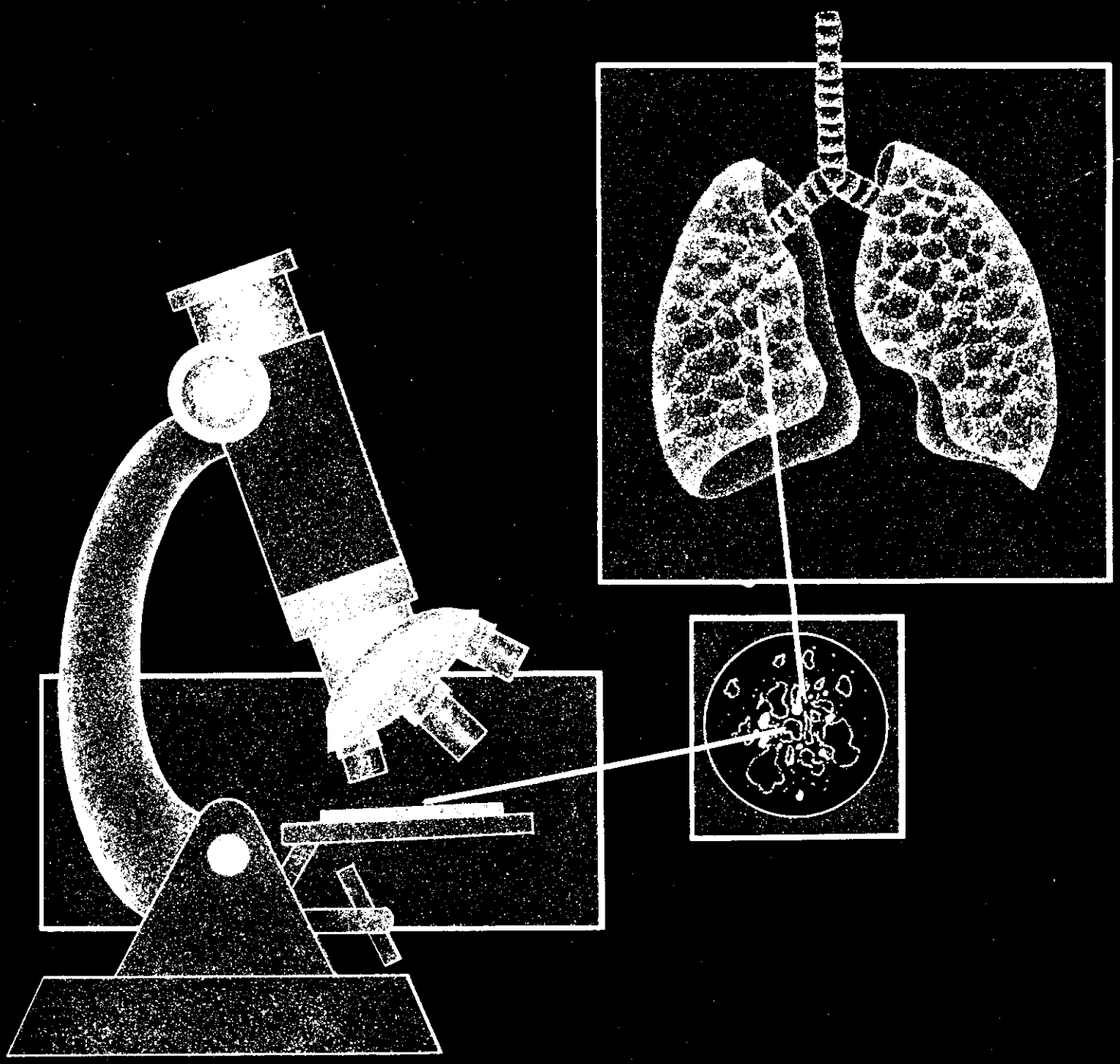
Tuberculosis in New York City 1982



NEW YORK LUNG ASSOCIATION

The Christmas Seal People

22 East 40th Street • New York, New York 10016 • (212) 889-3370

The New York Lung Association is pleased to publish this report as a service to our fellow New Yorkers, and to the medical community and the Department of Health.

Data in Tuberculosis in New York City 1982 were collected by the Bureau of Tuberculosis of the New York City Department of Health which also prepared the report.

The disease has not yet been totally eradicated. More effective preventive measures together with more sophisticated means of reaching victims, and treating them, have brought about improved results. Nevertheless, in some areas of our city, incidence continues at a high rate. Our efforts must continue therefore until we reach the goal of zero tuberculosis.

In learning how to work with and ultimately defeat tuberculosis, we have acquired knowledge and skill to deal with other public health menaces as well. These efforts demonstrate the importance of unified action by the voluntary and government sectors and the community at large.

Edith Ewenstein, CAE
General Director

The City of New York

DEPARTMENT OF HEALTH

125 WORTH ST., NEW YORK, N. Y. 10013

Telephone:

TO THE MAYOR AND THE CITIZENS OF NEW YORK CITY, 1982

The Bureau of Tuberculosis is pleased to present the 1982 review of tuberculosis in New York City. In 1982 there were no appreciable declines in both the number of annual reported active tuberculosis cases and case rates. However, the number of individuals who reactivated decreased substantially. Considering that there is no decline in the total numbers, the Bureau must continue with its present program to find and investigate all possible contacts.

Several of the health districts showed appreciable increases in the number of cases. Eight of the districts account for more than half of all the cases in New York City. These health districts are areas that are socially and economically deprived. When the new active TB rate in Central Harlem is 10 times the national rate and 8 times the Upstate rate and 5 times the rate of the city as a whole it becomes clear that considerable work needs to be done in this and other areas. It is obvious that the incidence of TB reflects the social and economic problems of the city. The latter is an indicator of how good or how bad the delivery of health care is in underprivileged areas of the city.

The Bureau intends to continue its efforts to at least help decrease the amount of tuberculosis in these various districts. The Supervised Therapy Program which delivers medication to the door step, has paid off and will be enlarged in the year to come. It is hoped that with this program a sizable number of patients previously incurable can be cured. The Bureau wishes that with its continued efforts it can decrease the hardships of patients and families alike.

Sincerely yours,

Alje Vennema M.D.

Alje Vennema, M.D.
Director
Bureau of Tuberculosis

E R R A T A

Page 1, Part A, 2nd Paragraph, Line 11 - Change from 21.7 to 22.5.

Page 1, Part B, Paragraph 1, Line 9 - Change ratio from 2:1 to 1:2.

Page 2, Table 1, 1982 TB Case Rate - Change from 21.7 to 22.5.

Page 17, Table 8-B, Change Total New York City Rate for 1982 from 21.7 to 22.5.

Page 17, Table 8-B, Change Total New York City Rate for 1981 from 20.0 to 22.4.

A. Newly Reported Tuberculosis Cases, 1982 (Table 1, Fig. 1)

There were 1,594 cases of TB reported in New York City in 1982, an increase of 12 cases since 1981. The 1982 case rate per 100,000 population increased from 22.4 (1981) to 22.5, a negligible increase.

Tuberculosis continues to be a public health problem in New York City. This is evident from the increase in TB cases over the last three years, 1,514 in 1980, 1,582 in 1981 and 1,594 in 1982. While the national tuberculosis morbidity rate has declined over the years, New York City's continues to remain the same. Since 1977 almost all the cases reported are based on positive bacteriological evidence of M. tuberculosis. Where no bacteriological evidence is available cases are counted based on histological examination or a combination of four factors i.e. a positive tuberculin test, radiological evidence, clinical signs and symptoms and treatment with two or more anti-tuberculosis drugs. Over the past four years the number of TB cases and the TB case rate per 100,000 has increased somewhat from 1,530 (20.1) in 1979, to 1,594 (21.7) in 1982. The implication here is that despite the efficacy of drug regimens, epidemiological follow-up and patient contact surveillance, tuberculosis will not be eradicated in the near future. The problems associated with living in an urban area, non-compliance, high mobility, apathy and poverty, often nullify the advances made in treating TB today. Until the problems in urban areas are addressed, TB will continue to exist.

B. Tuberculosis Mortality (Tables 1 and 2, Fig. 1)

In 1982 there were 157 deaths in New York City with tuberculosis as the primary or as one of the contributing causes of death, an increase of 0.4% since 1981. The increase in numbers of deaths over the last few years seems to have leveled off. The death rate for 1982 was 2.2 per 100,000 population, a slight increase over 1981, (2.1 per 100,000). There were 71 cases of tuberculosis diagnosed at the time of death as compared to 61 for 1981. Table 2 illustrates the age, race and sex distribution of deaths from TB. No tuberculosis deaths were reported in the 0-9 age group. The ratio of female to male deaths is approximately the same as the ratio for newly reported cases (2:1), in 70 cases tuberculosis was the secondary cause of death; 87 deaths were directly attributable to tuberculosis i.e. primary TB deaths. The primary TB deaths were primarily pulmonary 72, miliary 9, meningeal 5, and peritoneal 1. Deaths due to atypical mycobacteriosis are not included, there were 6 such deaths in 1982. Where tuberculosis was the secondary cause of death, cancer (42), narcotics (12), alcohol (12) and miscellaneous other causes (4) were responsible. The Acquired Immune Deficiency Syndrome was associated with 11 deaths. There were no maternal deaths from tuberculosis in 1982.

When tuberculosis is first registered at the time of death, it represents a serious problem to the community. It is therefore important that this be properly defined. In all cases death certificates and charts were scrutinized to make certain that tuberculosis was the cause at the time of death. In 1982 4.4% of the registered active cases were not reported until the time of death. In the 71 cases i.e. 46% of the total deaths there was good clinical and pathological evidence for the diagnosis to substantiate that these deaths were indeed due to tuberculosis. This is also true for those listed as primary deaths from tuberculosis. Those, where tuberculosis was listed as a secondary cause of death were equally scrutinized. In these instances it was properly established that

TABLE 1

NEWLY REPORTED TUBERCULOSIS CASES AND RATES, DEATHS AND RATES, NEW YORK CITY, 1960-1982

	TUBERCULOSIS CASES				TUBERCULOSIS DEATHS			
			% CHANGE				% CHANGE	
YEAR	NUMBER	RATE*	NUMBER	RATE	NUMBER	RATE*	NUMBER	RATE
1960	4,699	60.4	-	-	810	10.4	-	-
1961	4,360	56.0	-7.2	-7.3	738	9.5	-8.9	-8.7
1962	4,437	57.0	+1.8	-1.9	740	9.5	+0.3	0
1963	4,891	62.9	+10.2	+10.4	683	8.8	-7.7	-7.4
1964	4,207	53.7	-14.0	-14.6	581	7.4	-15.0	-15.9
1965	4,242	53.3	+0.8	-0.7	592	7.4	+1.9	0
1966	3,663	45.6	+13.6	-14.4	537	6.7	-9.3	-9.5
1967	3,542	43.6	-3.3	-4.4	525	6.5	-2.2	-3.0
1968	3,224	39.7	-9.0	-8.9	485	6.0	-7.6	-7.7
1969	2,951	36.4	-8.5	-8.3	418	5.2	-16.0	-13.3
1970	2,590	32.8	-12.2	-9.9	386	4.9	-7.7	-5.8
1971	2,572	32.6	-0.7	-0.6	310	3.9	-19.7	-20.4
1972	2,275	28.8	-11.5	-11.6	331	4.2	+6.8	+7.7
1973	2,101	26.6	-7.6	-7.6	262	3.3	-20.8	-27.3
1974	2,022	25.6	-3.8	-3.8	215	2.7	-17.9	-22.2
1975	2,151	27.2	+5.4	+6.3	208	2.6	-3.3	-3.8
1976	2,156	27.3	+0.2	+0.4	187	2.4	-10.1	-7.7
1977	1,605	21.1	-25.6	-23.1	175	2.3	-6.4	-4.2
1978	1,307	17.2	-18.6	-18.5	168	2.2	-4.0	-4.3
1979	1,530	20.1	+17.1	+16.9	119	1.6	-29.2	-27.3
1980	1,514	21.4	-1.0	+6.5	135	1.8	+13.4	+12.3
1981	1,582	22.0	+4.5	+2.8	150	2.1	+11.0	+16.6
1982	1,594	21.7	+1.0	+1.5	157	2.2	+4.5	+.6

*Per 100,000 population

Note: Tuberculosis Deaths include both the primary and contributing cause.

FIGURE 1

RATES of NEWLY REPORTED TUBERCULOSIS CASES and DEATHS NEW YORK CITY, 1960-1982

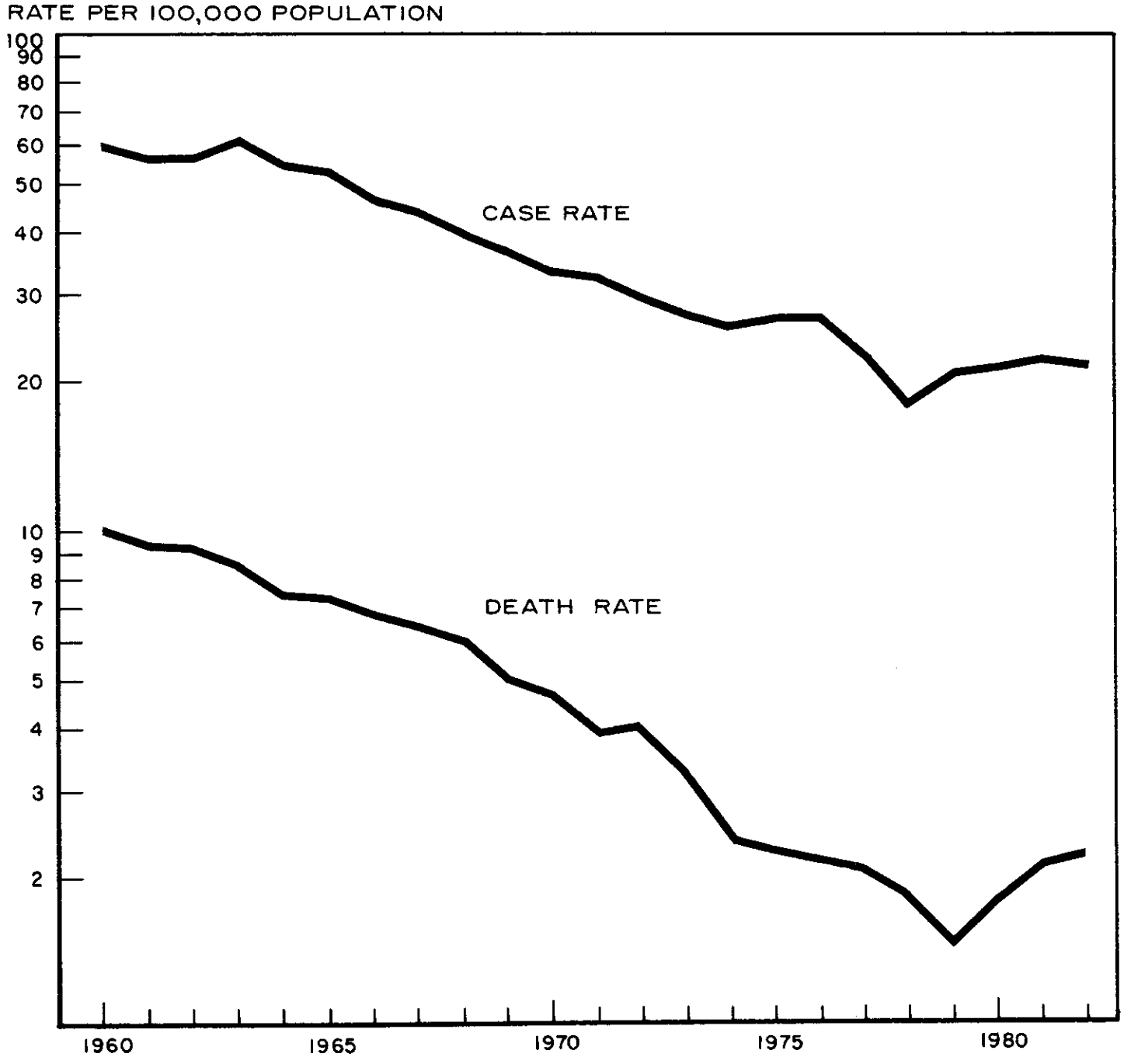


Table 2

TB DEATHS BY AGE, RACE, AND SEX

1982

Age	Total Number	White M	White F	Black M	Black F	Puerto Rican M	Puerto Rican F	Asian M	Asian F	TB Found at Death
0-4	0	0	0	0	0	0	0	0	0	0
5-9	0	0	0	0	0	0	0	0	0	0
10-14	1	0	0	0	1	0	0	0	0	0
15-19	0	0	0	0	0	0	0	0	0	0
20-24	6	2	0	3	0	1	0	0	0	0
25-34	18	1	1	10	3	2	1	0	0	7
35-44	22	5	2	8	4	1	1	1	0	9
45-54	21	7	0	5	6	2	0	0	1	13
55-64	34	10	2	10	7	1	2	2	0	21
65+	55	16	9	11	7	5	2	3	2	21
	157	41	14	47	28	12	6	6	3	71

The number of deaths and death rates have not declined over the last five years, similar to the number and rates of new cases. In previous years prior to 1979 a rather rapid decline was evidenced in the number of deaths. It is gratifying that no deaths occurred under the age of ten. Seventy-one deaths had tuberculosis diagnosed as the primary cause of death at the time of death.

TABLE 3

NEWLY REPORTED TUBERCULOSIS CASES BY SITE OF DISEASE

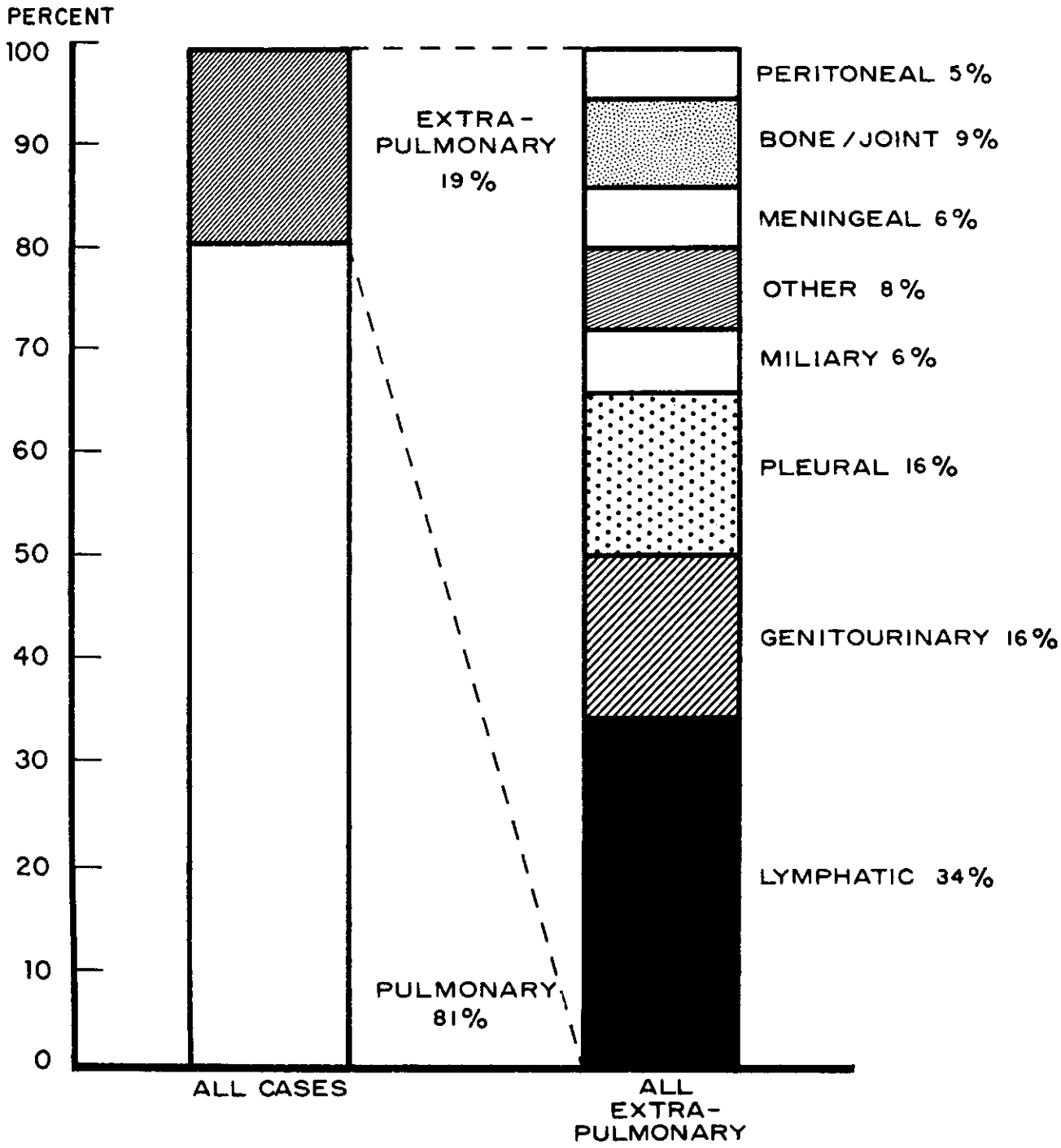
AND BY BACTERIOLOGIC STATUS, NEW YORK CITY, 1982

Predominant Site	Total Cases	Bacteriologic Status			
		Positive		Negative	Not Done
		Culture (1)	Smear Only (2)	(3)	
Pulmonary	1,288	1,226	5	9	48
Extra Pulmonary	306	290	7	1	8
Pleural	51	50	0	0	1
Lymphatic	103	99	3	0	1
Bone/Joint	28	26	2	0	0
Genitourinary	49	46	2	0	1
Miliary	19	15	0	0	4
Meningeal	17	16	0	1	0
Peritoneal	15	14	0	0	1
Other	24	24	0	0	0
Total All Sites	1,594	1,516	12	10	56

(1) Positive culture with positive, negative, unknown or not done smear.
(2) Histology positive or smear positive and no culture.
(3) All cultures negative or smear negative and no culture.

FIGURE 2

NEWLY REPORTED TUBERCULOSIS CASES BY SITE of DISEASE NEW YORK CITY 1982



tuberculosis played only a secondary role. It remains difficult to interpret mortality statistics for tuberculosis. Only one of the deaths occurred under the age of 15. The circumstances of these particular deaths are not known. Fig. 1 illustrates that though the death rate declined rapidly until 1979, in the last number of years it has not declined, but has risen slightly. There is a noticeable difference between the races and the sexes which seems to be the opposite of the case rate.

Cases of tuberculosis are more common amongst the black population as opposed to the white population, however there are less deaths amongst the black population from TB for 1982. The overall death rate due to tuberculosis as both primary and contributing cause of death increased slightly from 2.1 in 1981 to 2.2 in 1982 (per 100,000). New York County had the highest death rate 4.7 per 100,000 and showed the greatest increase in the number of deaths (see Table 2-B), from 54 in 1981 to 67 in 1982. The Central Harlem Health District had the greatest number of deaths (22) as compared to 1981 (9) and the highest death rate with 18 per 100,000 (1980, 7.4)

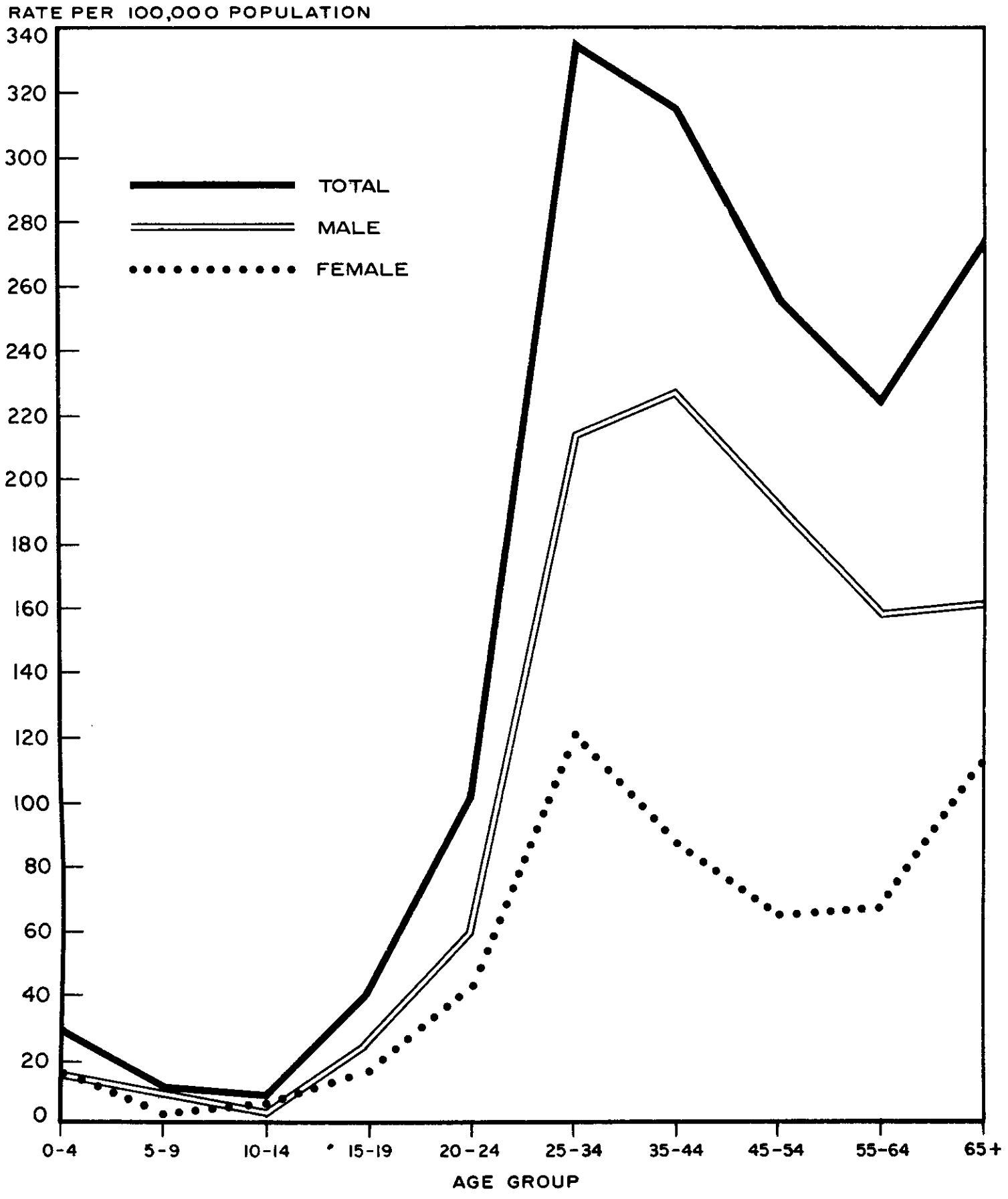
Fifteen of the 30 New York City Health Districts had death rates greater than the New York City composite rate of 2.2 per 100,000. Kips Bay/Yorkville reported only one death (rate 0.4 per 100,000 population). Seventy of all reported deaths were black, 55 whites, 18 Puerto Rican and 9 Asian. The age group with the greatest number was 65 and above i.e. 55 deaths.

C. Newly Reported Tuberculosis Cases by Site of Disease and by Bacteriologic Status (Table 3, Fig. 2)

There were 1,288 pulmonary cases and 306 extrapulmonary cases reported in New York City in 1982. Pulmonary tuberculosis accounted for 81% of the total morbidity for 1982 a decrease of 4 percent from 1981, extrapulmonary 19%, an overall increase of 20 percent from 1981. The number of extra-pulmonary cases for 1982 increased by 62 cases from 244 for 1981 to 306 for 1982. The number of pulmonary cases for 1982 decreased by 50 cases from 1,338 cases in 1981 to 1,288 cases in 1982. All categories of extra-pulmonary TB experienced an increase, with the exception of miliary tuberculosis which experienced a seventy percent decline from 1981. The number of pleural cases for 1982 increase by 20% from 1981, lymphatic cases by 22%, bone and joint 18%, genitourinary 31% meningeal 35% and peritoneal 8%.

Ninety-five percent of all cases were verified by positive cultures for mycobacterium hominis tuberculosis. Diagnosis in four percent of the reported cases was based on the presence of all of four criteria, a positive tuberculin test, radiological findings compatible with TB, clinical evidence of tuberculosis and the decision to treat with two anti-tuberculosis drugs. One percent of the reported cases was confirmed by histological evidence. The Bureau continues to emphasize the importance of obtaining cultures and biopsy specimens prior to treatment to benefit the patient's earliest recovery.

NEWLY REPORTED TUBERCULOSIS CASES BY AGE and SEX, NEW YORK CITY, 1982



D. Newly Reported Tuberculosis Cases by Age, Race, and Sex (Table 4, Fig. 3)

1. Age

Tuberculosis in the following age groups experienced a decline in 1982: 0-4 years old, a 9% decrease, 5-9 years, 31%, 10-14 years, 44% and 15-19 years, 5%. These figures represent an overall decrease in childhood TB 0-19 years for 1982 of 16%. Tuberculosis cases under twenty years of age represent 6% of the total 1982 morbidity, compared to 7% of the 1981 morbidity. Tuberculosis in the age group 20-24 years, 25-35 years experienced an overall increase in morbidity of five percent. The total morbidity for these age groups in 1981 was 42%. The 45-54 age group and the 55-64 age group has remained relatively stable for the past three years, representing 30% of the total morbidity for 1982. Tuberculosis in the above 65 group continued to decline for the third straight year, in 1982 this group represented 17% of the total morbidity, in 1981, 20% and in 1980, 23%.

2. Race (Table 5)

Tuberculosis occurs more frequently among non-whites than whites (899 cases vs. 695 cases). The number of newly reported cases among non-whites represents 56% of the total morbidity. While tuberculosis among whites has declined 3% from 1981, it has increased among non-whites (7%) for the fourth straight year in a row. The greatest increase in morbidity occurred among the non-white males age 35-44 years old. Since World War II, many changes have occurred in the ethnic make-up of New York City. In 1945, whites represented 90% of the population and accounted for 70% of the new cases reported. Non-whites and Puerto Ricans represented 10% of the total population and accounted for 30% of the new active cases. In 1982, whites made up 69% of the population and accounted for 43.4% of the new cases of TB. Non-whites represent 18.4% of the population, Puerto Ricans 12.1% and accounted for 49.2% and 7.4% of the new cases respectively. However, the new active case rates from 1945-1982 are a better reflection of TB incidence within ethnic groups (Table 5). The decrease has been greatest among the non-whites and Puerto Ricans up to 1970. However, from 1977 to 1982, the case rate for Puerto Ricans has changed very little. In 1982, the rate for non-whites was five times greater than the national rate (11.0) and eight times greater than the New York upstate rate (7.3).

3. Sex

Tuberculosis occurs more frequently among males than females. The ratio of TB in males versus females is 2:1. In every category with the exception of the 0-4 years and 15-19 year age group, males surpass females in TB incidence. Tuberculosis among males constitutes 66% of the total morbidity, compared to 34% for females. The total morbidity for males has remained stable for the past three years. The age distributions indicated a decline in the younger age groups. This decline is no doubt associated with a greater emphasis being placed on preventive prophylaxis for contacts under age 19. Most cases are concentrated in the middle age group with an appreciable decline in the older age groups, hence in New York City, TB is still a disease of all ages. The problem of TB in New York City is complicated by not only shifts in population, but also the racial origins of the population. The black population again experienced an increase in TB, especially amongst young males. Most of the cases however occurred in second generation blacks hence the disease was not imported, but acquired in New York City.

TABLE 4

NEWLY REPORTED TUBERCULOSIS CASES BY AGE, RACE, AND SEX, NEW YORK CITY, 1982

AGE GROUPS	TOTAL ALL RACES #	%	WHITE* MALE	FEMALE	BLACK** MALE	FEMALE	ASIAN MALE	FEMALE
0-4 years	31	1.9	6	8	8	9	0	0
5-9 years	11	0.7	3	2	4	1	1	0
10-14 years	9	0.5	1	1	1	6	0	0
15-19 years	40	2.5	10	4	11	10	3	2
20-24 years	101	6.3	25	13	28	25	6	4
25-34 years	336	21.0	75	42	118	66	22	13
35-44 years	315	20.0	82	33	142	48	4	6
45-54 years	254	16.0	83	21	97	40	10	3
55-64 years	223	14.0	74	34	75	28	8	4
65+ years	274	17.1	108	70	36	35	18	7
TOTALS	1594	100	467	228	520	268	72	39

*Includes White Hispanics.
**Includes Black Hispanics.
+Includes three American Indians.

When the figures in table 4 are plotted it becomes apparent that the age distribution for black patients lies considerably higher than the curve for whites in the age groups under 45. From this age on the curves are about the same. The black curve is at its highest around age 39, the white curve is highest at age 65 and above. The Black curve is slightly bimodal at age 27 and 40. The White curve has only one peak at age 65 and above. This would support the conclusion that considerably more transmission is occurring amongst Black's than White's.

TABLE 5

NEWLY REPORTED TUBERCULOSIS CASES, AND CASE RATES
WHITE VS. NON-WHITE RACIAL GROUPS, NEW YORK CITY,
AND 1945-1982 SELECTED YEARS

Year	Total Cases	White*	Non-Whites**
1960	4,699	2,896	1,803
1961	4,360	2,588	1,722
1962	4,437	2,578	1,859
1963	4,891	2,705	2,186
1964	4,207	2,283	1,924
1965	4,242	2,211	2,031
1966	3,663	1,853	1,810
1967	3,452	1,802	1,740
1968	3,224	1,614	1,610
1969	2,951	1,354	1,597
1970	2,590	1,130	1,460
1971	2,572	879	1,693
1972	2,275	925	1,350
1973	2,101	831	1,270
1974	2,022	843	1,179
1975	2,151	872	1,279
1976	2,156	840	1,316
1977	1,605	771	834
1978	1,307	641	666
1979	1,530	702	828
1980	1,514	668	846
1981	1,582	726	856
1982	1,594	695	899

CASE AND CASE RATES PER 100,000
POPULATION, SELECTED YEARS

Year	Total Cases	Case Rate	White*	Non-White**	Puerto Rican	White	Non-White	Puerto Rican
1945	7,067	91.9	4,930	1,855	282	71.3	298.9	173.0
1950	7,717	97.6	4,915	2,192	610	71.3	288.8	244.0
1960	4,699	60.4	2,264	1,803	633	37.4	161.6	103.3
1970	2,590	32.8	828	1,460	302	15.7	80.8	37.3
1980	1,514	21.4	668	767	81	13.6	58.9	9.4
1981	1,582	22.0	726	739	117	14.8	55.7	13.4
1982	1,594	21.7	685	774	125	13.4	57.2	14.1

*Persons having origins in any of the original peoples of Europe, North Africa or the Middle East.

**Persons having origins in any of the original peoples of Africa, the Far East, Southeast Asia, Indian subcontinent or the Pacific Islands.

E. Newly Reported Tuberculosis Cases with Disease Again (Reactivation) Tables 6,7

Patients who were previously treated for tuberculosis are counted as new cases after they have not been under medical supervision for 12 or more months and are diagnosed again with tuberculosis. The new diagnosis is confirmed by bacteriological findings and recent chest x-rays compatible with active tuberculosis. In 1982 there were 66 cases with reactivated TB, a decrease of 45% from 1981 (121 cases). All reactivations were over the age of 20, 41% under the age of 45 compared to 45% in 1981, while males in the 55-64 age group were again responsible for the greatest number of reactivations in 1982 (16) even though their total number declined. Black females showed again the greatest decline though reactivations amongst this group increased slightly in the younger ages. The number of "tuberculosis again" increased in Kings County and marginally in Richmond. It decreased in the other counties.

Treatment regimens available today should cure all patients. Patients should not reactivate hence it is disappointing to note that still 66 patients reactivated in 1982. These reactivations perhaps are due to interruption of treatment or premature termination of treatment. The fact that the number of reactivations has decreased substantially perhaps indicates that with the employment of short course chemotherapy patients are more apt to complete a full course of treatment.

F. Newly Reported Tuberculosis Cases with Place of Birth Outside the United States

Of the 1,594 cases reported in New York City in 1982, 486 were born outside the United States, 150 cases resided in New York for more than 5 years, 138 cases resided in New York for less than 5 years. Seventy-three of the previous number arrived in the United States in the last 2 years. For the purpose of analysis, those who were born in Puerto Rico were considered foreign-born. There were 125 cases born in Puerto Rico the country with the greatest number of cases reported in 1982. It was also noted that Haiti has the second greatest number of cases reported in 1982.

Every country demonstrated a different morbidity pattern by place of birth. In Kings County, the highest number of cases came from Haiti (46), New York County had 15 cases from the Dominican Republic and 15 cases from China; in the Bronx the second highest number came from the Dominican Republic. Richmond County had 5 cases who were foreign born, with 2 cases from China, one each from the Philippines and Poland and one of unknown origin; in Queens County the highest came from Haiti (10), the second greatest number came from Ecuador.

Of the foreign born, 11% were born in Europe, 26% in Puerto Rico and 21% in other Spanish speaking countries, 24% in Southeast Asia and other parts of Asia and less than 2% in Africa. If Puerto Rico were combined with the other Spanish Speaking countries, together they would account for 46% of the newly reported cases born outside the United States for 1982.

Thirty-one percent of all foreign born settled in Kings County, followed by Queens County (25%), New York County (25%), Bronx County (18%) and Richmond (1%). The greatest number of cases to settle in Kings County were from Haiti (46) and in New York County (15) from the Dominican Republic. The

possibility of infection being introduced by immigrants from countries where there is a high incidence of disease is frequently cited to be a serious problem. Seventy three cases had been less than 2 years in the United States and may have fallen ill shortly after arrival.

It is not unusual for people to break down with TB after a stressful experience such as immigration. The Department of Immigration and Naturalization requires that all newcomers be examined prior to leaving their native country by x-ray and sputum. Refugees are screened prior to departure or at holding centers in the United States before being allowed to move on.

TABLE 6

NEWLY REPORTED TUBERCULOSIS CASES WITH DISEASE AGAIN (REACTIVATIONS) BY AGE, RACE, AND SEX, NEW YORK CITY, 1982

Age Groups	Total Cases		White				Black				Asian			
	1981	1982	1981		1982		1981		1982		1981		1982	
			M	F	M	F	M	F	M	F	M	F	M	F
0-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5-8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-24	7	1	3	1	0	0	2	0	1	0	1	0	0	0
25-34	20	10	1	3	2	1	9	7	3	4	0	0	0	0
35-44	20	14	3	1	2	0	11	3	8	4	2	0	0	0
45-54	32	15	13	3	2	0	15	1	10	2	0	0	1	0
55-64	26	16	14	3	7	2	8	0	3	2	1	0	2	0
65+	21	10	8	7	2	4	3	1	2	1	2	0	1	0
Totals	126	66	42	18	15	7	48	12	27	13	6	0	4	0

TABLE 7

NEWLY REPORTED TUBERCULOSIS CASES WITH DISEASE AGAIN

BY COUNTY OF RESIDENCE, NEW YORK CITY 1982

County of Residence	Number of TB Again Cases			Percent of Total TB Again Cases		
	1980	1981	1982	1980	1981	1982
New York	53	47	17	39	39	26
Kings	46	36	30	34	30	45
Queens	17	16	7	13	13	11
Bronx	17	19	10	13	16	15
Richmond	2	3	2	1	2	3
Total N.Y.C.	135	121	66	100	100	100

TABLE 7A

COUNTY OF RESIDENCE OF FOREIGN BORN

County of Residence	# of Foreign Born Cases	Percent
New York	122	25
Kings	150	31
Queens	121	25
Bronx	88	18
Richmond	5	1
TOTAL	486	100

TABLE 7B

CASES BY COUNTRY OF BIRTH

Country	# of Cases	Country	# of Cases
Afghanistan	2	Japan	1
Algeria	1	Korea, Republic of	8
Austria	5	Korea, South	3
Bahamas	1	Mauritania	1
Bangladesh	1	Mexico	3
Barbados	2	Morocco	1
Brazil	1	Nicaragua	3
Burma	1	Norway	1
Chile	1	Pakistan	4
China	28	Panama	1
China (Taiwan)	5	Paraguay	1
Colombia	12	Peru	8
Cuba	9	Philippines	12
Czechoslavakia	3	Poland	5
Dominican Republic	28	Puerto Rico	125
Ecuador	18	Romania	2
ElSalvador	4	Saudi Arabia	1
France	1	Spain	1
Germany	5	St. Lucia	1
Ghana	2	Sweden	1
Gibralter	1	Syria	1
Greece	3	Trinidad	5
Guam	1	Turkey	3
Guatemala	2	Soviet Union	9
Guyana	6	United Kingdom	2
Haiti	63	Uganda	6
Honduras	11	Vietnam	12
Hong Kong	3	Virgin Islands	1
India	11	Yemen	2
Indonesia	1	Yugoslavia	3
Ireland	7	Unknown	8
Italy	5		
Jamaica	7	TOTAL	486

G. GEOGRAPHIC DISTRIBUTION OF NEWLY REPORTED TUBERCULOSIS CASES AND DEATHS NEW YORK CITY, 1982 (TABLES 8,9)

In 1982 the number of newly reported cases by county of residence ranged from a high of 127 cases with a case rate of 104.1 per 100,000 in Manhattans's Central Harlem District to a low of 18 cases with a case rate of 8.2 per 100,000 in the Pelham Bay District of the Bronx.

In New York County (Manhattan) there were 531 cases with a case rate of 37.2

per 100,000. This figure represents a slight decrease from 1981 (568 cases, 39.8 per 100,000). Central Harlem (127) and the Lower East Side (128) had the greatest number of newly reported cases while Kips Bay/Yorkville had the smallest number of cases (22). Central Harlem experienced a case rate per 100,000 of 104.1 an increase from 1981 of 24.2 per 100,000. The case rate in Central Harlem has increased four years in a row from 50.9 in 1979 to the current 104.1. The case rate for the Lower East Side declined for the third year in a row, while the Lower West Side (328) increased slightly.

Kings County (Brooklyn) had 490 newly reported cases with a case rate of 22.0 per 100,000. This is the same as 1981 and only slightly different from the preceding three years (1979-1981). Fort Greene and Bedford Health Districts had the highest case rate 45.6 per 100,000 and 41.2 per 100,000 respectively, Bay Ridge experienced a modest case rate of 7.6. Although Flatbush had the greatest number of cases (91), the case rate for that area was not as high as expected (18.9). Queens County reported 308 cases for 1982, with a case rate of 16.3, a slight increase over 1981. Jamaica East district had the greatest number of cases, (65) with a case rate of 20.1, an increase from 1981 of 2.4. Flushing had 62 cases with a case rate of 14.0 per 100,000, the ninth lowest rate in New York City. Maspeth/Forest Hills had the lowest case rate 6.9, a decline of 5.8 from 1981. Astoria/Long Island City and Corona had a case rate of 20.5 per 100,000. The case rate for Astoria/Long Island City remained virtually the same as 1981, while Corona's declined slightly (5.7).

Bronx County had 235 newly reported cases of TB with a case rate of 20.1 per 100,000. Morrisania District had the greatest number of cases, 54 with a case rate of 40.2, an increase from 1981 (7.5) and from 1980 (25.0). Mott Haven with 51 cases showed a case rate of 41.1 an increase from 1981 (11.5) and from 1980 (24.1). Pelham Bay had the lowest number of cases in New York City, a case rate of 8.2 per 100,000. The morbidity for the Fordham/Riverdale district again declined in 1982, the third year in a row, to 11.1.

Richmond County (Staten Island) had 30 newly reported cases for 1982 with a case rate of 8.5 per 100,000, an increase from 5.7 for 1981.

Table 8A

Reported TB Cases, Death Rates Per 100,000
Positive Bacteriology By Borough 1982

County	Population	Case Number	Rate	Pos. Bact. No.	Pos. Bact. %	Deaths No.	Deaths Rate
New York City	7,071,030	1,595	22.5	1,528	95.8	157	2.2
Bronx	1,169,115	235	19.8	224	95.3	21	1.7
Brooklyn	2,231,028	490	21.8	460	93.8	43	1.9
Manhattan	1,427,533	531	37.5	520	97.9	67	4.6
Queens	1,891,325	308	16.2	294	95.4	23	1.2
Richmond	352,029	30	8.5	30	100.0	3	0.8

TABLE 8B

NEWLY REPORTED TUBERCULOSIS CASES BY
COUNTY AND HEALTH DISTRICT OF RESIDENCE, NEW YORK CITY
1982, AND NEWLY REPORTED CASE RATES, 1980-1982

COUNTY	HEALTH DISTRICT	1982 Cases	1982 (1) Rate	1981 (1) Rate	1980 (1) Rate
NEW YORK		531	37.2	39.8	38.1
	Central Harlem	127	104.1	79.9	61.0
	East Harlem	27	22.0	38.5	25.6
	Kips Bay/Yorkville	22	9.5	13.8	11.9
	Lower East Side	128	55.8	68.9	69.7
	Lower West Side	89	32.8	29.5	42.5
	Riverside	58	28.1	29.5	29.1
	Washington Heights	80	33.1	38.9	26.6
BRONX		235	20.1	17.5	14.1
	Fordham/Riverdale	26	11.1	15.8	17.8
	Morrisania	54	40.2	32.7	15.2
	Mott Haven	51	41.1	29.8	17.0
	Pelham Bay	18	8.2	11.4	9.7
	Tremont	55	32.1	19.1	17.5
	Westchester	31	11.0	10.2	9.3
KINGS		490	22.0	22.0	20.2
	Bay Ridge	19	7.6	6.4	8.7
	Bedford	86	41.2	47.9	33.5
	Brownsville	62	22.8	24.0	16.9
	Bushwick	54	32.4	31.2	25.2
	Flatbush	91	18.9	13.6	17.4
	Fort Greene	67	45.6	47.4	40.9
	Gravesend	36	12.5	12.8	13.4
	Red Hook/Gowanus	21	18.3	31.5	21.1
	Sunset Park	29	17.6	12.2	14.7
	Williamburg/Greenpoint	25	17.5	20.4	20.7
QUEENS		308	16.3	15.8	12.3
	Astoria/LIC	49	20.5	20.1	17.8
	Corona	54	20.5	26.2	18.4
	Flushing	62	14.0	10.4	10.4
	Jamaica East	65	20.1	17.7	15.7
	Jamaica West	59	16.9	12.6	8.4
	Maspeth/Forest Hills	19	6.9	12.7	6.3
RICHMOND		30	8.5	5.7	7.0
	Richmond	30	8.5	5.7	7.0
TOTAL	NEW YORK CITY	1,594	21.7	20.0	21.4

1) Rate is per 100,000 population based on 1980 Census.
2) Rate is 100,000 population based on July 1976 estimate.

FIGURE 4

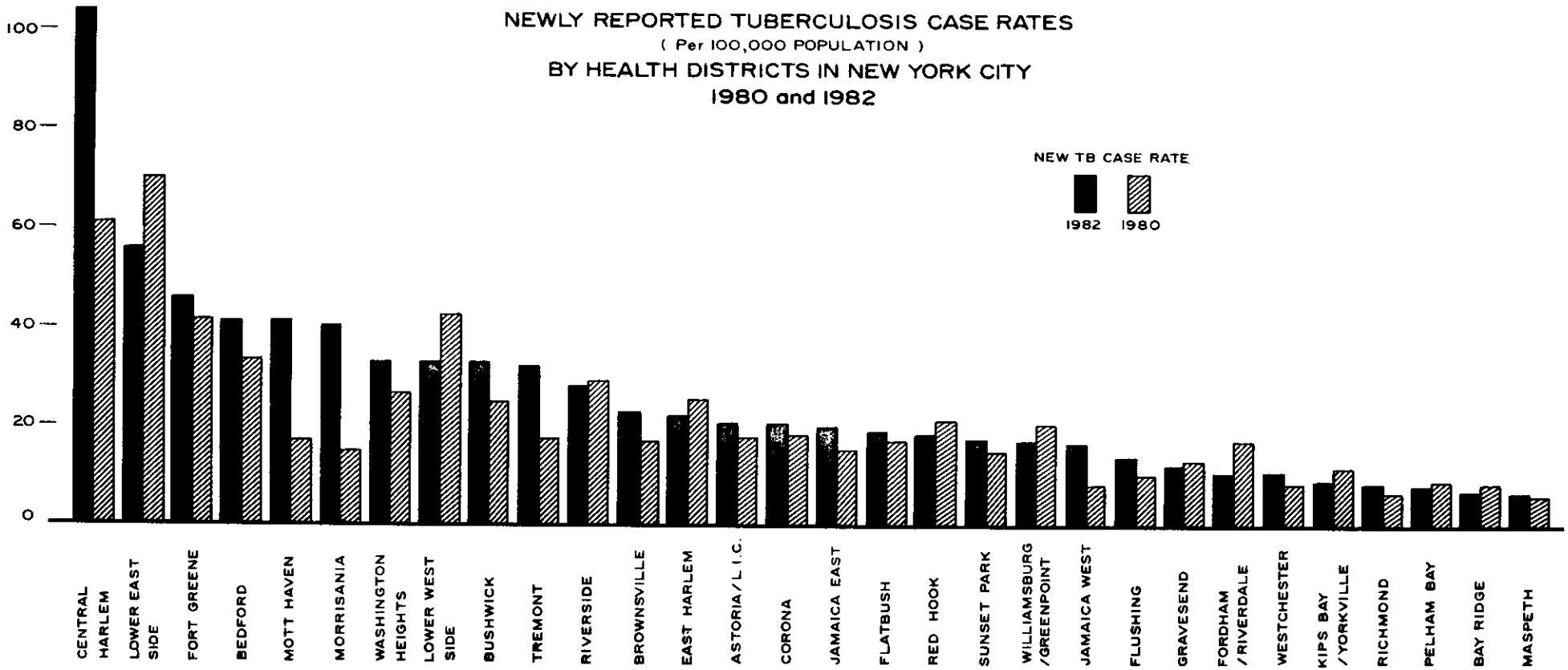

NEWLY REPORTED TUBERCULOSIS CASE RATES
(Per 100,000 POPULATION)
BY HEALTH DISTRICTS IN NEW YORK CITY
1980 and 1982
NEW TB CASE RATE
1982
1980
100
80
60
40
20
0
CENTRAL HARLEM
LOWER EAST SIDE
FORT GREENE
BEDFORD
MOTT HAVEN
MORRISANIA
WASHINGTON HEIGHTS
LOWER WEST SIDE
BUSHWICK
TREMONT
RIVERSIDE
BROWNSVILLE
EAST HARLEM
ASTORIA/L.I.C.
CORONA
JAMAICA EAST
FLATBUSH
RED HOOK
SUNSET PARK
WILLIAMSBURG /GREENPOINT
JAMAICA WEST
FLUSHING
GRAVESEND
FORDHAM /RIVERDALE
WESTCHESTER
KIPS BAY /YORKVILLE
RICHMOND
PELHAM BAY
BAY RIDGE
MASPETH

TABLE 9A

Tuberculosis Deaths and Death Rates by County and Health District of Residence, New York City, 1981 and 1982

COUNTY	HEALTH DISTRICT	1982 *DEATHS	1982 RATE**	1981 *DEATHS	1981 RATE**
NEW YORK		67	4.7	54	3.8
	Central Harlem	22	18.0	9	7.4
	East Harlem	6	4.8	4	3.2
	Kips Bay/Yorkville	1	0.4	5	2.2
	Lower East Side	12	5.2	11	4.7
	Lower West Side	9	3.3	7	2.6
	Riverside	9	4.3	5	2.4
	Washington Heights	8	3.3	13	5.4
BRONX		21	1.8	20	1.7
	Fordham/Riverdale	4	1.7	3	1.3
	Morrisania	4	2.9	2	1.5
	Mott Haven	5	4.0	4	3.2
	Pelham Bay	2	0.9	3	1.4
	Tremont	4	2.3	4	4.2
	Westchester	2	0.7	4	1.4
KINGS		43	1.9	48	2.2
	Bay Ridge	3	1.2	2	0.8
	Bedford	12	5.7	13	6.2
	Brownsville	7	2.6	3	1.1
	Bushwick	6	3.6	6	3.6
	Flatbush	3	6.2	9	1.9
	Fort Greene	5	3.4	5	3.4
	Gravesend	1	3.4	1	0.3
	Red Hook/Gowanus	2	1.7	2	1.7
	Sunset Park	1	0.6	1	0.6
	Williamsburg/Greenpoint	3	2.1	6	4.2
QUEENS		23	1.2	19	1.0
	Astoria/LIC	2	0.8	2	0.8
	Corona	4	1.5	3	1.1
	Flushing	3	0.6	3	0.7
	Jamaica East	6	1.8	3	0.9
	Jamaica West	4	1.1	5	1.4
	Maspeth/Forest Hills	4	1.4	3	1.1
RICHMOND		3	0.8	3	0.9
	Richmond	3	0.8	3	0.9
TOTAL	NEW YORK CITY	157+	2.2	144	2.1

* TB deaths include both primary and contributing cause of death

** Rate per 100,000 population based on data from 1980 Census.

\+ There were 168 deaths in NYC, of which 157 were NYC residents, 11 were non-residents.

TABLE 9B

NEWLY REPORTED TUBERCULOSIS CASES BY AGE, RACE AND SEX. BY COUNTY OF RESIDENCE
NEW YORK CITY, 1982

NEW YORK COUNTY (MANHATTAN)

Age Groups	Total All Races	White		Black		Asian	
		M	F	M	F	M	F
0-4 years	6	3	1	1	1	0	0
5-9 years	3	0	1	1	1	0	0
10-14 years	4	1	0	1	2	0	0
15-19 years	9	0	1	2	5	0	1
20-24 years	30	10	9	6	3	2	0
25-34 years	107	27	12	40	23	3	2
35-44 years	116	32	9	64	11	0	0
45-54 years	95	42	2	38	8	3	2
55-64 years	87	34	9	26	12	4	2
65+ years	74	33	7	12	12	8	2
TOTAL	531	182	51	191	78	20	9

BRONX

0-4 years	4	2	2	0	0	0	0
5-9 years	2	1	0	1	0	0	0
10-14 years	0	0	0	0	0	0	0
15-19 years	7	4	2	1	0	0	0
20-24 years	10	2	1	3	2	0	2
25-34 years	55	16	9	11	12	5	2
35-44 years	54	19	6	21	7	0	1
45-54 years	40	14	9	9	7	1	0
55-64 years	28	9	6	8	3	0	2
65+ years	35	14	10	3	8	0	0
TOTAL	235	81	45	57	39	6	7

KINGS

0-4 years	14	2	2	5	5	0	0
5-9 years	4	2	0	2	0	0	0
10-14 years	5	0	1	0	4	0	0
15-19 years	10	2	0	4	3	1	0
20-24 years	43	9	2	15	16	1	0
25-34 years	105	19	6	49	23	5	3
35-44 years	95	16	10	47	20	0	2
45-54 years	80	18	2	40	15	5	0
55-64 years	51	11	6	24	8	2	0
65+ years	83	26	26	14	11	3	3
TOTAL	490	105	55	200	105	17	8

(Continued Table 9B)

QUEENS

Age Groups	Total All Races	White M	White F	Black M	Black F	Asian M	Asian F
0-4 years	9	1	3	2	3	0	0
5-9 years	2	0	1	0	0	1	0
10-14 years	0	0	0	0	0	0	0
15-19 years	14	4	1	4	2	2	1
20-24 years	18	4	1	4	4	3	2
25-34 years	61	13	13	14	6	9	6
35-44 years	43	13	8	6	9	4	3
45-54 years	36	9	8	9	8	1	1
55-64 years	52	20	10	16	4	2	0
65+ years	73	32	23	8	4	4	2
TOTAL	308	96	68	63	40	26	15

RICHMOND

0-4 years	0	0	0	0	0	0	0
5-9 years	0	0	0	0	0	0	0
10-14 years	0	0	0	0	0	0	0
15-19 years	0	0	0	0	0	0	0
20-24 years	0	0	0	0	0	0	0
25-34 years	4	0	1	2	1	0	0
35-44 years	6	1	0	4	1	0	0
45-54 years	3	0	0	1	2	0	0
55-64 years	6	1	3	1	1	0	0
65+ years	11	4	4	0	0	3	0
TOTAL	30	6	8	8	5	3	0

TABLE 9C

Reported Cases By Source

Source	All Cases No.	All Cases %	Pulmonary No.	Pulmonary %	Extra-Pulmonary No.	Extra-Pulmonary %
Private Physician	70	4	66	5	4	2
Voluntary	739	46	589	44	150	59
Municipal	536	34	449	34	87	34
D.O.H.	114	7	108	8	6	2
Others	135	9	127	9	8	3
TOTAL	1,594	100	1,339	100	255	100

TABLE 10

NEWLY REPORTED TUBERCULOSIS CASES BY SOURCE OF REPORT BY COUNTY, NEW YORK CITY, 1982

Source of Report	New York City Totals		New York		Kings		Queens		Bronx		Richmond	
	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981	1982	1981
	Cases		Cases		Cases		Cases		Cases		Cases	
Department of Health Chest Clinics	114	149	26	50	34	64	23	21	29	14	2	0
Municipal Hospitals	536	514	167	178	185	146	85	103	97	87	2	0
Voluntary Hospitals	739	810	281	316	213	248	153	142	74	85	18	19
Private Physicians	70	50	26	12	17	15	17	15	10	7	0	1
Other	135	59	31	14	41	17	30	15	25	13	8	0
TOTALS	1,594	1,582	531	570	490	490	308	296	235	206	30	20

H. NEWLY REPORTED TUBERCULOSIS CASES BY SOURCE OF REPORT, 1982 (TABLE 10)

The number of cases reported by the Department of Health Chest Clinics declined in 1982 by 25%. New York County and Kings County experienced the greatest decrease in the number of cases reported. In New York County the number of cases reported dropped from 50 cases in 1981 to 27 cases in 1982 a decrease of 46%. Kings County experienced a drop from 64 cases in 1981 to 34 cases in 1982 a decrease of 50%. Cases reported by Bronx County increased by 46% while Richmond and Queens experienced slight increases in the number of cases reported. The number of cases reported in 1982 by Municipal Hospitals increased slightly (4%) from 1981. Kings County experienced a 21% increase in the number of cases reported in 1982 (185) compared to 1981 (146). Richmond and the Bronx County experienced slight increases in municipal reporting while New York and Queens County experienced a 16% decline. Cases reported by Voluntary Hospitals declined by 8% with every county experiencing a drop in reporting except Queens County. The most significant decrease in Voluntary Hospital reporting was noted in New York County (31%). The Counties of Kings, Bronx and Richmond experienced a modest drop in the number of cases reported by the voluntary sector. Cases reported by private physicians rose from 50 cases in 1981 to 70 cases in 1982 an increase of 28%. Every county with the exception of Richmond County experienced an increase in case reports by private physicians. Physicians are taking the initiative and are diagnosing and reporting cases of TB instead of referring suspected cases to a hospital for diagnosis and treatment, however all too frequently these cases are not confirmed by culture. Other sources of case reports accounted for 135 of all cases reported in 1982, an increase of 56% from 1981. The "other" category is composed of mental institutions (1), prisons (1), the medical examiners office (6), nursing homes and other private institutions (50) and out of town medical facilities (21).

The number of cases reported by the private sector represented 59% of the total morbidity for 1982 while the public sector represented 41% of total cases reported. The percentange of cases reported by the private sector (60%) and the public sector (40%) remains relatively the same for the third straight year, 1980, 58:42; 1981, 58:42.

The cases reported by the various sectors does not reflect the treatment status. The point prevalence in May 1982, was a total of 320 cases for the Health Department Chest Clinics even though the clinics reported only 111 new cases of TB. Many cases after having been diagnosed by the private sector came for treatment to the city clinics where treatment as dictated by public law is free of charge.

I. PRIMARY DRUG RESISTANCE (TABLE 11)

Resistance to antituberculosis medications presents a problem to the individual patient with disease as well as anyone exposed to them. For those with disease, it is a treatment problem because they may be given drugs which will not be effective. For those exposed, it is a problem because preventive medication may not provide any protection. Although the Bureau does not advocate sensitivity testing at the start of treatment, a careful review of each patient's history should be done to determine whether or not primary resistance has been acquired from the source case. If there is reason to believe that the latter has occurred, sensitivity studies are recommended from the beginning of treatment.

The greatest concern for resistance to anti-tuberculosis drugs should be primary resistance to isoniazid (INH). First, INH is included in every initial treatment regimen, and second, INH is the only drug yet proven to be effective for chemoprophylaxis. In 1982 in New York City, primary resistance to INH was 6.7% an increase of 0.1% based on 401 cultures collected between 1975 and 1982 from patients not previously treated. The overall primary drug resistance rate is 9.6% as compared to a national rate of 6.9% from 1981 and 2.7% greater than the nationwide average of 4.0%. In 1981 there were 3 cases resistant to ethambutol and again 3 in 1982 (0.8%). Resistance to streptomycin increased slightly from 5.0% to 5.2%. The rate for rifampin decreased from 1.1% to 1.0% and ethionamide remained the same at 2.1%.

There has been much discussion on resistance. There are some strains of bacilli that have natural resistance. However, the greatest amount of resistance is more than likely acquired from other patients who became resistant because they acquired drug-resistant bacteria from patients with secondary drug resistance due to inadequate chemotherapy. When these strains are transmitted to another person and produce disease there is no guarantee that they will be inhibited by standard drugs. During transmission the degree of resistance may fall and the proportion of sensitive organisms in the strain may rise. Hence, the above results obtained by non-randomized selection of isolettes may not entirely reflect the in-vivo situation. The so-called zig-zag regimen using single drugs in fast alternating sequence or adding a single drug to a failing regimen is a harmful practice that is unfortunately still being used in New York City. Bacterial drug resistance is due to the selection of resistant mutants. There is no evidence to support progressive adaptation of susceptible bacilli to the drug to which they are exposed. Frequently it is said that cavities harbor resistant bacilli because of fibrosis and poor vascularization and hence the drug can't enter and that hence bacilli adapt, this is not the case. Drug concentration in cavities is high enough to eliminate bacterial populations, if they are not eliminated the bacilli are truly resistant. If the latter is the case, sensitivity testing must be done and a completely new regimen of at least three new drugs must be employed. These findings corroborate the results of routine sensitivity testing and warrant no change in the basic drug regimen.

TABLE 11: NUMBER OF CULTURES AND PERCENTAGE OF PRIMARY RESISTANCE, 1980 - 1982

Drug Resistant	Number			New York City %			U.S.A. %		
	1982	1981	1980	1982	1981	1980	1982	1981	1980
Isoniazid	26	25	13	6.7	6.6	4.9	4.0	4.2	4.1
Rifampin	4	4	2	I.0	1.1	0.8	0.2	0.2	0.7
Ethambutol	3	3	0	0.8	0.8	0.8	0.3	0.3	0.3
Streptomycin	20	19	13	5.2	5.0	4.9	3.8	3.8	3.8
PAS	7	6	4	1.8	1.6	1.5	0.8	0.8	0.8
Ethionamide	8	8	4	2.1	2.1	1.5	1.0	1.1	0.8
Kanamycin	0	0	0	0.0	0.8	0.0	0.1	0.1	0.1
Cycloserine	1	1	1	0.3	0.3	0.4	0.1	0.1	0.1
Capreomycin	1	1	0	0.3	0.3	0.0	0.1	0.1	0.1

J. Tuberculosis in Refugees and Aliens

When immigrants come to the United States they are screened by means of an x-ray for tuberculosis prior to their arrival in the United States via the Public Health Service's Foreign Quarantine Service. Refugees are screened abroad or are screened while in holding camps. The TB screening procedures consist of a medical interview, a general physical exam and for persons above 15 years of age a chest x-ray. Those under 15 years of age receive a chest x-ray if clinically indicated or if they were members of a family where one or more family members had an abnormal chest x-ray. Refugees and/or aliens are then classified for tuberculosis control purposes as active or suspected to have active TB (Class A) and those considered non-infectious, non-active for travel purposes and no evidence of disease (Class B). The other categories concern external immigration. Internal migration from other endemic areas of the United States of course also exists. If the medical examination shows that the individual has active or suspected tuberculosis a visa will only be issued if the sponsor in the United States arranges medical examination, treatment and follow-up for the individual. The sponsor must obtain a guarantee from a physician who promises to give care to the patient. As of 1979 the Bureau of Tuberculosis provides this care. All immigrants and refugees are handled in a special clinic specifically created to screen newcomers. When a case of tuberculosis is discovered overseas treatment is started and when the patient has 2 negative cultures he is cleared for entry into the United States. These patients, both Class A and B, upon arrival are then examined and continued on treatment as deemed necessary.

In 1982 in New York City, 133 Class A aliens were screened. Of these four were discovered to have active pulmonary tuberculosis i.e. they had positive cultures in New York City. Only two had positive cultures prior to arrival. Others were presumably classified as Class A based on x-ray findings. Of the 133 Class A persons screened in 1982 in New York City, 83 came from Indochina, Vietnam (73), Laos (1) and Cambodia (9). There were none from Haiti amongst Class A patients. Two refugees from Indochina had TB prior to entry, none of the other Class A patients had developed TB by the end of 1982. The Class A patients accounted for 13% of the total of all refugees (A and B) and immigrants. A total of 883 Class B entrants were examined in 1982. Of these 53 were further investigated. No positive cultures were obtained in New York City. Only 20 were put on preventive medicine. Of the Class B, 176 came from Indochina and 61 from Haiti, none had active TB. It is interesting to note that 123 out of 883 almost 14% did not show up for their screening examinations either at the Health Department or at a private physician.

The Indochinese comprised only 2% of the total New York City cases for 1982. The incidence of TB for Indochinese cannot be calculated for New York City since it is not known how many refugees arrived here in the first place. It is important to note that bacteriologic confirmation is used as the only criterion to diagnose TB. Studies previously carried out in Indochina showed a prevalence of infection of 5% for the 0-4 age group, 12% for the 5-9 age group, ages 10-14 (20%),14-19 (40%) and above age 20, 50%.

K. Study 21

The U.S. Public Health Service, through the National Centers for Disease Control, have selected three nationally recognized New York City municipal hospitals to participate in their Therapy trial Study 21.

The primary purpose of this multicenter clinical trial is to compare the efficacy, toxicity, and acceptability of a six month regimen of isoniazid and rifampin, supplemented with pyrazinamide for the first two months, with a control regimen of nine months of isoniazid and rifampin in patients with pulmonary tuberculosis. The secondary purpose of this trial is to determine the acceptability of supervised twice weekly therapy for patients who fail to adhere to the self administered daily regimens.

Investigation of the proposed 6 months regimen is justified for several reasons: 1) It may decrease the risk of adverse reaction by reducing duration of exposure to drugs. 2) It may reduce the cost of providing clinic services. 3) It may increase compliance, i.e. increase percent of patients completing an adequate course of chemotherapy. 4) It should decrease the likelihood of relapse even for patients who abscond before completing treatment. 5) It may have the epidemiologic advantage of reducing transmission of infection since more patients will be culture negative earlier in treatment.

On the basis of several studies, regimens of nine months duration, which contain isoniazid and rifampin throughout have been recommended for routine use in Great Britain and the United States. In 1976, the British Thoracic and Tuberculosis Association recommended nine months of daily isoniazid and rifampin, supplemented by ethambutol in a dose of 25 mg/kg for the first 2 months as standard chemotherapy for pulmonary tuberculosis. In 1980, the American Thoracic Society (ATS) and the Centers for Disease Control (CDC) recommended a core regimen of daily isoniazid and rifampin for a minimum of nine months, provided at least six months had elapsed from conversion of sputum to cultures negativity. If there is an increased likelihood of drug resistance, particularly isoniazid resistance, ATS-CDC recommended adding ethambutol 15 mg/kg daily until initial drug susceptibility studies confirm susceptibility to isoniazid and rifampin. If resistance is found, revision of the chemotherapy regimen and length of treatment will be required.

This USPHS trial will determine the efficacy of a six month regimen (two months of isoniazid, rifampin and pyrazinamide followed by four months of isoniazid and rifampin) which, for most patients, will be self-administered on a daily basis. Participants in this trial who are unreliable in self-administering medication will be switched to directly administered, twice weekly therapy as recommended in the joint ATS-CDC short course chemotherapy statement.

L. SUPERVISED THERAPY PROGRAM

The treatment of tuberculosis has gone through many stages, from sanatoriums in the last century to chemotherapy starting in the 1940's. Despite the fact that by 1961 medications were available, results of treatment were promising and all forms of TB could be successfully treated medically, many patients did not get well. The fact that they did not get well was perhaps due to the approach and methodology employed by different programs. In New York City treatment failure is not uncommon. Yearly figures show failure rates in the range of 20% to 30%. Some of these may be theoretical failures due to non-reporting or non-availability of the data, nevertheless, many of the failures are real. The relatively high failure rate in New York City led in 1980 to the initiation of a supervised therapy program funded by a federal grant for two years. The program was started in September of 1980 and was completed December 31, 1982. Objectives of the program were: 1) Prevent transmission of tuberculosis by infectious non-compliant patients. 2) To directly administer medication to these patients on a daily or intermittent basis (two-three times weekly). 3) Convert sputum from positive to negative in 3 months for 75% of program patients and 6 months for 95% of program patients. 4) Maintain 95% of patients on continuous drug therapy for 12 consecutive months. 5) Avoid hospitalization as much as possible and a serious attempt is to be made to motivate the patient. 6) The social behavior of the patient is not allowed to affect the treatment regimen. 7) Patients to continue their normal life style regardless of their being alcohol or drug abusers. 8) Criteria for successful treatment were: a) Clinical improvement, b) bacteriological improvement and c) x-ray improvement.

Criteria for Admission/Referral Were

1. Frequently missed clinical appointments.
2. Drug resistance.
3. Mental incompetence.
4. Chronic alcoholism.
5. Failure to improve.
6. Sputum and culture studies indicating continued positive bacteriology.
7. Failure to self-administer medication, non-compliance.
8. Notification by the TB register that the patient has defaulted.
9. More than two hospital admissions for tuberculosis.
10. Living condition conducive to non-compliance.

The majority of cases were obtained from the Bureau of TB's record files which indicated that patients were delinquent. In some instances patients were referred by private or municipal hospitals. Patients were initially designated as "tracers". Tracers were then assigned to Public Health Advisers (Outreach Workers). Public Health Advisers would then attempt to locate the patient, interview the patient by means of a standard questionnaire, explain the program to the patient and enroll the patient if the patient so desired. A decision was then made based on the questionnaire whether the patient would be a good candidate. In some instances tracers could not be located. The patients found acceptable were then sent for x-ray and sputum was collected for culture. Within a relatively short time the patient would be visited by the physician and a decision concerning supervised treatment would be decided upon. In general patients received 12 months of medication. The length of treatment was decided upon on an individual basis. Most patients had been diagnosed two or more years prior to admission to the STP Program. Some were immediately enrolled after diagnosis when it became apparent that the patient might not comply with standard treatment protocol. All patients were, so to speak public patients. None were referred by private physicians. Most of the patients were noncompliant in the sense that their personal behavior kept them from taking medications. A great majority of the patients were aware of the consequences for not doing so. In some instances they were unable to attend regular clinics. The program attempted to remove any obstruction towards treatment. The vast majority of patients lived alone and therefore presented no public health problem.

Between September, 1980 and December, 1982, 115 patients were started on supervised therapy. The program has completed fifty patients who otherwise would never have been treated; twenty-nine are at present continuing treatment (December, 1982).

The chemotherapy and bacteriology indices of 96% and 90%, respectively, show that the impact of this program has been substantial. The New York City Tuberculosis Control Program is now in the process of expanding this type of ambulatory care and thereby effectively interrupting the transmission of tuberculosis.

M. Prevalence of Infection Among School Children in New York City, 1980-1982 and the Expected Incidence of T.B. in Years to Come

While tuberculosis is no longer perceived to be a major cause for concern nationally, it nevertheless remains endemic to large urban areas of the United States such as New York City. Little or no information is available locally or nationally concerning true prevalence and risk of infection. Hence, in order to measure the extent of TB transmission in New York City, a random prevalence survey was undertaken of students ranging in age from five to sixteen. In 1980, there were 818,600 students in 1,274 public and parochial schools. A random sample of 120 schools was selected from 30 Health Districts. Attempts were made to select one parochial and three public schools from each district. Because of limits placed on personnel and time, the survey was divided into three phases. The sample population consisted of 90,000 school children. In order to administer the tuberculin test a consent form was required from a parent of each child. These forms were written in English and Spanish and were distributed by the teachers to the student approximately one month prior to the test date in each school. Students were asked to take the forms home and return them to the school when completed. The tuberculin test was administered according to the procedure recommended by the T.S.R.U.[1] This consisted of 0.1 ml of PPD-S Tuberculin (Parke-Davis) injected intracutaneously with a 26 gauge 3/8" intradermal disposable glass syringe. Results were read 48-72 hours later and recorded on the standard multipart TB-44 form.

Students with no reaction or those with a reaction of less than 10 mm of induration were considered negative and given written reports to take home to their parents.

In all five boroughs, 30 parochial schools and 90 public schools participated in the survey. The pooled data from these schools was used to estimate the age-specific prevalence of infection in New York City. A best fit line was derived by linear regression and the risk of infection was calculated indirectly by the method of Styblo, et al.[2]

Over 20,000 consents comprising 22.5% of the sample were received. There was a significant difference between the number of consent forms received from students attending parochial schools and those attending public schools, 34.2% and 21.5% respectively.

[1] Tuberculosis Surveillance and Research Unit, The Hague, The Netherlands.

[2] Bulletin of the International Union Against Tuberculosis. Tuberculosis Surveillance and Research Unit, Report Number 1, Volume XLII, November, 1969, p. 81.

(df = 1, $p < .0001$). Of those with signed consent forms, 86% were given the test. Again, there was a significant difference in students receiving the test between public and parochial schools: 87.5% and 82.4% respectively ($p < .0001$). Of the children who were given the test 90.4% had the test read within 48-72 hours. The percentage of unread tests was again significantly greater in public schools (9.7%) than in parochial schools (3.7%) ($p < .0001$). A total of 17,912 students was given the PPD test, with 16,186 showing up for the reading. There were 15,522 (95.9%) negative and 664 (4.1%)positive reactions. The children in public schools--574 (4.2%) --showed a higher percentage positive than children in parochial schools--90 (3.1%). Of the 664 students with positive PPD, medical follow-up information was obtained on 500 or 75%. The remaining 164 either moved out of New York City or failed to respond to inquiries and field visits made by Public Health Advisors from the Bureau. Where information was obtained, 468 (93.6%) of the children received a chest x-ray and 375 (75.0%) were placed on preventive medication. On numerous occasions private doctors who were contacted for medical follow-up on positive children did not believe in giving the child x-rays after a positive result (6.4%), nor did they understand the benefits of preventive medication (25%). Many physicians were unaware of the PPD-Mantoux method and retested the child with the tine test.

Ethnic composition shows that the percentage of positive reactions differs notably between racial groups in New York City. Whites have considerably fewer positive reactions when compared with Blacks, Puerto Ricans and Asians. For the purpose of determining the prevalence of infection, the age group five through fifteen is being considered in this report. Of 15,854 tests done, 15,214 were negative and 640 were positive 95.9% and 4.0%, respectively.

When plotting the age-specific prevalence of infection, a relatively constant increase is apparent with increasing age.

The risk of infection calculated from the data and based on the possibility that the risk of infection may decrease by 7%, 9% or 11% per annum is calculated to be 0.30%, 0.27% and 0.24%, respectively. If it is determined that the annual decrease in the risk of infection is closer to 10% rather than 7%, the present risk of infection (1981) is .25% at the most.

There is now general agreement that the annual risk of infection is the single best indicator for evaluating the tuberculosis trend. It is an index which illustrates the attacking force of this disease, is "independent" of the procedure of the tuberculosis control program.

Information available on the tuberculin status makes it possible to divide the population into positives and negatives. The "Negative Tuberculin" group constitutes 76% of the total population and varies from 95.5% in the age group 0-14 to 68% in those aged 60 years and over. The total negative population is 5,721,210. At an annual risk of infection of .30%, this generates a total of 17,163 new infections and 1,062 new cases of tuberculosis at a conservative breakdown rate of 6%. The British Research Council B.C. G. Vaccine Trial reported an overall

breakdown of 8.1%.

In Saskatchewan, Canada, from 1960 to 1970 the overall rate was 9.0%. To select an overall rate of 6% for New York City is not unreasonable. Saskatchewan and the United Kingdom are areas with an annual risk rate of infection ten times less than New York City.

The "Positive Tuberculin" group of 1,349,424 constitutes about 24% of the total population. The percentage of positive reactors is less than 5% for the age group 0-14, remains low up to the age of 19 (11%), and reaches a maximum of 32% for those age 60 years and over. This group consists of people who were primarily infected many years ago and who contribute bacillary pulmonary tuberculosis at a rate of 10-20 per 100,000 positive reactors. It is likely that this group will continue to develop new bacillary cases in the future, but probably at a lower level if the risk of super-infection continues to decrease. At an annual risk of 15 per 100,000 developing tuberculosis disease, this group would generate a total of 203 cases per annum. The third group, "Fibrotic Lesions," probably comprises about 1%-3% of the population and contributes about 25% of all bacillary pulmonary tuberculosis cases. The annual risk of bacillary pulmonary tuberculosis ranges from .15% to .40% in different studies. At 1% of the population and at .15% annual risk of breakdown, 106 cases are generated. In the three main groups mentioned above the proportion of population at risk and the number of new cases from each group differs considerably. The largest group consists of the tuberculin negative reactors. It is not known whether this group will increase each year. If the risk of infection were declining this group would be expected to increase because of the natural elimination of positive reactors. It is, however, felt since there is an addition to the pool of infected by outside migration that this group will remain stationary. The latter is substantiated by the evidence that the incidence of tuberculosis has remained the same or has even increased over the past five years. Hence, between 1,300 and 2,600 new cases of tuberculosis will occur in New York City per annum until the risk of infection starts to drop significantly. In order to calculate the annual risk of infection, a systematic sample of 3,000-4,000 school children should be tested annually.

TABLE 12A

NYC ESTIMATED INFECTED AND NON-INFECTED POPULATION BY AGE GROUP

Age	% Pos.*	Age Group	N.Y.C. Population	% Pos.	Positive Population	% Neg.	Negative Population
10	4.5	0-14	1,424,304	4.5	64,094	95.5	1,360,210
20	11	15-19	563,492	9.4	52,968	90.6	510,523
30	16.5	20-29	1,234,943	13.7*	169,187	86.3	1,065,756
40	23	30-39	988,394	19.8	195,702	80.2	792,692
50	29	40-49	792,824	26.0	206,134	74.0	586,690
60	35	50-59	769,717	32.0	246,310	68.0	523,408
		Over 60	1,296,965	32.0	415,029	68.0	881,936
		Total	7,070,639		1,349,424		5,721,215

*Derived by linear regression.

TABLE 12B: RISK OF INFECTION BASED ON SPECIFIC DECREASES

Age (Years)	N Tested	Induration N	10 mm %	Decrease in the risk of Infection each year 7% Risk of TB Infection	9%	11%
9 1/2	15,854	640	4.0	0.30	0.27	0.24
5-7	3,551	86	2.4	0.28	0.27	0.25
8-10	5,887	206	3.5	0.26	0.24	0.21
11-13	5,376	270	5.0	0.26	0.22	0.19

Section II

Prevalence of Tuberculosis Disease, New York City December 31, 1982 (Table 13)

As of December 31, 1982 there were 2,602 cases under medical supervision for tuberculosis in New York City. Of that number approximately (7%), 190 were still in hospital at the end of 1982 and the remainder were ambulatory. During the period from January 1, 1982 to December 31, 1982 1,029 cases were closed to supervision; 58% had completed therapy; 14% had expired (not necessarily from tuberculosis) and 6% had moved to another jurisdiction, 22% were lost to supervision. The 58% figure is based on twelve months or more of completed treatment. Since the inception of short course chemotherapy as of January 1982, a denominator of nine months is used (a minimum of six months therapy after sputum conversion). The most recent cohort group based on short course chemotherapy from January 1, 1982 to March 31, 1982 shows a 70% completion of treatment. Patients who remained under supervision received their follow-up care at Department of Health Chest Clinics, municipal hospitals, combined chest clinics, or in the private sector. The private sector reported 59% of the new cases of tuberculosis in 1982, but supervised only 40% of the disease prevalence. Department of Health Chest Clinics reported only 7% of the morbidity, but provided 20% of the ambulatory care. Municipal hospitals reported 34% of new cases and provided 40% of the subsequent medical supervision. These differences reflect on the number of cases lost to supervision since there is quite often a substantial loss of time due to transfer of the patient from in-patient to out-patient care. As long as the majority of cases are diagnosed by the private sector and the majority of ambulatory care is provided by the public sector (60%), patients will continue to be lost to supervision.

Of the total number of cases under supervision at home (ambulatory), 63% (1,509) were on medication at the end of December 1982. This 63% represents twelve months of chemotherapy, and does not reflect the Bureau's current policy of nine months chemotherapy as the recommended course of treatment. Of the total case load of 2,412, 91% (2,201) were placed on two or more drugs, the remaining 117 were on one drug and 94 on no drugs. The number of cases with disease who were not on two or more drugs was 903 and represented 35% of the disease prevalence under supervision on December 31, 1982. In 1981, 58% were not on drugs, hence a considerable improvement. The latter patients are at risk and may infect others with tuberculosis. In addition, they are at greater risk of developing secondary drug resistance and therefore present a treatment problem for themselves and for those who they might subsequently infect.

Of the 2,201 patients recommended for two or more anti-tuberculosis medications, 42% were properly evaluated for bacteriologic status to check for conversion at three months; 904 patients should have had bacteriology done because their last known sputum was positive. The reasons why this is not done are not clear. Without documented conversion from positive to negative there is no way to determine whether or not those patients remained infectious and endangered others. The latter problem is serious in the private sector where only 50% of those who should have had bacteriology done actually had it performed. The Department of Health Chest Clinics performed monthly bacteriology on 82% of its cases and Health and Hospitals Corporation facilities did bacteriology on 65% of cases under supervision. The bacteriology index declined for 1982 from 52% (1981) to 42% (1982).

In order to prevent non-infected persons from becoming infected and those infected from becoming diseased, at least 95% of the close contacts should be identified and examined; 90% of the latter should complete one year of prophylaxis. The degree to which this is accomplished is interpreted as a measure of the success of any communicable disease program.

The number of close contacts identified per case continues to be less than expected (2.9 per case). Of the 1,895 contacts identified as close contacts, approximately 92% were examined in 1982. Of those infected 76% were placed on chemotherapy. Of those not infected 66% were covered with isoniazid and retested after three months.

TABLE 13

TUBERCULOSIS PROGRAM MANAGEMENT REPORT - CASE REGISTER
TUBERCULOUS DISEASE PREVALENCE, NEW YORK CITY
January 1, 1982, to December 1, 1982

A.	Patients Under Supervision		2,623
B.	Patients Added During Period		1,008
C.	Patients Closed to Supervision During Period		1,029
1.	Supervision Completed	590	
2.	Moved Out of Jurisdiction	65	
3.	Lost	231	
4.	Died	143	
D.	Patients Under Supervision at End of Period		2,602
1.	Patients in a General Hospital (Inpatient)	190	
2.	Patients at Home (Ambulatory Care)	2,412	

STATUS OF PATIENTS AT HOME AS OF DECEMBER 31, 1982 (See D -2 above)

	TOTAL CASES	TWO OR MORE TB DRUGS	ONE TB DRUG	NO TB DRUGS OR UNKNOWN
CHEMOTHERAPY				
Recommended	2,412	2,201 (i)	117	94
On Drugs	1,509	1,428 (ii)	81	0
Not on Drugs	903	773	36	94
Bacteriology				
Positive within past 3 months	194	180 (iii)	1	13
Negative within past 3 months	416	372 (iv)	43	1
Not Recommended	789	745 (v)	42	2
Recommended, but not done	1,013	904	31	78

Chemotherapy Index $\frac{(ii)}{(i)} \times 100 = 64\%$

Bacteriology Index $\frac{(iii) + (iv)}{(i) - (v)} \times 100 = 42\%$

SECTION III: Control of Tuberculosis

A. Introduction

Control of tuberculosis is defined as those activities mandated which involve the protection of public health. The responsible agent for meeting public health obligations is the Bureau of Tuberculosis. These responsibilities concern personal health through the elimination of death, disability, illness, emotional trauma, family disruption, and social stigma. The responsibilities concern public health by interruption of and prevention of transmission of tubercle bacilli to other members of the population. The programs's ultimate goal is to eliminate tuberculosis as a personal and public health problem. The existing prevalence and a stationary morbidity indicate that tuberculosis is a disease of significant volume and consequence in New York City.

B. New York City Tuberculosis Control Program General Responsibilities

1. To ensure that all cases of tuberculosis that are suspected or diagnosed in New York City's medical facilities are reported to the Bureau of Tuberculosis; to institute measures to ensure that such reporting is done in a timely and thorough manner; and to take corrective action when less than required results occur.

2. To ensure that epidemiologic follow-up is performed on all reported cases of infectious tuberculosis, i.e. contacts to such cases are identified and brought to examination and treatment.

3. To ensure that diseased patients are on effective treatment; to monitor the care of such patients; and to take corrective action to return delinquent/non-compliant patients to medical supervision and treatment.

4. To develop and disseminate Department policies, procedures, and guidelines for the proper management and treatment of tuberculosis.

5. To maintain documents and records, compile data, and information for the purpose of analyzing and assessing the scope and magnitude of the tuberculosis problem in New York City.

C. Basic Tuberculosis Objectives

In order for tuberculosis to be controlled, the following must occur:

1. Persons with disease able to infect others must be rendered non-infectious.

2. Persons with disease able to infect others must remain non-infectious.

D. Methodology to Achieve Basic Objectives

1. All tuberculosis cases and suspected cases must receive a rapid diagnosis and more importantly, be placed on an effective tuberculosis drug regimen.

2. All tuberculosis cases must be continuous in taking drugs and complete the prescribed course of treatment.

3. All tuberculosis cases with positive sputum must convert to negative in the shortest possible time.

4. Contacts to infectious tuberculosis must be rapidly identified and brought to examination and treatment.

5. Persons on preventive treatment must be continuous in taking their drug and complete the prescribed course.

E. Performance Indicators

1. Continuity and Completion of Drug Therapy

Cases of tuberculosis started on chemotherapy are evaluated for their continuity of drug therapy during the initial 12 months of treatment and for completion of their prescribed course of drug therapy. Cases are evaluated on a quarterly basis using cohorts of cases reported January-March, April-June, July-September, and October-December of the incidence year. A high level of achievement in this indicator assures the Bureau that infectious cases will become non-infectious and that non-infectious cases will not become infectious. Provided the case has been recommended to be treated with effective anti-tuberculosis drugs and takes the drugs with minimal interruption to completion of the prescribed course, the patient will become noninfectious within a short period of time and will be cured.

The Bureau's optimal objective is to have at least 95% of the cases started on drugs maintain continuity without interruption for 12 consecutive months and have 90% completed the prescribed course of therapy. Table 14 presents the current results of this performance indicator.

Continuity and Completion of Drug Therapy

An integral part of the Bureau's responsibility to render persons with disease non-infectious and to see that they remain non-infectious is to ensure that patients remain on effective medication for a sufficient period of time to effect a cure. This can only be accomplished by maintaining patients on an effective drug regimen for a period of one year. It is crucial that chemotherapeutic treatment is maintained on a monthly basis with no interruptions. The percentage of cases that complete therapy reflect success in meeting the program's objectives. The Bureau measures its effectiveness as a program by the percentage of patients started on treatment and who complete treatment. The target is currently 95%. The percentage of cases on continuous therapy for twelve months has increased over the last thirteen quarters. As of the last available cohort i.e. of January-March, 70% of patients are continuous for twelve months. The Bureau's goal is 95%.

The percentage of patients who completed the recommended course of treatment in 1982 (68%) was short of the Bureau's goal of 95%.

A number of contributory factors should be taken into consideration when assessing the completion of treatment. These are:

- the current recommended length of treatment
- interruption of therapy due to psychological, social or behavioral problems
- patients' progress, feeling better and hence no longer motivated to take medications.

Some practical approaches to these problems are the introduction of short course chemotherapy in the treatment of all patients and an adequate number of Public Health Advisors who can assess needs and identify problems of patients and refer patients to the proper agency, a provision of health education which will give the patient an indepth understanding of his illness.

TABLE 14

TWELVE MONTH CONTINUITY OF DRUG THERAPY PERCENTAGES FOR CASES REPORTED JANUARY-MARCH 1979 TO JANUARY-MARCH 1981; COMPLETION OF DRUG THERAPY PERCENTAGES FOR CASES REPORTED JANUARY-MARCH 1979 TO JANUARY-MARCH 1982, NEW YORK CITY

Cohort of Cases	% of Cases Continuous on Therapy for 12 Months	% of Cases* Completing Therapy
Jan.-Mar. 1979	57	63
Apr.-June 1979	58	64
July-Sept. 1979	58	67
Oct.-Dec. 1979	52	62
Jan.-Mar. 1980	68	76
Apr.-June 1980	56	71
July-Sept. 1980	57	66
Oct.-Dec. 1980	61	77
Jan.-Mar. 1981	76	-
Apr.-June 1981	51	-
July-Sept. 1981	63	-
Oct.-Dec. 1981	70	-
Jan.-Mar. 1982	70	-

*The % of Cases Completing Therapy from 1979-1980 was based on 24 months of treatment. Since the inception of short course chemotherapy this index is no longer used. The Bureau presently considers twelve months of continuous therapy sufficient for completion of treatment.

TABLE 15

CONVERSION OF POSITIVE SPUTUM CULTURE CASES OF TB AT THREE AND SIX MONTHS OF CASES REPORTED JANUARY-MARCH 1980 TO JULY-SEPT. 1982 IN PERCENT, NEW YORK CITY

Cohort of Cases	% of Cases Converting Sputum Culture to Negative	
	Within 3 Months	Within 6 Months
Jan.-Mar. 1980	26	41
Apr.-June 1980	28	41
July-Sept. 1980	22	49
Oct.-Dec. 1980	35	51
Jan.-Mar. 1981	27	50
Apr.-June 1981	34	53
July-Sept. 1981	40	50
Oct.-Dec. 1981	22	34
Jan.-Mar. 1982	37	62
Apr.-June 1982	61	73
July-Sept. 1982	60	84

Bacteriologic Conversion of Sputum

One of the objectives of the Bureau of Tuberculosis is to render all those individuals who are infected with disease and are able to transmit infection to others, non-infectious. Provided that the antituberculosis medication prescribed are effective and that the patient takes his/her medication in the manner prescribed, 75% of the cases reported with positive sputum culture may be expected to convert to negative within 3 months, and 95% within 6 months.

As may be seen from Table 15, we have not achieved the expected results. There is no simple explanation for this rather poor performance. Part of the problem may be that follow-up sputa are not being collected routinely either because clinical improvement is perceived as a substitute measure and/or the patient is not able to produce sputum without the assistance of mechanical aids. Another explanation may be that facilities may not recognize that bacteriologic reports of negative results for patients with previously positive culture are helpful in measuring the effectiveness of treatment at present. The Bureau pursues this information aggresively in order to determine how accurately records are being kept. Bacteriologic conversion of sputum as a performance indicator is a necessary determinant of success.

TABLE 16

SUMMARY OF CLOSE CONTACTS IDENTIFIED AND EXAMINED JANUARY-SEPTEMBER 1980, 1981 JANUARY-SEPTEMBER, 1982

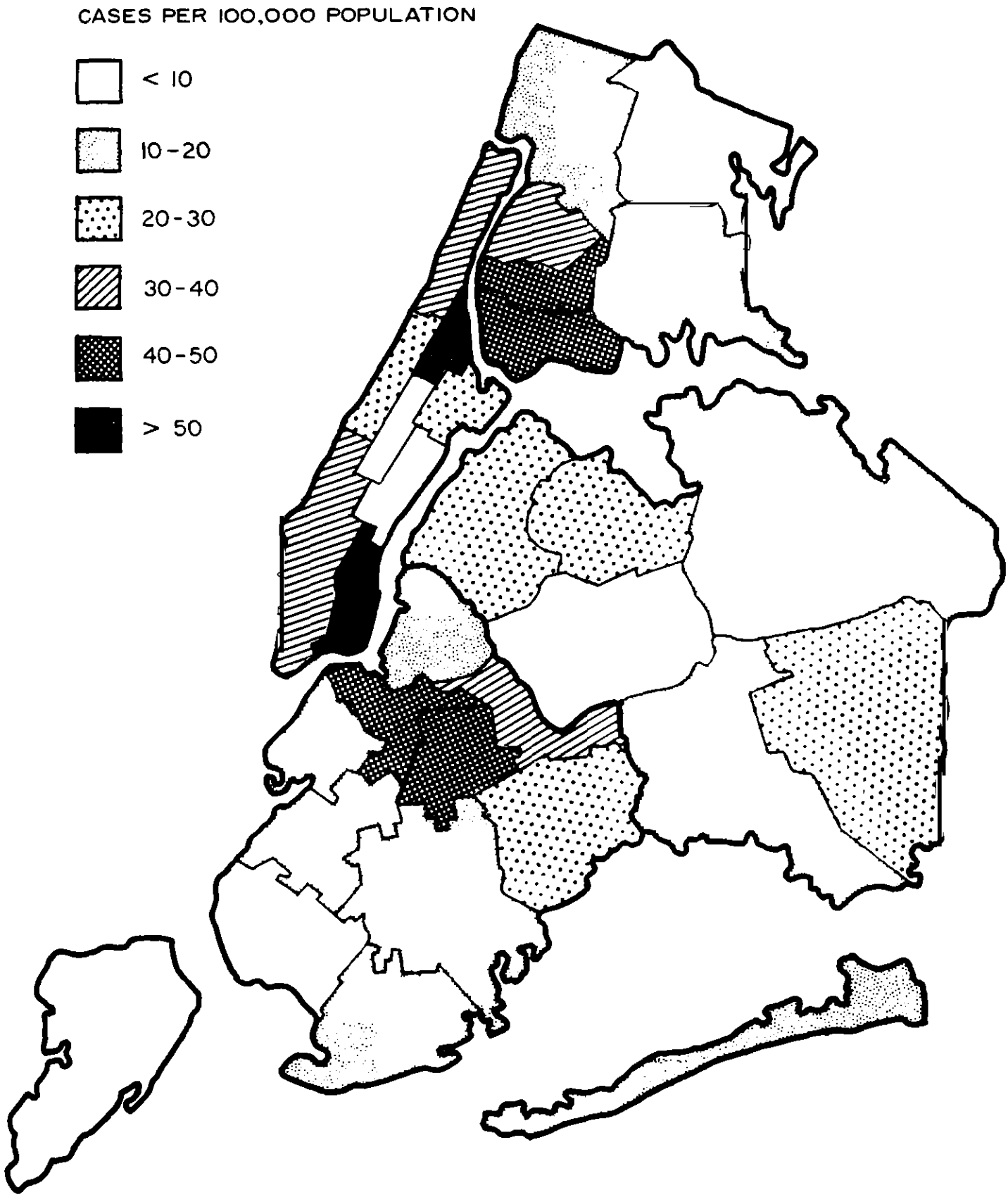
NEW YORK CITY

	1980	1981	1982
# Identified	2,071 (1.4/case)	1,917 (1.7/case)	1,895 (2.9/case)
# Examined	1,854 (90%)	1,783 (93%)	1,738 (92%)
# Not Infected	1,229 (66%)	1,162 (65¢)	1,152 (66%)
# Not Infected, on Treatment	196 (16%)	554 (48%)	192 (17%)
# Infected	578 (31%)	574 (32%)	409 (35%)
# Infected, on Treatment	425 (74%)	475 (83%)	450 (76%)
# With Disease	47 (2.5%)	47 (2.6%)	24 (2.8%)

F. Contact Summary (Table 16)

Specific cases of tuberculosis are interviewed by Public Health Advisors for the purpose of determining those individuals who are most at risk of becoming infected and developing disease. All cases of pulmonary and laryngeal tuberculosis are interviewed regardless of age; in addition, childhood converters and children with non-infectious tuberculosis are followed-up epidemiologically because they have been the recipients of recent transmission. Contacts who are identified are evaluated according to criteria which determine the degree of risk and the likelihood of infection. Contacts who have been exposed to a source case who has a high bacillary count and who has shared air space for prolonged periods of time are classified as "close" contacts; those who have had limited exposure to a source case are classified as "casual" contacts. Close contacts are examined and placed on chemoprophylaxis as deemed appropriate.

1982 TUBERCULOSIS INCIDENCE
NEW YORK CITY by HEALTH DISTRICT



CHRISTMAS SEALS
Fight Lung Disease
IT'S A MATTER OF LIFE AND BREATH