Tuberculosis and COVID–19: Impact on Programs and Services in the United States

Effect of COVID-19 on TB Surveillance

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Tuberculosis in the United States — 2020*

20% decline in TB incidence

*Data are provisional, as of February 17, 2021, as reported to the National Tuberculosis (TB) Surveillance System.
Hypotheses for decline in reported TB

- Decline in international travel and immigration
- Improved TB control
- Effects of COVID-19 disease or interventions
  - Decreased TB transmission
  - Increased mortality among people at risk for TB

Hypotheses for decline in reported TB

- True decline in incidence

- Underdiagnosis
  - Patient reluctance to seek health care
  - Low suspicion for TB
  - Missed or delayed TB diagnosis
  - Reduced public health capacity for active case finding
Hypotheses for decline in reported TB

- True decline in incidence
- Underdiagnosis
- Underreporting

TB cases, 2010–2020*

<table>
<thead>
<tr>
<th>Year</th>
<th>Expected</th>
<th>Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>13,075</td>
<td>7,163</td>
</tr>
<tr>
<td>2011</td>
<td>11,076</td>
<td>10,481</td>
</tr>
<tr>
<td>2012</td>
<td>9,926</td>
<td>9,548</td>
</tr>
<tr>
<td>2013</td>
<td>9,538</td>
<td>9,387</td>
</tr>
<tr>
<td>2014</td>
<td>9,251</td>
<td>9,079</td>
</tr>
<tr>
<td>2015</td>
<td>9,019</td>
<td>8,909</td>
</tr>
<tr>
<td>2016</td>
<td>8,938</td>
<td>8,736</td>
</tr>
<tr>
<td>2017</td>
<td>8,681</td>
<td>8,538</td>
</tr>
<tr>
<td>2018</td>
<td>8,477</td>
<td>8,387</td>
</tr>
<tr>
<td>2019</td>
<td>8,333</td>
<td>8,251</td>
</tr>
<tr>
<td>2020</td>
<td>8,209</td>
<td>8,079</td>
</tr>
</tbody>
</table>

TB incidence rates (IR), 2010–2020

- Expected IR: ~ 2.6
- Reported IR: 2.2
Relative changes in TB incidence rates from 2019

Source: provisional NTSS data as of 2/17/2021

Incidence rates by origin of birth, 2010–2020

Source: provisional NTSS data as of 2/17/2021


Source: provisional NTSS data as of 2/17/2021 NHOPI=Native Hawaiian or Other Pacific Islander; AI/AN=American Indian/Alaska Native; NH=Non-Hispanic

Relative change in incidence rate from 2019

-51% to -100%
-26% to -50%
-6% to -25%
-5% to +5%
0% to +25%
+26% to +50%
+51% to +100%

Relative change in incidence rate from 2019

D.C. >= +51%
+26% to +50%
-5% to +5%
-6% to -25%
-51% to -100%
-26% to -50%
+6% to + 25%

Source: provisional NTSS data as of 2/17/2021

Incidence rates by origin of birth, 2010–2020

-20%

Incidence rates by origin of birth, 2010–2020

-19%

Incidence rates by origin of birth, 2010–2020

AI/AN – NH (-3.9%)
NHOPI – NH (+64.5%)
Black – NH (-21.5%)
Asian – NH (-15.5%)
Hispanic (-21.9%)
White – NH (-25.3%)

Source: provisional NTSS data as of 2/17/2021


NHON – NH (-68.2%)
AJ/AN – NH (3.9%)
Black – NH (-21.5%)
Asian – NH (-15.5%)
Hispanic (-21.9%)
White – NH (-25.3%)

**TB incidence by race/ethnicity among non-U.S.–born persons, 2010–2020**

- **AI/AN – NH (-28.9%)**
- **NHOPI – NH (+31.2%)**
- **Black – NH (-22.9%)**
- **Asian – NH (-17.0%)**
- **Hispanic (-21.9)**
- **White – NH (-9.8%)**

**Percentage of TB cases categorized by years since arrival in the United States, 2020 compared with 2015–2019**

- **<1 year**: 2015–2019: 16%, 2020: 16%
- **1–4 years**: 2015–2019: 12%, 2020: 19%
- **5–9 years**: 2015–2019: 10%, 2020: 28%
- **10–19 years**: 2015–2019: 32%, 2020: 13%
- **>20 years**: 2015–2019: 13%
- **Unknown / Missing**: 2015–2019: 10%, 2020: 12%

**Countries of birth among non-U.S.–born persons, 2020**

- **Mexico**: 31%
- **Philippines**: 13%
- **Vietnam**: 9%
- **China**: 8%
- **Other Countries**: 29%

Source: provisional NTSS data as of 2/17/2021

NHOPI=Native Hawaiian or Other Pacific Islander; AI/AN=American Indian/Alaska Native; NH=Non-Hispanic
### Age distribution, 2015–2019 vs. 2020

<table>
<thead>
<tr>
<th>Age category (years)</th>
<th>2015–2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>5–14</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>15–24</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>25–44</td>
<td>31%</td>
<td>30%</td>
</tr>
<tr>
<td>45–64</td>
<td>31%</td>
<td>30%</td>
</tr>
<tr>
<td>65+</td>
<td>25%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: provisional NTSS data as of 2/17/2021

### Reason evaluated for TB, 2015–2019 vs. 2020

<table>
<thead>
<tr>
<th>Reason evaluated</th>
<th>2015–2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abnormal x-ray</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Contact tracing</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Employee test</td>
<td>0.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Health care worker</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Immigration exam</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Incidental</td>
<td>12%</td>
<td>10%</td>
</tr>
<tr>
<td>Targeted testing</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>TB symptoms</td>
<td>57%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Source: provisional NTSS data as of 2/17/2021

### Comparison of key variables 2015–2019 vs. 2020

<table>
<thead>
<tr>
<th>Key variable</th>
<th>2015–2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>US–born*</td>
<td>30%</td>
<td>29%</td>
</tr>
<tr>
<td>Average years in United States**</td>
<td>14.3 years</td>
<td>16.0 years</td>
</tr>
<tr>
<td>Experienced homelessness</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Resident of correctional facility</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Resident of long-term care facility</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Smear AFB positive*</td>
<td>44%</td>
<td>47%</td>
</tr>
<tr>
<td>Culture positive*</td>
<td>68%</td>
<td>69%</td>
</tr>
</tbody>
</table>

*Required as part of provisional data set
**Among non-US–born persons
Summary

- Steep decline in reported TB cases and incidence rate
- Little difference in key variables
- Similar declines across origin of birth and most racial/ethnic groups
- Change among new arrivals to United States

Additional investigations

DTBE data sources

- National Tuberculosis Surveillance System
  - Demographic, risk factor, and reason evaluated variables
  - Clinical characteristics and disease severity
  - Association between change in TB incidence and COVID incidence by state
- TB Genotyping Information Management System
  - Frequency of genotype clusters and characteristics of clustered cases
  - Estimates of recent transmission
- Other DTBE program data sources
- Monitoring 2021 case reports
External Data Sources

- Outpatient retail pharmacy data (IQVIA)
- Immigrant and refugee screening data (EDN)
- Hospital administration data (HCUP)
- Electronic health record data (OCHIN)
- TB mortality (vital statistics) data

Conclusions

- State and local TB programs successfully met TB reporting deadline in spite of staffing and resource challenges
- 20% decline in reported TB in 2020 is likely due to underdiagnosis as well as a true decline in TB incidence
- Further analyses of 2020 TB data and monitoring of 2021 case reports are ongoing
- Concern that decline in 2020 will not be sustained if largely a result of underdiagnosis or reduced immigration
- Concern that preliminary data for 2021 are consistent with the decline observed in 2020

Thank you!

- Molly Deutsch-Feldman
- Clarisse Tsang
- Bob Pratt
- Sandy Price
- Cindy Adams
- Adam Langer
- State and local TB partners
- Division of TB Elimination

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.