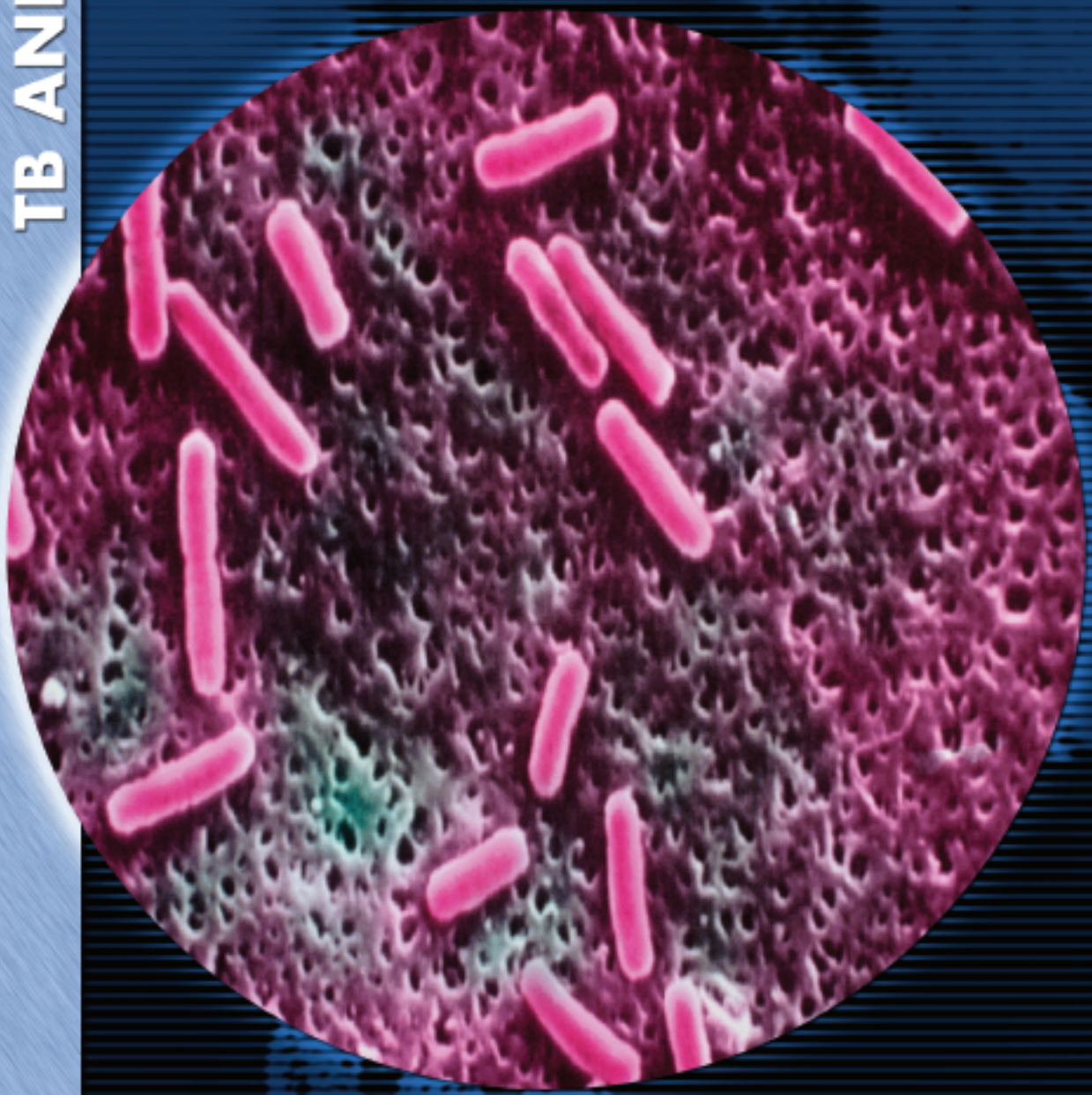
2004

TB ANNUAL SUMMARY

New York City Department of Health and Mental Hygiene

Bureau of Tuberculosis Control



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Mission Statement

New York City Department of Health and Mental Hygiene

Bureau of Tuberculosis Control

The mission of the Bureau of Tuberculosis Control is to prevent the spread of tuberculosis (TB) and eliminate it as a public health problem in New York City.

The goals of the Bureau of TB Control are:

1. To identify all individuals with suspected or confirmed TB disease and ensure their appropriate treatment, ideally on a regimen of directly observed therapy.
2. To ensure that individuals who are at high risk for progression from latent infection to active disease (e.g., contacts of active cases, immunocompromised individuals, recent immigrants from areas where TB is widespread) receive treatment for latent TB infection and do not develop disease.

The Bureau achieves its goals through direct patient care, education, surveillance, and outreach. Its mandated activities include the following:

1. Ensuring that suspected and confirmed cases of TB identified in all facilities in New York City are reported to the Bureau and documented on the computerized, confidential TB Registry.
2. Conducting intensive case interviews and maintaining an effective outreach program so that TB cases remain under medical supervision until completion of a full course of treatment and identified contacts receive appropriate medical care.
3. Monitoring and documenting the treatment status of all patients with active TB.
4. Setting standards and guidelines, and providing consultation on the prevention, diagnosis, and treatment of latent TB infection and disease in New York City.
5. Operating clinical sites throughout New York City that provide state-of-the-art care for persons with suspected or confirmed TB disease and their close contacts, at no cost to the patient.
6. Ensuring care for persons who have or are suspected of having active TB disease, in accordance with New York State Public Health Law §2202, Article 22, Title 1, at no cost to the patient.
7. Collaborating with community-based organizations and health and social agencies in New York City and New York State to improve case-finding and the prevention and control of TB through education, outreach, and targeted screening in communities at high risk for TB.

New York City Department of Health and Mental Hygiene

Bureau of Tuberculosis Control

2004 TB Annual Summary

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Executive Summary

Trends: 1992–2004

Since the peak of the most recent tuberculosis (TB) epidemic in 1992, the number of TB cases in New York City (NYC) has declined by more than 72%, from 3,811 in 1992 to 1,039 in 2004. The dramatic decrease in cases is attributable to both improved case finding and patient management practices, especially directly observed therapy (DOT). In addition to the reduction of active TB cases, the intensive effort by NYC Department of Health and Mental Hygiene's (DOHMH's) Bureau of TB Control (the Bureau, or BTBC) to control the epidemic in NYC has also led to decreases in drug resistance and TB deaths.

While overall rates of TB have dropped considerably, NYC has experienced a slight increase in TB among non-U.S.-born persons since 1992, and a large increase in the proportion of non-U.S.-born persons among TB cases, from 17.7% (676) in 1992 to 67.9% (706) in 2004. Better TB control methods have led to the overall decrease in TB cases. These improved control methods, along with a shift to a larger proportion of non-U.S.-born TB cases, have been associated with significant changes in the epidemiologic profile of TB disease in NYC.

Since 1992:

- The rate of TB declined from 51.1 cases per 100,000 in 1992 to 13.0 per 100,000 in 2004.
- The rate of TB cases decreased markedly among non-Hispanic blacks from 110.6 per 100,000 in 1992 to 17.1 per 100,000 in 2004. By contrast, the TB rate among Asians declined less dramatically, from 49.4 per 100,000 to 36.7 per 100,000.
- There were 95.9% fewer multidrug-resistant TB cases (MDR-TB, resistant to at least isoniazid and rifampin).
- The number of deaths due to TB decreased significantly, from 200 in 1992 to 30 in 2004.
- The percentage of patients with TB who are also infected with HIV decreased from 33.6% in 1992 to 16.3% in 2004.

Profile of Tuberculosis Cases, 2004

The rate of TB in NYC in 2004 was 13.0 per 100,000, well above the national average of 4.9 per 100,000. In addition to a higher overall incidence of TB compared to the rest of the nation, NYC also has a higher rate of drug-resistant TB. In 2004, 2.3% of NYC patients with culture positive TB had MDR-TB when their isolates were tested for drug susceptibility — about double the 2003 national rate of 1.1%. While NYC has high levels of both overall and drug-resistant TB, treatment completion rate is above national levels.

In 2004:

- Of patients confirmed with TB, 169 (16.3%) were also infected with HIV.
- Non-Hispanic blacks comprised 58.0% of U.S.-born patients with TB and 20.3% of non-U.S.-born patients; Asian patients were much more likely to be non-U.S.-born (39.7%) than U.S.-born (1.8%).
- The borough of Queens had the highest proportion of patients with confirmed TB (30.8%) and the highest proportion of non-U.S.-born TB patients (38.7%).
- MDR-TB was confirmed in 18 patients, while other drug resistance (ODR) patterns were found in 117 persons.
- Of those eligible for DOT programs, 686 (74.2%) patients were enrolled.
- Of smear-positive patients with pulmonary TB, 82.4% were on DOT.
- Of patients started on anti-TB medications, 891 (87.8%) were initially treated with four or more first-line TB drugs.

Tuberculosis Control Activities, 2004

The Bureau continues to be involved in all phases of disease detection, treatment, and prevention.

2004 accomplishments:

- BTBC Chest Centers provided care to 36,177 patients during 122,674 visits. 405 patients with confirmed TB were treated at Chest Centers, while 779 were evaluated for suspicion of TB. An additional 5,827 new patients received treatment for latent TB infection (LTBI).
- In addition to 1,039 patients confirmed with active TB throughout the City, 3,063 patients were evaluated and found not to have active TB.
- Of patients confirmed with active TB in 2003, 86.5% of those eligible completed therapy within a year.
- Of patients treated by BTBC providers at some point during the course of their illness, 88.9% were on DOT.
- Field staff members conducted 1,488 patient interviews, evaluated 3,374 contacts, and provided an initial tuberculin skin test (TST) to 3,404 patients.
- The Bureau conducted 29 large-scale contact investigations, during which 1,666 contacts were tested.
- An investigation of an outbreak of *Mycobacterium bovis* suggested that unpasteurized cheese imported from Mexico was the probable cause (see page 20).
- Efforts to improve the timeliness of TB reporting led to significant decreases in the number of late reports, from almost 50% in 2003 to 33% in 2004.
- The Bureau developed a TB cohort review course and video with the Centers for Disease Control and Prevention (CDC); the educational materials are being used nationally.
- BTBC staff members created and revised important protocols, including hospital surveillance, interjurisdictional referrals, contact investigations, and case management of TB patients. The Bureau also conducted comprehensive training of its staff supervisors on core TB management issues.
- BTBC physicians presented up-to-date information on TB and LTBI to the medical community at 30 medical grand rounds. In addition, over 200 health care providers attended the BTBC annual seminar.
- HIV rapid testing was successfully piloted at 1 Chest Center. Following implementation, the number of patients tested for HIV infection at the Chest Center increased three-fold, from a monthly average of 31 to 96. Part of this increase may be due to the provision of anonymous HIV testing at the center.
- Using free tuberculin solution, syringes, and TB medications provided by the Bureau, various schools and community health centers administered 2,697 TSTs and treated 919 patients for LTBI.
- Through contracts with selected Health and Hospitals Corporation hospitals, 1,138 patients were started on treatment for LTBI.

Priorities for Tuberculosis Control, 2005

- Develop and implement a comprehensive plan to increase the number of persons with LTBI who are identified and complete treatment.
- Develop and implement a plan to increase the use of nucleic acid amplification tests for rapid TB diagnosis.
- Evaluate rapid HIV testing at Chest Centers.
- Implement QuantiFERON GOLD™ TB test at Chest Centers and evaluate its utilization and cost-effectiveness.
- Select a new TB registry system, and expand the electronic medical record system currently used by Chest Centers.

Fewer TB Cases and Shifting Profiles

In 2004, 1,039 patients were confirmed to have TB in NYC, a 72.7% decrease since the peak of the recent TB epidemic in 1992. Similarly, the rate of TB declined from 51.1 per 100,000 in 1992 to 13.0 per 100,000 in 2004 (Table 1, Figure 1). While the rates of TB in New York City (NYC) and the United States have both declined fairly steadily in recent years, TB rates remain high in many countries around the world. The global TB situation is reflected in TB incidence among non-U.S.-born persons in NYC. Since 1992, despite the overall decrease in TB in NYC, the number of non-U.S.-born persons with TB increased slightly, from 676 in 1992 to 706 in 2004. Remarkably, the proportion of TB patients who are non-U.S.-born increased from 17.8% in 1992 to 67.9% in 2004, while TB cases among U.S.-born persons decreased significantly (Figure 2). During the same period, the number and proportion of patients with TB who are HIV-infected have decreased, particularly among men and U.S.-born persons. Overall, HIV infection rates among persons with TB decreased from 33.6% in 1992 to 16.3% in 2004 (Table 2). Accompanying these important trends have been other related changes in the TB epidemiologic profile.

Epidemiologic Trends

Demographic and Social Characteristics

During 1992–2004, the proportion of HIV-positive TB patients has dropped. Also, the proportion of patients diagnosed with TB among persons who tend to have higher rates of HIV infection, such as males, young adults, drug-users, and black-non-Hispanics, has decreased.

Since 1992:

- There has been a dramatic decrease in the number and rate of TB cases among patients aged 20–64 years. In 1992, the rates of TB among persons 20–44 years of age and 45–64 years of age was 75.5 per 100,000 and 62.6 per 100,000, respectively. By 2004, these rates declined to 15.8 per 100,000 and 18.0 per 100,000. Smaller decreases have been seen among other age groups (Figure 3).
- Similarly, the rate of TB has decreased significantly among non-Hispanic blacks from 110.6 per 100,000 in 1992 to 17.1 per 100,000 in 2004 (Figure 4).
- By contrast, the rate of TB among Asians, who have lower HIV rates and are often born in countries with a high prevalence of TB, has remained relatively stable (Figure 4).

Neighborhoods

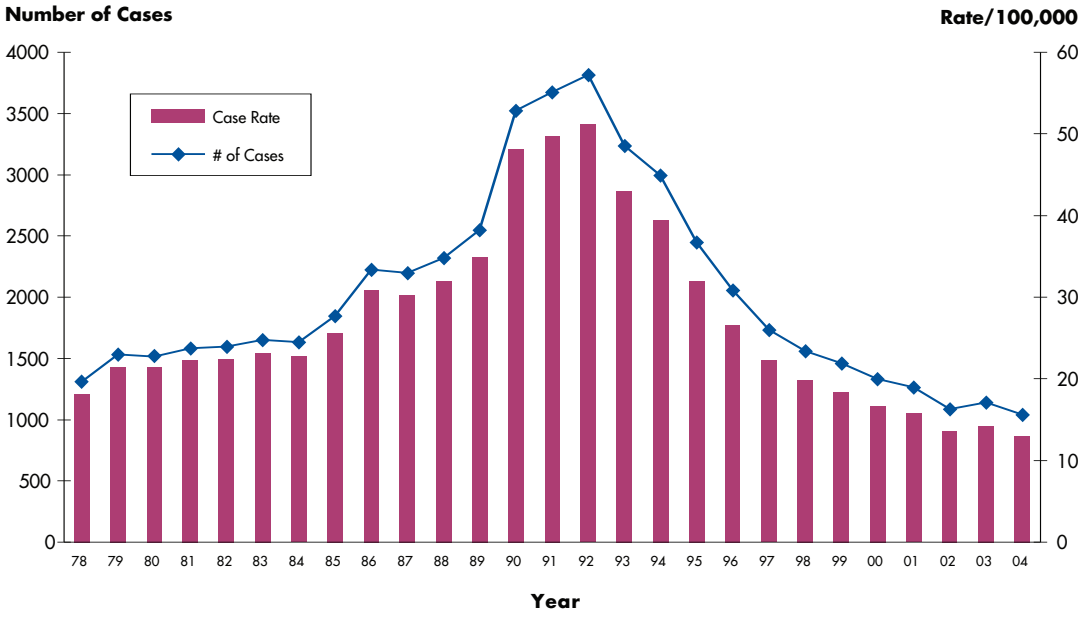
While most areas of NYC have experienced decreases in TB case rates, this decline is especially evident in areas where a high proportion of U.S.-born cases existed in 1992 (Figure 5, Table 3).

Since 1992:

- All of NYC's boroughs experienced a significant decrease in TB. Manhattan and Brooklyn, both of which had the highest number of U.S.-born patients in 1992, experienced the greatest decrease during this time. Comparatively, TB rates in the Bronx, Queens, and Staten Island decreased less remarkably, while the proportion of TB patients who are non-U.S.-born in the three boroughs has increased (Figure 5, Table 3).
- The significant decrease in TB during 1992–2004 is particularly striking in the neighborhoods with the highest initial burden of TB: Central Harlem, East Harlem, Bedford-Stuyvesant/Crown Heights, and Williamsburg/Bushwick (Table 3).

Figure 1

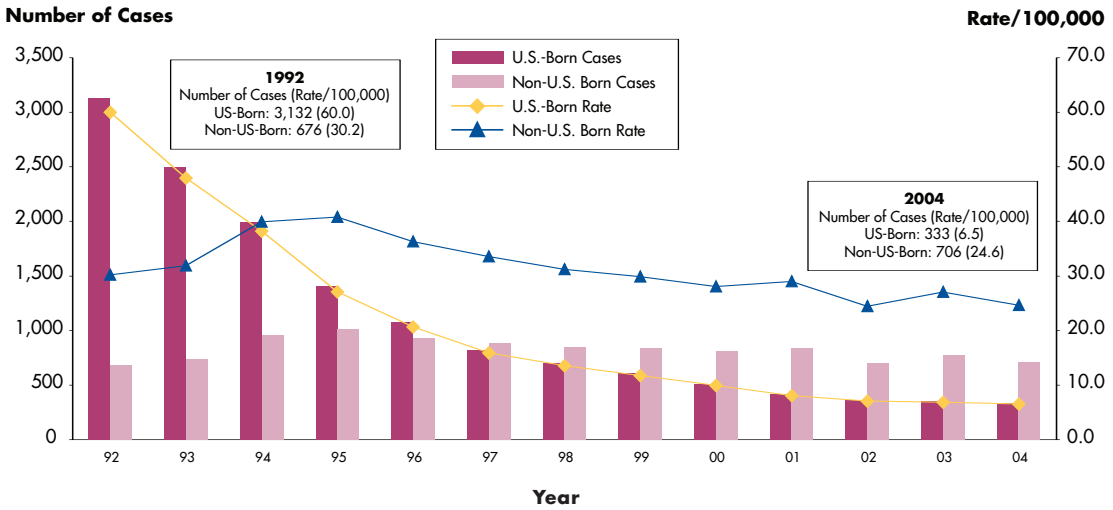
Tuberculosis Cases and Rates[1]
New York City, 1978–2004



[1]*Rates based on official census data and intercensal estimates prior to 2000. Rates since 2000 are based on 2000 census data.*

Figure 2

U.S.[1] and Non-U.S. Born Cases and Case Rates[2]
New York City, 1992–2004



[1] *Puerto Rico and U.S. Virgin Islands are included as U.S.-born.*
[2] *Rates are based on official census data and intercensal estimates prior to 2000. Rates since 2000 are based on 2000 census data.*

Clinical Trends

Improvements in TB control activities in NYC over the last decade — including better case detection, the widespread use of DOT, standardized four-drug treatment and universal case management of TB patients, and the prevention of TB among HIV-infected persons and others at high risk of developing TB — contributed to the decrease in the number of patients with TB and the shift in the clinical picture. This is reflected in disproportionately large decreases in these risk groups, as described below.

Since 1992:

- The proportion of TB patients who had acid-fast bacilli (AFB) positive sputum smears declined, from 48.7% in 1992 to 37.6% in 2004. The proportion of patients with culture-positive TB decreased from 90.3% in 1992 to 76.8% in 2004 (Table 1). Both trends reflect enhanced case detection efforts and increased diagnosis of culture-negative and extrapulmonary TB. The absolute number of patients with smear-positive TB and those with culture-positive TB declined by 79% and 77%, respectively.
- The number of deaths due to TB decreased significantly, from 200 in 1992 to 30 in 2004 (Table 1). This statistic is an indicator of the effectiveness of case detection, management, and treatment.
- There were 95.9% fewer patients with multidrug-resistant tuberculosis (MDR-TB, resistant to at least isoniazid and rifampin) and 73.5% fewer patients with other drug resistance patterns (Table 1). The proportion of MDR-TB patients among patients with no history of prior treatment, suggesting primary drug resistance, decreased in both U.S. and non-U.S.-born persons. This decrease is likely attributable to the successful TB control measures listed above, as well as the use of legal interventions as needed to ensure treatment completion (Figure 6A).
- No specific trend was seen among patients with ODR-TB when analyzed by history of prior TB treatment (Figure 6B).
- The proportion of patients receiving treatment under DOT increased from 31.0% in 1992 to 74.2% in 2004 (Figure 7).

Figure 3

Tuberculosis Cases and Rates by Age Group
New York City, 1992–2004

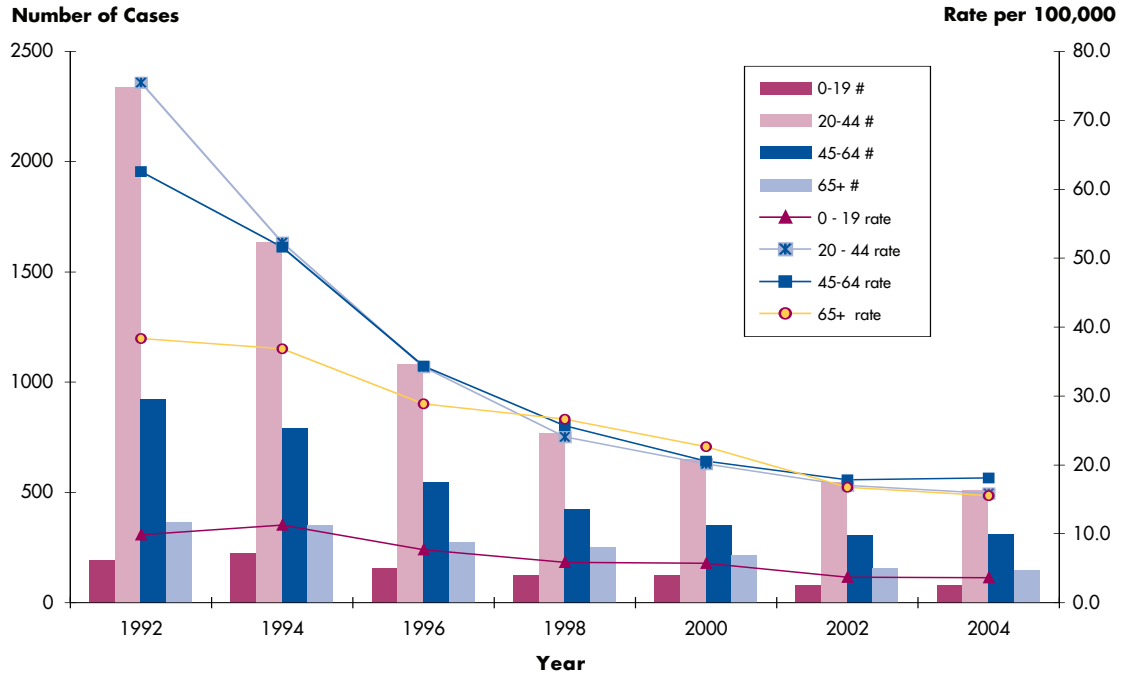


Figure 4

Tuberculosis Cases and Rates by Race/Ethnicity
New York City, 1992–2004

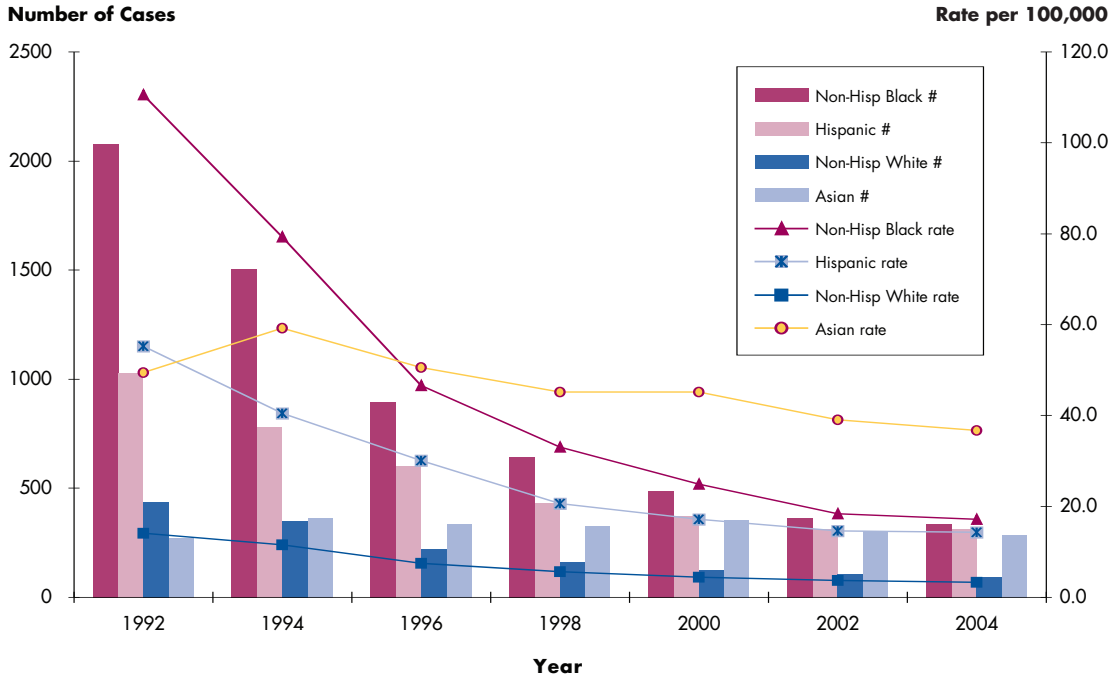
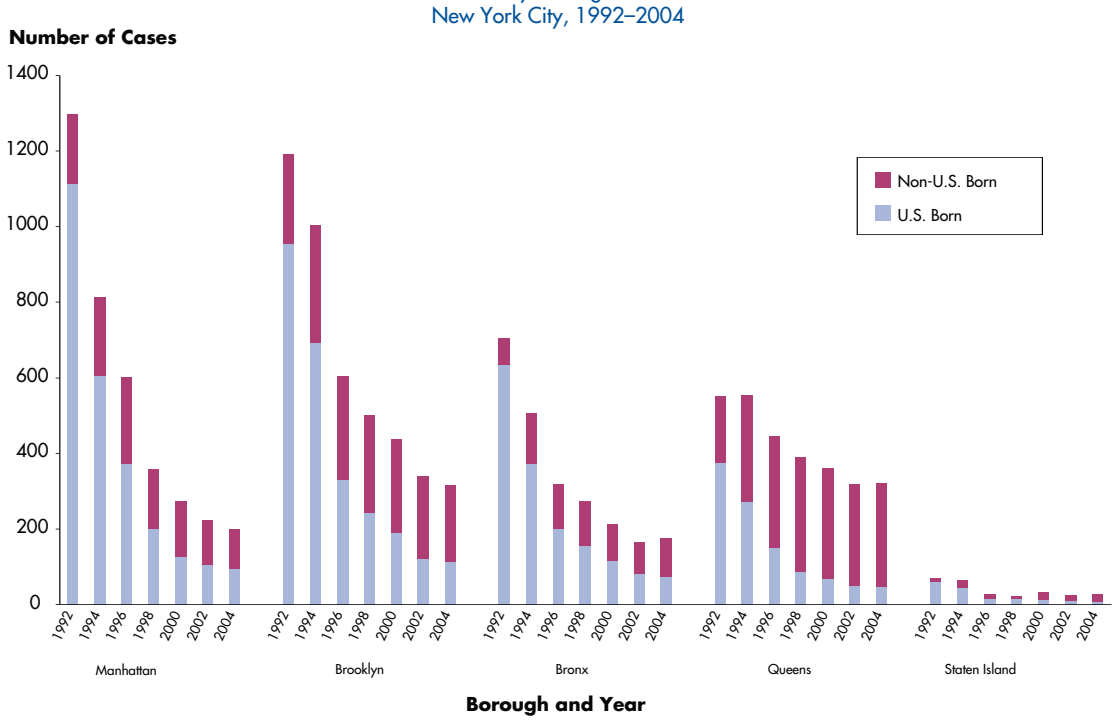


Figure 5

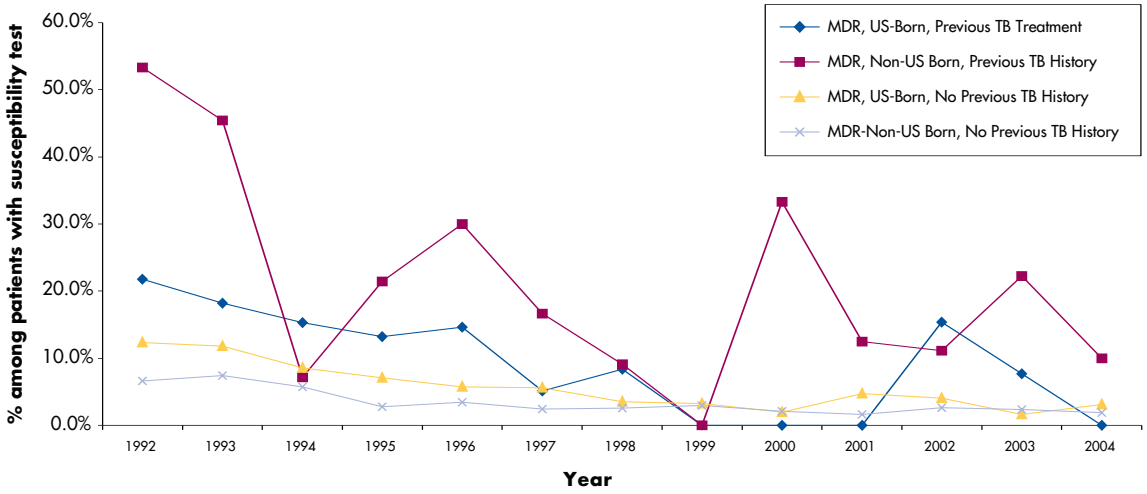
Tuberculosis Cases by Borough and Area of Birth[1]
New York City, 1992–2004



[1] *Puerto Rico and U.S. Virgin Island are included as U.S.-born.*

Figure 6A

Multidrug Resistance[1] (MDR) by Area of Birth and History of Previous TB Treatment[2]
New York City, 1992–2004

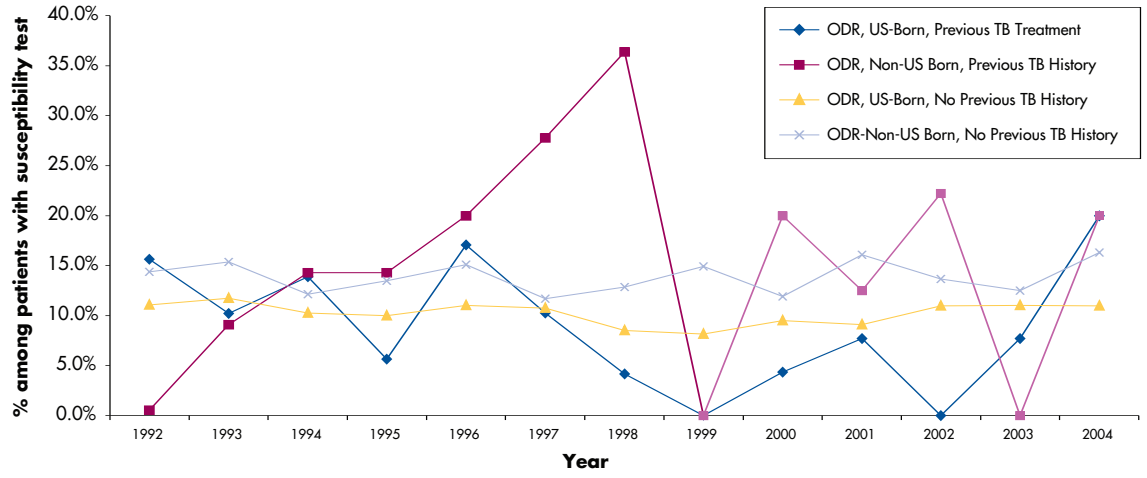


[1] *MDR is defined as isolates resistant to at least Isoniazid and Rifampin.*

[2] *Patients with a history of prior tuberculosis treatment include those who received two or more anti-tuberculosis drugs for confirmed or suspected TB in the past.*

Figure 6B

Other Drug Resistance[1] (ODR) by Area of Birth and History of Previous TB Treatment
New York City, 1992–2004

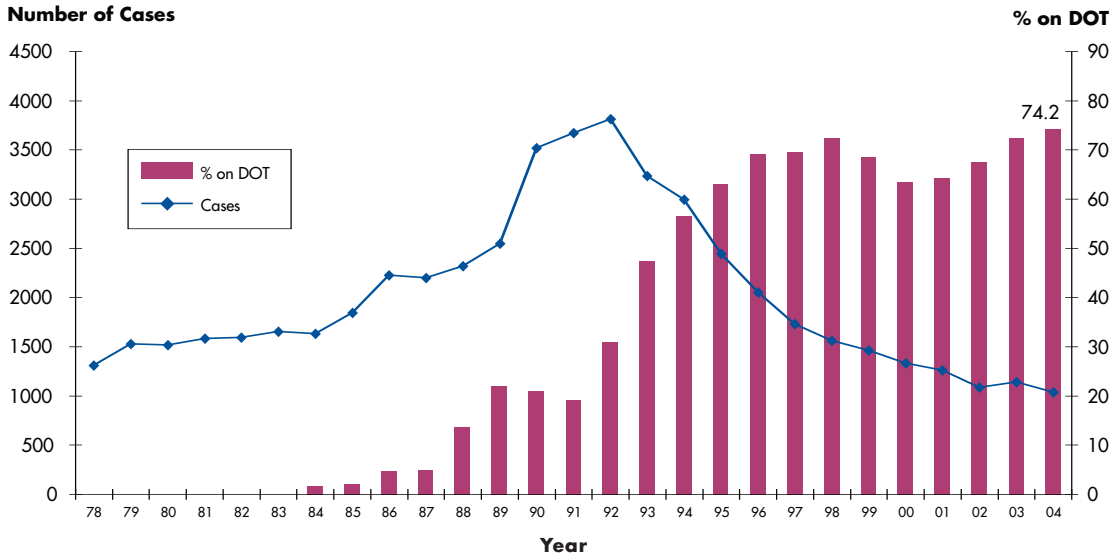


[1] *ODR is defined as isolates resistant to other first line drugs but not MDR.*

[2] *Patients with a history of prior tuberculosis treatment include those who received two or more anti-tuberculosis drugs for confirmed or suspected TB in the past.*

Figure 7

Tuberculosis Cases on Directly Observed Therapy[1]
New York City, 1978–2004



[1]*Of those who were diagnosed while alive and received treatment with two or more drugs on an outpatient basis.*

More Residents at Increased Risk

In 2004, the NYC TB rate of 13.0 per 100,000 remains above the national average of 4.9 per 100,000, despite a marked decline since 1992. A likely explanation for the higher NYC rate is the large number of NYC residents at increased risk for exposure to *M. tuberculosis* or disease progression once infected. These high-risk residents include immigrants from countries with a high-incidence of TB, homeless individuals, and persons with HIV infection. Increased efforts are needed to detect LTBI in these high-risk groups and to provide treatment for the prevention of active disease.

While NYC has a high burden of tuberculosis, outcome measures, such as treatment completion rate, are similar to or exceed national averages. In 2001 (the most recent year for national data), 85% of eligible NYC patients had a treatment completion rate within 1 year, compared with 80% nationally.

Epidemiologic Profile

Demographic Characteristics and Country of Birth

The rates of TB in NYC are higher among men and nonwhite persons, while rates vary greatly by age and area of birth within population subgroups.

In 2004:

- The highest TB case rates were among Asians — 36.7 /100,000 (Table 4).
- Close to half (49.1%) of patients diagnosed with TB were aged 20–44 years. Among U.S.-born persons, only 32.1% of patients were 20–44 years of age (Table 5); 57.1% of non-U.S.-born persons were in this age group.
- Approximately 60% of U.S.-born and non-U.S.-born TB patients were male (Table 5).
- Non-Hispanic blacks comprised 58.0% of U.S.-born patients, but only 20.3% of non-U.S.-born persons with TB. Conversely, only 1.8% of U.S.-born patients were Asian versus 39.7% of non-U.S.-born patients (Table 5).
- The main countries of birth for non-U.S.-born patients were China, the Dominican Republic, Ecuador, Haiti, India, Mexico, the Philippines, Pakistan and South Korea. Patients from the Caribbean and Latin America accounted for 30% of all TB patients in 2004 (Table 6).
- Over half (55.8%) of non-U.S.-born patients had been in the U.S. for more than five years before being diagnosed with TB (Table 5).

Geographic Distribution

NYC neighborhoods with a large number of residents from countries endemic for TB or high HIV rates are disproportionately burdened with TB.

In 2004:

- Queens, the borough with the highest proportion of non-U.S.-born residents, had the most TB cases — 320 (30.8%). Brooklyn followed closely with 314 (30.2%) cases (Table 5).
- United Hospital Fund (UHF) neighborhoods that had TB rates more than 20/100,000 included: West Queens (26.8/100,000), Central Harlem (24.5), East Harlem (24.1), and Sunset Park (22.4) (Table 2, Figure 8).

Social Characteristics

Homeless persons, residents of long-term care and correctional facilities, alcohol and drug users, health care workers, and correctional employees are at increased likelihood of contracting TB. In addition, they are more likely to expose vulnerable populations if they develop active disease.

In 2004:

- Of patients confirmed with TB, 6.4% were homeless at the time of diagnosis or during treatment (Table 5).

- Residents of long-term care facilities made up 1.0% of confirmed TB cases, while patients residing in correctional facilities accounted for 2.0% of cases.
- The rates of injection drug use, non-injection drug use, and alcohol abuse in the 12 months prior to diagnosis were 1.5%, 5.9%, and 15.7% respectively.
- Less than half (41.6%) of patients with TB were employed during the 24 months before their TB diagnosis.
- Health care workers accounted for 4.4% of TB cases; 0.1% of TB patients were correctional employees.

Clinical Profile

Disease Presentation and Diagnosis

Although *M. tuberculosis* can infect any part of the body and active disease can have a varied clinical picture, most patients with active disease have pulmonary TB. While many patients do not have positive acid-fast bacilli (AFB) smears during the course of disease, most have culture-positive TB.

In 2004:

- TST results were available for 834 (80.3%) patients; 81.7% of non-U.S.-born patients received a TST, compared to 77.2% of U.S.-born patients. Of patients tested, 686 (78%) had a positive result.
- Less than half (37.6%) of patients had a sputum smear-positive for AFB, while 76.8% of patients had culture-confirmed TB (Table 5).
- 65.7% of patients had pulmonary TB, while 11.2% had both pulmonary and extrapulmonary disease; 23.1% had extrapulmonary TB with no evidence of pulmonary involvement (Table 5, Figure 9).
- The primary site of disease for the majority of patients was pulmonary (72.8%), followed by the lymphatic system (10.5%) (Figure 9).
- MDR-TB was confirmed in 18 (2.3%) patients using drug susceptibility tests; other drug resistance patterns were detected among 117 (14.9%) patients (Tables 5, 7).

Disease Diagnosis, Treatment and Outcome

- Most TB patients (891, 87.8%) were initially treated with four or more first-line anti-TB drugs; 24 (2.3%) did not start anti-TB treatment.
- Of eligible patients, 686 (74.2%) were treated under DOT; most eligible MDR-TB patients (11, 84.6%) were treated via DOT (Figure 10).
- Of patients confirmed with TB in 2003, 86.5% completed treatment in 1 year or less, with an additional 5.2% completing treatment in over a year. The overall treatment completion rate was 91.7% (July 2005) (Figure 11).
- Based on vital record data, 30 patients had TB as the underlying cause of death in 2004.

Nucleic Acid Amplification Tests

Nucleic acid amplification (NAA) tests are major tools in the rapid diagnosis of TB. While it may take several weeks to get standard TB culture results, NAA test results are generally available in two to three days.

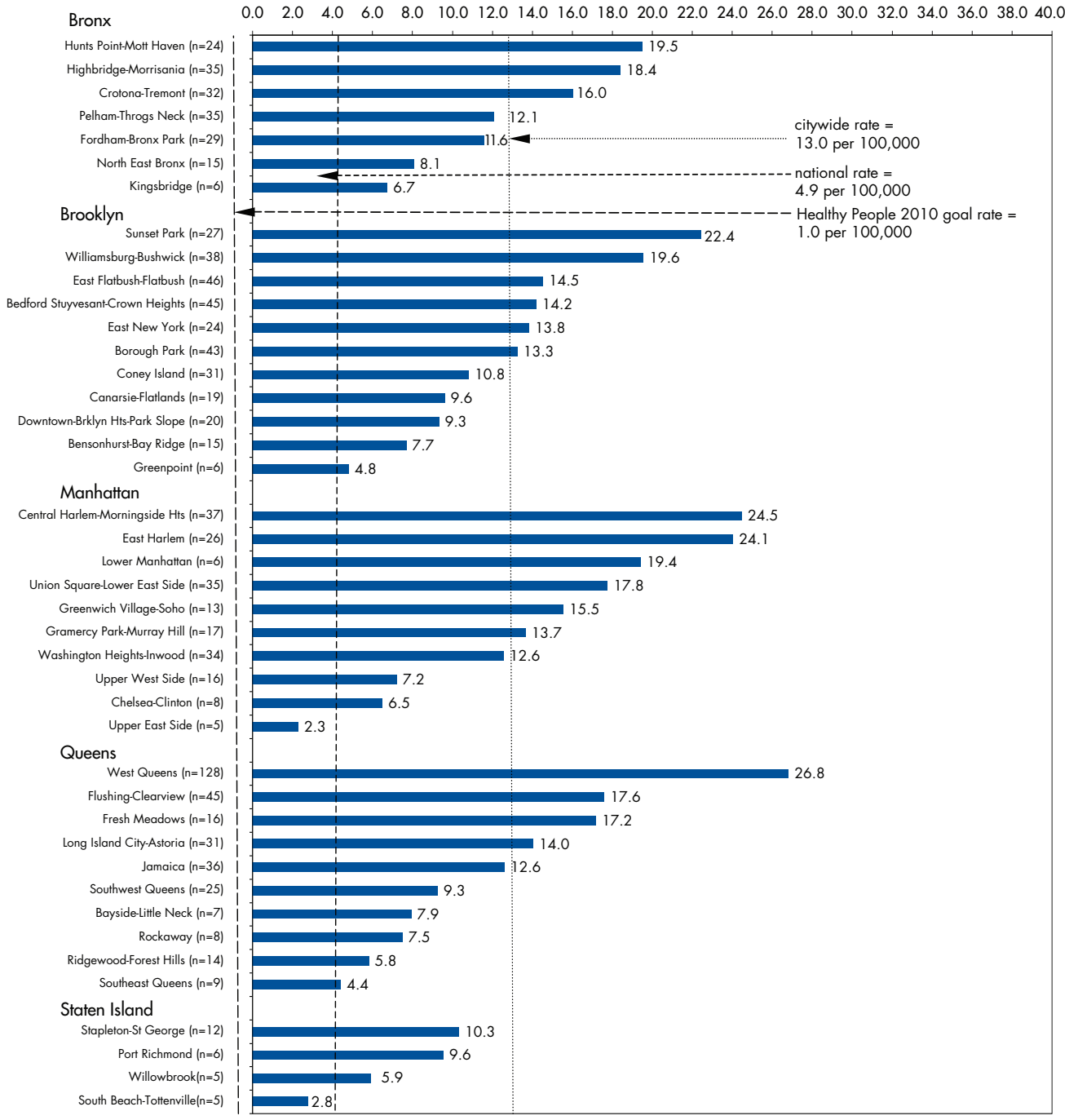
- Use of NAA tests was approved by the Food and Drug Administration (FDA) for respiratory specimens during the 1990s.
- During 2004, 391 (33.8%) patients had NAA tests performed. Of patients with sputum smear-positive TB, 287 (73.4%) had NAA tests. Of those, 95.1% were NAA positive.

Providers should order NAA tests for the following patients:

- Those who have AFB-positive sputum smears.
- Those who are sputum smear-negative, but strongly suspected clinically of having pulmonary TB.

Figure 8

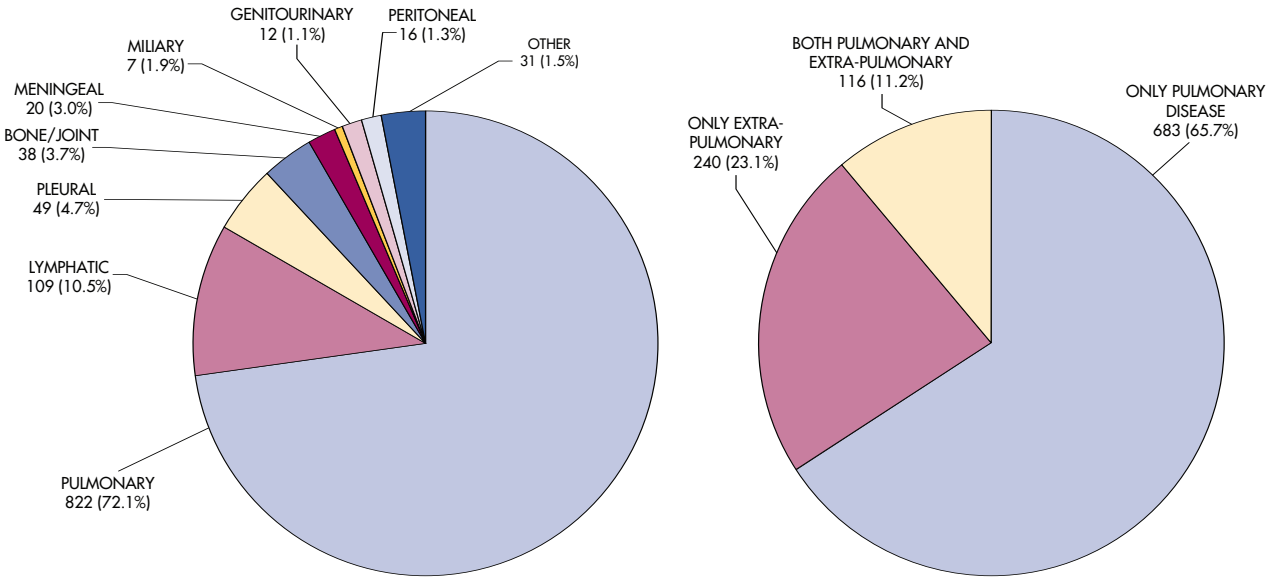
Rates of Tuberculosis by United Hospital Fund Neighborhood[1]
New York City, 2004



[1]*Number of tuberculosis cases and rate per 100,000 population, by United Hospital Fund neighborhood (sorted highest to lowest by rate within each borough), based on 2000 census. Caution should be used in interpreting case rates with a small number of cases.*

Figure 9

Tuberculosis Cases by Site of Disease (N=1039)
New York City, 2004

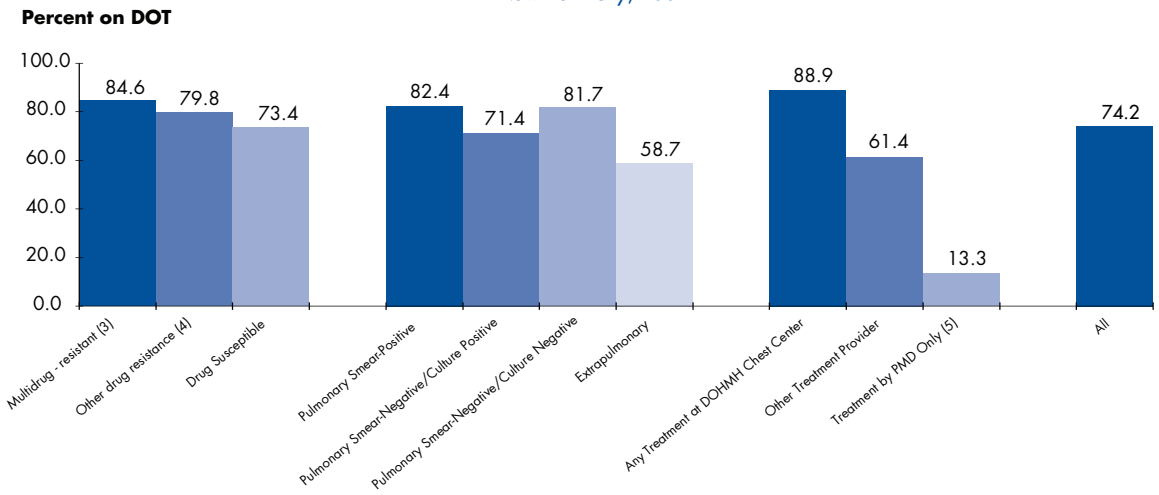


Tuberculosis Cases by Primary Site of Disease

Tuberculosis Cases by All Sites of Disease

Figure 10

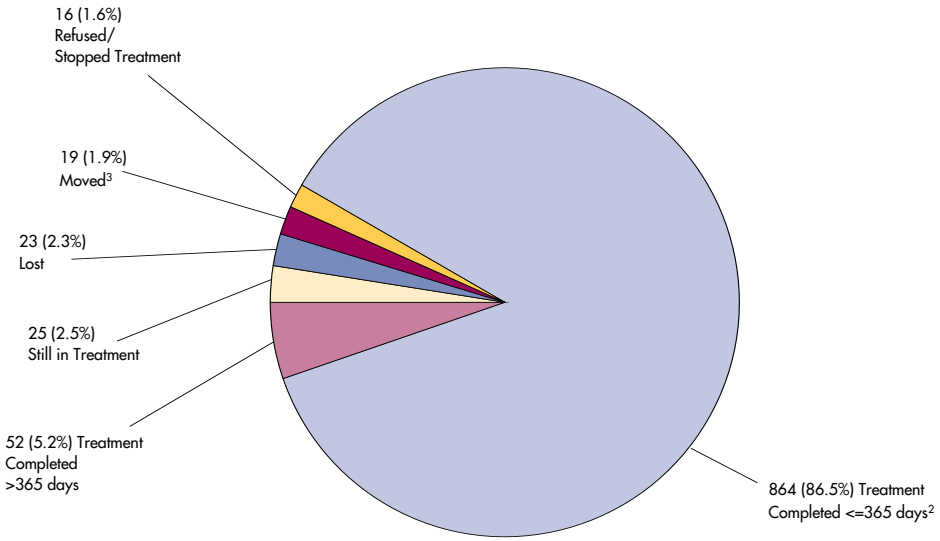
Proportion of Eligible[1] Tuberculosis Patients on DOT[2]
New York City, 2004



[1] Eligible patients were those diagnosed while alive and who received treatment with two or more anti-tuberculosis drugs on an outpatient basis. [2] Ever on DOT as of March of the year after being confirmed as a case of tuberculosis. [3] Multidrug-resistant is defined as resistant to at least rifampin and isoniazid. [4] ODR is defined as first-line anti-TB drug resistance other than MDR. [5] PMD=Private medical provider.

Figure 11

Treatment Completion for Active Cases Counted in 2003 (N=999[1])
New York City, 2004



[1] *Denominator excludes patients found not to have TB; those who died; those who never started anti-tuberculosis therapy; and those for whom more than 365 days of treatment is indicated (those under 15 years of age with bone, miliary, or meningeal TB, and those initially resistant to rifampin). In 2003, 71 (6.2%) cases were either reported at death or died before completing treatment. This leaves 999 patients eligible for treatment completion calculation. Data are as of April 29, 2005.*

[2] *Currently recommended treatment regimens for most patients can be completed within 365 days.*

[3] *Patients are categorized as moved only if their transfer to another jurisdiction is confirmed and no further follow-up information is available.*

Tuberculosis Control Activities, 2004

Continuing Control Efforts

A leader in TB control since the 1890s, the Bureau today is involved in all phases of disease detection, prevention, and control — from testing to the provision of directly observed therapy.

The Bureau's main functions are to:

- Provide case management and conduct contact investigations for all NYC TB patients, including those treated by non-DOHMH providers.
- Provide testing and treatment for latent and active TB at 10 Chest Centers.
- Monitor TB incidence, treatment, and clinical presentation to detect outbreaks and other important trends.
- Educate health care providers and the general public about key TB control issues and policies.
- Engage in research to ensure that the Bureau operates in an effective and efficient manner.
- Disseminate findings of research and evaluation activities.
- Assist organizations that serve populations at risk to better detect and treat TB.

Testing and Treatment

The Bureau operates 10 Chest Centers staffed with board-certified physicians, nurses, and non-clinical personnel. Chest Centers provide free TB testing and state-of-the-art treatment to all patients. Services include TB screening, TSTs, chest X-rays, sputum induction, medical and nursing care for active and latent TB, social services, and HIV counseling and testing.

At Chest Centers in 2004:

- 36,177 patients were seen during 122,674 visits.
- 20,140 TSTs were performed.
- 13,733 chest X-rays were performed and interpreted.
- 488 patients with active TB received care. BTBC physicians diagnosed 91 patients, while 397 were diagnosed by outside providers and later referred to a Chest Center for treatment.
- HIV rapid testing was piloted at 1 Chest Center and will be implemented at all sites in 2005.
- 2,996 patients received HIV counseling, 2,542 patients were tested for HIV, and 41 HIV-positive patients were identified.
- 5,827 patients began treatment for LTBI.
    - 1,949 (33.4%) of these patients completed treatment as of July 15, 2005.
    - 1,765 patients are still undergoing treatment.
    - 3,395 (47.9%) of 7,089 patients who started LTBI treatment in 2003 completed treatment by July 15, 2005.

Case Management and Contact Investigation

Case management and contact investigation, when indicated, are conducted for all NYC patients with confirmed or suspected tuberculosis. These services are provided for DOHMH patients through Chest Centers, or through outreach staff members when patients are under the care of non-DOHMH providers.

Contact investigations involve the identification, testing, and, if necessary, treatment of people who have close associations with patients who have pulmonary or laryngeal TB. If more than 15 contacts are identified — as is often the case if the patient is a student, or lives or works in a congregate setting — an expanded contact investigation (ECI) is performed. A specialized BTBC unit trained to conduct large-scale investigations in congregate settings conducts all ECIs.

Case management for TB includes:

- Extensive patient interviews
- Collection of information about diagnostic procedures and treatment

Free Services Offered Through the Bureau

- Tuberculosis testing and treatment at 10 Chest Centers.
- Case management for all patients with TB, regardless of medical provider. Case management includes patient education, treatment oversight, return of non-compliant patients to care, provision of directly observed therapy, and contact investigations. BTBC physicians are on call during work hours for consultation on all aspects of TB management.
- Medications for all patients enrolled in a state-approved DOT program.
- Evaluation of new immigrants in need of TB care and follow-up.

- Treatment oversight
- Assurance of patient adherence to treatment
- Provision of DOT
- Use of legal interventions to increase adherence to treatment when patients fail to comply with other case management efforts
- Transfer of medical data to and from NYC and other jurisdictions

In 2004:

- BTBC outreach staff members conducted 1,488 patient interviews and evaluated 3,374 contacts; 3,404 contacts were implanted with initial TSTs.
- The Office of Epidemiology conducted 29 ECIs. During these investigations, 1,666 contacts were tested; 498 other individuals requested testing (Table 8).
- Of 605 patients confirmed with TB in 2004 and for whom a contact investigation was indicated, 5337 contacts were identified. Of those, 4386 were evaluated and 1259 were TST-positive; 866 were started on LTBI treatment and 382 (44%) completed treatment, as of August 2005.
- Of contacts to 2003 cases with latent TB infection TB, 80.7% were started on LTBI treatment; 64.0% completed treatment by August 2005.
- Of eligible patients treated by BTBC providers at some point during the course of their illness, 88.9% (432) were on DOT.
- The BTBC interstate coordinator referred 502 patients from NYC to other jurisdictions and processed 181 patients referred from other jurisdictions to NYC. These patients included persons confirmed and suspected of having TB, contacts of active TB cases, and patients with LTBI.
- The Bureau finalized guidelines for TB patient discharge and hospitalization.
- The Bureau conducted a case management evaluation funded by CDC. The evaluation was a follow-up to a 2002 evaluation that confirmed anecdotal evidence of lapses in case management practices. Interventions undertaken as a result of the 2002 evaluation focused on training for frontline staff members and supervisors. The training included updates of expectations and highlights of areas for improvement. The 2004 evaluation found mixed outcomes — while patient education practices improved, supervision and timeliness of case management activities remained poor. A survey of non-DOHMH TB providers showed a lack of awareness of BTBC case managers' responsibilities, poor knowledge of the Bureau's role, poor utilization of BTBC services, and serious knowledge gaps concerning BTBC case management and TB reporting procedures. Important interventions are underway in all these areas.

Surveillance, Outbreak Detection, and Reporting

To facilitate the provision of case management services and the monitoring of TB epidemiologic trends, the Bureau maintains a registry of all patients reported since 1982. The registry includes patient demographic and social information, tuberculosis history, diagnostic tests results, and treatment type and scheduling. In addition, the Bureau maintains one of the largest TB molecular epidemiology databases in the country. This database is used to assess the extent and dynamics of *M. tuberculosis* transmission.

Completeness of TB reporting is strengthened through active surveillance by BTBC staff members at hospital infection control departments and laboratories. In addition, BTBC engages in continuous provider education and follow-up.

Data is shared with a number of key parties, including CDC, New York State DOH, BTBC staff members, health care providers, and the general public. CDC is notified weekly of new case information, multiple reports are produced on a monthly basis for BTBC staff members, and annual reports are made available to providers and the public. Data not available from these sources are provided upon request.

In addition to accomplishments listed in the executive summary, in 2004:

- 42 health care workers diagnosed with TB were evaluated for employment history and prior TB history. Of those, 18 (42%) were employed in hospitals, 12 (29%) worked in home health care agencies, 7 (17%) in outpatient health care facilities, 4 (10%) in nursing homes and 1 (2%) in a residential facility for developmentally disabled persons. Health care workers who had a prior history of TB or a positive TST at the time of employment accounted for 33 (79%) cases. While 1 health care worker had MDR-TB, 4 had disease with organisms resistant to isoniazid alone.
- BTBC staff members responded to 17 formal requests from outside researchers for registry data.
- The Bureau conducted 86 investigations of potential false-positive cultures; 22 cultures were proven to be false positive due to errors in either laboratory procedures or specimen handling. As a result, 15 patients were ultimately found not to have TB.
- Provider education about the importance of complete and timely reporting continued through educational sessions, late reporting follow-up, and an annual letter with updated reporting instructions.
- The Bureau worked with DOHMH Bureau of Informatics and Data Services staff members to certify laboratories for electronic TB reporting. By law, all laboratories must use this type of reporting by June 2006. To date, 2 NYC laboratories have been certified for electronic TB reporting.

Education and Training

The Bureau provides TB-related training for its staff members and NYC health care providers, as well as education sessions for the public.

In 2004:

- BTBC physicians conducted 30 medical grand rounds for the medical community on TB and LTBI. More than 200 health care providers attended the BTBC annual TB seminar.
- A protocol was developed to provide standardized TST certification for DOHMH and non-DOHMH staff members.

Mycobacterium bovis Health Alert

In New York City, universal genotyping of all culture-positive TB cases began in 2001. Since then, 35 cases of TB due to *Mycobacterium bovis (M. bovis)* have been identified, involving 22 adults and 13 children. Of the adult patients, 19 were Mexican-born, 2 were born in the Dominican Republic, and 1 in Guatemala. Of the children, 11 were U.S.-born of Mexican parents, 1 was born in Mexico, and 1 was born in Guyana. Seven cases occurred in children who were younger than 6 years old; the children were born in the United States of Mexican-born parents. One 15-month-old child with *M. bovis* peritonitis died in March 2004 from complications of the disease.

M. bovis is most commonly acquired through consumption of unpasteurized dairy products. The disease is not expected in U.S.-born children because they usually do not have access to unpasteurized dairy products. In New York State, dairy products sold in retail stores are pasteurized, and cattle are not infected with *M. bovis*. Due to the unexpected presence of disease due to *M. bovis* among U.S.-born children, NYC DOHMH conducted an investigation of *M. bovis* disease in NYC. No person-to-person linkages that would allow airborne transmission of *M. bovis* infection were discovered between affected individuals. Of the 23 patients interviewed, 19 (83%) reported eating cheeses produced in Mexico while they were living in the United States, including 4 (80%) of the 5 children younger than 5 years old. Eighteen persons (78%) did not know if the dairy products they consumed were pasteurized.

The investigation found that the cheeses consumed could have been obtained from several sources: a courier agency bringing Mexican products to NYC, a visitor carrying food in luggage, a Mexican specialty grocery store, and a door-to-door vendor. Consumers should avoid eating cheese that is not labeled or does not have the word "pasteurized" stated clearly on the label.

- TST certification training was given to 46 health care workers, including 36 DOHMH and 10 non-DOHMH staff members.
- Education and training staff members conducted 25 educational sessions for non-DOHMH physicians, nurses, counselors, and case managers.
- TB education for patient contacts was provided at more than 20 sites for more than 800 people.
- Basic TB educational sessions were conducted at 28 sites for more than 1,800 people.
- BTBC staff members participated in the development of a cohort review training manual and course with CDC. The educational materials provide instruction on the systematic case review process in place at the Bureau. Public health workers around the country are now using the training materials.
- The Bureau distributed 306,554 culturally targeted educational materials in various campaigns.

Research

BTBC staff members routinely engage in research on a number of topics relevant to the control and prevention of TB. Results are shared internally, at conferences, and through peer-reviewed journals. The Bureau co-authored 2 papers published in peer-reviewed journals, submitted 9 manuscripts for publication, and presented 13 posters at national and international conferences.

In 2004, the Bureau:

- Monitored and analyzed TB prevalence in homeless persons

A match between TB cases reported during 2001–2003 and the Department of Homeless Services' (DHS) single male and family databases was performed to determine TB prevalence rates in the homeless population. Thirty-three known TB cases were newly identified as having a history of homelessness. The cases were distributed across the 3 years: 14 cases were diagnosed in 2001, 9 in 2002, and 10 in 2003. Age-adjusted TB rates in the family shelter population were similar to that of the general NYC population. However, TB case rates among DHS single adult shelter residents were almost 10 times higher than the NYC population. Matching between the TB registry and DHS databases will continue quarterly.

- Examined and profiled differences in two large *Mycobacterium tuberculosis* genotype clusters (NYC, 2001–2003)

The two largest genotype clusters associated with outbreaks among homeless persons in NYC during 2001–2004 were examined. The cluster of TB cases due to the Cs30-strain was composed of 105 patients, 51 (49%) of whom were homeless, while the BEs75-strain cluster contained 47 patients, 28 (60%) of whom were homeless; 44 (42%) Cs30-strain case-patients compared to 35 (74%) BEs75-strain case-patients were HIV-infected. Homeless Cs30-strain patients were less likely to be respiratory AFB smear-positive and HIV-infected compared to homeless BEs75 cases. TB caused by BEs75-strains was more likely to be the result of continuing transmission while disease caused by Cs30-strains was more likely to be due to re-activation from infection acquired during the epidemic period during the early 1990s.

- Reviewed necessity of TB hospitalizations

The objective of the study was to determine factors associated with initial TB hospitalization in NYC and the proportion of admissions that could have been avoided. Patients with TB confirmed during April–June 2003 were interviewed and medical records reviewed. Of 315 patients with confirmed TB and hospitalization information, 226 (72%) were initially admitted for evaluation and treatment of TB. Based on patients' characteristics and admitting diagnoses, approximately one-third of hospitalizations did not appear justified.

- Identified missed opportunities for TB prevention

The study was undertaken to evaluate the use of currently recommended prevention strategies; specifically, it sought to determine the proportion of TB cases that could have been prevented. The study sample included all tuberculosis cases confirmed during April–June 2003. Of 316 patients enrolled in the study, 218 were interviewed. Of 39 patients eligible for screening with a TST or a chest radiograph, 26 (67%) were screened and 12 (46%) had a positive TST or abnormal findings on chest radiograph. Of patients diagnosed with latent TB, 7 (58%) were treated for LTBI and only 3 (43%) completed treatment. In summary, 13 (33%) patients eligible for TB screening were not tested and 9 (75%) patients with a positive TST did not complete their course of therapy. More TB cases could potentially be prevented if all eligible patients were screened for latent TB and treated adequately when infected.

Collaboration with Other Organizations

The Bureau collaborates with other offices within NYC DOHMH, other city agencies, and non-governmental organizations that serve communities at high-risk for TB. The nature of the collaboration is organization dependent and includes identification of patients with active or latent TB, various aspects of case management, treatment oversight, and the direct provision of treatment.

In 2004, the Bureau collaborated with the following offices and organizations:

The NYC DOHMH Office of Correctional Health

BTBC staff members assigned to the Riker's Island correctional facility provide TB-related services to inmates. These individuals perform surveillance activities, educate and interview TB suspects and cases, and serve as liaisons between prison health providers and the Bureau.

- 86 patients confirmed or suspected to have TB were reported to the Bureau; 13 were confirmed to have TB.
- 31 TB patients received care and treatment at Riker's island.
- The Bureau worked with Correctional Health staff members to develop new TB screening procedures at Riker's Island.

Selected single-room-occupancy hotels (SROs)

BTBC staff members provided DOT for patients with active TB and for HIV-infected patients with LTBI. The Bureau screens new SRO residents for TB via onsite TST screening and referrals to Chest Centers, and ensures that eligible patients receive appropriate treatment.

- 771 individuals were screened for TB, 589 TSTs were implanted, and 30 individuals tested positive.
- BTBC staff members provided DOT for 61 persons with active TB or LTBI.

The Department of Homeless Services

The Bureau ensures screening and treatment of homeless individuals, as well as education and screening of employees.

30th Street Men's Shelter's TB unit — provides comprehensive TB treatment excluding laboratory and radiology services.

- 71 men lived in the unit, 25 received medical services for active TB, and 46 for latent TB.

Kingsboro Shelter — provides TB case management, TSTs, and DOT for LTBI.

- 117 persons were screened for TB, 110 were eligible for TSTs, and 79 received a TST.

The Shelter Employee TB Screening Project — employees receive TB education and TSTs.

- 218 employees at the 30th Street Men's Shelter and Atlantic assessment facility received TSTs; 2 were found to have positive results.
- In a rollout of the program to 41 additional homeless facilities, 89 educational sessions were held for 826 shelter employees. 565 employees were screened for TSTs and 263 persons received TSTs.

The United States Public Health Service, Division of Quarantine at JFK International Airport

The Bureau ensures that all immigrants and refugees entering the United States through the port of New York with a TB diagnosis receive appropriate treatment.

- 284 notifications of immigrants or refugees needing follow-up were processed.
- 263 of these persons were located and evaluated; 13 patients were diagnosed with active TB.

Various school and community health centers

Through its pharmacy support program, the Bureau provides free tuberculin solution, syringes, and TB medications for LTBI treatment. The goal is to support targeted testing and treatment of high-risk populations.

- 2697 persons were given TSTs.
- 919 persons were treated for LTBI.

Health and Hospital Corporation medical centers

Currently, the Bureau contracts with various HHC facilities to aid in TB testing and provision of LTBI treatment in high-risk patients. These services are provided by Elmhurst, Lincoln, and Harlem Hospitals, and the Center for Immigrant Health via a contract with Bellevue/NYU.

- 1,138 patients were started on treatment for latent TB at these facilities or at Chest Centers.

Table 1: Tuberculosis Incidence, New York City, 1920–2004

Year	Number[1,6]	Rate per 100,000[2]	Culture-Positive Cases	Sputum Smear-Positive Cases[3] (Rate per 100,000)		Multidrug-Resistant Cases[4,8]	Other Drug Resistant Cases[5,8]	TB Deaths[9] (Rate per 100,000)	
1920	14,035	246.9						7,915	(144.1)
1930	11,821	170.2						4,574	(68.2)
1940	9,005	120.8						3,680	(50.0)
1950	7,717	97.8						2,173	(27.4)
1960	4,699	60.4						824	(10.6)
1970	2,590	32.8						432	(5.5)
1971	2,572	32.9						316	(4.0)
1972	2,275	29.4						335	(4.3)
1973	2,101	27.5						259	(3.4)
1974	2,022	26.7						215	(2.8)
1975	2,151	28.7						208	(2.8)
1976	2,151	29.1						187	(2.5)
1977	1,605	21.9						175	(2.4)
1978[6]	1,307	18.1						188	(2.6)
1979	1,530	21.4						121	(1.7)
1980	1,514	21.4						143	(2.0)
1981	1,582	22.3						155	(2.2)
1982	1,594	22.4						168	(2.4)
1983	1,651	23.1						151	(2.1)
1984	1,629	22.7	1,527					168	(2.3)
1985	1,843	25.6	1,785					155	(2.2)
1986	2,223	30.8	2,181					186	(2.6)
1987	2,197	30.3	2,157					219	(3.0)
1988	2,317	31.9	2,241					246	(3.4)
1989	2,545	34.9	2,405					236	(3.2)
1990	3,520	48.1	3,372					256	(3.5)
1991	3,673	49.7	3,484	1,772	(24.0)	366		245	(3.3)
1992	3,811	51.1	3,442	1,856	(24.9)[7]	441	442	200	(2.7)
1993	3,235	43.0	2,854	1,526	(20.3)	296	328	166	(2.2)
1994	2,995	39.4	2,479	1,265	(16.7)	176	245	133	(1.8)
1995	2,445	31.9	2,014	989	(12.9)	109	216	94	(1.2)
1996	2,053	26.5	1,721	837	(10.8)	84	216	67	(0.9)
1997	1,730	22.2	1,401	665	(8.5)	56	162	55	(0.7)
1998	1,558	19.8	1,255	558	(7.1)	38	135	52	(0.7)
1999	1,460	18.4	1,143	515	(6.5)	34	131	49	(0.6)
2000	1,332	16.6	1,066	467	(5.8)	25	114	44	(0.5)
2001	1,261	15.7	964	453	(5.7)	24	129	33	(0.4)
2002	1,084	13.5	823	429	(5.4)	27	102	30	(0.4)
2003	1,140	14.2	872	427	(5.3)	21	103	34	(0.2)
2004	1,039	13.0	798	391	(4.9)	18	117	30	(0.4)

[1] *For "phthisis," or pulmonary cases, 1920–1940; thereafter, all forms of tuberculosis.*

[2] *Rates through 2000 are based on official census population data and intercensal estimates. Rates since 2000 are based on 2000 census data.*

[3] *Patients with a sputum smear positive for acid-fast bacilli regardless of culture result and regardless of site of disease.*

[4] *Resistant to at least isoniazid and rifampin. Mandatory drug susceptibility reporting became effective during 1991; figure from that year is not complete.*

[5] *Resistant to other first first line drugs, but not multidrug resistant.*

[6] *Case definition revised in 1978 to include persons who had verified disease in the past and were discharged or lost to supervision for more than 12 months and had verified disease again.*

[7] *This information was estimated for 1992, exact figures are not available.*

[8] *Definition for 'Other Drug Resistant Cases' changed in 2004 to include all non-MDR cases with a resistant result reported for a first-line drug, regardless of methology. All historical data updated to reflect this definition.*

[9] *TB deaths are obtained from vital statistics records and may include cases diagnosed in previous years.*

Table 2: HIV Status of Tuberculosis Cases by Sex and Area of Birth, New York City, 2004

Year	N (%)									
	Females HIV (+)		Males HIV (+)		U.S.-Born HIV (+)		Non-U.S.-Born HIV (+)		Total[1] HIV (+)	
1992	297	(25.1)	984	(37.4)	1294[2]	(42.6)	118	(16.5)	1281	(33.6)
1993	308	(27.5)	760	(35.9)	958	(38.4)	110	(14.9)	1068	(33.0)
1994	244	(23.5)	767	(39.2)	852	(42.9)	147	(15.4)	1011	(33.8)
1995	226	(25.4)	575	(37.0)	658	(46.9)	139	(13.8)	801	(32.8)
1996	204	(26.0)	429	(33.8)	490	(45.9)	124	(13.4)	633	(30.8)
1997	147	(21.8)	301	(28.5)	323	(39.4)	122	(13.8)	448	(25.9)
1998	108	(18.6)	238	(24.4)	250	(35.7)	96	(11.3)	346	(22.2)
1999	102	(18.3)	219	(24.3)	216	(35.7)	102	(12.2)	321	(22.0)
2000	74	(14.1)	167	(20.6)	159	(31.1)	77	(9.6)	241	(18.1)
2001	65	(13.3)	119	(15.4)	123	(29.9)	60	(7.2)	184	(14.6)
2002	57	(13.7)	136	(20.4)	129	(35.6)	58	(8.3)	193	(17.8)
2003	47	(11.1)	131	(18.3)	106	(30.0)	72	(9.3)	178	(15.6)
2004	52	(12.6)	117	(18.7)	99	(29.7)	70	(9.9)	169	(16.3)

[1] Total HIV infected cases may be more than the sum of U.S. and non-U.S.-born HIV infected cases because area of birth is unknown for some cases.
[2] Breakdown by the area of birth for 1992 is estimated, exact figures are not available.

Table 3: Tuberculosis Rates by United Hospital Fund (UHF) Neighborhood, New York City, 1994–2004

UHF Neighborhood	2004 cases	Rate per 100,000 population[1,2] 2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
BRONX	176	13.3	13.3	12.4	12.7	16.3	14.9	20.2	21.5	24.3	31.1	39.1
KINGSBRIDGE	6	6.7	7.9	17.5	6.7	16.9	11.2	9.0	8.9	15.6	8.9	24.5
NORTH EAST BRONX	15	8.1	6.5	16.4	5.4	7.5	7.1	11.0	10.0	6.2	11.5	20.3
FORDHAM-BRONX PARK	29	11.6	17.2	16.3	13.6	20.0	19.0	30.3	21.9	26.8	25.9	33.1
PELHAM-THROGS NECK	35	12.1	9.7	16.3	12.8	11.7	9.4	11.6	12.4	14.7	23.5	17.9
CROTONA-TREMONT	32	16.0	14.0	8.1	13.0	23.1	17.7	22.5	27.3	37.5	48.4	63.8
HIGH BRIDGE-MORRISANIA	35	18.4	22.7	6.7	17.4	21.1	20.3	31.3	36.0	35.9	55.8	68.9
HUNTS POINT-MOTT HAVEN	24	19.5	13.0	5.9	18.7	13.8	21.2	21.2	36.7	36.0	39.3	54.0
BROOKLYN	314	12.7	14.8	14.0	15.8	18.1	19.1	20.7	23.8	25.9	35.5	43.0
GREENPOINT	6	4.8	9.6	22.1	9.6	15.3	12.1	11.4	18.9	20.7	25.9	34.5
DOWNTOWN-BKLYN HEIGHTS-PARK SLOPE	20	9.3	12.1	19.1	15.4	15.4	17.2	13.0	20.9	23.2	28.8	38.1
BEDFORD STUYVESANT-CROWN HEIGHTS	45	14.2	18.6	18.6	18.0	23.6	24.9	40.5	40.9	47.0	65.9	77.8
EAST NEW YORK	24	13.8	11.5	15.3	16.7	15.0	24.9	20.4	18.8	28.4	45.3	64.9
SUNSET PARK	27	22.4	19.9	14.4	27.4	33.2	13.5	22.4	21.0	30.4	35.5	32.5
BOROUGH PARK	43	13.3	13.6	14.2	10.5	10.5	18.4	21.6	16.7	16.0	20.6	22.2
EAST FLATBUSH-FLATBUSH	46	14.5	18.6	11.5	18.9	31.3	23.3	23.0	29.8	28.2	42.9	52.5
CANARSIE-FLATLANDS	19	9.6	12.6	10.8	12.1	9.1	8.7	13.0	15.9	8.6	18.1	18.4
BENSONHURST-BAY RIDGE	15	7.7	8.7	10.5	10.8	13.4	14.0	11.0	11.1	10.7	14.6	14.8
CONEY ISLAND	31	10.8	10.5	9.1	12.9	11.5	16.9	12.8	17.2	14.8	19.3	23.1
WILLIAMSBURG-BUSHWICK	38	19.6	24.7	5.6	25.2	22.1	26.8	25.8	39.2	51.6	62.0	77.6
MANHATTAN	198	12.9	15.6	14.8	16.7	17.9	21.5	23.8	29.3	40.9	42.1	55.0
WASHINGTON HEIGHTS-INWOOD	34	12.6	19.6	31.1	17.7	19.2	24.1	28.7	28.9	48.7	34.1	45.7
CENTRAL HARLEM	37	24.5	21.2	20.8	20.5	28.5	38.6	46.7	52.3	82.2	93.4	101.4
EAST HARLEM	26	24.1	28.7	17.6	28.7	27.8	24.2	39.2	42.2	58.5	68.2	81.0
UPPER WEST SIDE	16	7.2	13.1	16.3	12.6	9.9	13.5	11.7	18.4	22.5	30.1	37.8
UPPER EAST SIDE	5	2.3	4.1	14.5	5.0	8.3	4.6	6.9	11.1	9.3	14.5	17.8
CHELSEA-CLINTON	8	6.5	10.6	11.4	23.6	16.3	22.7	17.8	34.0	52.6	44.4	67.8
GRAMERCY PARK-MURRAY HILL	17	13.7	19.3	9.7	15.3	20.1	19.4	22.7	26.8	33.4	44.2	63.2
GREENWICH VILLAGE-SOHO	13	15.5	9.6	8.6	16.7	19.1	21.6	12.1	25.5	42.7	35.6	60.5
UNION SQUARE-LOWER EAST SIDE	35	17.8	19.8	8.4	20.8	22.3	32.0	32.1	38.8	44.5	44.6	64.2
LOWER MANHATTAN	6	19.4	3.2	6.9	12.9	12.9	19.7	30.0	23.6	24.0	38.3	49.5
QUEENS	320	14.3	14.7	14.4	18.6	16.2	19.7	18.5	18.6	22.3	25.3	28.8
LONG ISLAND CITY-ASTORIA	31	14.0	12.7	25.5	19.0	16.7	28.4	25.1	25.4	22.9	28.1	37.8
WEST QUEENS	128	26.8	30.6	20.8	32.5	25.3	32.5	28.4	27.0	35.8	40.3	42.7
FLUSHING	45	17.6	15.7	17.2	22.3	21.9	19.3	19.5	24.9	19.5	27.8	22.3
BAYSIDE-LITTLE NECK	7	7.9	10.2	13.7	6.8	11.3	5.7	6.9	9.3	12.9	3.6	14.3
RIDGEWOOD	14	5.8	11.2	10.7	10.0	12.9	10.5	11.8	10.7	12.1	10.4	18.0
FRESH MEADOWS	16	17.2	12.9	10.3	10.7	17.2	17.4	8.8	8.9	15.7	18.2	13.8
SOUTHWEST QUEENS	25	9.3	9.6	7.5	11.5	10.0	9.8	15.4	9.4	12.8	18.8	18.0
JAMAICA	36	12.6	8.1	6.8	18.9	11.9	18.0	18.9	18.8	27.7	28.0	39.5
SOUTHEAST QUEENS	9	4.4	8.8	6.4	13.3	10.3	15.8	11.0	15.1	18.7	18.4	20.6
ROCKAWAY	8	7.5	0.9	4.8	11.2	10.3	16.0	12.3	16.2	22.0	29.9	30.1
STATEN ISLAND	28	6.3	6.5	5.6	6.1	7.2	7.8	5.8	7.5	6.9	9.5	16.5
PORT RICHMOND	6	9.6	8.0	8.6	17.5	11.1	17.8	11.6	13.5	12.0	14.0	26.7
STAPLETON-ST GEORGE	12	10.3	17.2	8.0	9.5	15.5	12.2	9.8	11.7	12.8	19.5	25.5
WILLOWBROOK	5	5.9	4.7	4.7	3.5	5.9	4.8	3.6	4.8	4.9	2.5	17.4
SOUTH BEACH-TOTTENVILLE	5	2.8	0.0	3.3	1.1	1.1	2.8	2.3	4.1	2.4	4.8	6.8
Total NYC	1039	13.0	14.2	13.5	15.7	16.6	18.4	19.8	22.2	26.5	31.9	39.4

[1] *Rates are based on intercensal estimates for 1994–1999. Rates since 2000 are based on 2000 census data.*

[2] *There were 2 cases in 2001 and 1 case in 1998 with missing zipcode information that are not included in the totals. Rates are estimated for these years.*

[3] *There is one case missing a UHF code. This case lives outside of the 5 boroughs but is counted as a NYC case.*

Table 4: Tuberculosis Incidence (Rates per 100,000) by Race/Ethnicity, Sex, and Age in Years, New York City, 2004

	Age Groups										
Race/Sex	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Total[2]
	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate[1]	N Rate [1]	
Non-Hispanic White, total	2 1.5	2 1.6	0 0.0	1 0.8	4 2.3	20 4.2	11 2.6	17 4.3	13 4.5	23 4.3	93 3.3
Males	1 1.4	1 1.6	0 0.0	1 1.6	2 2.4	8 3.3	8 3.7	14 7.3	8 6.0	12 5.7	55 4.1
Females	1 1.5	1 1.6	0 0.0	0 0.0	2 2.2	12 5.1	3 1.5	3 1.5	5 3.3	11 3.4	38 2.6
Non-Hispanic Black, total	11 7.5	3 1.8	5 3.1	8 5.3	16 11.6	50 17.1	80 25.4	66 27.7	54 32.3	43 23.2	336 17.1
Males	7 9.5	3 3.5	2 2.4	4 5.3	7 11.1	30 23.7	54 39.3	51 50.5	31 46.1	23 36.0	212 24.2
Females	4 5.5	0 0.0	3 3.7	4 5.3	9 12.1	20 12.0	26 14.6	15 10.9	23 23.0	20 16.5	124 11.4
Hispanic, total	10 5.4	4 2.0	3 1.7	18 10.3	36 19.0	64 16.7	71 21.4	48 20.5	24 16.1	31 22.3	309 14.3
Males	5 5.3	2 2.0	2 2.2	10 11.1	23 23.9	37 19.5	44 27.9	32 30.4	14 21.3	17 33.2	186 17.9
Females	5 5.5	2 2.1	1 1.1	8 9.5	13 13.9	27 13.9	27 15.5	16 12.5	10 12.0	14 16.0	123 11.0
Asian, total	1 2.1	0 0.0	3 6.6	7 14.6	25 40.1	72 45.3	53 36.8	40 37.3	39 65.1	46 78.1	286 36.7
Males	1 4.1	0 0.0	3 12.6	3 12.1	14 46.7	31 40.2	30 40.6	27 50.4	24 82.2	30 114.0	163 42.0
Females	0 0.0	0 0.0	0 0.0	4 17.4	11 34.0	41 50.1	23 32.8	13 24.2	15 48.8	16 49.2	123 31.4
TOTAL[2]	24 4.4	9 1.6	11 2.1	34 6.5	81 13.7	206 15.1	215 17.0	171 16.9	130 19.0	143 15.2	1024 12.8
Males	14 5.1	6 2.1	7 2.6	18 6.8	46 16.1	106 16.0	136 22.2	124 26.4	77 25.2	82 22.8	616 16.2
Females	10 3.8	3 1.1	4 1.5	16 6.3	35 11.5	100 14.2	79 12.1	47 8.7	53 14.0	61 10.6	408 9.7

[1] *Rates are based on 2000 census data.*

[2] *Totals do not include 3 patients with other races (1 Multiple, 2 Pacific Islander), and 12 patients with unknown race or ethnicity.*

Table 5: Selected Characteristics of U.S.-born and Non-U.S.-born Cases, New York City, 2004

Characteristic	U.S.-Born #	(%)	Non-U.S.-Born #	(%)	Total #	(%)
DEMOGRAPHICS						
Age Group						
0-19	47	14.1%	31	4.4%	78	7.5%
20-44	107	32.1%	403	57.1%	510	49.1%
45-64	122	36.6%	184	26.1%	306	29.5%
65+	57	17.1%	88	12.5%	145	14.0%
Sex						
Female	130	39.0%	283	40.1%	413	39.7%
Male	203	61.0%	423	59.9%	626	60.3%
Race/ethnicity[17]						
Black Non-Hispanic	193	58.0%	143	20.3%	336	32.3%
White Non-Hispanic	50	15.0%	43	6.1%	93	9.0%
Hispanic	79	23.7%	230	32.6%	309	29.7%
Asian	6	1.8%	280	39.7%	286	27.5%
Other	0	0.0%	3	0.4%	3	0.3%
Unknown	5	1.5%	7	1.0%	12	1.2%
Borough of residence						
Manhattan	93	27.9%	105	14.9%	198	19.1%
Bronx	73	21.9%	103	14.6%	176	16.9%
Brooklyn	112	33.6%	202	28.6%	314	30.2%
Queens	47	14.1%	273	38.7%	320	30.8%
Staten Island	8	2.4%	20	2.8%	28	2.7%
Time in the US[18]						
<1 year	n/a	n/a	105	14.9%	105	14.9%
1-5 years	n/a	n/a	192	27.2%	192	27.2%
> 5 years	n/a	n/a	394	55.8%	394	55.8%
CLINICAL CHARACTERISTICS[1]						
Received DOT (of those eligible)[2]	202	74.5%	484	74.1%	686	74.2%
Sputum smear positive[3]	129	38.7%	262	37.1%	391	37.6%
NAA done[4]	111	33.3%	240	34.0%	351	33.8%
NAA positive[4,15]	101	91.0%	219	91.3%	320	91.2%
Culture positive	243	73.0%	555	78.6%	798	76.8%
Clinical case[5]	90	27.0%	151	21.4%	241	23.2%
Pulmonary site of disease	221	66.4%	462	65.4%	683	65.7%
Cavitary chest x-ray[16]	42	20.0%	114	25.4%	156	23.7%
Extra-pulmonary site of disease	75	22.5%	165	23.4%	240	23.1%
Both pulmonary & extra-pulmonary	37	11.1%	79	11.2%	116	11.2%
Multidrug resistance[6]	7	2.9%	11	2.0%	18	2.3%
Other drug resistance[7]	27	11.3%	90	16.4%	117	14.9%
History of prior TB treatment	9	2.7%	12	1.7%	21	2.0%
HIV Status						
Positive	99	29.7%	70	9.9%	169	16.3%
Negative	143	42.9%	412	58.4%	555	53.4%
Refused Testing	43	12.9%	150	21.2%	193	18.6%
Unknown	48	14.4%	74	10.5%	122	11.7%
Last medical provider type						
DOHMH chest centers	122	36.6%	320	45.3%	442	42.5%
Health and Hospitals Corporation hospitals	64	19.2%	195	27.6%	259	24.9%
Private hospitals	79	23.7%	71	10.1%	150	14.4%
Private physicians	32	9.6%	95	13.5%	127	12.2%
Other providers[8]	36	10.8%	25	3.5%	61	5.9%
SOCIAL CHARACTERISTICS[9]						
Homeless[10]	44	13.2%	22	3.1%	66	6.4%
Employed[11]	88	26.4%	344	48.7%	432	41.6%
Health care worker	14	4.2%	32	4.5%	46	4.4%
Correctional employee	1	0.3%	0	0.0%	1	0.1%
Injection drug use[12]	13	3.9%	3	0.4%	16	1.5%
Non-injection drug use[12]	65	19.5%	10	1.4%	75	7.2%
Alcohol abuse[12]	96	28.8%	67	9.5%	163	15.7%
Any drug abuse[13]	124	37.2%	71	10.1%	195	18.8%
Resident of correctional facility[14]	16	4.8%	5	0.7%	21	2.0%
Resident of long-term care facility[14]	10	3.0%	0	0.0%	10	1.0%
Total	333		706		1039	

[1]Not all categories are complete and totals may include cases with unknown area of birth; [2]Received DOT at some point during treatment; eligible cases include those who were treated wtih 2 or more drugs on an outpatient basis [3]Sputum smear positive at any time during course of illness; [4]NAA=nucleic acid amplification; [5]As per CDC clinical case definition; [6]Multidrug resistant (MDR) is defined as resistant to at least Isoniazid and Rifampin; [7]Other drug resistance is defined as not MDR, but resistant to one or more first line drugs; [8]Other providers include correctional facilities, VA hospitals, out-of-NYC, and psychiatric providers; [9]Categories not mutually exclusive; [10]Homeless is at diagnosis or any time during treatment; [11]Occupation is for the past 24 months before diagnosis; [12]In past 12 months before TB diagnosis; [13]Includes any drug use or alcohol abuse [14]At time of diagnosis. [15]Denominator for percentage is all those tested [16]Denominator for percentage is pulmonary cases with chest X-ray done [17]Totals do not include 4 patients with other races (1 Multiple, 2 Pacific Islander), and 12 patients with unknown race or ethnicity. [18]Totals do not include those with an unknown date of entry; [19]Borough totals do not add up to city total because 3 non-US born patients did not have NYC addresses but were verified NYC TB cases.

Table 6: Tuberculosis Cases by Age in Years and Area Birth, New York City, 2004

	Age Groups								
	0 - 19		20-44		45-64		65+		TOTAL
Area of Birth	N	(%)	N	(%)	N	(%)	N	(%)	
CARIBBEAN AND LATIN AMERICA[1]	21	(6.7%)	186	(59.6%)	75	(24.0%)	30	(9.6%)	312
ASIA[2]	6	(2.1%)	147	(51.9%)	84	(29.7%)	46	(16.3%)	283
AFRICA[3]	2	(2.6%)	53	(69.7%)	19	(25.0%)	2	(2.6%)	76
EUROPE[4]	1	(3.4%)	13	(44.8%)	5	(17.2%)	10	(34.5%)	29
MIDDLE EAST[5]	1	(16.7%)	4	(66.7%)	1	(16.7%)	0	(0.0%)	6
TOTAL NON-USA	31	(4.4%)	403	(57.1%)	184	(26.1%)	88	(12.5%)	706
USA[6]	47	(15.6%)	98	(32.5%)	106	(35.1%)	51	(16.9%)	302
PUERTO RICO	0	(0.0%)	9	(2.9%)	16	(51.6%)	6	(19.4%)	31
TOTAL USA	47	(14.1%)	107	(34.3%)	122	(36.6%)	57	(17.1%)	333
TOTAL	78	(7.5%)	510	(49.1%)	306	(29.5%)	145	(14.0%)	1,039

[1] *Dominican Republic (63), Ecuador (61), Mexico (56), Haiti (38), Guyana (18), Peru (14), Colombia (14), Jamaica (11), Trinidad & Tobago (8), Honduras (7), Panama (4), El Salvador (4), Other (14)*
[2] *China (95), India (37), South Korea (31), Philippines (25), Pakistan (19), Bangladesh (18), Nepal (16), Vietnam (8), Burma (8), Hong Kong (7), Indonesia (5), Other (14)*
[3] *Ghana (12), Ivory Coast (10), Guinea (7), Mali (5), Senegal (4), Cameroon (4), Zambia, (4), Other (30)*
[4] *Russia (7), Ukraine (5), Other (17)*
[5] *Yemen (4), Other (2)*
[6] *Includes the US Virgin Islands and other US territories, excludes Puerto Rico*

Table 7: First Line Drug Resistance by Area of Birth and History of Prior TB Treatment[1], New York City, 2004

	N (%)											
	U.S.-BORN[2]				NON-U.S.-BORN				TOTAL			
	Prior TB Treatment		No Prior Treatment		Prior TB Treatment		No Prior Treatment		Prior TB Treatment		No Prior Treatment	
Positive culture for *M. tuberculosis*	10		233		10		545		20		778	
Tested for susceptibility to first-line drugs (% of those with positive culture for *M. tuberculosis*)	10	(100.0)	228	(97.9)	10	(100.0)	539	(98.9)	20	(100.0)	767	(98.6)
Susceptibility results (% of those tested for susceptibility to first-line drugs)												
"Multidrug-resistant (resistant to at least isoniazid & rifampin)"	0	(0.0)	7	(3.1)	1	(10.0)	10	(1.9)	1	(5.0)	17	(2.2)
Isoniazid-resistant and rifampin-susceptible	1	(10.0)	16	(7.0)	1	(10.0)	57	(10.6)	2	(10.0)	73	(9.5)
Resistant to first-line drugs other than isoniazid & rifampin	0	(0.0)	7	(3.1)	0	(0.0)	29	(5.4)	0	(0.0)	36	(4.7)
Rifampin-resistant and isoniazid-susceptible	1	(10.0)	2	(0.9)	1	(10.0)	2	(0.4)	2	(10.0)	4	(0.5)
Susceptible to all first-line drugs	8	(80.0)	196	(86.0)	7	(70.0)	441	(81.8)	15	(75.0)	637	(83.1)

[1] *Patients with a history of prior tuberculosis treatment includes those who received two or more anti-tuberculosis drugs for confirmed or suspected TB in the past, at least 30 days before the current diagnosis.*
[2] *Includes Puerto Rico, US Virgin Islands and other US territories.*

Table 8: Epidemiologic Investigations of Tuberculosis Exposure in Congregate Settings, New York City, 2004 (N=29)

Site	Close contacts					Other-than-close contacts					Transmission[1,2]
	Identified #	Tested #	Tested %	Positive #	Positive %	Identified #	Tested #	Tested %	Positive #	Positive #	
Health care facilities											
HCF A3	1487	391	26	59	15	0	0	0	0	0	Probable
HCF B, C, D	76	64	84	2	3	0	0	0	0	0	Probable4
Sub-total	1563	455	29	61	13	0	0	0	0	0	
Religious Organizations											
Church A	24	15	63	1	7	60	16	27	2	13	Unlikely
Sub-total	24	15	63	1	7	60	16	27	2	13	
Schools											
Kindergarten School	27	22	81	0	0	6	6	100	0	0	Unlikely
Elementary School	21	15	71	0	0	5	5	100	0	0	Unlikely
Elementary School	16	12	75	1	8	0	0	0	0	0	Probable
Elementary School	9	9	100	0	0	6	6	100	0	0	Unlikely
Middle School	29	29	100	2	7	29	3	10	0	0	Probable
High School	98	61	62	31	51	263	55	21	20	36	Unable to assess
High School	28	17	61	0	0	123	39	32	2	5	Unable to assess
High School	14	9	64	6	67	49	10	20	5	50	Unable to assess
High School	18	18	100	0	0	91	90	99	6	7	Unlikely
High School	28	20	71	8	40	108	10	9	1	10	Possible
High School	18	18	100	2	11	12	6	50	0	0	Probable
Sub-total	306	230	75	50	22	692	230	33	34	15	
Service and Treatment Centers											
Center A	18	13	72	1	8	4	4	100	1	25	Unlikely
Sub-total	18	13	72	1	8	4	4	100	1	25	
Worksites											
Worksite A	23	13	57	1	8	31	20	65	3	15	Unable to assess
Worksite B	29	26	90	2	8	64	52	81	6	12	Unlikely
Worksite C	25	21	84	8	38	54	44	81	6	14	Probable
Worksite D	8	6	75	3	50	71	33	46	7	21	Probable
Worksite E	25	21	84	7	33	3	3	100	0	0	Probable
Worksite F	15	13	87	1	8	36	20	56	2	10	Unlikely
Worksite G	19	15	79	2	13	6	6	100	0	0	Unlikely
Worksite H	3	3	100	0	0	58	35	60	1	3	Unlikely
Worksite I	52	37	71	0	0	112	69	62	6	9	Unlikely
Worksite J	19	15	79	3	20	9	9	100	1	11	Unlikely
Worksite K	15	13	87	1	8	71	49	69	1	2	Possible
Worksite L	33	15	45	0	0	47	8	17	1	13	Unable to assess
Worksite M	21	17	81	3	18	0	0	0	0	0	Unlikely
Worksite N5	11	10	91	6	60	189	130	70	23	18	Probable
Sub-total	298	225	76	37	16	751	478	64	57	12	
Totals	2209	938	42	150	16	1507	728	48	94	13	

[1] *Transmission is "probable" when the exposed group has a significantly higher proportion of TST-positive individuals than a comparison group; or there are documented TST conversions in non-BCG vaccinated individuals; or secondary cases with epidemiologic or molecular linkage to the index case. Transmission is considered "possible" when the proportion of contacts that are TST-positive is significantly greater than the proportion in a comparison group but the proportion of identified contacts tested is less than 75%. Transmission is considered "unlikely" when these conditions are not met. "Unable to assess" indicates that less than 75% of potential contacts are tested and the proportion that is TST-positive among those tested is not greater than expected, and there are no TST conversions or secondary cases.*

[2] *2470 unexposed individuals were tested upon their request and 30 (6%) were TST-positive and referred for evaluation.*

[3] *Exposure was in a well-baby nursery and on a maternity ward. Many mothers, infants and co-workers were exposed.*

[4] *Transmission was probable in HCF B, but unlikely in HCF C and HCF D.*

[5] *Preliminary numbers; investigation is on-going.*

Appendix 1

Centers for Disease Control and Prevention's Objectives for Tuberculosis Control Programs

The Centers for Disease Control and Prevention (CDC) has provided objectives for tuberculosis control programs nationwide. These objectives are divided into 5 functional areas: reporting, completion of therapy, contact investigations, treatment of latent tuberculosis infection, and laboratory services.

Reporting:

- All newly diagnosed cases of tuberculosis will be reported to CDC using the electronic reporting system developed by CDC. There will be at least 95% completeness for variables in the expanded Report of a Verified Case of Tuberculosis (RVCT).
- Drug susceptibility results will be reported for at least 90% of all newly reported culture-positive tuberculosis cases.
- Human immunodeficiency virus (HIV) status will be reported for at least 75% of all newly reported tuberculosis cases aged 25 through 44 years.

Completion of Therapy:

- At least 90% of patients with newly diagnosed tuberculosis, for whom therapy of one year or less is indicated, will complete therapy within 12 months.

Contact Investigation:

- Contacts will be identified for at least 90% of sputum acid-fast bacilli (AFB) smear-positive tuberculosis cases.
- At least 95% of close contacts of sputum AFB smear-positive tuberculosis cases will be evaluated for infection and disease.
- At least 85% of infected contacts who are started on treatment for latent tuberculosis infection will complete therapy.

Treatment of Latent Tuberculosis Infection:

- At least 75% of persons with latent tuberculosis infection (LTBI) found through targeted skin testing activities (supported with program resources) and started on treatment for LTBI will complete therapy.

Laboratory Services:

- All initial isolates of *M. tuberculosis* complex obtained by the public health laboratory will be reported to CDC using the electronic reporting system developed by CDC. For at least 95% of the isolates, all information specified in the Mycobacterium module of the Public Health Laboratory Information System (PHLIS) will be completed.
- For at least 80% of initial diagnostic specimens received by the public health laboratory for TB diagnosis, the following laboratory turnaround times will be met: reporting of smear-positive or smear-negative results of acid-fast examination of specimens within 24 hours of specimen receipt; for culture-positive specimens, reporting of *M. tuberculosis* complex or not *M. tuberculosis* complex within 14–21 days from specimen receipt; and reporting of drug susceptibility tests for first-line drugs within 15 to 35 days from specimen receipt.
- For at least 80% of isolates of mycobacteria referred to the public health laboratory for additional TB diagnostic testing, the following laboratory turnaround times will be met: reporting of isolates as *M. tuberculosis* complex or not *M. tuberculosis* complex within seven days of isolate receipt, and reporting of first-line drug susceptibility tests within 10 to 14 days from isolate receipt.

Source: Centers for Disease Control and Prevention. Objectives for TB Control Programs. Unpublished guidance, 2004.

Appendix 2

Healthy People 2010 Tuberculosis Objectives

14.11 Reduce tuberculosis.
Target: 1.0 new case per 100,000 population.

14.12 Increase the proportion of all tuberculosis patients who complete curative therapy within 12 months.
Target: 90.0% of patients.

14.13 Increase the proportion of contacts and other high-risk persons with latent tuberculosis infection who complete a course of treatment.
Target: 85.0%.

14.14 Reduce the average time for a laboratory to confirm and report tuberculosis cases.
Target: 2 days for 75.0% of cases.

Source: U.S. Department of Health and Human Services. *Healthy People 2010.* 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

Appendix 3

How to Report Suspected and Confirmed Tuberculosis

Who Must Report

Medical Providers

Medical providers and infection control practitioners are required by the New York City Health Code article 11, sections 11.03, 11.05 and 11.47(a), to report all patients suspected and confirmed with tuberculosis (TB) to the New York City Department of Health and Mental Hygiene (DOHMH), Bureau of Tuberculosis Control, within 24 hours of the time the diagnosis is first suspected. Medical providers must report these patients even though microbiologists and pathologists are also required to report findings consistent with TB. Note that the reports have to be received by the DOHMH within 24 hours, whether by express or overnight mail, fax, telephone, or electronically (See How to Report, below).

It is mandatory to report patients who meet at least 1 of the following criteria:

- Smear-positive (from any anatomic site) for acid-fast bacilli (AFB)
- Nucleic acid amplification test (e.g., Roche's AMPLICOR®, Genprobe's MTD™)[1] result positive for *Mycobacterium tuberculosis* complex
- Culture positive for *Mycobacterium tuberculosis* complex including: *M. tuberculosis, M. africanum, M. bovis-BCG, M. caprae, M. canettii, M. microti, M. pinnipedii, M. bovis.*
- Culture positive for *Mycobacterium tuberculosis* complex
- Biopsy, pathology, or autopsy findings consistent with active tuberculosis disease, including but not limited to caseating granulomas in biopsy of lung, lymph nodes or other specimens
- Treatment with 2 or more anti-TB medications for suspected or confirmed TB
- Clinical suspicion of pulmonary or extrapulmonary tuberculosis such that the physician or other health care provider has initiated or intends to initiate isolation or treatment for tuberculosis
- Any child younger than 5 years old (up to the day of the 5th birthday) who has a positive result on a tuberculin skin test[2]

Microbiology and Pathology Laboratories

The New York City Health Code also requires laboratories to report, as per articles 11 and 13, sections 11.03, 11.05, and 13.03, all of the following to the New York City DOHMH, Bureau of Tuberculosis Control:

- AFB-positive smears (regardless of anatomic site)
- Cultures positive for *M. tuberculosis* complex
- Any culture result associated with an AFB-positive smear (even if negative for *M. tuberculosis* complex)
- Rapid diagnostic test results that identify *M. tuberculosis* complex (e.g. AMPLICOR®, MTD™)
- Results of susceptibility tests performed on *M. tuberculosis* complex cultures
- Pathology findings consistent with TB, including the presence of AFB and granulomas

How to Report

By Phone and Mail

Suspected and confirmed TB patients may be reported by telephone to the TB Hotline, (212) 788-4162.

A completed Universal Reporting Form (URF) must follow within 48 hours. The URF should be faxed to (212) 788-4179, and the original mailed to:

NYC DOHMH
125 Worth Street, Room 315, CN-6,
New York, NY 10013

Online

The URF can also be completed online by first creating an account on NYC-MED at www.nyc.gov/health/nycmed. Assistance is available by calling (888) NYCMED9 or (212) 442-3384. Laboratories can report via the Electronic Clinical Laboratory Reporting System (ECLRS). Assistance with ECLRS is available by calling (212) 442-3380.

How to Get Copies of Forms

To order copies of the URF, call 1-866-NYC-DOH1. To order copies of the reporting form for latent TB infection treatment (TB78), the laboratory report form (TB159), the pathology report form (TB158) and the report of patient services form (TB65), call (212) 442-5100 or mail order form to:

Patient Care Services Unit, Bureau of Tuberculosis Control
225 Broadway, 22nd floor, Box 72B
New York, NY 10007

Forms are also available online. Visit http://www.nyc.gov/html/doh/html/tb/tb-hcp.shtml.

Notes:

[1] Product names are provided for identification purposes only; their use does not imply endorsement by the New York City Department of Health and Mental Hygiene.

[2] To report tuberculosis skin tests in children less than 5 years old, use the Universal Reporting Form. For guidelines for interpreting skin test results, see New York City Department of Health and Mental Hygiene, Guidelines for Testing and Treatment for Latent Tuberculin Infection, January 2005, www.nyc.gov/html/doh/html/tb/tb.html.

TB CHEST CENTERS

Bronx
Morrisania Chest Center
1309 Fulton Avenue, First Floor
Bronx, NY 10456

Brooklyn
Bedford Chest Center
485 Throop Avenue, Third Floor
Brooklyn, NY 11221

Brownsville Chest Center
259 Bristol Street, Third Floor
Brooklyn, NY 11212

Bushwick Chest Center
335 Central Avenue, Second Floor
Brooklyn, NY 11212

Fort Greene Chest Center
295 Flatbush Ave. Ext., Fourth Floor
Brooklyn, NY 11201

Manhattan
Chelsea Chest Center
303 9th Avenue, Third Floor
New York, NY 10031

Washington Heights Chest Center
600 West 168th Street, Third Floor
New York, NY 10032

Queens
Corona Chest Center
34-33 Junction Blvd., Second Floor
Queens, NY 11372

Jamaica Chest Center
90-37 Parsons Blvd, 4th Floor
Jamaica, NY 11432

Staten Island
Richmond Chest Center
51 Stuyvesant Place, Room 415
Staten Island, NY 10301

Call 311 for hours of operation.

NYC Health
nyc.gov/health

The New York City Department of Health and Mental Hygiene

Thomas R. Frieden, MD, MPH
Commissioner

Michael R. Bloomberg
Mayor