2007

ANNUAL SUMMARY

CONTINUED VIGILANCE IN THE FIGHT AGAINST TB

New York City Department of Health and Mental Hygiene
BUREAU OF TUBERCULOSIS CONTROL

NYC Health

MISSION STATEMENT

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

GOALS:

1. **To identify all individuals with suspected or confirmed TB disease and ensure their appropriate treatment, ideally on a regimen of directly observed therapy (DOT).**

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 in 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.

CONTINUED VIGILANCE IN THE FIGHT AGAINST TB

Bureau of Tuberculosis Control

Annual Summary 2007

New York City Department of Health and Mental Hygiene

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ASSISTANT COMMISSIONER'S LETTER

CHRISPIN KAMBILI, MD *Assistant Commissioner, Bureau of TB Control*

Dear Fellow New Yorkers,

In 2007, for the third consecutive year, we recorded fewer than 1,000 cases of tuberculosis (TB). In addition, for the first time since tracking multidrug resistant tuberculosis (MDRTB), there were fewer than 10 MDRTB cases in New York City (NYC). Despite this success, there continue to be pockets of TB transmission in NYC. Our vigilance and commitment are still needed for continued success in the control of TB.

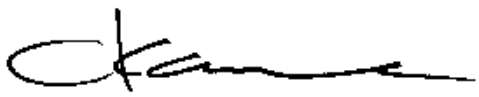
2007 was a busy and challenging year for TB control efforts in NYC. The Bureau of TB Control continued to respond to outbreaks and to conduct contact investigations citywide, while implementing strategies to improve core services. The Bureau expanded its investigation of a rapidly growing outbreak in Harlem and the South Bronx. We worked closely with local health care providers and community-based organizations to identify cases and their contacts, distribute educational materials and increase awareness about TB. By the end of 2007, 17 new cases were identified, bringing the total number in the cluster to 42. The investigation is still ongoing, and the Bureau will continue to explore additional avenues to ensure that TB transmission in Harlem and the South Bronx is halted.

During World TB Day in March 2007, we addressed several ongoing challenges, such as the importance of cultural competency among those working in TB control. As part of World TB Day, the Coalition for a TB-Free New York City organized the first annual Community Forum on Tuberculosis in NYC. The forum brought together community leaders, physicians, researchers and other health care professionals representing 19 agencies to share information about TB in New York City and discuss strategies for community-based approaches to TB control.

Controlling TB continues to be a priority for New York City. The city remains a center of expertise for TB control and treatment. I thank all of the providers who report cases and manage TB patients. I also thank the Bureau staff for their continued efforts and dedication.

Working together, we will continue to make progress toward a TB-free New York City.

Sincerely,

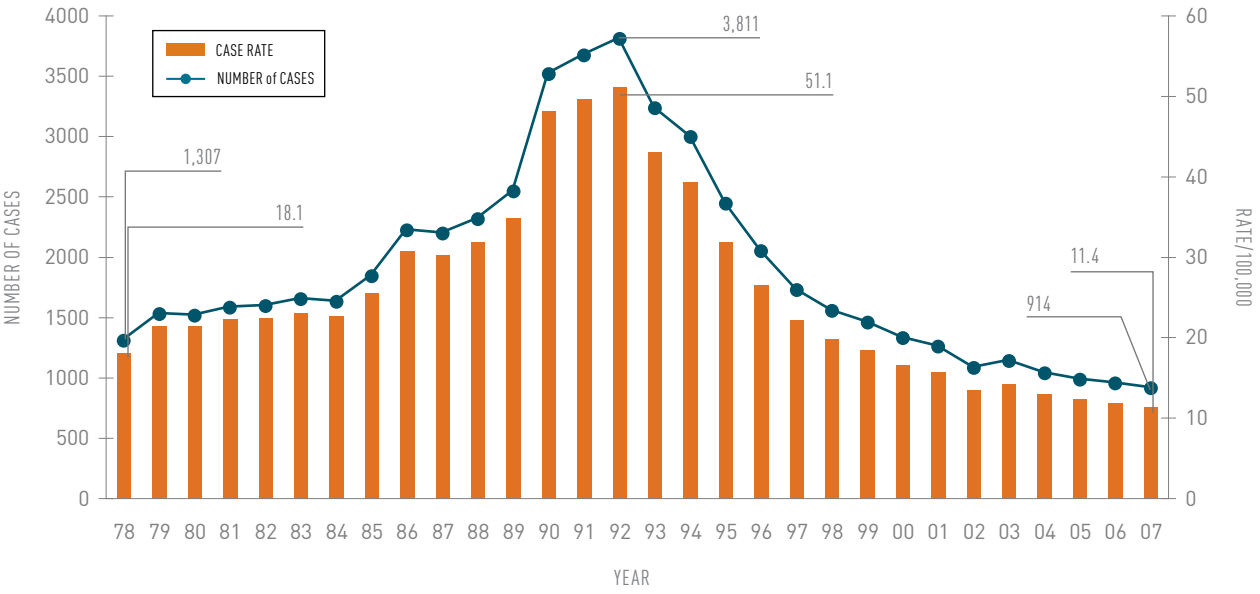


Chrispin Kambili, MD
Assistant Commissioner, Bureau of Tuberculosis Control

EXECUTIVE SUMMARY

In 2007, New York City (NYC) recorded **914** confirmed tuberculosis (TB) cases; the lowest number since TB became reportable in 1897.

FIGURE 1: TB CASES AND RATES,[1] NEW YORK CITY, 1978-2007



[1] Rates prior to 2000 are based on official Census data and intercensal estimates. Rates after 2000 are based on 2000 Census data.

For the third consecutive year, TB cases remained fewer than 1,000, a 4% drop from the previous year and a 76% decline since the peak of the NYC TB epidemic in 1992. In 2007, NYC recorded fewer than 10 multidrug resistant TB (MDRTB) cases for the first time since mandatory drug susceptibility reporting went into effect in 1991. Since 1992, MDRTB cases have declined significantly (98%), from 442 to nine in 2007.

Despite this progress, the NYC TB case rate of 11.4/100,000 population remains more than twice the national average of 4.4/100,000 population. In addition, the average annual decline in NYC's TB rate has slowed from 13% per year during 1992-1999 to 6% per year during 2000-2007.

EXECUTIVE SUMMARY

(CONTINUED)

In NYC, TB continues to disproportionately affect non-US-born persons and ethnic/racial minorities. In 2007, 71% of TB cases were born outside the US, with ethnic/racial minorities accounting for over 90% of all cases. Asians accounted for 44% of the non-US-born cases. Among US-born cases, the greatest disparity in TB rates was for non-Hispanic blacks, whose rates were four times those of non-Hispanic whites. Non-Hispanic blacks accounted for 56% (148/263) of all US-born cases.

HIV is the most important known risk factor for the progression from TB infection to disease. The number of TB cases infected with HIV in NYC has declined 52% since 2000, from 881 to 116.

Geographically, TB continues to be concentrated primarily in the 15 health districts that had higher TB rates than the city average.

In 2007, the Bureau continued to make progress identifying TB suspects and cases, identifying and evaluating contacts, improving treatment outcomes and controlling TB transmission. Despite the decline in TB cases, there was a 10% increase in the number of cases reported, likely due to increased awareness among providers. The Bureau identified 10,220 contacts to TB cases, of whom 7,652 (75%) were evaluated. Expanded contact investigations (ECI) were conducted in 34 congregate sites, such as workplaces, schools and health care facilities. The proportion of eligible TB cases on Directly Observed Therapy (DOT) has improved since 1994, rising from 57% to 77% in 2007.

In 2004, the Bureau identified a rapidly growing TB outbreak whose strains had matching genotypes. The outbreak has been geographically centered in northern Manhattan and the South Bronx. In late 2006, the first case of isoniazid (INH)-resistant TB was identified among the outbreak cases. In 2007, 17 cases (12 INH-resistant and 5 susceptible) were identified, bringing the total number in the outbreak to 42. In response, the Bureau launched an aggressive interagency investigation using novel techniques to uncover links between the cases, to explain the potential causes for the emergence of drug resistance and to identify new contacts. The Bureau continues to investigate the outbreak and to increase awareness among providers and the community.

9 Number of multidrug resistant TB (MDRTB) cases diagnosed in NYC in 2007. This is the first time there were less than 10 MDRTB cases in NYC since mandatory drug susceptibility reporting went into effect.

With the slowing decline of TB incidence and the persistent disparities between US-born and non-US-born persons, progress towards TB elimination in NYC is threatened. The Bureau remains vigilant and continues to provide multifaceted services to NYC residents, including free TB diagnosis and treatment at nine chest centers citywide. We also continue to expand partnerships with NYC providers and community-based organizations to improve case finding, identify contacts, ensure treatment adherence and provide education, outreach and targeted screening to communities at high risk for TB.

CORE ACTIVITIES

SURVEILLANCE

Surveillance and Reporting Innovations and Accomplishments

Surveillance is an essential component of TB control in NYC. The Bureau's Office of Surveillance ensures thorough and accurate reporting of TB suspects and cases by providers and laboratories, assigns patients for case management, reviews the timeliness and completeness of data and coordinates the interstate transfer of patients. The office also maintains the TB registry, monitors TB trends and provides data support to the Bureau.

35

Number of laboratory facilities in NYC that are now certified to report TB test results electronically through the Electronic Clinical Laboratory Reporting System (ECLRS).

- The Bureau continues to work on the development of our new TB Registry, which will provide up-to-date patient information. In 2007, we identified and began the process of acquiring a surveillance software system. Additionally, the Bureau completed a business analysis report documenting Bureau activities and began work on the functional requirements for the new system.
- Electronic reporting for laboratories was mandated in New York City in July 2006. In 2007, 26 facilities were certified to report TB test results electronically through the Electronic Clinical Laboratory Reporting System (ECLRS), bringing the total number to 35. The Surveillance Office is working with the Division of Informatics and Information Technology to certify the remaining 11 laboratories that perform TB tests.
- The Bureau made progress in its effort to encourage hospitals to implement voluntary in-house pharmacy surveillance. Pharmacy surveillance allows infection control staff to identify patients placed on anti-TB medications in instances when providers did not report them. An additional 26 facilities implemented a system in 2007, bringing the total using pharmacy surveillance to 30.
- The Bureau continues to work with providers and laboratories to improve the timeliness of TB case and suspect reporting. In 2007, we continued to provide timely feedback to providers through phone calls and the distribution of educational materials.
- In 2007, the Office of Surveillance received and processed new reports for 5,268 persons (914 confirmed and 4,354 suspects). Despite the declining number of TB cases, reporting of TB suspects increased by 10% from the previous year, with a 33% rise since 2003.

5,268

Number of new TB reports processed by the Bureau in 2007.

CORE ACTIVITIES

CLINICAL MANAGEMENT OF TUBERCULOSIS

Chest Centers

The Bureau operates nine chest centers citywide. Each provides free TB diagnostic testing, outpatient medical and nursing care, treatment for latent and active TB, social service assistance and HIV counseling, testing and patient education (see Appendix V).

- In 2007, chest centers provided free TB testing and treatment to 30,999 New Yorkers during 122,481 visits. This is a 6% increase from 2006, with the greatest increase occurring in the two clinics that are located in Queens.
- The chest centers reported 9% of all confirmed cases in 2007 and identified 13% of all suspects.
- In 2007, 46% of TB cases received care at the chest centers.

30,999

Number of New Yorkers who received free TB testing and treatment at Bureau chest centers in 2007.

Field Services

In 2007, more than half of NYC TB cases received care outside of the Bureau's chest centers. These patients are case-managed by Bureau staff to ensure that they complete an appropriate course of treatment and that all contacts are identified and evaluated. The Bureau's medical consultants provide health care providers with recommendations on treatment and medical management. They also perform standardized case reviews to assess treatment and possible treatment failure.

CORE ACTIVITIES

CLINICAL MANAGEMENT OF TUBERCULOSIS (CONTINUED)

Clinical Management Innovations and Accomplishments

74%

Percentage of AFB smear-positive TB suspects and cases in NYC who received NAA testing in 2007.

- Since 2006, New York State has required Nucleic Acid Amplication (NAA) testing for all initial AFB smear-positive respiratory specimens. Rapid diagnostic tests are useful in determining appropriate management of potentially infectious patients, initiating contact investigations and lending support to ruling out TB. In 2007, 74% of AFB smear-positive TB suspects and cases in NYC received NAA testing, compared to 64% in 2005.

- In 2007, the Bureau made the approved QuantiFERON®-TB Gold (QFT-G) (Cellestis, Inc., Carnegie, Australia) test available at seven of its chest centers. This blood-based test was first implemented in two chest centers in 2006. It has several advantages over the tuberculin skin test (TST), such as a lower likelihood of false-positive results and only requiring a single clinic visit. In 2007, 17,044 patients received a QFT-G test.

- All Bureau chest centers offer rapid testing for HIV. In 2007, 4,051 patients were tested for HIV, with 3,991 (99%) receiving rapid HIV testing.

- The Bureau offers extended clinics hours to ensure that testing, evaluation, and Directly Observed Therapy (DOT) services are available to patients who are unable to visit during regular business hours.

- In 2006, the Bureau initiated a cross match between the TB surveillance registry and the Riker's Island Inmate Information System. This matching system ensured the rapid identification, evaluation and isolation (if needed) of inmates with suspected or confirmed TB. In 2007, 3,102 probable matches—most with latent TB infection (LTBI) or contacts—were identified, with Riker's Island reporting four TB cases and 84 suspects.

- In 2007, the Bureau began a new initiative in collaboration with the Department of Homeless Services to screen and provide DOT for LTBI to homeless persons at 20 homeless facilities citywide. Two facilities enrolled in the project in 2007, with 83 homeless persons getting screened.

17,044

Number of patients who received a QFT-G test at a Bureau chest center in 2007.

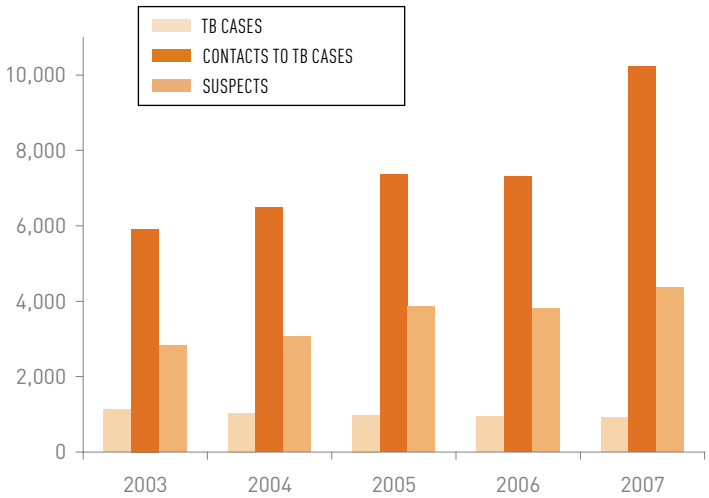
CORE ACTIVITIES

CASE MANAGEMENT AND CONTACT INVESTIGATION

The Bureau provides case management for confirmed TB cases and for many TB suspects. We initiate a contact investigation for suspected or confirmed respiratory TB cases that are acid-fast bacilli (AFB) smear-positive, have a positive NAA test or a positive *M.tuberculosis* culture, as well as those with cavitary disease with high clinical suspicion of TB.

- Case management for TB includes:
  - Extensive patient interviews
  - Collection of information about diagnosis and treatment procedures
  - Treatment oversight
  - Assurance of patient adherence to treatment
  - Provision of DOT
  - Legal intervention when patients fail to adhere to treatment or comply with case management efforts
  - Transfer of medical data between NYC and other jurisdictions

FIGURE 2: CASES, SUSPECTS[1] AND CONTACTS EVALUATED BY THE BUREAU OF TB CONTROL, NEW YORK CITY, 2003-2007



- In 2007, the Bureau provided case management to 345 TB cases from 2006 who were still on treatment, in addition to the 914 cases and 1,319 suspects newly reported.
- Among eligible patients in 2007, 611 (77%) were treated under DOT. 941 patients, including 330 cases reported the previous year, received DOT services. All nine cases with MDRTB were also treated under DOT.
- Among the 648 cases eligible for contact investigation, 10,220 contacts were identified. Among the 7,652 contacts evaluated, 1,249 (16%) were infected with latent TB.
- In 2007, the Bureau referred 783 patients (including cases, suspects and contacts) to other jurisdictions for follow-up and treatment.

[1] Includes suspects that were evaluated but may not have been assigned for case investigation

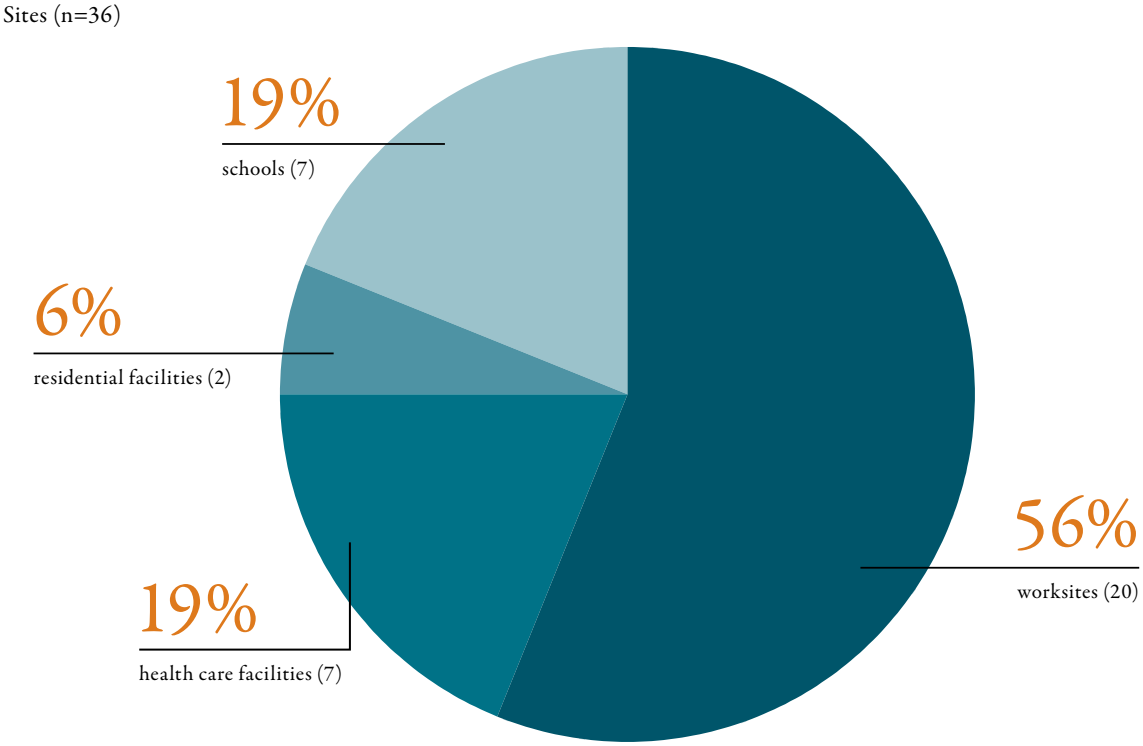
CORE ACTIVITIES

OUTBREAK DETECTION AND MANAGEMENT

Early detection of TB is crucial to preventing transmission and controlling outbreaks. The Bureau utilizes multiple methods to identify and control TB transmission. The Bureau investigates all TB exposures in congregate settings to identify contacts and to determine if transmission occurred and whether further testing is warranted.

- 242 congregate sites—representing 180 cases—were referred for expanded contact investigation (ECI). The Bureau conducted 34 epidemiologic investigations in congregate settings involving 36 sites (Figure 2). Among the 36 sites, 20 (56%) were work place exposures, seven (19%) were in schools, seven (19%) were in health care facilities and two (6%) were in residential facilities (Figure 3). 1,597 contacts were identified in these investigations.
- The Bureau classifies the results of contact investigations at congregate settings based on the likelihood of TB transmission to contacts. Among the 34 investigations conducted in 2007, transmission was considered probable in 12 (36%), possible in five (15%) and unlikely in 11 (33%). In six of the investigations, the number of contacts tested was not sufficient to assess transmission.

FIGURE 3: EPIDEMIOLOGIC INVESTIGATIONS CONDUCTED IN CONGREGATE SETTINGS, NEW YORK CITY, 2007



CORE ACTIVITIES

OUTBREAK DETECTION AND MANAGEMENT (CONTINUED)

Universal Genotyping and Clustering in 2007

97%

Percentage of 2007 TB cases in NYC for which complete genotyping results are available.

The Bureau began universal genotyping of all culture-positive TB patients in 2001. Genotype results identify whether TB strains are genetically related. This information helps the Bureau identify false-positive culture results, detect outbreaks and previously unknown links among patients, and detect sites of TB transmission.

- Preliminary 2007 genotyping results indicate that the participation of hospital and commercial laboratories continues to be high. Isolates were submitted to NYC and New York State public health laboratories for 699 (99%) of 708 culture-confirmed cases. To date, complete genotyping results are available for 678 (97%) patients.
- In 2007, 301 (42%) of the 678 cases with available genotyping results were clustered to another NYC case that had been diagnosed between 2001 and 2007. The clustered cases from 2007 were in 164 genotype clusters. Among the 301 clustered cases, 190 (63%) were clustered to at least one other 2007 case, indicating recent transmission in NYC.

USING GENOTYPING TO IDENTIFY TRANSMISSION IN A LONG-TERM CARE FACILITY

Early in 2007, two TB cases whose isolates had matching genotypes were identified at a long-term care facility (LTCF). TB exposure occurred in both the residential facility and the adjoining hospital. The Bureau identified 64 patients and 192 employees as close contacts. Tuberculin skin test (TST) conversions were documented for 12 contacts (seven patients and five employees) who were all exposed at the LTCF. All exposed residents who were still patients at the time of the investigation were placed on treatment for LTBI regardless of the result of their test for TB infection. This decision was based on the number of test conversions among residents and the possibility of test anergy due to co-morbidities. Treatment was also recommended to all discharged LTCF residents. In December 2007, a third case with a matching genotype was identified. This case was a discharged resident whose private physician had advised against LTBI treatment.

CORE ACTIVITIES

OUTBREAK DETECTION AND MANAGEMENT (CONTINUED)

Transmission of a New and Rapidly Growing Strain of TB in Harlem and the South Bronx

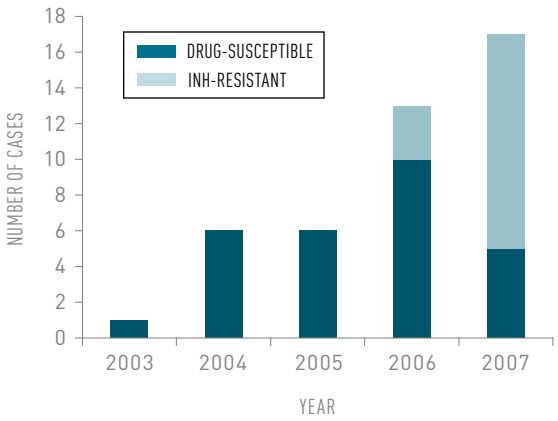
In 2004, the Bureau identified a rapidly growing outbreak of TB cases whose strains had matching genotypes. The outbreak has been geographically concentrated in Harlem and the South Bronx. Since 2003, the number of cases in this cluster has risen steadily. In October 2006, the first case of INH-resistant TB was identified among outbreak cases. In 2007, 17 cases (12 INH-resistant and five drug-susceptible) were identified, bringing the total number in the cluster to 42.

DEMOGRAPHICS The demographic profile of cases in the cluster changed with the emergence of the INH-resistant phenotype. The Bureau identified several common social networks among the initial drug-susceptible cases and the INH-resistant cases. However, definite epidemiologic links which could explain the transmission chain among the cases were not identified.

PREVIOUS TREATMENT The emergence of INH resistance in this cluster cannot be clearly explained. None of the previously diagnosed clustered cases with INH-susceptible TB failed treatment and none of the cases with INH-resistant TB failed previous INH treatment for LTBI.

WORK WITH PARTNERS Due to the extensive resources required to investigate and stop the outbreak, the Bureau sought assistance from the CDC's Division of TB Elimination twice in 2007. The CDC helped the Bureau to re-assess investigation efforts and to identify additional methods for supplementing the ongoing investigation

The Bureau also worked with local health providers and community-based organizations to organize TB screenings, distribute information and provide educational presentations at health fairs and local events.



CONTACT INVESTIGATIONS To date, secondary cases have not been found among the 1,006 contacts identified for the cases in the cluster. In addition, none of the 43 cluster cases have identified each other as contacts.

NEXT STEPS Community transmission of this strain of TB continues despite the Bureau's intensive efforts. The greatest challenge for the Bureau remains the lack of clear links between the cases and sites of transmission.

The Bureau will continue to investigate this outbreak and explore additional ways to partner with community-based organizations and health care providers to interrupt TB transmission in Harlem and the South Bronx.

CORE ACTIVITIES

EDUCATION AND OUTREACH

In an effort to continue promoting the campaign "Moving Towards a Tuberculosis-Free New York City," the Bureau planned a series of events to mobilize high-risk communities, encourage support, expand partnerships, reach out to medical providers serving targeted communities and promote high-quality TB control and care. Campaign activities included:

- In commemoration of World TB Day 2007, the Bureau hosted its annual TB conference. The theme was "TB Anywhere is TB Everywhere" and 343 providers—representing more than 90 agencies—attended. The conference addressed ongoing challenges in TB control and prevention in NYC, including changes in the epidemiology of TB, the threat of highly drug-resistant TB, patterns and effects of ongoing transmission and the Bureau's implementation of the QFT-G test.
- Throughout 2007, the Bureau distributed 700 Provider Information Kits, which contained up-to-date TB educational resources. The Bureau also distributed over 6,500 brochures at health fairs and events, such as World TB Day, World Refugee Day and World AIDS Day.

700

Number of provider kits containing up-to-date TB educational resources that were distributed in 2007.

The Coalition for a TB-Free New York City

Launched in 2006, the Coalition for a TB-Free New York City continued to meet monthly in 2007. The Coalition's mandate is to involve community leaders in areas where the TB burden is high, to ensure access to services and to increase advocacy for the funding of national and global TB research and programs.

- In 2007, the Bureau participated in 25 TB Coalition meetings, which focused on increasing awareness of the current status of TB in NYC and on federal legislation under consideration (including the Comprehensive Tuberculosis Elimination Act and the Stop TB Now Act). The Coalition also met with the staff of Congressman Charles Rangel to encourage support of federal TB funding legislation.
- In 2007, the Coalition organized the Community Forum on Tuberculosis in New York City. The goals of the forum were to bring together communities disproportionately impacted by or at risk for TB in NYC, to share information about the burden of TB and to help community-based organizations develop strategies to address TB through community education, policy advocacy and support for increased program and research funding. The forum drew 43 community leaders, physicians, researchers and other health care professionals representing 19 agencies.

CORE ACTIVITIES

PUBLICATIONS

In 2007, Bureau staff co-authored five papers published in peer-reviewed journals and presented 12 posters at national and international conferences (Appendix III).

The Bureau added to the literature on molecular epidemiology and genotyping with a publication that examined the use of universal, real-time TB genotyping in NYC in a time of declining TB incidence. The paper considered the added value from universal genotyping in identifying ongoing transmission and reducing unnecessary treatment among patients with false-positive cultures.

The Bureau also published two studies evaluating the efficiency and efficacy of TB control activities in the city. The first paper explored the feasibility and cost of HIV referral, counseling and testing of close contacts to pulmonary TB cases. The second paper examined outcomes of a three-year effort to improve case management practices. The findings from both studies were used to revise protocols, target interventions and focus education and training to improve work practices.

The Bureau published on the outcome of multidrug resistant TB treatment in HIV-positive patients in NYC, and on the fear of reporting and deportation among undocumented immigrants and its implications on the treatment and control of TB in NYC.

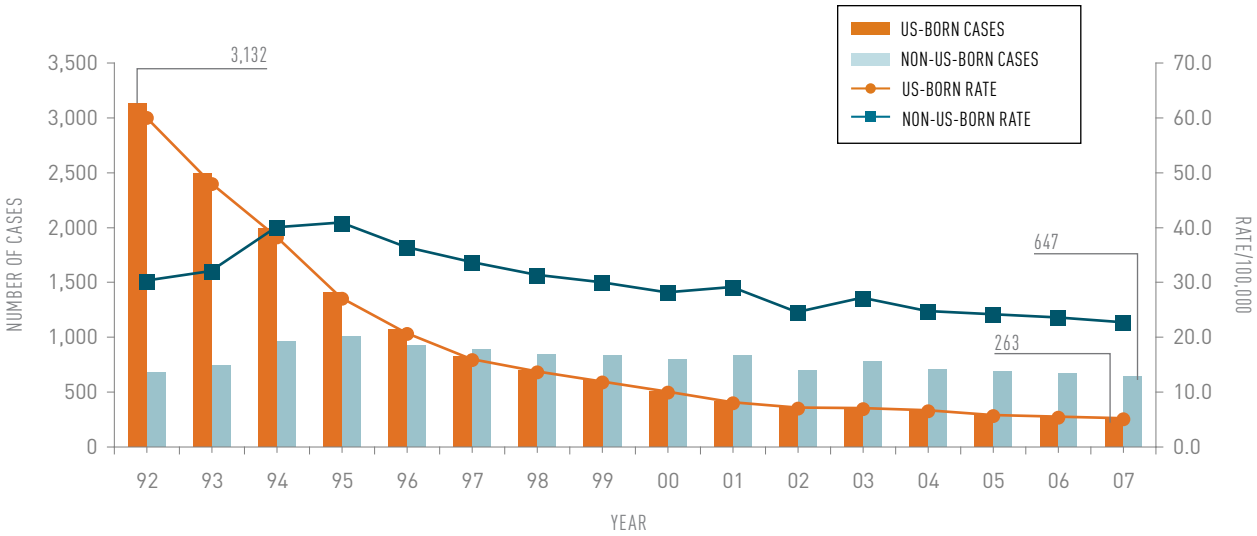
PROFILE of TB CASES

PATIENT CHARACTERISTICS

Country of Birth

- Persons born outside the United States constituted the majority of TB patients in NYC, representing 71% (647/914) of the City's TB patients in 2007 (Figure 4). The TB rate in non-US-born persons was more than four times that of US-born persons (22.6/100,000 versus 5.1/100,000).
- Countries of birth with the highest number of TB cases among non-US-born patients were: China (114), Mexico (48), Ecuador (46), the Dominican Republic (41), India (39), the Philippines (38), Haiti (32) and Bangladesh (28).
- Overall, 60% of non-US-born TB cases in 2007 had been in the United States for more than five years prior to their TB diagnosis.

FIGURE 4: US[1] AND NON-US-BORN TB CASES AND RATES[2], NEW YORK CITY, 1992-2007



[1] US-born includes people born in Puerto Rico and the U.S. Virgin Islands.
[2] Rates before 2000 are based on official US Census data and intercensal estimates. Rates after 2000 are based on 2000 Census data.

Countries of Birth with the Highest Number of Non-US-Born TB Cases, New York City, 2007:

CHINA	MEXICO	ECUADOR	DOMINICAN REPUBLIC	INDIA	PHILIPPINES	HAITI	BANGLADESH
114	48	46	41	39	38	32	28

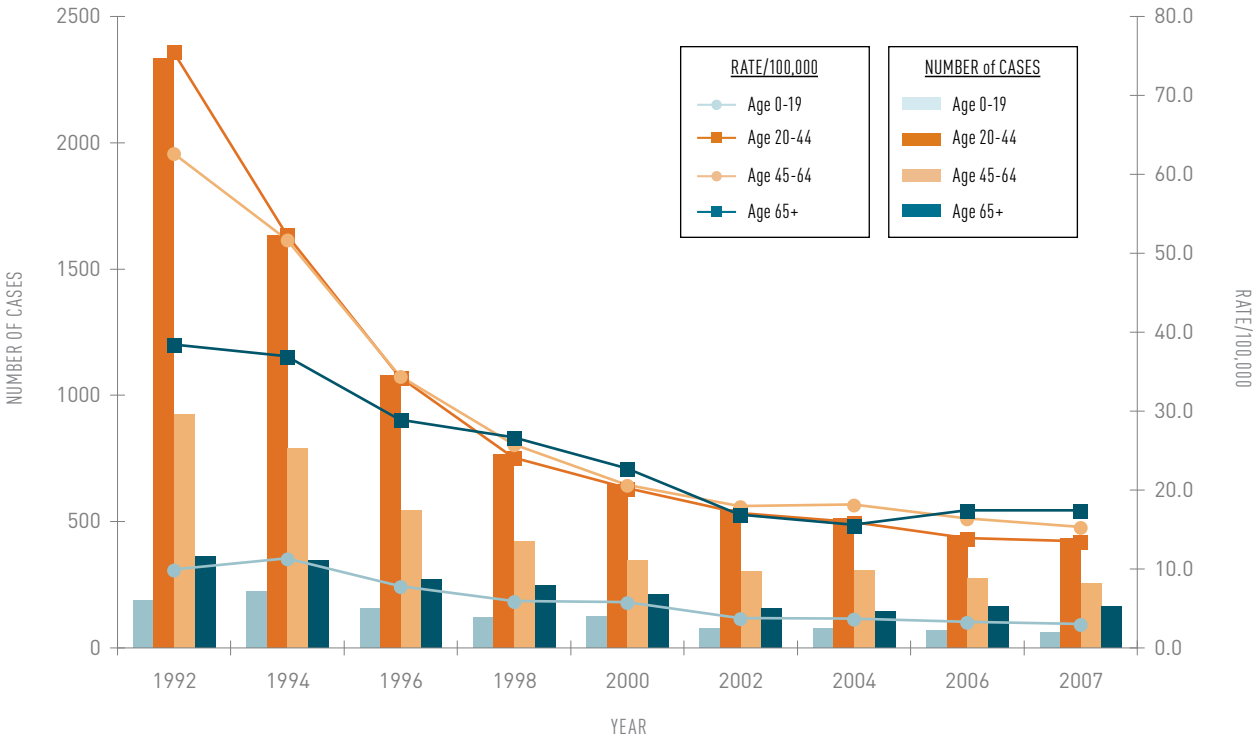
PROFILE of TB CASES

PATIENT CHARACTERISTICS (CONTINUED)

Age/Sex

- The majority of TB cases were among those in the 20-44 year old age group with 432 cases (47%), followed by the 45-64 age group with 257 cases (28%), the 65 and over age group with 162 cases (18%) and the 0-19 age group with 63 cases (7%) (Figure 5).
- Compared to 2006, there was a slight decrease in rates among those aged 19 and younger and those between ages 45 and 64. Persons aged 65 and over had the highest rate of TB at 17.3/100,000.
- Among pediatric TB cases, the number of children five years of age and younger decreased from 23 in 2006 to 12 in 2007. However, the number of cases in children between the ages of 10 and 19 increased 22% from 37 to 45.
- 58% (533) of cases were among men, while 42% (381) were among women. The highest rate for women was for those aged 25 to 34 (12.6/100,000), while the highest rate for men was for the age group 65 and over (26.7/100,000).

FIGURE 5: TB CASES AND RATES[1] BY AGE GROUP, NEW YORK CITY, 1992-2007



[1] Rates before 2000 are based on official US Census data and intercensal estimates. Rates after 2000 are based on 2000 Census data.

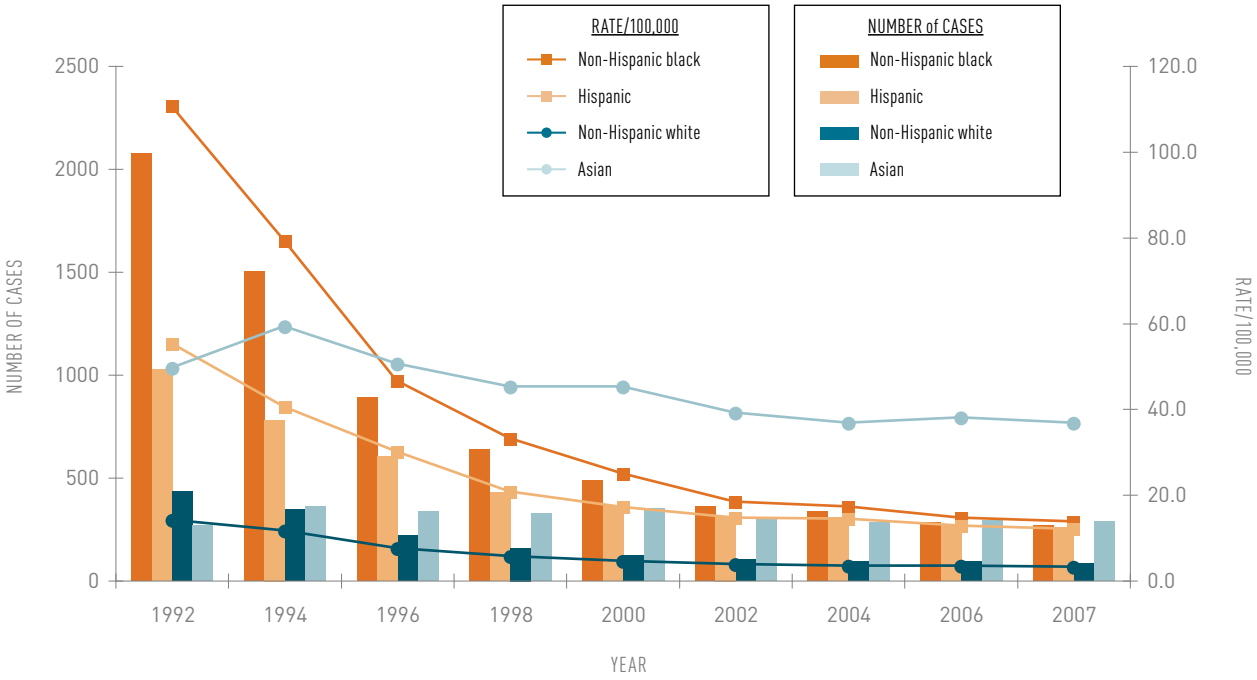
PROFILE of TB CASES

PATIENT CHARACTERISTICS (CONTINUED)

Race/Ethnicity

- Racial/ethnic minorities continue to be disproportionately affected by TB disease in NYC. The overall TB rates for all racial/ethnic groups decreased from 2006 to 2007. However, TB rates among Hispanics, non-Hispanic blacks and Asians were 3.8, 4.4 and 11.8 times higher, respectively, than those of non-Hispanic whites.
- Asians continue to have the highest TB rates in NYC at 36.7/100,000. For the second consecutive year, the number of Asian TB cases (287) surpassed the number of cases among non-Hispanic blacks (269) and Hispanic cases (258) (Figure 6).
- All TB cases among children five years of age or younger were among non-Hispanic blacks (7) and Hispanics (5).

FIGURE 6: TB CASES AND RATES[1] BY RACE/ETHNICITY, NEW YORK CITY, 1992-2007



[1] Rates before 2000 are based on official US Census data and intercensal estimates. Rates after 2000 are based on 2000 Census data.

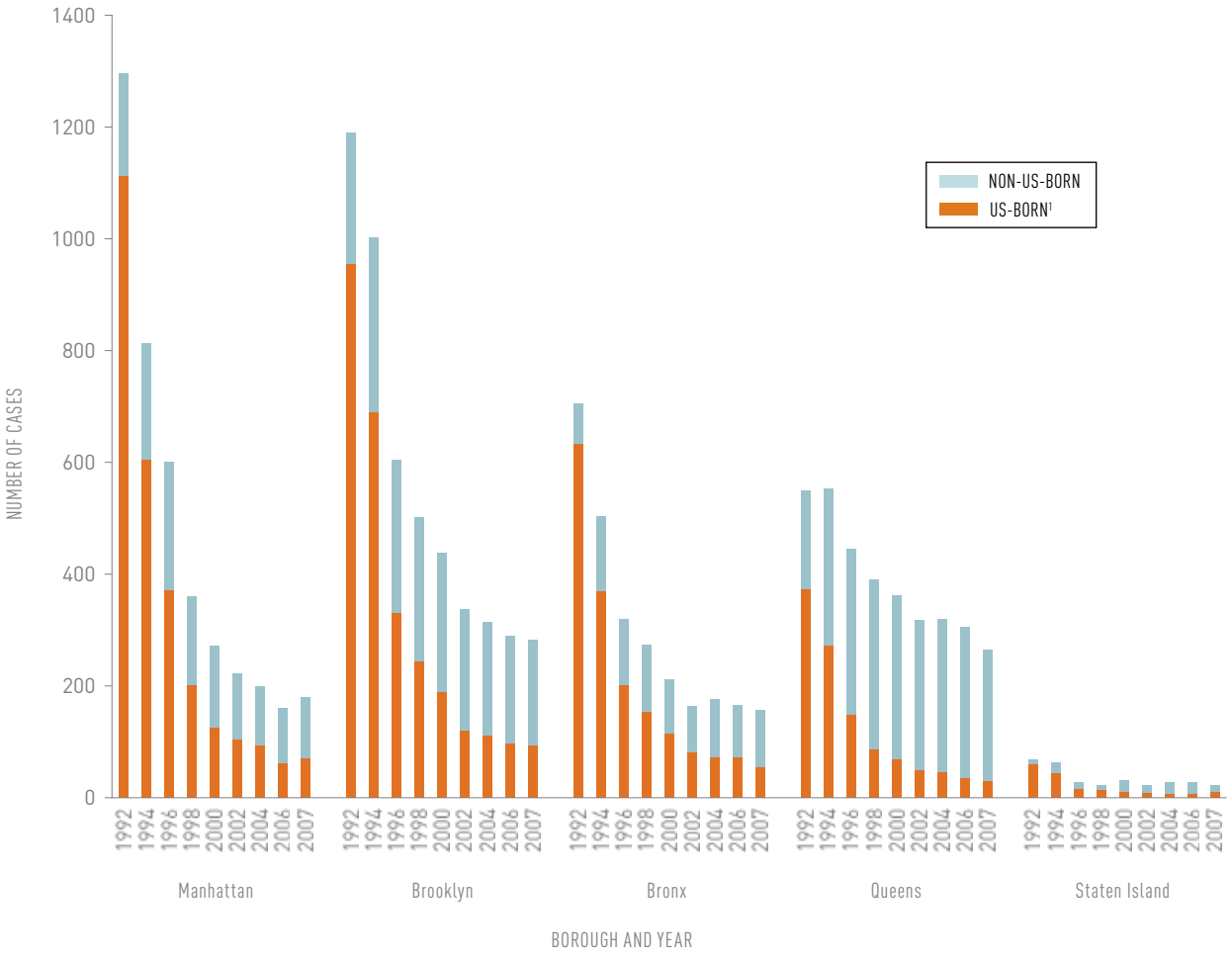
PROFILE of TB CASES

PATIENT CHARACTERISTICS (CONTINUED)

Neighborhoods

- Brooklyn had the highest burden of TB with 283 (31%) cases, followed by Queens with 266 (29%) cases (Figure 7).
- From 2006 to 2007, the TB rate decreased by 18% and 13% in Staten Island and Queens, respectively, while the rate in Manhattan increased 11%.

FIGURE 7: TB CASES BY BOROUGH AND AREA OF BIRTH, NEW YORK CITY, 1992-2007

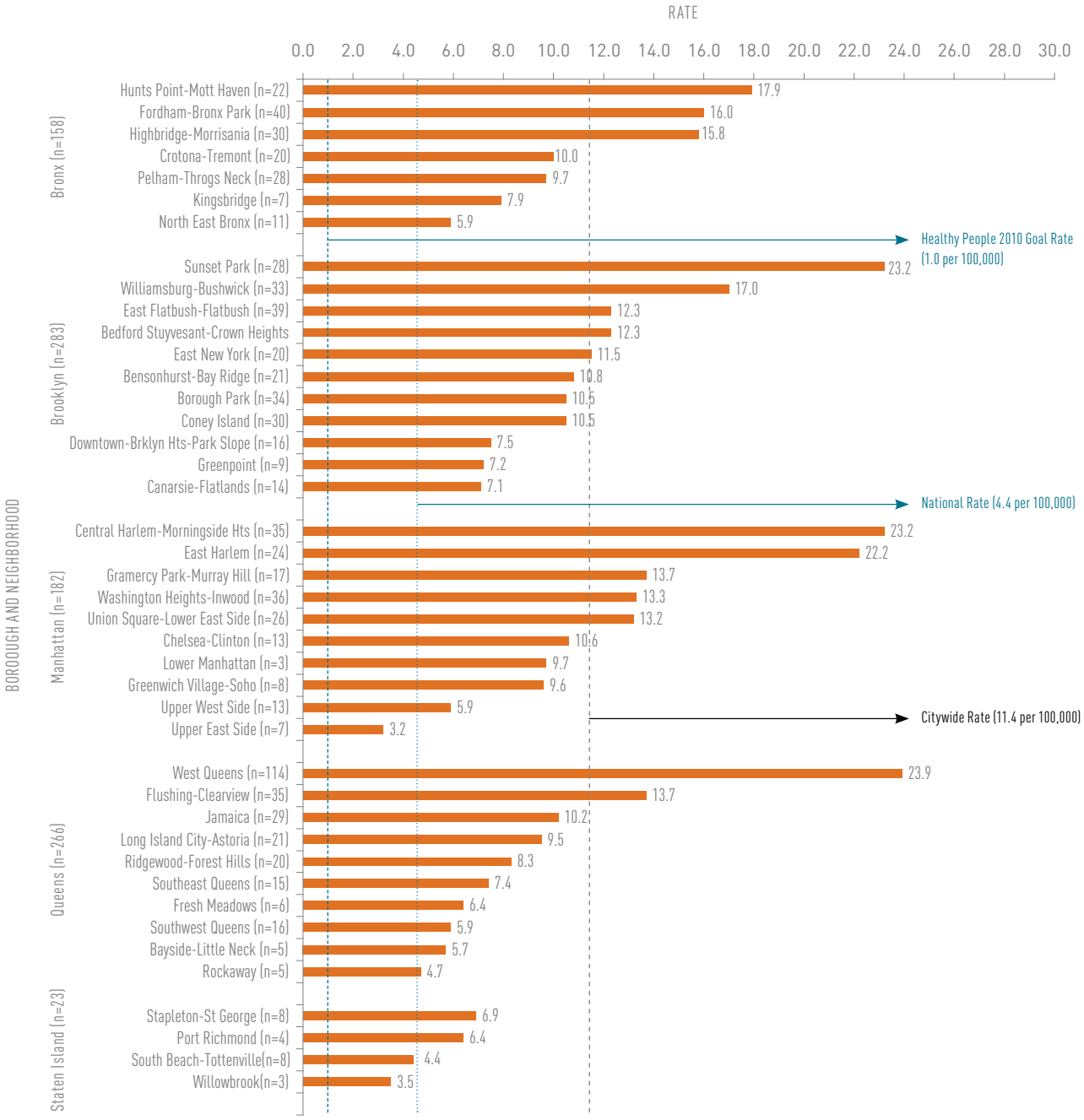


[1] Includes people born in Puerto Rico and the U.S. Virgin Islands.

PROFILE of TB CASES

PATIENT CHARACTERISTICS (CONTINUED)

FIGURE 8: RATES OF TB BY UNITED HOSPITAL FUND NEIGHBORHOOD,[1,2] NEW YORK CITY, 2007



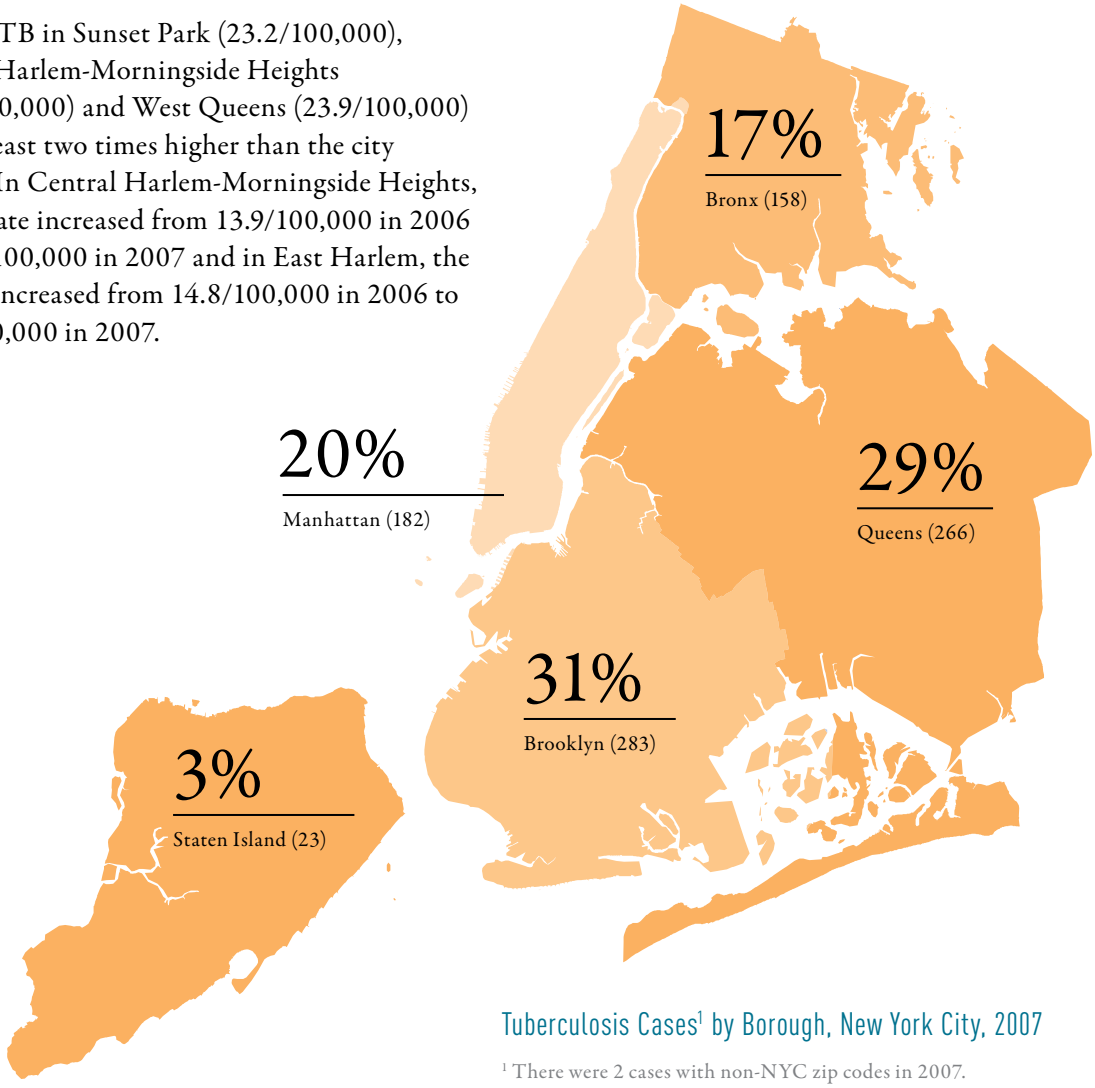
[1] Rates are based on 2000 Census data.
[2] There were two cases with non-NYC zip codes in 2007.

PROFILE of TB CASES

PATIENT CHARACTERISTICS (CONTINUED)

88% Percentage of 2007 TB cases residing in Queens who were non-US-born.

- TB rates decreased in Crotona-Tremont, Williamsburg-Bushwick, Lower Manhattan and Fresh Meadows.
- Rates of TB in Sunset Park (23.2/100,000), Central Harlem-Morningside Heights (23.2/100,000) and West Queens (23.9/100,000) were at least two times higher than the city average. In Central Harlem-Morningside Heights, the TB rate increased from 13.9/100,000 in 2006 to 23.2/100,000 in 2007 and in East Harlem, the TB rate increased from 14.8/100,000 in 2006 to 22.2/100,000 in 2007.
- Two NYC United Hospital Fund (UHF) neighborhoods—the Upper East Side and Willowbrook—had TB rates lower than the national average rate of 4.4/100,000.
- Fifteen UHF neighborhoods had TB rates higher than the city average of 11.4/100,000 (Figure 8).



Tuberculosis Cases[1] by Borough, New York City, 2007

[1] There were 2 cases with non-NYC zip codes in 2007.

PROFILE of TB CASES

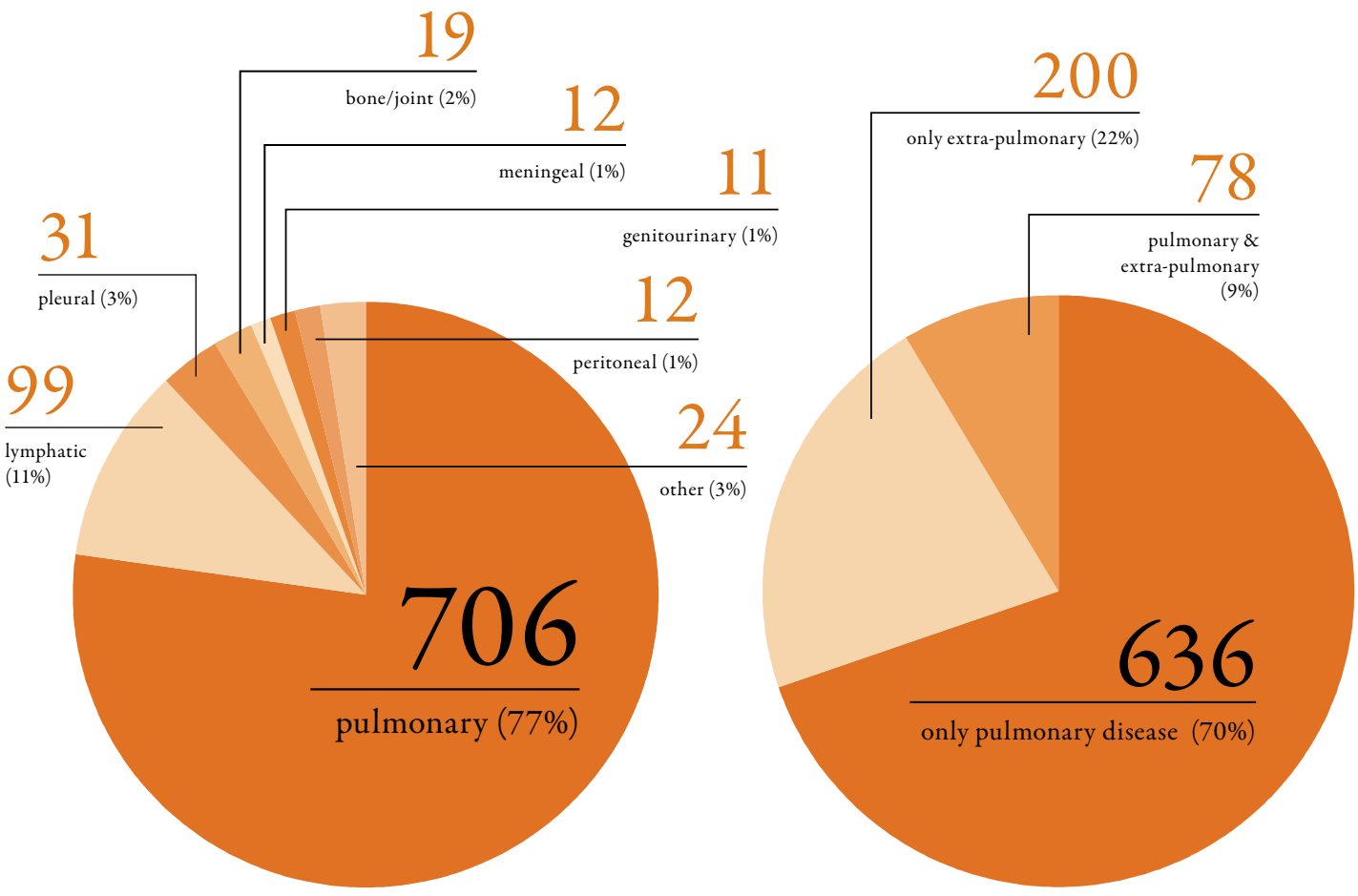
CLINICAL CHARACTERISTICS

Among the 914 TB cases in NYC in 2007, 709 (78%) were culture positive and 380 (42%) were sputum smear positive for acid-fast bacilli (AFB).

Sites of Disease

The lung was the most common primary site of disease with 706 (77%) cases having pulmonary-only TB. The lymphatic system was the second most common site of TB (99 cases), followed by pleural TB (31) and TB of the bone/joint (19) (Figure 9). Seventy-eight (9%) cases had both pulmonary TB and an additional site of disease and 200 (22%) had only extrapulmonary TB.

FIGURE 9: TB CASES BY SITE OF DISEASE, NEW YORK CITY, 2007



Tuberculosis Cases by Primary Disease Site

Tuberculosis Cases by All Sites of Disease

PROFILE of TB CASES

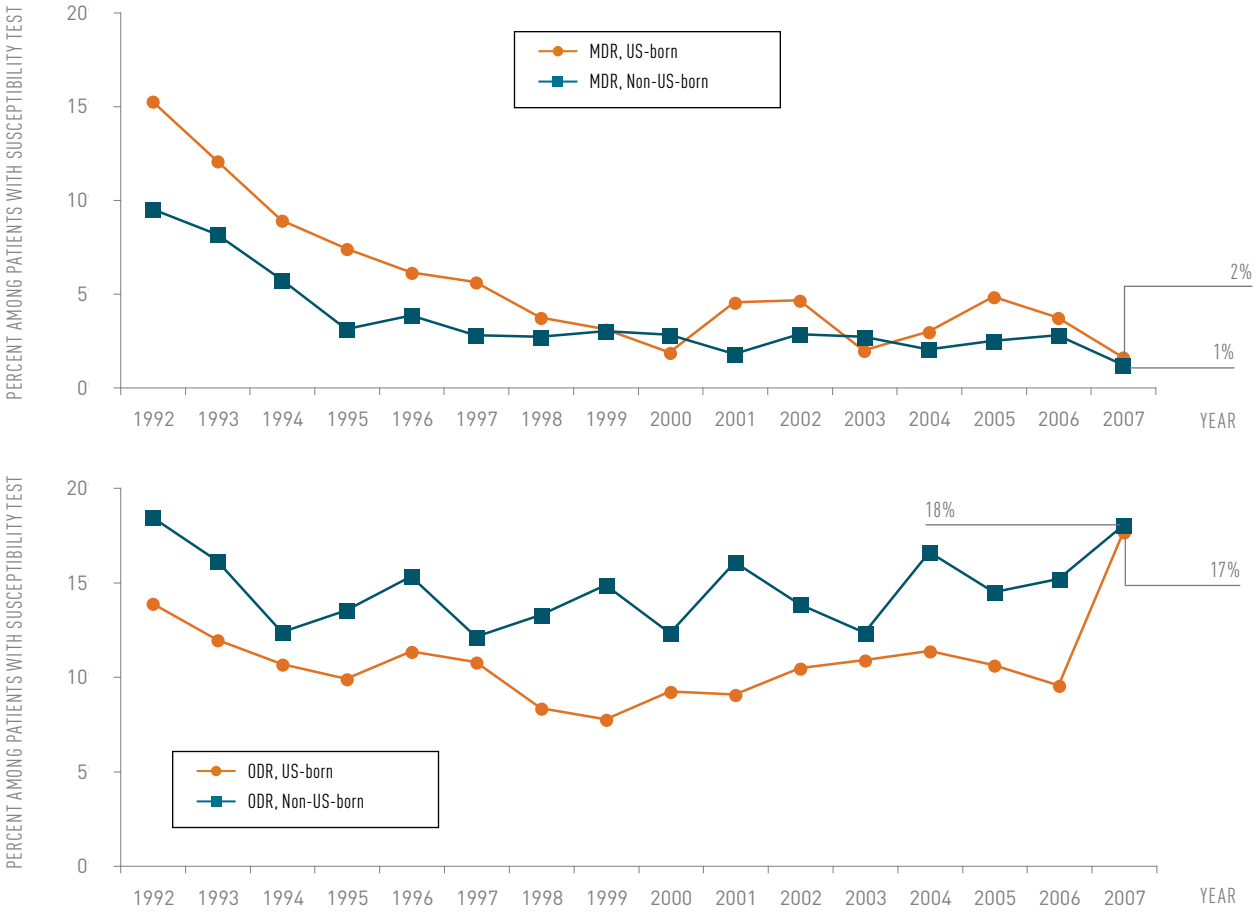
CLINICAL CHARACTERISTICS (CONTINUED)

Drug Resistance

- Among culture-positive cases for whom drug susceptibility was performed, 132 (19%) were drug-resistant. The number of multidrug resistant (MDRTB) cases decreased by 57%, from 21 cases in 2006 to 9 in 2007. The number of cases with other drug resistance patterns (ODR), however, increased from 95 in 2006 to 123 in 2007. There were no cases of extremely drug resistant TB[1] in 2007.
- Overall drug resistance was 19% for both non-US-born and US-born cases. Compared to the previous year, the percentage of cases with ODR patterns increased for both US-born and non-US-born cases, 8% and 3% respectively (Figure 10).

[1] Extremely drug-resistant TB is defined as resistance to isoniazid and rifampin plus resistance to any fouroquinolone and at least one of three injectable second-line anti-TB drugs (i.e. amikacin, kanamycin, or capreomycin).

FIGURE 10: DRUG RESISTANCE[2] BY AREA OF BIRTH, NEW YORK CITY, 1992-2007



[2] Multidrug resistance (MDR) is defined as isolates resistant to at least isoniazid and rifampin. Other drug resistance (ODR) is defined as isolates resistant to other first line drugs but not isoniazid and rifampin.

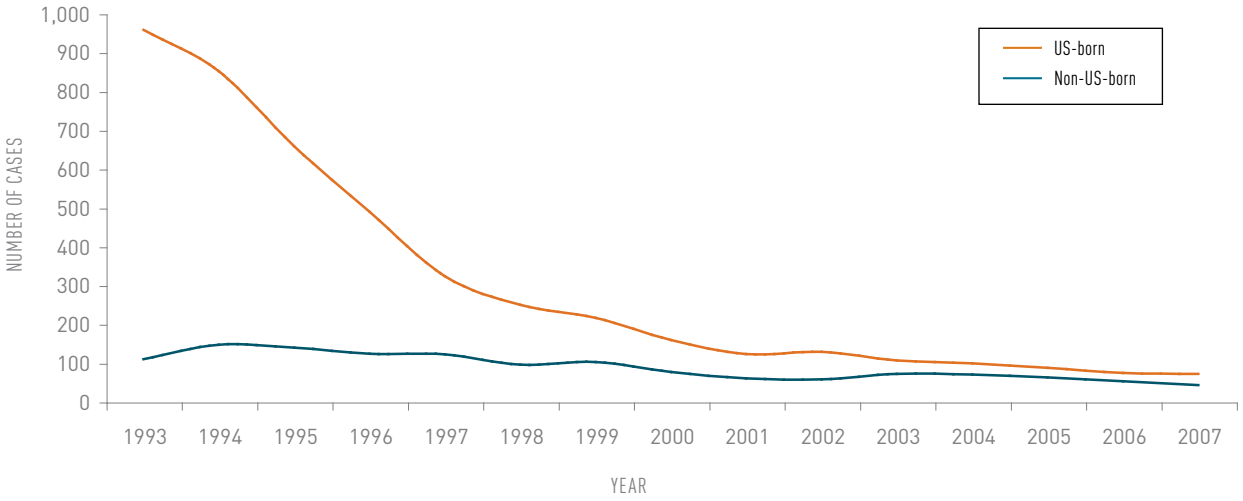
PROFILE of TB CASES

CLINICAL CHARACTERISTICS (CONTINUED)

HIV Co-Infection

- 116 (13%) TB cases were infected with HIV in 2007, a 9% decrease from the previous year and an 89% decrease from 1993 (Figure 11). However, the rate of decline among US-born and non-US-born varied, 17% vs. 5%, respectively.
- In 2007, HIV infection was most common among US-born TB cases (27%, 72/263) and among male TB cases (14%, 75/533).

FIGURE 11: HIV COINFECTION[1] IN PERSONS WITH TB BY AREA OF BIRTH, NEW YORK CITY, 1993-2007



[1] Data for HIV status is from the Bureau's TB Registry. Cross-matching of TB and AIDS registries was not conducted.

PROFILE of TB CASES

PATIENT MANAGEMENT AND OUTCOMES

Directly Observed Therapy

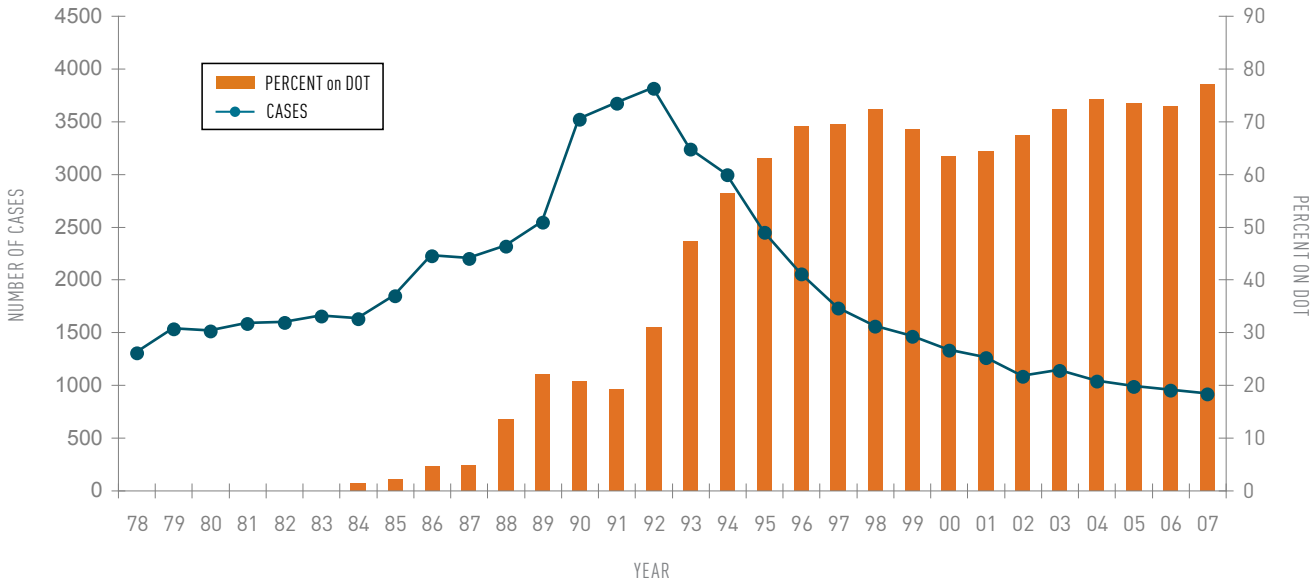
- In 2007, 77% of eligible TB patients—4% more than in 2006—received Directly Observed Therapy (DOT). (Figure 12).

77%

Percentage of eligible TB patients in NYC who received DOT in 2007.

- DOT rates were higher for patients with drug-resistant TB, patients who were pulmonary AFB smear-positive and patients who were treated at a Bureau chest center. All nine MDRTB cases diagnosed in 2007 received DOT.
- DOT rates were lower among patients with extrapulmonary TB and among those treated exclusively by a private medical provider. However, DOT rates for patients treated by a private provider improved from 32% in 2006 to 39% in 2007 (Figure 13).

FIGURE 12: TUBERCULOSIS CASES ON DIRECTLY OBSERVED THERAPY (DOT),[1] NEW YORK CITY, 1978-2007

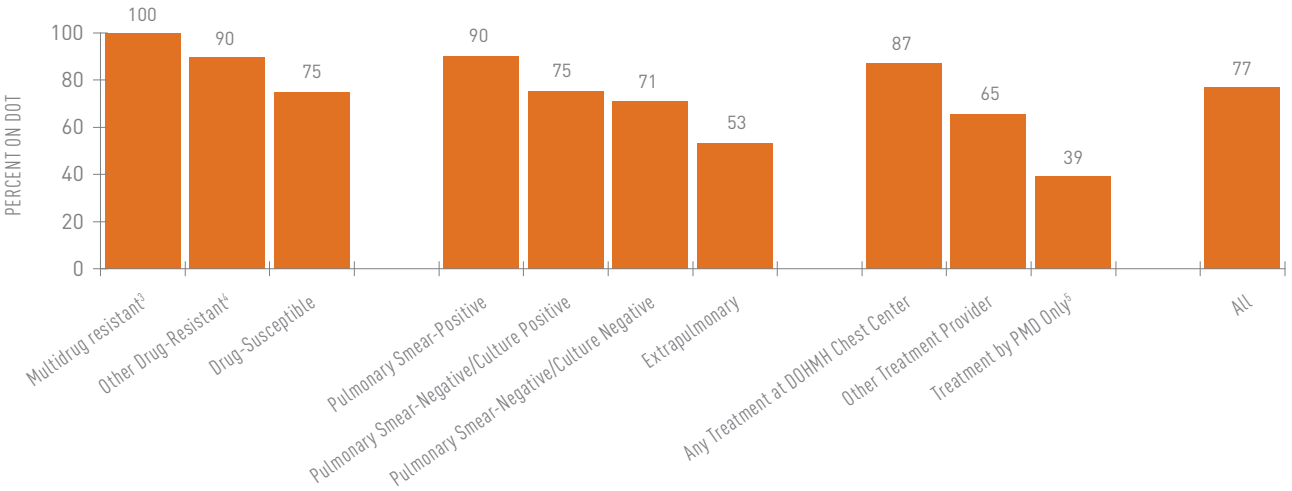


[1] Among those who received treatment with two or more drugs on an outpatient basis. Excludes patients who were diagnosed at death.

PROFILE of TB CASES

PATIENT MANAGEMENT AND OUTCOMES (CONTINUED)

FIGURE 13: PERCENTAGE OF ELIGIBLE[1] TUBERCULOSIS CASES ON DOT,[2] NEW YORK CITY, 2007



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

Treatment Outcomes[1]

85%

Percentage of patients diagnosed with TB in 2006 who completed treatment within one year

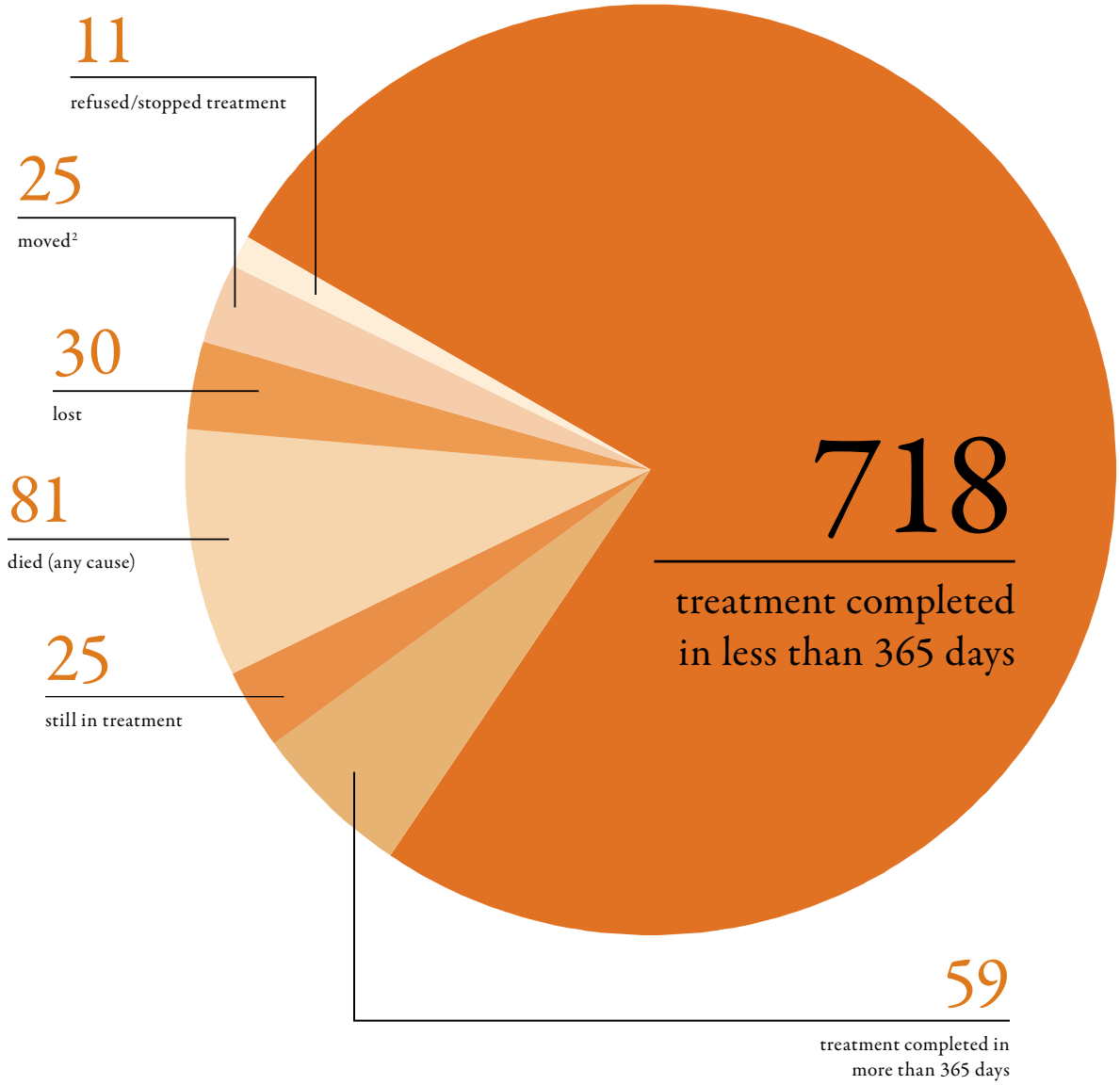
Most (85%) of the patients diagnosed with TB in 2006 completed their treatment within one year[2]; 7% completed treatment in more than 365 days[3] (Figure 14). Only 11 patients (1%) refused to continue treatment and 30 (3%) were lost to follow-up. Through interstate coordination, efforts were made to ensure that the 25 patients who moved from New York City completed their treatment.

[1] TB treatment usually lasts six to nine months. Treatment completion is analyzed within one year of delay to allow sufficient time for completion.
[2] Excluding patients who did not start on anti-TB medications, those who died before completion, those with Rifampin resistance and children younger than 15 years of age with bone and meningeal TB.
[3] Excluding patients did not start on anti-TB medications and those who died before treatment completion.

PROFILE of TB CASES

PATIENT MANAGEMENT AND OUTCOMES (CONTINUED)

FIGURE 14: OUTCOMES FOR CONFIRMED CASES COUNTED IN 2006 (N=949)[1], NEW YORK CITY



[1] Four of the 953 confirmed TB cases identified in NYC in 2006 were not counted as NYC cases. Information available as of June 2008.
[2] Patients are categorized as "moved" only if their transfer to another jurisdiction is confirmed and no further information is available.

APPENDICES

APPENDIX I

TABLES

TABLE 1: TUBERCULOSIS INCIDENCE, NEW YORK CITY, 1900-2007

Year[1]	Number[2,3]	Rate per 100,000[4]	Culture + Cases	Sputum Smear + Case[5]	Rate per 100,000	Multidrug-Resistant Cases[6,7]	Other Drug-Resistant Cases[7,8]	Deaths[9]	Death Rate per 100,000
1900	11,997	348.1						9,630	279.5
1910	32,065	670.0						10,074	210.5
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
2005	984	12.3	745	373	4.7	24	98	21	0.3
2006	953	11.9	708	354	4.4	21	94	17	0.2
2007	914	11.4	709	380	4.7	9	123	19	0.2

[1] TB became reportable on January 19, 1897. [2] From 1920-1940 includes "phthisis," or pulmonary cases; thereafter, all forms of tuberculosis. [3] 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." [4] Rates through 2000 are based on official Census population data and intercensal estimates. Rates after 2000 are based on 2000 Census data. [5] Patients with a sputum smear positive for acid-fast bacilli regardless of culture result. [6] Resistant to at least isoniazid and rifampin. Mandatory drug susceptibility reporting became effective during 1991; figure from that year is not complete. [7] 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 drug susceptibility testing method. All historical data updated to reflect this definition. [8] This information was estimated for 1992, exact figures are not available. [9] TB deaths are obtained from vital statistics records where TB was listed as the cause of death and may include cases diagnosed in previous years.

TABLE 2: HIV STATUS OF TUBERCULOSIS CASES BY SEX AND AREA OF BIRTH, NEW YORK CITY, 1992-2007

Year	Females HIV (+)		Males HIV (+)		US-born HIV (+)		Non-US-born HIV (+)		Total[1] HIV (+)	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
1992	297	(25)	984	(37)	1294[2]	(43)	118	(17)	1281	34)
1993	308	(28)	760	(36)	958	(38)	110	(15)	1068	(33)
1994	244	(24)	767	(39)	852	(43)	147	(15)	1011	(34)
1995	226	(25)	575	(37)	658	(47)	139	(14)	801	(33)
1996	204	(26)	429	(34)	490	(46)	124	(13)	633	(31)
1997	147	(22)	301	(29)	323	(39)	122	(14)	448	(26)
1998	108	(19)	238	(24)	250	(36)	96	(11)	346	(22)
1999	102	(18)	219	(24)	216	(36)	102	(12)	321	(22)
2000	74	(14)	167	(21)	159	(31)	77	(10)	241	(18)
2001	65	(13)	119	(15)	123	(30)	60	(7)	184	(15)
2002	57	(14)	136	(20)	129	(36)	58	(8)	193	(18)
2003	47	(11)	131	(18)	106	(30)	72	(9)	178	(16)
2004	52	(13)	117	(19)	99	(30)	70	(10)	169	(16)
2005	38	(11)	113	(18)	87	(30)	63	(9)	151	(15)
2006	39	(10)	88	(15)	74	(27)	53	(8)	127	(13)
2007	41	(11)	75	(14)	72	(28)	43	(7)	116	(13)

[1] Total HIV infected cases may be more than the sum of US and non-US-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 INCIDENCE RATES[1] BY RACE/ETHNICITY, SEX, AND AGE, NEW YORK CITY, 2007

	Age (Years)										
Race/Sex	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Total
Non-Hispanic White, #	0	1	1	1	2	13	14	11	13	30	86
Non-Hispanic White, Rate	0.0	0.8	0.8	0.8	1.1	2.7	3.3	2.8	4.5	5.6	3.1
Males, Number	0	0	0	0	0	7	8	9	7	16	47
Males, Rate	0.0	0.0	0.0	0.0	0.0	2.9	3.7	4.7	5.2	7.6	3.5
Females, Number	0	1	1	1	2	6	6	2	6	14	39
Females, Rate	0.0	1.6	1.7	1.6	2.2	2.5	2.9	1.0	3.9	4.3	2.7
Non-Hispanic Black, #	7	1	3	12	15	44	54	64	35	34	269
Non-Hispanic Black, Rate	4.8	0.6	1.8	7.9	10.9	15.0	17.1	26.9	20.9	18.4	13.7
Males, Number	6	0	1	5	9	28	27	44	22	17	159
Males, Rate	8.1	0.0	1.2	6.7	14.3	22.1	19.7	43.6	32.7	26.6	18.2
Females, Number	1	1	2	7	6	16	27	20	13	17	110
Females, Rate	1.4	1.2	2.5	9.2	8.0	9.6	15.2	14.6	13.0	14.0	10.1
Hispanic, #	5	2	1	10	28	74	51	40	19	28	258
Hispanic, Rate	2.7	1.0	0.6	5.7	14.8	19.3	15.4	17.1	12.8	20.2	11.9
Males, Number	2	1	1	5	18	43	36	23	9	18	156
Males, Rate	2.1	1.0	1.1	5.6	18.7	22.7	22.8	21.8	13.7	35.2	15.0
Females, Number	3	1	0	5	10	31	15	17	10	10	102
Females, Rate	3.3	1.0	0.0	5.9	10.7	16.0	8.6	13.3	12.0	11.4	9.1
Asian, #	0	2	3	14	24	59	46	40	30	69	287
Asian, Rate	0.0	4.2	6.6	29.3	38.5	37.1	31.9	37.3	50.1	117.2	36.8
Males, Number	0	1	1	6	15	31	23	25	17	45	164
Males, Rate	0.0	4.1	4.2	24.2	50.1	40.2	31.1	46.7	58.2	170.9	42.3
Females, Number	0	1	2	8	9	28	23	15	13	24	123
Females, Rate	0.0	4.4	9.3	34.7	27.9	34.2	32.8	27.9	42.3	73.7	31.4
Total,[2] #	12	6	8	37	69	194	169	156	101	162	914
Total, Rate	2.2	1.1	1.5	7.1	11.7	14.2	13.4	15.4	14.8	17.3	11.4
Males, Number	8	2	3	16	42	109	98	102	57	96	533
Males, Rate	2.9	0.7	1.1	6.0	14.7	16.5	16.0	21.7	18.7	26.7	14.0
Females, Number	4	4	5	21	27	85	71	54	44	66	381
Females, Rate	1.5	1.5	1.9	8.2	8.9	12.0	10.9	10.0	11.6	11.4	9.0

[1] Rate/100,000. Rates are based on 2000 census data.
[2] There are 10 patients with multiple races, four patients who are of Pacific Islander, Native American or unknown race or ethnicity. They are included in the totals.

TABLE 4: SELECTED CHARACTERISTICS OF US-BORN AND NON-US-BORN CASES, NEW YORK CITY, 2007

Characteristics	US-born		Non-US-born		Total	
	N	(%)	N	(%)	N	(%)
DEMOGRAPHICS						
Age Group						
0-19	33	(13)	30	(5)	63	(7)
20-44	100	(38)	332	(51)	432	(47)
45-64	85	(32)	169	(26)	257	(28)
65+	45	(17)	116	(18)	162	(18)
Sex						
Female	115	(44)	265	(41)	381	(42)
Male	148	(56)	382	(59)	533	(58)
Race/ethnicity						
Black Non-Hispanic	148	(56)	120	(19)	269	(29)
White Non-Hispanic	38	(14)	46	(7)	86	(9)
Hispanic	70	(27)	188	(29)	258	(28)
Asian	5	(2)	282	(44)	287	(31)
Multiple	2	(1)	8	(1)	10	(1)
Pacific Islander	0	(0)	2	(0)	2	(0)
Native American	0	(0)	1	(0)	1	(0)
Unknown ethnicity or race	0	(0)	0	(0)	1	(0)
Borough of residence						
Manhattan	71	(27)	109	(17)	182	(20)
Bronx	56	(21)	102	(16)	158	(17)
Brooklyn	94	(36)	188	(29)	283	(31)
Queens	31	(12)	234	(36)	266	(29)
Staten Island	11	(4)	12	(2)	23	(3)
Time in the US						
<1 year	n/a	n/a	102	(16)	102	(11)
1-5 years	n/a	n/a	147	(23)	147	(16)
>5 years	n/a	n/a	388	(60)	388	(42)
Unknown	n/a	n/a	10	(2)	10	(1)
CLINICAL CHARACTERISTICS						
Ever on DOT (of those eligible)	157	(75)	454	(78)	611	(77)
Ever smear positive	141	(54)	358	(55)	502	(55)
Sputum smear positive	100	(38)	277	(43)	380	(42)
NAA positive[2]	90	(78)	220	(74)	312	(75)
Culture positive	194	(74)	511	(79)	709	(78)
Clinical case[3]	69	(26)	136	(21)	205	(22)
Pulmonary site of disease	182	(69)	450	(70)	636	(70)
Extra-pulmonary site of disease	57	(22)	143	(22)	200	(22)
Both pulmonary & extra-pulmonary	24	(9)	54	(8)	78	(9)
Cavitary chest x-ray[4]	39	(19)	96	(19)	135	(19)
Multidrug resistance[5]	3	(2)	6	(1)	9	(1)
Other drug resistance[6]	33	(17)	90	(18)	123	(18)
History of prior TB	5	(2)	9	(1)	14	(2)
HIV Status						
Positive	72	(27)	43	(7)	116	(13)
Negative	135	(51)	387	(60)	523	(57)
Refused	35	(13)	165	(26)	200	(22)
Not offered/done and unknown	21	(8)	52	(8)	75	(8)
Last medical provider type						
DOHMH chest center	98	(37)	324	(50)	422	(46)
Health and Hospitals Corporation hospitals	48	(18)	162	(25)	210	(23)
Private hospitals	54	(21)	60	(9)	117	(13)
Private physicians	30	(11)	72	(11)	102	(11)
Other providers6	33	(13)	30	(5)	64	(7)
Started on 4 first line anti-TB drugs	227	(86)	580	90	810	(89)
Started on 4 or more anti-TB drugs (other)	16	(6)	20	(3)	37	(4)
SOCIAL CHARACTERISTICS[7]						
Homeless[8]	38	(14)	21	(3)	60	(7)
Employed[9]	68	(26)	302	(47)	370	(40)
Health care worker	3	(1)	29	(4)	32	(4)
Correctional employee	0	(0)	0	(0)	0	(0)
Injection drug use[10]	19	(7)	2	(0)	21	(2)
Non-injection drug use[10]	63	(24)	19	(3)	82	(14)
Alcohol abuse[10]	74	(28)	68	(11)	142	(16)
Any drug or alcohol abuse[10]	99	(38)	79	(12)	178	(19)
Resident of correctional facility[11]	15	(6)	0	(0)	15	(2)
Resident of long-term care facility[11]	10	(4)	5	(1)	15	(2)
TOTAL	**263**	**(29)**	**647**	**(71)**	**914**	

[1] Not all categories are complete and totals may include cases with unknown area of birth. There were 4 cases with unknown country of birth; [2] Of patients with any pulmonary disease site and positive respiratory acid-fast bacilli (AFB) smears; [3] As per CDC clinical case definition; [4] Percent of pulmonary cases which includes cases with pulmonary-only and both pulmonary and extra pulmonary site of disease; [5] Multidrug resistant is defined as resistant to at least isoniazid and rifampin, percent is of culture positive and susceptibility done; [6] Other drug resistance is defined as not MDR, but resistant to one or more first line drugs, percent is of culture positive and susceptibility done; [7] Other providers include correctional facilities, VA hospitals, out-of-NYC, and psychiatric providers; [8] Categories are not mutually exclusive; [9] Homeless is at diagnosis or any time during treatment; [10] Occupation is for the past 24 months before diagnosis; [11] In past 12 months before TB diagnosis; [12] At time of diagnosis.

TABLE 5: TUBERCULOSIS RATES[1] BY UNITED HOSPITAL FUND NEIGHBORHOOD, NEW YORK CITY, 1997-2007

		Rate per 100,000 population										
UHF Neighborhood	**# Cases**	**2007**	**2006**	**2005**	**2004**	**2003**	**2002**	**2001**	**2000**	**1999**	**1998**	**1997**
BRONX	**157**	**11.8**	**12.4**	**11.9**	**13.3**	**13.3**	**12.4**	**12.7**	**16.3**	**14.9**	**20.2**	**21.5**
High Bridge-Morrisania	30	15.8	20.0	17.9	18.4	22.7	6.7	17.4	21.1	20.3	31.3	36.0
Crotona-Tremont	19	9.5	15.0	16.0	16.0	14.0	8.1	13.0	23.1	17.7	22.5	27.3
Hunts Point-Mott Haven	22	17.9	13.8	14.6	19.5	13.0	5.9	18.7	13.8	21.2	21.2	36.7
Fordham-Bronx Park	40	16	13.6	9.6	11.6	17.2	16.3	13.6	20.0	19.0	30.3	21.9
Pelham-Throgs Neck	28	9.7	8.6	11.4	12.1	9.7	16.3	12.8	11.7	9.4	11.6	12.4
Kingsbridge	7	7.9	7.9	6.7	6.7	7.9	17.5	6.7	16.9	11.2	9.0	8.9
Northeast Bronx	11	5.9	7.5	5.9	8.1	6.5	16.4	5.4	7.5	7.1	11.0	10.0
BROOKLYN	**283**	**11.5**	**11.8**	**13.1**	**12.7**	**14.8**	**14.0**	**15.8**	**18.1**	**19.1**	**20.7**	**23.8**
Sunset Park	28	23.2	29.1	29.9	22.4	19.9	14.4	27.4	33.2	13.5	22.4	21.0
Williamsburg-Bushwick	33	17	23.7	23.2	19.6	24.7	5.6	25.2	22.1	26.8	25.8	39.2
East Flatbush-Flatbush	39	12.3	12.6	19.3	14.5	18.6	11.5	18.9	31.3	23.3	23.0	29.8
Borough Park	34	10.5	12.6	12.3	13.3	13.6	14.2	10.5	10.5	18.4	21.6	16.7
Bed. Stuyvesant-Crown Heights	39	12.3	11.0	13.2	14.2	18.6	18.6	18.0	23.6	24.9	40.5	40.9
East New York	20	11.5	10.9	12.1	13.8	11.5	15.3	16.7	15.0	24.9	20.4	18.8
Coney Island	30	10.5	8.0	10.1	10.8	10.5	9.1	12.9	11.5	16.9	12.8	17.2
Bensonhurst-Bay Ridge	21	10.8	7.7	6.2	7.7	8.7	10.5	10.8	13.4	14.0	11.0	11.1
Canarsie Flatlands	14	7.1	7.6	5.6	9.6	12.6	10.8	12.1	9.1	8.7	13.0	15.9
Downtown-Bklyn Hts-Pk Slope	16	7.5	7.5	8.4	9.3	12.1	19.1	15.4	15.4	17.2	13.0	20.9
Greenpoint	9	7.2	4.8	6.4	4.8	9.6	22.1	9.6	15.3	12.1	11.4	18.9
MANHATTAN	**182**	**11.9**	**10.7**	**11.9**	**12.9**	**15.6**	**14.8**	**16.7**	**17.9**	**21.5**	**23.8**	**29.3**
Union Square-Lower East Side	26	13.2	19.3	14.7	17.8	19.8	8.4	20.8	22.3	32.0	32.1	38.8
Lower Manhattan	6	19.4	16.2	12.9	19.4	3.2	6.9	12.9	12.9	19.7	30.0	23.6
East Harlem	24	22.2	14.8	15.7	24.1	28.7	17.6	28.7	27.8	24.2	39.2	42.2
Central Harlem	35	23.2	13.9	23.2	24.5	21.2	20.8	20.5	28.5	38.6	46.7	52.3
Washington Heights-Inwood	36	13.3	13.3	11.8	12.6	19.6	31.1	17.7	19.2	24.1	28.7	28.9
Gramercy Park-Murray Hill	17	13.7	9.6	12.1	13.7	19.3	9.7	15.3	20.1	19.4	22.7	26.8
Chelsea-Clinton	13	10.6	8.1	17.1	6.5	10.6	11.4	23.6	16.3	22.7	17.8	34.0
Grennwich Village-SoHo	8	9.6	7.2	10.8	15.5	9.6	8.6	16.7	19.1	21.6	12.1	25.5
Upper West Side	13	5.9	5.9	4.1	7.2	13.1	16.3	12.6	9.9	13.5	11.7	18.4
Upper East Side	4	1.8	3.2	5.0	2.3	4.1	14.5	5.0	8.3	4.6	6.9	11.1
QUEENS	**266**	**11.8**	**13.5**	**13.6**	**14.3**	**14.7**	**14.4**	**18.6**	**16.2**	**19.7**	**18.5**	**18.6**
West Queens	114	23.9	27.6	22.4	26.8	30.6	20.8	32.5	25.3	32.5	28.4	27.0
Flushing	35	13.7	14.5	17.2	17.6	15.7	17.2	22.3	21.9	19.3	19.5	24.9
Fresh Meadows	6	6.4	12.9	7.5	17.2	12.9	10.3	10.7	17.2	17.4	8.8	8.9
Jamaica	29	10.2	10.9	12.3	12.6	8.1	6.8	18.9	11.9	18.0	18.9	18.8
Ridgewood/Forest Hills	20	8.3	10.4	10.8	5.8	11.2	10.7	10.0	12.9	10.5	11.8	10.7
Long Island City-Astoria	21	9.5	8.6	11.3	14.0	12.7	25.5	19.0	16.7	28.4	25.1	25.4
Southwest Queens	16	5.9	7.8	11.9	9.3	9.6	7.5	11.5	10.0	9.8	15.4	9.4
Southeast Queens	15	7.4	7.4	8.3	4.4	8.8	6.4	13.3	10.3	15.8	11.0	15.1
Bayside-Little Neck	5	5.7	6.8	3.4	7.9	10.2	13.7	6.8	11.3	5.7	6.9	9.3
Rockaway	5	4.7	6.6	7.5	7.5	0.9	4.8	11.2	10.3	16.0	12.3	16.2
STATEN ISLAND	**23**	**5.1**	**6.3**	**3.8**	**6.3**	**6.5**	**5.6**	**6.1**	**7.2**	**7.8**	**5.8**	**7.5**
Port Richmond	4	6.4	8.0	4.8	9.6	8.0	8.6	17.5	11.1	17.8	11.6	13.5
Stapleton-St. George	8	6.9	7.7	6.9	10.3	17.2	8.0	9.5	15.5	12.2	9.8	11.7
South Beath-Tottenville	8	4.4	6.1	1.1	2.8	0.0	3.3	1.1	1.1	2.8	2.3	4.1
Willowbrook	3	3.5	3.5	4.7	5.9	4.7	4.7	3.5	5.9	4.8	3.6	4.8
TOTAL, NEW YORK CITY	**914**	**11.4**	**11.9**	**12.3**	**13.0**	**14.2**	**13.5**	**15.7**	**16.6**	**18.4**	**19.8**	**22.2**

[1] Rates are based on intercensal estimates prior to 1999. Rates since 2000 are based on 2000 Census data.
[2] There were two cases in 2007, two cases in 2001 and one case in 1998 with missing zip code information not included in the totals. Rates are estimated for these years.

TABLE 6: TUBERCULOSIS CASES BY AGE AND AREA OF BIRTH, NEW YORK CITY, 2007

Area of Birth	Age (Years) 0-19		20-44		45-64		65+		Total	Rate/ 100,000
	N	(%)	N	(%)	N	(%)	N	(%)	N	
Caribbean & Latin America[1]	9	(4)	146	(57)	73	(29)	26	(10)	254	17
Asia[2]	17	(6)	137	(45)	79	(26)	73	(24)	305	48
Africa[3]	2	(4)	38	(79)	8	(17)	0	(0)	48	51
Europe[4]	1	(3)	9	(26)	9	(26)	16	(46)	35	6
Middle East[5]	1	(33)	2	(67)	0	(0)	0	(0)	3	6
Total Non-US-Born[6]	30	(5)	333	(51)	168	(26)	116	(18)	647	22
US[7]	32	(14)	92	(39)	76	(32)	35	(15)	235	5
Puerto Rico	1	(4)	8	(3)	9	(32)	10	(36)	28	9
Total US	33	(13)	100	(39)	85	(32)	45	(17)	263	5
Unknown	0	(0)	0	(0)	3	(75)	1	(25)	4	
Total	63	(7)	433	(47)	257	(28)	162	(18)	914	11

[1] Mexico (48), Ecuador (46), Dominican Republic (41), Haiti (32), Honduras (12), Guyana (10), Peru (10), Jamaica (9), Guatemala (9), Trinidad and Tobago (8), Colombia (5), Cuba (4), Grenada (4), Other (16).
[2] China (114), India (39), Philippines (38), Bangladesh (28), Nepal (17), South Korea (16), Pakistan (14), Hong Kong (7), Myanmar (6), Vietnam (4), Other (20).
[3] Guinea (9), Gambia (6), Sierra Leone (5), Ghana (4), Ivory Coast (4), Other (20)
[4] Ukraine (8), Russia (7), Poland (6), Other (14)
[5] Yemen (2), Egypt (1), Morroco (1), Israel (1)
[6] Other area of birth (2)
[7] Includes the US Virgin Islands and other US territories, excludes Puerto Rico.

TABLE 7: DRUG RESISTANCE BY AREA OF BIRTH, NEW YORK CITY, 2007

	US-born[1]		Non-US-born		Total[2]	
	N	(% of those with positive culture for M. tuberculosis)	N	(% of those with positive culture for M. tuberculosis)	N	(% of those with positive culture for M. tuberculosis)
Positive Culture for M. tuberculosis	194		511		709	
Tested for susceptibility to first-line drugs	190	(98)	508	(99)	702	(99)
SUSCEPTIBILITY RESULTS	N	% of those tested for susceptibility to first line drugs	N	% of those tested for susceptibility to first line drugs	N	% of those tested for susceptibility to first line drugs
Any Resistance[3]	36	(19)	96	(19)	132	(19)
Multidrug resistant (resistant to at least isoniazid & rifampin)	3	(2)	6	(1)	9	(1)
Other Drug-Resistant TB[4]	33	(17)	90	(18)	123	(18)
Isoniazid Resistance Only	16	(8)	27	(5)	43	(6)
Rifampin Resistance Only	5	(3)	2	(0)	7	(1)
Ethambutol Resistance Only	1	(1)	0	(0)	1	(0)
Streptomycin Resistance Only	7	(4)	20	(4)	27	(4)
Pyrazinamide Resistance Only	0	(0)	13	(3)	13	(2)
‹1 First-line Drug Resistance	4	(2)	28	(6)	32	(5)
INH Resistant + Other First Line	4	(2)	27	(5)	31	(4)
INH + SMN Resistant + Other First Line	0	(0)	9	(2)	9	(1)
Susceptible to all first-line drugs	151	(79)	404	(80)	559	(80)

[1] Includes Puerto Rico, the US Virgin Islands and other US territories.
[2] Totals include drug resistance for patients with unknown country of birth.
[3] Eight patients had a history of prior anti-TB treatment, one had a drug-resistant TB strain.
[4] Forms of other drug resistance are not mutually exclusive,

TABLE 8: HIV STATUS BY AREA OF BIRTH AND AGE, NEW YORK CITY, 2007

HIV Status/Area of Birth	Age (Years) 0-19		20-44		45-64		65+		Total	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
HIV positive	0	(0)	58	(50)	54	(47)	3	(3)	115	(13)
US-born[1]	0	(0)	35	(49)	35	(49)	2	(3)	72	(27)
Non-US-born	0	(0)	23	(53)	19	(44)	1	(2)	43	(7)
HIV negative	41	(8)	306	(59)	126	(24)	49	(9)	522	(57)
US-born	25	(19)	54	(40)	38	(28)	18	(13)	135	(51)
Non-US-born	16	(4)	252	(65)	88	(23)	31	(8)	387	(60)
HIV test refused	11	(6)	52	(26)	54	27	83	42	200	(22)
US-born	2	(6)	8	(23)	7	(20)	18	(51)	35	(13)
Non-US-born	9	(5)	44	(27)	47	(28)	65	(39)	165	(26)
HIV status unknown	11	(15)	16	(22)	20	(27)	26	(36)	73	(8)
US-born	6	(29)	3	(14)	5	(24)	7	(33)	21	(8)
Non-US-born	5	(10)	13	(25)	15	(29)	19	(37)	52	(8)
Total[2]	63	(7)	432	(47)	254	(28)	161	(18)	910	
US-born	33	(13)	100	(38)	85	(32)	45	(17)	263	(29)
Non-US-born	30	(5)	332	(51)	169	(26)	116	(18)	647	(71)

[1] Includes Puerto Rico, US Virgin Islands and other US territories.
[2] Excludes four patients with unknown country of birth.

TABLE 9: EPIDEMIOLOGIC INVESTIGATIONS OF TUBERCULOSIS EXPOSURE IN CONGREGATE SETTINGS, NEW YORK CITY, 2007 (N=34)

Site	Close Contacts					Other-than-Close Contacts					Transmission[1]
	# Identified	# Tested	% Tested	# Positive	% Positive	# Identified	# Tested	% Tested	# Positive	% Positive	
HEALTH CARE FACILITIES											
HCF A	610	214	36	12	33	0	0	0	0	0	Unable to assess
HCF B	127	97	76	12	12	26	17	65	0	0	Probable
HCF C	2	2	100	0	0	41	39	95	0	0	Unlikely
HCF D	0	0	0	0	0	44	23	52	1	4	Unable to assess
HCF E	12	12	100	0	0	0	0	0	0	0	Unlikely
HCF F & G											Unable to assess
Sub-total	751	325	43	24	7	111	79	71	1	1	
RESIDENCES											
Residence A	3	3	100	1	33	21	21	100	5	24	Probable
Residence B	5	4	80	0	0	140	31	22	0	0	Unable to assess
Sub-total	8	7	88	1	14	161	52	32	5	10	
SCHOOLS											
School A	18	14	78	0	0	5	2	40	0	0	Unlikely
School B	21	16	76	0	0	4	3	75	1	33	Unlikely
School C & D	40	16	40	7	44	2	0	0	0	0	Possible
School E	20	16	80	4	25	119	66	55	2	3	Possible
School F	13	11	85	0	0	159	20	13	0	0	Unlikely
School G	32	21	66	2	10	62	30	48	2	7	Possible
Sub-total	144	94	65	13	14	351	121	35	5	4	
WORKSITES											
Worksite A	8	8	100	3	38	31	30	97	16	53	Probable
Worksite B	0	0	0	0	0	59	41	69	10	24	Possible
Worksite C	57	49	86	7	14	0	0	0	0	0	Probable
Worksite D	4	4	100	1	25	14	10	71	5	50	Unlikely
Worksite E	0	0	0	0	0	124	100	81	12	12	Probable
Worksite F	67	60	90	15	25	146	95	65	6	6	Probable
Worksite G	2	2	100	1	50	23	18	78	10	56	Unable to assess
Worksite H	17	17	100	1	6	73	62	85	2	3	Unlikely
Worksite I	35	30	86	6	20	0	0	0	0	0	Unlikely
Worksite J	45	41	91	8	20	0	0	0	0	0	Probable
Worksite K	4	4	100	1	25	102	99	97	12	12	Probable
Worksite L	6	6	100	3	50	103	43	42	3	7	Probable
Worksite M	12	11	92	1	9	7	7	100	1	14	Probable
Worksite N	22	14	64	0	0	19	14	74	2	14	Unlikely
Worksite O	0	0	0	0	0	20	10	50	1	10	Unable to assess
Worksite P	16	16	100	14	88	19	18	95	13	72	Probable
Worksite Q	8	7	88	1	14	19	14	74	1	7	Unlikely
Worksite R	2	2	100	0	0	23	15	65	0	0	Unlikely
Worksite S	72	31	43	8	26	86	17	20	8	47	Possible
Worksite T	11	11	100	3	27	13	13	100	1	8	Probable
Sub-total	388	313	81	73	23	881	606	69	103	17	
TOTALS	**1291**	**739**	**57**	**111**	**15**	**1504**	**858**	**57**	**114**	**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. *Investigation was around 2 or more TB cases diagnosed at the same residence and linked by DNA fingerprint. †Two or more TB cases were diagnosed at the same site; however, investigations were not conducted around the secondary cases due to low likelihood of infectiousness

APPENDIX II

REPORTING SUSPECTED AND CONFIRMED CASES OF TUBERCULOSIS

Medical providers and infection control practitioners are required by the New York City Health Code Article 11, in particular, 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 diagnosis or clinical suspicion. Medical providers must report these patients even though microbiologists and pathologists are also required to report findings consistent with TB. Note that the reports must be received by the DOHMH within 24 hours.

It is **Mandatory** to Report Patients Who Meet Any of the Following Criteria:

- Smear (from any anatomic site) positive for acid-fast bacilli (AFB).
- Nucleic acid amplification (NAA) test (e.g., Roche's AMPLICOR®, Genprobe's MTD™) result positive for *Mycobacterium tuberculosis* complex.
- Culture positive for *M. tuberculosis* complex including: *M. tuberculosis, M. africanum, M. bovis-BCG, M.caprae, M. canetti, M. microti, M. pinnipedii, M. bovis*.
- Biopsy, pathology or autopsy findings consistent with active TB, including but not limited to caseating and necrotizing granulomas in biopsy of lung, lymph nodes or other specimens.
- Treatment with two or more anti-TB medications for suspected or confirmed active TB.
- Clinical suspicion of pulmonary or extrapulmonary TB such that the physician or other health care provider has initiated or intends to initiate isolation or treatment for TB.
- Continuation, discontinuation, completion or other outcomes of treatment for active TB.
- Any child younger than five years of age (up to the day of the fifth birthday) who has a positive Tuberculin Skin Test or a positive US Food and Drug Administration (FDA) approved blood-based test for TB infection [such as QuantiFERON®- TB Gold (QFT-G)][1,2].
- In addition, Section 47.21 requires that Day Care staff report those with LTBI to the Bureau of Day Care.

When an individual has an AFB-positive smear or has started treatment for TB, reporting should never be delayed pending identification of *M. tuberculosis* with an NAA test. Patients should be reported whenever TB is suspected, even if bacteriologic evidence of disease is lacking or treatment has not been initiated. Additionally, when requested by the DOHMH, a physician shall report the results of any examination of a contact.

[1] Product names are provided for identification purposes only; their use does not imply endorsement by the New York City DOHMH.

[2] To report a positive test for TB infection in a child younger than five years of age, use the Universal Reporting Form. For guidelines for interpreting skin test results, see: City Health Information: Testing and Treating for Latent TB Infection, April 2006, **www.nyc.gov/html/doh/downloads/pdf/chi/chi25-4.pdf**.

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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 within 24 hours of identification to the Bureau of TB Control:

- AFB-positive smears (regardless of anatomic site).
- Cultures positive for *M. tuberculosis* complex.
- NAA 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.
- Any culture or NAA result associated with an AFB-positive smear (even if negative for *M. tuberculosis* complex)

Laboratories are required to report using the Electronic Clinical Laboratory Reporting System (ECLRS) as of July 1, 2006. Assistance with ECLRS is available by calling (212)313-5137. In addition, within 24 hours of observing growth of *M. tuberculosis* complex in a culture from any specimen, the New York City Health Code Section 13.05(a) requires that a portion of the initial culture be sent for DNA analysis to the New York City DOHMH Public Health Laboratory (455 First Avenue, Room 236, NY, NY 10016). Laboratories outside of New York City should submit isolates directly to the Wadsworth Center Mycobacteriology Laboratory in Albany, NY for genotyping.

Reporting by Telephone and the URF

Suspected and confirmed TB patients may be reported by telephone to the TB Hotline, (212)788-4162, but a completed Universal Reporting Form (URF) must follow within 48 hours. The URF should be faxed to the Bureau of Tuberculosis Control at (212)788-4179 and the original mailed to the Bureau of Tuberculosis Control, DOHMH at 253 Broadway, Room 602, CN-72, NY, NY 10007. Assistance is available by calling (888)NYC-MED9 or (212)442-3384. The URF can also be completed online, by first creating an account on NYC-MED at: **http://www.nyc.gov/health/nycmed**.

Information reported on the URF should be as complete as possible. The following essential information must be included when the report is submitted to the New York City DOHMH.

- Information needed to identify and locate the individual (i.e., name, telephone, address and date of birth).
- Provider information (i.e., physician's name and telephone number, reporting facility)
- Results of smear for AFB (including date specimen obtained and accession number, if available), chest radiographs and any treatment information

APPENDIX II

REPORTING SUSPECTED AND CONFIRMED CASES OF TUBERCULOSIS

Reporting TB-Related Evaluation and Treatment of Contacts

Medical providers are required, under Section11.47 (b) of the New York City Health Code, to report to the DOHMH, when requested, all information on the evaluation, testing and treatment of individuals who have been in contact with a person with active TB disease.

PATIENT FOLLOW-UP The treating physician should also report whether the patient completed treatment and the outcome of the patient (cured, failed, relapsed, lost, moved) or whether treatment was discontinued if the patient was found not to have TB. Physicians must assist the DOHMH in its efforts to evaluate persons suspected of having TB and in patient follow-up. Case managers will be in contact with the treating physicians to request updates and ensure that appropriate treatment and monitoring is being conducted. A Report of Patient Services Form (TB 65) may need to be completed.

Inquiries & Forms

To inquire further about reporting procedures, please call the Surveillance Office at the Bureau of Tuberculosis Control at (212)788-4162. To order copies of the Report of Patients Services Form (TB 65) call (212)442-5100.

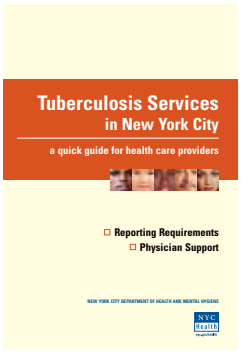
Obtain the Universal Reporting Form by calling toll free (866)NYC-DOH1 (866)392-3641 or at **http://www.nyc.gov/health/tb**

APPENDIX III

EDUCATION MATERIALS

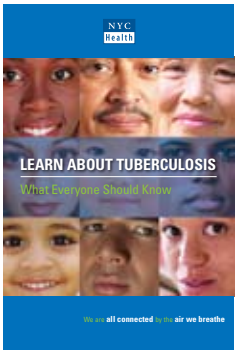
The following is a selection of culturally, technically and linguistically targeted TB education materials available to patients, the general public and health care providers. Materials are available at http://www.nyc.gov/html/doh/html/tb/tb-hcp-kit.shtml or by calling **311**. The patient brochure and TB screening form have been translated into 10 languages, including Spanish, Chinese, Korean, French and Creole. Versions in Bengali, Hindi, Urdu, Arabic and Russian will be available soon.

1.



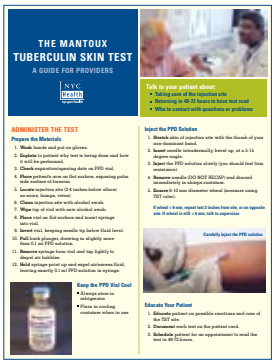
PROVIDER BROCHURE, "Tuberculosis Services in New York City: a Quick Guide for Health care Providers"

2.



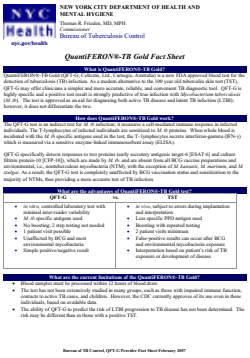
PATIENT BROCHURE "Learn About Tuberculosis: What Everyone Should Know"

3.



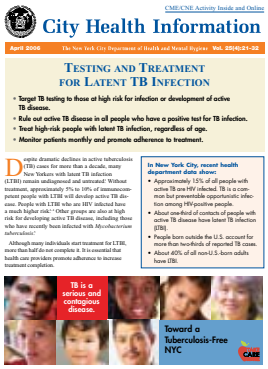
REFERENCE GUIDE for the TST test, "The Mantoux/Tuberculin Skin Test: A Guide for Providers"

4.



FACT SHEETS on the QFT®-G TB test for patients and providers, and a fact sheet entitled "Rapid Confirmatory Tests for TB"

5.



"Testing and Treatment for Latent TB Infection," which provides current GUIDELINES and steps for LTBI testing and treatment, recommended to improve both diagnosis and treatment of LTBI.

6.

REFERENCE GUIDE for PROVIDERS, "Antiretroviral Drug Use with Rifampin and Rifabutin" provides updated information on the use of antiretroviral drugs with the anti-TB medications rifampin and rifabutin.

APPENDIX IV

PUBLICATIONS AND PRESENTATIONS, 2007

Publications in Peer-Review Journals

1. Driver CR, Kreiswirth B, Macaraig M, Clark C, Munsiff SS, Driscoll J, Zhao B. Molecular epidemiology of tuberculosis after declining incidence, New York City, 2001-2003. *Epidemiol Infect* 2007;135:634-43.

2. Frieden TR, Munsiff SS, Ahuja SD. Outcomes of multidrug resistant tuberculosis treatment in HIV-positive patients in New York City, 1990-1997. *Int J Tuberc Lung Dis* 2007;11:116.

3. Li J, Marks SM, Driver CR, Diaz FA, Castro AF, Regner AF, Gibson AE, Dokubo-Okereke K, Munsiff SS, and the Tuberculosis Epidemiologic Studies Consortium. HIV counseling, testing, and referral of close contacts to patients with pulmonary tuberculosis: feasibility and costs. *J Public Health Manag Pract* 2007;13:252-62.

4. Munsiff S. Communicable Disease and Immigration Fears. *Virtual Mentor* 2007;9:799-805 (available at http://virtualmentor.ama-assn.org/2007/12/ccas3-0712.html; accessed July23, 2008).

5. Udeagu CC, Dorsinville MS, Munsiff SS, Vilnyanskaya Y, Wang I. Evaluation of case management in tuberculosis control: a three-year effort to improve case management practices in New York City. *Int J Tuberc Lung Dis* 2007;11:1094-100.

Presentations at Scientific and Professional Meetings

1. Ahuja SD, Munsiff SS, Wiseman R, Dworkin F, Nilsen D. High Incidence of Tuberculosis (TB) among Tibetan Immigrants in New York City (New York City), 2000-2006. 11th Annual Meeting International Union Against Tuberculosis and Lung Disease - North American Region, Vancouver, Canada, February 22-24, 2007.

2. Harris T, Dorsinville M, Munsiff SS, Agerton T, Kil N, Li J. Use of QuantiFERON-TB Gold (QFT-G) by the New York City Department of Health and Mental Hygiene. Poster presented at the meeting "Rethinking the Epidemiology of Tuberculosis Infection - The First Global Symposium on Interferon-Gamma Assays" on February 21-22, 2007, Vancouver, BC, Canada.

3. Li J, Harris TG, Agerton T, Munsiff SS. Changing clinical presentation of tuberculosis (TB) among HIV-infected patients, 1992 to 2005, New York City (New York City). 11th Annual Meeting, North American Region, International Union Against Tuberculosis and Lung Disease, Vancouver, BC, Canada, February 22-24, 2007.

APPENDIX IV

PUBLICATIONS AND PRESENTATIONS, 2007

Presentations at Scientific and Professional Meetings (cont'd)

4. Ahuja SD, Munsiff SS, Wiseman R,Dworkin F, Nilsen D. Extensive drug resistance (XDR) tuberculosis (TB) in New York City. International Conference of the American Thoracic Society (ATS), San Francisco, CA, May 19-23, 2007.

5. Clark CM, Agerton T, Kreiswirth BN, Driscoll JR, Munsiff SS, Li J. Evaluation of genotyping methods for detecting TB clusters in New York City (New York City) 2004-2006. International Conference
of the American Thoracic Society (ATS), San Francisco, CA, May 19-23, 2007

6. Laraque F, Silin M, Munsiff S, Slopen M. Impact of monitoring for tuberculosis reporting delays. International Conference of the American Thoracic Society (ATS), San Francisco, CA, May 19-23, 2007.

7. Slopen M, Laraque F, Munsiff S, Ahuja S, Piatek A. Missed Opportunities for TB Prevention Among New York City Patients. National Tuberculosis Controllers Association Workshop, Atlanta, Georgia, June 12-14, 2007.

8. Dorrejo X, Munsiff S, Ahuja S, Alexander M. Moving towards a TB Free New York City: Lessons learned from a TB awareness campaign. 7th Annual TB Education and Training Network Annual Conference, Atlanta, Georgia, August 7-9, 2007.

9. Macaraig MM, King L, Agerton TB, Ahuja SD, Munsiff SS. Tuberculosis Exposures at Health Care Facilities in New York City. 45th Infectious Diseases Society of America Conference, New York City, October 4-7, 2007.

10. Ahuja SD, Munsiff SS, Nilsen D. Clinical outcomes of extensively drug resistant tuberculosis (XDR-TB) patients in New York City. 38th Union World Conference on Lung Health, Cape Town, South Africa, November 8-13, 2007. .

11. King L, Ahuja SD, Munsiff SS. Is a tuberculosis (TB) treatment success target of 85% achievable for HIV-infected persons? 38th Union World Conference on Lung Health, Cape Town, South Africa, November 8-13, 2007.

12. Osahan J, Herbert C, Dorsinville M. Implementation of the Rapid HIV Test in New York City TB Clinics. Poster presented at a meeting, Putting the Pieces Together: Routinizing HIV Testing in New York City, November 13, 2007.

APPENDIX V

NYC DEPARTMENT OF HEALTH AND MENTAL HYGIENE TB CHEST CENTERS

BRONX

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

MANHATTAN

Chelsea Chest Center
303 9th Avenue, Third Floor
New York, NY 10001

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

BROOKLYN

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

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

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

STATEN ISLAND

Richmond Chest Center
51 Stuyvesant Place, Fourth Floor
Staten Island, NY 10301

For Hours of Operation, Call 311.

NYC Health