

# Executive Commentary

## Highlights of 2013 Report

Since 1953, in cooperation with state and local health departments, the United States national tuberculosis program has collected information on each newly reported case of tuberculosis (TB) disease in the United States. Currently, each individual TB case report (Report of Verified Case of Tuberculosis or RVCT) is submitted electronically. Following are the highlights of the 2013 report.

1. Updated case counts for each year from 1993 through 2012.
2. Case counts: 9,582 TB cases were reported to CDC from the 50 states and the District of Columbia (DC) for 2013, representing a 3.6% decrease from 2012 (Table 1).
  - Eighteen states reported increased case counts from 2012 (Table 30).
  - California, Texas, New York, and Florida accounted for 51% of the national case total (Table 31).
  - Asians exceeded all other racial or ethnic groups with the largest percentage of total cases (31%) (Table 2).
  - Hispanics comprise the second largest racial or ethnic group (28%) (Table 2).
  - Blacks or African Americans born in the United States represented 37% of TB cases in U.S.-born persons (Table 18) and accounted for 13% of the national case total.
  - Asians born outside the United States represented 46% of TB cases in foreign-born persons (Table 19) and accounted for 30% of the national case total.
3. Case rates: In 2013, the TB case rate declined from 3.2 to 3.0 per 100,000 persons, representing a 4.3% decrease from 2012 (Table 1).
  - Fourteen states and DC reported rates above the national average (Table 30).
  - The TB case rate was 1.2 per 100,000 for U.S.-born persons and 15.6 for foreign-born persons (Table 5).
  - Asians continued to have the highest case rate (18.7 per 100,000 persons) among all racial or ethnic groups (Table 2).
4. Burden among the foreign-born: In 2013, the percentage of cases occurring in foreign-born persons increased to 65% of the national case total (Table 5). This percentage has risen steadily since 1993.
  - Foreign-born Hispanics and Asians together represented 79% of TB cases in foreign-born persons, and accounted for 51% of the national case total (Table 19).
  - In 34 states,  $\geq 50\%$  of TB cases occurred among foreign-born persons (Table 34).
  - The top five countries of origin of foreign-born persons with TB were Mexico, the Philippines, India, Vietnam, and China (Table 6).
5. Drug resistance: 1.0% of reported cases had primary multidrug resistance, which is defined as no previous history of TB disease and resistance to at least isoniazid and rifampin (Table 9). This percentage has remained stable, fluctuating from 0.9% to 1.3%, over the past decade.
6. HIV status: In 2013, 88% of persons with TB reported HIV test results.
  - The percentage of persons with HIV test results reported remained relatively stable between 2012 and 2013 at 86–88% among persons of all ages and 93–94% among persons 25–44 years of age (Table 11).
7. Genotype surveillance coverage: In 2013, genotype surveillance coverage was 94.6%.
  - Genotype surveillance coverage has increased steadily since 2004. Thirty-nine states met or exceeded the national target of 94% genotype surveillance coverage in 2013 (Table 53). Among genotyped cases during 2011–2013, 21% were clustered, suggesting recent transmission (Table 23).

## **Tuberculosis in the United States**

In 2013, the reported number of TB cases (9,582) and case rate (3.0 cases per 100,000) both decreased; these represented declines of 3.6% and 4.3%, respectively, compared to 2012. Since the 1992 TB resurgence peak in the United States, the number of TB cases reported annually has decreased by 64% (Table 1).

TB case rates vary by well-known factors such as age, race and ethnicity, and country of origin. The proportion of total cases occurring in foreign-born persons has been increasing since 1993. In 2013, 65% of TB cases occurred in foreign-born persons, an all-time high. Foreign-born persons have accounted for the majority of TB cases in the United States every year since 2001. Moreover, the case rate among foreign-born persons in 2013 was approximately 13 times higher than among U.S.-born persons (Table 5).

Tuberculosis deaths compiled from National Vital Statistics reports decreased by 5.8%, from 569 deaths in 2010 to 536 deaths in 2011. The number of TB deaths reported annually has decreased by 69% since 1992 (Table 1).

### **Age**

Since 1993, TB case rates have declined annually for almost all age groups. In 2013, TB case rates continued the trend with declines in all age groups except among children aged  $\leq 14$ , which remained the same as the previous year at 0.8/100,000. The highest burden of disease continues to be among older adults. In 2013, adults aged 65 years and older had a case rate of 4.9 cases per 100,000, while children aged  $\leq 14$  years had the lowest rate at 0.8 cases per 100,000 (Table 4).

### **Race and Ethnicity**

In 2003, the race and ethnicity category “non-Hispanic, Asian or Pacific Islander” was split into “non-Hispanic Asian” and “non-Hispanic Native Hawaiian or Other Pacific Islander.” In 2013, Asians had the highest TB case rate at 18.7 cases per 100,000, which was a slight decrease from 19.0 in 2012. Native Hawaiians or Other Pacific Islanders had the second-highest TB case rate at 11.3 cases per 100,000, which is a decrease compared to 12.1 cases per 100,000 reported in 2012. Owing to low case numbers among Native Hawaiians or other Pacific Islanders, case rates fluctuate and must be interpreted with caution (Table 2).

Since 1993, TB case rates have declined in almost all racial and ethnic groups: among Hispanic or Latinos, the decline has been from 19.9 to 5.0 cases per 100,000 (-75%); among non-Hispanic blacks or African Americans, from 28.5 to 5.4 cases per 100,000 (-81%);

among American Indian or Alaska Natives, from 14.0 to 5.4 cases per 100,000 (-61%); among non-Hispanic whites, from 3.6 to 0.7 cases per 100,000 (-81%); and among Asians, from 41.2 to 18.7 cases per 100,000 (-55%). In 2013, the TB case rate for Asians remained over three times higher than that for Hispanics or blacks or African Americans (Table 2).

### **Origin of Birth**

Since 1993, the TB case rate among U.S.-born persons has declined annually. In 2013, the TB case rate for U.S.-born persons was 1.2 cases per 100,000, representing a 84% decrease from 7.4 cases per 100,000 in 1993. The TB case rate among foreign-born persons also declined during the same interval, though the decline was less substantial. In 2013, the TB case rate among foreign-born persons was 15.6 cases per 100,000, representing a 54% decrease from 34.0 cases per 100,000 in 1993 (Table 5).

The proportion of TB cases among persons born in the United States has also declined annually since 1993. In 2013, 35% of TB cases were among U.S.-born persons compared to 69% in 1993 (Table 5). In 34 states,  $\geq 50\%$  of TB cases occurred among foreign-born persons. In 17 states (Arizona, California, Colorado, Connecticut, Hawaii, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Oregon, Rhode Island, Utah, Vermont, Virginia, Washington),  $\geq 70\%$  of TB cases occurred among foreign-born persons (Table 34).

### **Country of Origin and World Region**

From 2009 through 2013, the top five countries of origin of foreign-born persons with TB were Mexico, the Philippines, India, Vietnam and China (Table 6). The distribution of TB cases by world region of origin reflects immigration patterns among persons settling in the United States. Of the 6,193 TB cases reported among foreign-born persons in 2013, 37% occurred among persons born in the Americas region, and 32% occurred among persons born in the Western Pacific region (Table 20). From 1993 through 2013, the proportion of cases increased among persons born in the Eastern Mediterranean region (3% in 1993 to 5% in 2013), the Southeast Asia region (6% in 1993 to 15% in 2013), and the Africa region (2% in 1993 to 8% in 2013) (Table 20).

### **Multidrug-resistant Tuberculosis**

Since 1993 the proportion of patients with primary multidrug-resistant (MDR) TB, which is defined as no previous history of TB disease and resistance to at least isoniazid and rifampin, decreased from 3% to 1% by 1998. During 2009 through 2013, the percentage of

primary MDR TB cases has remained stable at approximately 1%. Since 1997, the percentage of U.S.-born patients with primary MDR TB has remained below 1%. However, of the total number of reported primary MDR TB cases, the proportion occurring in foreign-born persons increased from 25% (103 of 407) in 1993 to 92% (75 of 82) in 2013 (Table 9).

### Extensively Drug-resistant Tuberculosis

CDC has included an updated case count of extensively drug-resistant (XDR) TB cases from 1993 to 2013 in the slide set that accompanies this report. XDR TB is defined as resistance to isoniazid and rifampin, plus resistance to any fluoroquinolone and at least one of three injectable second-line anti-TB drugs (i.e., amikacin, kanamycin, or capreomycin).<sup>1,2</sup> Four cases were reported as XDR TB in 2013, compared to two cases in 2012, five cases in 2011, one case in 2010, and 0 cases in 2009. Of the 12 XDR TB cases reported since 2009, 9 were among foreign-born persons.

### Tuberculosis Therapy

The proportion of TB patients prescribed an initial treatment regimen including isoniazid, rifampin, pyrazinamide, and ethambutol increased from 40.3% in 1993 to 84.1% in 2013. The proportion of patients who completed therapy within 1 year increased from 63.4% in 1993 to 89.0% in 2011 (the latest year for which complete outcome data are available). The proportion of persons receiving directly observed therapy for at least a portion of the treatment duration also increased from 36% in 1993 to 88% in 2011, the latest year for which complete outcome data are available (Table 10).

### HIV Status

Between 2012 and 2013, the proportion of persons with TB who reported HIV test results has remained high at 86–88% for all ages and 93–94% for persons aged 25–44 (Table 11). The percentage of persons with TB who reported HIV test results and who were HIV-positive was 7% in 2013, which has remained the same since 2011 (Table 11). Among persons 25–44 years of age, 9% of persons with TB who reported HIV test results were HIV-positive in 2013, decreasing from 11% in 2012 (Table 11). The percentages have declined since 1993, when 48% of persons with TB of all ages with HIV test results reported HIV-positive results; among persons between 25–44 years of age, the percentage

<sup>1</sup> Centers for Disease Control and Prevention. Revised Definition of Extensively Drug-Resistant Tuberculosis. MMWR Morb Mortal Wkly Rep 2006;55:1176.

<sup>2</sup> Extensively drug-resistant tuberculosis (XDR-TB): recommendations for prevention and control. Wkly Epidemiol Rec 2006;81:430-2.

was 63% in 1993 (Table 11). The American Thoracic Society and the Infectious Diseases Society of America recommend that all TB patients be counseled and tested for HIV.<sup>3</sup>

### Genotyping

TB genotyping is a laboratory-based analysis of the genetic material of the bacteria that cause TB disease. In the United States, routine genotyping of isolates from culture-positive TB cases started in 2004 CDC's National Tuberculosis Genotyping Service (NTGS). TB genotyping surveillance coverage, defined as the proportion of culture-positive TB cases with a genotype result, has increased from 53% in 2004 to 95% in 2013 (Table 13). TB genotype clusters are defined as two or more cases with matching genotypes in the same county during a 3-year time period. Cases that are clustered suggest recent transmission, while unique cases are more likely attributable to reactivation of disease that was acquired in the past. Among genotyped cases during 2011–2013, 21% were clustered (Table 23). During this period, the percentage of clustered cases among U.S.-born persons with TB was 35%, compared to 14% among foreign-born persons with TB (Table 22). Among 4,625 cases in clusters during 2011–2013, 976 cases were in 101 high-alert clusters, 997 cases were in 338 medium-alert clusters, and 2652 cases were in 1093 non-alerted clusters (Table 22). In 2013, among all genotyped cases, 1.6% had a genotype that was consistent with *Mycobacterium bovis*; the majority of these (67.3%) were among foreign-born cases (Table 15).

### United States Affiliated Pacific Islands (USAPI)

The USAPI consist of six jurisdictions in the Pacific Ocean: American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, Federated States of Micronesia, Republic of the Marshall Islands, and Republic of Palau. As a result of their affiliations with the United States, the USAPI are among the recipients of U.S. federal government funding, including CDC cooperative agreement funding for domestic TB control program activities. In 2013, the USAPI had 357 reported cases of TB. Among these, 186 (52%) were male, 66 (19%) were aged less than 15 years and 107 (30%) were aged 25–44 years. In addition, 28 (8%) were not born in the USAPI jurisdictions or the United States, and of those, 22 (79%) emigrated from the Republic of the Philippines. Some other data highlights of the 357 reported USAPI cases are that 306 (86%) were diagnosed with pulmonary disease only, 171 (48%) were positive culture for *Mycobacterium tuberculosis*; less than

<sup>3</sup> CDC. Treatment of tuberculosis. American Thoracic Society, CDC, and Infectious Diseases Society of America. MMWR 2003;52(No. RR-11).

1% had MDR TB, and 148 (42%) were unemployed. Genotype surveillance coverage for USAPI was 82% in 2013.

### **Puerto Rico**

In 2013, the Commonwealth of Puerto Rico reported 50 TB cases to CDC, a case rate of 1.4 per 100,000 persons. Among those cases, 37 (74%) were male, four (8%) were aged less than 25 years, and 35 (70%) were aged 45 years and older. Of the 50 reported cases, 13 were born outside of Puerto Rico, and of those, 9 (70%) emigrated from the Dominican Republic. The majority of reported cases (92%) were diagnosed with pulmonary disease only, 90% were positive culture for *Mycobacterium tuberculosis*, 2.3% had MDR TB, and 42% were unemployed. Genotype surveillance coverage for Puerto Rico was 91% in 2013.

### **Summary**

Both the absolute number of TB cases and the TB case rate in the United States have declined each year since 1993. The total case count of 9,582 and case rate of 3.0 per 100,000 persons represent steady progress toward the goal of TB elimination in the United States (< 1 case per 1,000,000 population)<sup>4</sup>. However, despite consistent declines in TB cases and case rates over the past 60 years, vulnerable populations remain at higher risk for TB in the United States.

Although progress has been made in closing the gap among disparate groups, racial and ethnic minorities and the foreign-born continue to be disproportionately affected by TB. In 2013, 85% of all TB cases occurred among persons who were Asian, black or African American, Hispanic, American Indian or Alaskan Native, or Native Hawaiian. Asians accounted for 31% of all TB cases reported in 2013, the highest percentage of any racial or ethnic group; 95% of TB patients in that group were foreign-born. Hispanics comprise the second largest racial or ethnic group at 28%. African Americans represent 37% of TB cases among U.S.-born persons, the highest racial or ethnic group percentage among the U.S.-born. In 2013, the percentage of cases reported in foreign-born persons increased to 65% of the national case total. To achieve TB elimination, intensified efforts are needed to address the persistent disparities that exist between U.S.-born and foreign-born persons, and between whites and minorities in the United States.

There are a number of tables contained in this report that highlight the disproportionate incidence of TB among racial/ethnic and foreign-born minorities. Tables 2, 3, 5, 6, and 21 contain national-level race/ethnicity and country of origin data while Tables 33-37, 59, 65, and 66 contain similar data stratified by state and Metropolitan Statistical Area.

To address cases and case rates among TB disparity groups, CDC and the Division of Tuberculosis are collaborating with national and local organizations to address social determinates of health (SDH), which are the economic and social conditions that influence the health of people and communities as a whole. CDC collects 10 SDH variables: ethnicity (Table 33), occupation (Table 48), incarceration status (Table 42), immigration status and date of arrival in the United States (Tables 36 and 37), country of birth (Table 35), homelessness (Tables 43 and 67), and resident of long-term care facility at time of treatment (Table 44), HIV status (Table 51), and receipt of treatment (Tables 58 and 59). CDC continues to strengthen collaborations with local partners collecting and evaluating progress reports on SHD measures.

Progress toward TB elimination in the United States will require ongoing surveillance and improved TB control and prevention activities to address persistent disparities between U.S.-born and foreign-born persons, and between whites and racial/ethnic minorities. Along with sustained focus on domestic TB control activities, continued support of global TB control initiatives, and focused initiatives are needed to address conditions that might contribute to increased exposure to TB<sup>5</sup>. Disparities and inequalities among racial/ethnic minorities are affected by many unmeasured factors. CDC recommends improving awareness, testing, and treatment of latent infection and TB disease in minorities and foreign-born populations to reduce TB<sup>5</sup>.

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<sup>4</sup> Ending Neglect: The Elimination of Tuberculosis in the United States. Washington, DC: National Academy Press; 2000.

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<sup>5</sup> CDC; Tuberculosis—United States, 1993–2010. CDC Health Disparities and Inequalities Report—United States, MMWR 2013; 62 (Supplement; November 22, 2013).