

TUBERCULOSIS IN NEW YORK STATE

2014

Annual Statistical Report
Bureau of Tuberculosis Control



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EXECUTIVE SUMMARY

Executive Summary

MORBIDITY & MORTALITY

- From 2013 to 2014, tuberculosis (TB) morbidity decreased in New York State. The 2014 total of 787 cases (585 cases in New York City, 202 cases in the remainder of New York State) represents a 9.9 percent decrease from the 873 cases reported in 2013. The nation as a whole experienced a 1.6 percent decline in morbidity. Since the most recent peak epidemic in 1992 with 4,574 cases, there was an 82.8 percent decrease in New York State compared to a national decline of 64.7 percent.
- In New York State (exclusive of New York City), the number of TB cases decreased 6.9 percent from 217 cases in 2013 to 202 cases in 2014. The number of TB cases in New York City decreased by 10.8 percent from 656 cases in 2013 to 585 cases in 2014. In 2014, the nation as a whole reported 9,412 cases, down 1.8 percent from the 9,588 cases reported in 2013.
- New York State ranked sixth nationally for TB morbidity with an incidence rate of 4.1 per 100,000 population in 2014. This rate is influenced by New York City, which had a TB case rate of 7.2 per 100,000. In contrast, New York State (exclusive of New York City) reported an incidence rate of 1.8 per 100,000.

GEOGRAPHIC DISTRIBUTION

- Three counties – Nassau, Suffolk and Westchester – reported nearly half of the TB cases in New York State (exclusive of New York City) in 2014.

RACE-ETHNICITY

- In 2014, Asians continued to have one of the highest incidence rates of TB statewide (24.0 per 100,000). White, non-Hispanics had the lowest incidence rate of 0.6 per 100,000.

FOREIGN-BORN

- Statewide, the proportion of foreign-born cases in 2014 remained nearly the same as in 2013 at 82.7 percent (N=651), with people born in China comprising the greatest number of foreign-born TB cases (N=132). In New York State (exclusive of New York City), people born in India comprised the greatest number of TB cases (N=23).

DRUG SUSCEPTIBILITY

- Among individuals with drug susceptibilities reported in 2014, the number of multidrug-resistant (MDR TB) cases in New York City was nine, a small increase from the seven cases seen in 2013. In New York State (exclusive of New York City), the number of MDR TB cases was two, which was the same number seen in 2013.

TB IN THE PRISONS

- Since 1991, the number of TB cases among the New York State Department of Corrections and Community Supervision (DOCCS) inmate population had been continually declining, and in 2011 and 2012 no new cases were reported. However, in 2013, three new DOCCS cases were reported. In 2014, this number dropped to one case.

TUBERCULOSIS CASES AND RATES

Table 1. Tuberculosis Cases and Rates,* New York State, 1960-2014

Year	New York State (Exclusive of New York City)		New York City		New York State (Total)	
	No.	Rate	No.	Rate	No.	Rate
1960	2,376	26.4	4,699	60.4	7,075	42.2
1961	2,052	22.3	4,360	56.3	6,412	37.8
1962	2,005	21.4	4,437	56.7	6,442	37.5
1963	1,865	19.6	4,891	61.7	6,756	38.7
1964	1,715	17.8	4,207	52.7	5,922	33.6
1965	1,627	16.6	4,242	53.0	5,869	33.0
1966	1,633	16.5	3,663	45.7	5,296	29.5
1967	1,527	15.2	3,542	44.4	5,069	28.1
1968	1,475	14.5	3,224	40.5	4,699	25.9
1969	1,384	13.5	2,951	37.4	4,335	23.9
1970	1,275	12.3	2,590	32.8	3,865	21.2
1971	1,180	11.3	2,572	32.5	3,752	20.4
1972	1,176	11.2	2,275	29.0	3,451	18.8
1973	1,009	9.6	2,101	27.4	3,110	17.1
1974**	844	8.1	2,022	26.6	2,866	15.9
1975	1,041	9.9	2,893	38.6	3,934	21.8
1976	916	8.7	2,156	29.0	3,072	17.1
1977	829	7.9	1,605	22.0	2,434	13.6
1978	753	7.1	1,307	18.2	2,060	11.6
1979	699	6.6	1,530	21.5	2,229	12.6
1980	780	7.4	1,514	21.4	2,294	13.1
1981	641	6.1	1,582	22.4	2,223	12.7
1982	674	6.4	1,594	22.5	2,268	12.9
1983	658	6.2	1,651	23.1	2,309	13.1
1984	616	5.8	1,630	22.6	2,246	12.7
1985	638	6.0	1,843	25.5	2,481	13.9
1986	615	5.8	2,223	30.6	2,838	15.9
1987	615	5.8	2,197	30.1	2,812	15.7
1988	688	6.5	2,317	31.8	3,005	16.8
1989	657	6.2	2,545	34.8	3,202	17.8
1990	656	6.1	3,520	48.1	4,176	23.2
1991	748	7.0	3,673	50.2	4,421	24.6
1992	763	7.2	3,811	52.0	4,574	25.4
1993	717	6.7	3,235	44.2	3,952	22.0
1994	641	6.0	2,995	40.9	3,636	20.2
1995	621	5.8	2,445	33.4	3,066	17.0
1996	535	5.0	2,053	28.0	2,588	14.4
1997	535	5.0	1,730	23.6	2,265	12.6
1998	442	4.1	1,558	21.3	2,000	11.1
1999	377	3.5	1,460	19.9	1,837	10.2
2000	412	3.8	1,332	16.6	1,744	9.2
2001	415	3.8	1,261	15.7	1,676	8.8
2002	350	3.2	1,084	13.5	1,434	7.6
2003	340	3.1	1,140	14.2	1,480	7.8
2004	324	3.0	1,039	13.0	1,363	7.2
2005	305	2.8	984	12.3	1,289	6.8
2006	317	2.9	954	11.9	1,271	6.7
2007	261	2.4	914	11.4	1,175	6.2
2008	305	2.8	895	11.2	1,200	6.3
2009	246	2.2	760	9.5	1,006	5.3
2010	243	2.2	711	8.7	954	4.9
2011	221	2.0	689	8.4	910	4.7
2012	215	1.9	651	8.0	866	4.5
2013	217	1.9	656	8.0	873	4.5
2014	202	1.8	585	7.2	787	4.1

*Rate calculations are based on United States decennial Census data; per 100,000 population

**Figures after 1974 reflect a nationally revised case definition that includes reactivated cases

Source: New York State Department of Health Bureau of Tuberculosis Control

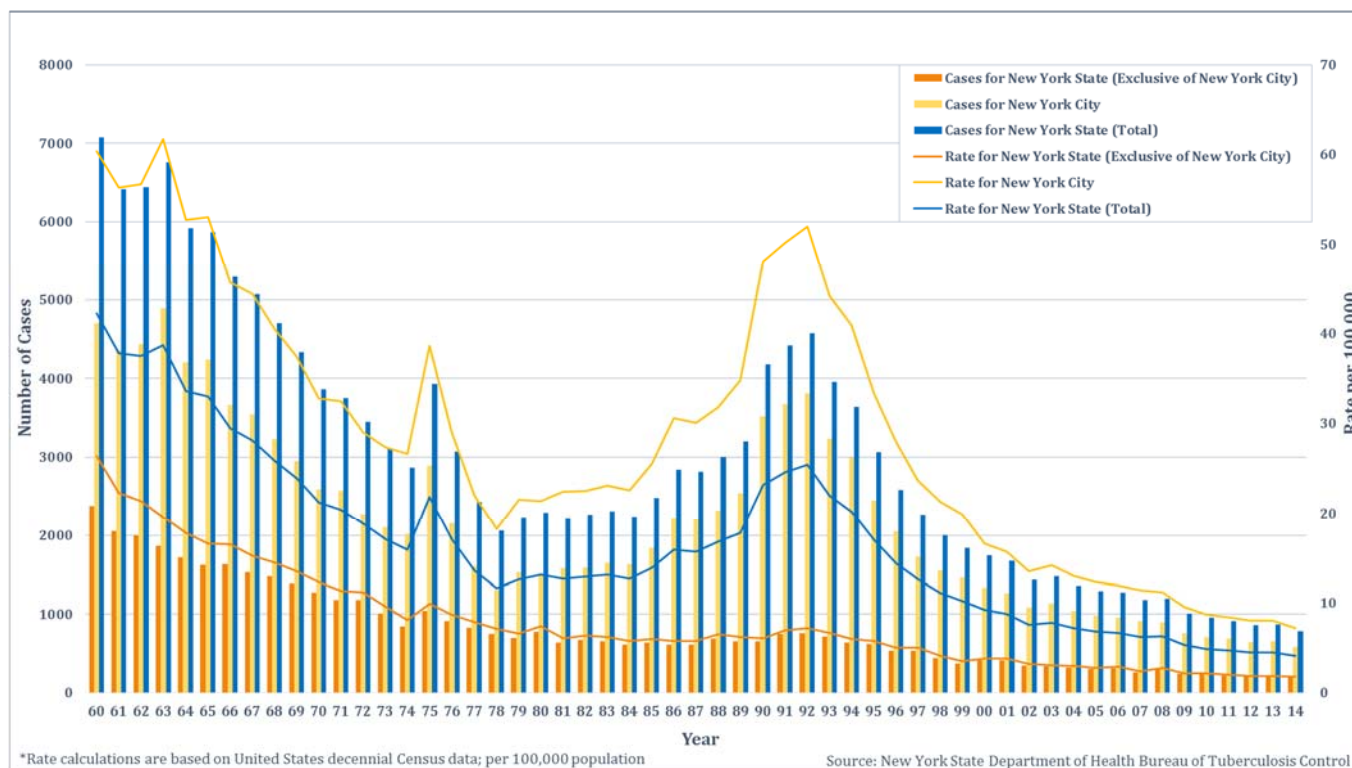
TUBERCULOSIS CASES AND RATES

From 2013 to 2014, TB cases and rates continued to decline statewide. In 2014, a total of 787 cases were reported in New York State, representing a 9.9 percent decrease from the 873 cases reported in 2013 and an 88.9 percent decrease from the 7,075 cases reported in 1960. Nearly three-quarters of the state's TB morbidity is concentrated in New York City.

In 2014, New York City reported 74.3 percent (N=585) of the total cases despite having only 42 percent of the state population. The rest of the state reported 202 cases, which was a 6.9 percent decrease compared to the 217 reported in 2013.

The rate of TB in New York State is greatly influenced by the high morbidity in New York City. Outside of New York City, the rate in 2014 was 1.8 per 100,000 population, but New York City reported a rate of 7.2 per 100,000, resulting in an overall rate of 4.1 per 100,000 population for the whole state.

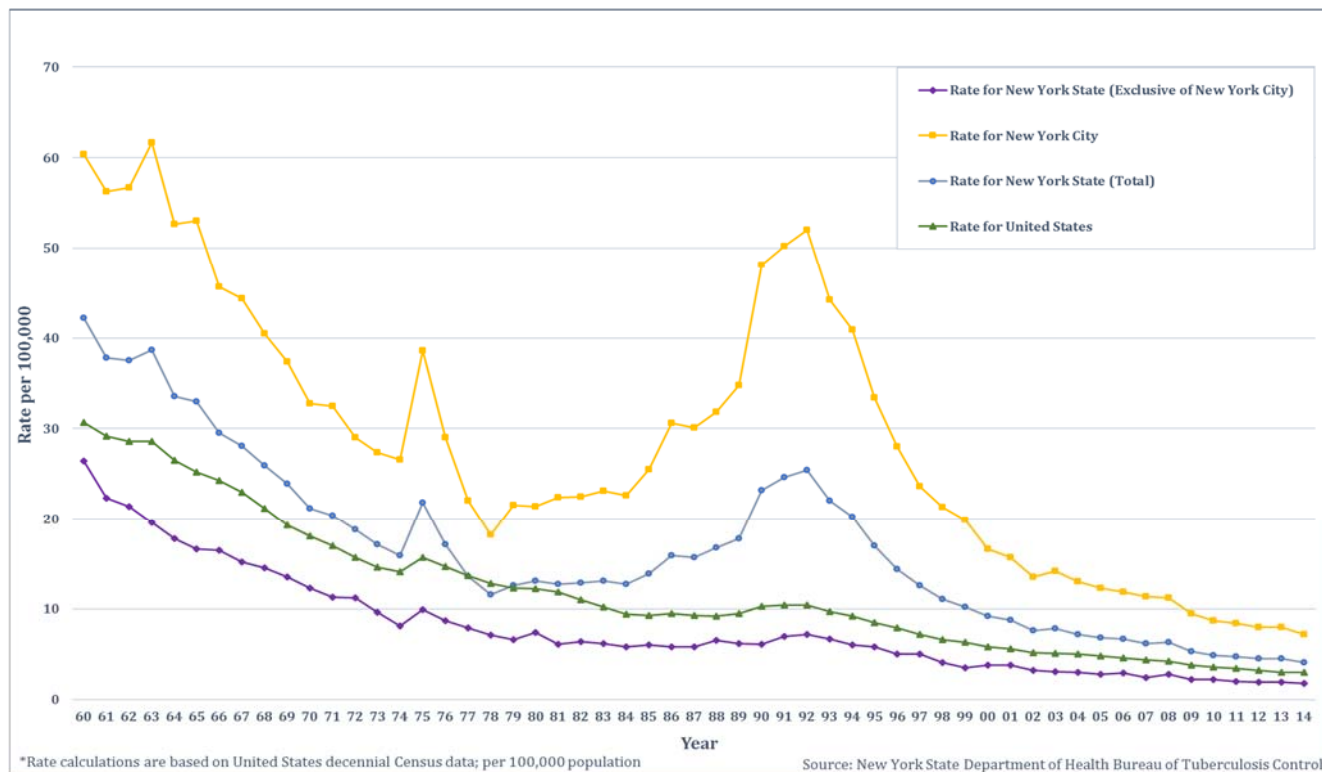
Figure 1. Tuberculosis Cases and Rates,* New York State, 1960-2014



Over the last 50 years, there have been two peaks in TB morbidity where the number and rate of TB substantially increased. The peak in 1975 can be explained by a change in the case definition to include reactivated TB cases. The increase that began in the mid-1980s and extended through the early 1990s was driven mainly by the resurgence of TB cases in New York City. This rise was largely due to two factors. One was the HIV/AIDS epidemic that started in the early 1980s. The other was the reduction of TB control resources combined with the rise in high risk populations such as foreign-born and homeless.

TUBERCULOSIS CASES AND RATES

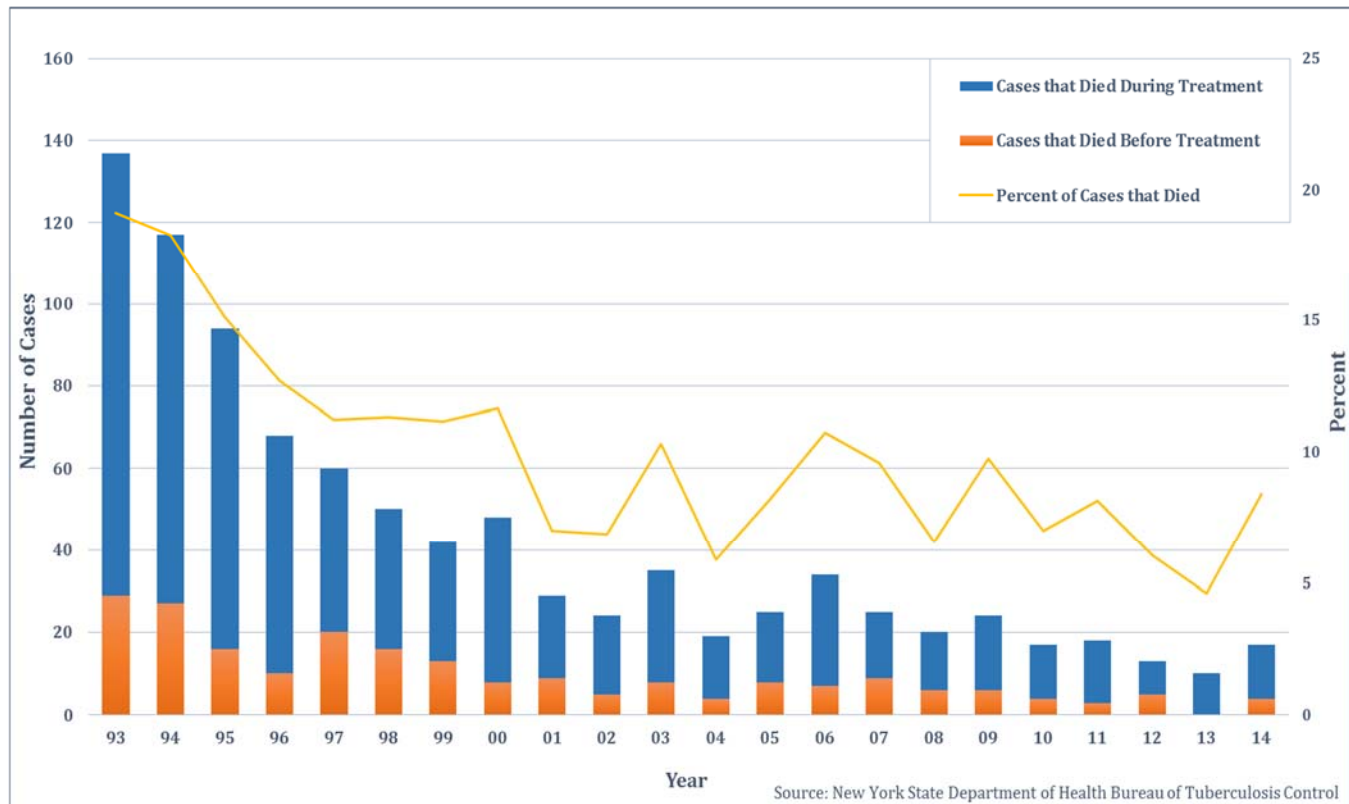
Figure 2. Tuberculosis Case Rates,* New York State and the United States, 1960-2014



Historically, TB case rates in New York State (exclusive of New York City) have been lower than the national average, while case rates in New York City have exceeded national rates. In 2014, the national case rate was 3.0 per 100,000 population and ranged from 0.3 to 9.6 per 100,000 population across all the states. New York State ranked third based on the number of cases (N=787) and sixth based on incidence rate (4.1 per 100,000 population), but these rankings were largely influenced by New York City which, by itself, would have ranked fourth nationally based on number of cases (N=585) and third based on incidence rate (7.2 per 100,000 population).

TUBERCULOSIS CASES AND RATES

Figure 3. Number and Percent of Deaths Among Tuberculosis Cases, New York State (Exclusive of New York City), 1993-2014



The number and percent of deaths among TB cases in New York State (exclusive of New York City) decreased considerably following the last epidemic that peaked in the early 1990s. This drop in mortality slowed by 1997 and has varied each year since 2000. The deaths portrayed in Figure 3 were not all TB-related.

Among the reported TB cases in New York State (exclusive of New York City), there were 17 total deaths in 2014. The cause of death was TB-related for six cases, one of which was diagnosed at death before treatment could be started. Of the remaining five cases, four were over 60 years of age with other comorbidities such as HIV, diabetes, immunosuppression (other than HIV/AIDS), and end-stage renal failure.

GEOGRAPHIC DISTRIBUTION

Table 2. Tuberculosis Cases and Rates* by County, New York State, 2010-2014

County	2010		2011		2012		2013		2014	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Albany	10	3.3	8	2.6	6	2.0	5	1.6	7	2.3
Allegany	1	2.0	0	---	0	---	0	---	0	---
Broome	1	0.5	1	0.5	5	2.5	1	0.5	0	---
Cattaraugus	0	---	0	---	0	---	0	---	0	---
Cayuga	0	---	1	1.2	0	---	1	1.2	2	2.5
Chautauqua	1	0.7	0	---	0	---	0	---	0	---
Chemung	0	---	0	---	1	1.1	1	1.1	0	---
Chenango	0	---	0	---	0	---	0	---	0	---
Clinton	0	---	0	---	2	2.4	1	1.2	0	---
Columbia	1	1.6	0	---	2	3.2	0	---	2	3.2
Cortland	0	---	0	---	1	2.0	0	---	0	---
Delaware	0	---	1	2.1	0	---	0	---	0	---
Dutchess	9	3.0	3	1.0	4	1.3	4	1.3	7	2.4
Erie	11	1.2	14	1.5	19	2.1	21	2.3	16	1.7
Essex	0	---	0	---	0	---	0	---	1	2.5
Franklin	0	---	0	---	0	---	0	---	0	---
Fulton	0	---	0	---	0	---	1	1.8	0	---
Genesee	1	1.7	2	3.3	0	---	0	---	0	---
Greene	0	---	0	---	0	---	3	6.1	0	---
Hamilton	0	---	0	---	0	---	0	---	0	---
Herkimer	0	---	0	---	0	---	1	1.5	0	---
Jefferson	0	---	1	0.9	0	---	2	1.7	1	0.9
Lewis	0	---	0	---	0	---	0	---	0	---
Livingston	0	---	0	---	0	---	2	3.1	0	---
Madison	0	---	0	---	0	---	0	---	0	---
Monroe	16	2.1	19	2.6	14	1.9	22	3.0	20	2.7
Montgomery	1	2.0	0	---	0	---	0	---	0	---
Nassau	48	3.6	33	2.5	36	2.7	40	3.0	33	2.5
Niagara	0	---	1	0.5	2	0.9	3	1.4	3	1.4
Oneida	7	3.0	8	3.4	5	2.1	8	3.4	3	1.3
Onondaga	13	2.8	8	1.7	11	2.4	9	1.9	10	2.1
Ontario	1	0.9	3	2.8	0	---	0	---	0	---
Orange	5	1.3	9	2.4	6	1.6	9	2.4	8	2.1
Orleans	1	2.3	1	2.3	0	---	0	---	0	---
Oswego	0	---	0	---	3	2.5	0	---	1	0.8
Otsego	0	---	0	---	0	---	0	---	0	---
Putnam	0	---	4	4.0	0	---	0	---	2	2.0
Rensselaer	3	1.9	2	1.3	3	1.9	1	0.6	2	1.3
Rockland	21	6.7	10	3.2	11	3.5	15	4.8	11	3.5
Saratoga	2	0.9	0	---	1	0.5	2	0.9	1	0.5
Schenectady	5	3.2	3	1.9	3	1.9	3	1.9	3	1.9
Schoharie	0	---	0	---	0	---	0	---	0	---
Schuyler	0	---	0	---	0	---	0	---	0	---
Seneca	0	---	0	---	2	5.7	0	---	0	---
St. Lawrence	0	---	0	---	1	0.9	1	0.9	0	---
Steuben	3	3.0	0	---	0	---	1	1.0	0	---
Suffolk	40	2.7	43	2.9	33	2.2	22	1.5	35	2.3
Sullivan	1	1.3	1	1.3	0	---	1	1.3	1	1.3
Tioga	0	---	0	---	0	---	0	---	0	---
Tompkins	0	---	3	3.0	4	3.9	1	1.0	4	3.9
Ulster	1	0.5	1	0.5	3	1.6	4	2.2	0	---
Warren	0	---	0	---	0	---	0	---	0	---
Washington	0	---	0	---	0	---	1	1.6	1	1.6
Wayne	1	1.1	3	3.2	0	---	1	1.1	1	1.1
Westchester	37	3.9	38	4.0	35	3.7	30	3.2	27	2.8
Wyoming	1	2.4	0	---	0	---	0	---	0	---
Yates	1	3.9	0	---	2	7.9	0	---	0	---
New York State Total (Exclusive of New York City)	243	2.2	221	2.0	215	1.9	217	1.9	202	1.8
Bronx	116	8.4	102	7.4	101	7.3	91	6.6	99	7.1
Kings	233	9.3	214	8.5	190	7.6	197	7.9	192	7.7
New York	90	5.7	109	6.9	93	5.9	102	6.4	72	4.5
Queens	259	11.6	250	11.2	244	10.9	242	10.8	212	9.5
Richmond	13	2.8	14	3.0	23	4.9	24	5.1	10	2.1
New York City Total	711	8.7	689	8.4	651	8.0	656	8.0	585	7.2
STATE TOTAL	954	4.9	910	4.7	866	4.5	873	4.5	787	4.1

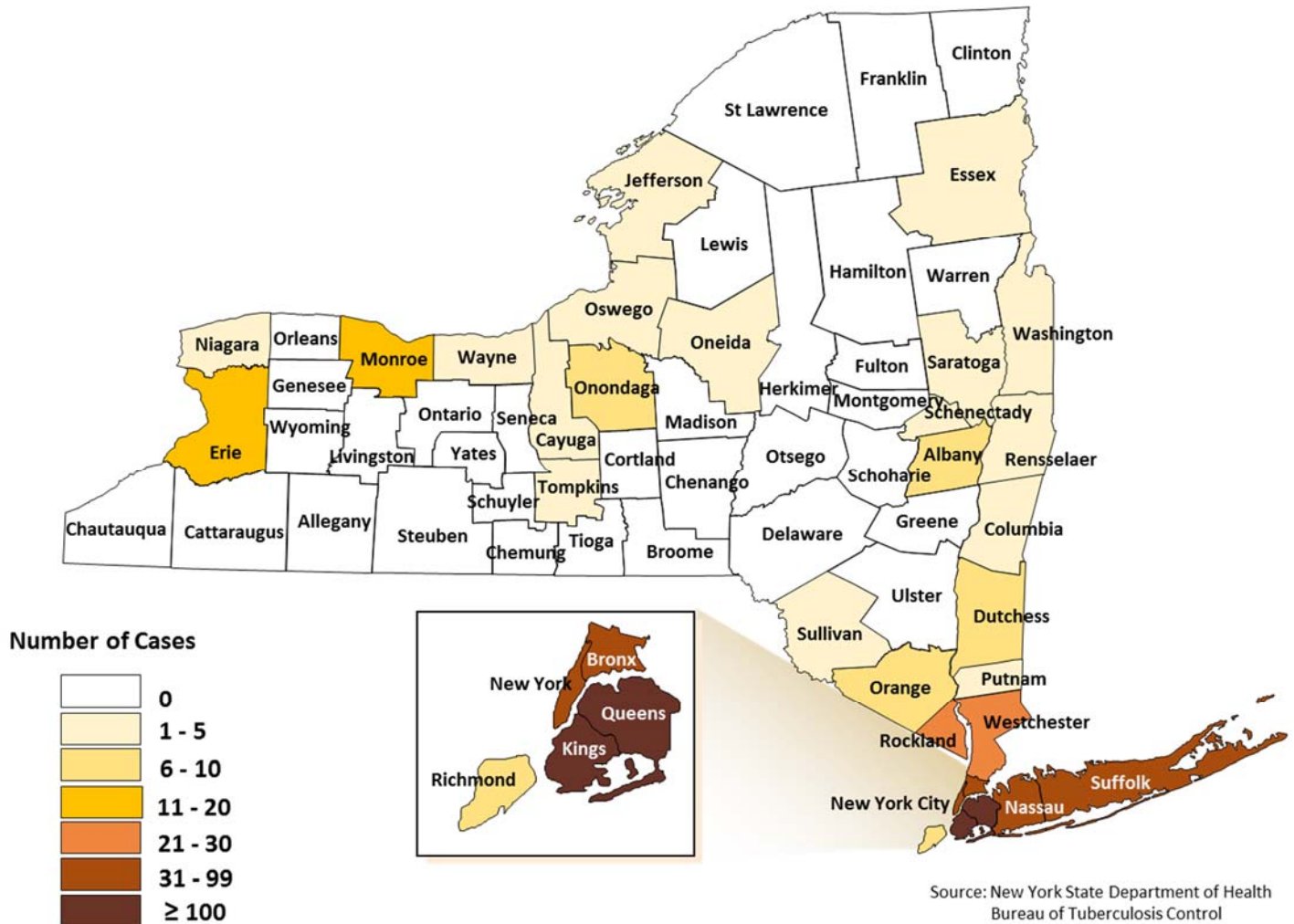
*Rate calculations are based on 2010 United States Census data; per 100,000 population

Source: New York State Department of Health
Bureau of Tuberculosis Control

GEOGRAPHIC DISTRIBUTION

TB morbidity is not evenly distributed across NYS and varies greatly between counties. In 2014, all five boroughs of New York City and 25 (43.9%) of the 57 upstate counties reported at least one TB case. Higher numbers of cases were seen in the metropolitan areas. As in previous years, nearly half of all TB morbidity reported for NYS (exclusive of New York City) was concentrated in Nassau, Suffolk and Westchester counties (47.0%, N=95/202).

Figure 4. Distribution of Tuberculosis Cases in New York State, 2014



DEMOGRAPHIC CHARACTERISTICS

Table 3. Tuberculosis Cases and Rates* by Gender, Age, and Race/Ethnicity, New York State, 2014**

Demographic Characteristics		New York State (Exclusive of New York City)		New York City		New York State (Total)	
		No.	Rate	No.	Rate	No.	Rate
Gender	Male	116	2.1	373	9.6	489	5.2
	Female	86	1.5	212	4.9	298	3.0
Age Group	Under 5 years	6	0.9	4	0.8	10	0.9
	5-9	0	---	3	0.6	3	0.3
	10-14	1	0.1	7	1.5	8	0.7
	15-19	4	0.5	21	3.9	25	1.8
	20-24	18	2.3	49	7.6	67	4.7
	25-34	32	2.5	104	7.5	136	5.1
	35-44	33	2.3	85	7.4	118	4.5
	45-54	29	1.6	79	7.1	108	3.8
	55-64	28	2.0	98	11.0	126	5.5
65+	51	3.1	135	13.6	186	7.1	
Race/Ethnicity	White, non-Hispanic	35	0.4	36	1.3	71	0.6
	Black, non-Hispanic	22	2.4	128	6.9	150	5.4
	Hispanic	49	4.5	146	6.2	195	5.7
	Asian	92	24.3	245	23.8	337	24.0
	Pacific Islander	1	39.6	0	---	1	18.8
	Multiple Races	1	0.6	23	15.5	24	7.4
	Other/Unknown	2	8.4	7	12.1	9	11.0
TOTAL CASES		202	1.8	585	7.2	787	4.1

*Rate calculations are based on 2010 United States Census data; per 100,000 population

**Age calculations are based on date of birth and report date

Source: New York State Department of Health
Bureau of Tuberculosis Control

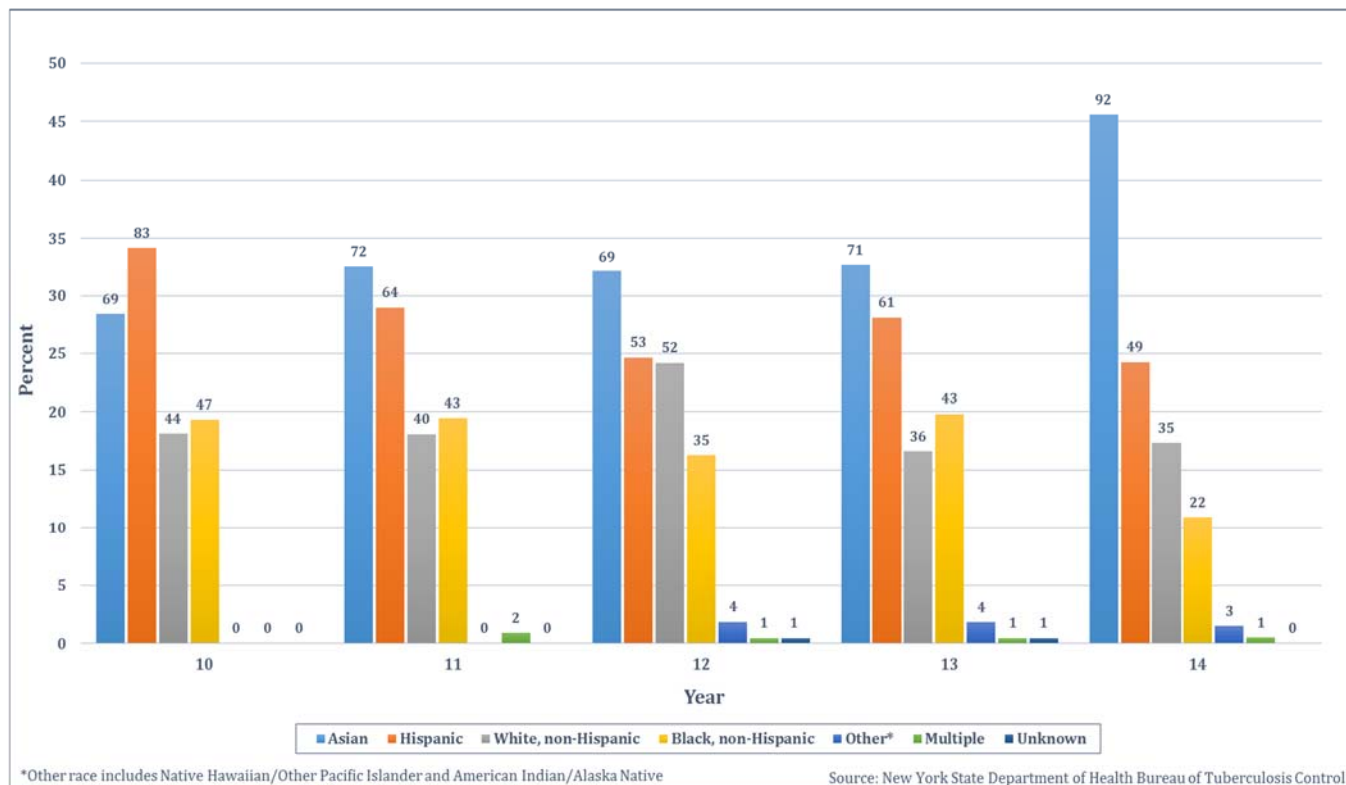
For New York State as a whole, the incidence rate for males was 1.7 times that of females (5.2 per 100,000 and 3.0 per 100,000, respectively) in 2014. This gender disparity was greatest in New York City where males had a rate 2.0 times greater than females (9.6 compared to 4.9 per 100,000). Males in New York City also had a case rate 4.6 times that of males in the rest of the state (9.6 compared to 2.1 per 100,000).

TB cases in the 65 years and older age group had the highest incidence rate in New York City, as well as the rest of the state (13.6 per 100,000 and 3.1 per 100,000, respectively). Statewide, the lowest rates were seen among the high risk pediatric population (<15 years old), with those in the 5-9 year old age group contributing only three cases for a rate of 0.6 per 100,000 in New York City and 0.3 per 100,000 for the whole state.

In 2014, the highest incidence rate for TB was seen among Asians in New York State (24.0 per 100,000). In previous years, the rate for Asians was considerably higher in New York City compared to the rest of the state, but in 2014 the rate for Asians outside of New York City slightly exceeded that found within the city (24.3 per 100,000 and 23.8 per 100,000, respectively).

DEMOGRAPHIC CHARACTERISTICS

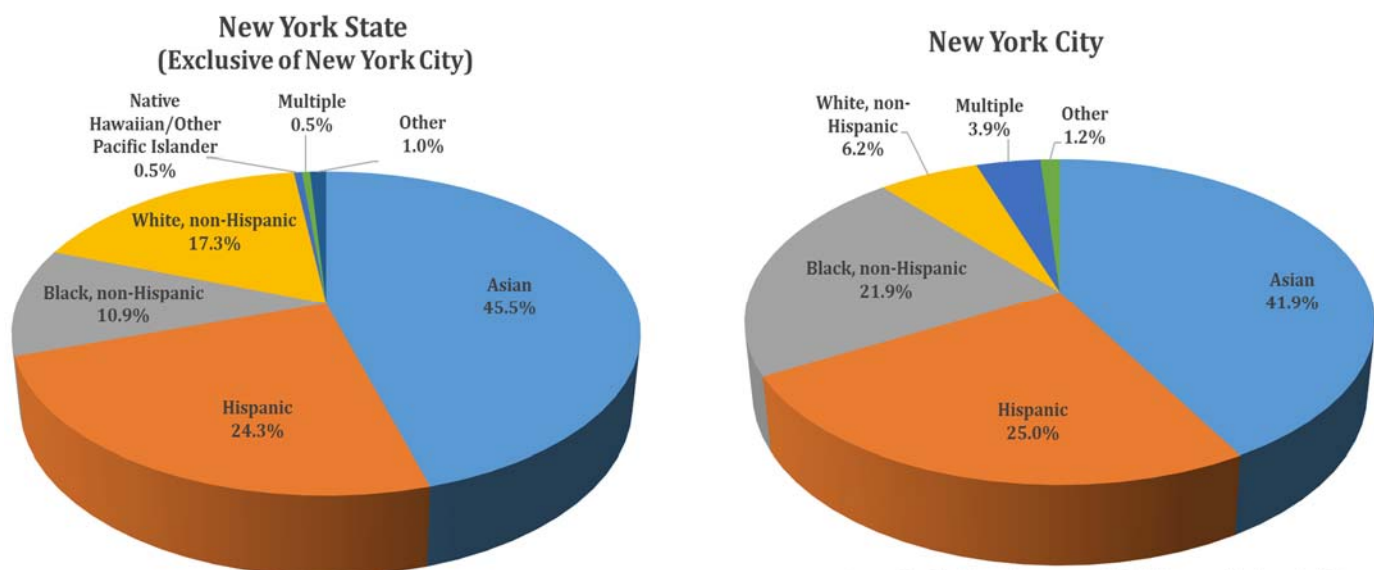
Figure 5. Number and Percent of Tuberculosis Cases by Race/Ethnicity, New York State (Exclusive of New York City), 2010-2014



Over the last five years, the majority of TB cases reported in New York State (exclusive of New York City) have been of Asian and Hispanic descent. Between 2010 and 2011, the proportion of Asians with TB increased from 28.4 percent to 32.6 percent, surpassing the proportion of Hispanic cases, which decreased from 34.2 percent to 29.0 percent. In the following years, Asians have continued to represent a larger percentage of reported cases than any other racial/ethnic group, especially in 2014 when the percentage of Asian cases dramatically increased to 45.5 percent (N=92/202).

DEMOGRAPHIC CHARACTERISTICS

Figure 6. Race/Ethnicity of Tuberculosis Cases, New York State, 2014

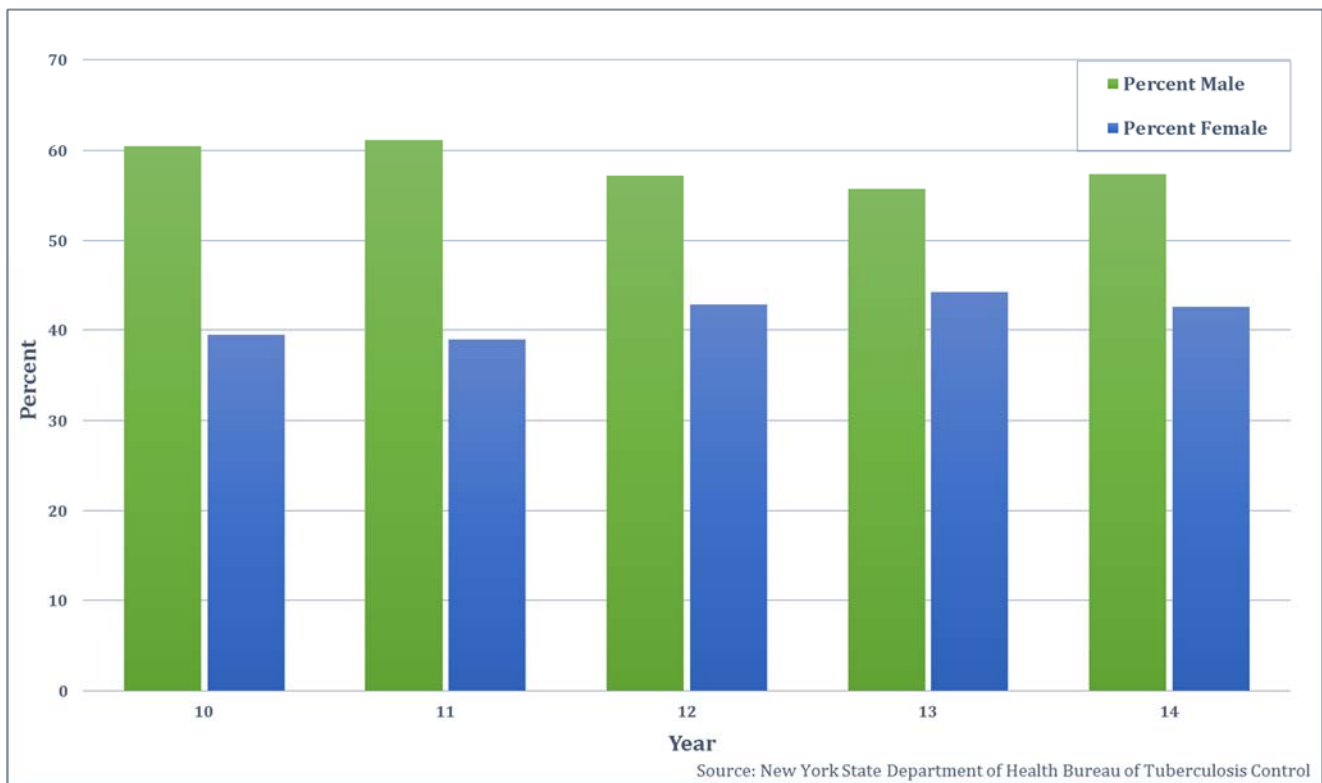


Source: New York State Department of Health Bureau of Tuberculosis Control

In New York State (exclusive of New York City), 45.5 percent (N=92/202) of reported cases in 2014 were Asian and an additional 24.3 percent (N=49/202) were Hispanic. Similar percentages were seen in New York City, where Asians contributed 41.9 percent (N=245/585) of the cases and Hispanics represented 25.0 percent (N=146/585). In contrast, the proportion of white, non-Hispanics was nearly three times lower in New York City compared to the remainder of the state (6.2% and 17.3%, respectively).

DEMOGRAPHIC CHARACTERISTICS

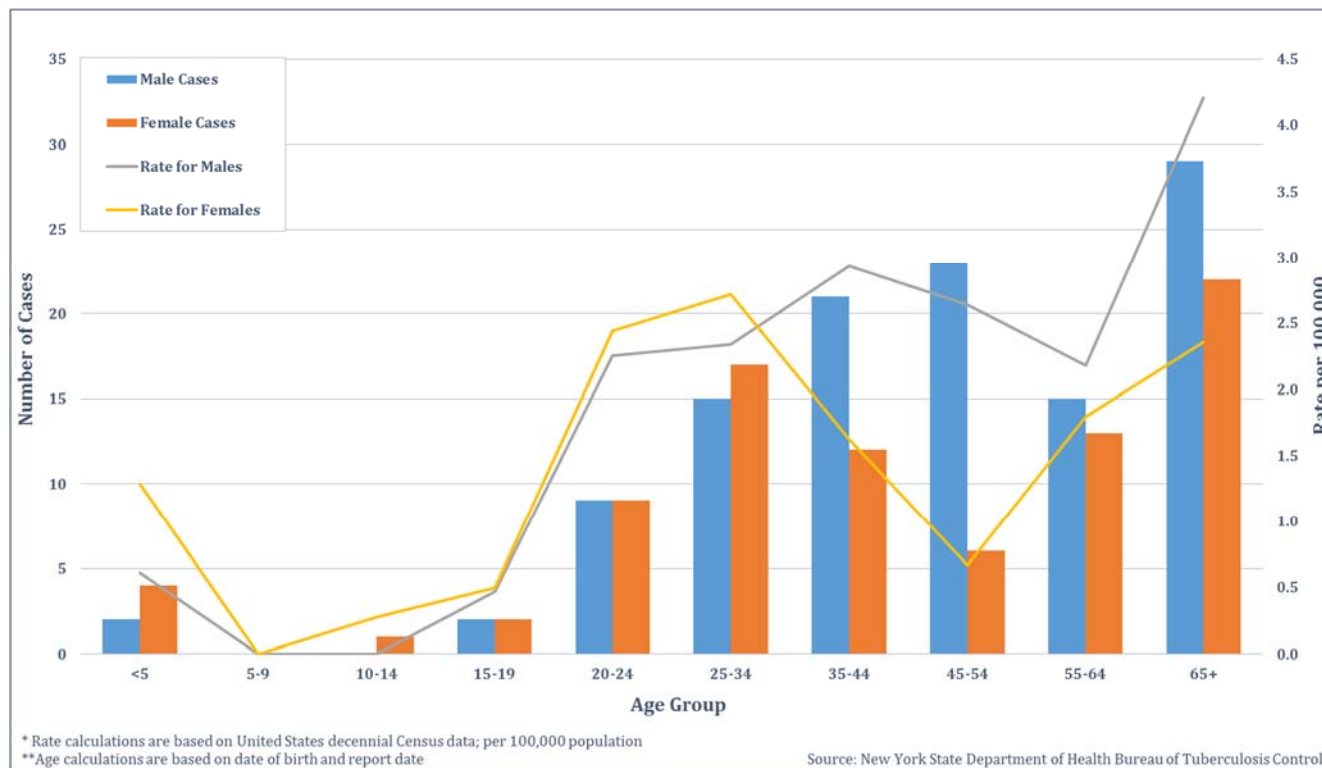
Figure 7. Percent of Tuberculosis Cases by Gender, New York State (Exclusive of New York City), 2010-2014



Over the last five years, males have consistently comprised a higher proportion of cases compared to females in New York State (exclusive of New York City). In 2014, 57.4 percent (N=116/202) of reported cases were male.

DEMOGRAPHIC CHARACTERISTICS

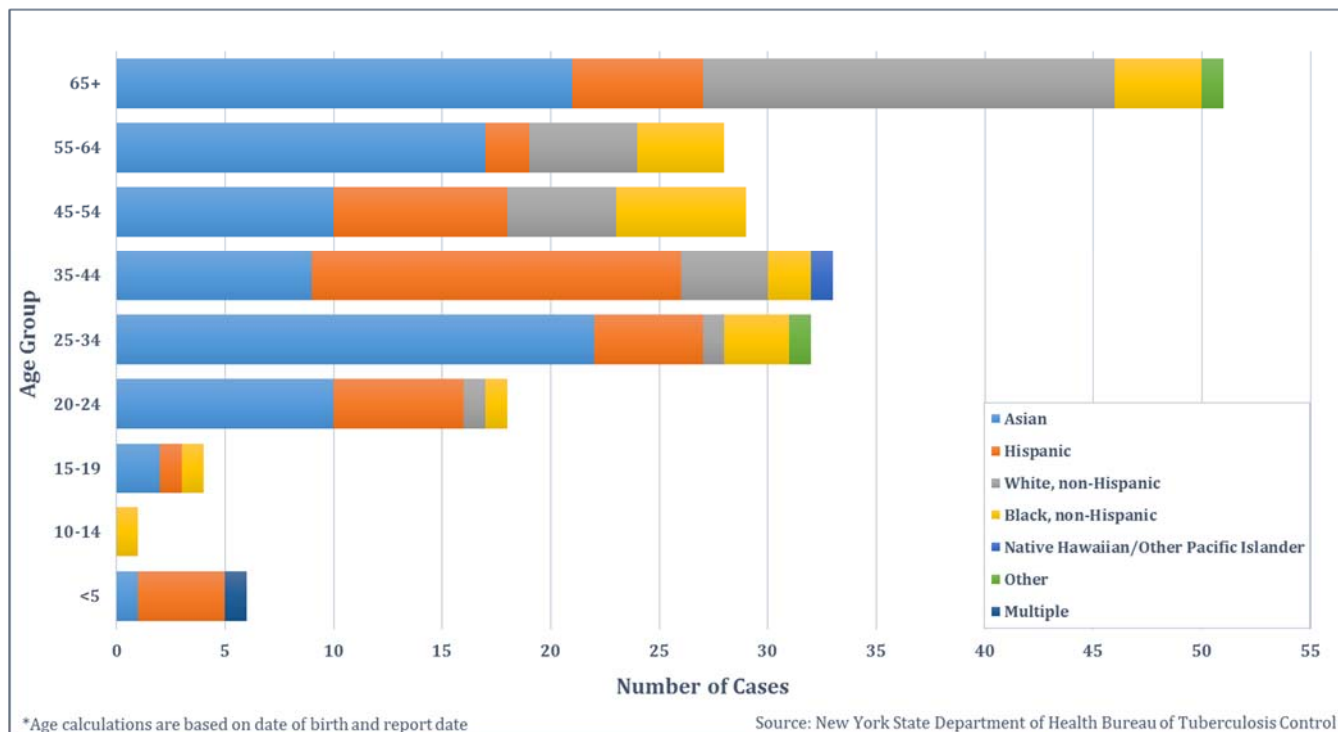
Figure 8. Tuberculosis Cases and Rates* by Age and Gender, New York State (Exclusive of New York City), 2014**



In 2014, the difference in TB morbidity between males and females in New York State (exclusive of New York City) varied depending on age. The distribution and rate of males and females across age groups was relatively even among TB cases under 35 years of age, but for cases 35 years of age or older, the number and rate for males greatly exceeded that of females. The largest gender gap in TB morbidity was seen in the 45-54 year old age group where the case rate for males was 3.7 times that of females (2.6 per 100,000 for males; 0.7 per 100,000 for females). Additionally, the number of male cases was four times greater than the number of female cases in this age group (N=24 for males; N=6 for females).

DEMOGRAPHIC CHARACTERISTICS

Figure 9. Tuberculosis Cases by Age* and Race/Ethnicity, New York State (Exclusive of New York City), 2014



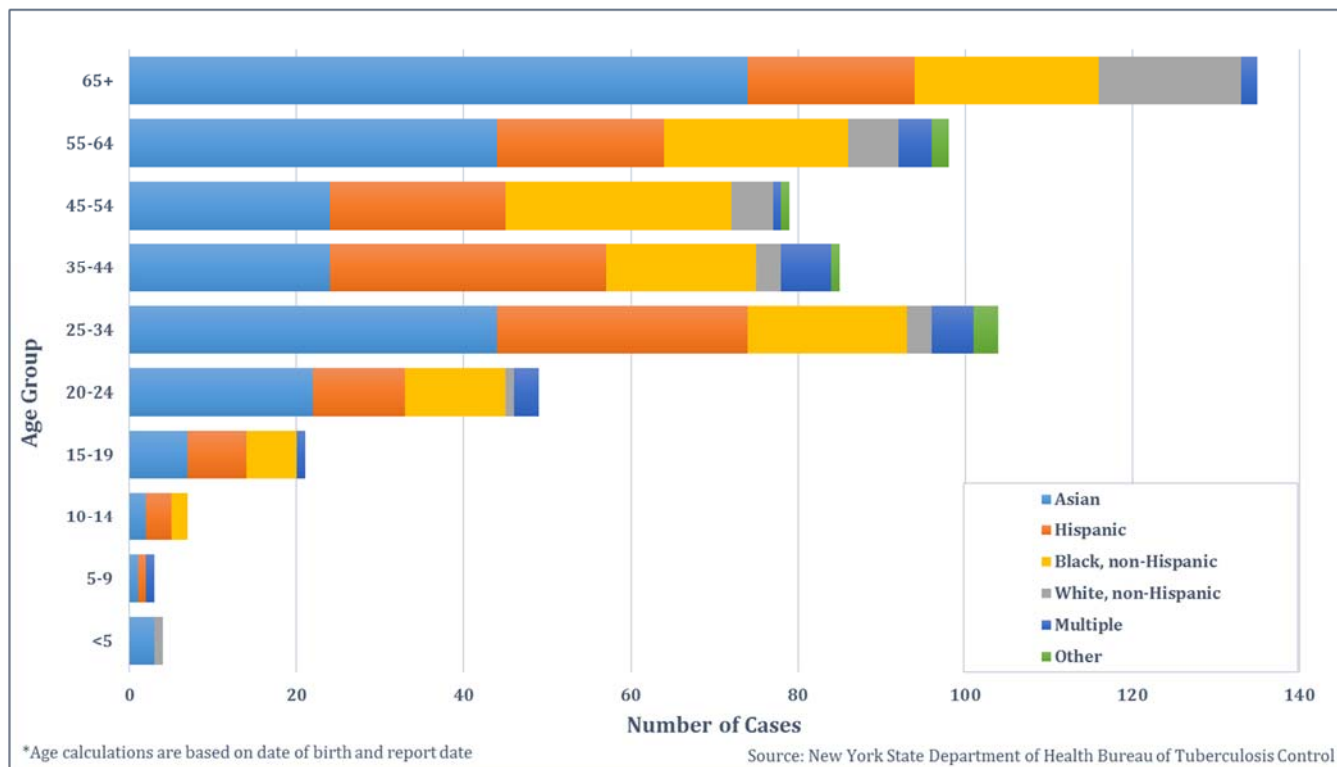
In 2014, a quarter of reported cases in New York State (exclusive of New York City) were 65 years of age and older (25.2%, N=51/202). Among the 51 cases in this age group, 21 (41.2%) were Asian and 19 (37.3%) were white, non-Hispanic.

The second largest number of TB cases reported in 2014 for New York State (exclusive of New York City) was seen in the 35-44 year age group (N=33) followed by the 25-34 year age group (N=32). Over two-thirds (N=22/32, 68.8%) of the cases in the 25-34 year age group were Asian and over half (N=17/33, 51.5%) of the cases in the 35-44 year age group were Hispanic.

In contrast to the broad age distribution of nearly every other race and ethnicity, all of the white, non-Hispanic TB cases were at least 20 years of age, with 54.3 percent (N=19/35) being 65 years of age or older.

DEMOGRAPHIC CHARACTERISTICS

Figure 10. Tuberculosis Cases by Age* and Race/Ethnicity, New York City, 2014

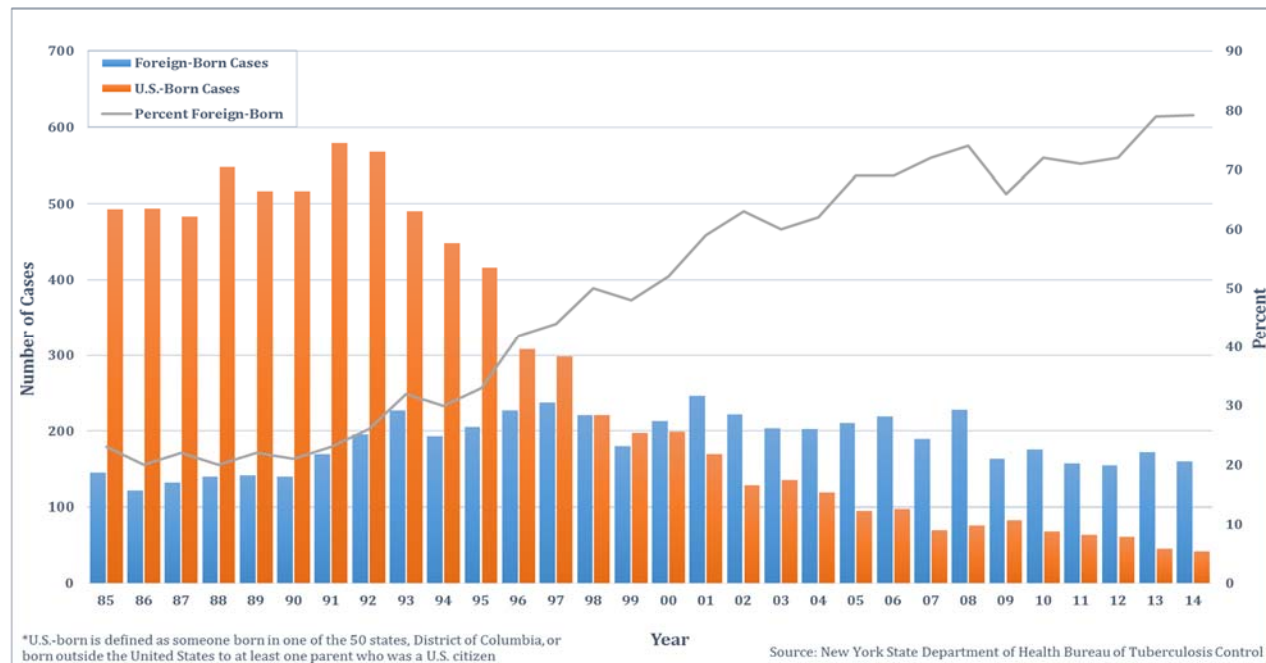


In New York City, the largest number of TB cases reported in 2014 was seen in the 65 years of age and older group (N=135). Among these 135 cases, 74 (54.8%) were Asian, 22 (16.3%) were black, non-Hispanic and 20 (14.8%) were Hispanic.

The second largest number of TB cases in New York City was identified in the 25-34 year age group (N=104). Forty-four (42.3%) cases in this age group were Asian and 30 (28.8%) cases were Hispanic.

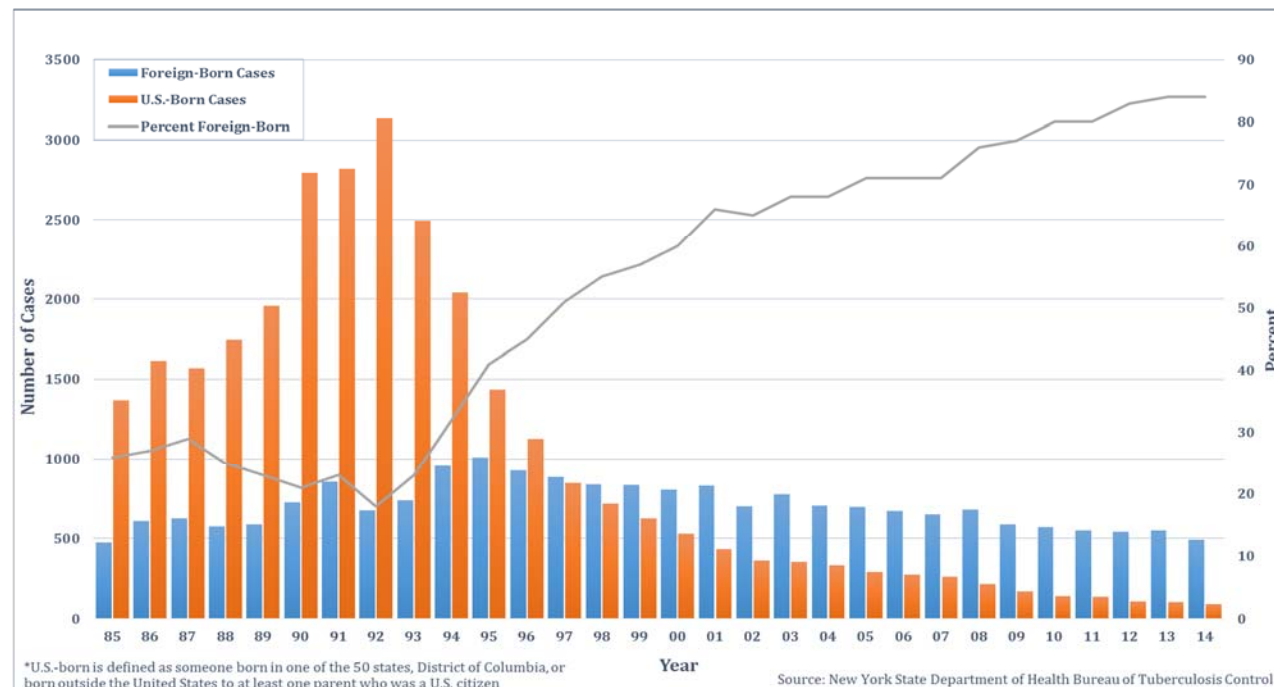
TUBERCULOSIS IN THE FOREIGN-BORN

Figure 11a. Number and Percent of Tuberculosis Cases by U.S.-Born* and Foreign-Born Status, New York State (Exclusive of New York City), 1985-2014



In 2014, there were 160 foreign-born cases in New York State (exclusive of New York City), a decrease from the 172 reported in 2013. Despite this decrease in number, the overall foreign-born percentage remained at 79 percent. Similarly, in New York City, the number of foreign-born TB cases decreased from 551 in 2013 to 491 in 2014, but the overall percentage remained at 84 percent.

Figure 11b. Number and Percent of Tuberculosis Cases by U.S.-Born* and Foreign-Born Status, New York City, 1985-2014



TUBERCULOSIS IN THE FOREIGN-BORN

Table 4. Tuberculosis Cases by Country of Origin,* New York State, 2014

Country	New York State (Exclusive of New York City)	New York City	New York State (Total)
China	15	117	132
United States	41	78	119
India	23	28	51
Mexico	7	30	37
Philippines	12	25	37
Ecuador	11	24	35
Dominican Republic	1	33	34
Haiti	4	26	30
Nepal	7	14	21
Bangladesh	1	17	18
Pakistan	2	15	17
Honduras	6	10	16
Guyana	0	13	13
Burma	5	7	12
Bhutan	11	0	11
Korea, South	4	7	11
Puerto Rico**	1	9	10
Guatemala	4	5	9
Peru	6	3	9
El Salvador	5	3	8
Ghana	1	7	8
Jamaica	1	7	8
Taiwan	2	6	8
Vietnam	3	5	8
Hong Kong	0	7	7
Senegal	0	7	7
Colombia	2	4	6
Nigeria	3	3	6
Poland	1	5	6
Trinidad and Tobago	1	5	6
Ukraine	1	5	6
Other Countries	21	59	80
Unknown	0	1	1
TOTAL CASES	202	585	787

*Only countries representing ≥5 TB cases are named

**Puerto Rico and other U.S. Territories are considered separately

Source: New York State Department of Health
Bureau of Tuberculosis Control

In 2014, there were 80 different countries represented by the 787 TB cases reported in New York State, 31 of which were represented by at least five cases. Similar to previous years, the most common country of origin for foreign-born TB cases reported by New York State (exclusive of New York City) was India (N=23) and for New York City, the most common country was China (N=117). The number of cases born in the U.S. has historically been greater than any other single country, but in 2014 this number fell below that of China (N=119 and N=132, respectively).

TUBERCULOSIS IN THE FOREIGN-BORN

Table 5. Number and Percent of Foreign-Born Tuberculosis Cases by County, New York State (Exclusive of New York City), 2014

County	Total Number	U.S.-Born*	Foreign-Born Number	Foreign-Born Percent
Albany	7	3	4	57.1
Allegany	0	0	0	0.0
Broome	0	0	0	0.0
Cattaraugus	0	0	0	0.0
Cayuga	2	2	0	0.0
Chautauqua	0	0	0	0.0
Chemung	0	0	0	0.0
Chenango	0	0	0	0.0
Clinton	0	0	0	0.0
Columbia	2	1	1	50.0
Cortland	0	0	0	0.0
Delaware	0	0	0	0.0
Dutchess	7	2	5	71.4
Erie	16	5	11	68.8
Essex	1	1	0	0.0
Franklin	0	0	0	0.0
Fulton	0	0	0	0.0
Genesee	0	0	0	0.0
Greene	0	0	0	0.0
Hamilton	0	0	0	0.0
Herkimer	0	0	0	0.0
Jefferson	1	1	0	0.0
Lewis	0	0	0	0.0
Livingston	0	0	0	0.0
Madison	0	0	0	0.0
Monroe	20	3	17	85.0
Montgomery	0	0	0	0.0
Nassau	33	7	26	78.8
Niagara	3	2	1	33.3
Oneida	3	0	3	100.0
Onondaga	10	0	10	100.0
Ontario	0	0	0	0.0
Orange	8	2	6	75.0
Orleans	0	0	0	0.0
Oswego	1	0	1	100.0
Otsego	0	0	0	0.0
Putnam	2	1	1	50.0
Rensselaer	2	0	2	100.0
Rockland	11	1	10	90.9
St. Lawrence	0	0	0	0.0
Saratoga	1	0	1	100.0
Schenectady	3	0	3	100.0
Schoharie	0	0	0	0.0
Schuyler	0	0	0	0.0
Seneca	0	0	0	0.0
Steuben	0	0	0	0.0
Suffolk	35	8	27	77.1
Sullivan	1	0	1	100.0
Tioga	0	0	0	0.0
Tompkins	4	0	4	100.0
Ulster	0	0	0	0.0
Warren	0	0	0	0.0
Washington	1	1	0	0.0
Wayne	1	1	0	0.0
Westchester	27	1	26	96.3
Wyoming	0	0	0	0.0
Yates	0	0	0	0.0
TOTAL CASES	202	42	160	79.2

In 2014, there were 160 foreign-born TB cases reported in New York State (exclusive of New York City). Nearly half (49.4%, N= 79) of these cases were identified in Nassau, Suffolk and Westchester alone. Among the other higher morbidity counties that reported at least 10 foreign-born cases, Erie reported the lowest foreign-born percentage (68.8%) while Onondaga reported the highest percentage (100.0%). In the remaining counties with foreign-born cases, the number and percentage varied.

*U.S.-born is defined as someone born in one of the 50 states, District of Columbia, or born outside the United States to at least one parent who was a U.S. citizen.

Source: New York State Department of Health Bureau of Tuberculosis Control

TUBERCULOSIS IN THE FOREIGN-BORN

Table 6. Length of Time Foreign-Born Tuberculosis Cases were in the United States Prior to Diagnosis, New York State (Exclusive of New York City), 2014

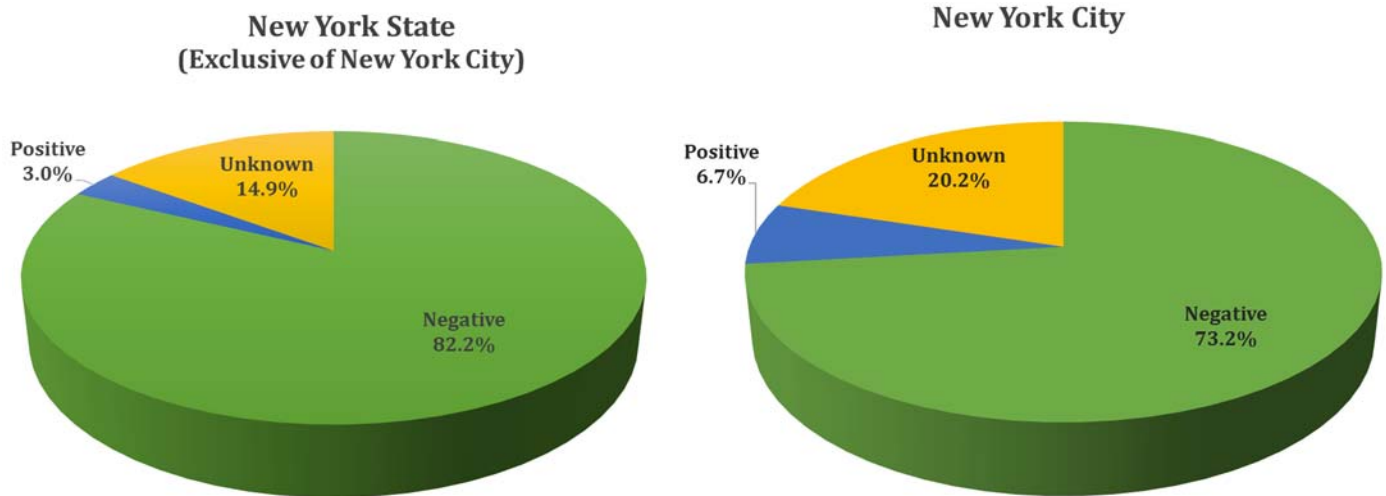
Length of Time in the United States (Years)	No.	%
<1	20	12.5
1-5	48	30.0
6-10	27	16.9
11-20	29	18.1
21-30	13	8.1
31-40	11	6.9
41-50	5	3.1
51-60	4	2.5
Unknown	3	1.9

In New York State (exclusive of New York City), 42.5 percent (N=68/160) of foreign-born TB cases were diagnosed within five years of entering the U.S. Over half (54.4%, N=37) of these 68 cases had entered the U.S. within two years prior to diagnosis. After five years, the number of newly diagnosed cases decline as the number of years in the U.S. increases.

HIV CO-INFECTION

Knowledge of HIV status is essential for the proper management of patients with TB. HIV infection impairs the immune system leaving individuals at greater risk for becoming infected with TB and developing active disease.

Figure 12. HIV Status for Tuberculosis Cases, New York State, 2014

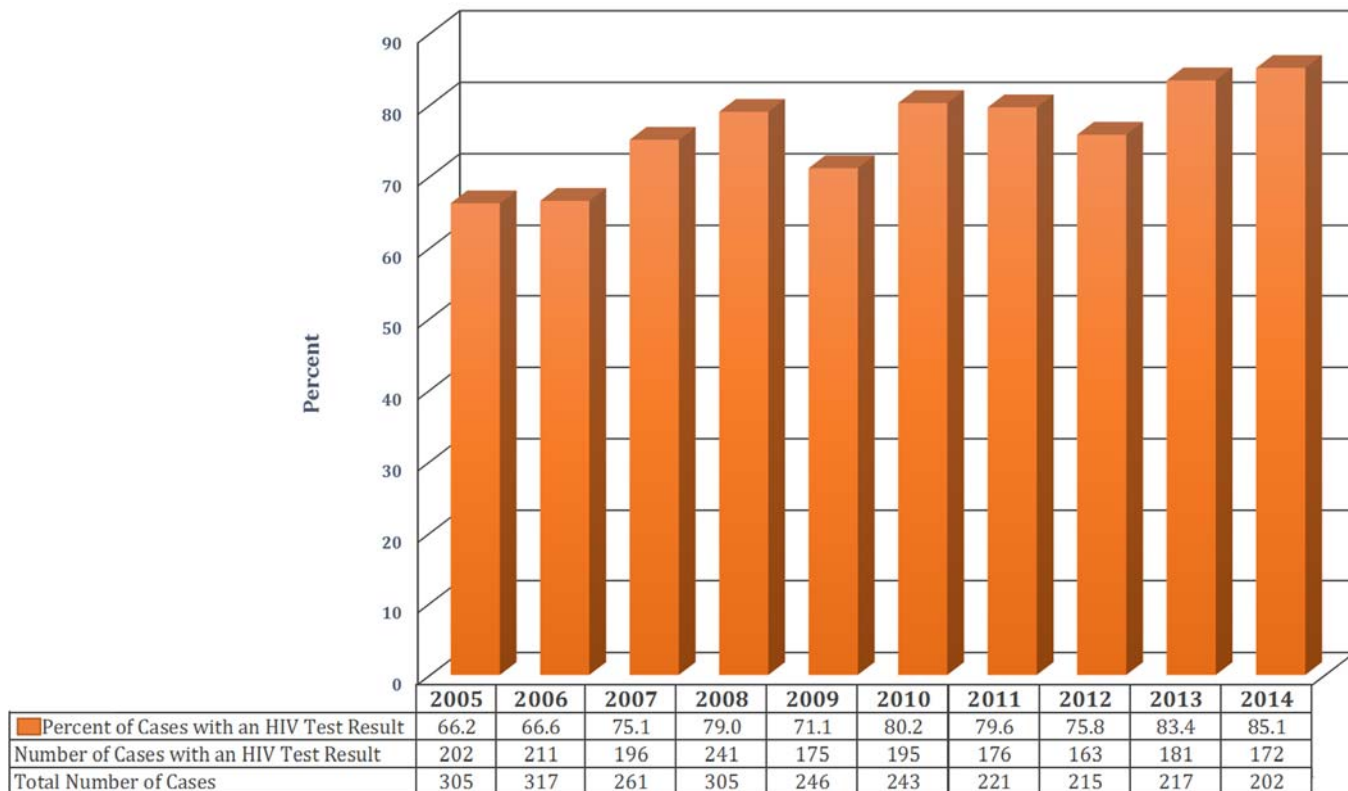


Source: New York State Department of Health Bureau of Tuberculosis Control

Eighty-five percent (N=172/202) of TB cases in New York State (exclusive of New York City) and 80 percent of cases in New York City had a known HIV status in 2014. The co-infection rate for TB cases in New York State (exclusive of New York City) was three percent (N=6/202), which was less than half of that seen in New York City (6.7%, N=39/585). Individuals missing HIV testing information and those who were not offered or had refused testing were considered to have an unknown status.

HIV CO-INFECTION

Figure 13. Number and Percent of Tuberculosis Cases Who Have Been Tested for HIV, New York State (Exclusive of New York City), 2005-2014



Source: New York State Department of Health Bureau of Tuberculosis Control

In New York State (exclusive of New York City), the proportion of TB cases with a known HIV status has increased over the last 10 years. In 2014, 85.1 percent (N=172/202) of TB cases had a documented HIV result, which was an increase of 18.9 percent compared to the 66.2 percent (N=202/305) seen in 2005.

In 2014, only 16.7 percent (N=1/6) of TB cases under five years old had a known HIV status in New York State (exclusive of New York City). The proportion of cases with a known HIV status was also relatively low in the 55-64 year age group (71.4%, N=20/28) and the 65 years and older age group (80.4%, N=41/51).

HIV CO-INFECTION

Table 7a. HIV Status for Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

HIV Test	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Negative	179	73.7	166	75.1	157	73.0	167	77.0	166	82.2
Positive	16	6.6	10	4.5	6	2.8	14	6.5	6	3.0
Refused	28	11.5	23	10.4	25	11.6	19	8.8	19	9.4
Not Offered	17	7.0	20	9.0	23	10.7	13	6.0	7	3.5
Missing/Unknown	3	1.2	2	0.9	4	1.9	4	1.8	4	2.0
TOTAL CASES	243		221		215		217		202	

Source: New York State Department of Health
Bureau of Tuberculosis Control

In 2014, only 15 percent (N=30/202) of TB cases in New York State (excluding New York City) had an unknown HIV status (refused, not offered or missing/unknown). This was the lowest percentage seen over the last five years. The percentage of 2014 cases not offered an HIV test dropped 41.7 percent compared to 2013 (3.5% and 6.0%, respectively). This decline was even more substantial when compared to 2010-2012.

Table 7b. HIV Status for Tuberculosis Cases by Gender, New York State (Exclusive of New York City), 2014

HIV Test	Male		Female		Total	
	No.	%	No.	%	No.	%
Negative	99	85.3	67	77.9	166	82.2
Positive	3	2.6	3	3.5	6	3.0
Refused	9	7.8	10	11.6	19	9.4
Not Offered	3	2.6	4	4.7	7	3.5
Missing/Unknown	2	1.7	2	2.3	4	2.0
TOTAL CASES	116		86		202	

Source: New York State Department of Health
Bureau of Tuberculosis Control

There were 16 female TB cases (18.6%, N=16/86) and 14 male cases (12.1%, N=14/116) reported in New York State (exclusive of New York City) who did not have a known HIV status in 2014. Nearly four percent more female cases refused testing compared to male TB cases (11.6% and 7.8%, respectively).

REASONS FOR EVALUATION

Table 8a. Primary Reason for Evaluation of Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

Primary Reason for Evaluation	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
TB Symptoms	115	47.3	116	52.5	110	51.2	111	51.2	116	57.4
Abnormal Chest Radiograph	70	28.8	54	24.4	54	25.1	48	22.1	42	20.8
Incidental Lab Result	35	14.4	28	12.7	35	16.3	35	16.1	23	11.4
Contact Investigation	4	1.6	10	4.5	4	1.9	6	2.8	9	4.5
Targeted Testing	1	0.4	5	2.3	2	0.9	1	0.5	4	2.0
Immigration Medical Exam	6	2.5	4	1.8	3	1.4	6	2.8	3	1.5
Employment/Administrative Testing	2	0.8	0	0.0	1	0.5	2	0.9	1	0.5
Health Care Worker	1	0.4	0	0.0	1	0.5	0	0.0	1	0.5
Unknown	9	3.7	4	1.8	5	2.3	8	3.7	3	1.5
TOTAL CASES	243		221		215		217		202	

Source: New York State Department of Health
Bureau of Tuberculosis Control

In 2014, 57.4 percent (N=116/202) of cases in New York State (exclusive of New York City) were evaluated as a result of presenting with TB symptoms and another one-third of cases either had an abnormal chest radiograph (N=42/202, 20.8%) or an incidental lab result (N=23/202, 11.4%). Over the past five years, these have continued to be the three most frequently reported reasons for evaluation.

Table 8b. Primary Reason for Evaluation of Tuberculosis Cases by U.S.-born* and Foreign-Born Status, New York State (Exclusive of New York City), 2014

Primary Reason for Evaluation	U.S.-Born		Foreign-Born		Total	
	No.	%	No.	%	No.	%
TB Symptoms	17	40.5	99	61.9	116	57.4
Abnormal Chest Radiograph	13	31.0	29	18.1	42	20.8
Incidental Lab Result	7	16.7	16	10.0	23	11.4
Contact Investigation	4	9.5	5	3.1	9	4.5
Targeted Testing	0	0.0	4	2.5	4	2.0
Immigration Medical Exam	0	0.0	3	1.9	3	1.5
Employment/Administrative Testing	0	0.0	1	0.6	1	0.5
Health Care Worker	0	0.0	1	0.6	1	0.5
Unknown	1	2.4	2	1.3	3	1.5
TOTAL CASES	42		160		202	

*U.S.-born is defined as someone born in one of the 50 states, District of Columbia, or born outside the United States to at least one parent who was a U.S. citizen

Source: New York State Department of Health
Bureau of Tuberculosis Control

Nearly 62 percent (N=99/160) of foreign-born cases in New York State (exclusive of New York City), underwent TB evaluation due to TB symptoms compared to 40.5 percent (N=17/42) of U.S.-born cases in 2014. Aside from TB symptoms, the reasons for evaluation varied more widely for foreign-born cases than for U.S.-born cases.

RISK FACTORS

Aside from the commonly collected risk factors, such as HIV status, drug/alcohol usage, occupation and country of birth, there are additional medical and exposure risk factors that are associated with TB. Medical risk factors are conditions that weaken an individual's immune defenses against TB and may complicate the management of the disease. Exposure risk factors are those that place an individual at increased risk of TB transmission.

Table 9a. Additional Risk Factors* Among Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

Additional Risk Factors		2010		2011		2012		2013		2014	
		No.	%	No.	%	No.	%	No.	%	No.	%
Medical Risk	Diabetes Mellitus	24	9.9	23	10.4	23	10.7	25	11.5	30	14.9
	Immunosuppression (not HIV/AIDS)	19	7.8	18	8.1	15	7.0	9	4.1	11	5.4
	Incomplete LTBI Therapy	13	5.3	13	5.9	13	6.0	9	4.1	8	4.0
	End-Stage Renal Disease	3	1.2	4	1.8	3	1.4	4	1.8	6	3.0
	Post-Organ Transplantation	2	0.8	2	0.9	1	0.5	0	0.0	4	2.0
	TNF- α Antagonist Therapy	2	0.8	0	0.0	2	0.9	2	0.9	1	0.5
Exposure Risk **	Contact of Infectious TB Patient	15	6.2	12	5.4	8	3.7	13	6.0	17	8.4
	Contact of MDR-TB Patient	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0
	Missed Contact	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0
Other Risk	Other Factors	10	4.1	12	5.4	24	11.2	16	7.4	28	13.9
None	No Additional Factors	162	66.7	144	65.2	131	60.9	146	67.3	117	57.9
TOTAL CASES		243		221		215		217		202	

*Categories are not mutually exclusive

**Within the last 2 years

LTBI = Latent Tuberculosis Infection

Source: New York State Department of Health
Bureau of Tuberculosis Control

Although the majority of TB cases in New York State (exclusive of New York City) didn't have additional risk factors, between 33 and 42 percent of those diagnosed in the last five years had at least one. Among these cases, most factors were medical risk factors, with diabetes, immunosuppression (not HIV/AIDS) and incomplete latent tuberculosis infection (LTBI) therapy being most common.

The proportion of TB cases with diabetes has steadily increased since 2010. In 2014 nearly 15 percent (N=30/202) of cases in New York State (exclusive of New York City) had diabetes. Another 8.4 percent (N=17/202) of cases in 2014 had been in contact with an infectious TB patient within the last two years.

Table 9b. Additional Risk Factors* Among Tuberculosis Cases by Gender, New York State (Exclusive of New York City), 2014

Additional Risk Factors		Male		Female		Total	
		No.	%	No.	%	No.	%
Medical Risk	Diabetes Mellitus	16	13.8	14	16.3	30	14.9
	Immunosuppression (not HIV/AIDS)	7	6.0	4	4.7	11	5.4
	Incomplete LTBI Therapy	5	4.3	3	3.5	8	4.0
	End-Stage Renal Disease	4	3.4	2	2.3	6	3.0
	Post-Organ Transplantation	3	2.6	1	1.2	4	2.0
	TNF- α Antagonist Therapy	1	0.9	0	0.0	1	0.5
Exposure Risk **	Contact of Infectious TB Patient	8	6.9	9	10.5	17	8.4
	Contact of MDR-TB Patient	0	0.0	0	0.0	0	0.0
	Missed Contact	0	0.0	0	0.0	0	0.0
Other Risk	Other Factors	16	13.8	12	14.0	28	13.9
None	No Additional Factors	68	58.6	49	57.0	117	57.9
TOTAL CASES		116		86		202	

*Categories are not mutually exclusive

**Within the last 2 years

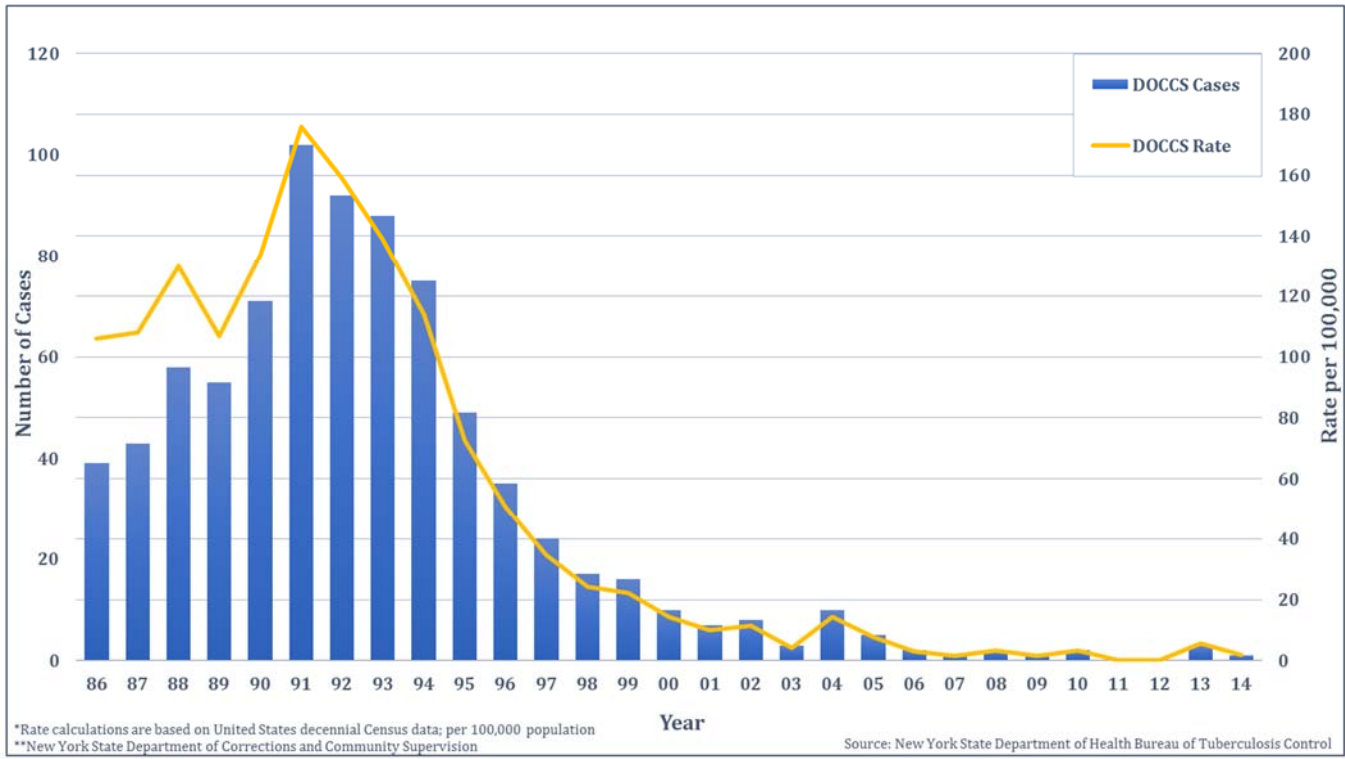
LTBI = Latent Tuberculosis Infection

Source: New York State Department of Health
Bureau of Tuberculosis Control

In 2014, diabetes was more commonly identified among females than males (N=14, 16.3% for females; N=16, 13.8% for males), as was being a recent contact to an infectious TB case (N=9, 10.5% for females; N=8, 6.9% for males).

RISK FACTORS

Figure 14. Tuberculosis Cases and Rates* Among DOCCS Inmates, New York State (Exclusive of New York City), 1986-2014**



During the late 1980s and early 1990s, a substantial proportion of TB cases reported by New York State (exclusive of New York City) were in the New York State Department of Corrections and Community Supervision (DOCCS) inmate population. Among the DOCCS inmate population, there has been a notable decline in cases since 1991 when 102 new cases (176 per 100,000 inmates) were reported. In 2011 and 2012 there were no new cases reported, but in 2013 there were three new cases (5.5 per 100,000 inmates) and in 2014 there was one new case (1.8 per 100,000 inmates).

RISK FACTORS

There is an increased risk of TB transmission for residents and staff of congregate settings (e.g., correctional facilities and long-term care facilities) due to the close proximity and prolonged contact with others. Residents of congregate settings may also have significant comorbidities that amplify this risk even further.

Table 10. High-Risk Congregate Setting at the Time of Diagnosis for Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

Congregate Setting at Time of TB Diagnosis		2010		2011		2012		2013		2014	
		No.	%	No.	%	No.	%	No.	%	No.	%
Correctional Facility	Juvenile Facility	0	0.0	0	0.0	0	0.0	0	0.0	1	0.5
	Local Jail	3	1.2	3	1.4	0	0.0	0	0.0	1	0.5
	State Prison	2	0.8	0	0.0	0	0.0	3	1.4	1	0.5
	Federal Prison	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Other Facility	2	0.8	2	0.9	0	0.0	0	0.0	0	0.0
Long-Term Care Facility	Alcohol/Drug Treatment	0	0.0	0	0.0	0	0.0	0	0.0	1	0.5
	Hospital-Based	1	0.4	1	0.5	0	0.0	0	0.0	0	0.0
	Mental Health Residence	0	0.0	0	0.0	0	0.0	1	0.5	0	0.0
	Nursing Home	2	0.8	2	0.9	3	1.4	2	0.9	1	0.5
	Residential	2	0.8	0	0.0	1	0.5	0	0.0	0	0.0
	Other Long-Term Care	3	1.2	1	0.5	1	0.5	2	0.9	0	0.0
	Unknown	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0
TOTAL CASES		243		221		215		217		202	

Source: New York State Department of Health
Bureau of Tuberculosis Control

The number and percentage of cases diagnosed while residing in a congregate setting varied over the last five years in New York State (exclusive of New York City), but was highest in 2010 (N=15, 6.2%) and lowest in 2012 (N=5, 2.3%). In 2014, five (2.5%) cases were identified in a congregate setting, three of which were in a correctional facility and two were in a long-term care facility.

Table 11. Homelessness Among Tuberculosis Cases Within the Past Year, New York State (Exclusive of New York City), 2010-2014

The homeless population is at increased risk of acquiring or transmitting TB to others as homelessness is often accompanied by other risk factors associated with TB, such as substance abuse, HIV infection, and inadequate medical care. A person is considered to be homeless if they don't have a fixed, regular nighttime residence. These individuals may live on the streets, alternate between many temporary residences, or reside in privately or publicly supervised shelters.

Year	Homeless Cases	
	No.	%
2010	8	3.3
2011	3	1.4
2012	1	0.5
2013	5	2.3
2014	2	1.0

From 2010 to 2014, an average of 1.7 percent (N=19/1,098) of TB cases in New York State (exclusive of New York City) were homeless within the 12 months prior to diagnosis.

RISK FACTORS

Substance abuse weakens the immune system which can leave people more infectious or at greater risk of becoming infected and developing active TB. Also, the drugs used to treat TB can be toxic to the liver so substance abuse, such as excess alcohol use, can increase the damaging effects of treatment.

Table 12. Substance Abuse* Among Tuberculosis Cases Within the Past Year, New York State (Exclusive of New York City), 2010-2014

Substance Abuse	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Injection Drug Use	4	1.6	1	0.5	0	0.0	2	0.9	1	0.5
Non-Injection Drug Use	7	2.9	7	3.2	5	2.3	6	2.8	3	1.5
Excess Alcohol Use	20	8.2	20	9.0	10	4.7	22	10.1	13	6.4
TOTAL CASES	243		221		215		217		202	

*Categories are not mutually exclusive

Source: New York State Department of Health
Bureau of Tuberculosis Control

In New York State (exclusive of New York City), excess alcohol use has been the most commonly reported form of substance abuse among TB cases over the last five years. There were 13 cases (6.4%) in 2014 who reported alcohol abuse, two of which also reported non-injection drug use.

DRUG RESISTANCE

The first-line drugs used for treating TB disease are isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), ethambutol (EMB), and less commonly streptomycin (SM), but there are other second-line drugs that can be used when necessary. Most TB strains are susceptible to all first-line drugs, but resistance to one or more can occur, which could complicate the management of the disease. MDR TB is caused by a TB strain that is resistant to at least INH and RIF. Extensively drug resistant TB (XDR TB) is MDR TB with additional resistance to second-line drugs, such as any fluoroquinolone (levofloxacin, moxifloxacin, and ofloxacin) and at least one of the injectable drugs (amikacin, kanamycin, and capreomycin). Drug susceptibility testing is performed whenever possible to identify any drug resistance.

Table 13a. Drug Susceptibility Results for Culture-Confirmed Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

First-Line Drug Susceptibility Results		2010		2011		2012		2013		2014	
		No.	%	No.	%	No.	%	No.	%	No.	%
Positive Culture		170		172		161		157		164	
Susceptibility Test Reported		169	99.4	169	98.3	158	98.1	157	100.0	163	99.4
Susceptibility Test Results	Susceptible to all first-line drugs	136	80.5	136	80.5	133	84.2	134	85.4	139	85.3
	INH and RIF resistant (MDR TB)	3	1.8	6	3.6	3	1.9	2	1.3	2*	1.2
	INH resistant, RIF susceptible	13	7.7	12	7.1	11	7.0	6	3.8	11	6.7
	RIF resistant, INH susceptible	4	2.4	1	0.6	0	0.0	1	0.6	0	0.0
	Resistance other than INH and RIF	13	7.7	14	8.3	11	7.0	14	8.9	11	6.7

INH = Isoniazid; RIF = Rifampin; MDR TB = Multidrug-resistant TB
*1 case had extensively drug resistant TB (XDR TB)

Source: New York State Department of Health
Bureau of Tuberculosis Control

Over the last five years, there have been 824 culture-confirmed TB cases in New York State (exclusive of New York City). Drug susceptibility results have been reported for 99 percent (N=816/824) of these cases, most (N=678, 83.1%) of which have been susceptible to all first-line TB drugs. Despite this high level of susceptibility, there were 138 cases with first-line drug resistance between 2010 and 2014, 16 of which had MDR TB.

In 2014, susceptibility results were reported for 163 of the 164 cases with culture confirmed TB in New York State (exclusive of New York City). Nearly 88 percent (N=29/33) of U.S.-born cases and 84.6 percent (N=110/130) of foreign-born cases were susceptible to all first-line drugs. Among the two foreign-born cases with MDR TB, one was XDR and had resistance to all first-line drugs as well as many second-line drugs.

Table 13b. Drug Susceptibility Results for Culture-Confirmed Tuberculosis Cases by U.S.-Born and Foreign-Born Status, New York State (Exclusive of New York City), 2012-2014

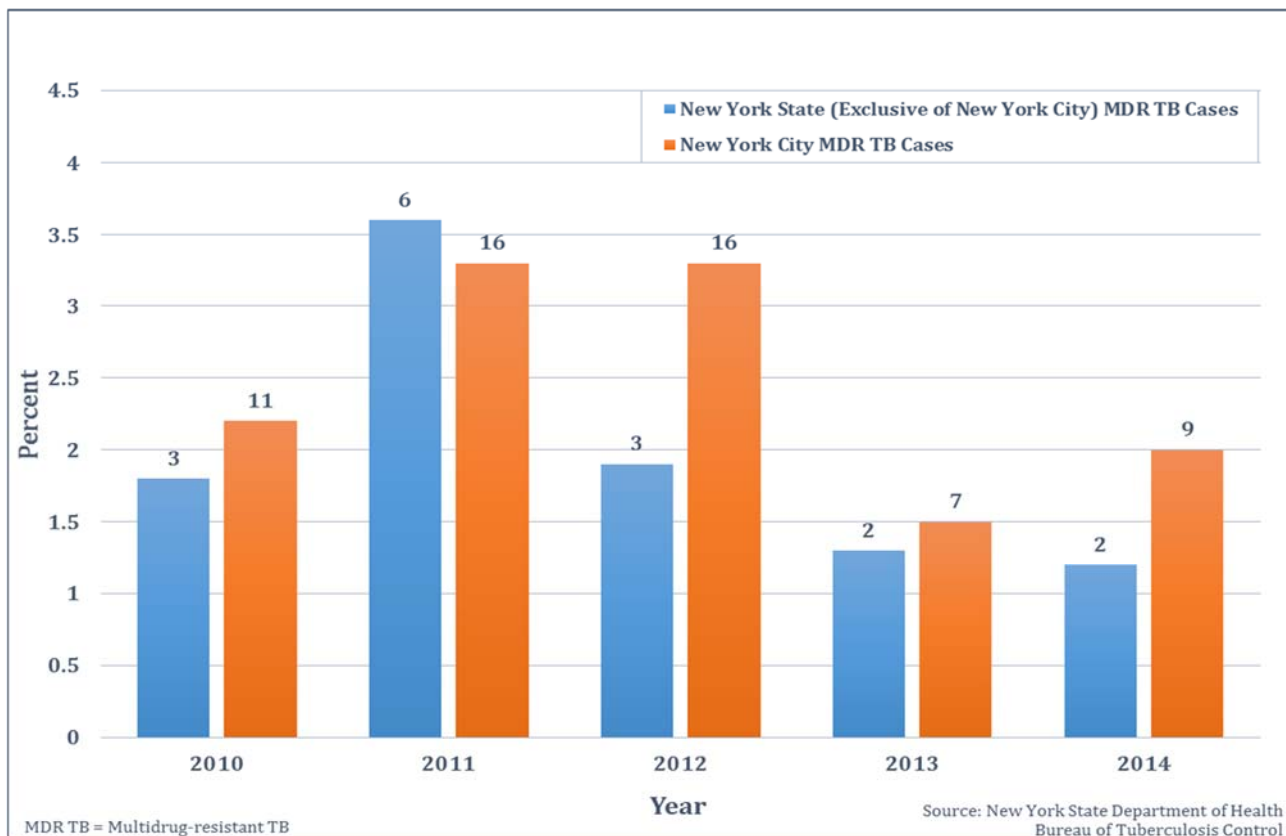
First-Line Drug Susceptibility Results		2012				2013				2014			
		U.S.- Born		Foreign-Born		U.S.- Born		Foreign-Born		U.S.- Born		Foreign-Born	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Positive Culture		45		116		30		127		34		130	
Susceptibility Test Reported		43	95.6	115	99.1	30	100.0	127	100.0	33	97.1	130	100.0
Susceptibility Test Results	Susceptible to all first-line drugs	36	83.7	97	84.3	28	93.3	106	83.5	29	87.9	110	84.6
	INH and RIF resistance (MDR TB)	2	4.7	1	0.9	0	0.0	2	1.6	0	0.0	2*	1.5
	INH resistance only	2	4.7	9	7.8	0	0.0	6	4.7	2	6.1	9	6.9
	RIF resistance only	0	0.0	0	0.0	0	0.0	1	0.8	0	0.0	0	0.0
	Resistance other than INH and RIF	3	7.0	8	7.0	2	6.7	12	9.4	2	6.1	9	6.9

INH = Isoniazid; RIF = Rifampin; MDR TB = Multidrug-resistant TB
*1 case had extensively drug resistant TB (XDR TB)

Source: New York State Department of Health
Bureau of Tuberculosis Control

DRUG RESISTANCE

Figure 15. Number and Percent of Multidrug-Resistant Tuberculosis Cases, New York State, 2010-2014



Over the last five years, the number of MDR TB cases was close to three times higher in New York City compared to the remainder of the state (N=59 and N=16, respectively). Despite this large difference in number, the proportion of MDR TB cases was comparable.

GENOTYPING

Table 14. Tuberculosis Genotyping Summary for Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

Genotyping		2010		2011		2012		2013		2014	
		No.	%	No.	%	No.	%	No.	%	No.	%
Initial Positive Cultures		172		177		163		161		170	
False Positives	Total False Positives	2		5		2		3		3	
	Control strain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Contamination	1	0.6	2	1.1	1	0.6	0	0.0	0	0.0
	M. bovis BCG	1	0.6	3	1.7	1	0.6	3	1.9	3	1.8
True Positives	Total True Positives	170		172		161		158		167	
	Isolates Available	170		172		155		158		162	
	Complete Genotype*	166	97.6	155	90.1	142	91.6	128	81.0	154	95.1
	Incomplete Genotype	167	98.2	167	97.1	154	99.4	151	95.6	160	98.8
	No Result	3	1.8	5	2.9	1	0.6	6	3.8	2	1.2

*Complete genotype means having both a spoligotype and MIRU result
MIRU = mycobacterial interspersed repetitive unit

Source: New York State Department of Health
Bureau of Tuberculosis Control

New York State requires that all initial positive cultures be submitted for genotyping. Beginning in 2004, real time spoligotyping and subsequent restriction fragment length polymorphism (RFLP) testing were performed at the Department's Wadsworth Center for Laboratories and Research, but as of 2009 RFLP was discontinued. In addition, the CDC-sponsored National Tuberculosis Genotyping regional lab in Michigan has performed mycobacterial interspersed repetitive unit (MIRU) and spoligotyping, both of which are needed for a genotype to be considered complete.

In 2014, 97 percent (N=162/167) of isolates in New York State (exclusive of New York City) were available for genotyping, a slight decrease from the 100 percent (N=158/158) in 2013. Of these 162 isolates, 95.1 percent (N=154) had a complete genotype (spoligotype and MIRU result). An additional six isolates only had a spoligotype or a MIRU result available, so 98.8 percent of cases had at least some genotype information available.

SITE OF DISEASE

The primary site of disease for most TB cases is pulmonary, but extrapulmonary involvement also occurs. TB is spread from person to person through airborne transmission, so cases with pulmonary involvement have the greatest potential to infect others.

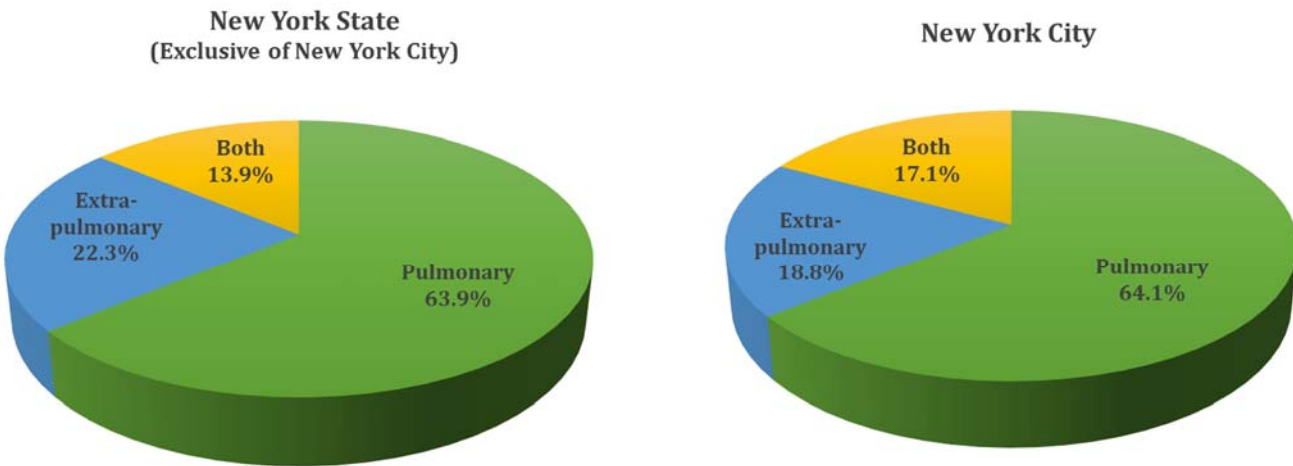
Table 15. Primary Site of Disease for Tuberculosis Cases, New York State (Exclusive of New York City), 2010-2014

Primary Site of Disease	2010		2011		2012		2013		2014	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pulmonary	148	60.9	141	63.8	126	58.6	119	54.8	129	63.9
Extrapulmonary	58	23.9	54	24.4	65	30.2	67	30.9	45	22.3
Both	37	15.2	26	11.8	24	11.2	31	14.3	28	13.9
TOTAL CASES	243		221		215		217		202	

Source: New York State Department of Health Bureau of Tuberculosis Control

In the last five years, the proportion of TB cases with pulmonary disease ranged from 70 to 78 percent in New York State (exclusive of New York City). The lowest proportion of cases with pulmonary TB was observed in 2013 (69.1%) and the highest was seen in 2014 (77.8%).

Figure 16. Primary Site of Disease for Tuberculosis Cases, New York State, 2014



Source: New York State Department of Health Bureau of Tuberculosis Control

For New York State as a whole, 632 (80.3%) TB cases were reported with pulmonary disease in 2014. Among these 632 pulmonary cases, 128 also had disease in one or more extra-pulmonary sites.

SITE OF DISEASE

Table 16. Extra-Pulmonary Sites of Disease* for Tuberculosis Cases, New York State, 2014

Extra-Pulmonary Site of Disease	New York State (Exclusive of New York City)	New York City	New York State (Total)
Lymphatic	38	83	121
Pleural	12	62	74
Bone/Joint	7	17	24
Meningeal	3	14	17
Genitourinary	6	10	16
Peritoneal	5	10	15
Laryngeal	1	1	2
Other	6	31	37

*Categories are not mutually exclusive

Source: New York State Department of Health
Bureau of Tuberculosis Control

Among the 283 cases in New York State with at least one extra-pulmonary site of disease, the most common sites of disease in 2014 were lymphatic (N=121), pleural (N=74) and bone/joint (N=24). While 224 cases only had one extra-pulmonary site of disease, 59 had multiple sites identified.

COMPLETION OF THERAPY

Table 17a. Treatment Status for Tuberculosis Cases,* New York State (Exclusive of New York City), 2009-2013

Treatment Status	2009		2010		2011		2012		2013	
	No.	%	No.	%	No.	%	No.	%	No.	%
Complete	202	84.5	221	92.5	197	90.4	189	90.9	195	91.1
Died	18	7.5	13	5.4	15	6.9	8	3.8	10	4.7
Uncooperative/Refused	3	1.3	0	0.0	2	0.9	0	0.0	3	1.4
Lost	4	1.7	1	0.4	0	0.0	1	0.5	1	0.5
Adverse Treatment Event	2	0.8	1	0.4	1	0.5	2	1.0	2	0.9
Other	10	4.2	3	1.3	3	1.4	8	3.8	3	1.4
TOTAL CASES	239		239		218		208		214	

*Excludes patients found not to have TB, those reported at death and those who never started treatment

Source: New York State Department of Health
Bureau of Tuberculosis Control

In New York State (exclusive of New York City), the average treatment completion rate for TB cases who were alive at diagnosis and started treatment between 2009 and 2013 (the most recent year for which completion information is available) was 89.9 percent (N=1,004/1,118). The highest completion percentage of 92.5 percent (N=221/239) was seen in 2010, followed by 91.1 percent (195/214) in 2013.

Table 17b. Treatment Status for Tuberculosis Cases* Reported in 2013, New York State (Exclusive of New York City)

Treatment Status	Non-MDR TB		MDR TB		Total	
	No.	%	No.	%	No.	%
Complete	193	91.0	2	100.0	195	91.1
Died	10	4.7	0	0.0	10	4.7
Uncooperative/Refused	3	1.4	0	0.0	3	1.4
Lost	1	0.5	0	0.0	1	0.5
Adverse Treatment Event	2	0.9	0	0.0	2	0.9
Other	3	1.4	0	0.0	3	1.4
TOTAL CASES	212		2		214	

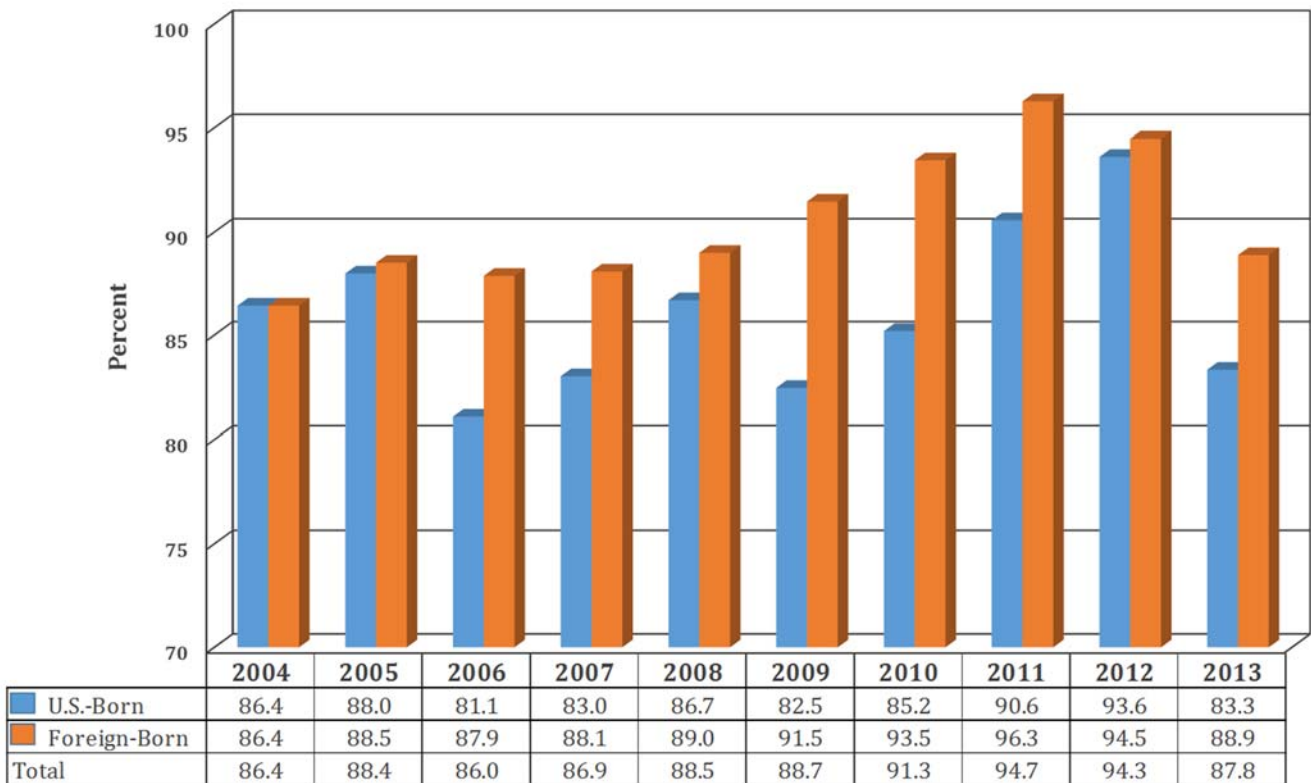
*Excludes patients found not to have TB, those reported at death and those who never started treatment
MDR TB = Multidrug-resistant TB

Source: New York State Department of Health
Bureau of Tuberculosis Control

In 2013, the two MDR cases reported in New York State (Exclusive of New York City) completed treatment.

COMPLETION OF THERAPY

Figure 17. Percent of Tuberculosis Cases Who Completed Treatment Within 12 Months,* by U.S.-Born and Foreign-Born Status, New York State (Exclusive of New York City), 2004-2013**



*Among those eligible to complete within 12 months.

**U.S.-born is defined as someone born in one of the 50 states, District of Columbia, or born outside the United States to at least one parent who was a U.S. citizen

Source: New York State Department of Health
Bureau of Tuberculosis Control

For 2013 (the most recent year for which complete information is available), 87.8 percent (N=156/180) of patients in New York State (exclusive of New York City) eligible[^] to complete treatment within 12 months, did so. This decrease compared to recent prior years was due to several patients in 2013 having complicated clinical presentations and adverse reactions to treatment. An additional 9.4 percent (N=17/180) of patients completed treatment in more than 12 months for an overall completion rate of 97.2 percent. A larger percentage of foreign-born cases completed therapy within 12 months compared to U.S.-born cases in 2013 (88.9% and 83.3%, respectively).

[^]Patients with rifampin resistance, those with meningeal TB, and children under 15 who have disseminated TB (miliary TB or evidence of miliary TB on chest radiograph, or a positive blood culture) are ineligible to complete within 12 months so they are excluded. Those who were never started on treatment, were dead at diagnosis, or who died while on treatment are also excluded. Effective January 2009, the CDC revised the definition of who is eligible to complete treatment to also exclude patients who moved out of the country while on treatment.

CONTACTS TO INFECTIOUS TUBERCULOSIS CASES

People who come in close contact with an infectious TB case for a prolonged period of time are at high risk of becoming infected. Since TB is spread person to person by breathing in airborne particles from another infected individual, pulmonary TB cases who are exhibiting symptoms, such as coughing, are most likely to transmit TB to others. For newly diagnosed cases, investigations are conducted to identify close contacts who may have been infected. Once contacts are identified, they are notified of their exposure and efforts are made to get each individual evaluated. Upon evaluation, if a contact has a positive tuberculin skin test (TST) or a positive Interferon-Gamma Release Assay, further evaluation is done to determine if the infection is active TB disease or LTBI. Treatment options for either condition are then discussed. Individuals who have been recently infected have a greater risk of their infection developing into active TB disease so it is important for LTBI patients to complete treatment.

Table 18. Number and Percent of Infectious Tuberculosis Cases with Contacts Identified, New York State (Exclusive of New York City), 2004-2013

Year	Total Infectious Cases	Infectious Cases with Contacts Identified	
		No.	%
2004	98	96	98.0
2005	104	103	99.0
2006	97	92	94.8
2007	78	76	97.4
2008	92	90	97.8
2009	66	65	98.5
2010	73	72	98.6
2011	80	78	97.5
2012	75	75	100.0
2013	63	62	98.4

In 2013, the most recent year for which complete information is available, 98.4 percent (N=62/63) of infectious TB cases in New York State (exclusive of New York City) had contacts identified. This exceeds the state objective of 96.5 percent. The one infectious TB case without contacts identified was interviewed and it was determined that the patient did not come in prolonged contact with any other individuals while experiencing symptoms.

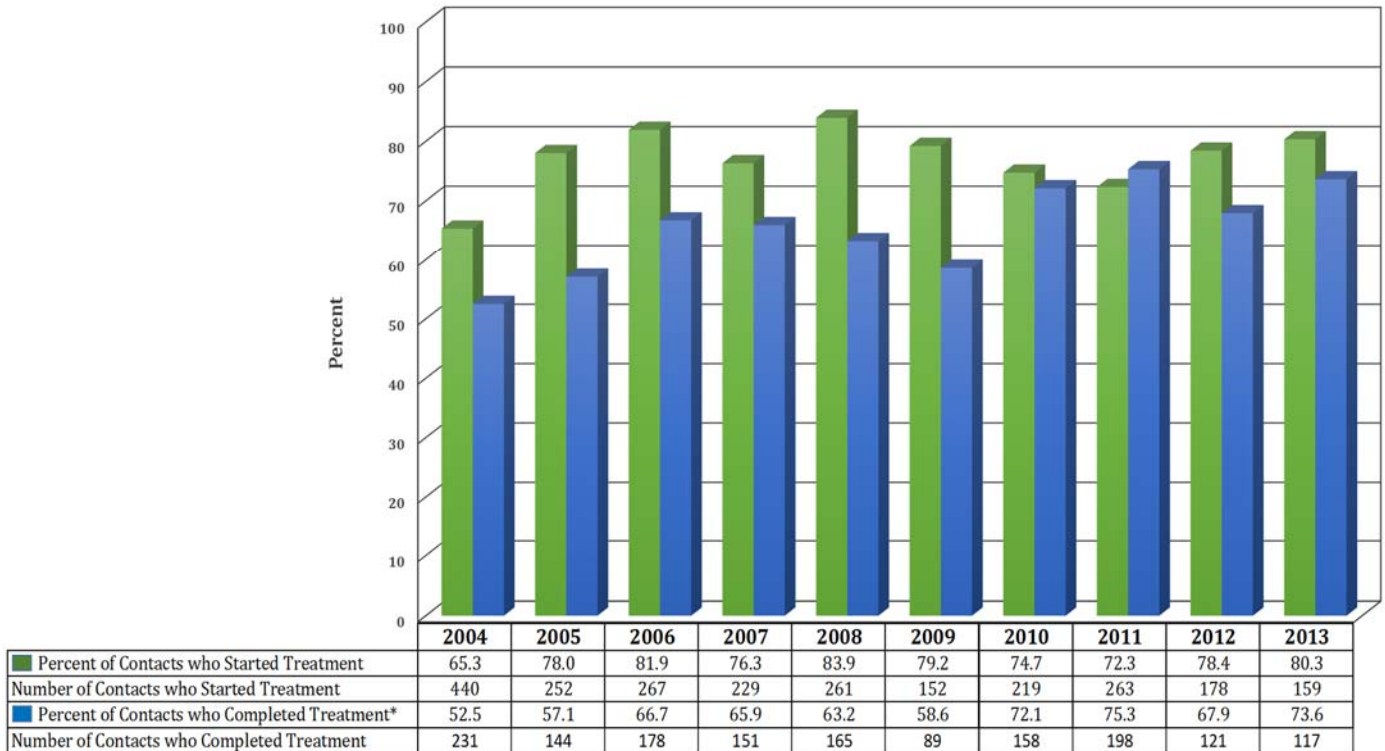
Table 19. Number and Percent of Contacts to Infectious Tuberculosis Cases Evaluated for Latent Tuberculosis Infection, New York State (Exclusive of New York City), 2004-2013

Year	Total Contacts Identified	Contacts Evaluated	
		No.	%
2004	3,994	3,178	79.6
2005	1,865	1,665	89.3
2006	2,970	2,506	84.4
2007	4,050	3,322	82.0
2008	3,549	2,647	74.6
2009	1,768	1,447	81.8
2010	2,253	2,027	89.9
2011	3,662	3,049	83.3
2012	1,851	1,587	85.7
2013	1,462	1,215	83.1

Eighty-three percent (N=1,215/1,462) of contacts to infectious cases in New York State (exclusive of New York City) were evaluated for LTBI in 2013 (the most recent year for which complete information is available). This is a decline of 2.6 percent compared to the 85.7 percent who were evaluated in 2012. Common reasons for not evaluating contacts include the inability to locate the individual and the contact refusing evaluation.

CONTACTS TO INFECTIOUS TUBERCULOSIS CASES

Figure 18. Number and Percent of Contacts to Infectious Tuberculosis Cases Placed on Treatment for Latent Tuberculosis Infection and Completed, New York State (Exclusive of New York City), 2004-2013



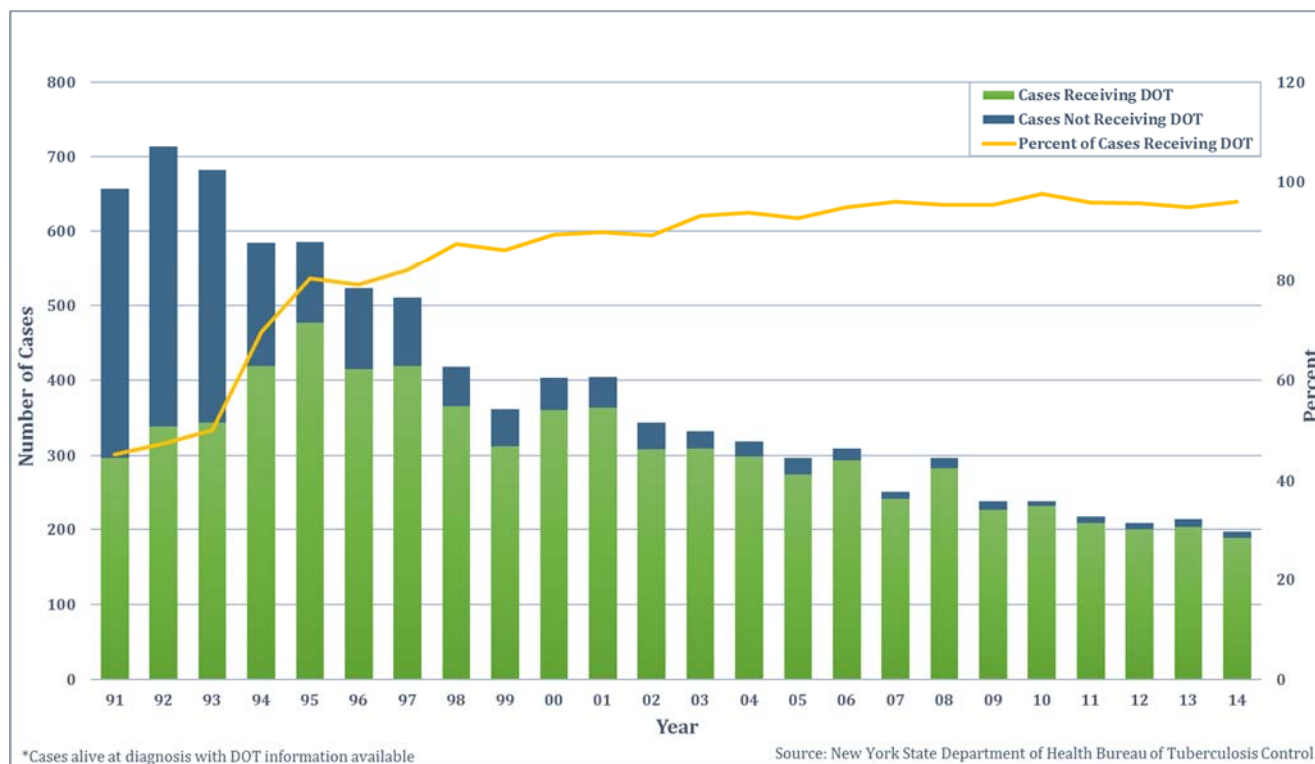
*Among those that started treatment

Source: New York State Department of Health Bureau of Tuberculosis Control

Among the contacts to infectious cases in New York State (exclusive of New York City) who were evaluated in 2013 (the most recent year for which complete information is available), 198 (16.3%) were diagnosed with LTBI and were candidates for treatment. Eighty percent (N=159/198) of these contacts were started on a treatment regimen and 73.6 percent (N=117/159) of those who started treatment completed the prescribed regimen.

DIRECTLY OBSERVED THERAPY

Figure 19. Number and Percent of Tuberculosis Cases* Receiving Any Directly Observed Therapy, New York State (Exclusive of New York City), 1991-2014



In New York State (exclusive of New York City) the proportion of cases receiving directly observed therapy (DOT) has been increasing since the early 1990s when it was first actively promoted by the New York State Department of Health, local health units, and others. In 1991, 45.2 percent (N=297/657) of TB cases on treatment received at least part of their therapy as DOT. Since then, the proportion of cases receiving a portion of their treatment as DOT has more than doubled to 95.9 percent (N=189/197) in 2014.

CONTACT INFORMATION

New York State Department of Health Bureau of Tuberculosis Control

New York State Department of Health
Bureau of Tuberculosis Control
Empire State Plaza
Corning Tower, Room 565
Albany, NY 12237

Tel (518) 474-7000

Main Fax (518) 473-6164

Confidential Fax (518) 408-1941

Email tbcontrol@health.ny.gov

For more information:

www.health.ny.gov/diseases/communicable/tuberculosis

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

New York City Department of Health & Mental Hygiene
Bureau of Tuberculosis Control
42-09 28th Street, CN 72B
Long Island City, NY 11101

Tel (844) 713-0559 (TB Hotline)

Fax (844) 713-0557/0558

For more information:

www1.nyc.gov/site/doh/health/health-topics/tuberculosis.page