



2016 STATE AND CITY  
**TUBERCULOSIS  
INDICATORS REPORT**



**Centers for Disease  
Control and Prevention**  
National Center for HIV/AIDS,  
Viral Hepatitis, STD, and  
TB Prevention



# 2016 STATE AND CITY Tuberculosis Indicators

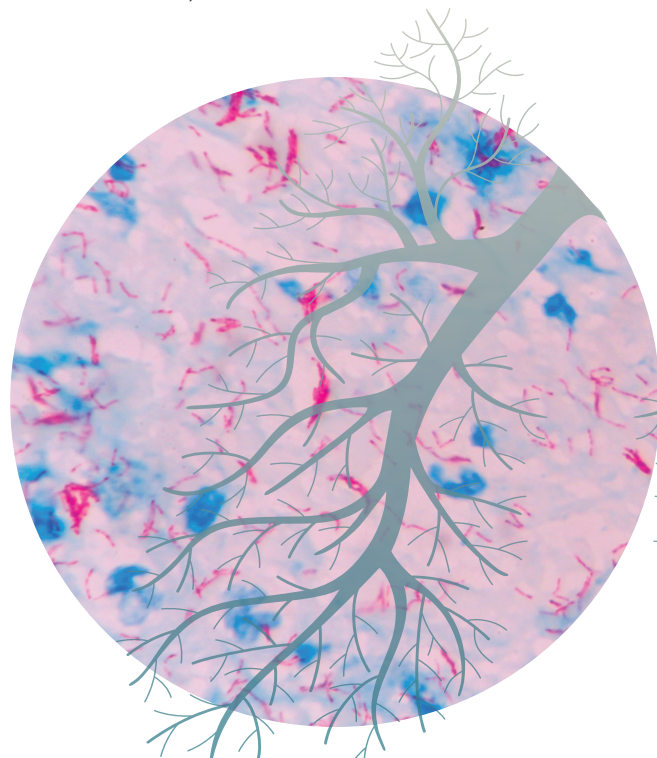
The Centers for Disease Control and Prevention (CDC) provides funding for tuberculosis control activities in 50 U.S. states and 9 cities (Baltimore, MD; Chicago, IL; District of Columbia; Houston, TX; Los Angeles, CA; New York City, NY; Philadelphia, PA; San Diego, CA; and San Francisco, CA) through the *Tuberculosis Elimination and Laboratory Cooperative Agreement*. Information about each newly reported case of tuberculosis (TB) in the 50 states and 9 cities is submitted to CDC's National TB Surveillance System (NTSS) with a standard form, the Report of Verified Case of TB (RVCT). The initial case report includes a patient's demographic data, occupation, initial drug regimen, and information on HIV status, substance use, homelessness, and residence in correctional or long-term care facilities. Follow-up reports collect drug susceptibility test results for *Mycobacterium tuberculosis* isolates and treatment status, among other items.

CDC also collects information from states and cities about their contact investigation activities: finding and examining persons who have had contact with TB cases, and treating those found to have TB disease or latent TB infection. Data for contact investigation are reported by each TB control jurisdiction annually through the Aggregate Reports for Program Evaluation (ARPE).

National TB Indicators are key process and outcome measures for TB control programs in the United States. These indicators are selected by CDC in cooperation with partners in state and local health departments. Data for calculating these indicators are derived from existing surveillance systems such as NTSS and ARPE. CDC publishes TB indicator data to assist in evaluating progress toward achievement of national objectives through monitoring of TB program performance, assessment of needs for education and technical assistance, and identification of areas that need improvement.<sup>1,2</sup> For the purposes of this report, states and cities were categorized into 3 groups based on the numbers of TB cases reported to NTSS in the relevant year for each indicator (2016 for TB incidence and known HIV status, 2015 for LTBI positive contacts of smear positive cases who started and completed preventive treatment, and 2014 for completion of treatment of newly diagnosed TB cases). The cutoffs for the groups were determined by the numbers of cases that fell within the 33rd and 66th percentiles. City results are not included in the respective state results (e.g., percentage of known HIV results for Texas are exclusive of known HIV results for Houston).

## Incidence<sup>3</sup>

Elimination of TB is defined as reducing TB disease incidence in the United States to less than 1 case per million persons per year. Therefore, measuring the number of new cases occurring each year remains the best overall indicator of progress toward TB elimination. In 2016, TB incidence in the United States was 2.9 overall TB cases (including U.S.-born and non-U.S.-born persons) per 100,000 persons (30 per million). Overall, TB incidence slightly declined from 2015 to 2016, however the nation has not yet achieved the 2020 national target of  $\leq 1.4$  TB cases per 100,000 (Figures 1 and 2).

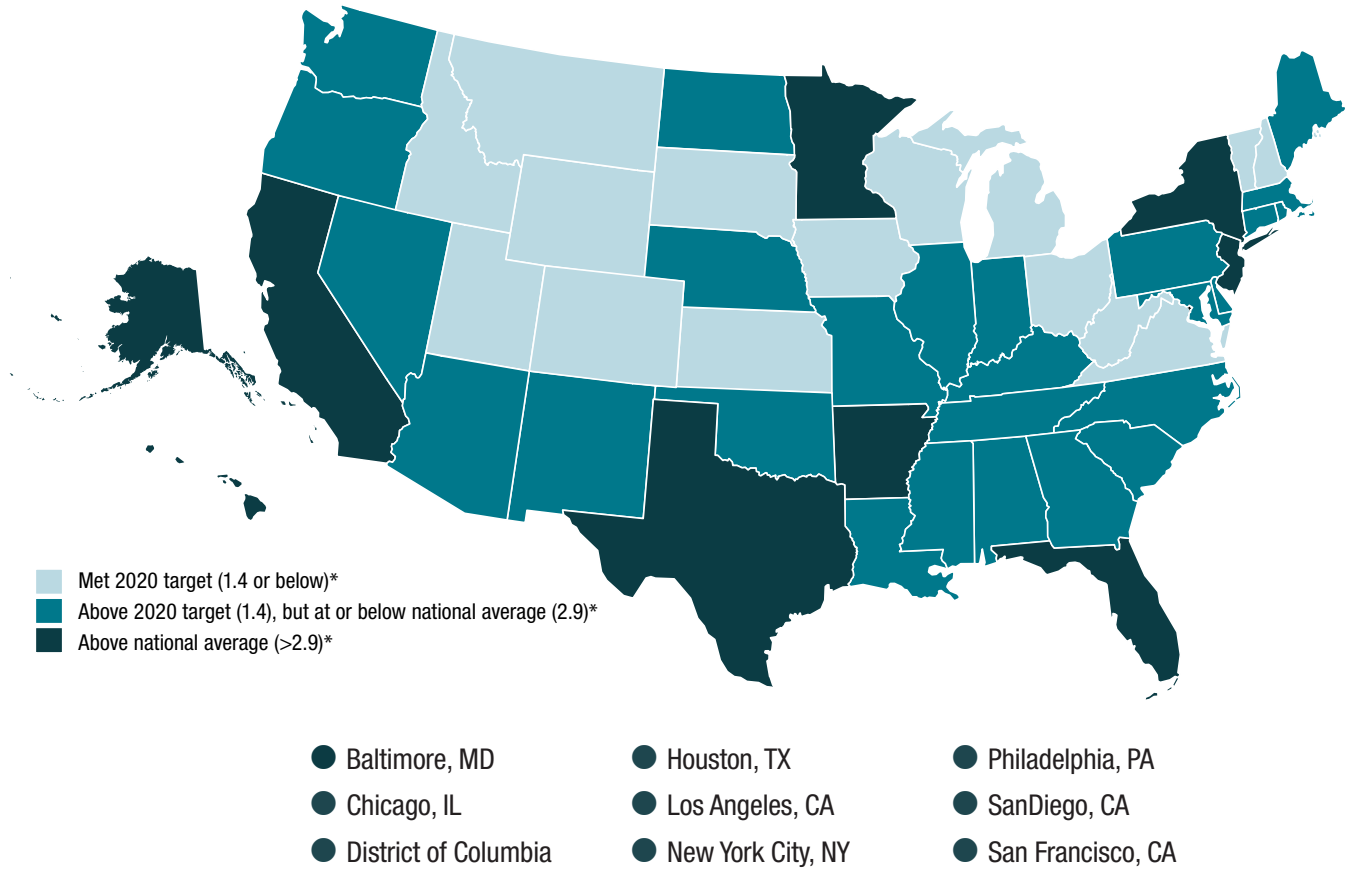


<sup>1</sup>Data in this report are based on the final 2016 dataset from the National TB Surveillance System (NTSS).

<sup>2</sup>For more information about the National TB Program Objectives and Performance Targets for 2020 please visit: <http://www.cdc.gov/tb/programs/evaluation/indicators/default.htm>.

<sup>3</sup>Centers for Disease Control and Prevention (CDC). Reported Tuberculosis in the United States, 2016. Atlanta, GA: US Department of Health and Human Services, CDC; 2017.

**Figure 1. Overall TB Incidence\*, United States, 2016**

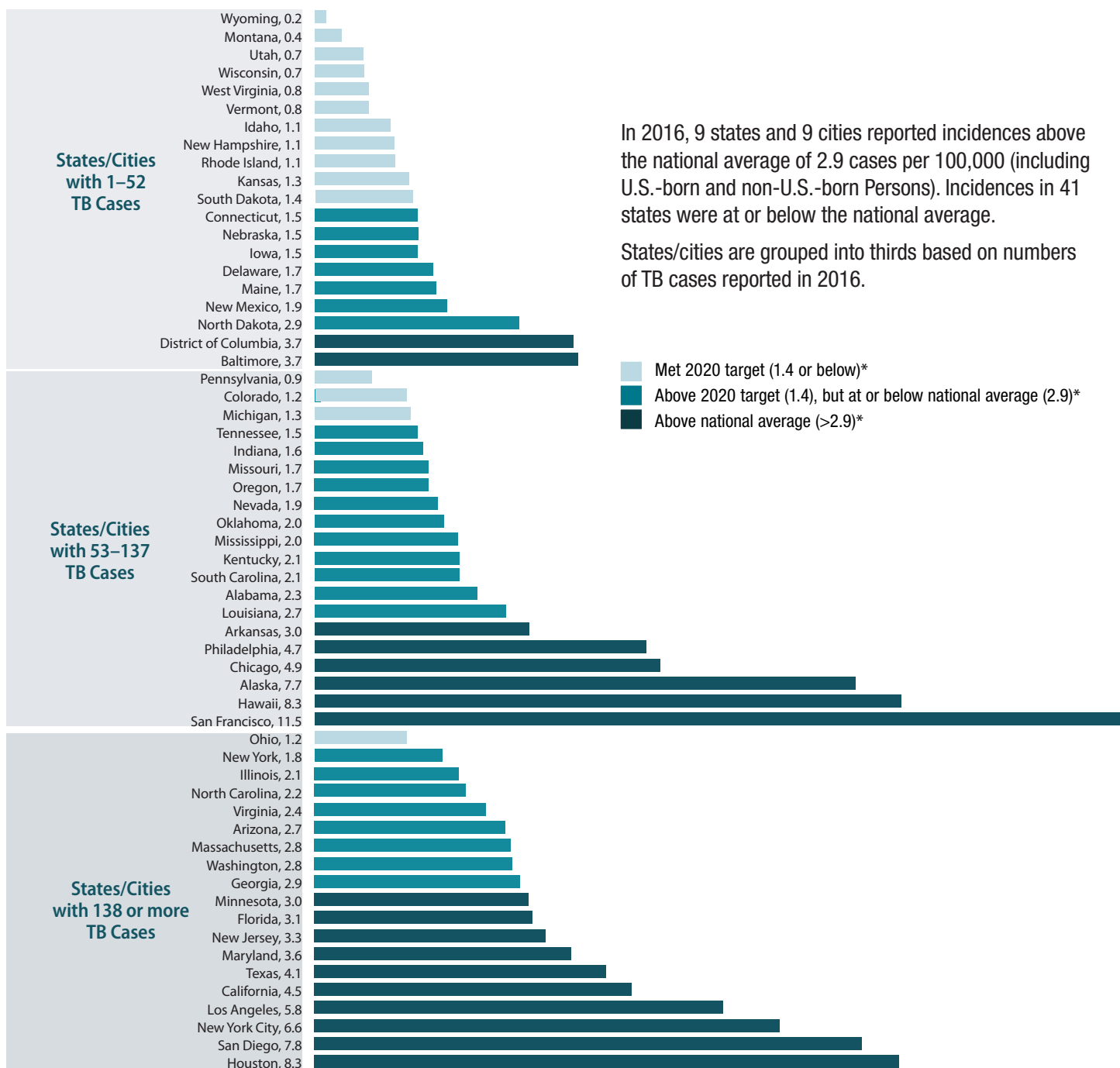


Data source: National TB Surveillance Systems as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 persons



**Figure 2. Overall TB Incidence\*, United States, 2016**



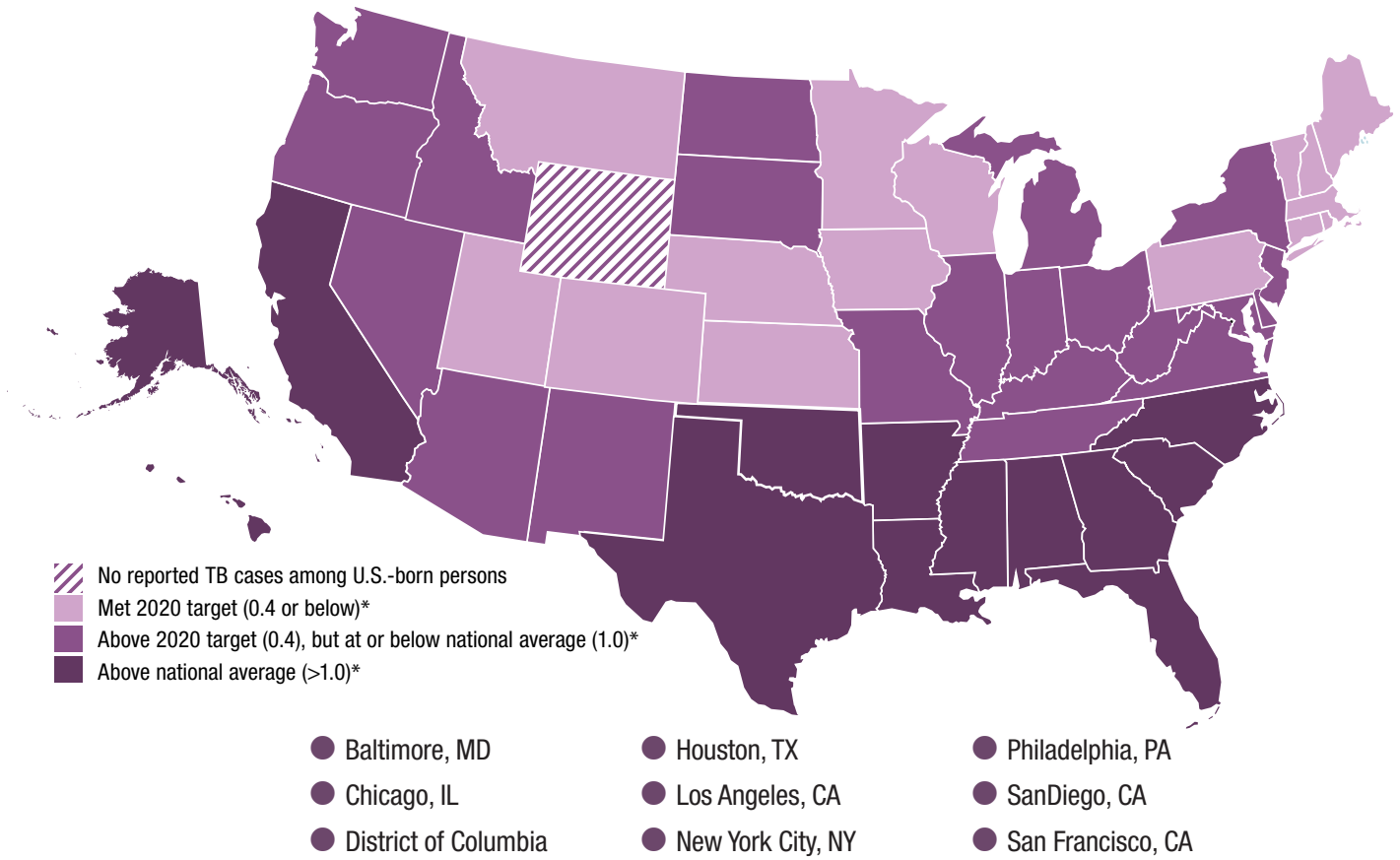
In 2016, 9 states and 9 cities reported incidences above the national average of 2.9 cases per 100,000 (including U.S.-born and non-U.S.-born Persons). Incidences in 41 states were at or below the national average.

States/cities are grouped into thirds based on numbers of TB cases reported in 2016.

Data source: National TB Surveillance Systems as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 persons

**Figure 3. TB Incidence\*, U.S.-born Persons, United States, 2016**

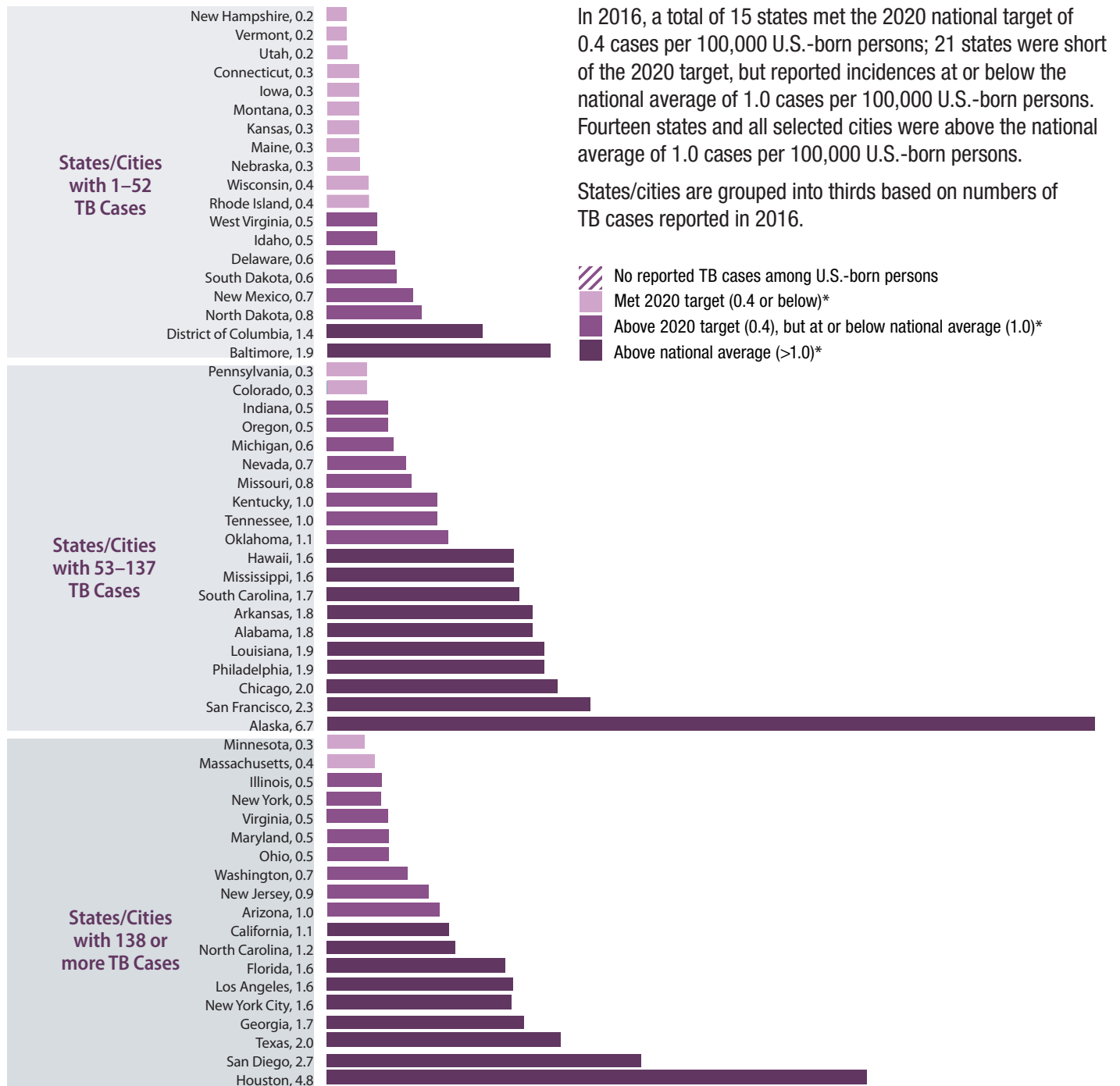


Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 U.S.-born persons



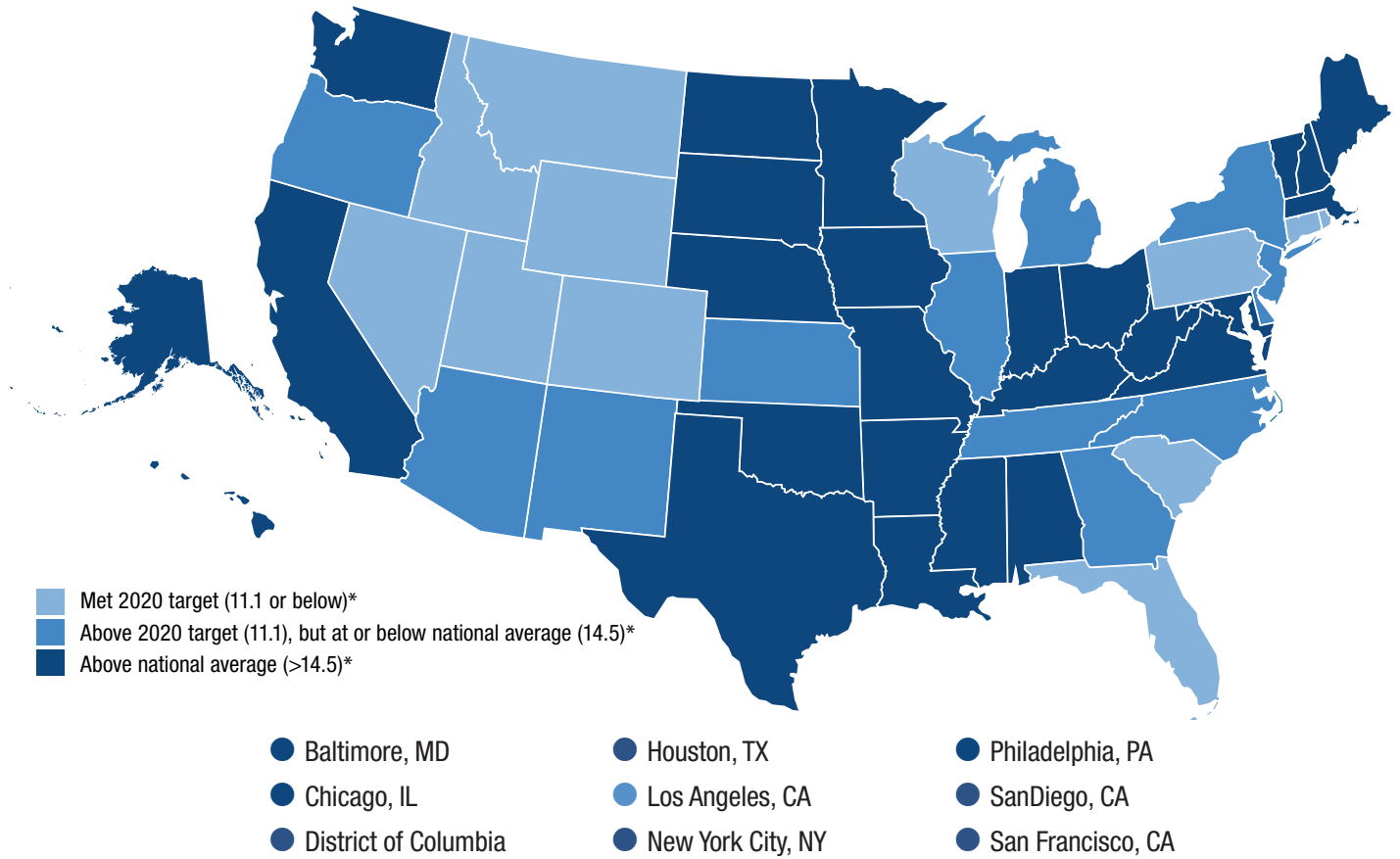
**Figure 4. TB Incidence\*, U.S.-born Persons, United States, 2016**



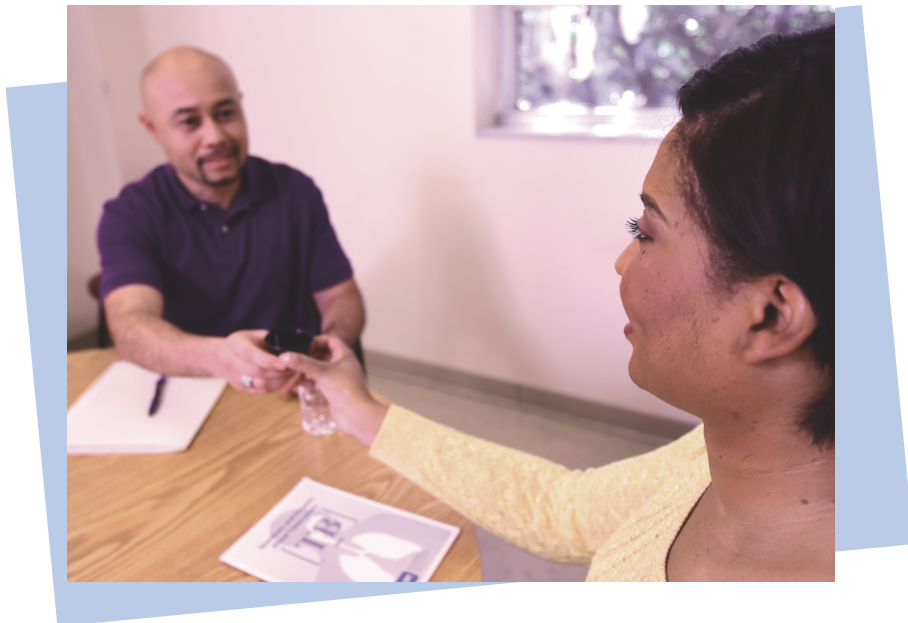
Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 U.S.-born persons

**Figure 5. TB Incidence\*, Non-U.S.–born Persons, United States, 2016**

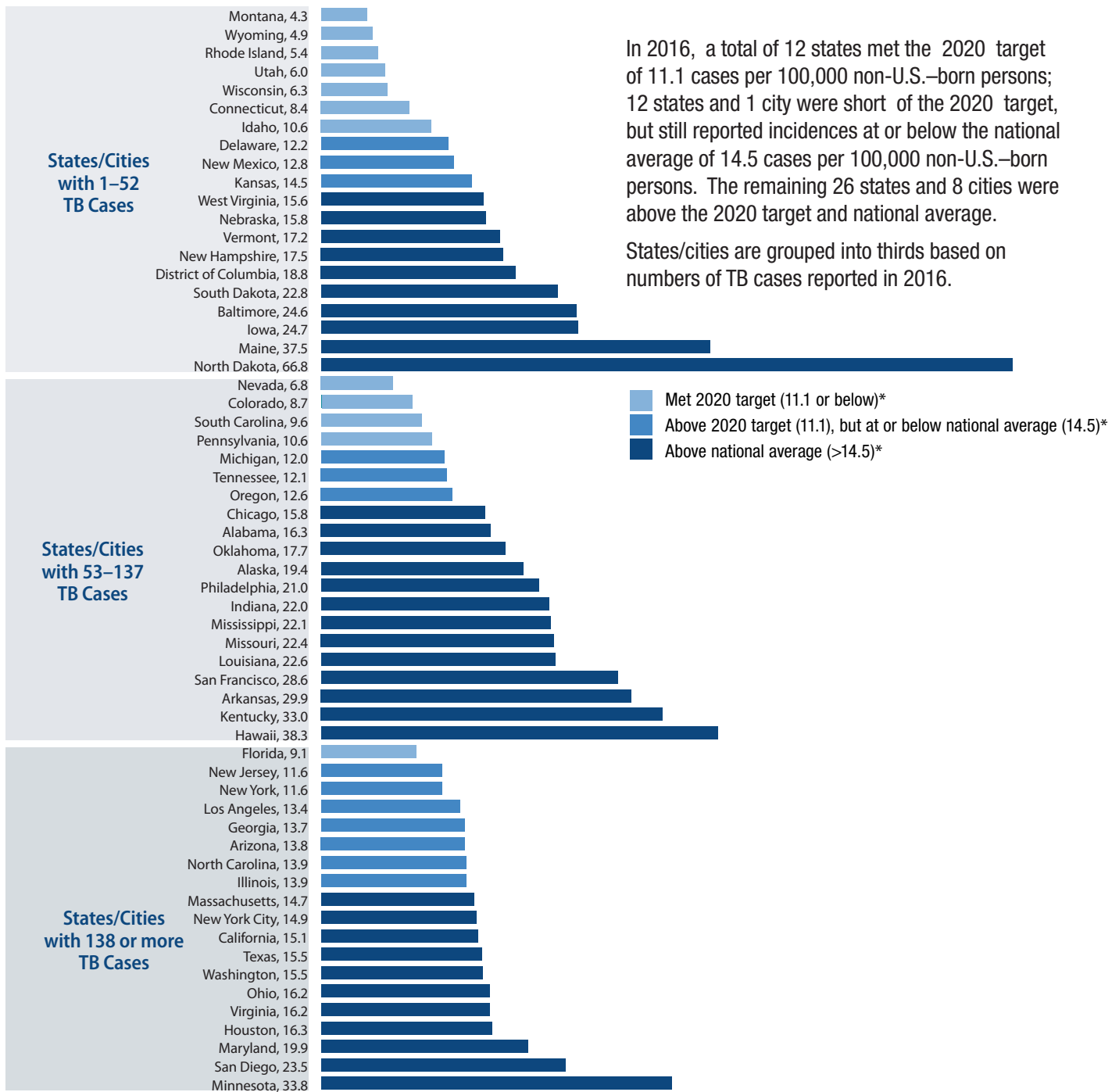


*Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.  
 \*Numbers of TB cases per 100,000 Non-U.S.–born persons*





**Figure 6. TB Incidence\*, Non-U.S.–born Persons, United States, 2016**



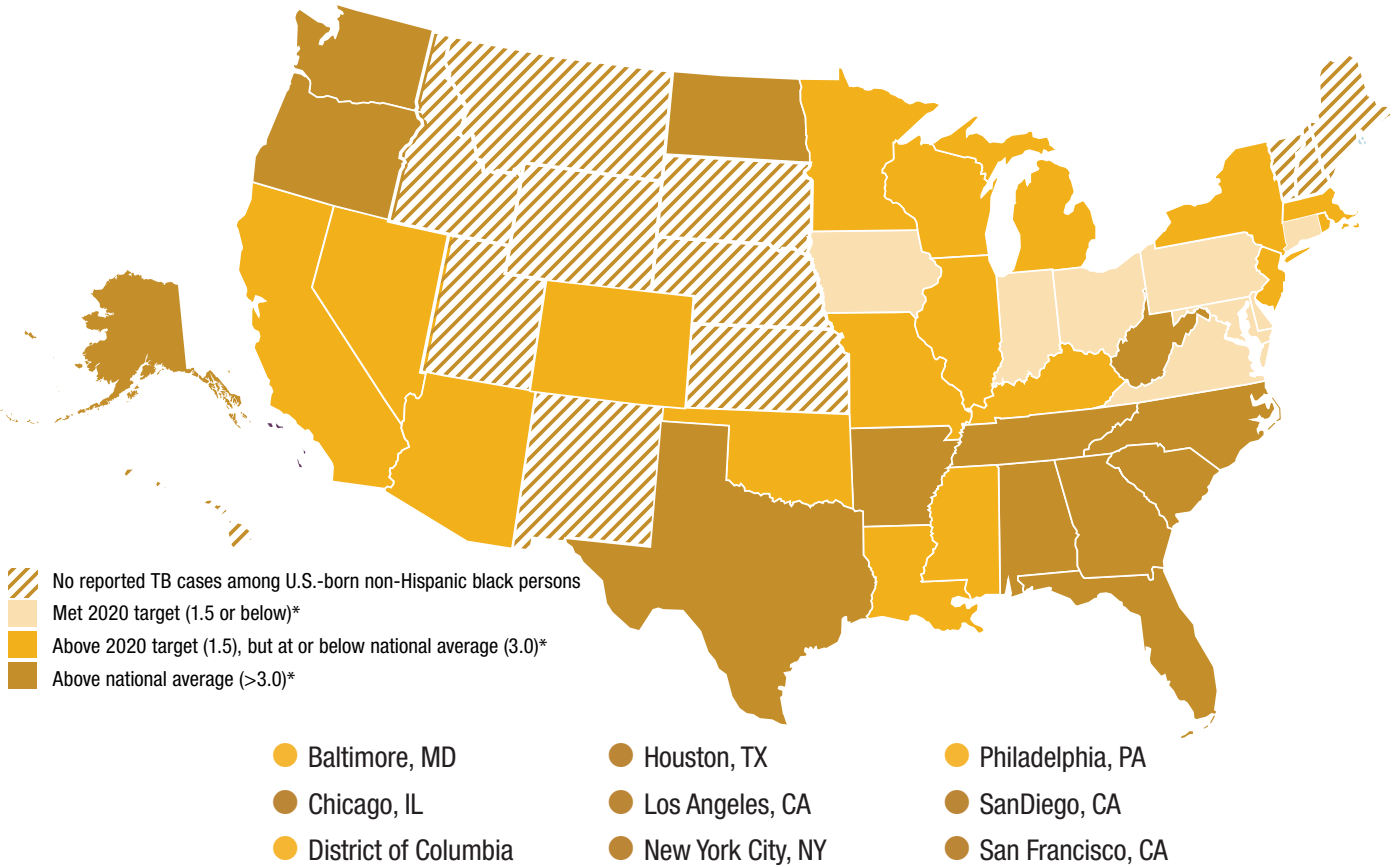
In 2016, a total of 12 states met the 2020 target of 11.1 cases per 100,000 non-U.S.–born persons; 12 states and 1 city were short of the 2020 target, but still reported incidences at or below the national average of 14.5 cases per 100,000 non-U.S.–born persons. The remaining 26 states and 8 cities were above the 2020 target and national average.

States/cities are grouped into thirds based on numbers of TB cases reported in 2016.

Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 non-U.S.–born persons

**Figure 7. TB Incidence\*, U.S.-born Non-Hispanic Blacks or African Americans, United States, 2016**



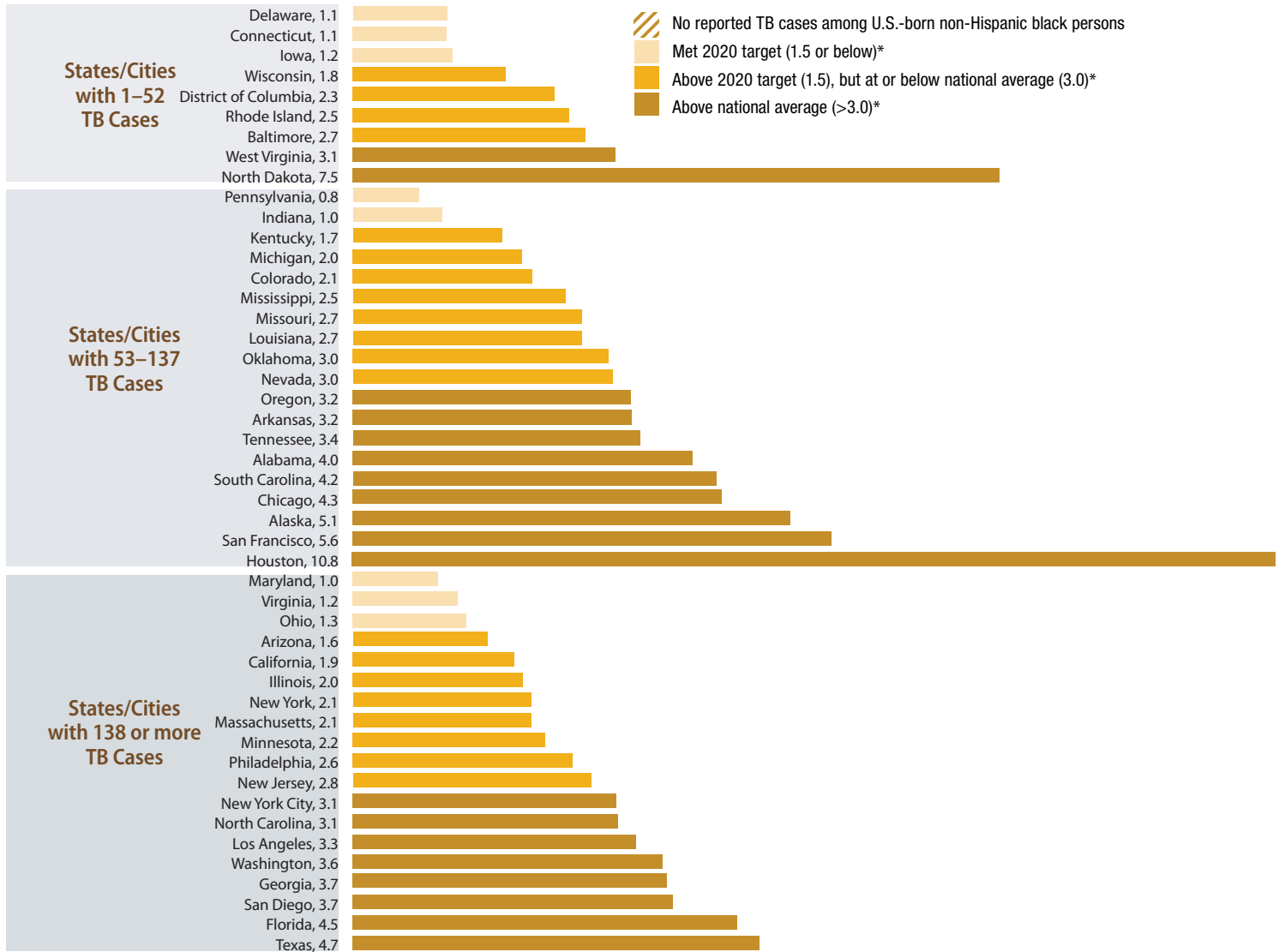
Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.  
 \*Numbers of TB cases per 100,000 U.S.-born non-Hispanic black persons



**Figure 8. TB Incidence\*, U.S.-born Non-Hispanic Blacks or African Americans, United States, 2016**

In 2016, a total of 8 states met the 2020 national target of 1.5 cases per 100,000 U.S.-born non-Hispanic black persons; 17 states and 3 cities were short of the 2020 target, but reported incidences at or below the national average of 3.0 cases per 100,000 U.S.-born non-Hispanic black persons. Thirteen states and 6 cities reported incidences above the 2020 target and national average. Twelve states did not report any cases of TB among U.S.-born non-Hispanic black persons.

States/cities are grouped into thirds based on numbers of TB cases reported in 2016.



Data source: National TB Surveillance System as of June 21, 2017; population data from the U.S. Census Bureau's American Community Survey, 2016.

\*Numbers of TB cases per 100,000 U.S.-born non-Hispanic black persons

## Completion of Therapy

Fully treating and, therefore, preventing further spread of *M. tuberculosis* is key to TB control and elimination. If TB drugs are stopped too soon or not taken correctly, a person may develop symptoms again or drug resistance may develop, enabling the further spread of TB. Each patient is unique, and there are many reasons why a patient might be unable or unwilling to complete TB treatment such as no longer experiencing symptoms of TB, not fully understanding the treatment regimen, not being willing or able to manage side effects of their treatment regimen, cultural beliefs, language barriers, difficulty getting health care, substance use, or mental health issues. Completion of therapy among persons who have experienced homelessness or been incarcerated can be particularly challenging due to difficulty locating patients for follow up care and treatment, and also particularly important because of the risk of transmission through shelter and jail or prison systems. There are several ways to increase treatment completion. These include directly observed therapy (in which patients are observed to ingest each dose of anti-TB medications) and use of incentives and enablers (e.g., gift cards for food or bus fare for transportation to get to and from the health department).

TB treatment is complex and can take several months to complete. It can take up to 2 years to have full treatment information reported for each TB patient. As a result, the most recent information available on completion of therapy is from patients identified with TB in 2014. For these patients, 15 states met or exceeded the 2020 national target of 95.0% of TB cases completing a full treatment regimen in 12 months or less; 18 states and one city were short of the 2020 target, but exceeded the national average (90.1%) (Figure 9 on page 12). Additionally, in 2014 there were 8 states and 5 cities that reported 10 or more TB patients, 15 years of age or older who were homeless in the year prior to diagnosis; 6 of these jurisdictions exceeded the national average of 83.2% completion of therapy among homeless TB patients (Table 1 on page 16). There were 9 states and 4 cities in 2014 that reported 5 or more TB patients, 15 years of age or older who were incarcerated at TB diagnosis; 8 of these jurisdictions exceeded the national average of 85.4% completion of therapy among incarcerated TB patients (Table 2 on page 17).



## HIV Status

People living with HIV are more likely than others to become sick with TB if they are exposed and become infected. Untreated latent TB infection (see below) may quickly progress to TB disease in people living with HIV because the immune system is already weakened. Without treatment, TB disease can progress from sickness to death rapidly. Measuring the number of TB patients who are also tested for HIV and have a known HIV status is not only important in terms of saving lives, but also in interrupting the spread of TB and HIV to others.

In 2016, 35 states and 5 cities performed above the national average (89.9%) and 13 states and 1 city met the 2020 national target of having HIV status known among at least 98.0% of reported TB cases (Figure 10 on page 13).

## Treatment for Latent TB Infection

When a person with infectious TB coughs (or sneezes or sings or talks), droplet nuclei containing *M. tuberculosis* are expelled into the air. If another person inhales air containing these droplet nuclei, he or she may become infected. However, not everyone infected with TB bacteria develops symptoms of TB. As a result, two TB-related conditions exist: latent TB infection (LTBI) and TB disease. Persons with LTBI do not feel sick and do not have any symptoms. They are infected with *M. tuberculosis*, but do not have TB disease. The only sign of LTBI is a positive reaction to a TB skin test or TB blood test. Persons with LTBI are not infectious and cannot spread TB to others. However, at some point in their lives, 5-10% of all people with normal immune systems who have LTBI will become sick with TB disease. As previously described, the chances of progression from LTBI to TB disease are higher for persons with weakened immune systems, such as those infected with HIV. LTBI can be treated to prevent progression to TB disease. Thus, it is important, in terms of accelerating the decline in TB incidence, to measure how many people with LTBI begin and complete treatment.



TB programs work to identify persons who are at high risk for LTBI or at high risk for developing TB disease once infected so that they can be offered testing and treatment for LTBI. High risk persons include known close contacts of someone with infectious TB disease, persons from regions of the world with high TB incidence, and those who work or reside in facilities or institutions with people who are also at high risk for TB. Risk factors for developing TB disease once infected include HIV infection, injection drug use, evidence of prior healed TB disease, diabetes, or low body weight. Infants and children under the age of five years are also at higher risk of getting sick with TB disease once infected.

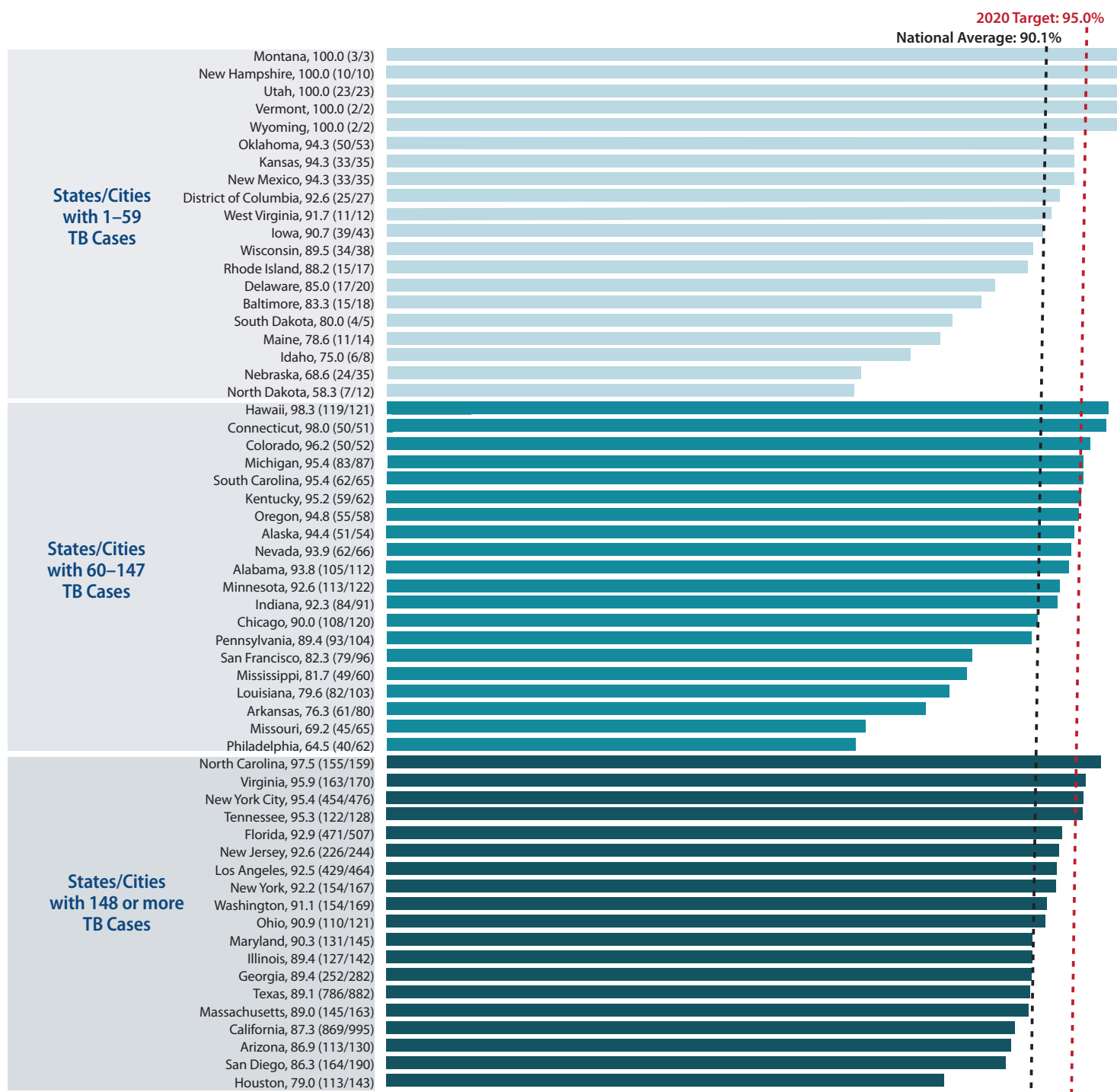


In 2015, the most recent year for which data are available, 15 states and one city met or exceeded the 2020 national target of initiating treatment for 91.0% of people diagnosed with LTBI found during contact investigations; 19 states and 5 cities were short of the 2020 target, but exceeded the national average (72.6%) (Figure 11 on page 14).

In 2015, 24 states and 5 cities met or exceeded the 2020 national target of treatment completion for 81.0% of people diagnosed with LTBI through contact investigation who started treatment; 6 states and 3 cities were short of the 2020 target, but met or exceeded the national average of 75.3% (Figure 12 on page 15).

For more information about TB disease and TB prevention and control activities in the United States, visit the National TB Controllers Association website at: <http://www.tbcontrollers.org> and the CDC TB website at: <http://www.cdc.gov/tb>. If you need additional state-specific data not available in this report, you can contact your state TB control office: <http://www.cdc.gov/tb/links/tboffices.htm>.

**Figure 9. Percentage of Newly Diagnosed TB Cases Completing Treatment ≤12 Months, United States, 2014**



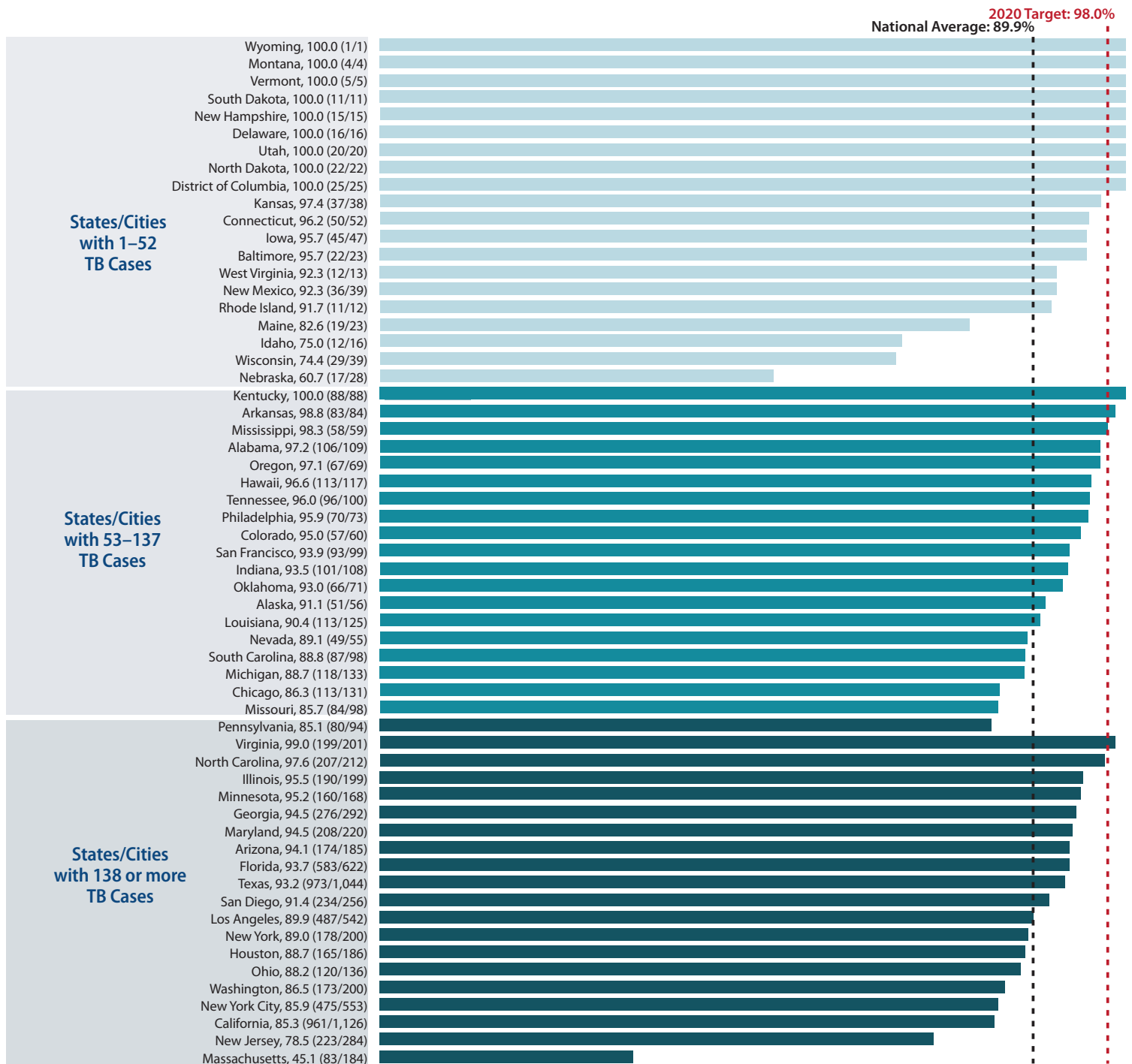
Baltimore, DC, DE, ID, KS, ME, MT, ND, NE, NH, NM, RI, SD, UT, VT, WI, WV and WY reported 50 or fewer TB cases in 2014. Due to the small denominator, data should be interpreted with caution.

States/cities are grouped into thirds based on numbers of TB cases reported in 2014.

The fraction in each parenthesis reports the number of TB patients who completed treatment within 12 months out of the total number of patients who were eligible to complete treatment within 12 months.

Data source: National TB Surveillance System as of June 21, 2017.

**Figure 10. Percentage of TB Cases with Known HIV Status (Positive or Negative), United States, 2016.**



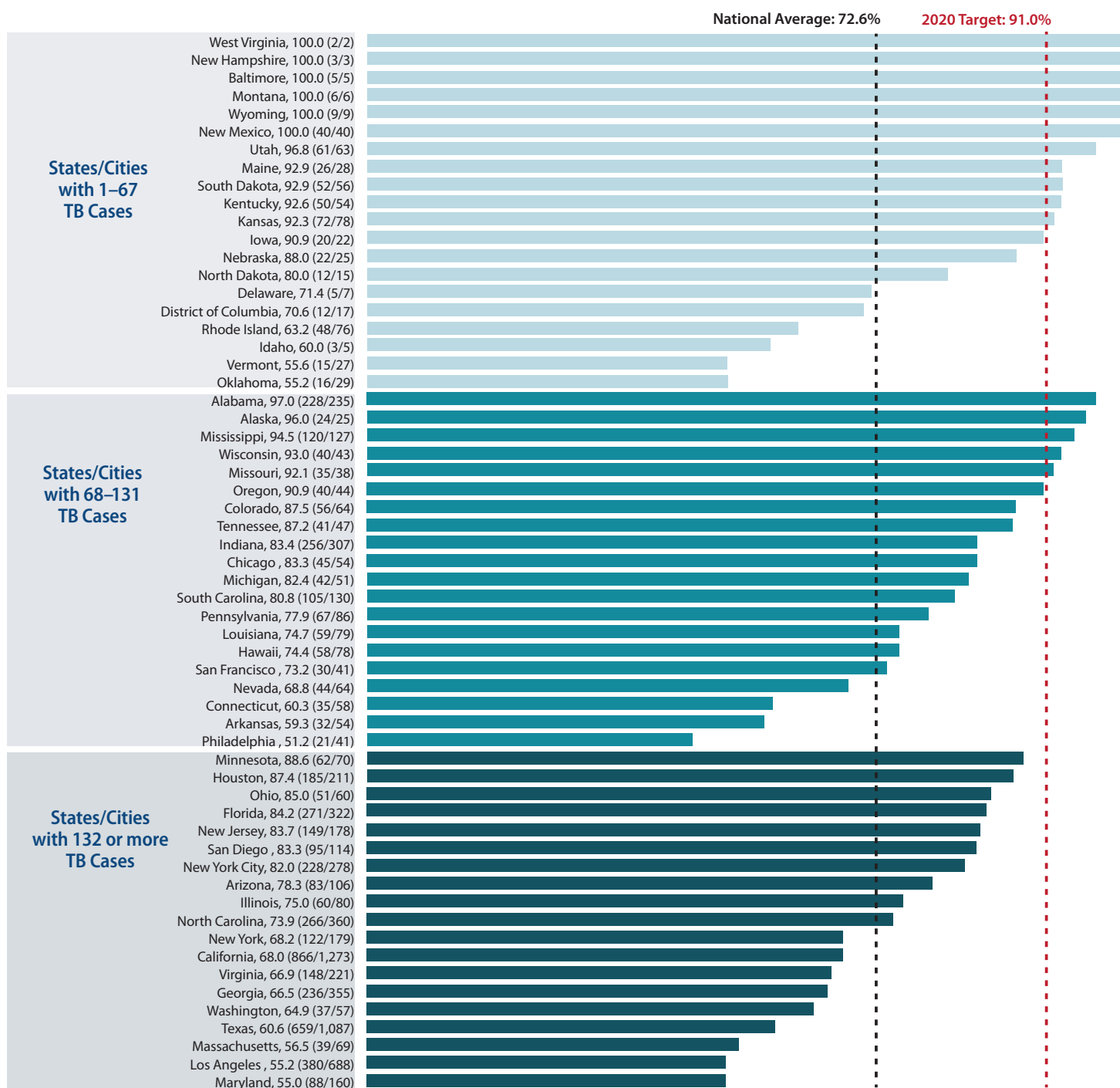
Baltimore, DC, DE, IA, ID, KS, ME, MT, ND, NE, NH, NM, RI, SD, UT, VT, WI, WV and WY reported 50 or fewer TB cases in 2016. Due to the small denominator, data should be interpreted with caution.

States/cities are grouped into thirds based on numbers of TB cases reported in 2016.

The fraction in each parenthesis reports the number of TB patients with either positive or negative HIV test results out of the total number of TB patients.

Data source: National TB Surveillance System as of June 21, 2017.

**Figure 11. Percentage of Contacts (to Sputum Acid-Fast Bacilli Smear-Positive TB Patients) Newly Diagnosed with Latent TB Infection Who Began Treatment, United States, 2015**



Baltimore, DC, DE, IA, ID, KS, ME, MT, ND, NE, NH, NM, RI, SD, UT, VT, WV and WY reported 50 or fewer TB cases in 2015. Due to the small denominator, data should be interpreted with caution.

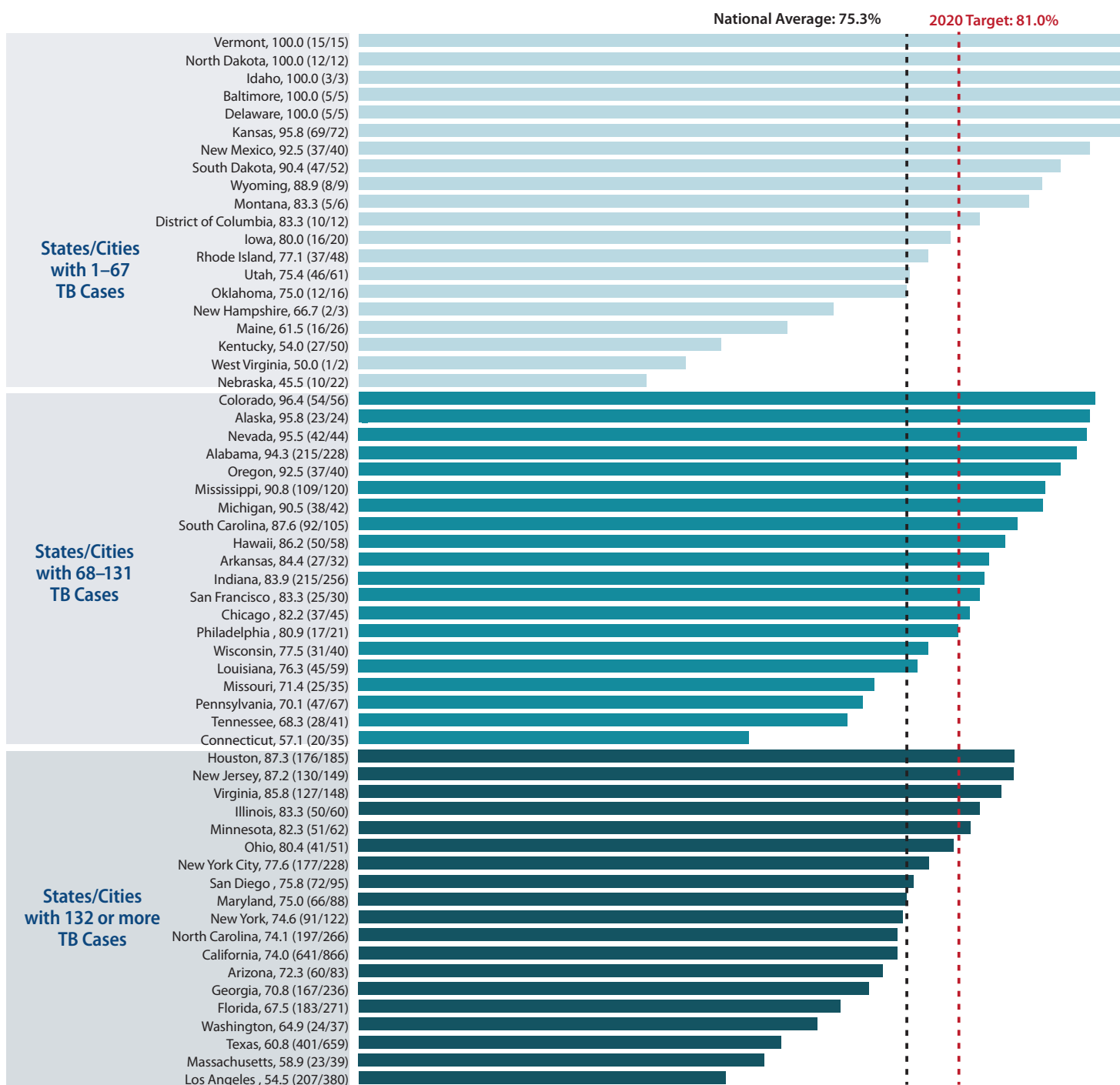
States/cities are grouped into thirds based on numbers of TB cases reported in 2015.

The fraction in each parenthesis reports the number of contacts who started treatment out of those contacts newly diagnosed with TB infection.

Data Source: Aggregate Reports for Program Evaluation as of March 16, 2018.



**Figure 12. Percentage of Contacts (to Sputum Acid-Fast Bacilli Smear-Positive TB Patients) Newly Diagnosed with Latent TB Infection Who Completed Treatment, United States, 2015**



Baltimore, DC, DE, IA, ID, KS, ME, MT, ND, NE, NH, NM, RI, SD, UT, VT, WV and WY reported 50 or fewer TB cases in 2015. Due to the small denominator, data should be interpreted with caution.

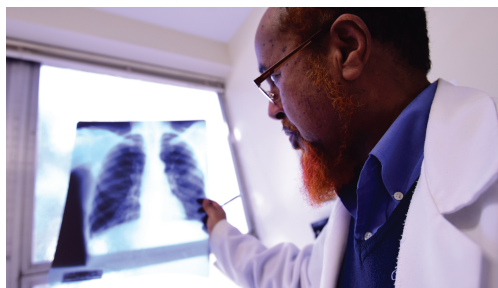
States/cities are grouped into thirds based on numbers of TB cases reported in 2015.

The fraction in each parenthesis reports the number of contacts newly diagnosed with TB infection who completed treatment out of those contacts who started treatment.

Data Source: Aggregate Reports for Program Evaluation as of March 16, 2018.

**Table 1. Treatment Completion within 12 Months or Less among Newly Diagnosed TB Patients Age ≥ 15 Who were Homeless within the Year Prior to Diagnosis, United States, 2014**

States/cities with 1-59 TB cases reported in 2014*	Percentage of homeless patients age ≥15 who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>	States/cities with 60-147 TB cases reported in 2014*	Percentage of homeless patients age ≥15 who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>	States/cities with 148 or more TB cases reported in 2014*	Percentage of homeless patients age ≥15 who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>
Utah	100.0	100.0	Connecticut	100.0	98.0	North Carolina	100.0	97.5
New Mexico	100.0	97.1	Nevada	100.0	96.9	Virginia	100.0	95.9
Oklahoma	100.0	96.2	South Carolina	100.0	96.9	New York	100.0	95.1
District of Columbia	100.0	92.6	Indiana	100.0	94.4	New Jersey	100.0	95.0
Maine	100.0	91.7	Minnesota	100.0	94.2	Ohio	100.0	94.0
Wisconsin	100.0	89.5	Hawaii	90.0	99.2	Massachusetts	100.0	91.8
Kansas	83.3	94.3	Oregon	87.5	96.5	Maryland	100.0	91.3
Nebraska	0.0	100.0	Alaska	85.7	94.4	Los Angeles	94.1	94.1
Delaware	0.0	89.5	San Francisco	83.3	85.9	New York City	93.8	97.0
Baltimore	0.0	88.2	Kentucky	80.0	96.7	Florida	90.5	95.7
North Dakota	0.0	70.0	Alabama	80.0	94.6	Georgia	83.7	93.0
			Mississippi	80.0	89.1	Illinois	83.3	90.7
			Michigan	75.0	98.8	Tennessee	80.0	95.3
			Arkansas	75.0	83.6	Texas	80.0	93.3
			Chicago	72.7	93.1	California	78.6	91.4
			Philadelphia	66.7	67.8	San Diego	75.0	87.7
			Louisiana	50.0	85.4	Houston	75.0	85.6
			Missouri	33.3	86.5	Arizona	66.7	90.4
			Colorado	0.0	96.2	Washington	63.6	95.1



\*States/cities are grouped into thirds based on numbers of TB cases reported in 2014.

<sup>^</sup>Among those age ≥15 who were eligible to complete treatment within 12 months.

<sup>†</sup>Among all patients of any age who were eligible to complete treatment within 12 months.

Note: IA, ID, MT, NH, PA, RI, SD, VT, WV, WY did not report TB cases among persons age ≥15 experiencing homelessness who were eligible to complete treatment.

Data source: National TB Surveillance System as of June 21, 2017.

**Table 2. Treatment Completion within 12 Months or Less among Newly Diagnosed TB Patients Age  $\geq 15$  who were Incarcerated at the Time of Diagnosis, United States, 2014**

States/cities with 1-59 TB cases reported in 2014*	Percentage of incarcerated patients age $\geq 15$ who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>	States/cities with 60-147 TB cases reported in 2014*	Percentage of incarcerated patients age $\geq 15$ who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>	States/cities with 148 or more TB cases reported in 2014*	Percentage of incarcerated patients age $\geq 15$ who completed treatment within 12 months <sup>^</sup>	Percentage of all patients who completed treatment within 12 months <sup>†</sup>
Nebraska	100.0	100.0	Hawaii	100.0	99.2	North Carolina	100.0	97.5
Rhode Island	100.0	100.0	Michigan	100.0	98.8	New York City	100.0	97.0
New Mexico	100.0	97.1	South Carolina	100.0	96.9	Florida	100.0	95.7
Oklahoma	100.0	96.2	Kentucky	100.0	96.7	Tennessee	100.0	95.3
West Virginia	100.0	91.7	Oregon	100.0	96.5	New York	100.0	95.1
Delaware	100.0	89.5	Pennsylvania	100.0	94.9	New Jersey	100.0	95.0
North Dakota	0.0	70.0	Alabama	100.0	94.6	Ohio	100.0	94.0
			Alaska	100.0	94.4	Maryland	100.0	91.3
			Minnesota	100.0	94.2	Illinois	100.0	90.7
			Chicago	100.0	93.1	San Diego	100.0	87.7
			Philadelphia	100.0	67.8	California	95.8	91.4
			Mississippi	80.0	89.1	Los Angeles	88.9	94.1
			Indiana	75.0	94.4	Arizona	81.3	90.4
			Missouri	33.3	86.5	Texas	76.7	93.3
			Louisiana	0.0	85.4	Georgia	75.0	93.0
						Massachusetts	75.0	91.8
						Houston	64.3	85.6
						Washington	0.0	95.1



\*States/cities are grouped into thirds based on numbers of TB cases reported in 2014.

<sup>^</sup>Among those age  $\geq 15$  who were eligible to complete treatment within 12 months.

<sup>†</sup>Among all patients of any age who were eligible to complete treatment within 12 months.

Note: AR, Baltimore, CO, CT, DC, IA, ID, KS, ME, MT, NH, NV, San Francisco, SD, UT, VA, VT, WI, WY did not report TB cases among incarcerated persons age  $\geq 15$  who were eligible to complete treatment.

Data source: National TB Surveillance System as of June 21, 2017.

## Appendices

**Figure 1.** Overall TB Incidence, United States, 2016. This map shows states and cities color coded into one of 3 categories based on TB incidence: those that were at or below the 2020 target of 1.4 TB cases/100,000 persons (Wyoming, Montana, Utah, Wisconsin, West Virginia, Vermont, Pennsylvania, Idaho, New Hampshire, Rhode Island, Colorado, Ohio, Michigan, Kansas, and South Dakota), those that were above the 2020 target of 1.4, but were at or below the national average of 2.9 (Connecticut, Nebraska, Iowa, Tennessee, Indiana, Missouri, Delaware, Oregon, Maine, New York, New Mexico, Nevada, Oklahoma, Mississippi, Kentucky, Illinois, South Carolina, North Carolina, Alabama, Virginia, Arizona, Louisiana, Massachusetts, Washington, North Dakota, and Georgia) and those that were above the national average of 2.9 (Minnesota, Arkansas, Florida, New Jersey, Maryland, District of Columbia, Baltimore, Texas, California, Philadelphia, Chicago, Los Angeles, New York City, Alaska, San Diego, Houston, Hawaii, and San Francisco).

**Figure 2.** Overall TB Incidence, United States, 2016. This horizontal bar graph shows individual state and city TB incidence per 100,000 persons. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2016. Within each group states and cities are ordered by increasing incidence and color coded by whether or not they met the 2020 national target (1.4), were between the 2020 target and national average (2.9), or had incidence above the national average. Among states/cities that reported 1-52 TB cases in 2016, incidences ranged from 0.2 in Wyoming to 3.7 in Baltimore. Wyoming, Montana, Utah, Wisconsin, West Virginia, Vermont, Idaho, New Hampshire, Rhode Island, Kansas, and South Dakota had incidences at or below the 2020 target; Connecticut, Nebraska, Iowa, Delaware, Maine, New Mexico, North Dakota had incidences that were above the 2020 target, but were at or below the national average; the District of Columbia and Baltimore had incidences that were above the national average. Among states/cities that reported 53-137 TB cases in 2016, incidences ranged from 0.9 in Pennsylvania to 11.5 in San Francisco. Pennsylvania, Colorado and Michigan had incidences at or below the 2020 target; Tennessee, Indiana, Missouri, Oregon, Nevada, Oklahoma, Mississippi, Kentucky, South Carolina, Alabama and Louisiana had incidences that were above the 2020 target, but were at or below the national average; Arkansas, Philadelphia, Chicago, Alaska, Hawaii and San Francisco had incidences that were above the national average. Among states/cities that reported 138 or more TB cases in 2016, incidence ranged from 1.2 in Ohio to 8.3 in Houston. Ohio had an incidence at or below the 2020 target; New York, Illinois, North Carolina, Virginia, Arizona, Massachusetts, Washington, and Georgia had incidences that were above the 2020 target, but were at or below the national average; Minnesota, Florida, New Jersey, Maryland, Texas, California, Los Angeles, New York City, San Diego, and Houston had incidences that were above the national average.

**Figure 3.** TB Incidence, U.S.-born Persons, United States, 2016. This map shows states and cities color coded into one of 3 categories based on TB incidence among U.S.-born persons: those that were at or below the 2020 target of 0.4 TB cases/100,000 U.S.-born persons (New Hampshire, Vermont, Utah, Connecticut, Iowa, Pennsylvania, Montana, Kansas, Maine, Minnesota, Nebraska, Colorado, Wisconsin, Massachusetts, and Rhode Island), those that were above the 2020 target of 0.4, but were at or below the national average of 1.0 (Illinois, New York, West Virginia, Idaho, Indiana, Virginia, Maryland, Ohio, Oregon, Michigan, Delaware, South Dakota, Nevada, Washington, New Mexico, Missouri, North Dakota, New Jersey, Kentucky, Arizona, and Tennessee) and those that were above the national average of 1.0 (Oklahoma, California, North Carolina, District of Columbia, Florida, Los Angeles, Hawaii, New York City, Mississippi, South Carolina, Georgia, Arkansas, Alabama, Louisiana, Philadelphia, Baltimore, Chicago, Texas, San Francisco, San Diego, Houston, and Alaska). Wyoming did not report any TB cases among U.S.-born persons.

**Figure 4.** TB Incidence, U.S.-born Persons, United States, 2016. This horizontal bar graph shows individual state and city TB incidence per 100,000 U.S.-born persons. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2016. Within each group states and cities are ordered by increasing incidence and color coded by whether or not they met the 2020 national target (0.4), were between the 2020 target and national average (1.0), or had incidence above the national average. Among states/cities that reported 1-52 TB cases among U.S.-born persons in 2016, incidence ranged from 0.2 in New Hampshire to 1.9 in Baltimore. New Hampshire, Vermont, Utah, Connecticut, Iowa, Montana, Kansas, Maine, Nebraska, Wisconsin, and Rhode Island had incidences at or below the 2020 target; West Virginia, Idaho, Delaware, South Dakota, New Mexico, and North Dakota had incidences that were above the 2020 target, but were at or below the national average; the District of Columbia and Baltimore had incidences that were above the national average. Among states/cities that reported 53-137 TB cases among U.S.-born persons in 2016, incidence ranged from 0.3 in Pennsylvania to 6.7 in Alaska. Pennsylvania and Colorado had incidences at or below the 2020 target; Indiana, Oregon, Michigan, Nevada, Missouri, Kentucky, and Tennessee had incidences that were above the 2020 target, but were at or below the national average; Oklahoma, Hawaii, Mississippi, South Carolina, Arkansas, Alabama, Louisiana, Philadelphia, Chicago, San Francisco, and Alaska had incidences that were above the national average. Among states/cities that reported 138 or more TB cases among U.S.-born persons in 2016, incidence ranged from 0.3 in Massachusetts to 4.8 in Houston. Minnesota and Massachusetts had incidences at or below the 2020 target; Illinois, New York, Virginia, Maryland, Ohio, Washington, New Jersey and Arizona had incidences that were above the 2020 target, but were at or below the national average; California, North Carolina, Florida, Los Angeles, New York City, Georgia, Texas, San Diego, and Houston had incidences that were above the national average.

**Figure 5.** TB Incidence, Non-U.S.-born Persons, United States, 2016. This map shows states and cities color coded into one of 3 categories based on TB incidence among non-U.S.-born persons: those that were at or below the 2020 target of 11.1 TB cases/100,000 non-U.S.-born persons (Montana, Wyoming, Rhode Island, Utah, Wisconsin, Nevada, Connecticut, Colorado, Florida, South Carolina, Idaho, and Pennsylvania), those that were above the 2020 target of 11.1, but were at or below the national average of 14.5 (New Jersey, New York, Michigan, Tennessee, Delaware, Oregon, New Mexico, Los Angeles, Georgia, Arizona, North Carolina, Illinois, and Kansas) and those that were above the national average of 14.5 (Massachusetts, New York City, California, Texas, Washington, West Virginia, Chicago, Nebraska, Ohio, Virginia, Houston, Alabama, Vermont, New Hampshire, Oklahoma, District of Columbia, Alaska, Maryland, Philadelphia, Indiana, Mississippi, Missouri, Louisiana, South Dakota, San Diego, Baltimore, Iowa, San Francisco, Arkansas, Kentucky, Minnesota, Maine, Hawaii, and North Dakota).

**Figure 6.** TB Incidence, Non-U.S.–born Persons, United States, 2016. This horizontal bar graph shows individual state and city TB incidence per 100,000 non-U.S.–born persons. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2016. Within each group states and cities are ordered by increasing incidence and color coded by whether or not they met the 2020 national target (11.1), were between the 2020 target and national average (14.5), or had incidence above the national average. Among states/cities that reported 1-52 TB cases among non-U.S.–born persons in 2016, incidence ranged from 4.3 in Montana to 66.8 in North Dakota. Montana, Wyoming, Rhode Island, Utah, Wisconsin, Connecticut, and Idaho had incidences at or below the 2020 target; Delaware, New Mexico, and Kansas had incidences that were above the 2020 target, but were at or below the national average; West Virginia, Nebraska, Vermont, New Hampshire, District of Columbia, South Dakota, Baltimore, Iowa, Maine, and North Dakota had incidences that were above the national average. Among states/cities that reported 53-137 TB cases among non-U.S.–born persons in 2016, incidences ranged from 6.8 in Nevada to 38.3 in Hawaii. Nevada, Colorado, South Carolina, and Pennsylvania had incidences at or below the 2020 target; Michigan, Tennessee, and Oregon had incidences that were above the 2020 target, but were at or below the national average; Chicago, Alabama, Oklahoma, Alaska, Philadelphia, Indiana, Mississippi, Missouri, Louisiana, San Francisco, Arkansas, Kentucky, and Hawaii had incidences that were above the national average. Among states/cities that reported 138 or more TB cases among non-U.S.–born persons in 2016, incidence ranged from 9.1 in Florida to 33.8 in Minnesota. Florida had an incidence at or below the 2020 target; New Jersey, New York, Los Angeles, Georgia, Arizona, North Carolina, and Illinois had incidences that were above the 2020 target, but were at or below the national average; Massachusetts, New York City, California, Texas, Washington, Ohio, Virginia, Houston, Maryland, San Diego, and Minnesota had incidences that were above the national average.

**Figure 7.** TB Incidence, U.S.-born Non-Hispanic Blacks or African Americans, United States, 2016. This map shows states and cities color coded into one of 3 categories based on TB incidence among U.S.-born non-Hispanic black or African American persons: those that were at or below the 2020 target of 1.5 TB cases/100,000 U.S.-born non-Hispanic black or African American persons (Pennsylvania, Maryland, Indiana, Delaware, Connecticut, Iowa, Virginia, and Ohio), those that were above the 2020 target of 1.5, but were at or below the national average of 3.0 (Arizona, Kentucky, Wisconsin, California, Michigan, Illinois, New York, Massachusetts, Colorado, Minnesota, District of Columbia, Mississippi, Rhode Island, Philadelphia, Missouri, Louisiana, Baltimore, New Jersey, Oklahoma and Nevada) and those that were above the national average of 3.0 (West Virginia, New York City, North Carolina, Oregon, Arkansas, Los Angeles, Tennessee, Washington, Georgia, San Diego, Alabama, South Carolina, Chicago, Florida, Texas, Alaska, San Francisco, North Dakota, and Houston). Montana, Idaho, Wyoming, Utah, New Mexico, South Dakota, Nebraska, Kansas, Vermont, New Hampshire, Maine, and Hawaii did not report any TB cases among U.S.-born non-Hispanic black or African American persons.

**Figure 8.** TB Incidence, U.S.-born Non-Hispanic Blacks or African Americans, United States, 2016. This horizontal bar graph shows individual state and city TB incidence per 100,000 U.S.-born non-Hispanic black or African American persons. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2016. Within each group states and cities are ordered by increasing incidence and color coded by whether or not they met the 2020 national target (1.5), were between the 2020 target and national average (3.0), or had incidence above the national average. Among states/cities that reported 1-52 TB cases among U.S.-born non-Hispanic black or African American in 2016, incidence ranged from 1.1 in Delaware to 7.5 in North Dakota. Delaware, Connecticut, and Iowa had incidences at or below the 2020 target; Wisconsin, District of Columbia, Rhode Island, and Baltimore had incidences that were above the 2020 target, but were at or below the national average; West Virginia and North Dakota had incidences that were above the national average of. Among states/cities that reported 53-137 TB cases among U.S.-born non-Hispanic black or African American persons in 2016, incidence ranged from 0.8 in Pennsylvania to 10.8 in Houston. Pennsylvania and Indiana had incidences at or below the 2020 target; Kentucky, Michigan, Colorado, Mississippi, Missouri, Louisiana, Oklahoma, and Nevada had incidences that were above the 2020 target, but were at or below the national average; Oregon, Arkansas, Tennessee, Alabama, South Carolina, Chicago, Alaska, San Francisco, and Houston had incidences that were above the national average. Among states/cities that reported 138 or more TB cases among U.S.-born non-Hispanic black or African American persons in 2016, incidence ranged from 1.0 in Maryland to 4.7 in Texas. Maryland, Virginia, and Ohio had incidences at or below the 2020 target; Arizona, California, Illinois, New York, Massachusetts, Minnesota, Philadelphia, and New Jersey had incidences that were above the 2020 target, but were at or below the national average; New York City, North Carolina, Los Angeles, Washington, Georgia, San Diego, Florida, and Texas had incidences that were above the national average.

**Figure 9.** Percentage of Newly Diagnosed TB Cases Completing Treatment < 12 Months, United States, 2014. This horizontal bar graph shows percentages for treatment completion by individual state and city. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2014. Within each group states and cities are ordered by decreasing percentage of TB cases who completed treatment within 12 months. Vertical lines show the 2020 national target (95.0%) and the national average (90.1%). Among states/cities that reported 1-59 TB cases in 2014, percentages ranged from 100 in Montana to 58.3 in North Dakota. Montana, New Hampshire, Utah, Vermont, and Wyoming had percentages at or above the 2020 target; Oklahoma, Kansas, New Mexico, District of Columbia, West Virginia, and Iowa had percentages that were below the 2020 target but were at or above the national average; Wisconsin, Rhode Island, Delaware, Baltimore, South Dakota, Maine, Idaho, Nebraska, and North Dakota had percentages that were below the national average. Among states/cities that reported 60-147 TB cases in 2014, percentages ranged from 98.3 in Hawaii to 64.5 in Philadelphia. Hawaii, Connecticut, Colorado, Michigan, South Carolina, and Kentucky had percentages at or above the 2020 target; Oregon, Alaska, Nevada, Alabama, Minnesota, and Indiana had percentages that were below the 2020 target but were at or above the national average; Chicago, Pennsylvania, San Francisco, Mississippi, Louisiana, Arkansas, Missouri, and Philadelphia had percentages that were below the national average. Among states/cities that reported 148 or more TB cases in 2014, percentages ranged from

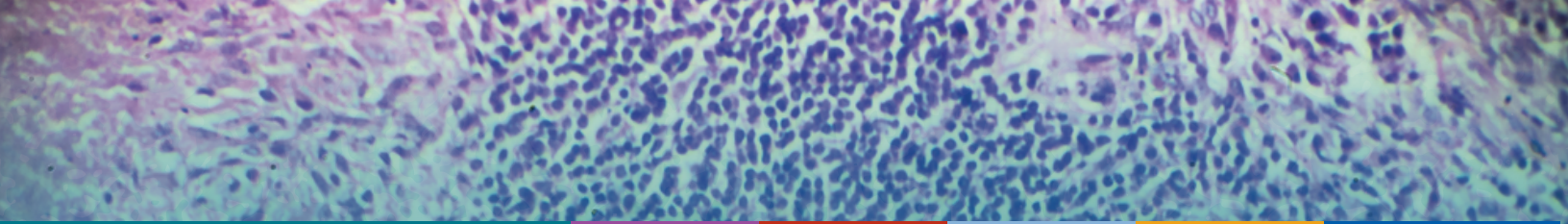
97.5 in North Carolina to 79.0 in Houston. North Carolina, Virginia, New York City, and Tennessee had percentages at or above the 2020 target; Florida, New Jersey, Los Angeles, New York, and Washington had percentages that were below the 2020 target but were at or above the national average; Ohio, Maryland, Illinois, Georgia, Texas, Massachusetts, California, Arizona, San Diego, and Houston had percentages that were below the national average.

**Figure 10.** Percentage of TB Cases with Known HIV Status (Positive or Negative), United States, 2016. This horizontal bar graph shows percentages of TB cases with HIV status reported by individual state and city. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2016. Within each group states and cities are ordered by decreasing percentage of TB cases who had HIV status reported. Vertical lines show the 2020 national target (98.0%) and the national average (89.9%). Among states/cities that reported 1-52 TB cases in 2016, percentages ranged from 100 in Wyoming to 60.7 in Nebraska. Wyoming, Montana, Vermont, South Dakota, New Hampshire, Delaware, Utah, North Dakota, and the District of Columbia had percentages at or above the 2020 target; Kansas, Connecticut, Iowa, Baltimore, West Virginia, New Mexico, and Rhode Island had percentages that were below the 2020 target but were at or above the national average; Maine, Idaho, Wisconsin, and Nebraska had percentages that were below the national average. Among states/cities that reported 53-137 TB cases in 2016, percentages ranged from 100 in Kentucky to 85.1 in Pennsylvania. Kentucky, Arkansas, and Mississippi had percentages at or above the 2020 target; Alabama, Oregon, Hawaii, Tennessee, Philadelphia, Colorado, San Francisco, Indiana, Oklahoma, Alaska, and Louisiana, had percentages that were below the 2020 target but were at or above the national average; Nevada, South Carolina, Michigan, Chicago, Missouri, and Pennsylvania had percentages that were below the national average. Among states/cities that reported 138 or more TB cases in 2016, percentages ranged from 99.0 in Virginia to 45.1 in Massachusetts. Virginia's percentage was at or above the 2020 target; North Carolina, Illinois, Minnesota, Georgia, Maryland, Arizona, Florida, Texas, San Diego, and Los Angeles had percentages that were below the 2020 target but were at or above the national average; New York, Houston, Ohio, Washington, New York City, California, New Jersey, and Massachusetts had percentages that were below the national average.

**Figure 11.** Percentage of Contacts (to Sputum Acid-Fast Bacilli Smear-Positive TB Patients) Newly Diagnosed with Latent TB Infection Who Began Treatment, United States, 2015. This horizontal bar graph shows percentages of contacts to smear-positive TB cases who were diagnosed with and started treatment for LTBI. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2015. Within each group states and cities are ordered by decreasing percentage of contacts with LTBI who started treatment. Vertical lines show the 2020 national target (91.0%) and the national average (72.6%). Among states/cities that reported 1-67 TB cases in 2015, percentages ranged from 100 in West Virginia to 55.2 in Oklahoma. West Virginia, New Hampshire, Baltimore, Montana, Wyoming, New Mexico, Utah, Maine, South Dakota, Kentucky, and Kansas had percentages at or above the 2020 target; Iowa, Nebraska, and North Dakota had percentages that were below the 2020 target but were at or above the national average; Delaware, District of Columbia, Rhode Island, Idaho, Vermont, and Oklahoma had percentages that were below the national average. Among states/cities that reported 68-131 TB cases in 2015, percentages ranged from 97 in Alabama to 51.2 in Philadelphia. Alabama, Alaska, Mississippi, Wisconsin, and Missouri had percentages at or above the 2020 target; Oregon, Colorado, Tennessee, Indiana, Chicago, Michigan, South Carolina, Pennsylvania, Louisiana, Hawaii, and San Francisco had percentages that were below the 2020 target but were at or above the national average; Nevada, Connecticut, Arkansas, and Philadelphia had percentages that were below the national average. Among states/cities that reported 132 or more TB cases in 2015, percentages ranged from 88.6 in Minnesota to 55 in Maryland. There were no states/cities with percentages at or above the 2020 target; Minnesota, Houston, Ohio, Florida, New Jersey, San Diego, New York City, Arizona, Illinois, and North Carolina had percentages that were below the 2020 target but were at or above the national average; New York, California, Virginia, Georgia, Washington, Texas, Massachusetts, Los Angeles, and Maryland had percentages that were below the national average.

**Figure 12.** Percentage of Contacts (to Sputum Acid-Fast Bacilli Smear-Positive TB Patients) Newly Diagnosed with Latent TB Infection Who Completed Treatment, United States, 2015. This horizontal bar graph shows percentages of contacts to smear-positive TB cases who completed treatment for LTBI. States and cities are categorized into 3 groups based on numbers of TB cases reported in 2015. Within each group states and cities are ordered by decreasing percentage of contacts with LTBI who completed treatment out of those who started treatment. Vertical lines show the 2020 national target (81.0%) and the national average (75.3%). Among states/cities that reported 1-67 TB cases in 2015, percentages ranged from 100 in Vermont to 45.5 in Nebraska. Vermont, North Dakota, Idaho, Baltimore, Delaware, Kansas, New Mexico, South Dakota, Wyoming, Montana, and the District of Columbia had percentages at or above the 2020 target; Iowa, Rhode Island, and Utah had percentages that were below the 2020 target but were at or above the national average; Oklahoma, New Hampshire, Maine, Kentucky, West Virginia, and Nebraska had percentages that were below the national average. Among states/cities that reported 68-131 TB cases in 2015, percentages ranged from 96.4 in Colorado to 57.1 in Connecticut. Colorado, Alaska, Nevada, Alabama, Oregon, Mississippi, Michigan, South Carolina, Hawaii, Arkansas, Indiana, San Francisco, and Chicago had percentages at or above the 2020 target; Philadelphia, Wisconsin, and Louisiana had percentages that were below the 2020 target but were at or above the national average; Missouri, Pennsylvania, Tennessee, and Connecticut had percentages that were below the national average. Among states/cities that reported 132 or more TB cases in 2015, percentages ranged from 87.3 in Houston to 54.5 in Los Angeles. Houston, New Jersey, Virginia, Illinois, and Minnesota had percentages at or above the 2020 target; Ohio, New York City, and San Diego had percentages that were below the 2020 target but were at or above the national average; Maryland, New York, North Carolina, California, Arizona, Georgia, Florida, Washington, Texas, Massachusetts, and Los Angeles had percentages that were below the national average.





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