TUBERCULOSIS IN NEW YORK CITY-1986

A REPORT

BY

THE NEW YORK CITY

DEPARTMENT OF HEALTH

PUBLISHED BY

NEW YORK LUNG ASSOCIATION

NEW YORK LUNG ASSOCIATION
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Message to the Community
March 1988

The data in Tuberculosis in New York City 1986 were prepared by the New York City Department of Health. The New York Lung Association, the Christmas Seal People, is pleased to publish the report as a community service.

Tuberculosis is an ancient disease, and a persistent one, having effectively resisted all efforts to date to eradicate it. The incidence of TB in New York City has in fact risen during the past several years so that today it represents a serious public health threat. Some of the earlier gains in tuberculosis control are being eroded because of the increase in HIV infection and other socioeconomic conditions currently prevalent in our city. It will take renewed commitment and the application of the most up to date methods available to reverse this trend.

The New York Lung Association remains dedicated to the elimination of this disease. Our efforts in education, in advocacy, and in other appropriate programs, will continue until this goal is achieved.

Edith Ewenstein

Edith Ewenstein, CAE
General Director

THE CITY OF NEW YORK
COMMISSIONER OF HEALTH
Stephen C. Joseph, M.D., M.P.H.

125 WORTH STREET
NEW YORK, N.Y. 10013

February 8, 1988

To the Mayor and the Citizens of New York City:

The largest increase in reported cases of tuberculosis since 1983 occurred in 1986. This is a continuation of the trend which began in 1979, after almost two decades of decline in the disease.

Tuberculosis increased by more than 30% among males over 20 years of age. The highest case rates were among black men 25-44 years old. As in the previous two years, Central Harlem and the Lower East Side were the health districts with the highest rates of tuberculosis.

The role of HIV infection and AIDS in tuberculosis is still not fully understood, but the age, sex and geographic distribution in both diseases indicate a strong correlation between them. In order to prevent breakdown from tuberculosis disease among dually infected individuals, the Department of Health is strongly recommending testing for HIV infection among positive tuberculin reactors. In addition, all persons diagnosed with tuberculosis should be counseled and tested for HIV infection. A prolonged drug regimen should be prescribed for persons with tuberculosis who are HIV infected. The Department of Health also recommends that HIV seropositive individuals be tested for tuberculosis.

A new program to identify and treat homeless persons with tuberculosis has increased our ability to manage this difficult-to-reach population. Field workers are assigned to the shelters. They locate patients, medicate them and follow their therapeutic progress. In order to more efficiently detect disease among the homeless, x-ray screening is being implemented.

New initiatives include providing skin testing to the city's school children. Such screening will permit us to assess the prevalence of infection among this population and to design future control activities for the Department of Health.

This report for 1986 details the epidemiology of tuberculosis in New York City and describes the activities of the Department of Health in identifying, treating and following tuberculosis cases and their contacts. In 1988, the Department is undertaking a major reorganization in tuberculosis to support a series of public health initiatives to reverse the resurgence of this disease during the past several years.

Sincerely,

Stephen C. Joseph, M.D., M.P.H.
Commissioner of Health

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I. Introduction

Tuberculosis rates in New York City in 1986 continued an increase which began in 1979, reversing a 20 year downward trend. There were 2,223 new cases of tuberculosis reported to the New York City Department of Health, a rate of 31.4 per 100,000 population. This represents an increase of 21% over 1985 (Table 1, Figure 1), and is more than triple the national rate of 9.4. In 1986, New York City had the fifth highest case rate of the 59 largest US cities, whereas in 1985 it had the ninth highest case rate. Because there were no changes in reporting methods (except for pediatric cases) and no cutbacks in service provision, the increase is believed to be genuine.

This report outlines the demographic and geographic distribution of tuberculosis in 1986, discusses control activities carried out by the Bureau of Tuberculosis of the New York City Department of Health, and describes future programs for high risk groups.

II. Epidemiology

The highest rates of disease correspond generally with those areas of the city with the poorest socioeconomic conditions. The areas most adversely affected are economically depressed and exhibit typical characteristics of urban poverty: overcrowded and substandard housing, low income, high unemployment, high maternal and infant mortality rates, and drug abuse. In addition, areas with high rates of tuberculosis also coincide with areas with a high incidence of AIDS.

As in 1984 and 1985, rates remained high or increased among 25-44 year olds in all racial and ethnic groups, especially among black and Hispanic males. Rates increased 22% in those 65 years and older, the first such rise in the elderly since 1980.

A. Distribution by Sex, Age, and Race/Ethnicity (Figures 2 - 5 and Tables 2 - 4)

1) Males

From 1985 to 1986, the incidence rate of tuberculosis in males of all ages rose sharply by 25%, and increased from 39 to 49 cases per 100,000 population. Between 1984 and 1985, the rate in this group had increased by 15%. There were slight declines in rates among male children and teenagers, but increases in all age groups twenty years and over (Table 3). The greatest increases in 1986 occurred among males 65 years and older (36% more cases than 1985); those 45-54 years of age (32% rise); and among 35-44 year olds (30% increase). These trends contrast with the previous year; from 1984 to 1985, the oldest age cohort experienced only a 12% increase, 45-54 year olds an 8% decline, and 35-44 year olds a 19% rise in incidence.

Black males continued to experience the highest incidence of tuberculosis, with 30% more cases reported in this group in 1986 (878) than in 1985 (676). As in the two previous years, incidence rates in 1986 peaked in the 35-44 year old age group, but also rose dramatically in all older age groups among black males.

Of the males with tuberculosis, 54% were in the 25-44 year age range. Compared to the 1982 proportion of cases which occurred among black males, there was an increase from 16% of the total morbidity to 23%.

While rates among black males of all ages increased by 22% in 1986, Hispanic males experienced an even greater increase in incidence (44%), whereas incidence in this group had increased only 7% from 1984 to 1985. The rise among Hispanic males was concentrated in 35-44 year olds (68% increase in 1986 following a slight decline between 1984 and 1985); 45-54 year olds (130% increase in incidence over 1985); and those 65 years and older, among whom the tuberculosis incidence rate climbed by 53%.

Asian males experienced a 36% increase in the tuberculosis rate in 1986*. While the age specific rates are high for Asians, especially in the oldest age cohort, the 102 cases reported in 1986 are the smallest number for males in all racial ethnic groups.

Tuberculosis incidence among white males increased only slightly overall (3%), with the greatest rise occurring in those age groups 35-44 and 65 years and older. However, the rates among those 45-64 decreased substantially.

*The rate presented in the 1984-85 report for Asian males, all ages combined, was understated. It was actually 60 per 100,000 overall for both years. In addition, the 1985 rate for those 65 years and over was actually 197 per 100,000 and not 60.5.

2. Females

Tuberculosis incidence in females increased by 11% in 1986, slightly more than the increase of the previous year. (Table 4) The greatest increase occurred among Hispanic women; incidence jumped 35% in this group (from 13.9 to 18.8 cases per 100,000). Among females in general there was little change from the previous year with no consistent pattern. Tuberculosis did not rise as rapidly in black women of all ages (up 10%) as in Hispanics (35%), although the overall rate in blacks is nearly twice that in Hispanic women.

3. Pediatric Cases

Despite increases in tuberculosis incidence in the age groups most likely to transmit the disease to children (those of parental ages 25-44), rates in both males and females under five years of age declined by 32% in 1986 from 8.7 to 5.9 cases per 100,000. (Table 5) Stricter case ascertainment criteria for pediatric tuberculosis, instituted in 1986, may have contributed to some of this decline.

B. Geographic Distribution

Age-adjusted incidence rates by health district of residence were calculated for 1980, 1985, and 1986 (Table 6). Although the highest 1986 rates are in Manhattan, districts in the Bronx also experienced consistently large percentage increases in incidence rates.

1. Manhattan

Except for Kips-Bay/Yorkville on the Upper East Side, all health districts in Manhattan experienced increases in tuberculosis incidence in 1986. Most notable are the near doubling in East Harlem, and a 30% rise in Washington Heights. The rate in the Lower East Side increased by 13%, to 83.5 per 100,000. This is the second highest rate in the borough and in the entire city. The rate in Central Harlem remains the highest in NYC at 130.4 per 100,000.

2. Bronx

While age-adjusted rates are generally lower than in Manhattan, Bronx health districts did experience consistently larger percentage increases in incidence. Most prominent are the increases in Morrisania and Mott Haven in the South Bronx, and Tremont in the central Bronx, an area contiguous with the South Bronx. While the rate remains low in Pelham Bay, it did increase by 68% in 1986.

3. Brooklyn

The incidence rates in six of ten health districts in Brooklyn held fairly steady from 1985 to 1986, and the rate in Brownsville declined by 11 percent. The largest increases occurred in Sunset Park (66%), Williamsburg (30%), Bedford (27%), and Fort Greene (26%).

4. Queens

Tuberculosis rates in Queens remained fairly steady in the majority of health districts in this borough. The rate in Astoria, however, increased by more than 60%.

5. Staten Island

Only 25 cases of tuberculosis were reported from Staten Island in 1986, yielding an age adjusted rate of 7.4 per 100,000. This is a 16% increase over 1985.

6. Distribution of Age-Specific Tuberculosis by Area of Birth

In 1986, as in the two previous years, approximately three-quarters of all newly reported cases of tuberculosis occurred among individuals born in the United States (Table 7). The Caribbean area accounted for about half of those born outside the continental United States, the largest group represented. A total of 70 countries were reported as place of birth for those tuberculosis cases born outside the United States.

C. Tuberculosis among Immigrants and Aliens

The United States Public Health Service's Foreign Quarantine Service screens immigrants for tuberculosis before they enter this country. The screening process consists of a general physical examination and, for persons 15 years of age and older (1 year of age for Indochinese refugees), a chest x-ray. Those under 15 years old receive a chest x-ray if clinically indicated, or if they are members of a family where one or more members had an abnormal chest x-ray.

Individuals with abnormal results on chest x-rays are then classified for tuberculosis control purposes as either having, or as suspected of having, tuberculosis in an active state (Class A), or as infected, with no evidence of active disease (Class B). Among New York City immigrants during 1986, 187 Class A aliens (immigrants and/or refugees) and 1,156 Class B aliens were screened, of whom none were discovered to have infectious pulmonary tuberculosis on the basis of a positive culture for M. tuberculosis. Table 8 summarizes these data for the years 1976 to 1986.

D. Reactivated Cases

Patients who were previously treated for tuberculosis are considered to be new cases if they have not been under medical supervision for twelve months and are diagnosed again with disease. There were 62 reactivated cases in 1986, which represents a 13% decrease from the 71 reactivators reported in 1985 (Tables 9 and 10).

Approximately 70% of reactivators were males, and half of these cases occurred among those ages 25-44. Reactivators accounted for 3% of all cases in 1986.

E. Drug Resistance

Drug resistance in New York City in patients being treated for the first time is relatively rare. Resistance is more likely to be acquired as a result of failure of the patient to take the required amount of medication regularly or from a failure on the part of health care providers to properly prescribe the medication.

Information on drug resistance during 1986 is derived from data obtained from two separate sources. In the Department of Health chest clinics, 21 of 294 (7.1%) patients showed resistance to anti-tuberculin medication, whereas in Kings County Hospital in Brooklyn, Drs. Steiner and Sierra reported that of 206 patients, 35 (20.5%) demonstrated resistance. These facilities represent the low and high proportion of drug resistant patients.

F. Mortality

In 1986, there were 186 deaths in New York City in which tuberculosis was categorized by nosologists as the underlying cause on the death certificate, making it the 23rd most prevalent cause of death. The crude tuberculosis mortality rate of 2.6 is the highest since 1978 (Table 11, Figure 1).

All figures presented in this year's report are based on statistics issued by the Bureau of Health Statistics and Analysis. In 1984 and 1985, pulmonary tuberculosis accounted for approximately 75% of the tuberculosis deaths, whereas in 1986, pulmonary deaths rose to 85%, a statistically significant increase.

The mean age of those who died from tuberculosis was 53 years for both 1984 and 1985 and 51 years for those who died in 1986. Males represented 74% of the tuberculosis deaths in 1986 and 72% in the two previous years. Blacks accounted for 60% of deaths in 1986; whites 14%; Hispanics 13%; and others were 13%. This represents a 12% increase in tuberculosis deaths among blacks over 1985 and a 16% decrease in deaths among whites.

There were, in addition, 155 deaths in which tuberculosis was mentioned on the death certificate, but was not coded as the underlying cause of death. Forty-two per cent of these deaths had AIDS listed as the underlying cause of death. This represents a statistically significant increase over 1984 and 1985 when AIDS was the cause of death in 29% and 31%, respectively, of death certificates in which tuberculosis was mentioned.

III. Tuberculosis Control Activities

The responsibilities of the Bureau of Tuberculosis include the interruption and prevention of transmission of the tubercule bacilli. The ultimate goal is to eliminate tuberculosis as a personal and public health problem. The Bureau acts to protect the health of the public through surveillance, containment, and prevention activities.

A. Surveillance

The basic surveillance mechanism used is case reporting; the New York City Health Code requires that all health facilities and private physicians report confirmed or suspected cases of tuberculosis within 24 hours of diagnosis. Measures are taken to ensure that such reporting is done in a timely and thorough manner, and corrective actions are taken when reports are not received. Cases are tracked to assure that they receive appropriate treatment.

The Bureau established a special Surveillance Unit in 1986 to audit hospital laboratory log books for positive smear and culture results. This information, when combined with case reports, assists the Bureau to identify and correct reporting bottlenecks, thus improving the completeness of reporting.

In addition, the Unit is responsible for routine communication with select personnel in hospitals and other health care facilities. Staff visit facilities to review medical records, consult, and provide educational support. The Bureau solicits and receives patient update information on known or suspected tuberculosis patients, so that the number of patients receiving adequate treatment can be maximized.

B. Containment

The primary containment goal of the Department of Health is to assure that patients receive prompt, specific therapy adequate to halt transmission of tuberculosis. Case management activities see to it that diseased patients are on effective treatment by having field workers monitor their care and take corrective action to return delinquent patients to medical supervision.

In situations when standard case management activities are not sufficient, special programs may be implemented. Two such programs are the Supervised Therapy and Homeless Programs.

1 Supervised Therapy Program (STP)

The major thrust of the Supervised Therapy Program (STP) is to treat the proven noncompliant patient, and it is designed to provide adequate therapy to those individuals who would otherwise not obtain it due to a wide variety of social and psychological problems.

Medical facilities throughout New York City are encouraged to refer tuberculosis patients meeting the criteria for STP admission to the Department of Health in order to initiate an evaluation and follow-up. The criteria for admission to the STP are:

1. frequently missed clinical appointments
2. drug resistance
3. mental incompetence
4. chronic alcoholism
5. failure to respond to therapy
6. continued positive bacteriology
7. failure to self-administer medication
8. more than two hospital admissions for TB
9. a living condition conducive to noncompliance

All patients identified with chronic delinquencies and persistent positive sputa are evaluated for admission to this program. Once admitted, these patients have their medication delivered to them at home or at an alternate site, on a daily or intermittent basis. The field worker actually observes ingestion of the prescribed medication.

As of December 31, 1986, STP was managing 59 patients, 54 of whom completed treatment during the year as a result of the program. Without this program, it is unlikely that those patients would have been properly treated. The bacteriology conversion rate of 86% within 6 months and drug continuity rate of 92% shows directly observed therapy as an effective tool in managing difficult to reach tuberculosis patients.

2. Homeless Program

A 1985 analysis revealed that of the 150 reported tuberculosis patients among the city's homeless population, 54% were lost to medical supervision. In response to this disturbing finding, a special containment program was designed and implemented in October 1986. This program was modelled after the successful Supervised Therapy Program which serves a similar population of noncompliant patients who are difficult to reach. In general, homeless people with

tuberculosis are in special need of therapy and supervision. The transient nature and diversity of the lodging offered by the shelter system does not lend itself well to the systematic and orderly ingestion of medication by the patient. The homeless patient is often an individual who misses clinic appointments, shows drug resistance, evidences mental incompetence, or has substance abuse and/or alcohol problems.

As a result of this program, by December 1986, 222 homeless tuberculosis patients had been identified through computerized matching of addresses, as well as the efforts of outreach workers. Of the 175 actually located, about 50% are medically managed by field staff or DOH chest clinics, others have been hospitalized, or have died, and only 6% have been lost to supervision.

C. Prevention

The reduction of future disease can be accomplished by identifying close contacts of persons with disease and having those who are infected undergo a course of preventive treatment.

Prevention activities include identification of close contacts of infected persons by public health advisors, skin testing of these contacts by public health advisors, and the provision of prophylactic or therapeutic treatment. Contacts with positive skin tests are x-rayed. If tuberculosis is not diagnosed, chemoprophylaxis is recommended for individuals under 35 or for those with known risk factors.

In 1986, 4,161 contacts were identified and 86% of them were examined, which was similar to the experience of 1985 (Table 12). The rate of 4.6 contacts per case for 1986 represents a 24% increase over 1985. The rate of contacts found to be infected has remained constant for the past four years at around 27%, and the contacts who actually are diseased has hovered between 4 and 5% for the past three years.

D. Clinical Services

The City of New York provides tuberculosis services at its 11 municipal hospitals and at nine New York City Department of Health District chest clinics throughout the City. Each hospital/clinic is located in an area where there is a need for health services and where the public can readily take advantage of them. The staff of the New York City Department of Health chest clinics includes physicians, nurses, x-ray technicians and clerical personnel.

Tuberculosis diagnostic, treatment and preventive services are provided by a number of diverse medical facilities in New York City from private physicians' offices to tertiary care centers. As mandated by State law, these services are available to every person regardless of their ability to pay. The Department of Health works closely with all providers to ensure patient compliance and accurate case reporting. Annually, approximately 45% of new cases are reported by municipal hospitals, 44% by voluntary hospitals, 3% by the Department of Health clinics and the remaining 8% by private physicians and other clinical settings.

IV. Future Activities

The Department of Health is particularly concerned about three high risk groups for tuberculosis infection and disease: children, the homeless, and HIV-seropositive individuals of all ages. Accordingly, the following activities are being undertaken during 1987.

A. Screening of School Children

A systematic, randomized screening of a sample of children in New York City public and parochial schools is planned to begin in the fall of 1987 in order to determine the prevalence of infection in children living in different areas of the city. A periodic estimate of this prevalence of infection is an important method of evaluating the degree of disease control. The results of this screening will allow the Department of Health to more accurately target its prevention and containment activities among children.

B. Screening of Children Living in Family Hotels

A screening of children living in family hotels will assess the rate of infection and disease in this high risk population. A pilot study in seven hotels, testing over 800 children, will determine the need for future tuberculosis control activities among homeless families.

C. Testing of HIV Seropositive and Tuberculosis Infected Persons

The Centers for Disease Control recommends that all persons known to be HIV seropositive be given a tuberculin skin test, and further recommends that HIV tests be performed in tuberculin positive individuals. Because of the extremely high risk of developing active tuberculosis in persons with both HIV and tuberculosis infection, isoniazid preventive therapy is recommended for all HIV seropositive individuals, regardless of age, who have a positive skin test. To carry out these recommendations the Health Department is initiating combined HIV/TB testing in high risk populations in all nine district chest clinics.

Persons with a positive HIV antibody test will be referred to the nearest Department of Health chest clinic for a tuberculin skin test. If the skin test reaction is significant, and disease is not present, the individual will be prescribed prophylactic medication for 12 months in order to preclude the development of active disease. The Department of Health field and clinic staff will monitor the infected persons for the successful completion of preventive therapy.

Those persons who are 35 years and over with significant reactions to the tuberculin skin test will be tested for HIV infection by the nursing staff at the chest clinics. This staff will be trained in counselling techniques by the AIDS program staff. Those patients who test seropositive will be prescribed prophylactic treatment and be followed as described.

D. Extended Activities in the Homeless Shelters

Although there has been an ongoing skin testing program conducted by the field workers assigned to the single adult shelters, many persons do not return to have these tests read. After more than one year of operation, it is clear that this difficult population requires more intensive screening methods than originally anticipated.

In order to obtain more immediate information on every homeless individual and prevent loss of follow-up, the Department of Health plans to use chest x-ray screening as a means of identifying undiscovered cases of tuberculosis. X-ray screening would permit early identification of disease and eliminate the skin testing procedures which produced a high rate of clients being lost to follow-up. In addition, x-ray screening will identify persons who had disease at an earlier point in time but were incompletely medicated.

Because of the distribution of shelters throughout the city and the transiency of the homeless population, a mobile x-ray van is being considered as the most effective method of reaching this group in order to diagnose disease. Incentives have proven successful elsewhere in ensuring follow-up to screenings and compliance with treatment among noncompliant patients. We are exploring the use of incentives among the homeless.

Additional education and training of both shelter staff and clients is planned to cover information about tuberculosis, its pathogenesis and transmission as well as how to recognize signs and symptoms. Vigilance in the shelters will continue so that breakdown of disease does not occur in this high risk population.

SUMMARY AND DISCUSSION

In 1986, there was again a substantial increase in the number of newly identified tuberculosis cases. The 2,223 new cases represents an increase of 23% over the number identified in 1985 and continues the upward trend first observed in 1979 after many years of decline. In addition, the 186 deaths caused by tuberculosis is the largest number since 1976.

Incidence rates among males continued to be higher than those among females, with more than 70% of the cases occurring among the former. The rate among males was 49 per 100,000, while it was 16 per 100,000 among females. Once again, the highest age-specific rate was observed among 35-44 year old black males, and there was a 20% increase in this group over that in 1985. Although there was an increased rate in males of all races over the age of 65 years in 1986, the rate of that age/sex group has remained similar to that of the total population during the past 3 years. While the highest rates in females were seen among Asians, the number of total cases among them was only 48. For the other racial/ethnic groups, black female rates exceeded those of white and Hispanic women in every age group, with the highest occurring among black females in the age group 25-34 (67 per 100,000).

Disease trends in the very young (0-4 years) are an important measure of transmission. While there is an apparent decrease in the number of cases among those 0-4 years, this is predominantly a reflection of a more rigorous review process, but the general trends are similar to those in 1985. The greatest proportion of cases in this group occurred among black youngsters 0-11 months of age. Children under 10 years of age are the Bureau of Tuberculosis' highest priority . In every case of a positive skin test in children, prophylaxis is instituted and identification of the source case is mandated.

Assessment of the rate of infection among school aged children in the metropolitan area is expected to emerge from a school screening conducted during the 1987-88 school year. The results of this survey will indicate what further preventive actions the Department of Health takes in this population.

The age-adjusted incidence rates in the 30 health districts of New York City ranged from 7 per 100,000 in Maspeth/Forest Hills to 130 in Central Harlem; these two neighborhoods had the lowest and highest rates in 1985 as well. Once again, three quarters of newly reported cases were among individuals born within the 50 states. Among those born elsewhere, 52% come from the Caribbean area.

In response to the continuing increase in tuberculosis during the last several years, and the even greater increase in 1986, the Department of Health has continued and expanded its efforts to control the disease. Two new activities were initiated in 1986: a surveillance unit to monitor hospital and laboratory reporting was assembled, and a program to identify, follow and treat homeless tuberculosis patients in single adult shelters was created.

The surveillance unit identified over 100 cases who would have otherwise gone unreported and who may not have received adequate follow-up and therapy. Incidentally, these additional cases account for some of the increase observed in 1986.

The Homeless Program has enabled the Bureau of Tuberculosis to identify more than 200 diseased individuals, of whom more than 80% were located. Most of these individuals would have otherwise been lost to follow-up. Additionally, our presence at these shelters has increased our visibility and allows us to identify and monitor new cases. During 1986 we screened over 2,000 persons at these facilities. Extended activities in this high risk group will include enhanced client and staff education. These undertakings are aimed at achieving the earliest identification of infection and disease among this population. In addition, our Supervised Therapy Program continues to monitor and medicate other noncompliant patients.

As we discussed in detail in our last report, there are numerous factors which may account for the continuing increase in tuberculosis in New York City. Briefly, the increase cannot be explained entirely by the combined effects of the increase in funding for case finding, migration to this country, intravenous drug abuse, and the social and economic factors associated with tuberculosis which are common in New York City. Clearly, other new factors must be contributing to the increase, among which is the role of HIV infection and the possibility that those infected with HIV are predisposed to the development of tuberculosis disease.

Several of the investigations we conducted to examine the association between these two infections were described in the 1984-85 Annual Report. Since then, we have found an increased number of death certificates on which both tuberculosis and AIDS appeared, strengthening the evidence that an association does exist; while the sequence of infections cannot be determined from this study, it seems that HIV infection occurs first and results in the more rapid manifestation of tuberculosis disease. In addition, the increase in tuberculosis incidence among males (25%) exceeded the increase among females (11%). Among females the increase over 1985 was greatest among Hispanic women, and the rate among 25-44 year olds in both sexes is generally the highest. These factors fit well with the general pattern of the AIDS epidemic, and while they do not provide direct evidence for an association, they are what we would expect to see if an association exists. Because of the concern about the co-infection of TB and HIV, the Department of Health will recommend that tuberculin skin reactors as well as persons with tuberculosis be tested for HIV infection, and field workers will carefully monitor the therapy of those with co-infection.

An additional emerging trend noted this year is the increased rate of tuberculosis in males aged 65 years or older. The association of this finding with HIV infection is unlikely, and it is probable that more traditional risk factors are responsible for the development of disease in this population.

Table 1

Tuberculosis Incidence
New York City, 1960-1986

Year	Number[1]	Rate[2] Per 100,000
1960	4,699	60.4
1961	4,360	56.0
1962	4,437	57.0
1963	4,891	62.9
1964	4,207	53.7
1965	4,242	53.3
1966	3,663	45.6
1967	3,542	43.6
1968	3,224	39.7
1969	2,951	36.4
1970	2,590	32.8
1971	2,572	32.6
1972	2,275	28.8
1973	2,101	26.6
1974	2,022	25.6
1975	2,151	27.2
1976	2,151	27.3
1977	1,605	21.1
1978	1,307	17.2
1979	1,530	20.1
1980	1,514	19.9
1981	1,582	22.4
1982	1,594	22.5
1983	1,651	23.4
1984	1,629	23.0
1985	1,843	26.0
1986	2,223	31.4

1. Case definition revised in 1978 to reflect the inclusion of persons who had verified disease in the past and were discharged or lost to supervision for more than 12 months and have verified disease again.

2. Population based on 1960, 1970, and 1980 census.

Table 2

Tuberculosis Incidence Rates (per 100,000)
By Race/Ethnicity and Age, Sexes Combined
New York City, 1986

Race	N (Rate) 0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
	Age Group										
White	1	-	-	4	12	65	72	52	49	111	366
	(0.6)	(0)	(0)	(1.8)	(4.0)	(10.3)	(18.1)	(12.2)	(10.0)	(14.7)	(9.8)
Black	21	6	9	21	84	348	322	186	122	92	1211
	(14.8)	(4.4)	(5.6)	(11.9)	(56.6)	(129.0)	(144.7)	(109.4)	(85.6)	(75.1)	(71.5)
Hispanic	8	-	3	11	36	161	128	70	44	35	496
	(5.5)	(0)	(2.1)	(7.6)	(26.5)	(65.2)	(70.7)	(52.6)	(52.3)	(53.3)	(35.3)
Asian	2	1	2	4	17	45	21	14	12	32	150
	(15.6)	(0)	(12.2)	(23.9)	(92.6)	(86.1)	(58.8)	(60.3)	(75.6)	(206.5)	(64.9)
Total	32	7	14	40	149	619	543	322	227	270	2223
	(7.0)	(1.3)	(2.7)	(7.1)	(24.8)	(51.8)	(64.7)	(43.0)	(30.4)	(28.3)	(31.4)

Table 3

Tuberculosis Incidence Rates(per 100,000) in Males,
by Race/Ethnicity and Age
New York City, 1986

Race	N (Rate) 0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
					Age Group						
White	0 (0)	0 (0)	0 (0)	3 (2.6)	7 (4.8)	48 (15.3)	58 (29.7)	37 (18.4)	41 (18.8)	75 (25.9)	269 (15.4)
Black	15 (21.0)	3 (4.4)	1 (1.2)	10 (11.7)	44 (66.9)	244 (210.9)	263 (276.8)	148 (205.1)	92 (156.8)	58 (131.4)	878 (115.9)
Hispanic	4 (5.4)	0 (0)	1 (1.4)	7 (9.9)	19 (31.0)	109 (97.4)	101 (123.8)	62 (105.8)	29 (80.8)	23 (92.8)	355 (54.1)
Asian	1 (10.3)	0 (0)	2 (23.7)	3 (35.0)	11 (126.3)	26 103.7	16 (87.0)	12 (101.2)	7 (88.1)	24 (314.6)	102 (88.2)
TOTAL	20 (8.3)	3 (1.3)	4 (1.5)	23 (8.2)	81 (28.8)	427 (75.7)	438 (111.8)	259 (75.6)	169 (51.7)	180 (49.4)	1604 (49.0)

Table 4

Tuberculosis Incidence Rates (per 100,000) in Females,
By Race/Ethnicity and Age
New York City, 1986

Race	N (Rate) 0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
					Age Group						
White	1 (1.3)	0 (0)	0 (0)	1 (0.9)	5 (3.3)	17 (5.4)	14 (6.9)	15 (6.7)	8 (2.9)	36 (7.8)	97 (4.9)
Black	6 (8.5)	3 (4.4)	8 (9.9)	11 (12.1)	40 (48.6)	104 (66.7)	59 (46.6)	38 (39.4)	30 (35.5)	34 (43.4)	333 (35.6)
Hispanic	4 (5.6)	0 (0)	2 (2.9)	4 (5.5)	17 (22.9)	52 (38.8)	27 (26.5)	8 (10.7)	15 (31.0)	12 (29.3)	141 (18.8)
Asian	1 (21.1)	1 (0)	0 (0)	1 (12.3)	6 (62.2)	19 (70.0)	5 (28.9)	2 (17.6)	5 (63.1)	8 (101.7)	48 (41.5)
TOTAL	12 (5.6)	4 (1.4)	10 (4.0)	17 (6.0)	68 (21.4)	192 (30.3)	105 (23.4)	63 (15.7)	58 (13.8)	90 (15.3)	619 (16.3)

Table 5

Tuberculosis Incidence Rates (per 100,000 births), by Race and Age
Children Under 5 Years
New York City, 1986

Age in months

	0-11 Rate (N)	12-23 Rate (N)	24-35 Rate (N)	36-47 Rate (N)	48-59 Rate (N)	Total Rate (N)
White	(0)	(0)	(0)	(0)	2.9 (1)	0.6 (1)
Black	15.6 (6)	8.0 (3)	8.6 (3)	17.4 (6)	5.8 (2)	11.1 (20)
Hispanic	2.9 (1)	9.0 (3)	3.0 (1)	3.1 (1)	6.3 (2)	4.9 (8)
Asian	(0)	20.4 (1)	(0)	22.2 (1)	24.8 (1)	12.5 (3)
TOTAL	6.1 (7)	6.4 (7)	3.8 (4)	7.6 (8)	5.7 (6)	5.9 (32)

Denominator populations are the appropriate number of births to New York City residents 1982-1986

Table 6

Age-adjusted Tuberculosis Rates
New York City, 1980, 1985, and 1986

Borough	Health District	Cases	Rate per 100,000 Pop.		
		1986	1986	1985	1980
Manhattan	Central Harlem	158	130.4	110.9	78.6
	East Harlem	71	60.4	31.3	27.5
	Kips Bay-Yorkville	29	9.1	9.5	9.9
	Lower East Side	208	83.5	73.6	68.3
	Lower West Side	138	42.2	33.8	34.6
	Riverside	87	38.2	30.4	27.9
	Washington Heights	96	39.8	30.4	26.5
Bronx	Fordham-Riverdale	40	16.9	16.6	16.5
	Morrisania	79	68.7	51.8	31.4
	Mott Haven	51	48.8	32.5	28.8
	Pelham Bay	34	15.5	9.2	9.8
	Tremont	92	55.7	39.0	33.3
	Westchester	45	16.3	12.9	9.3
Brooklyn	Bay Ridge	19	7.5	7.7	8.8
	Bedford	144	73.8	58.0	46.7
	Brownsville	83	34.5	38.9	21.4
	Bushwick	71	48.7	46.7	37.0
	Flatbush	152	31.1	29.6	18.2
	Fort Greene	101	71.4	56.7	55.2
	Gravesend	35	12.1	10.9	13.2
	Red Hook-Gowanus	22	18.7	18.4	24.2
	Sunset Park	30	19.3	11.6	15.8
	W'burg-Gnspt.	51	38.9	29.9	27.0
Queens	Astoria-L.I.C.	79	32.5	19.9	17.7
	Corona	73	27.1	25.1	13.5
	Flushing	44	9.5	8.3	10.3
	Jamaica East	78	24.7	27.4	17.8
	Jamaica West	65	18.5	19.9	8.6
	Maspeth-Forest Hills	23	7.1	5.2	5.7
Staten Island	Richmond	25	7.4	6.4	7.3

Table 7

Age-Specific Numbers of Tuberculosis Cases
By Area of Birth, New York City, 1986

AGE GROUPS

AREA OF BIRTH	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	Total
U S A	30	5	9	29	92	428	415	240	172	196	1,616
Africa	0	1	0	0	2	9	2	1	1	0	16
Europe	0	0	0	0	3	9	8	8	9	21	58
Central/South America	0	0	1	8	15	30	13	13	9	4	93
Caribbean	1	0	2	1	21	109	85	53	22	21	315
Southeast Asia	0	0	0	0	3	4	3	0	1	1	12
Indo/Pakistan	0	0	0	0	1	13	3	2	1	2	22
Asia	2	0	2	2	12	22	10	7	10	24	91
TOTAL NON USA	3	1	5	11	57	196	124	84	53	73	607

Table 8

Screening, Treatment and Prophylaxis among Immigrants
1976-1986

	CLASS A				CLASS B				
Year	Number Screened	Therapy Recommended	(%)	Number Confirmed*	Number Screened	Prophylaxis Recommended	(%)	Number Confirmed*	Class A & B Total
1976	145	33	(22.7)	0	968	53	(5.4)	0	1,113
1977	129	7	(5.4)	3	1,129	46	(4.0)	0	1,258
1978	184	4	(2.1)	2	998	58	(5.8)	0	1,182
1979	129	10	(7.7)	4	786	34	(4.3)	0	915
1980	86	37	(21.0)	6	788	128	(16.2)	0	874
1981	124	10	(8.0)	2	700	52	(7.2)	1	824
1982	113	35	(31.0)	4	883	20	(2.2)	0	996
1983	52	11	(12.0)	5	774	6	(0.7)	0	826
1984	71	23	(32.0)	1	756	180	(24.0)	0	827
1985	147	72	(49.0)	4	1,050	62	(6.0)	0	1,197
1986	187	60	(32.0)	0	1,156	216	(18.7)	0	1,343

*These were diagnosed to have TB according to C.D.C. criteria.

Table 9

Newly Reported Tuberculosis Cases with
Disease Again (Reactivation) By Sex and Age
New York City, 1986

Sex	Age Group 10-14	20-24	25-34	35-44	45-54	55-64	65+	TOTAL
Male	0	0	12	12	9	7	3	43
Female	1	2	8	4	2	0	2	19
TOTAL	1	2	20	16	11	7	5	62

Table 10

Newly Reported Tuberculosis Cases With
Disease Again (Reactivation) By Borough of Residence* and Age
New York City, 1986

Borough	Age Group 10-14	20-24	25-34	35-44	45-54	55-64	65+	TOTAL
Manhattan	0	0	4	4	5	5	1	19
Bronx	0	0	2	1	0	1	0	4
Brooklyn	0	1	10	8	4	1	1	25
Queens	1	1	4	3	2	0	3	14
TOTAL	1	2	20	16	11	7	5	62

*No reactivated cases reported from Staten Island

Table 11

Tuberculosis Deaths and Rates (per 100,000)
New York City, 1978 - 1986

Year	Number of T.B. Deaths	Rate
1978	181	2.3
1979	121	1.5
1980	143	2.0
1981	155	2.2
1982	168	2.4
1983	151	2.1
1984	168	2.4
1985	155	2.2
1986	186	2.6

Table 12

Summary of Close Contacts Identified and Examined (1982 - 1986)

	1982	1983	1984	1985	1986
Identified (contacts per case))	3164 (3.0)	3310 (3.7)	3152 (3.5)	2805 (3.7)	4161 (4.6)
Examined	2915 (92%)	2975 (90%)	2830 (90%)	2405 (86%)	3572 (86%)
Not Infected	1896 (65%)	2071 (70%)	1870 (71%)	1621 (67%)	2426 (68%)
On Treatment	233 (12%)	306 (15%)	265 (14%)	228 (18%)	354 (15%)
Infected without Disease	929 (32%)	926 (28%)	818 (29%)	677 (28%)	977 (27%)
On Treatment	587 (63%)	524 (63%)	513 (63%)	513 (76%)	579 (59%)
Infected with Disease	53 (1.8%)	78 (2.6%)	142 (5.0%)	107 (4.4%)	75 (4.9%)

Figure 1

Tuberculosis Morbidity and Mortality Rates (per 100,000 Pop.)

New York City, 1960–1986

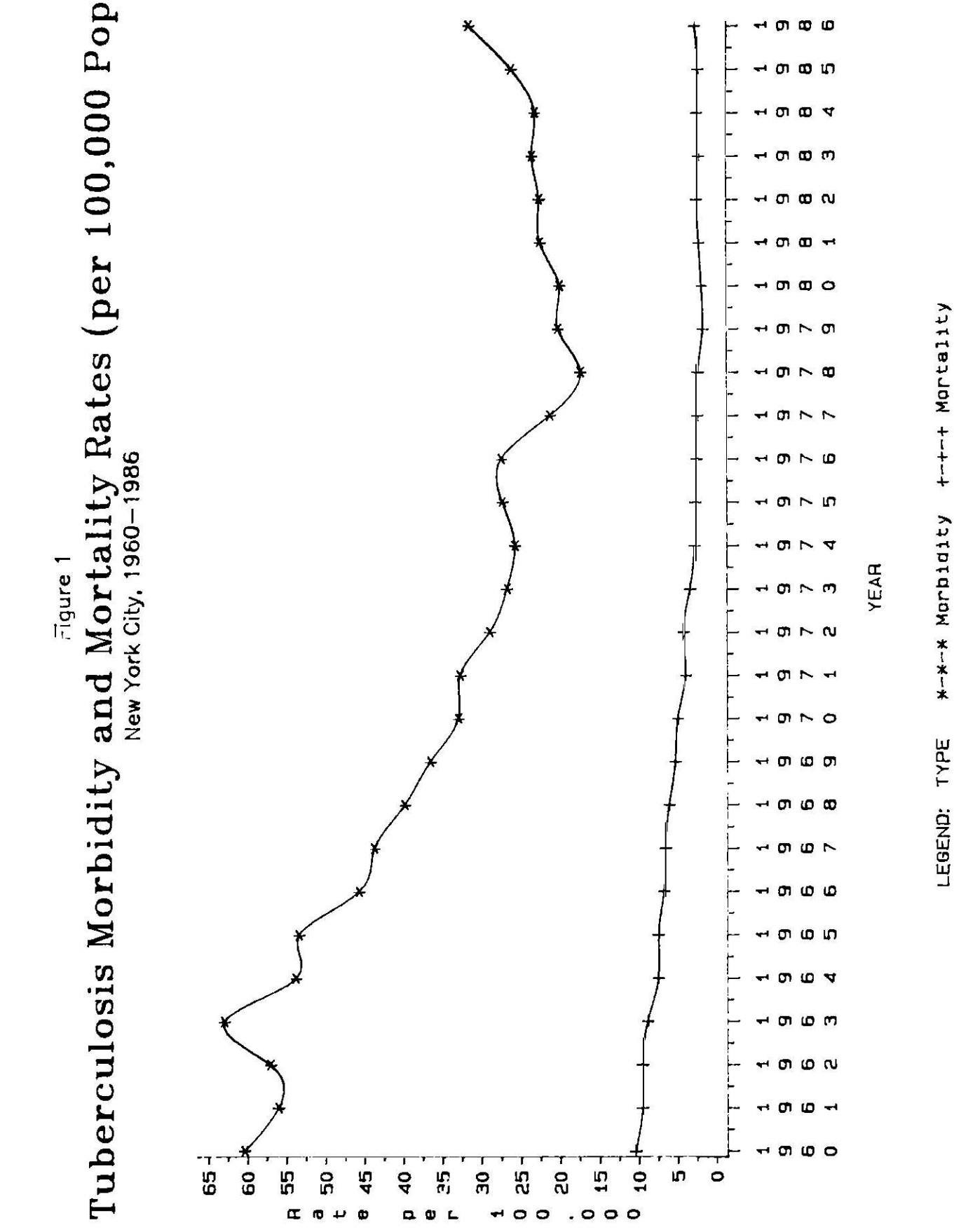


Figure 2

Tuberculosis Rates in New York City, 1986

Rates per 100,000 Population, By Sex and Age

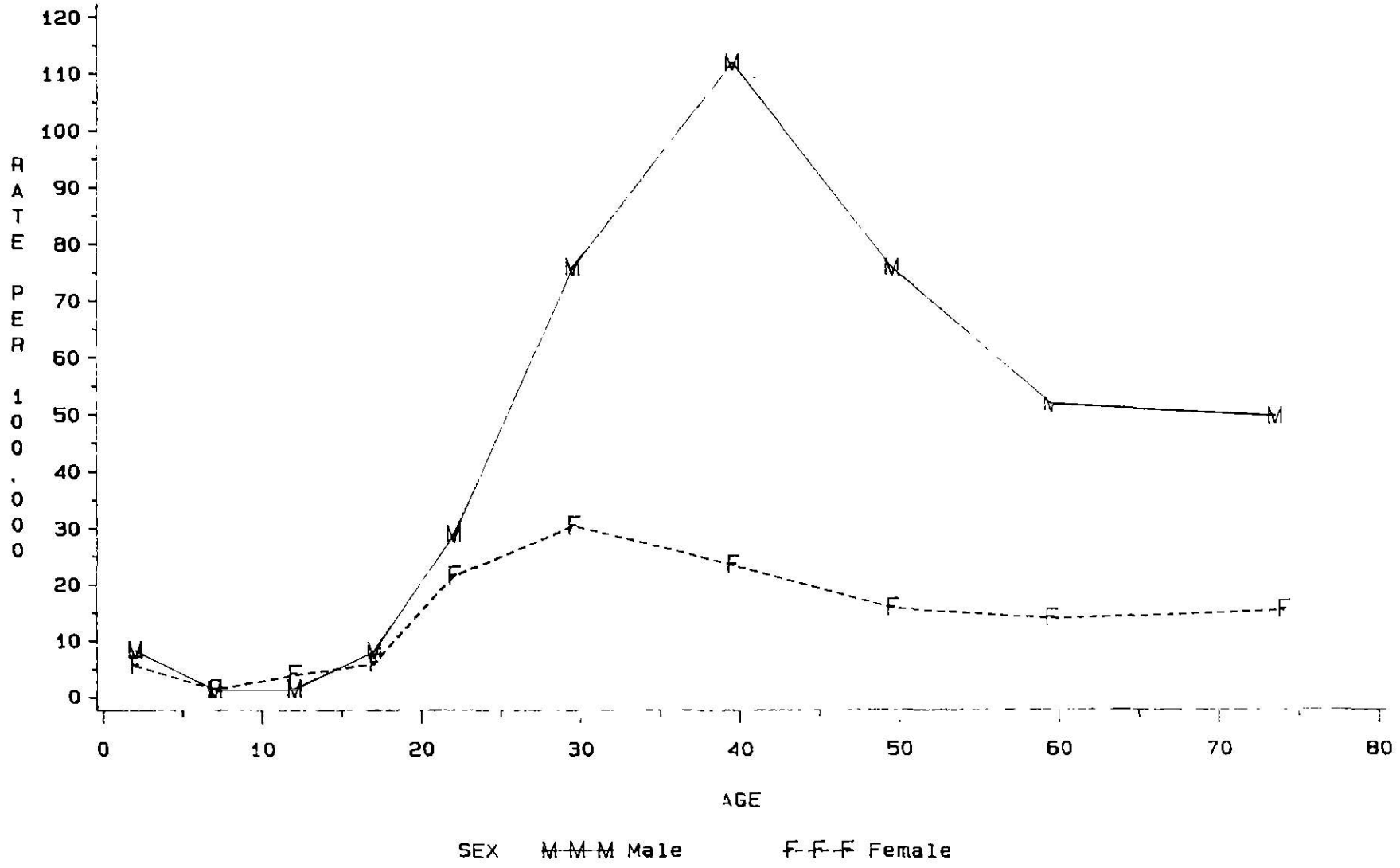


Figure 3

Tuberculosis Incidence Rates in New York City, 1986

Per 100,000 Population, by Age and Race/Ethnicity

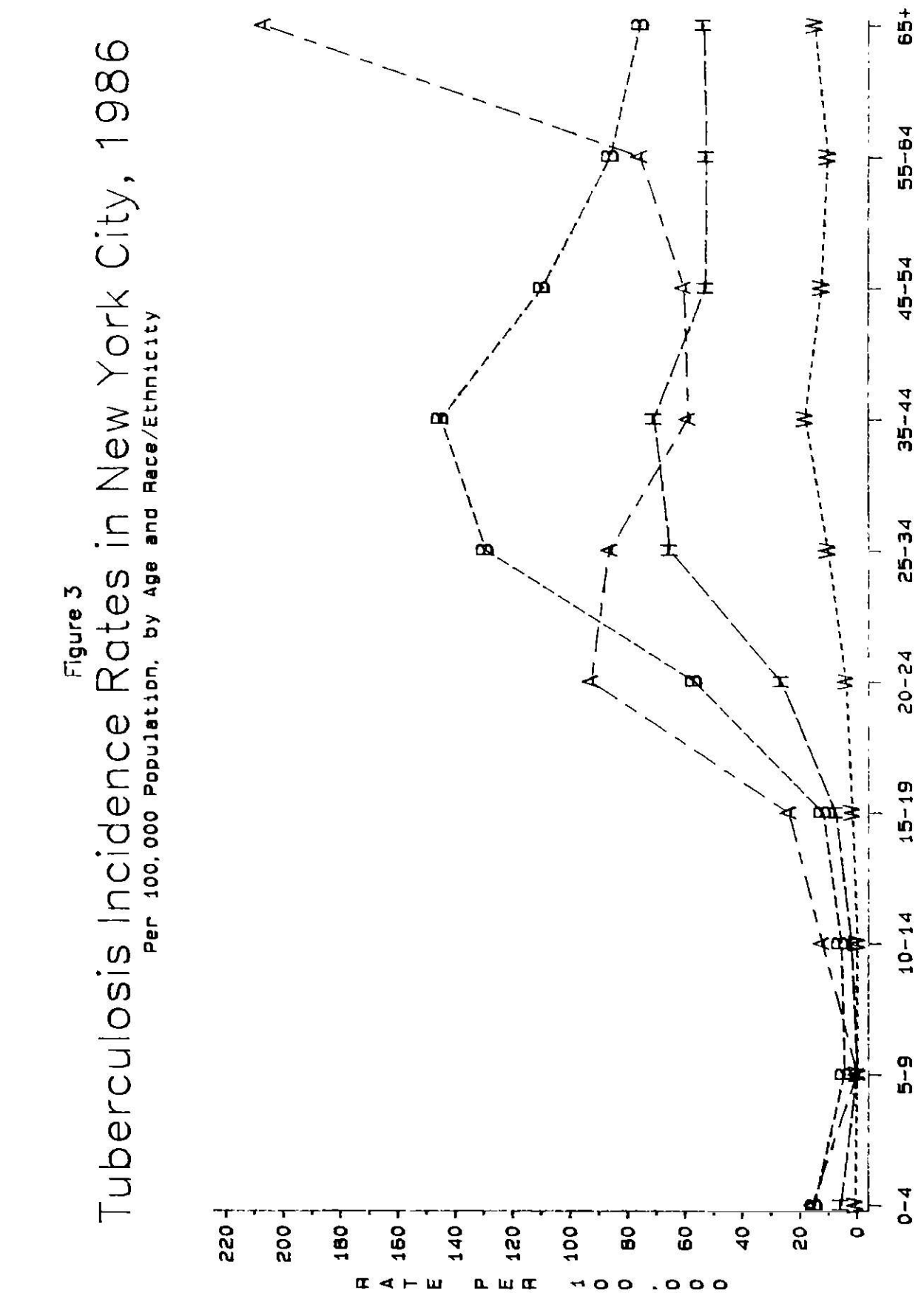


Figure 4

Tuberculosis Incidence per 100,000, New York City, 1982–1986

By Race

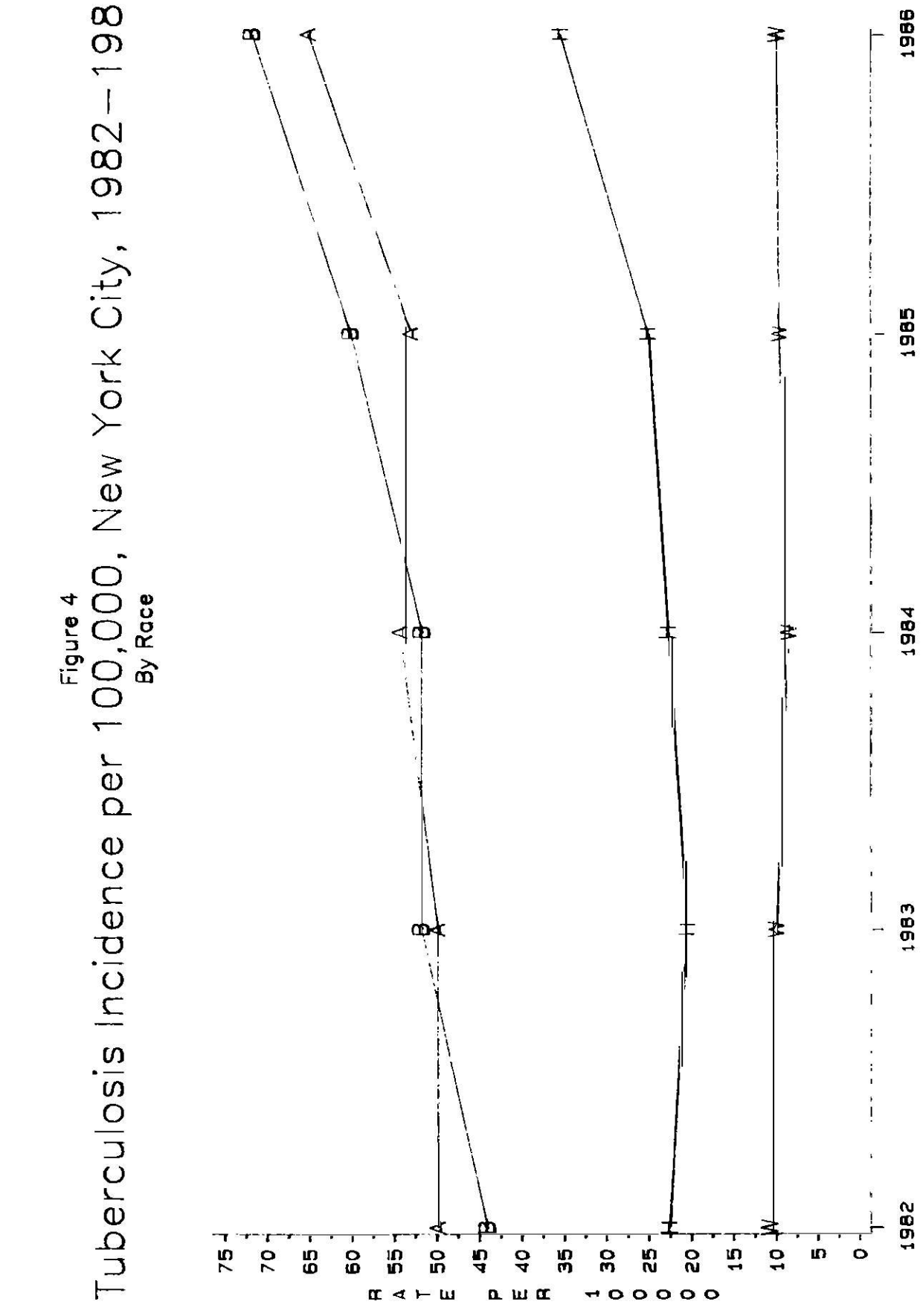
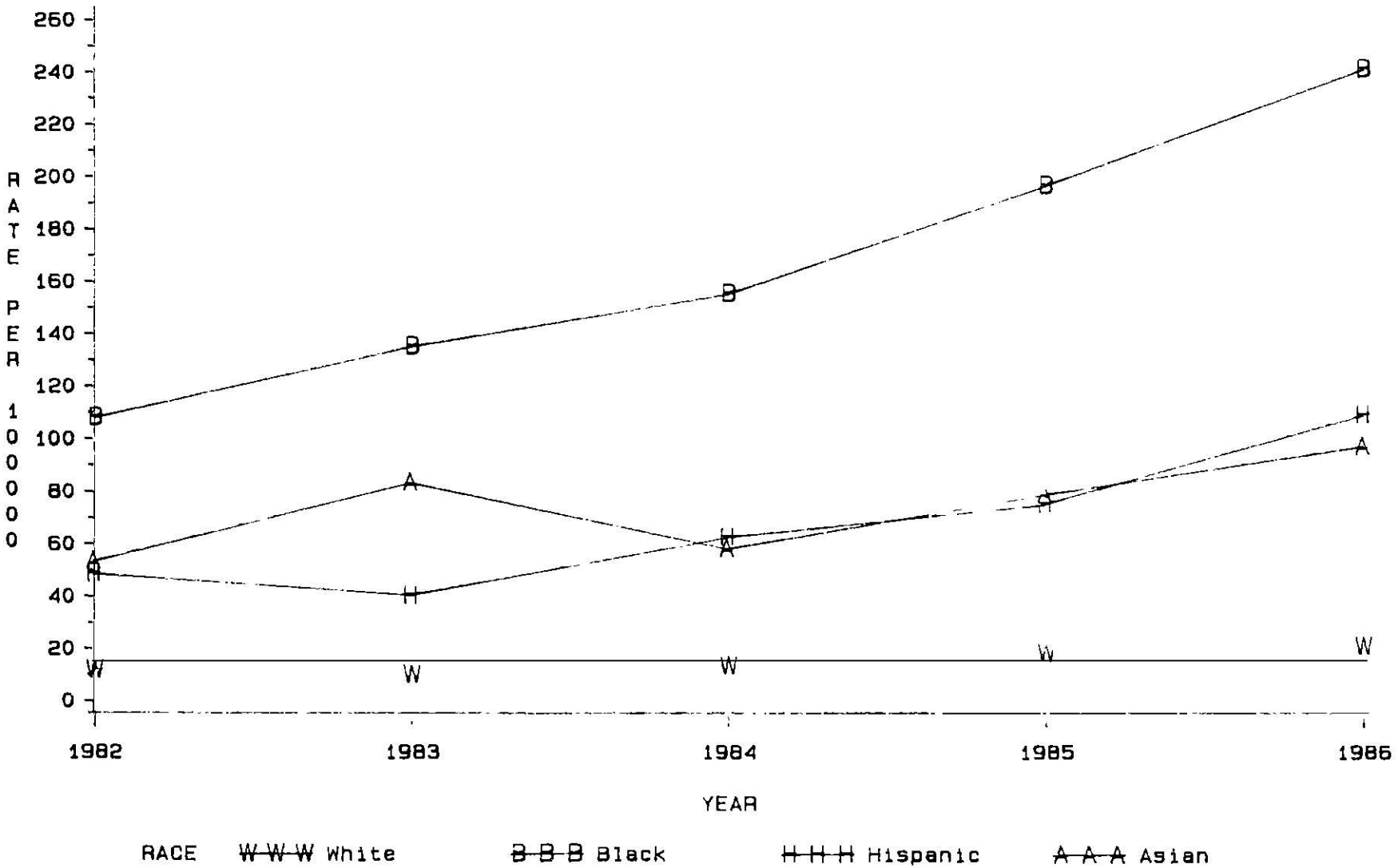


Figure 5

Tuberculosis Incidence per 100,000, New York City, 1982–1986

Males ages 25–44 only, by Race



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