

Tuberculosis Epidemiology New York City, 2005

**Bureau of Tuberculosis Control
New York City Department of
Health and Mental Hygiene**

2006

Tuberculosis in New York City 2005

- 984 cases (12.3 cases/100,000)
- 289 (29.4%) US-born patients and 690 (70.1%) non-US born patients
- 75.7% culture-positive (0.9% missing susceptibilities)
- 151 (15.3%) HIV-infected, compared to 169 (16.3%) in 2004
- 30% missing HIV status (58.9% of whom refused testing)
- 18.1% of 25-44 year olds HIV-infected
- 33.3% increase in MDRTB cases in 2005 (from 18 to 24)
- 3,852 patients suspected of TB in whom diagnosis was rejected
- 3:9 suspect to case ratio

Trends in Tuberculosis - 1

New York City, 1992-2005

➤ Since 1992

- 74.2% fewer cases
- 94.6% fewer MDRTB cases
- 90.2% fewer US-born cases
- Proportion of non-US-born cases increased from 18% in 1992 to 70% in 2005

➤ 5.3% fewer cases from 2004

Trends in Tuberculosis - 2

New York City, 1992-2005

- **289 (29.4%) US-born patients in 2005, 13% decrease from 2004**
- **690 (70.1%) non-US born patients in 2005, 2.3% decrease from 2004**
- **HIV-infected cases decreased from 33.6% in 1992 to 15.3% in 2005**
- **Proportion of females increased from 28% in 1986 to 35.5% in 2005**
- **82% decrease among 25-44 year-old cases since 1992**

U.S. Healthy People 2010 Tuberculosis Objectives

Objective # 14.11 Reduce tuberculosis.

Target: 1.0 new case per 100,000 population.

Objective # 14.12 Increase the proportion of all tuberculosis patients who complete curative therapy within 12 months.

Target: 90.0% of patients.

Objective # 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% of contacts.

Objective # 14.14 Reduce the average time for a laboratory to confirm and report tuberculosis cases.

Target: 2 days for 75.0% of cases.

Tuberculosis Reports by Facility Type, New York City 2005

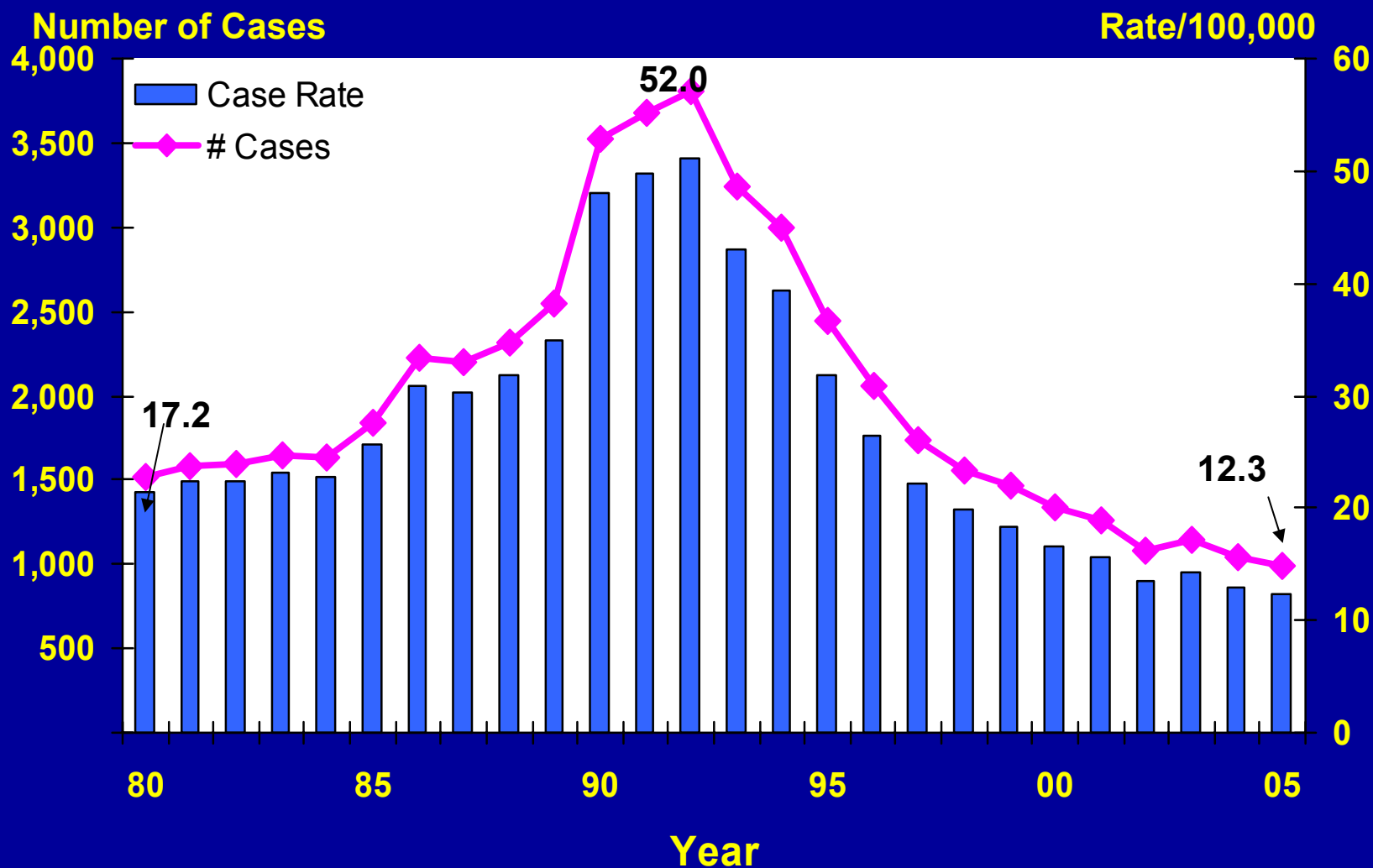
| Reporting Facility Type | Cases # (%) | Suspects # (%) |
|---|----------------|-------------------|
| DOHMH chest centers | 92 (9.3) | 680 (17.7) |
| Health and Hospitals Corporation facilities | 312 (31.7) | 1,957 (50.8) |
| Private hospitals | 480 (48.8) | 883 (22.9) |
| Private physicians | 26 (2.6) | 40 (1.0) |
| Other providers | 74 (7.5) | 292 (7.6) |
| Total | 984 | 3,852 |

Evaluating Patients for TB

New York City, 2005

| Facility Name | # of Cases | % of all Cases |
|--|------------|----------------|
| 1. Bellevue Hospital Center | 66 | 6.7 |
| 2. Elmhurst Hospital Center | 58 | 5.9 |
| 3. King's County | 35 | 3.6 |
| 4. Lincoln Hospital | 32 | 3.3 |
| 5. Corona Chest Center | 30 | 3.0 |
| 6. New York Hospital Medical Center of Queens | 24 | 2.4 |
| 7. Coney Island, Maimonides | 23 | 2.3 |
| 8. Bronx Lebanon, Fort Greene Chest Center | 21 | 2.1 |
| 9. Brooklyn Downtown Hospital, Montefiore | 20 | 2.0 |
| 10. Lutheran, St. Vincent's, Manhattan, Woodhull | 19 | 1.9 |

Tuberculosis Cases and Rates New York City, 1980 – 2005*



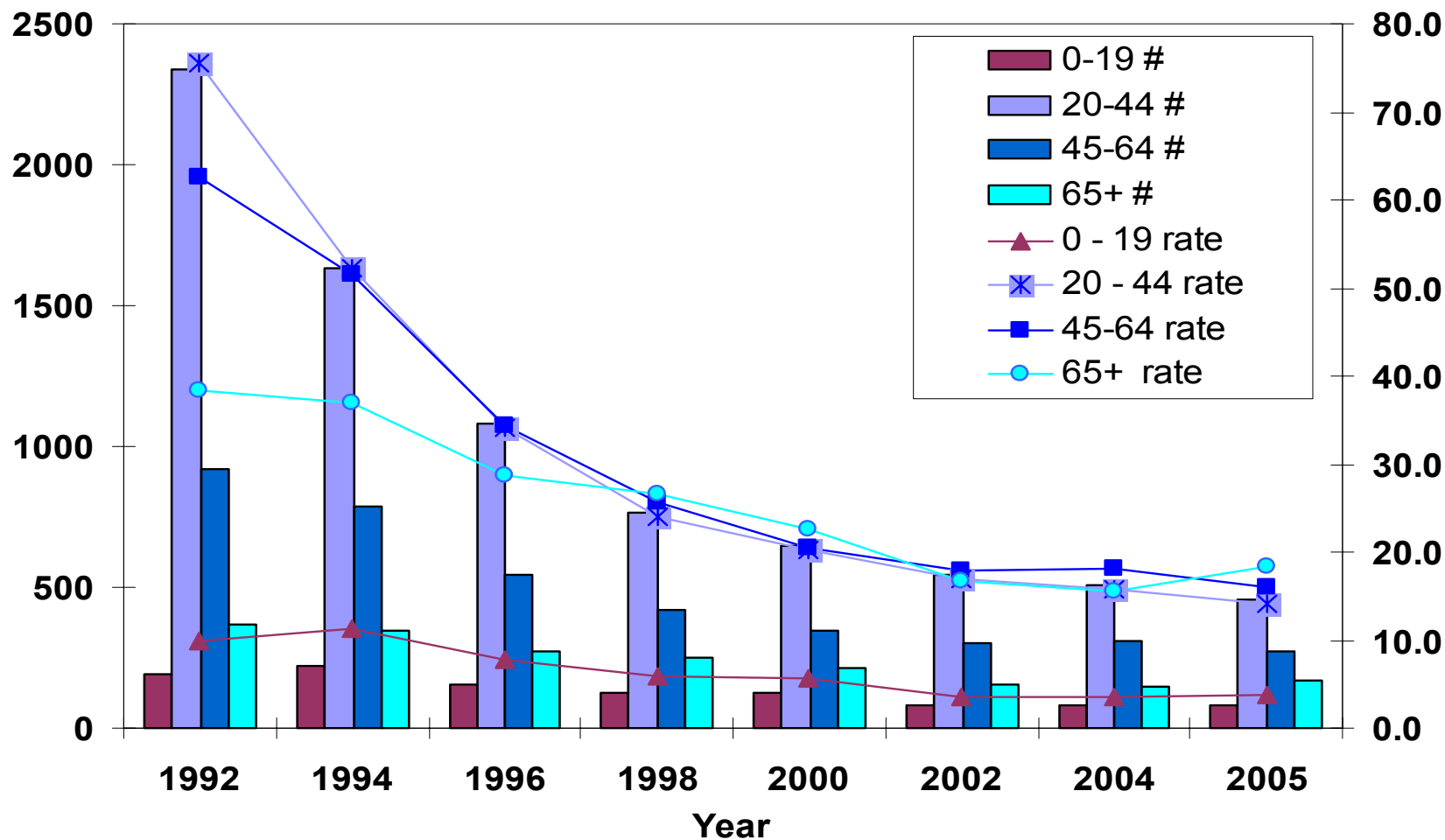
* Rates since 2000 are based on 2000 Census data

Tuberculosis Cases and Rates by Age Group

New York City, 1992 - 2005

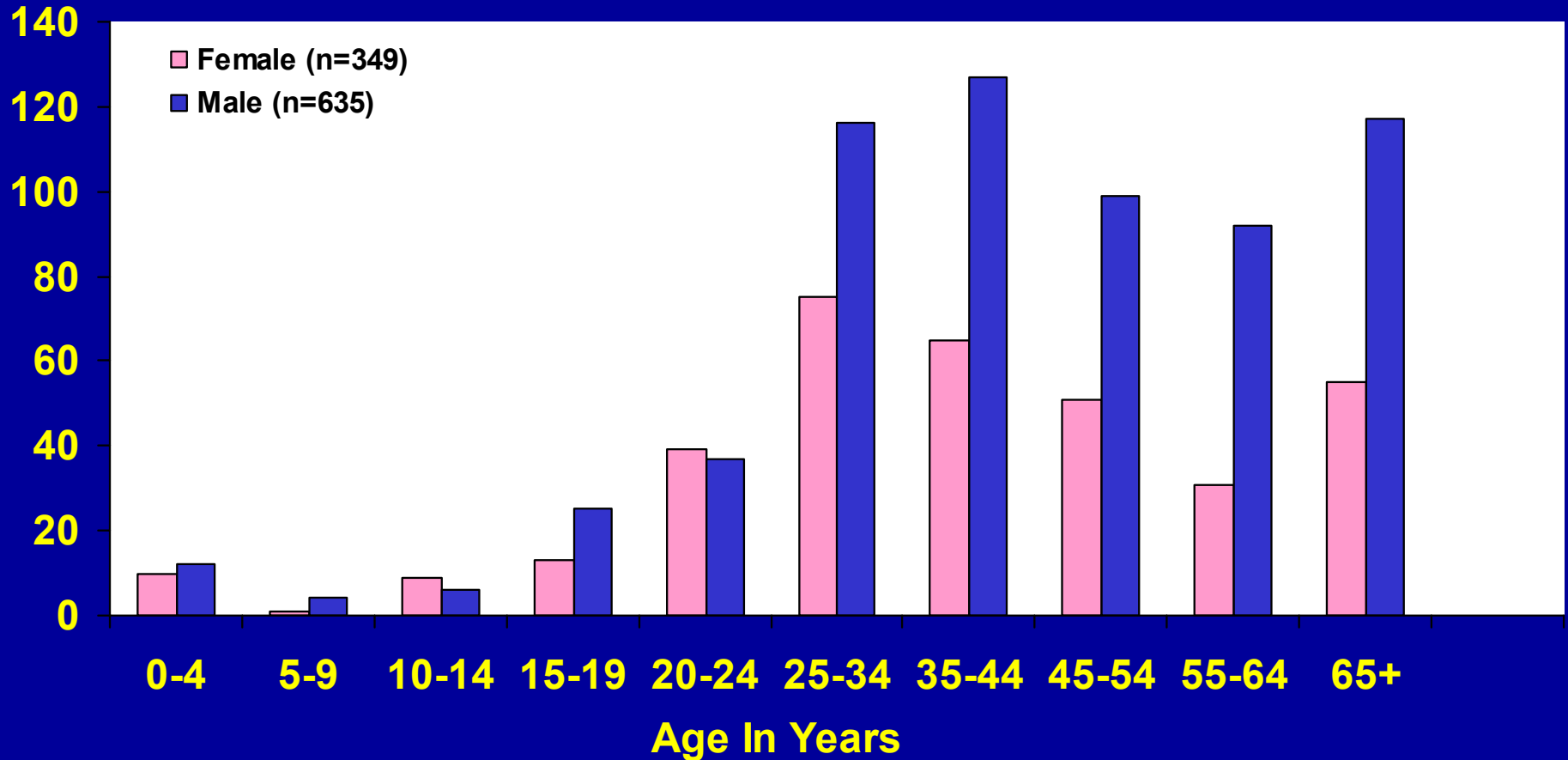
Case number

Rate per 100,000

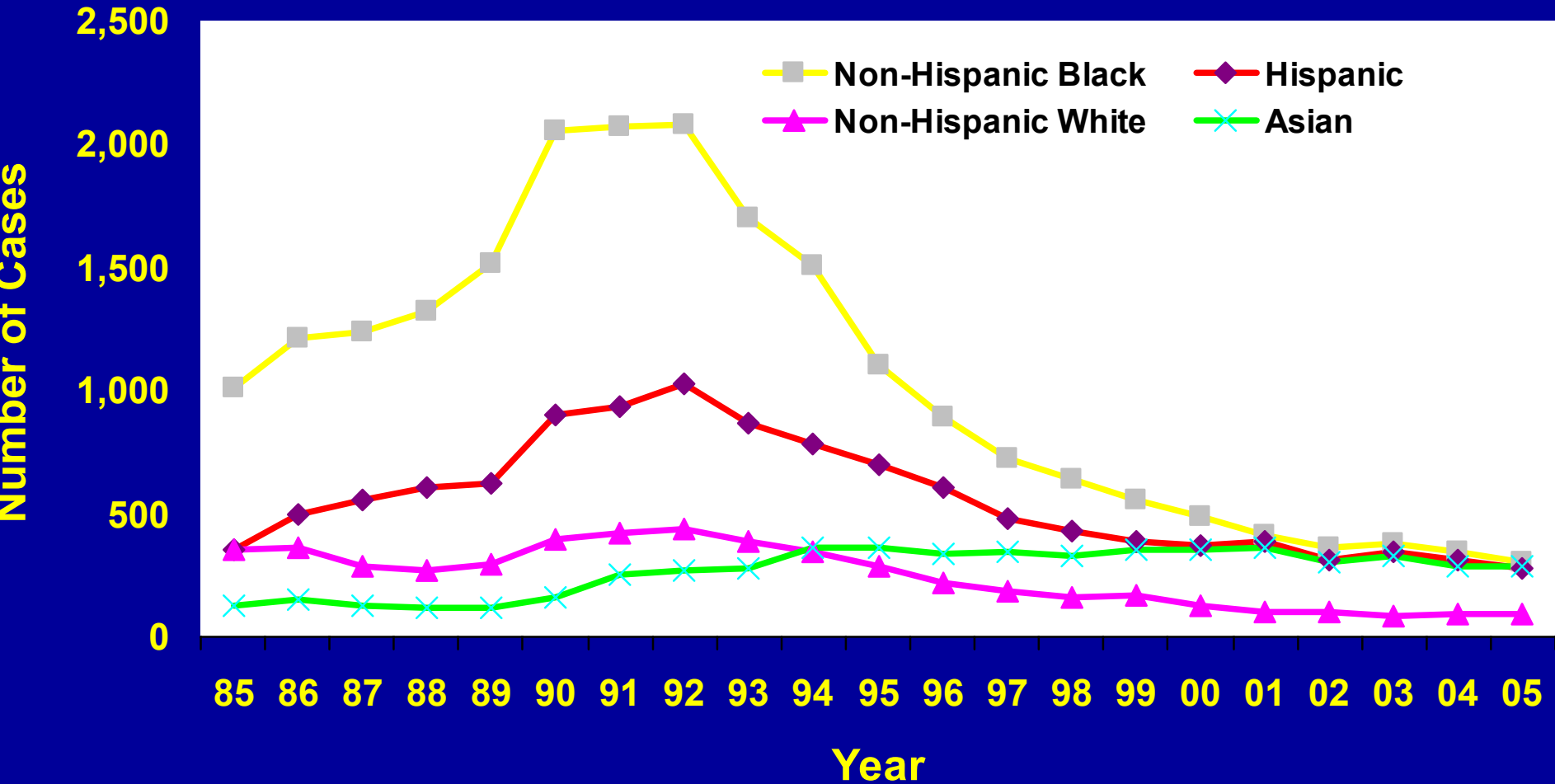


Tuberculosis Cases by Sex and Age New York City, 2005

Number of Cases



Tuberculosis Cases by Race & Ethnicity New York City, 1985-2005

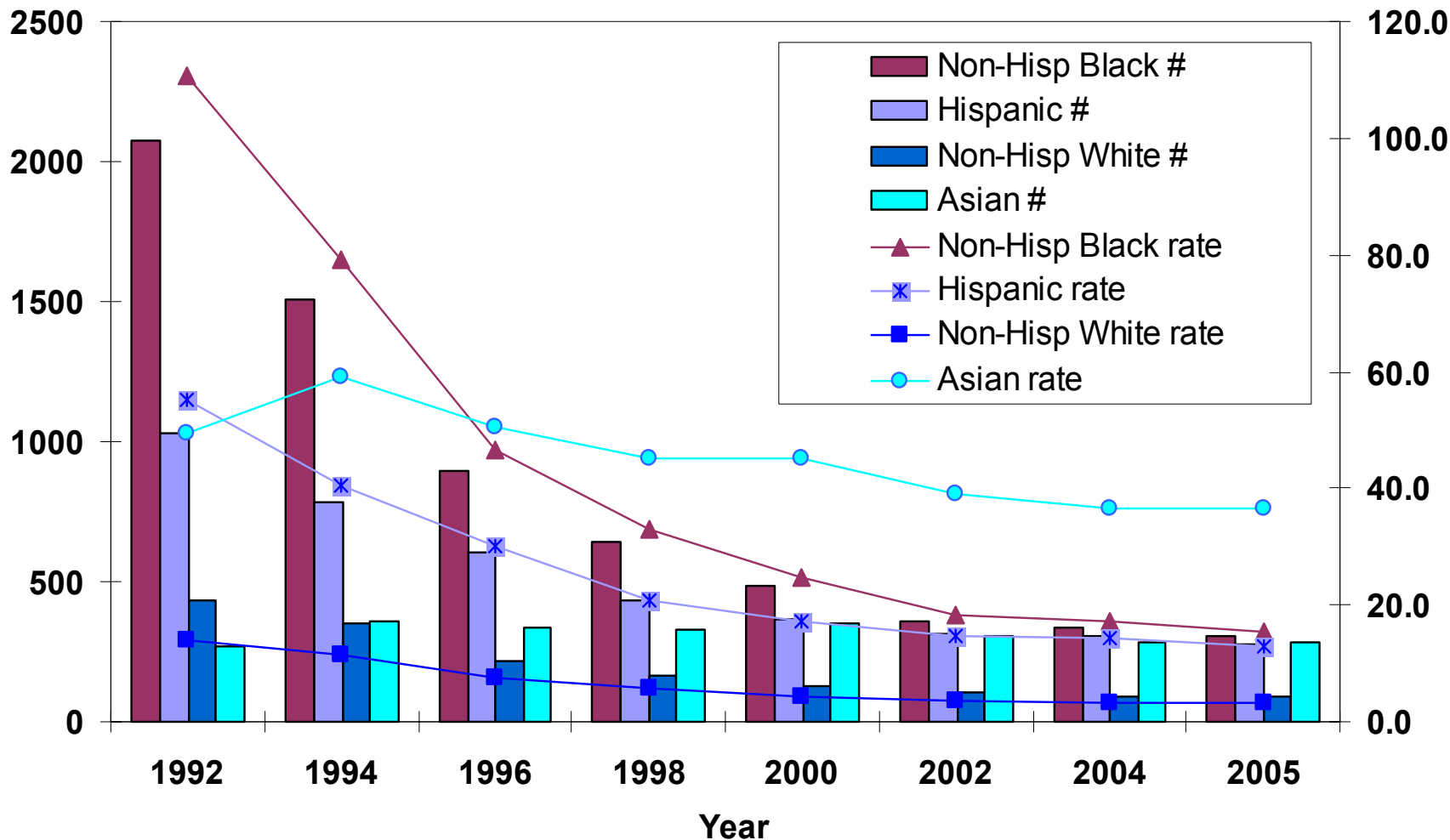


Tuberculosis Cases and Rates by Race/Ethnicity

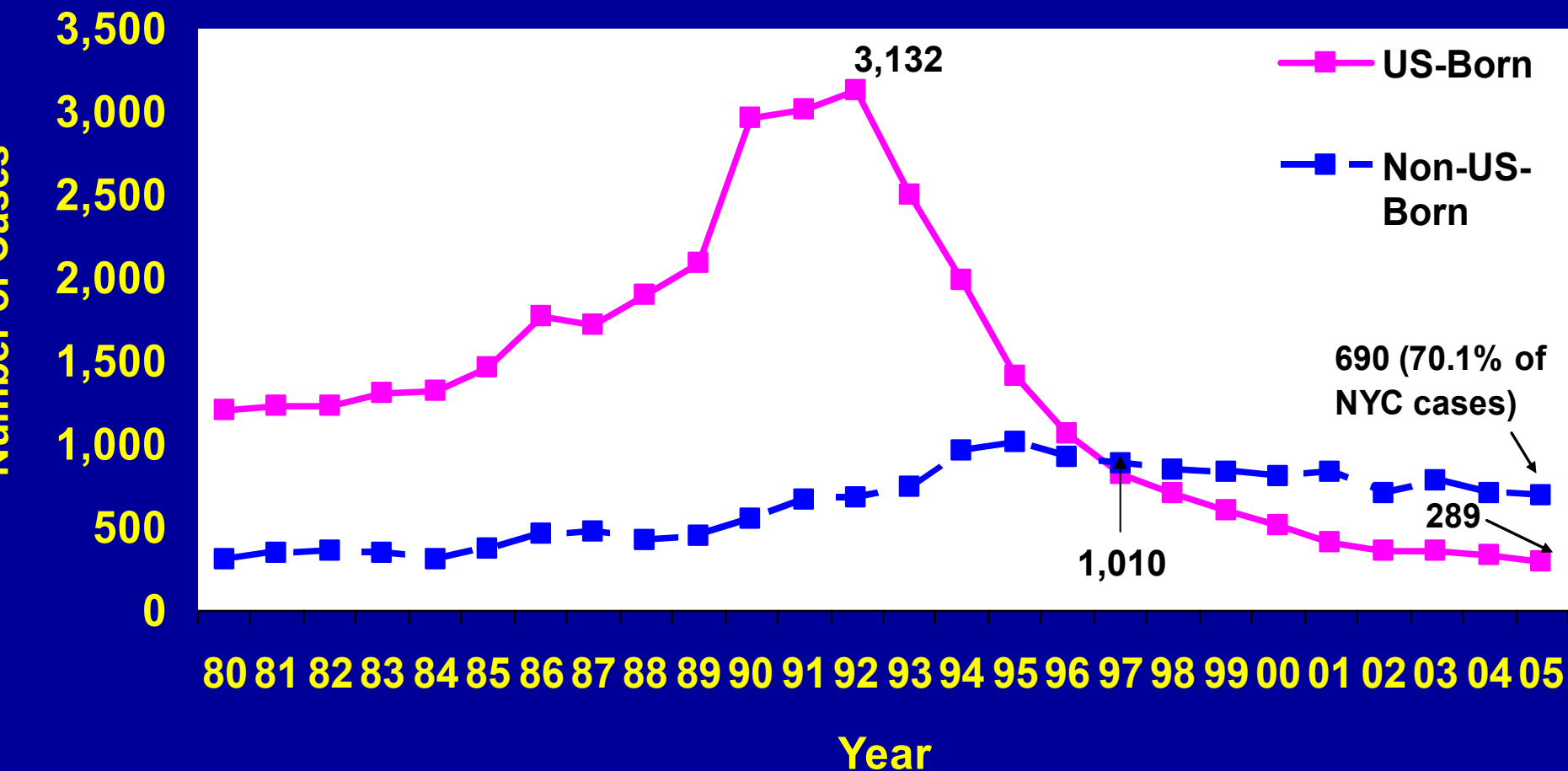
New York City, 1992 - 2005

Case number

Rate per 100,000

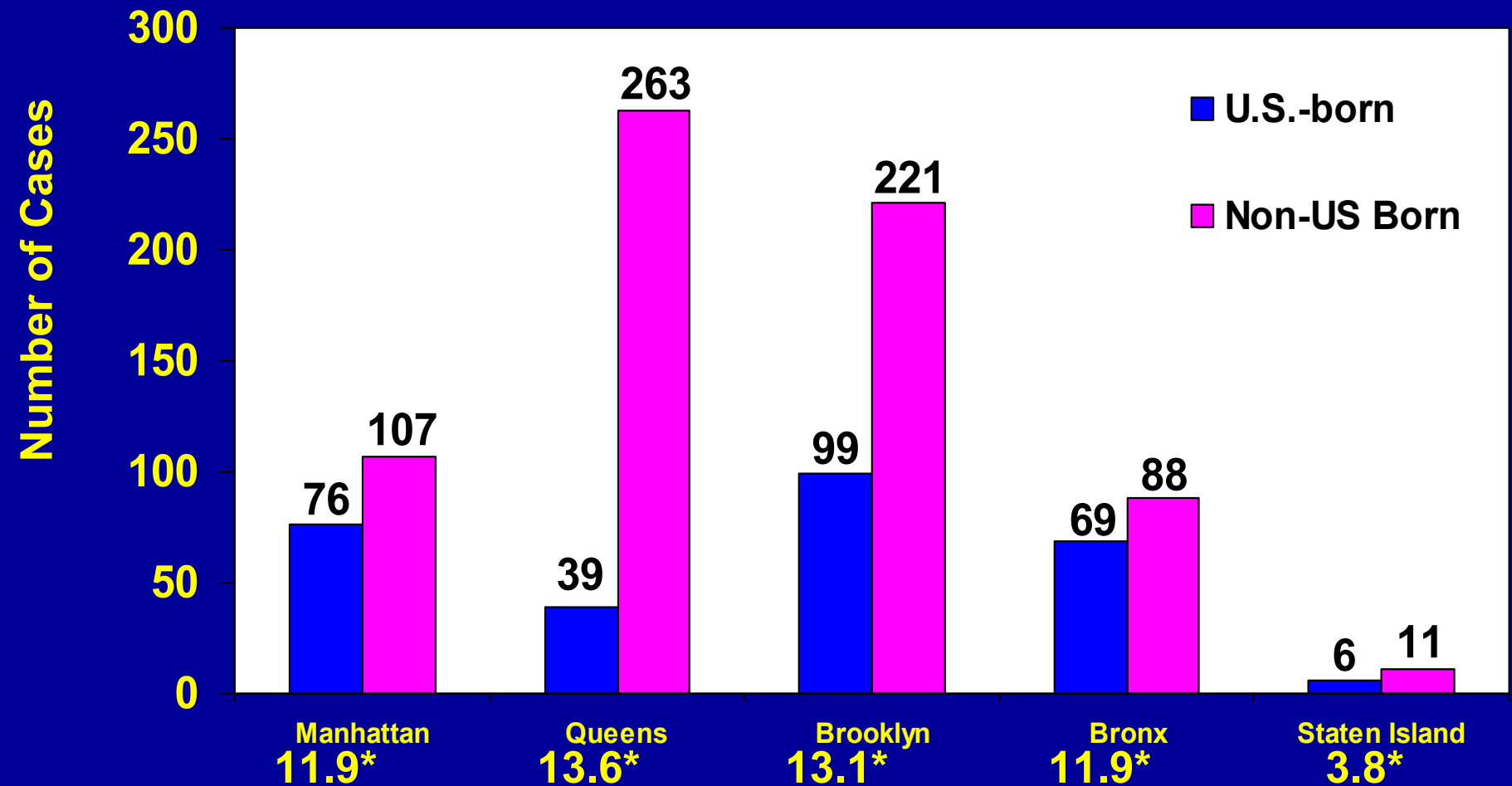


US* and Non-US Born TB Cases New York City, 1980 – 2005



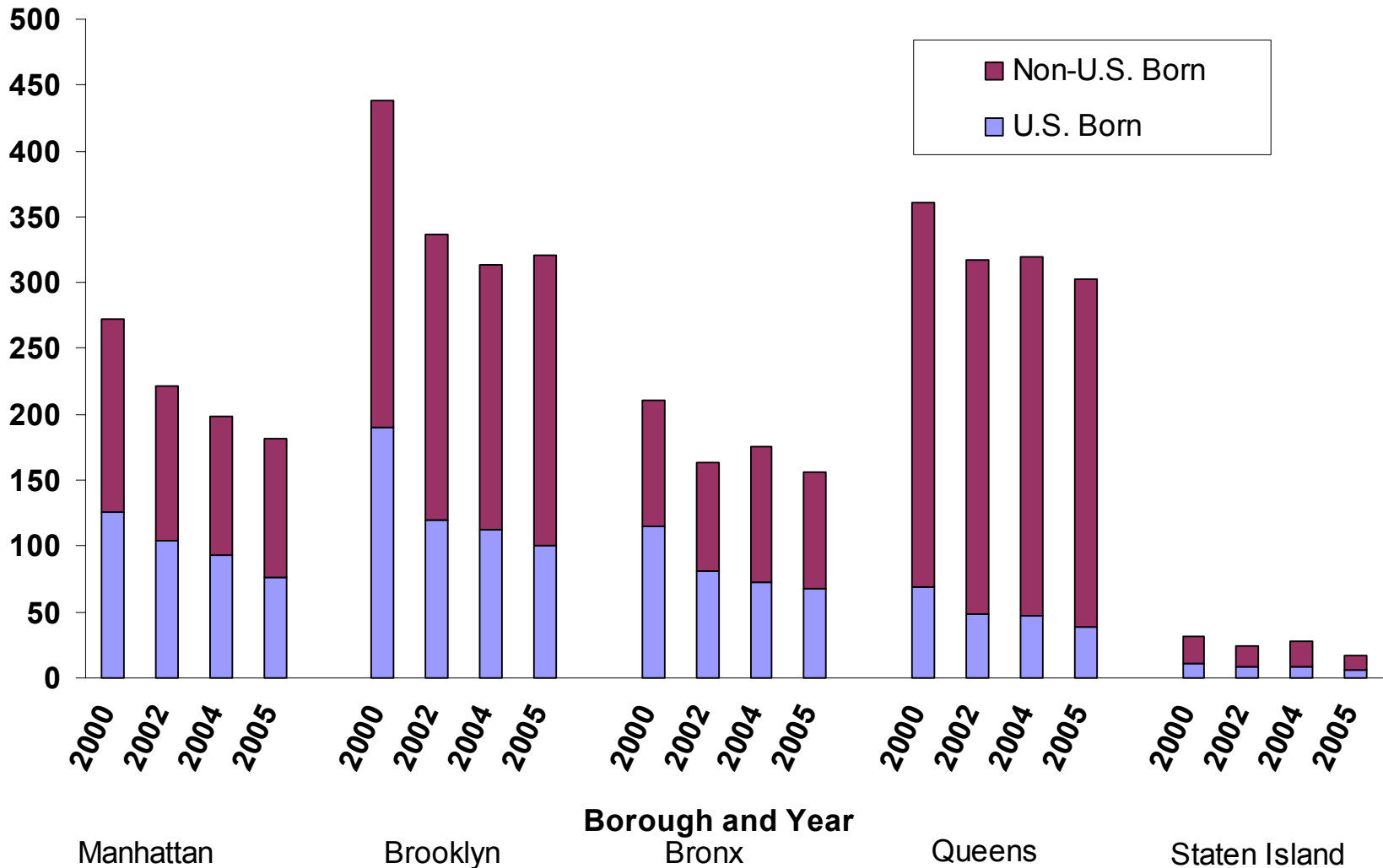
*Puerto Rico and U.S. Virgin Islands are included as U.S.-born

Tuberculosis Cases by Area of Birth and Borough, New York City, 2005



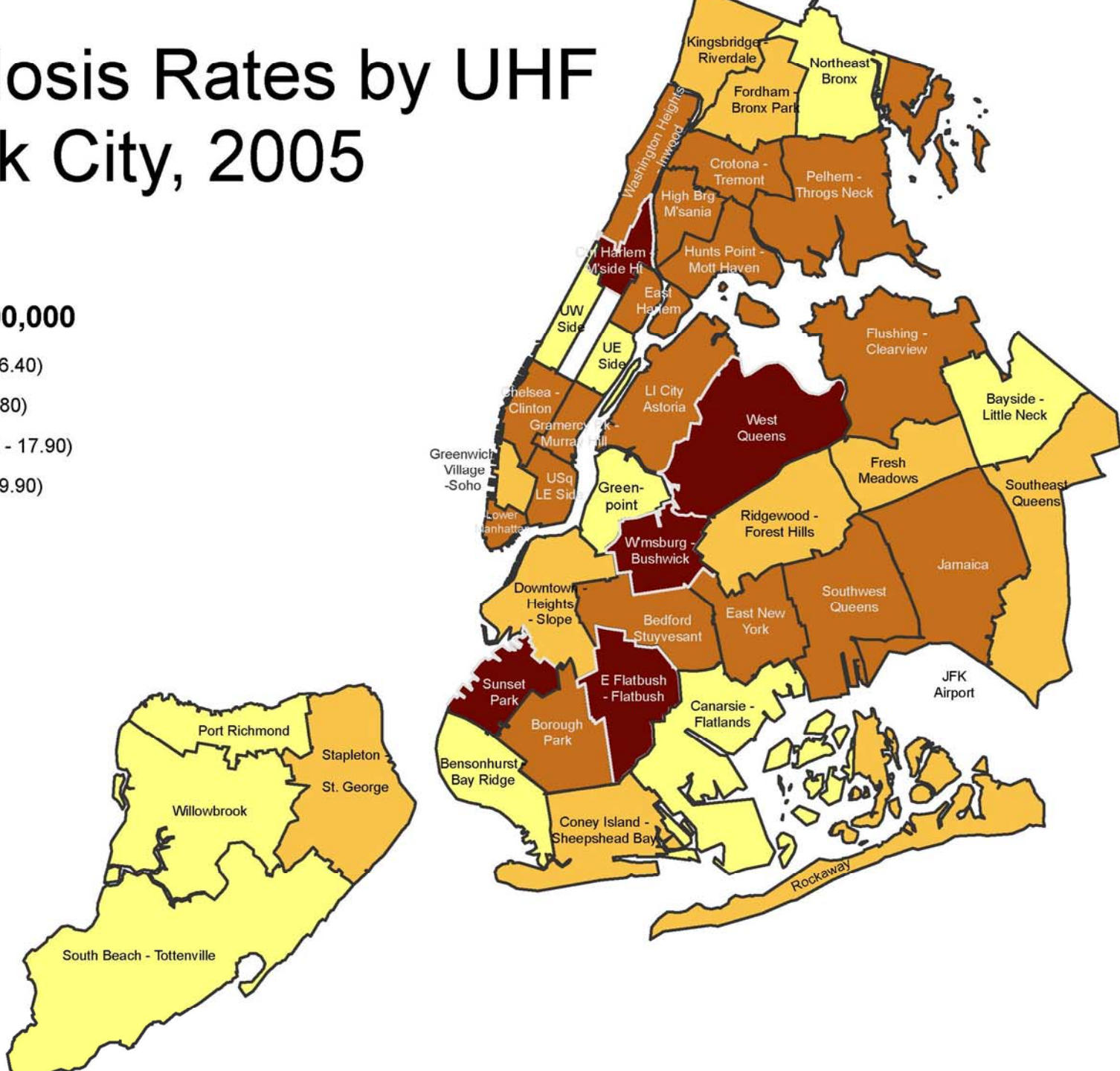
TB Cases by Area of Birth and Borough NYC, 2000-2005

Number of Cases



Tuberculosis Rates by UHF New York City, 2005

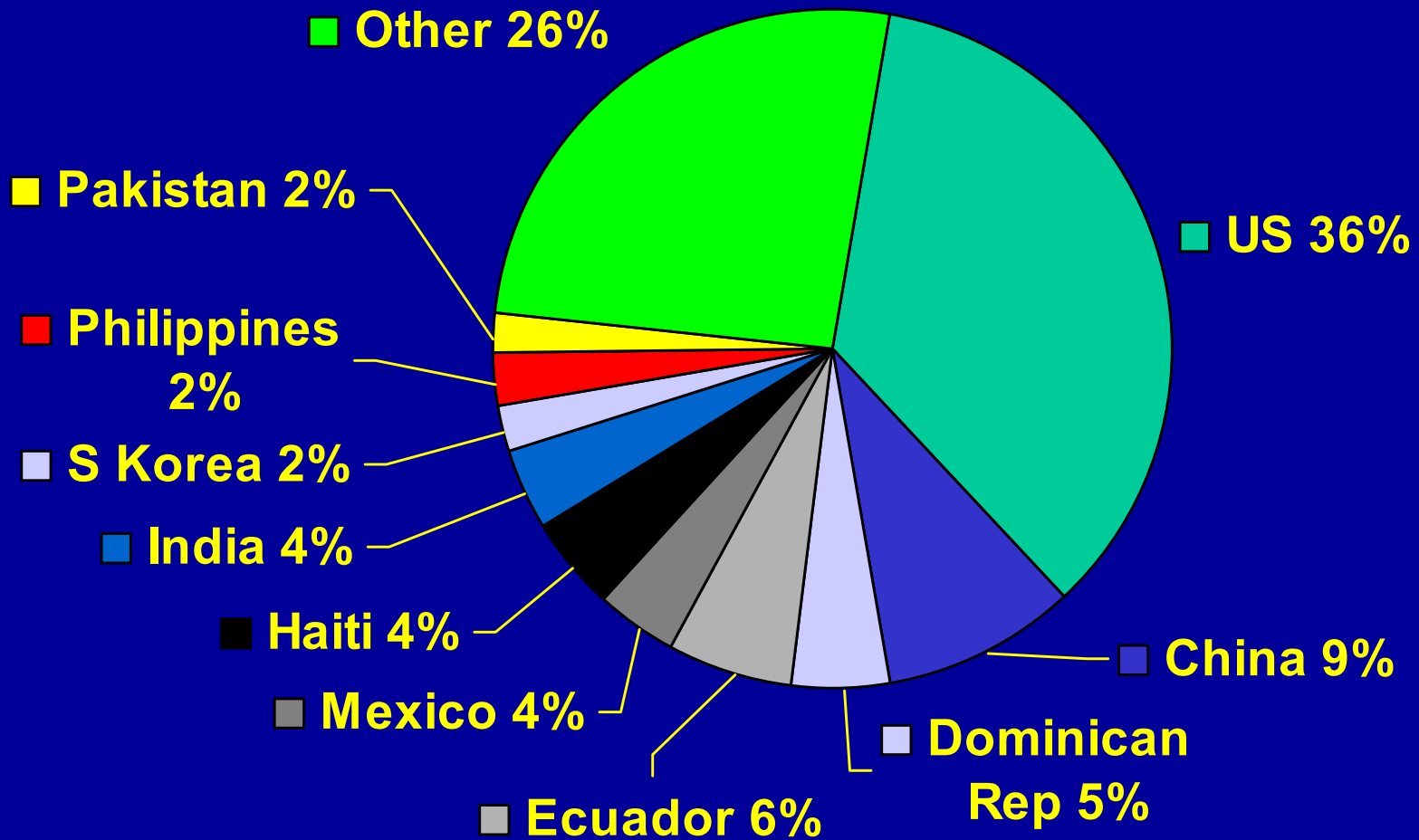
TB Rate per 100,000



Top 10 Countries of Birth, NYC TB Cases

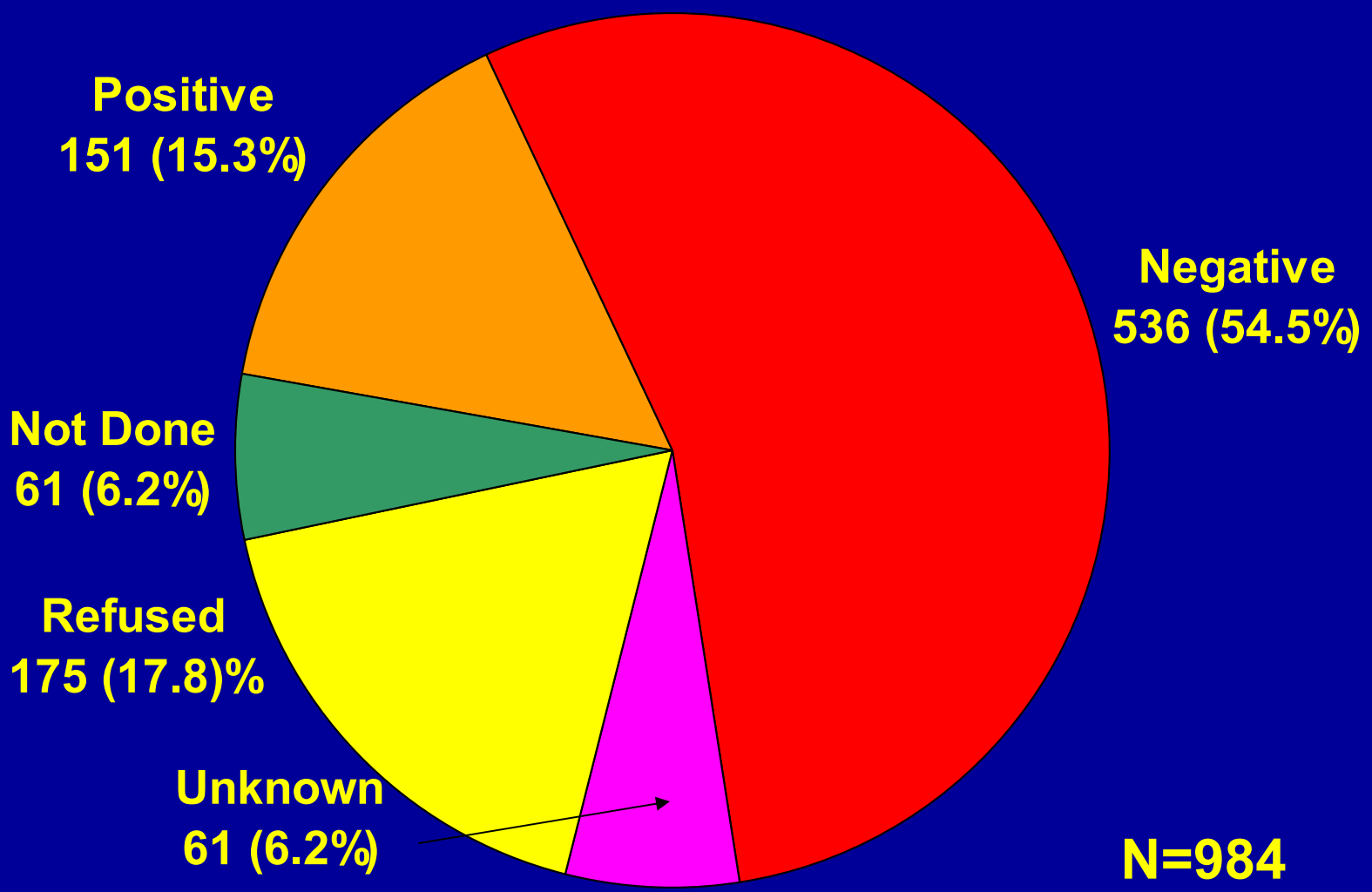
| <u>2005</u> | <u>N</u> | <u>2004</u> | <u>N</u> |
|--------------------|----------|--------------------|----------|
| China | 104 | China | 95 |
| Ecuador | 67 | Dominican Republic | 63 |
| Haiti | 48 | Ecuador | 61 |
| India | 40 | Mexico | 56 |
| Mexico | 40 | Haiti | 38 |
| Puerto Rico | 37 | India | 37 |
| Dominican Republic | 36 | South Korea | 31 |
| Philippines | 23 | Puerto Rico | 31 |
| South Korea | 20 | Philippines | 25 |
| Pakistan | 20 | Pakistan | 19 |

Total TB Cases From Selected Countries of Origin, 1999-2005



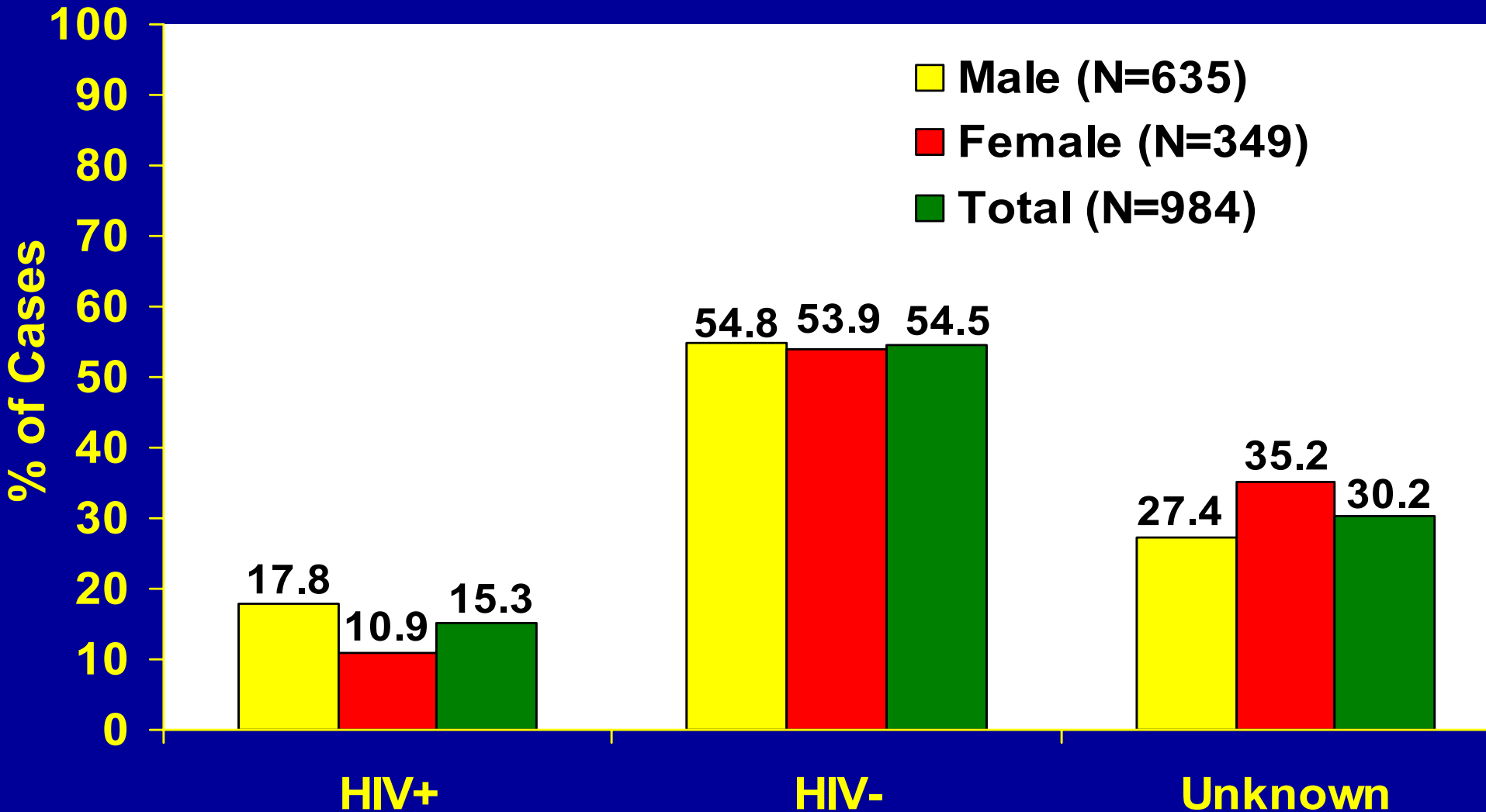
* Includes Puerto Rico

HIV Infection and Tuberculosis New York City, 2005

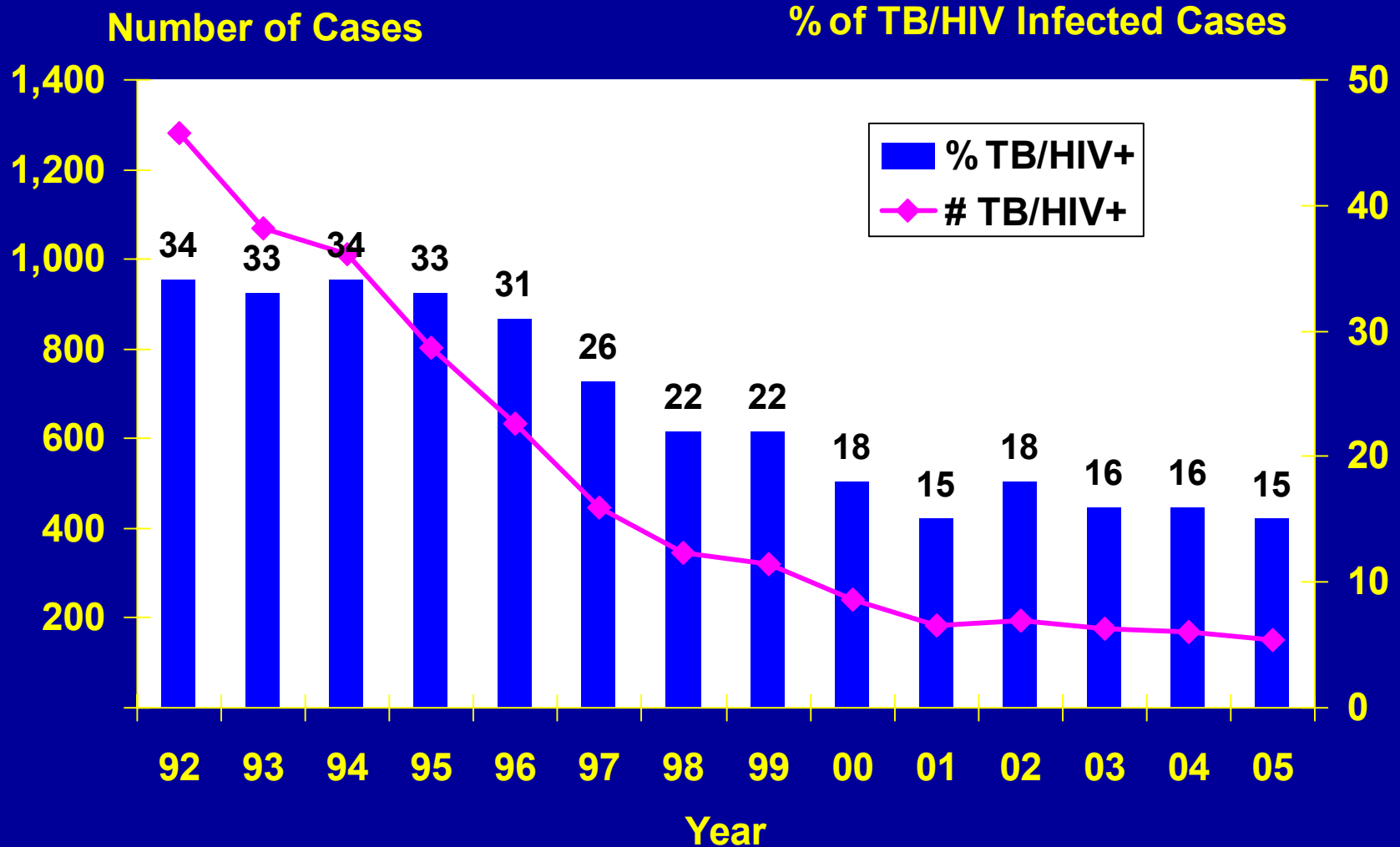


HIV Infection and Tuberculosis

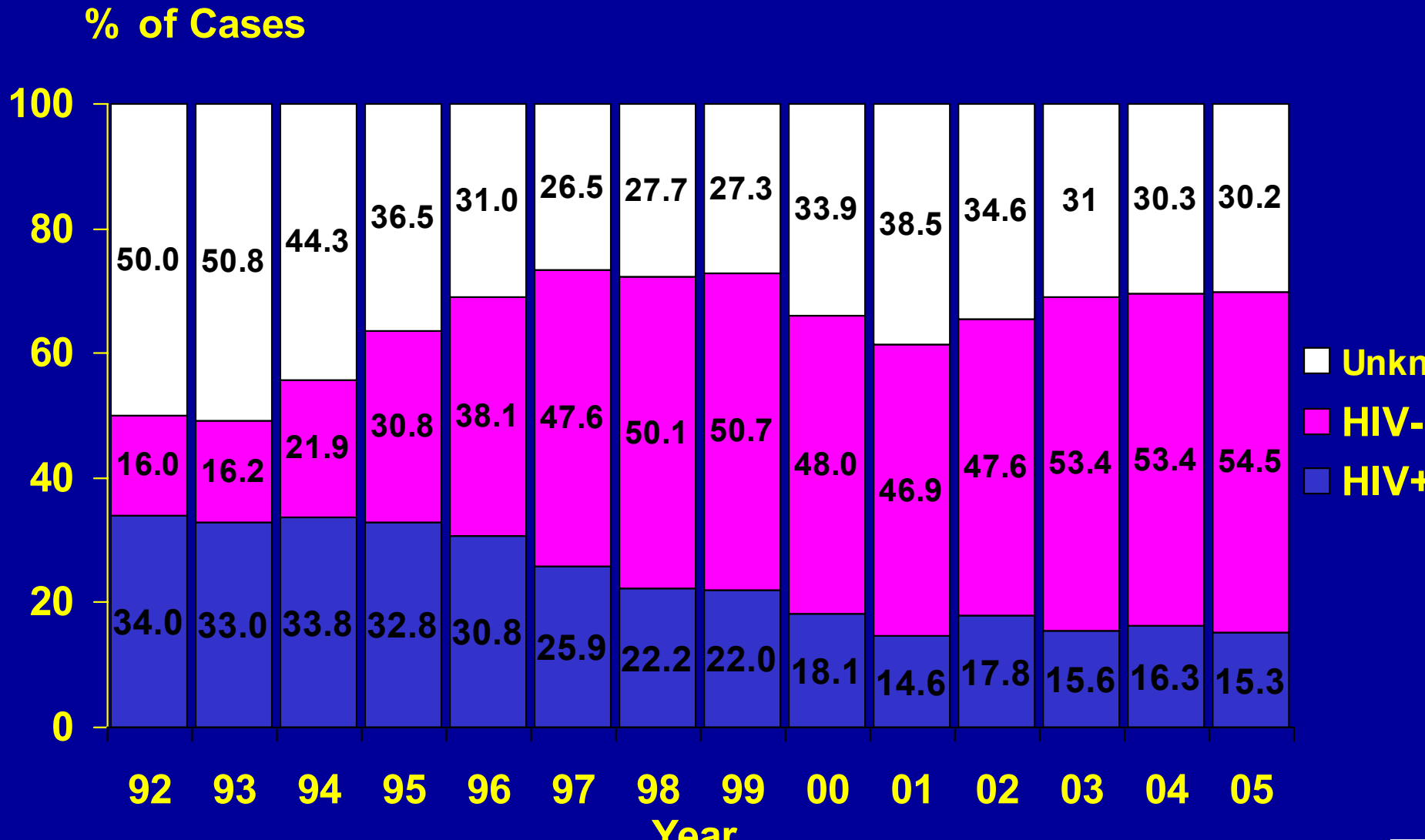
New York City, 2005



Trend in HIV-Infection and TB New York City, 1992-2005

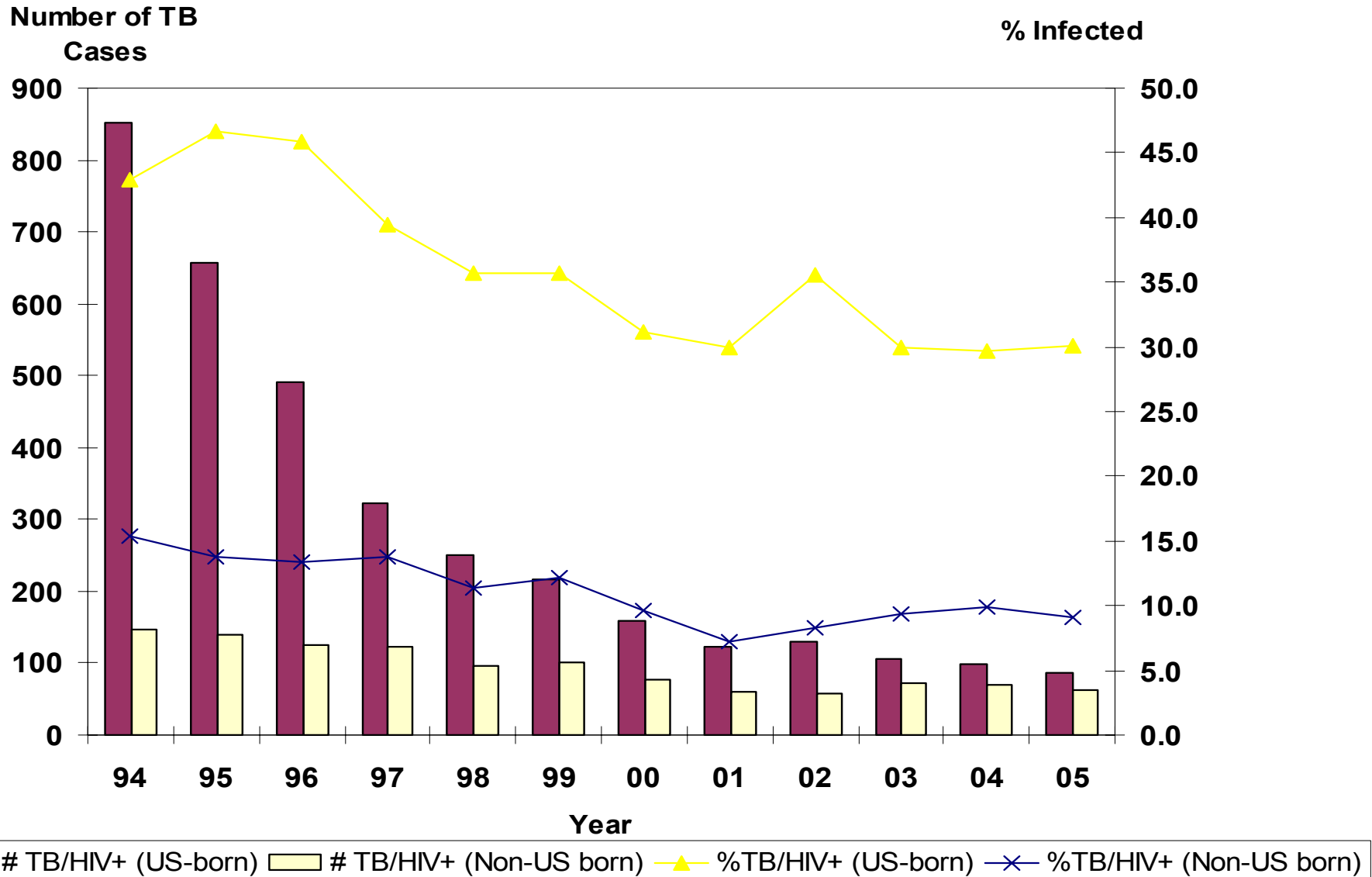


HIV-Infected TB Patients New York City, 1992 - 2005

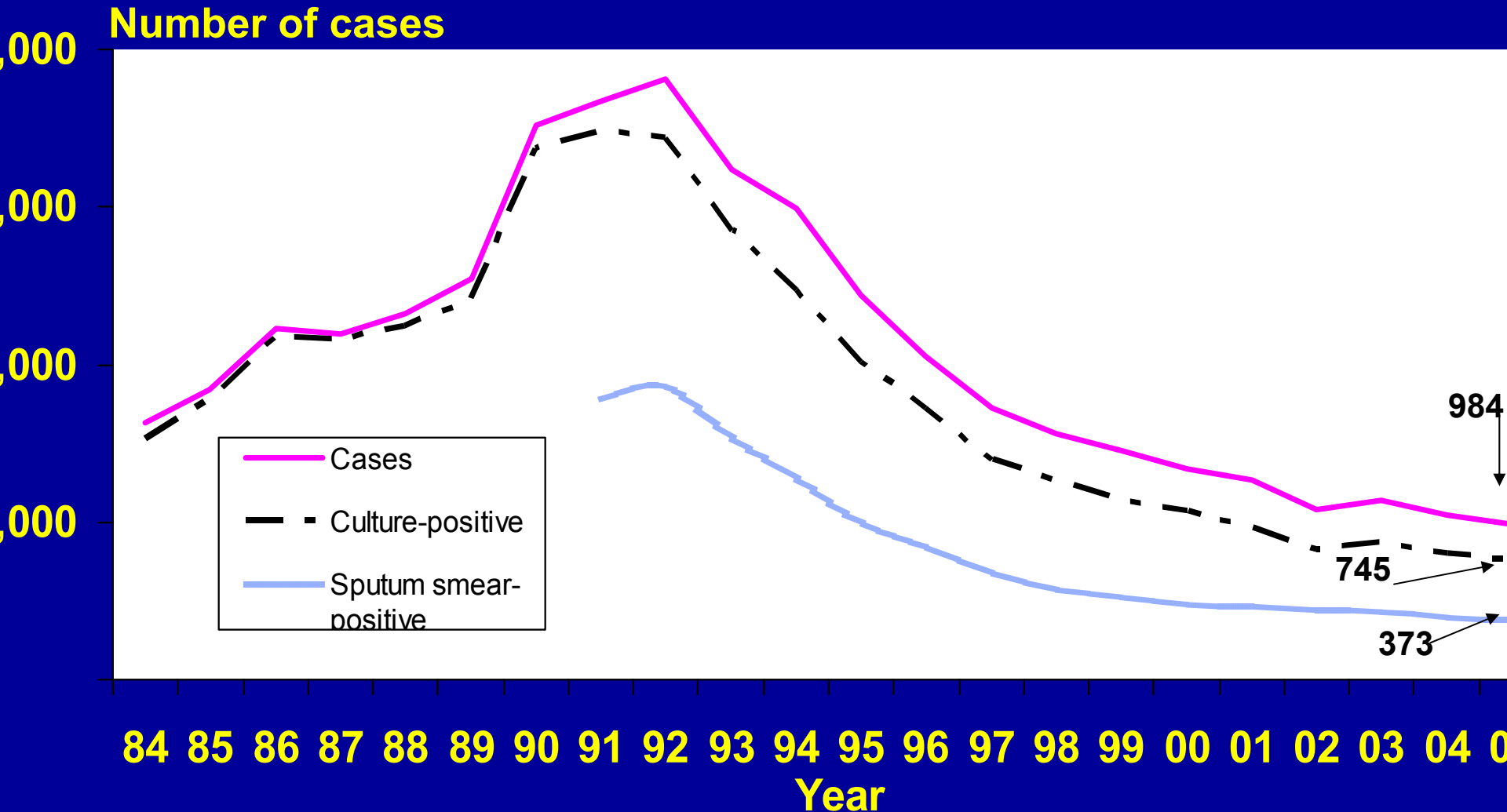


HIV-Infected TB Cases by Country of Birth

New York City, 1994-2005

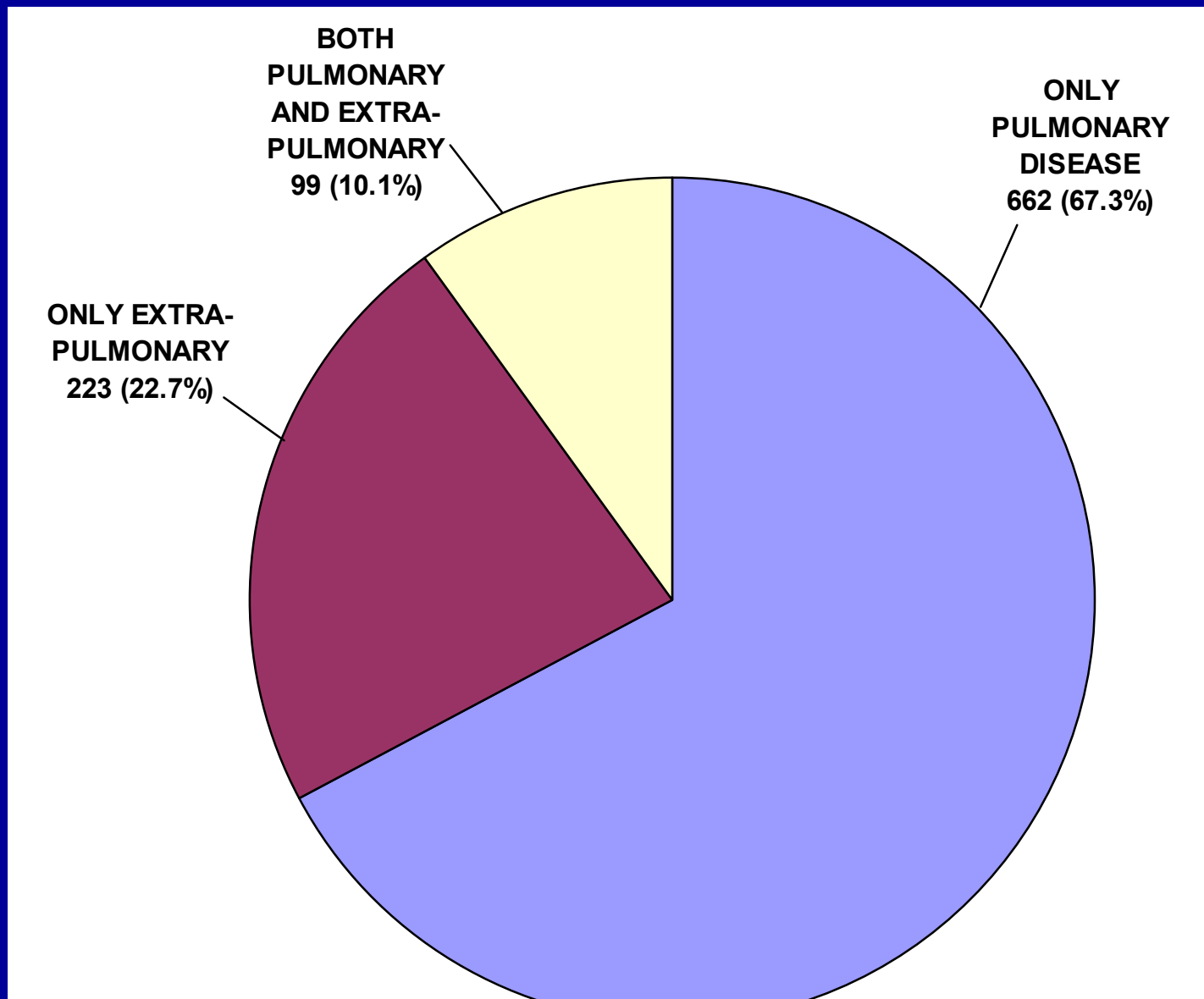


TB Cases by Smear and Culture Status, New York City, 1984-2005

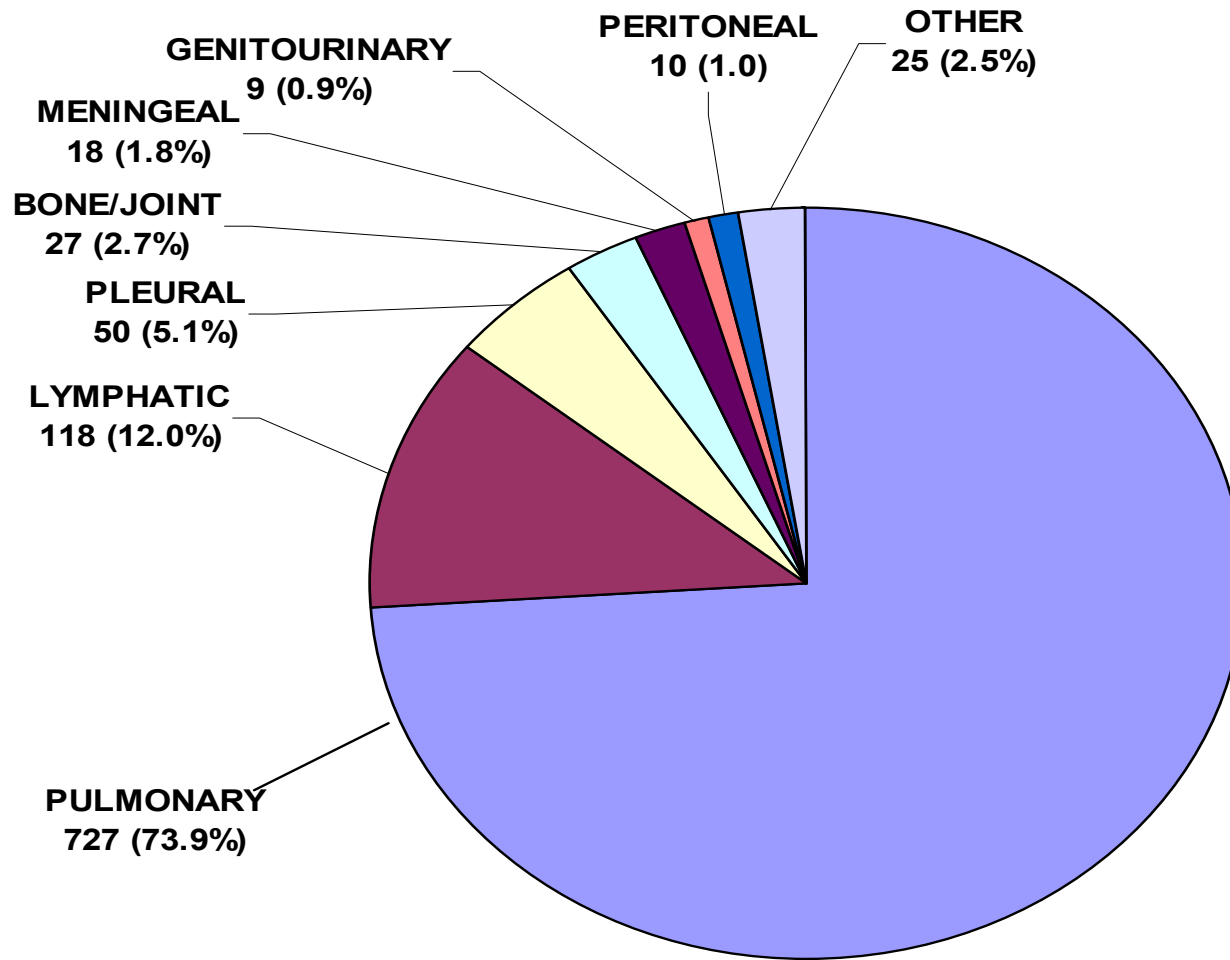


Tuberculosis Cases by Site of Disease

New York City, 2005



Tuberculosis Cases by Primary Site of Disease New York City, 2005



Nucleic Acid Amplification (NAA) Testing for TB New York City, 2005

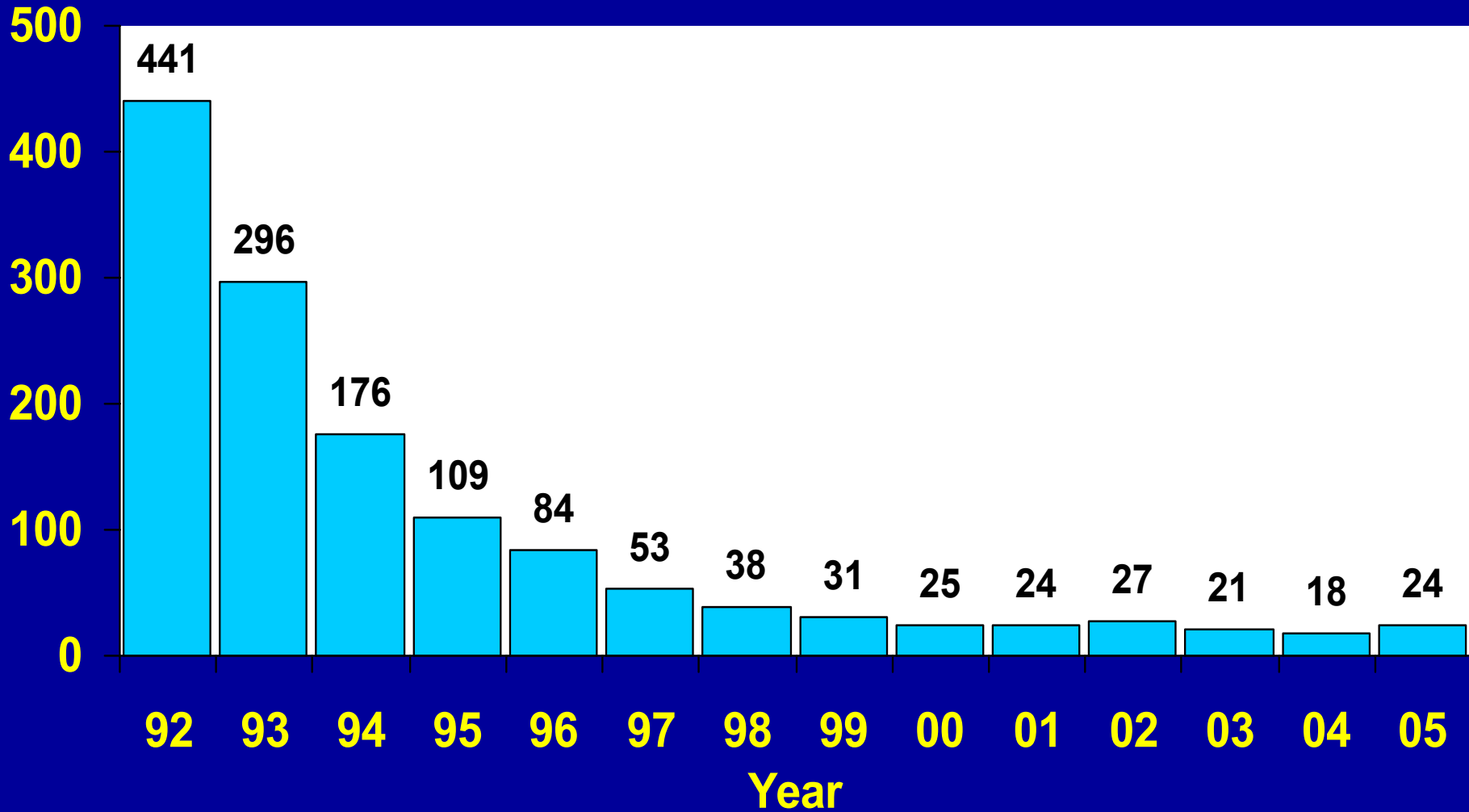
| | Total (%) | AFB smear positive (%) | Of AFB+, NAA done (%) | NAA positive (%) |
|-------------------------|---------------|----------------------------|-----------------------|------------------|
| Pulmonary Disease | 761 (77.3) | 418 (54.9) ¹ | 309 (73.9) | 289 (93.5) |
| Extra-pulmonary Disease | 223 (22.7) | 68 (31.2) ² | 6 (8.8) | 5 (83.3) |
| Total | 984 | 486 | 315 | 294 |

¹ Respiratory smear positive

Multidrug-Resistant TB*

New York City, 1992 - 2005

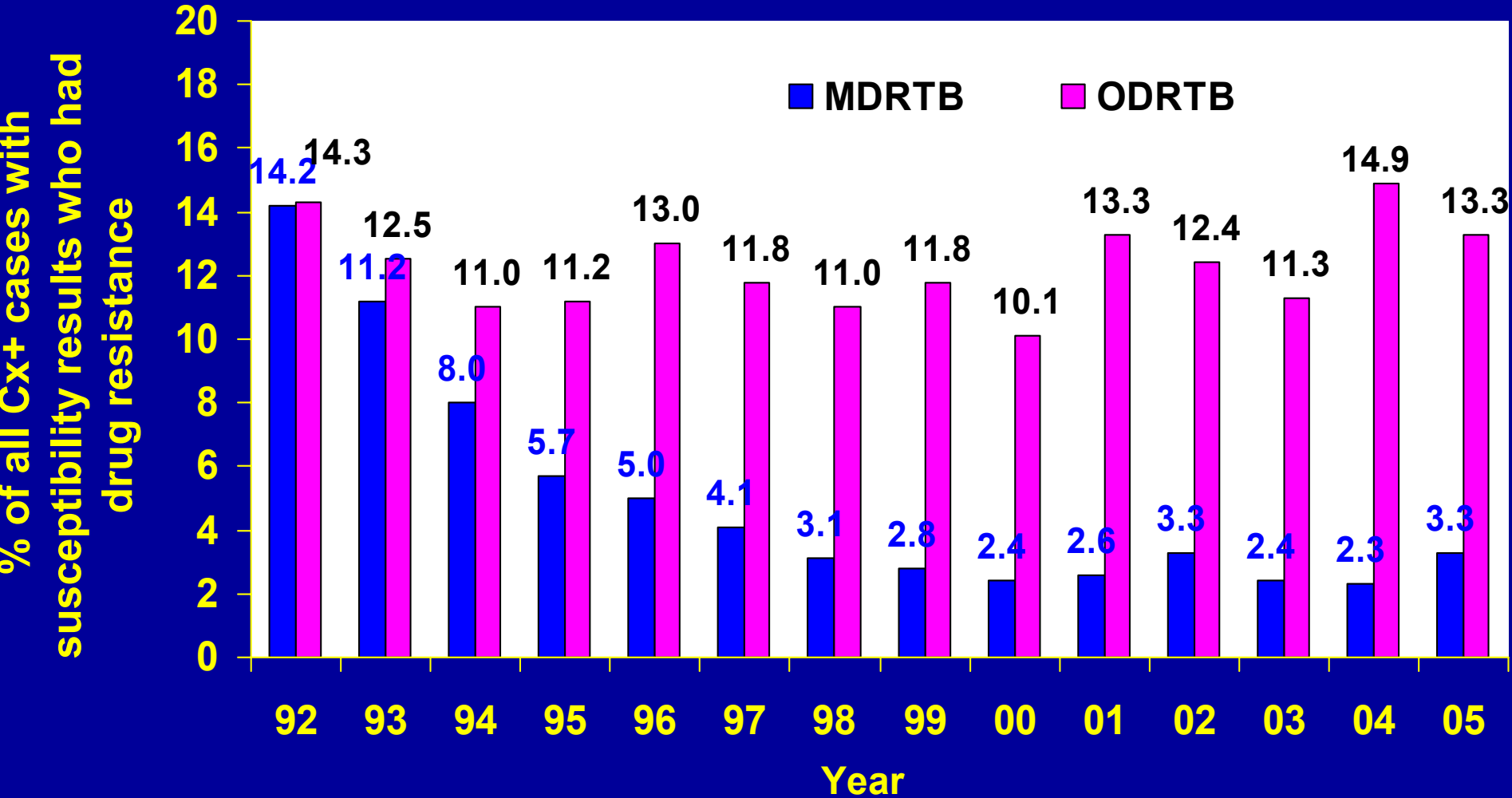
Number of Cases



Characteristics of MDR Cases (N=24) New York City, 2005

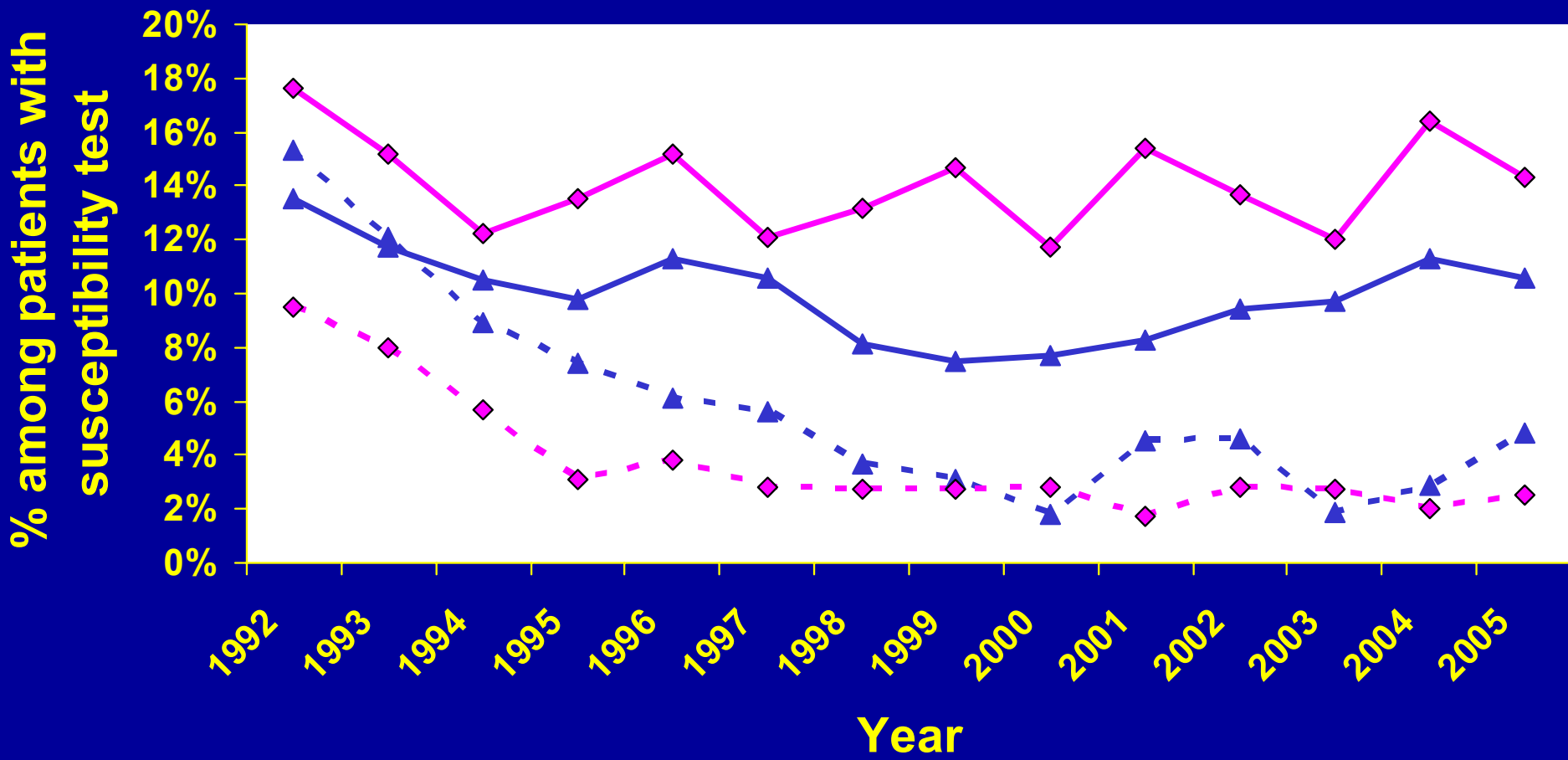
- 54.2% are non-US born.
- 29.2% are HIV-positive.
- 75% had pulmonary TB only.
- 16.7% had both pulmonary and extra-pulmonary TB.
- 8.3% had a previous history of TB, compared to 1.0% of non-MDR patients.

Tuberculosis Drug Resistance in New York City, 1992-2005



MDRTB: resistance to at least INH & RIF

First-Line Drug Resistance by Area of Birth New York City 1992-2005



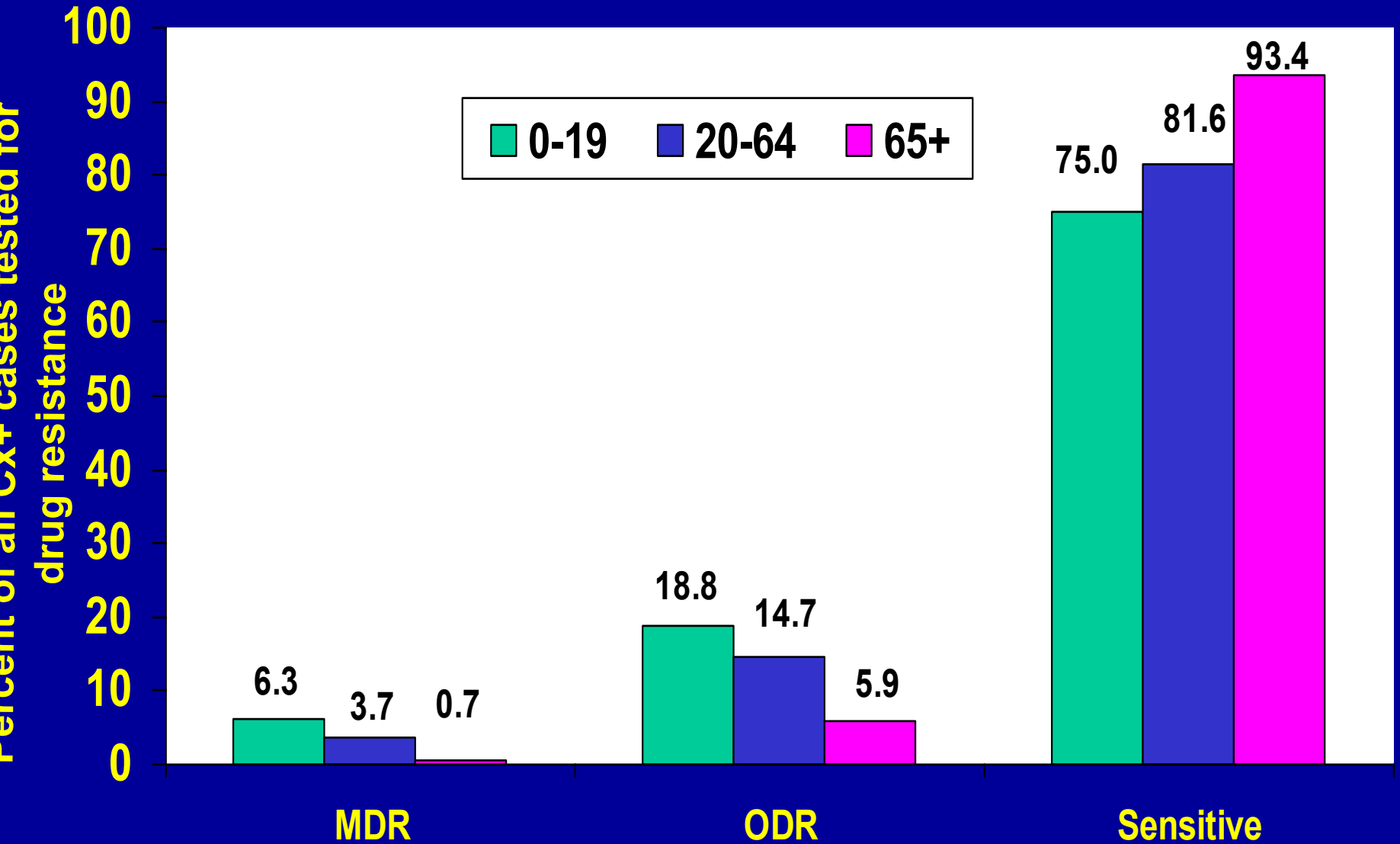
- ▲ - MDR US-Born

—▲— Other first-line resistance US-Born

- ◆ - MDR Non-US-Born

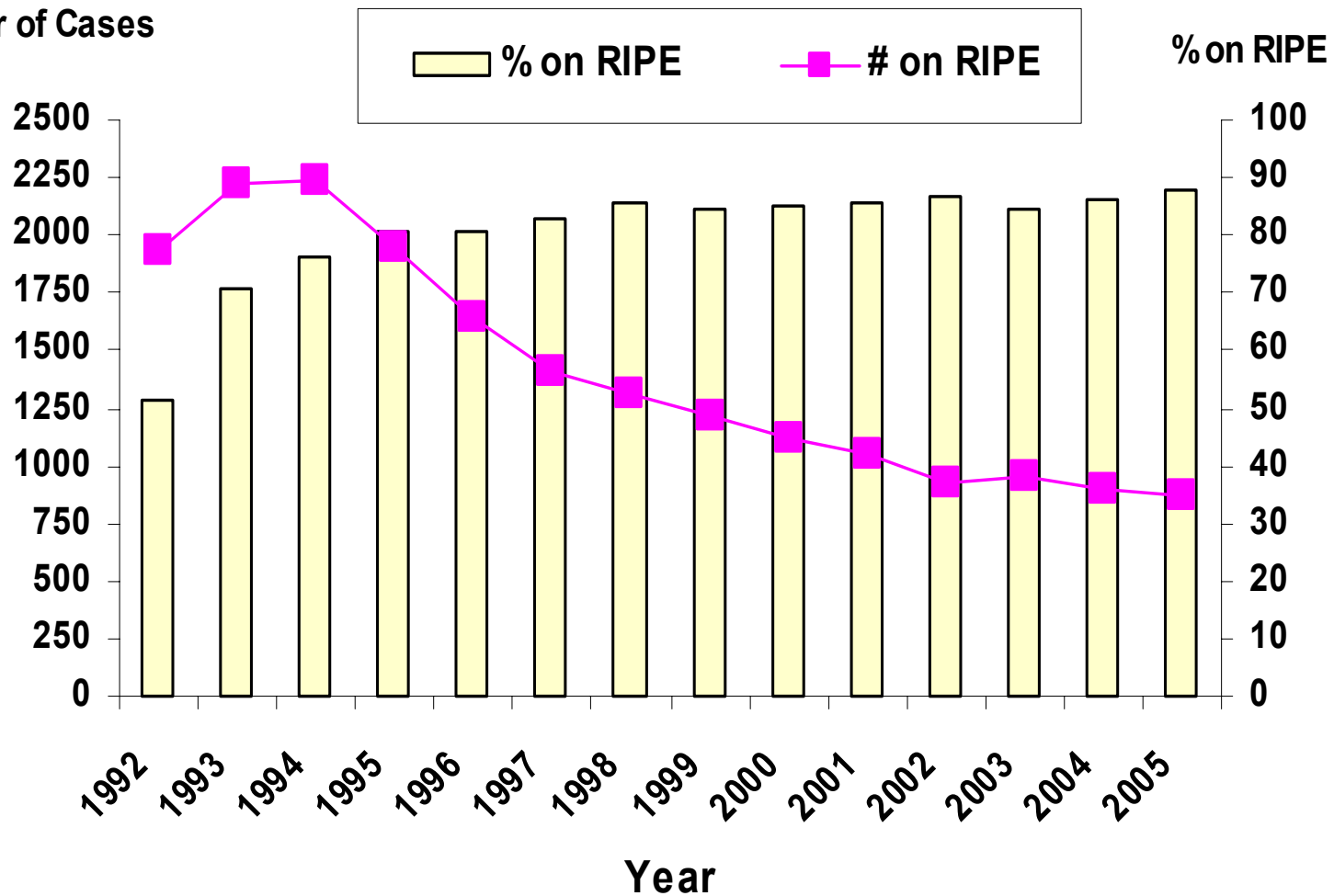
—◆— Other first-line resistance Non-US-Born

Drug Resistance by Age New York City, 2005



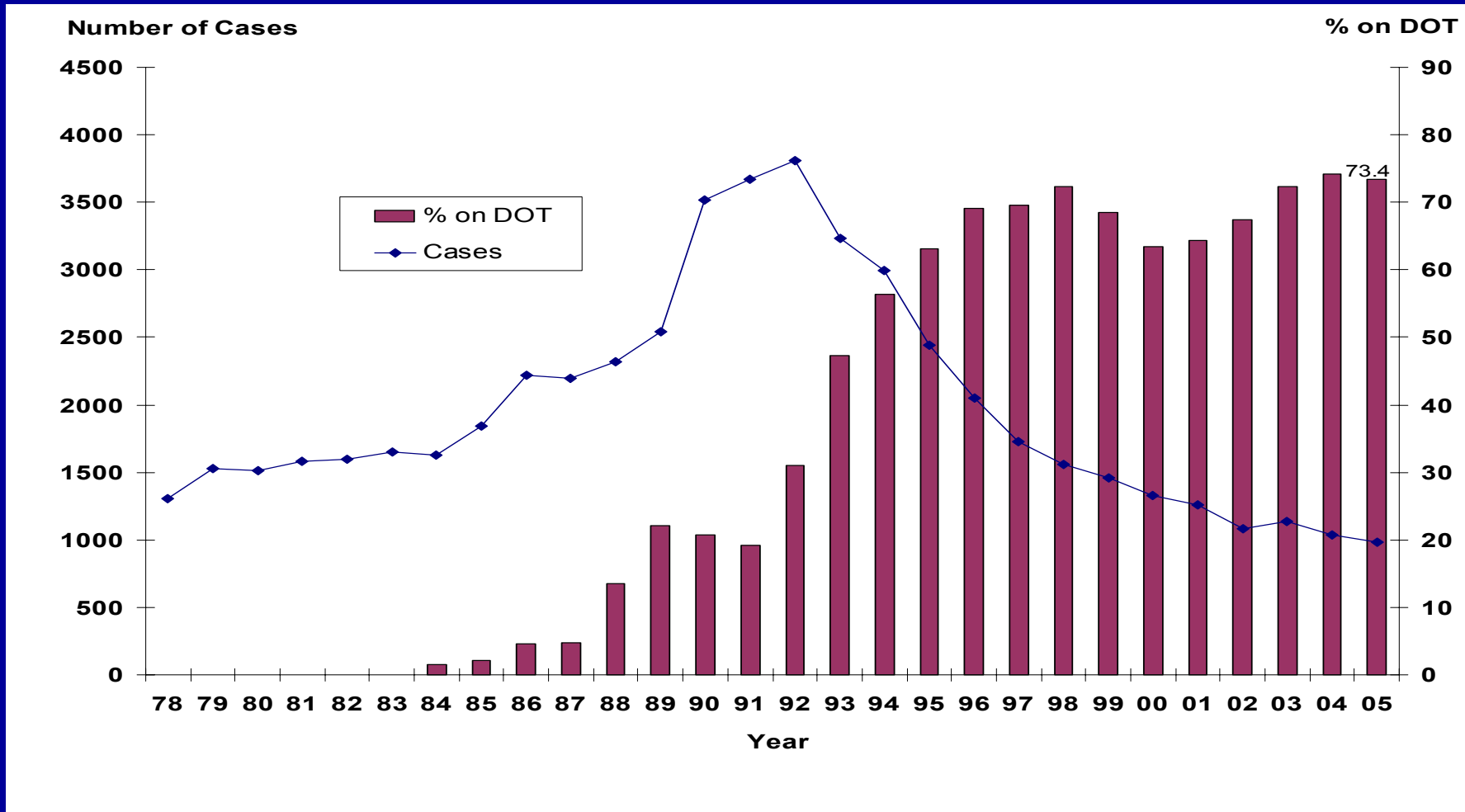
Treatment with 4 First Line Drugs New York City, 1992-2005

Number of Cases



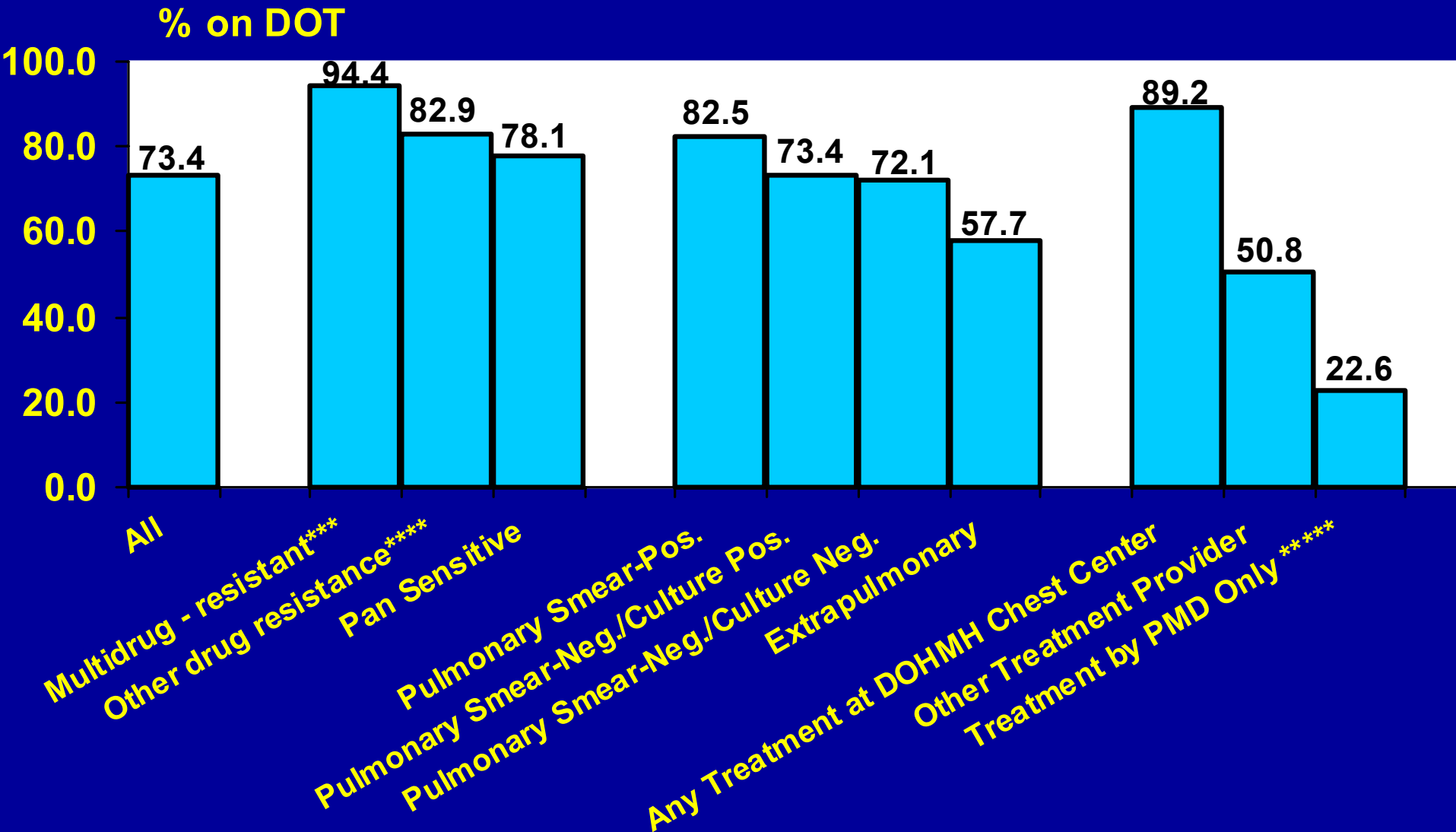
Trend in DOT Rates¹

New York City, 1978-2005



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

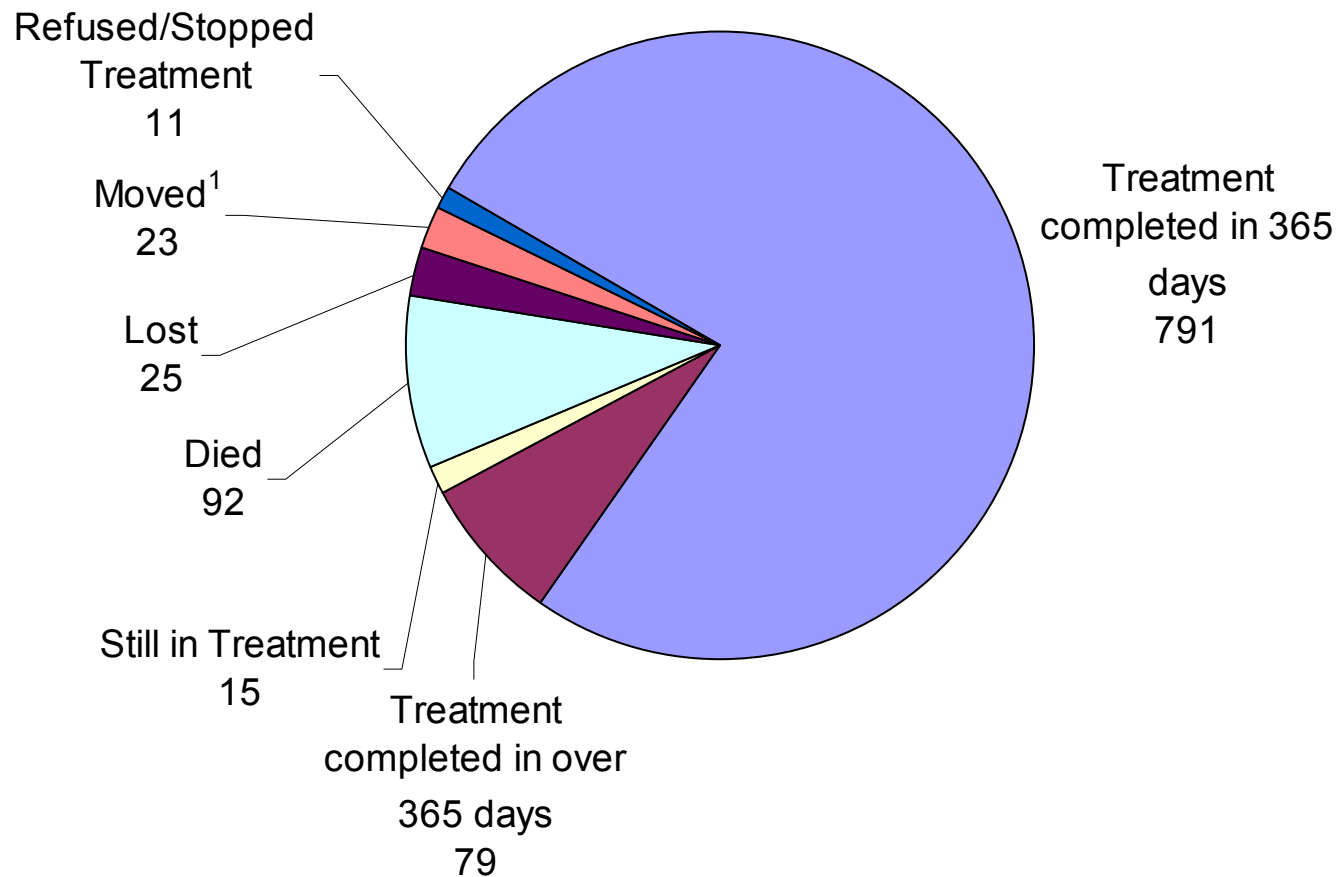
Percent of Eligible* TB Patients on DOT** New York City, 2005



Eligible patients are those diagnosed while alive and who received some treatment on an outpatient basis. **Ever on DOT as of April of the year after being confirmed as a case of tuberculosis. ***Multidrug-resistant is defined as

Outcome for TB Cases Counted in 2004 (N=1,030)

New York City, 2005

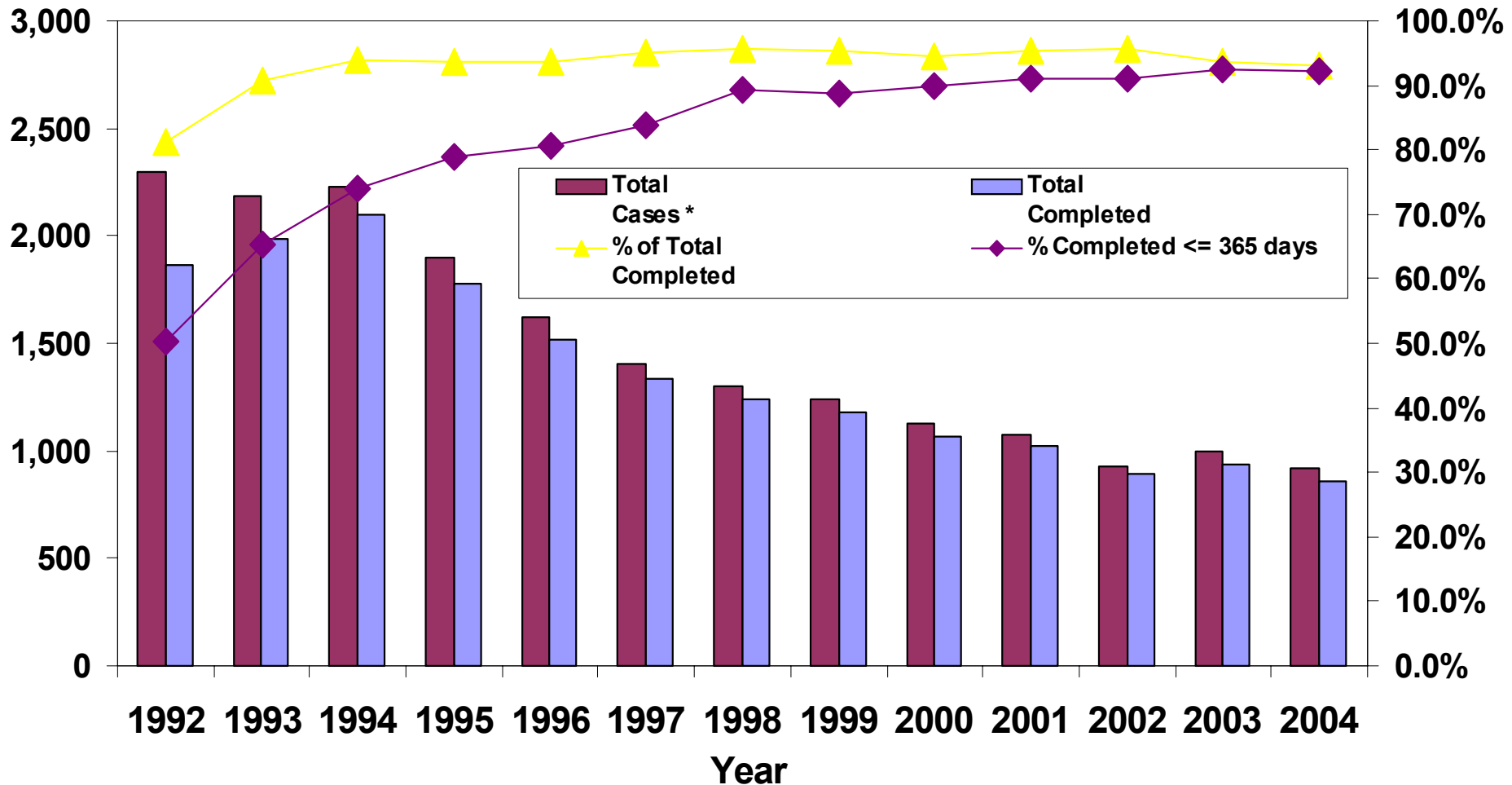


¹ Patients are categorized as moved only if their transfer to another jurisdiction is confirmed and no further follow-up information is available.

Treatment Completion Rates* New York City, 1992-2004

Number of Cases Eligible to Complete

% Completed



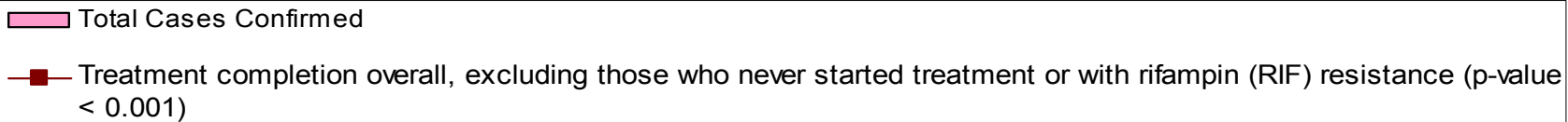
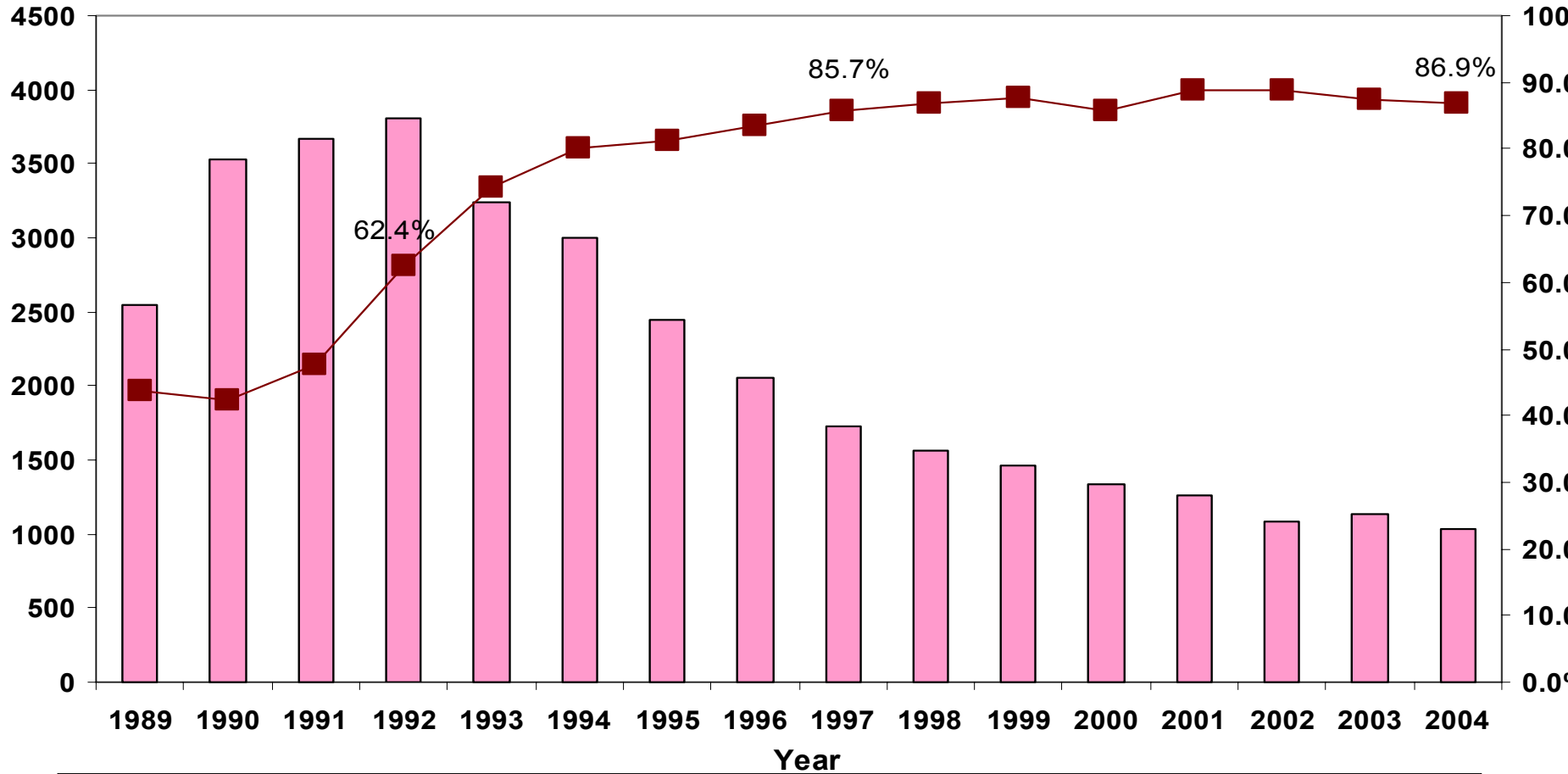
* NYC treatment completion definition excludes cases who died before completing treatment, those who were

Tuberculosis Treatment Completion

New York City, 1989 to 2004

Total Confirmed Cases

Treatment Completion Rate

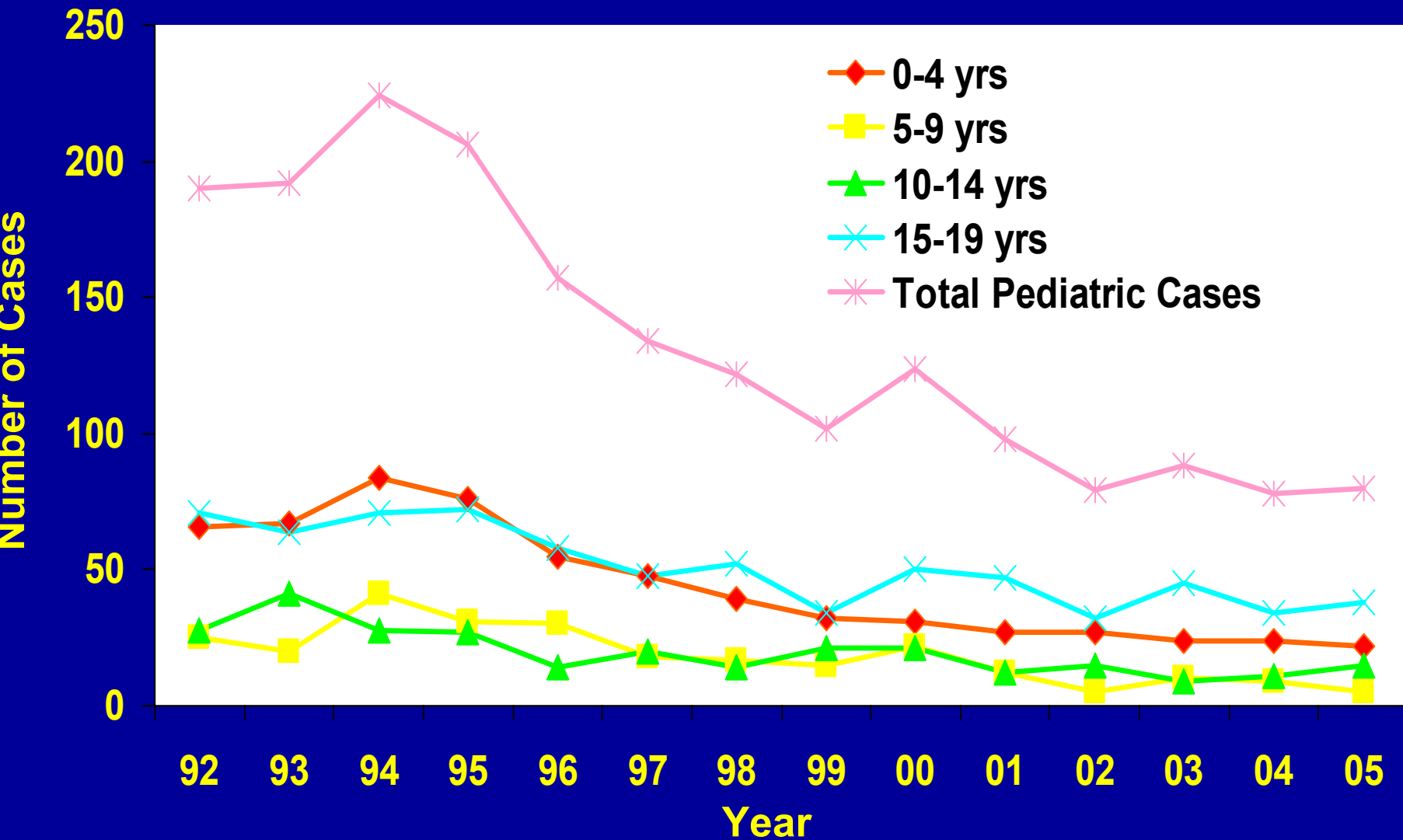


Among Contacts to 2004 Cases* New York City

| | Sputum Smear + N (%) | Sputum Smear – Cult. + N (%) | Centers for Disease Control and Prevention Objective |
|---|-----------------------------------|--|---|
| Cases with contacts identified | 392 (96.8) | 209 (93.7) | 90.0% |
| Contacts evaluated | 3,464 (82.3) | 966 (82.8) | - |
| Contacts starting LTBI treatment | 696 (66.5) | 180 (79.2) | - |
| Contacts completing LTBI treatment | 452 (65.0) | 123 (68.3) | 85.0% |

*2004 final data (as of 07/06)

Pediatric Tuberculosis New York City, 1992-2005

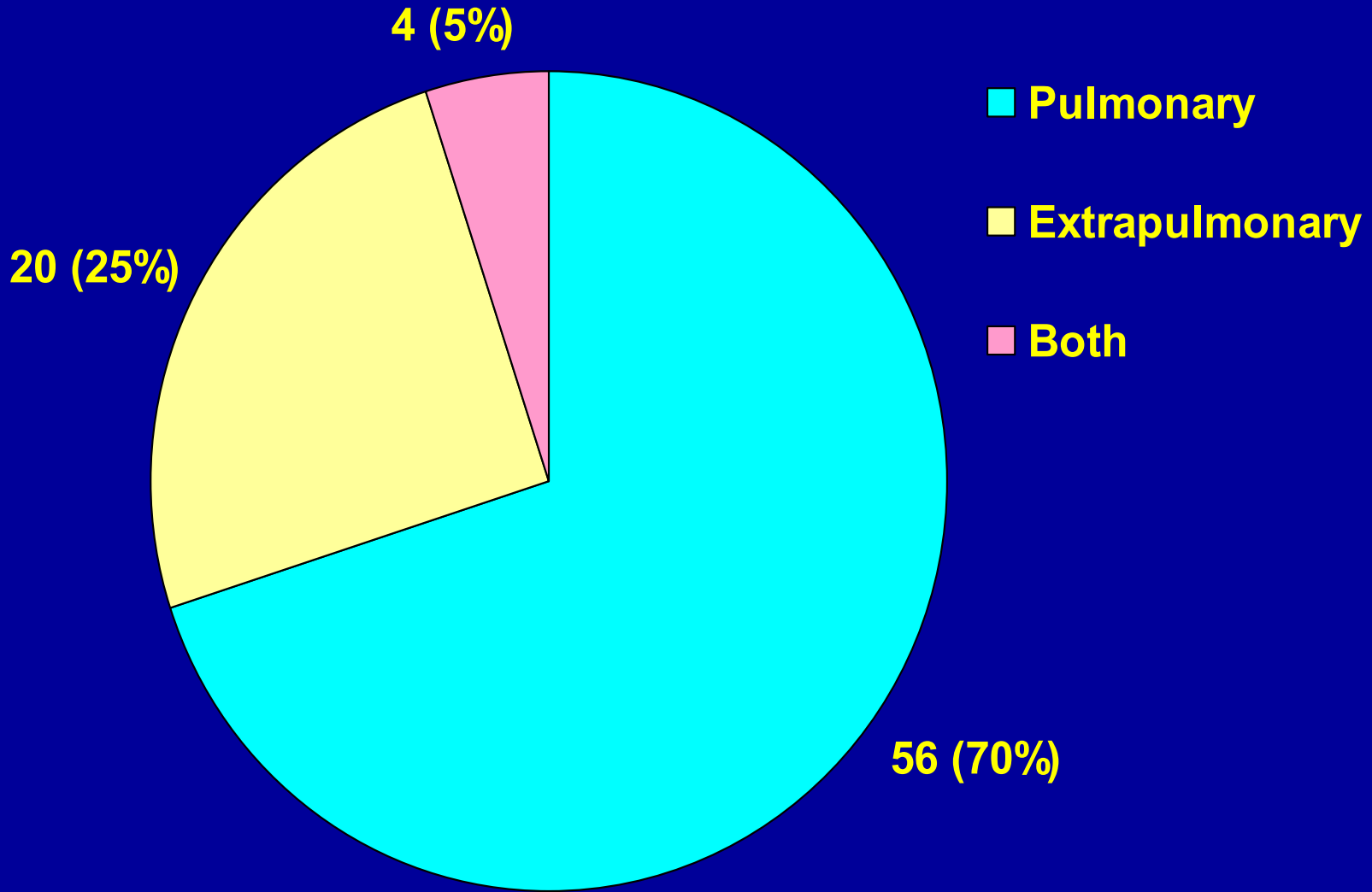


Pediatric* TB in New York City, 2005

- Total of 80 cases
 - 33 females (41.3%)
 - 47 males (58.8%)
 - 39 Hispanic (48.8%)
 - 19 Asian (23.8%)
 - 19 Non-Hispanic, Black (23.8%)
 - 3 Non-Hispanic, White (3.8%)
 - 37 (46.3%) are US-born
 - 43 (53.8%) are non-US born

* Pediatric is defined as age 0 to 19

Pediatric Tuberculosis by Site of Disease New York City, 2005-1



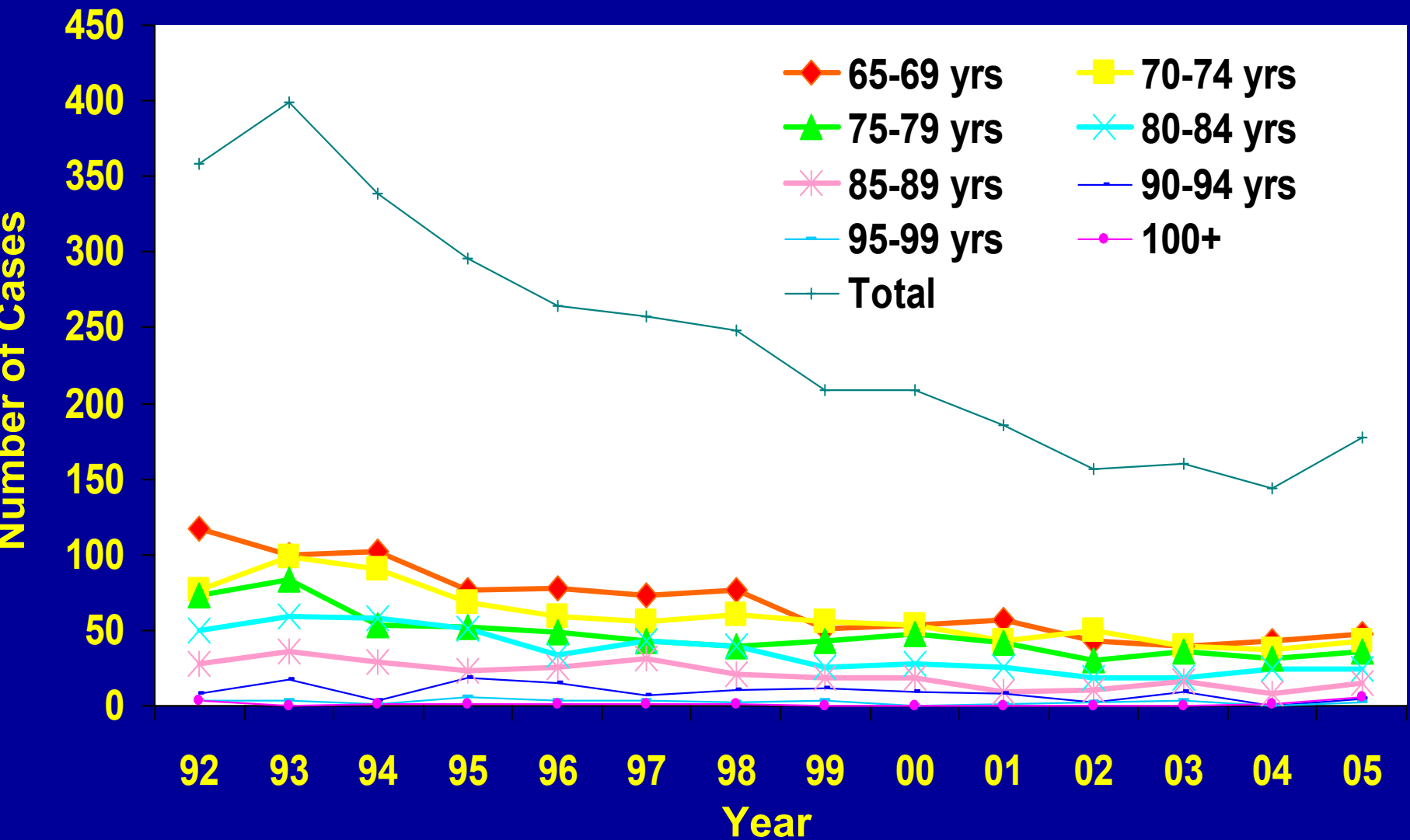
Extrapulmonary Sites of Pediatric Tuberculosis*

New York City, 2005-2

- Primary extra-pulmonary sites of disease (N=20)
 - Lymphatic (12)
 - Pleural (3)
 - Bone/joint (2)
 - Meningeal (2)
 - Peritoneal (1)

*Pediatric is defined as age 0 to 19

IB Cases in Patients ≥ 65 Years Old New York City, 1992-2005



TB Cases in Patients \geq 65 years, New York City, 2005

- 172 Cases in elderly
- 32% Female
- 68% Male
- 30.2% US born
- 42.4% from Asia
- 9.3% from the Caribbean, and 8.7% from Central/South America
- 41.3% are Asian
- 15.7% are Hispanic
- 23% are Non-Hispanic Black
- 18% are Non-Hispanic White

Main Sites of Tuberculosis In the Elderly New York City, 2005

- Pulmonary only: 126 (73.3%)
- Extra-pulmonary only: 38 (22.1%)
- Both pulmonary & extra-pulmonary: 8 (4.6%)

Primary extra-pulmonary sites of disease (N=39)

- Lymphatic (13)
- Pleural (10)
- Bone/joint (7)
- Genito-urinary (1)
- Meningeal (2)
- Other (6)

Reporting by Healthcare Providers

- Providers are required by law to report within 24 hours any case with:
 - AFB+ smear from any site
 - Nucleic Acid Amplification (NAA) test + for *Mycobacterium tuberculosis (M. tb)* complex
 - Culture + for *M. tb* complex
 - ≥ 2 anti-TB medications for suspected or confirmed TB
 - Clinically suspected TB
 - Pathology findings consistent with TB
- Child < 5 years old with + TST (regardless of BCG)

Reporting by Laboratories

Laboratories are required by law* to report **within 24 hours** :

- AFB + smears
- Cultures + for *M. tuberculosis* (*M. tb*) complex
- Any culture result associated with an AFB+ smear (even if negative for *M. tb* complex)
- Rapid diagnostic (NAA) tests identifying *M. tb* complex
- Results of susceptibility tests on *M. tb* complex cultures
- Pathology findings consistent w/ TB

*Articles 11 and 13, Sections 11.03, 11.05 and 13.03 NYC Public Health Code

TB Laboratory Case Definition

- Isolation by culture of *M. tuberculosis* complex from a clinical specimen
- OR
- Demonstration of *M. tuberculosis* from a clinical specimen by nucleic acid amplification (NAA) test (when used in accordance with FDA approved product labeling) OR
- Demonstration of acid-fast bacilli (AFB) in a clinical specimen when a culture has not been or cannot be obtained

TB Clinical Case Definition

- Evidence of TB infection based on a positive tuberculin skin test
- (AND)
- One of the following:
 - (1) Findings compatible with current TB disease, such as an abnormal, unstable (worsening or improving) chest radiograph, or
 - (2) Clinical evidence of current disease (e.g., fever, night sweats, cough, weight loss, hemoptysis)
- AND
- Improvement on current treatment with two or more anti-TB medications

Pathology Findings Suggestive of TB

- Presence of acid-fast bacilli (AFB)
- Caseating/non-caseating granuloma
- Tubercles
- Fibro-caseous lesions
- Necrotizing/non-necrotizing granuloma
- Langhans giant cells/multinucleated Langhans cells
- Epithelioid cells/Epithelioid granuloma
- Necrotizing inflammation
- Chronic granulomatous lesions/chronic inflammation with granuloma formation
- Giant cells