The State of Tuberculosis in New York City: The 2017 Data

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ABOUT THE ANNUAL REPORT, 2017

• Summarize preliminary data for 2017 (reflect the most complete information available as of January 22, 2018)
• Includes summary of key bureau activities and highlights from the year
• Report is used:
  • To share data with key internal and external stakeholders
  • For provider outreach
  • For program planning
NYC BUREAU OF TUBERCULOSIS CONTROL
KEY ACTIVITIES OVERVIEW

- Surveillance
- Clinical care
- Case management
- Contact investigation
- Genotyping
- Drug susceptibility testing
- Cluster investigation and outbreak detection/response
- Data analysis and research
- Outreach
- Support advocacy

YEAR AT-A-GLANCE:
TUBERCULOSIS IN NEW YORK CITY, 2017
REPORTED 6% INCREASE FROM 2002-2003

I. Executive Summary

New York City (NYC) has made enormous strides in tuberculosis control; the number of tuberculosis cases has declined by 70% since 1992. However, in 2003, the number of tuberculosis cases increased slightly for the first time in over 30 years, with 1,140 tuberculosis cases and a rate of 14.2 per 100,000. Despite the overall 10-year decreasing trend in tuberculosis in New York City, the rate of tuberculosis is 2.8 times higher than the national rate of 5.1 per 100,000 and 14 times higher than the Healthy People 2010 Objective of 1.0 per 100,000.

The increase in tuberculosis cases represents an excess of 50 cases over the number in 2002. This increase is partially the result of a change in case counting methods that occurred at the end of 2002; immigration from countries with high prevalence of tuberculosis and increased transmission of tuberculosis, in residences for homeless individuals.

Profile of Tuberculosis Cases
- Most tuberculosis patients were aged 20 to 64 years.

PERCENT CHANGE IN PROPORTION FOR SELECT CHARACTERISTICS AMONG TUBERCULOSIS CASES, 2016 TO 2017

NO CHANGE among patients 45-64 years of age, patients living in Staten Island at time of TB diagnosis or patients with HIV infection. Change in clustering proportion could not be assessed due to a change in genotyping and clustering methods.

1. Resistance to isoniazid and rifampin in patients born in the U.S. 2. MDR-TB is defined as resistance to at least isoniazid and rifampin.
3. In the 12 months before TB diagnosis.
TUBERCULOSIS CASES AND RATES \(^1\) BY BIRTH IN THE UNITED STATES (U.S.), \(^2\) NEW YORK CITY, 1992-2017

1. Rates prior to 2000 are based on 1990 U.S. Census data. Rates for 2000-2008 are based on 2000 U.S. Census data. Rates after 2008 are based on one-year American Community Survey data for the given year or the most recent available data. 2. U.S. born includes individuals born in the U.S. and its territories. 3. Excludes cases with unknown country of birth.

TUBERCULOSIS RATES \(^4\) AMONG PEOPLE BORN IN THE UNITED STATES (U.S.), \(^2\) BY RACE/ETHNICITY, NEW YORK CITY, 2008-2017

1. Rates are based on one-year American Community Survey Public Use Microdata Sample data for the given year or the most recent available data. 2. U.S. born does not include patients with multiple other, or unknown race/ethnicity. 3. U.S. born includes individuals born in the U.S. and its territories. 4. Excludes cases with unknown country of birth.
TUBERCULOSIS CASES, RATES AND SELECT CHARACTERISTICS BY PATIENT COUNTRY OF BIRTH, NEW YORK CITY, 2017

15.9
TB rate per 100,000 among patients born in a country other than the U.S.

1.6
TB rate per 100,000 among patients born at the U.S.

75
Number of countries of birth represented among patients with TB infection in 2017.

TOP TEN COUNTRIES OF BIRTH BY TUBERCULOSIS BURDEN AND INCIDENCE IN NEW YORK CITY, 2017

<table>
<thead>
<tr>
<th>COUNTRY OF BIRTH</th>
<th># OF NYC TB CASES</th>
<th>COUNTRY OF BIRTH</th>
<th>NYC TB RATE (PER 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>116</td>
<td>Eritrea</td>
<td>360</td>
</tr>
<tr>
<td>United States</td>
<td>83</td>
<td>Sierra Leone</td>
<td>225</td>
</tr>
<tr>
<td>Mexico</td>
<td>42</td>
<td>Bolivia</td>
<td>130</td>
</tr>
<tr>
<td>India</td>
<td>30</td>
<td>Duma</td>
<td>110</td>
</tr>
<tr>
<td>Ecuador</td>
<td>36</td>
<td>Indonesia</td>
<td>112</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>31</td>
<td>Ethiopia</td>
<td>93</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>27</td>
<td>Nepal</td>
<td>86</td>
</tr>
<tr>
<td>Philippines</td>
<td>25</td>
<td>Liberia</td>
<td>78</td>
</tr>
<tr>
<td>Haiti</td>
<td>19</td>
<td>Afghanistan</td>
<td>66</td>
</tr>
<tr>
<td>Nigeria</td>
<td>15</td>
<td>Nigeria</td>
<td>57</td>
</tr>
</tbody>
</table>

1. Rates are based on 2010 Americas Community Survey one-year sample data. 2. TB cases in 2017 were among patients with unknown country of birth. 3. These are 26 countries for which rate could not be calculated due to insufficient population data. 4. China includes individuals born in mainland China, Hong Kong, Taiwan, and Macau. 5. U.S.-born includes individuals born in the U.S. and U.S. territories.
HIV INFECTION AMONG TUBERCULOSIS CASES BY BIRTH IN THE UNITED STATES (U.S.), NEW YORK CITY, 1992-2017

You'll need to request this data from the Data Team.

MULTIDRUG RESISTANCE\(^1\) AMONG TUBERCULOSIS CASES, NEW YORK CITY, 1992-2017

1. MDR TB as defined as resistance to at least isoniazid and rifampin. 2. XDR TB is defined as resistance to at least isoniazid and rifampin plus at least one second-line injectable agent in TB medication.
LABORATORY METHOD USED TO FIRST IDENTIFY RESISTANCE TO BOTH ISONIAZID AND RIFAMPIN AMONG CASES WITH A MULTIDRUG-RESISTANT TUBERCULOSIS STRAIN, NEW YORK CITY, 2017 (N=14)

- Liquid/broth-based (MDR-T) phenotypic testing
- Whole genome sequencing
- Pyrosequencing
- Hain Lifescience GenoType MTBDRplus

50% of MDR cases identified in NYC in 2017 were first identified through a molecular-based test.

SELECT CHARACTERISTICS AMONG PATIENTS DIAGNOSED WITH MULTIDRUG-RESISTANT TUBERCULOSIS, NEW YORK CITY, 2017 (N=14)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (range)</td>
<td>41 (19-86)</td>
</tr>
<tr>
<td>Number from outside of the United States (%)(a)</td>
<td>12 (86%)</td>
</tr>
<tr>
<td>Years in the U.S. among non-U.S.-born patients (%)</td>
<td></td>
</tr>
<tr>
<td>&lt; 5 years</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>5-10 years</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>3 (25%)</td>
</tr>
<tr>
<td>Pulmonary site of disease (%)</td>
<td>12 (86%)</td>
</tr>
<tr>
<td>Median number of drugs to which there was known resistance among MDR TB cases (range)</td>
<td>7 (3-12)</td>
</tr>
<tr>
<td>Median number of contacts identified among patients with MDR TB (range)</td>
<td>3 (0-165)</td>
</tr>
</tbody>
</table>

FIGURE: Region of birth of all patients with multidrug-resistant tuberculosis, New York City, 2017 (n=14)

- Americas
- South-East Asia
- Africa
- Europe
- Western Pacific
- Eastern Mediterranean

29% of all patients with MDR TB were born in the Americas.

1. MDR TB is defined as resistance to at least isoniazid and rifampin.
2. Resistance to any rifampicin was counted once.
CONTACT INVESTIGATIONS IN NON-HOUSEHOLD SETTINGS\textsuperscript{1} BY SITE TYPE, NEW YORK CITY, 2017 (N=69)

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Total</th>
<th>&gt; 15 Exposed Contacts</th>
<th>≤ 15 Exposed Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worksite</td>
<td>27%</td>
<td>42%</td>
<td>8%</td>
</tr>
<tr>
<td>School/day care</td>
<td>14%</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td>Senior center</td>
<td>7%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Homeless shelter</td>
<td>3%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

74% of contact investigations in non-household settings were conducted around individuals in workplaces.

1. Excludes health care-associated investigations (n=153)
2. Proportion calculated among investigations where transmission could be assessed
3. Contacts eligible for testing are defined as contacts without a known history of TB disease or documented positive test for TB infection who were alive subsequent to the diagnosis of the infectious TB case to whom they were exposed

CONTACT INVESTIGATIONS IN HEALTHCARE-ASSOCIATED SETTINGS BY SITE TYPE, NEW YORK CITY, 2017 (N=153)

71% of contact investigations in health care-associated settings occurred in a hospital or acute care clinic.

- Acute care facilities\textsuperscript{1}
- Home health care service agencies
- Nursing homes/long-term care facilities
- Acute care facilities

1. Excludes health care-associated investigations (n=153)
PROPORTION CLUSTERED among tuberculosis cases with a complete genotype by select patient characteristics, New York City, 2017 (N=440)

47% Proportion of cases among patients younger than 18 with no other strain genotype

92% Proportion of culture positive cases with ATCC results available

1. Defined as a case with an isolate that has successfully matched 26 loci mycobacterial interspersed repetitive unit-variable number tandem repeats (MIRU-VNTR) results and spoligotypes and/or rifampicin resistance (rifampicin resistance) results or another NYC case verified in 2017. 2. History of homelessness and MIRU-VNTR results. 4. Of the 87% cases verified in 2017 and a complete genotype as of January 22, 2018. 3. US-born includes individuals born in the US and US territories, including those born overseas currently in the US. 4. Among patients with positive culture or multiple drug resistance. 6. Among patients born outside the U.S. 7. Race in the U.S. is not available for all patients. 8. In the 13 months before TB diagnosis.

TREATMENT OUTCOMES FOR TUBERCULOSIS CASES COUNTED IN 2016 who were eligible to complete treatment within 365 days, New York City (N=556)

86% of patients with verified TB disease in NYC in 2016 completed treatment within 365 days

1. Treatment outcomes are not reported for the current year to allow sufficient time for follow-up.
BTBC STAFF PUBLICATIONS IN PEER-REVIEWED JOURNALS, 2017

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