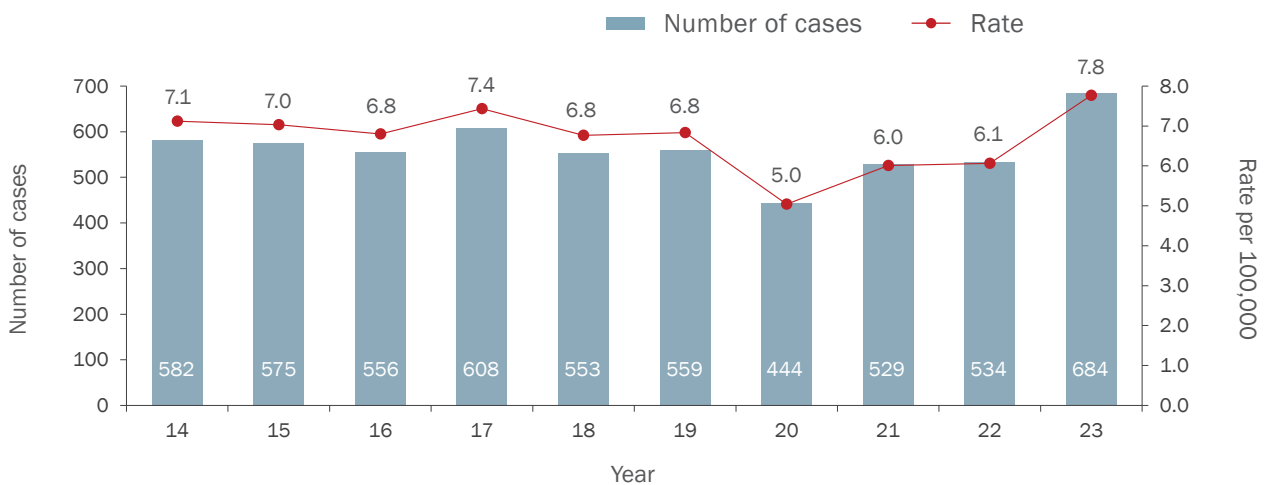
1. Rates are based on decennial census data.

Overview: TB in NYC in 2023

There were 684 confirmed cases of active TB disease identified in NYC in 2023, a 28% increase from 2022. This is the highest number of TB cases confirmed in NYC since 2011; the 2023 TB rate of 7.8 per 100,000 is the highest TB rate in NYC since 2013.

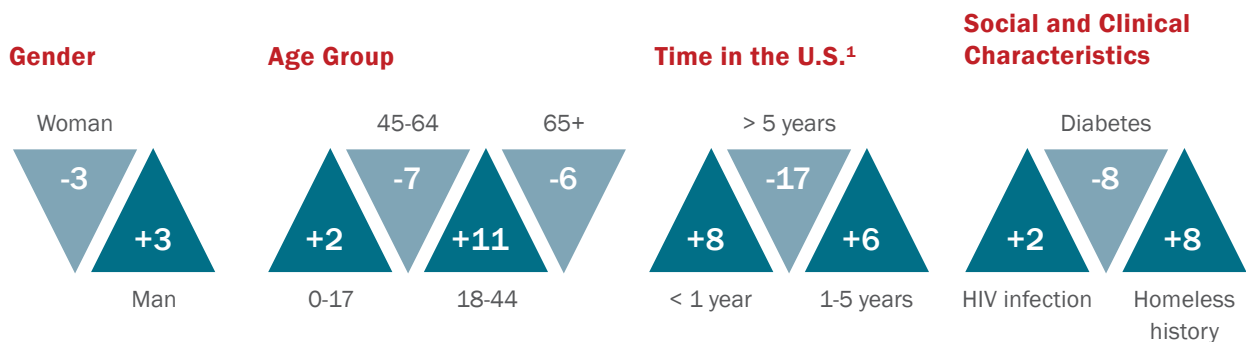
Increases in the number of TB cases between 2022 and 2023 were observed among both U.S.-born people and people born outside the U.S., among people with a history of homelessness within 12 months prior to TB diagnosis, among most age groups, including children younger than 18, and among individuals in the U.S. for less than one year prior to TB diagnosis. The number of people with a rifampin-resistant TB strain more than doubled between 2022 and 2023.

Figure 3: TB cases and rates,¹ NYC, 2014-2023



1. Rates are based on decennial census data.

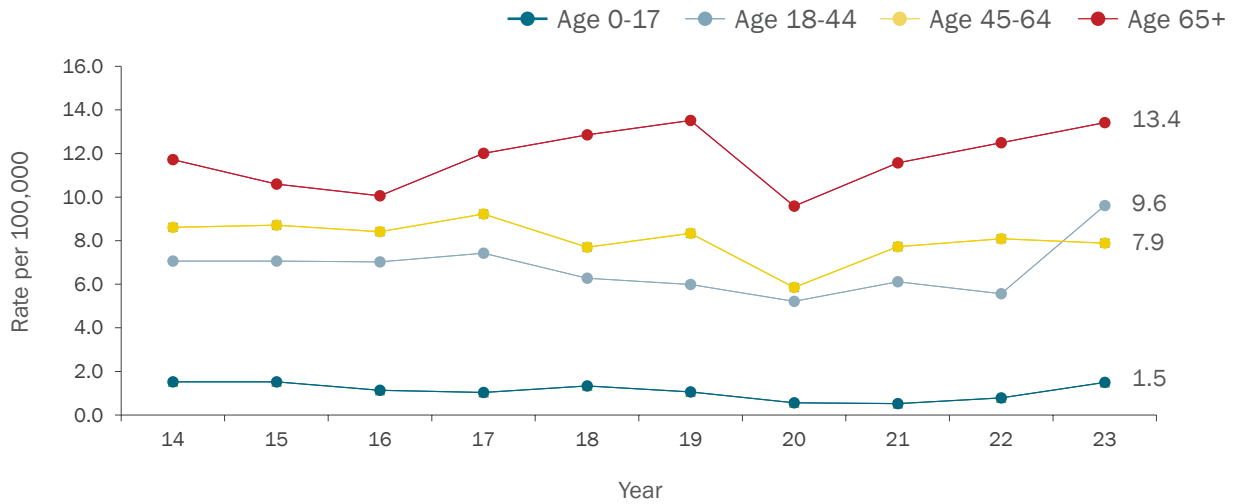
Figure 4: Percentage point change for select characteristics among patients with TB disease in 2023 compared with 2022, NYC



1. At time of TB diagnosis among individuals born outside the U.S.

Demographic Characteristics

Figure 5: TB rates by age group in years,¹ NYC, 2014-2023



1. Rates are based on NYC Health Department population estimates, modified from U.S. Census Bureau interpolated intercensal population estimates, 2000-2022. Updated January 2024.

Figure 6: TB cases by age group in years, NYC, 2023

- Age 0-17 4%
- Age 18-44 45%
- Age 45-64 24%
- Age 65+ 27%

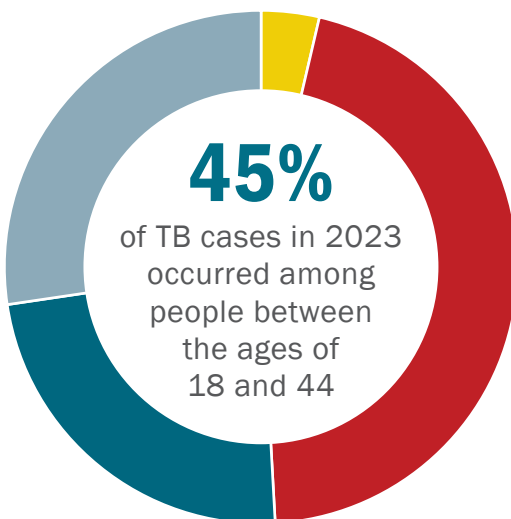
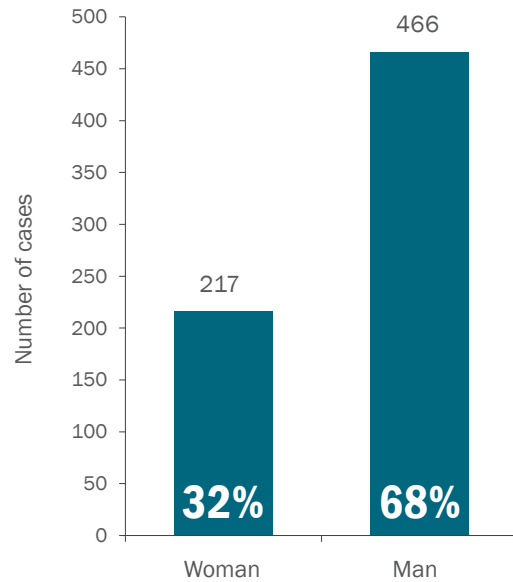
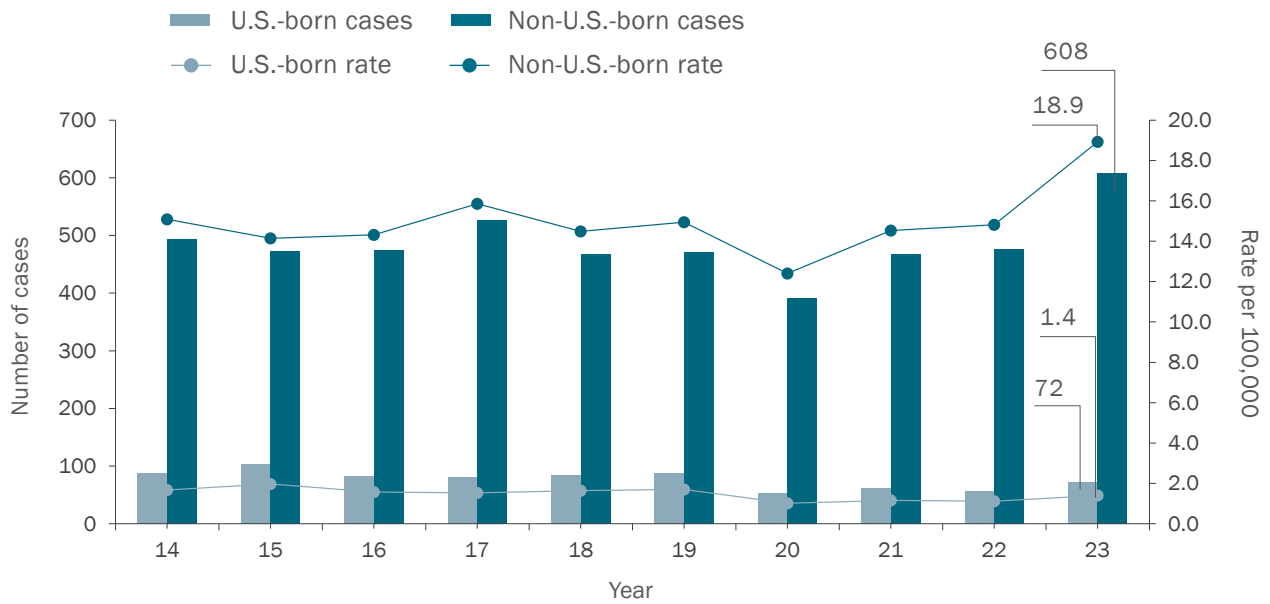


Figure 7: TB cases by gender,¹ NYC, 2023



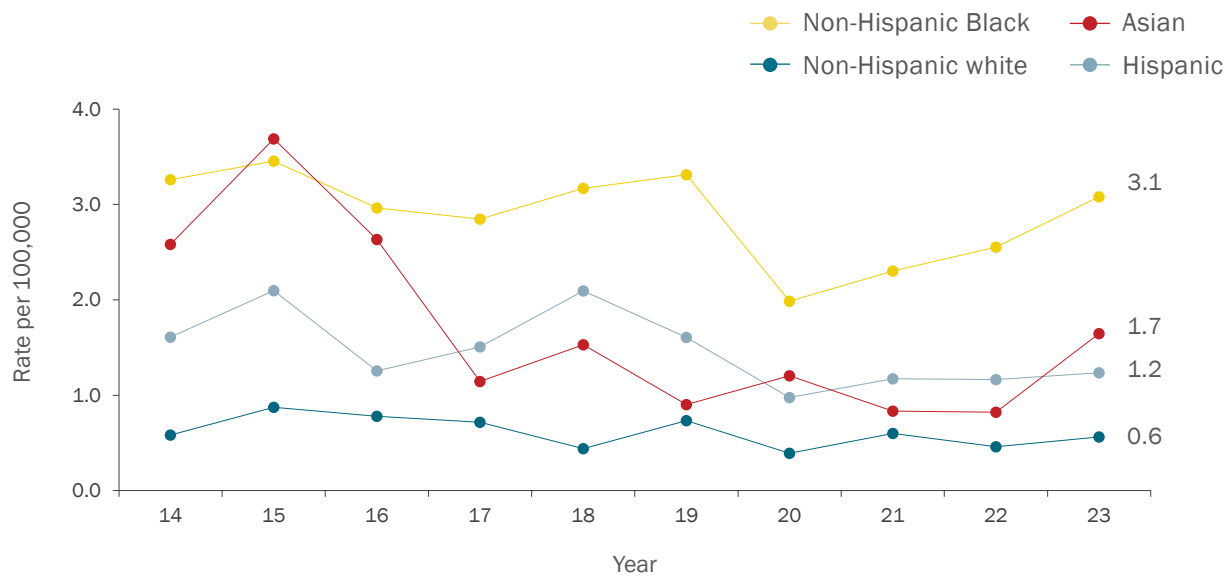
1. Persons for whom gender identity was listed only as transgender are excluded from this figure. See the Technical Notes (Page 36) for more information.

Figure 8: TB cases and rates¹ by birth in the U.S.,^{2,3} NYC, 2014-2023



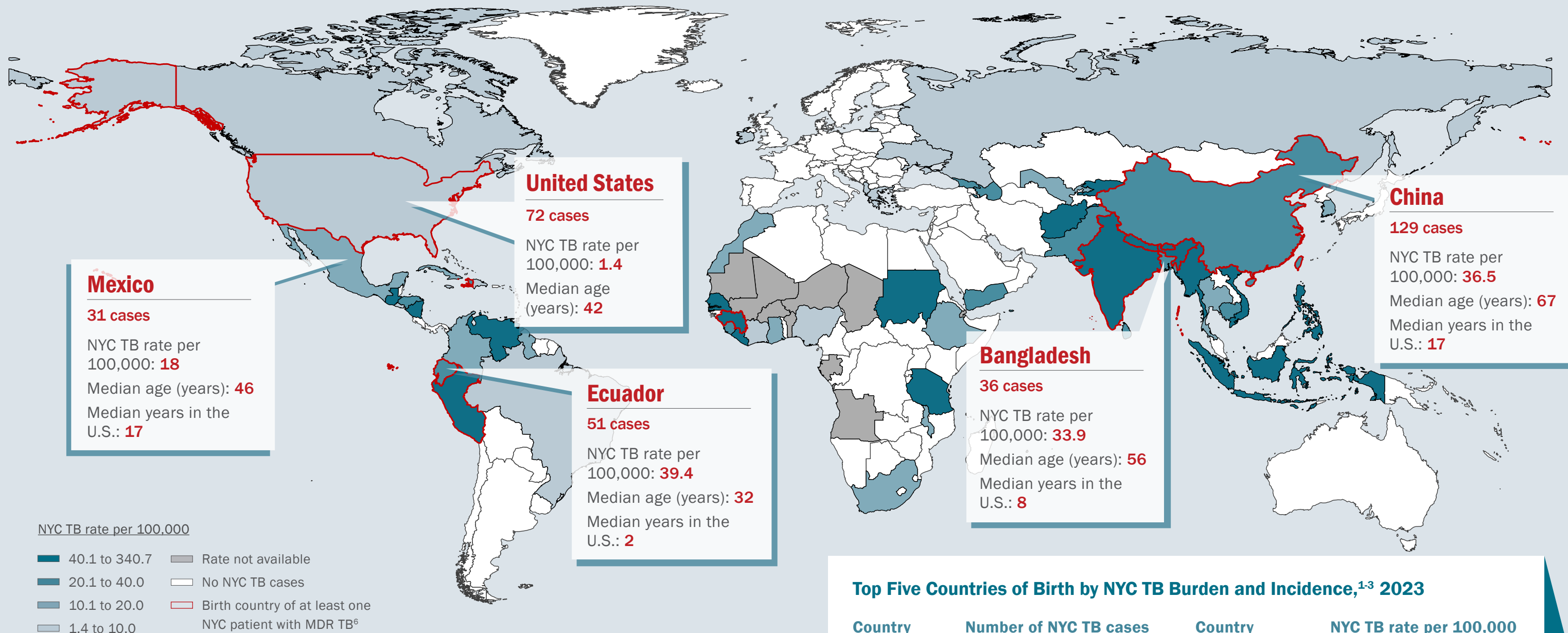
1. Rates are based on one-year American Community Survey data for the given year or the most recent available data. 2. U.S.-born includes individuals born in the U.S. and U.S. territories. 3. Excludes cases with unknown country of birth.

Figure 9: TB rates¹ by race and ethnicity² among patients born in the U.S.,^{3,4} NYC, 2014-2023



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 do not include patients with multiple, other or unknown race and 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 10: Tuberculosis cases, rates¹ and select characteristics by patient country of birth,²⁻⁵ NYC, 2023



Country of Birth

The five most common countries of birth among patients with TB disease in 2023 accounted for 47% of all cases identified. Patient characteristics and TB risk factors differ by country of birth.

68 | Number of countries of birth represented among patients with TB disease in 2023

10 | Median number of years in the U.S. among non-U.S.-born TB patients

Top Five Countries of Birth by NYC TB Burden and Incidence,¹⁻³ 2023

Country	Number of NYC TB cases	Country	NYC TB rate per 100,000
China ⁴	129	Bhutan	340.7
U.S. ⁵	72	Guinea	233.9
Ecuador	51	Senegal	223.6
Bangladesh	36	Venezuela	157.7
Mexico	31	United Republic of Tanzania	98.6

1. Rates are based on one-year American Community Survey sample data. 2. Four cases in 2023 were among patients who had unknown country of birth. 3. There were 10 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. MDR TB is defined as resistance to at least isoniazid and rifampin.

TB in NYC Neighborhoods

Figure 11: TB rates¹ by neighborhood,² NYC, 2023

Rate per 100,000

- Above citywide rate (7.9 to 23.5)
- At or below citywide rate (3.0 to 7.8)
- At or below provisional national rate (1.4 to 2.9)

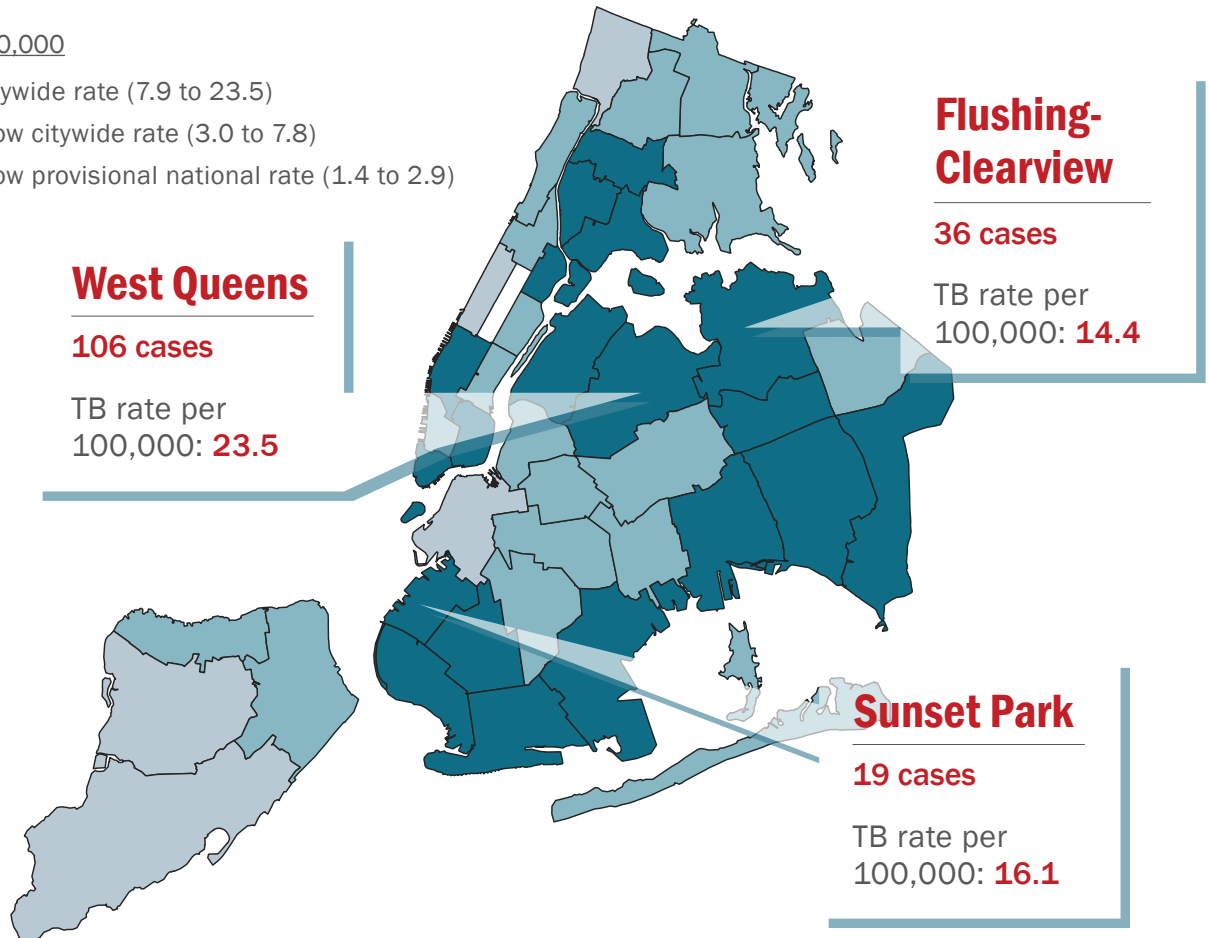
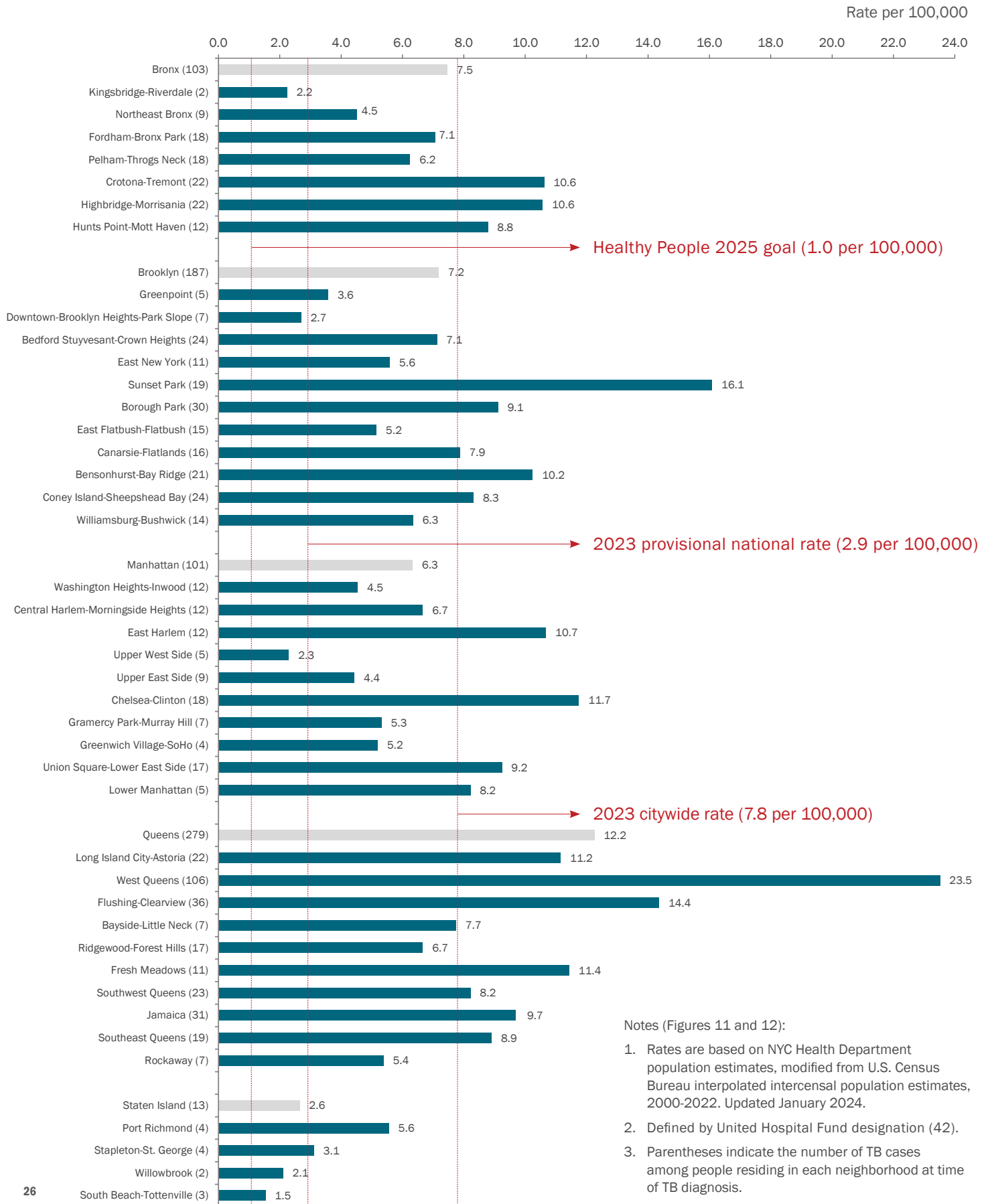


Table 2: Proportion of TB cases and rates¹ by birth in the U.S.^{2,3} and area-based poverty level of patient residential neighborhood,⁴ NYC, 2023

Area-based poverty level ⁴	U.S.-born rate	% U.S.-born	Non-U.S.-born rate	% non-U.S.-born	Total NYC rate	% of all cases
Very high (30 to 100%)	2.2	21%	22.9	14%	9.3	15%
High (20 to < 30%)	1.8	25%	18.4	17%	8.0	18%
Medium (10 to < 20%)	1.0	31%	18.0	47%	8.0	45%
Low (< 10%)	1.1	23%	17.0	22%	6.8	22%

1. Rates are based on 2017-2021 American Community Survey data. 2. U.S.-born includes individuals born in the U.S. and U.S. territories. 3. Four cases in 2023 had unknown country of birth and two had an unknown ZIP code. 4. Area-based poverty level is based on 2017-2021 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 time of TB diagnosis.

Figure 12: TB cases and rates¹ by neighborhood,² NYC, 2023³



Clinical Characteristics

In 2023, 82% of TB cases involved a pulmonary site of disease, and 82% of people with TB disease had a positive culture. Between 2022 and 2023, the overall proportion of patients with diabetes decreased from 27% to 19%.

Figure 13: TB cases by disease site, NYC, 2023

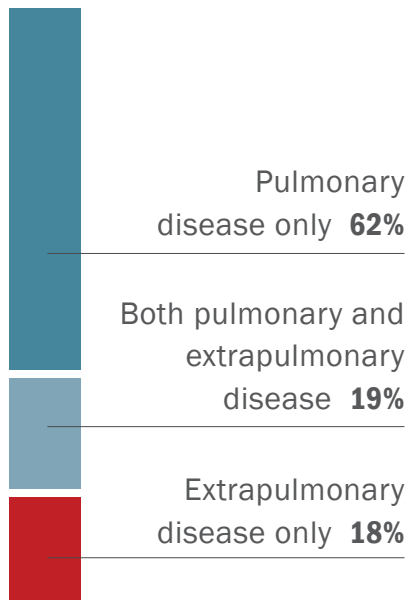
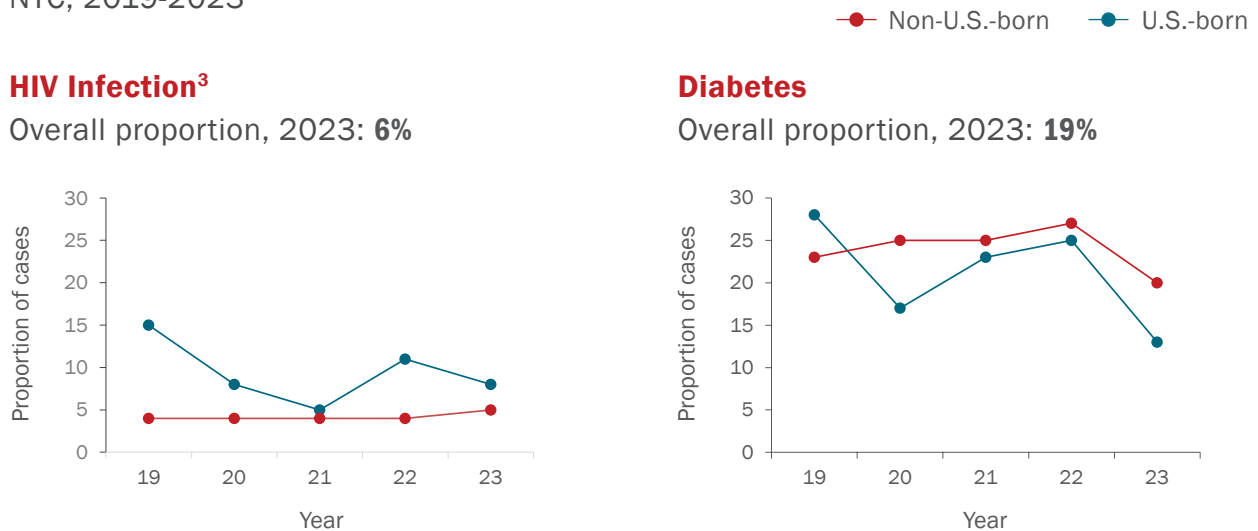


Table 3: Disease site among TB cases with extrapulmonary disease,¹ NYC, 2023 (257)

Disease site	# of cases	Percentage
Any extrapulmonary site	257	-
Lymphatic	99	39%
Pleural	91	35%
Bone/joint	19	7%
Meningeal	15	6%
Genitourinary	12	5%
Peritoneal	5	2%
Laryngeal	3	1%
Other	60	23%

1. Categories are not mutually exclusive.

Figure 14: Select comorbidities among patients with TB disease by birth in the U.S.,^{1,2} NYC, 2019-2023



1. U.S.-born includes individuals born in the U.S. and U.S. territories. 2. Excludes cases with unknown country of birth. 3. There were 115 patients in 2023 with an unknown HIV status.

Figure 15: Proportion of culture-confirmed TB cases among all cases, NYC, 2023

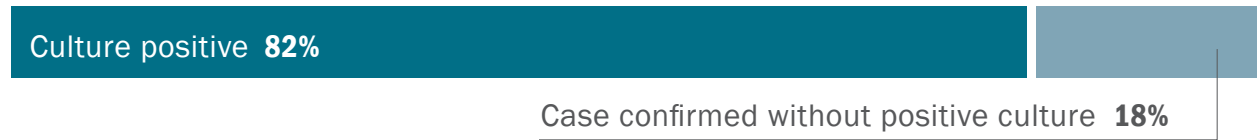
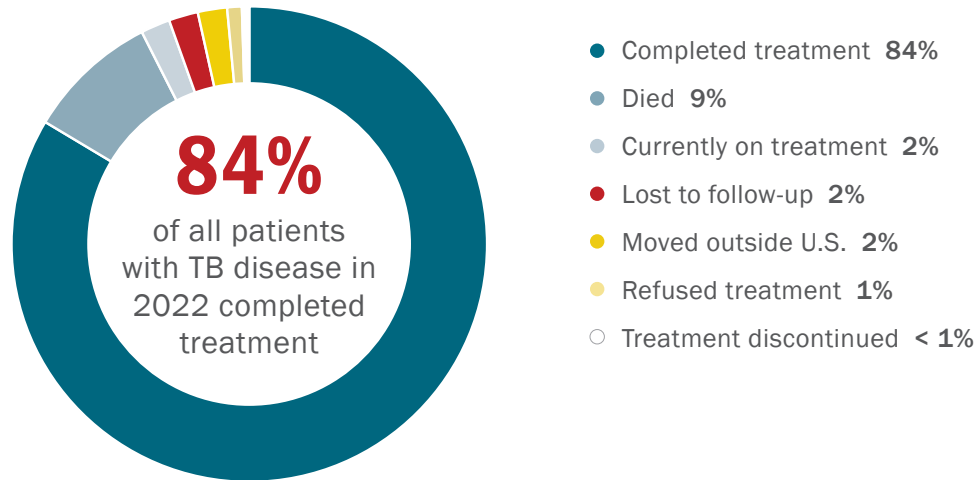
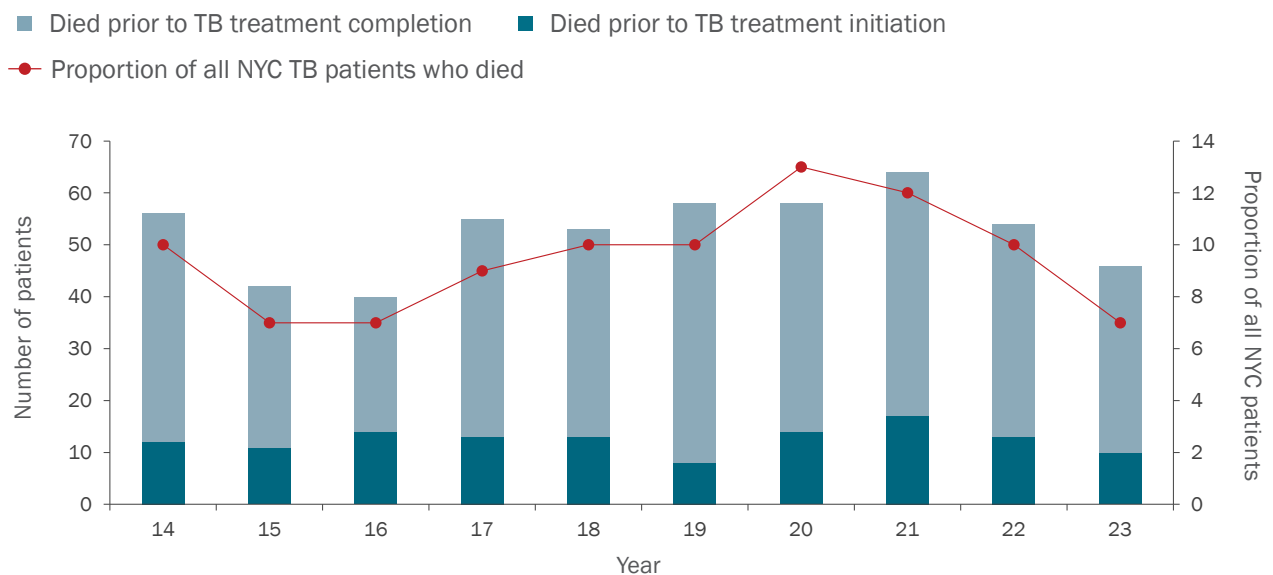


Figure 16: Treatment outcomes for TB cases counted in 2022,^{1,2} NYC (534)



1. Treatment outcomes are reported for 2022 instead of 2023 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.

Figure 17: Number and proportion of patients with TB who died¹ before or during treatment, NYC, 2014-2023

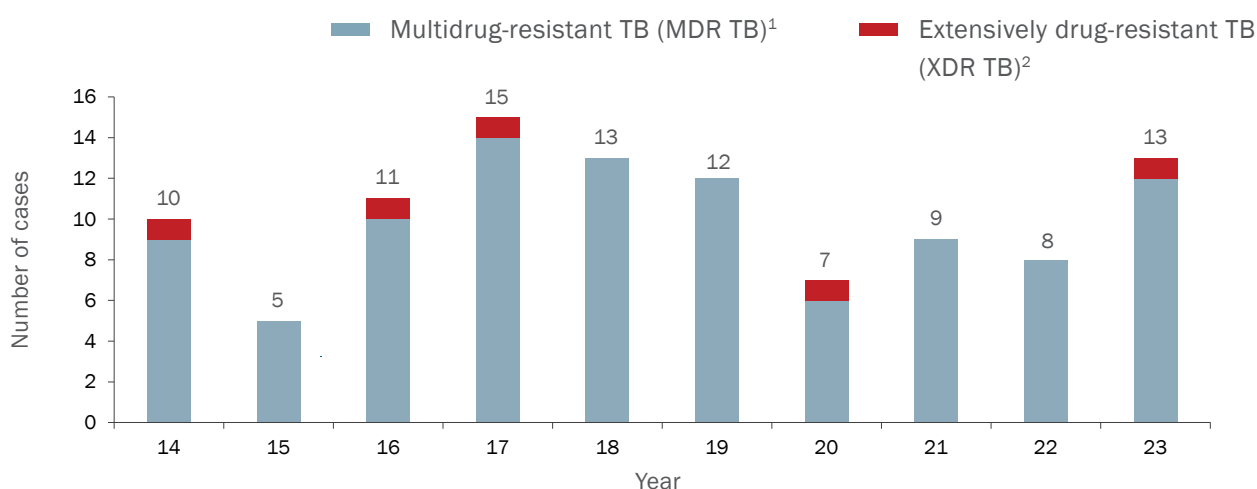


1. A death is defined as any patient who died prior to or during TB treatment, regardless of the cause of death.

Drug Resistance

Molecular-based tests that rapidly detect mutations associated with drug resistance are now being used routinely in hospitals, commercial laboratories and public health reference laboratories in NYC. In 2023, 13 patients were newly diagnosed with MDR TB, defined as a TB strain resistant to both isoniazid and rifampin, two of the most effective TB drugs. Of these, one person was newly diagnosed with XDR TB.

Figure 18: Multidrug resistance¹ among TB cases, NYC, 2014-2023



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 either a second-line injectable anti-TB medication, bedaquiline or linezolid.

Table 4: Detection of resistance to select TB medications by test type,¹ NYC, 2023

	INH	RIF	EMB	PZA	FLQ ²	INJ ³
Number of patients with a molecular test ⁴	530	578	523	522	530	523
➤ Number with mutation detected (%)	52 (10)	21 (4)	14 (3)	8 (2)	6 (1)	2 (< 1)
Number of patients with a phenotypic test	485	489	484	453	80	75
➤ Number with resistance detected (%)	55 (11)	16 (3)	12 (3)	34 (8)	8 (10)	2 (3)
Number of patients with any drug susceptibility test conducted	548	587	546	540	530	523
➤ Number with resistance detected (%)	58 (11)	21 (4)	15 (3)	35 (7)	9 (2)	2 (< 1)

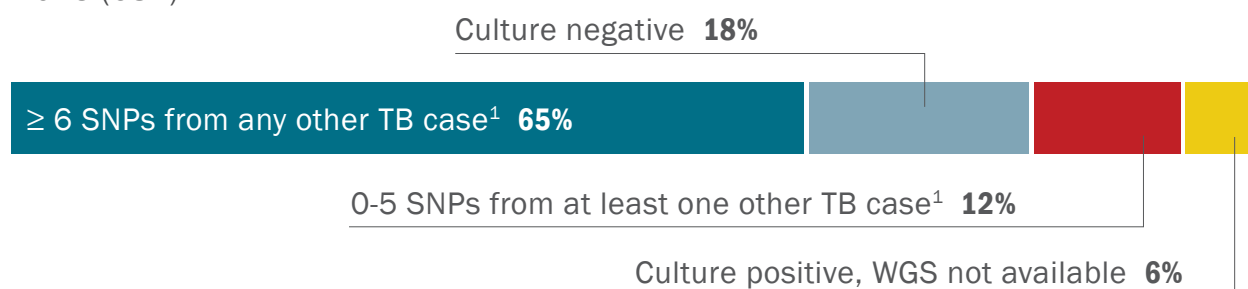
Abbreviations: INH - isoniazid; RIF - rifampin; EMB - ethambutol; PZA - pyrazinamide; FLQ - fluoroquinolones; INJ - injectables

1. Categories are not mutually exclusive. 2. Fluoroquinolones include levofloxacin, moxifloxacin, ciprofloxacin and ofloxacin. 3. Injectables include kanamycin, capreomycin and amikacin. 4. Molecular tests include GeneXpert MTB/RIF, pyrosequencing, Sanger sequencing and whole genome sequencing.

Whole Genome Sequencing and NYC Clusters

The Health Department uses WGS to characterize TB strains and assess transmission. Cases are reviewed, prioritized and assigned for epidemiologic investigation. A difference of five single nucleotide polymorphisms (SNPs) or less between isolates is considered suggestive of possible recent transmission and prompts further investigation.

Figure 19: TB cases by WGS availability and high-quality SNP analysis results, NYC, 2023 (684)



1. May include cases verified outside NYC with WGS results in the NYS Wadsworth laboratory database.

Table 5: Characteristics of patients whose isolate has less than or equal to five SNP differences from at least one other TB case,¹ NYC, 2023 (80)

Characteristic	n (percentage)
Male	56 (70%)
U.S.-born	19 (24%)
Non-U.S.-born	61 (76%)
➤ Most common countries of birth among patients born outside the U.S.	China (26%), Ecuador (25%), Mexico (7%), Peru (5%), Guatemala (5%)
➤ In the U.S. for > 5 years	32 (52%)
Median age (range)	34 (1-70)
Most common borough of residence at diagnosis	Queens (44%), Brooklyn (35%), Bronx (10%)
Pulmonary site of disease	73 (91%)
Sputum smear positive	41 (51%)
History of homelessness ²	11 (14%)
Nearest neighbor counted by NYS	6 (8%)
Known contact to a TB case	8 (10%)

1. May include cases confirmed outside NYC with WGS results in the NYS Wadsworth laboratory database. 2. In the 12 months before TB diagnosis.

Contact Investigation in Congregate Settings

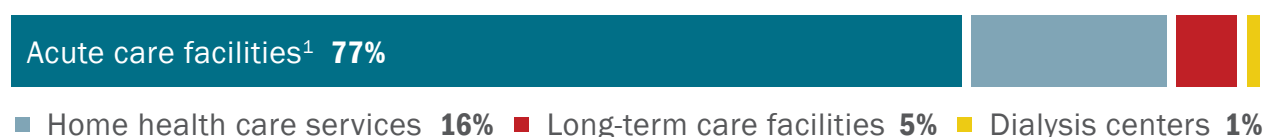
The Health Department investigates TB exposures in residential and nonresidential congregate settings in NYC to identify and evaluate contacts, ensure appropriate treatment for contacts with TB disease or LTBI, determine if transmission has occurred and assess whether testing of additional contacts or other interventions may be warranted. The number of investigations in congregate settings more than doubled from 2022 to 2023. In 2023, 63% of investigations in congregate settings occurred in shelter settings.

Table 6: Contact investigation outcomes in congregate settings¹ by number of exposed contacts and site type, NYC, 2023 (76)

	≥ 15 exposed contacts		< 15 exposed contacts		Total	
	n	(%)	n	(%)	n	(%)
Non-shelter settings						
Number of sites	6		22		28	
Likely transmission ²	1	17	2	9	3	11
Total number of contacts identified	215		143		358	
Contacts eligible for testing ³	211	98	140	98	351	98
Contacts tested	182	86	120	86	302	86
Contacts with a positive TB test result	11	6	18	15	29	10
Shelter settings						
Number of sites	4		44		48	
Likely transmission ²	1	25	19	43	20	42
Total number of contacts identified	74		201		275	
Contacts eligible for testing ³	74	100	197	98	271	99
Contacts tested	38	51	121	61	159	59
Contacts with a positive TB test result	7	18	61	50	68	43

1. Excludes health care-associated investigations. 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 after diagnosis of the infectious TB patient to whom they were exposed.

Figure 20: Contact investigations in health care settings¹ by site type, NYC, 2023 (147)



1. Includes hospitals and acute care clinics.

Appendix

Table 7: Select demographic, social and clinical characteristics among patients with confirmed TB disease by birth in the U.S.,¹ NYC, 2022-2023

Characteristics	2022						2023					
	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	%
Total	57	-	476	-	534	-	72	-	608	-	684	-
Age group												
0-17	7	12	6	1	13	2	9	13	16	3	25	4
18-44	18	32	162	34	180	34	29	40	281	46	311	45
45-64	19	33	145	31	165	31	17	24	143	24	161	24
65+	13	23	161	34	174	33	17	24	168	28	187	27
Gender												
Woman	21	37	166	35	187	35	24	33	192	32	217	32
Man	36	63	307	65	344	65	48	67	415	68	466	68
Transgender	0	0	1	< 1	1	< 1	0	0	1	< 1	1	< 1
Race and ethnicity												
Non-Hispanic white	9	16	12	3	21	4	11	15	26	4	38	6
Non-Hispanic Black	29	51	46	10	75	14	35	49	100	16	135	20
Hispanic	16	28	126	27	142	27	17	24	194	32	211	31
Asian	3	5	270	57	274	52	6	8	258	42	266	39
Multiple or other	0	0	18	4	18	3	2	3	28	5	31	5
Time in the U.S. (at time of reporting)												
< 1 year	n/a	n/a	46	10	46	10	n/a	n/a	108	18	108	18
1-5 years	n/a	n/a	89	19	89	19	n/a	n/a	155	25	155	25
> 5 years	n/a	n/a	332	71	332	71	n/a	n/a	331	54	331	54
Borough of residence												
Manhattan	7	12	46	10	53	10	15	21	85	14	101	15
Bronx	15	26	71	15	86	16	8	11	95	16	103	15
Brooklyn	24	42	112	24	137	26	23	32	163	27	187	27
Queens	11	19	232	49	243	46	23	32	254	42	279	41
Staten Island	0	0	13	3	13	2	2	3	11	2	13	2
Neighborhood poverty ³												
Low (< 10%)	7	12	116	24	123	23	16	22	133	22	150	22
Medium (10 to < 20%)	13	23	226	47	239	45	22	31	286	47	308	45
High (20 to < 30%)	17	30	78	16	96	18	18	25	104	17	125	18
Very high (30 to 100%)	20	35	56	12	76	14	15	21	84	14	99	14

Table 7 (continued): Select demographic, social and clinical characteristics among patients with confirmed TB disease by birth in the U.S.,¹ NYC, 2022-2023

Characteristics	2022						2023					
	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	%
Total	57	-	476	-	534	-	72	-	608	-	684	-
Homeless ⁴	7	12	21	4	28	5	5	7	84	14	89	13
Employed ^{4,5}	13	26	175	37	188	36	21	33	186	31	207	31
Health care worker ^{4,5}	0	0	6	3	6	3	2	10	9	5	11	5
Respiratory smear positive ever ⁶	24	51	236	59	261	58	33	52	287	58	321	58
Sputum smear positive	23	96	215	91	239	92	31	94	270	94	302	94
Culture positive	48	87	410	86	459	86	59	82	500	83	563	83
Pulmonary only site of disease	30	53	313	66	344	64	47	65	377	62	427	62
Extrapulmonary only site of disease	9	16	73	15	82	15	9	13	116	19	126	18
Both pulmonary and extrapulmonary disease	18	32	90	19	108	20	16	22	115	19	131	19
Cavities present on chest X-ray ever ⁶	11	23	66	16	77	17	13	21	79	16	92	16
Rifampin resistance ⁷	0	0	10	2	10	2	3	4	17	3	21	3
Multidrug resistance ⁸	0	0	8	2	8	2	2	3	11	2	13	2
Extensive drug resistance ⁹	0	0	0	0	0	0	0	0	1	< 1	1	< 1
History of TB disease	3	5	35	7	38	7	1	1	34	6	35	5
HIV infection	6	11	18	4	24	4	6	8	32	5	38	6
Diabetes	14	25	128	27	143	27	9	13	123	20	133	19

1. U.S.-born includes individuals born in the U.S. and U.S. territories. 2. Totals may not equal the sum of U.S.-born and non-U.S.-born due to missing country of birth data. 3. Area-based poverty level is based on 2017-2021 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. 4. In the 12 months before TB diagnosis. 5. Among patients 18 years of age and older. 6. Percentage is among patients with a pulmonary site of disease. 7. Percentage is among patients with susceptibility testing performed for rifampin. 8. MDR TB is defined as resistance to at least isoniazid and rifampin. Percentage is among patients with susceptibility testing performed for isoniazid and rifampin. 9. XDR TB is defined as resistance to at least isoniazid and rifampin plus a fluoroquinolone and either a second-line injectable anti-TB medication, bedaquiline or linezolid. Percentage is among patients with susceptibility testing performed for isoniazid, rifampin, any fluoroquinolone and any second-line injectable anti-TB medication.

Table 8: TB cases and rates¹ by select characteristics, NYC, 1900-2023

Year	Number of TB cases	Rate per 100,000	Cases with positive culture	Cases with positive sputum smear	Multidrug-resistant cases ²	Deaths attributable to TB ³	Death rate per 100,000
1900	11,997	349.0				9,630	280.2
1910	32,065	672.7				10,074	211.3
1920	14,035	249.7				7,915	140.8
1930	11,821	170.6				4,574	66.0
1940	9,005	120.8				3,680	49.4
1950	7,717	97.8				2,173	27.5
1960	4,699	60.4				824	10.6
1970	2,590	32.8				432	5.5
1980	1,514	21.4				143	2.0
1990	3,506	47.9	3,384			256	3.5
1991	3,653	49.9	3,462	1,826	385	245	3.3
1992	3,755	51.3	3,401	1,855	437	200	2.7
1993	3,151	43.0	2,784	1,529	289	166	2.3
1994	2,941	40.2	2,433	1,280	183	133	1.8
1995	2,408	32.9	1,996	1,001	114	94	1.3
1996	2,013	27.5	1,693	873	84	67	0.9
1997	1,705	23.3	1,383	708	57	55	0.8
1998	1,528	20.9	1,232	611	38	52	0.7
1999	1,436	19.6	1,124	571	31	49	0.7
2000	1,311	16.4	1,043	516	24	44	0.5
2001	1,232	15.4	938	454	25	33	0.4
2002	1,071	13.4	819	436	29	30	0.4
2003	1,132	14.1	865	428	22	34	0.4
2004	1,036	12.9	793	395	19	31	0.4
2005	983	12.3	745	378	24	21	0.3
2006	947	11.8	705	354	24	18	0.2
2007	909	11.4	707	379	9	16	0.2
2008	886	11.1	685	339	11	18	0.2
2009	757	9.5	539	281	9	25	0.3
2010	705	8.6	511	265	11	26	0.3
2011	684	8.4	501	264	16	32	0.4
2012	652	8.0	495	271	18	15	0.2
2013	650	8.0	473	258	7	17	0.2
2014	582	7.1	454	243	10	31	0.3
2015	575	7.0	444	240	5	20	0.2
2016	556	6.8	448	225	11	21	0.2
2017	608	7.4	504	261	15	15	0.1
2018	553	6.8	421	230	13	20	0.2
2019	559	6.8	461	254	12	24	0.2
2020	444	5.0	366	212	6	22	0.3
2021	529	6.0	441	239	9	Not available	Not available
2022	534	6.1	459	241	8	Not available	Not available
2023	684	7.8	563	304	13	Not available	Not available

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

Technical Notes

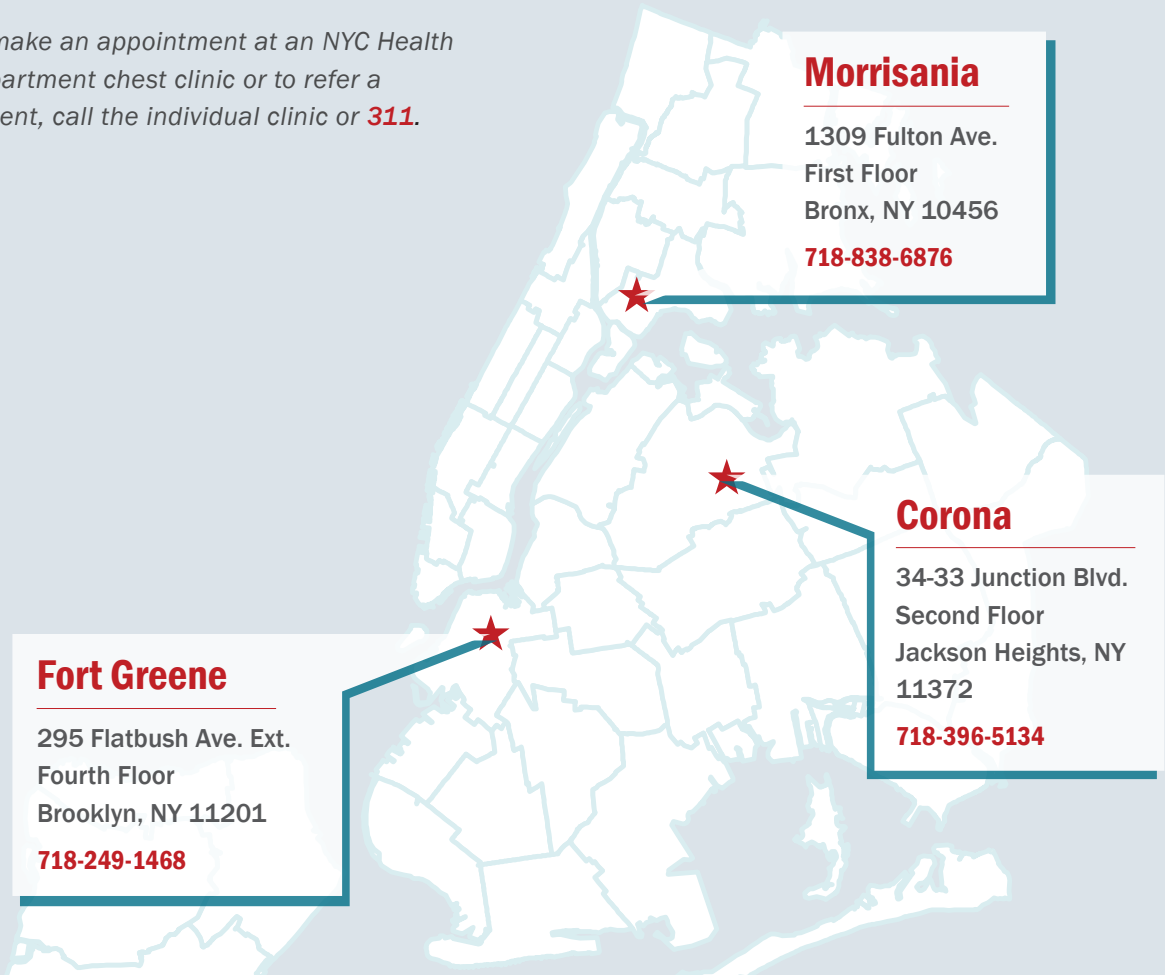
- Data for 2023 are preliminary and reflect the most complete information available as of January 16, 2024, unless otherwise noted.
- Data prior to 2023 have been updated since the release of the 2022 report. Data for these years reflect the final numbers and may differ from official estimates presented in previous reports.
- TB became a reportable disease on January 19, 1897. From 1920 to 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 gender are presented as woman, man and transgender. In future reports, more expansive categories of gender identity will be used to reflect changes in data collection.
- 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 are presented by geography, column sums may not equal applicable totals due to missing or unknown data.
- The sum of proportions do not always equal 100% due to rounding.
- All rates presented in this report are calculated per 100,000 population. 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, Washington, D.C., or 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, U.S. 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 five-year sample data from the American Community Survey, which measures the proportion of residents living below the federal poverty level in that census tract. The federal poverty level is a measure of income used by the U.S. government to determine eligibility for subsidies, programs and benefits. The U.S. Department of Health and Human Services updates the poverty guidelines each January. Patients with addresses outside NYC, addresses unable to be geocoded to a ZIP code or addresses located in ZIP codes where poverty level could not be determined were not assigned to a poverty level.
- 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 the Health Department. Misclassification of HIV status may occur if a patient refused to disclose known status or refused to be tested for HIV while under care for TB disease.
- Data on TB deaths are obtained from the Health Department 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.

NYC Health Department Chest Clinics

Eligible patients can be referred to one of three NYC Health Department chest clinics 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 or insurance status.



To make an appointment at an NYC Health Department chest clinic or to refer a patient, call the individual clinic or **311**.



Fort Greene

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

Morrisania

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

Corona

34-33 Junction Blvd.
Second Floor
Jackson Heights, NY
11372
718-396-5134

The Health Department provides a variety of TB services, including:

- Testing for TB infection using the latest generation blood-based QFT-Plus test and TST
- Sputum induction
- Chest radiographs
- Medical evaluation
- Treatment for TB disease and LTBI
- 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

