

Report on Tuberculosis in California, 2017

Edmund G. Brown Jr, Governor
State of California

Diana S. Dooley, Secretary
California Health and Human Services Agency

Karen L. Smith, MD, MPH
Director and State Health Officer
California Department of Public Health



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California Department of Public Health
Center for Infectious Diseases
Division of Communicable Disease Control
Tuberculosis Control Branch
850 Marina Bay Parkway
Richmond, CA 94804-6403
(510) 620-3000

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Link to report tables: https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH Document Library/TBCB_Report_2017_Tables.xlsx

Tuberculosis Control BranchJennifer Flood, MD, MPH, Chief

Surveillance and Epidemiology Section Pennan Barry, MD, MPH, Chief

Tuberculosis RegistryJanice Westenhause, MPH, Chief
Saul Kanowitz, MPH
Tessa Mochizuki, MPH
Maria Flores, MPH
Varsha Hampole, MPH
Alex Golden

Division of Communicable Disease Control James Watt, MD, MPH, Chief

For more information, contact the Tuberculosis Control Branch at the following address and phone number:

850 Marina Bay Parkway
Building P, 2nd Floor
Richmond, CA 94804-6403
Phone: (510) 620-3000

Cover figure: The figure illustrates the proportion of cases from the six most common countries of origin of California’s TB cases. From darkest to lightest color, the percentage of cases from each country is: United States 18, Mexico 21, Philippines 18, Vietnam 11, China 8, India 6, and all other countries 18.



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

July 31, 2018

Dear Colleagues,

It is my pleasure to present the 2017 annual Report on Tuberculosis (TB) in California. Although TB cases fell by nearly 25 percent in last decade, and by 62 percent since the peak of the epidemic in 1992, TB case numbers and rate did not decrease from 2016 to 2017.

Returning to the steeper decline in TB experienced in earlier years will require a multi-pronged approach. We continue to see TB disease disparities in race and ethnic groups and by place of birth. The proportion of California's TB cases in our oldest residents continues to grow. Directing our public health resources to find and treat TB disease in these hardest hit populations can lower the burden of TB in California.

In addition to addressing active TB cases, we must now expand our attention to the more than 2 million Californians with latent TB infection (LTBI). Our goal of eliminating TB from California will depend on identifying and treating individuals with LTBI through a focus on those at highest risk. Achieving elimination will require working together with national, state and local partners, and community healthcare providers. Surveillance of LTBI, including rates of treatment completion, will ensure that we have the data we need to track our progress and identify challenges as we move toward our elimination goal.

We look forward to working with you over the coming year to establish the needed collaborations and develop new tools to advance our shared vision of eliminating TB from our state. It is through your dedicated efforts that TB disease can resume a decline in our state.

Sincerely,

Jennifer Flood, M.D., M.P.H., Chief,
Tuberculosis Control Branch
Division of Communicable Disease Control
Center for Infectious Diseases
California Department of Public Health



Introduction

Tuberculosis (TB) case reports are submitted to the California Department of Public Health (CDPH), TB Control Branch (TBCB), by 61 local health jurisdictions (58 counties, and the cities of Berkeley, Long Beach, and Pasadena). In 1993, the Centers for Disease Control and Prevention (CDC), in conjunction with state and local health departments, began using the Report of Verified Case of Tuberculosis (RVCT) to collect information on each case of TB. The RVCT includes demographic and clinical characteristics of TB cases, as well as information on drug resistance, risk factors for TB, and treatment outcomes. In 2009, CDC released an expanded RVCT that collects additional information to address the changing epidemiology of TB in terms of risk factors, new drug treatments, and enhanced laboratory capacity for diagnostic tests. California implemented this revised RVCT January 1, 2010.

CDPH Division of Communicable Disease Control implemented an internet-based surveillance system for reportable diseases including TB in January 2010. This system, California Reportable Disease Information Exchange (CalREDIE), allows all jurisdictions in California to submit TB case reports and access their local data on-line in a timely manner.

Acknowledgment

TBCB would like to thank surveillance and reporting staff in all local reporting jurisdictions. Without their hard work we would not have data for this publication. We also acknowledge the support of our partners at CDC's Division of Tuberculosis Elimination.

Data Tables

The data tables of the 2017 Report on Tuberculosis in California are available on the CDPH website at the following link:

Link to report tables: https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH_Document_Library/TBCB_Report_2017_Tables.xlsx

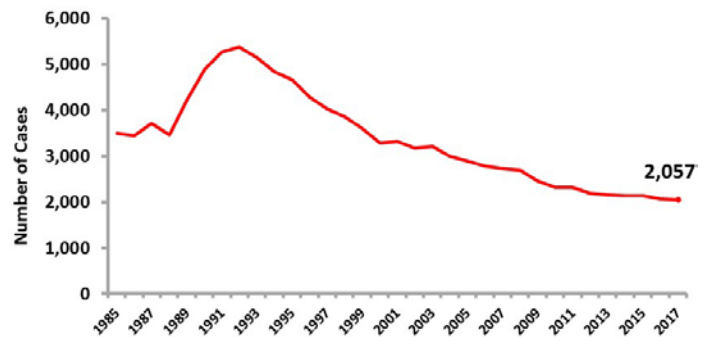
California TB Fact Sheet: 2017 Update

Active tuberculosis (TB) is an illness caused by the bacterium *Mycobacterium tuberculosis*. TB usually affects the lungs and spreads through the air when a person sick with TB coughs. Not everyone infected with the bacteria becomes sick. Those that have been infected but are not sick have latent tuberculosis infection (LTBI). Persons with LTBI can become sick with active TB in the future if they are not treated. The California Department of Public Health, Tuberculosis Control Branch works together with local and national partners to prevent and control TB, including addressing racial and ethnic disparities in the disease, treatment and management of drug-resistant TB, and identifying and controlling outbreaks. These efforts, together with renewed focus on diagnosing and treating persons with LTBI will move us closer to a TB-free California.

California Overview

- In 2017, California reported 2,057 new active TB cases, compared with 2,059 cases in 2016.
- In 2017, California's annual TB incidence was 5.2 cases per 100,000 persons, nearly double the national rate of 2.8.
- An estimated more than \$78 million was spent on medical management of TB cases in California during 2017.
- TB cases were reported in 46 of California's 61 (75%) local health jurisdictions; 14 (30%) of those reported 1-4 cases.
- Among California's TB cases, an estimated 6% were imported from outside the United States, 14% resulted from recent transmission, and 80% were due to progression of LTBI to active TB.
- More than 2 million Californians (6% of the population) have LTBI which can progress to active TB without diagnosis and treatment.

Reported TB Cases: California, 1985–2017



The resurgence of TB began in the 1980s and peaked in 1992. Case counts began decreasing again in 1993, and continued a downward trend through 2017.

Most Affected Populations

Persons Born Outside the U.S. Bear Significant Burden

- The TB rate among persons born outside of the United States (U.S.) (15.7 per 100,000) was 12 times higher than the rate among U.S.-born persons (1.3 per 100,000).
- In 2017, 82% of California's TB cases occurred in persons who were born outside the U.S.
- Persons born in Mexico, the Philippines, Vietnam, China, and India accounted for over 3/4 of TB cases in non-U.S.-born persons.
- In 2017, less than 10% of non-U.S.-born TB patients occurred within 1 year after arriving in the U.S., a decrease from 14% in 2008. Half of TB cases in non-U.S.-born occurred 18 years or more after arrival in the U.S.

Proportion of TB Cases by National Origin — California, 2017

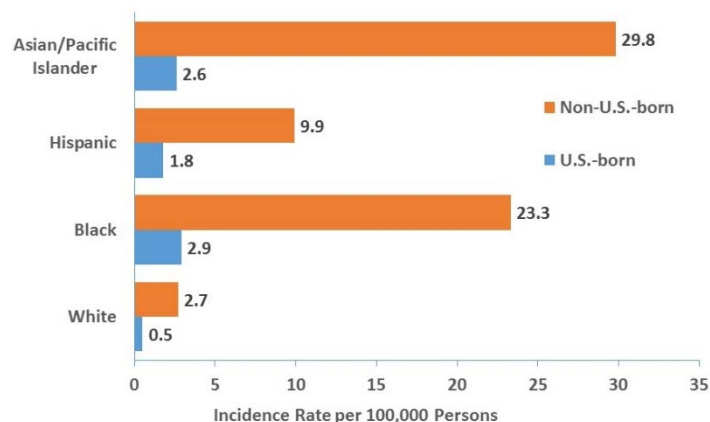


California TB Fact Sheet: 2017 Update

Racial/Ethnic Disparities Persist

- Persons born outside the U.S. continued to experience higher TB rates compared to their U.S.-born counterparts. The rate among Asians and Pacific Islanders born outside the U.S. was 11 times higher than among those born in the U.S., and the rate among Hispanics born outside the U.S. was 5 times higher than among those born in the U.S.
- Rates among racial/ethnic minorities were higher than in whites in both U.S.-born and non-U.S.-born persons.
- Over half (54%) of California's TB cases occurred in Asians and Pacific Islanders, up from 43% in 2008.

TB Rates by Place of Birth and Race/Ethnicity, 2017



Medical Comorbidities

- In 2017, 38% of adult TB cases had a medical comorbidity such as diabetes mellitus, end stage renal disease, HIV infection, or another condition that can increase the risk of progression from latent to active TB disease.
- The most common comorbidity was diabetes mellitus (29% of adult cases).
- HIV infection greatly increases a patient's risk for progression from LTBI to active TB disease, as well as for TB-related death. In 2017, 88% of patients with TB were tested for HIV. Of those tested, 68 (3.7%) were HIV-positive, down from 75 (3.9%) in 2013.

Children and Older Adults

- There were 39 TB cases among children less than 5 years of age in 2017, a decrease from 88 cases in 2008.
- The proportion of TB cases in older adults is growing. In 2017, 33% of TB cases were reported in persons 65 years of age or older, compared to 23% in this age category in 2008. The TB rate in this age group decreased to 11.9 per 100,000 from 15.5 in the same time period.
- In 2017, 225 (11%) persons age 80 or older were diagnosed with TB.
- Since 2008, the median age of all TB patients rose from 47 to 56 years, driven predominantly by the rising median age of non-U.S.-born TB cases from 49 years in 2008 to 58 years in 2017.

Special Populations

- Congregate living situations such as correctional facilities and homeless shelters may pose challenges for TB control due to the potential for a large number of persons to be exposed and infected with TB.
- In 2017, 38 (1.8%) TB patients were residing in a correctional facility at the time of their diagnosis.
- Data on homeless shelter stays are not collected, however, 107 (5%) TB patients were homeless at some point in the year prior to their TB diagnosis in 2017.

California TB Fact Sheet: 2017 Update

Diagnosis and Management of TB

- The results of nucleic acid amplification (NAA) tests, used to identify *Mycobacterium tuberculosis*, can be available within hours after specimen collection, resulting in earlier detection and treatment of TB cases. In 2017, NAA tests were used in 67% of cases.
- In 2017, pulmonary disease was diagnosed in 81% of TB cases, indicating a risk of transmission to others; of those, 14% also had TB in another site. Nineteen percent of TB patients had only extrapulmonary disease.
- Of pulmonary TB cases with an abnormal chest x-ray, cavitation was seen in more than 21%, indicating more advanced disease.
- TB was diagnosed by laboratory findings in 86% of cases; 14% of cases were clinically confirmed.
- Ninety-two percent of TB patients received at least some of their treatment via directly observed therapy.
- More than 60% of TB patients had at least some of their care provided by a local health department; 33% received care only from their private provider.

TB Transmission is Occurring in California

- An estimated 14% of TB cases resulted from transmission of TB in California during 2015–2017.
- In 2017, transmission occurred in 8 new or ongoing confirmed TB outbreaks, each involving at least 4 persons.

Deaths Among Persons with TB

- During 2013–2015, 608 persons (9% of TB cases) died with TB. Of persons who died with TB, 21% died before receiving TB treatment.

Drug-Resistant TB

- Multidrug-resistant (MDR) TB is TB resistant to the two most potent first line drugs, isoniazid and rifampin. Extensively drug-resistant (XDR) TB is MDR TB additionally resistant to two classes of second line drugs, fluoroquinolones and injectables. Patients with MDR and XDR TB generally have poorer outcomes because the most effective TB drugs are ineffective against their disease.
- In 2017, there were 30 (1.8%) MDR TB cases in California, compared with 29 MDR TB cases reported in 2016.
- Despite a worldwide increase in MDR TB, the proportion of TB cases in California that are MDR has remained consistent (1–2%) since drug susceptibility data began being systematically collected in 1993.
- Since 1993, the start of routine tracking of drug resistance, 24 XDR TB cases have been reported in California. Two XDR cases were reported in 2017.

Outcomes of TB Treatment

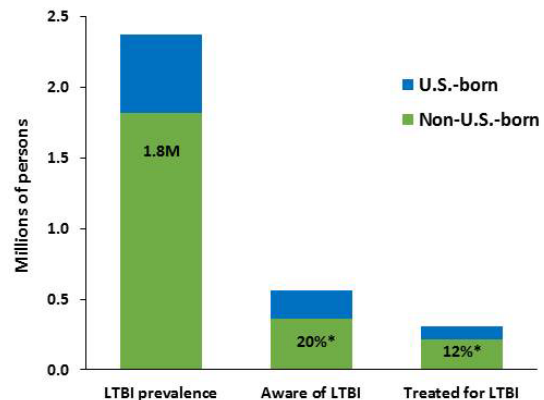
- Among persons reported with TB in 2015 who started anti-TB treatment, 87% completed treatment, 7% died, 1% were lost, and 0.7% refused to complete treatment, and 0.3% experienced an adverse effect of treatment. Outcomes have not been reported for the remaining 4%.
- Of TB patients for whom one year or less of treatment was recommended, 88% completed treatment in that time period.

California TB Fact Sheet: 2017 Update

Treating Latent TB Infection is Critical

- Approximately 80% of persons who become sick with TB have had longstanding infection, LTBI, before they develop disease. LTBI cannot be transmitted to others.
- There are estimated to be more than 2 million Californians who have LTBI, including 17% of the population born outside the U.S. and 2% of the population born in the U.S. Most are not aware of and have not been treated for LTBI and are at risk for progressing to active tuberculosis.
- LTBI is not currently a reportable condition in California.
- LTBI estimates were calculated using the 2011-2012 National Health and Nutrition Examination Survey results for race/ethnicity and nativity strata applied to 2017 California population data from the California Department of Finance.
- [Risk assessment tools](#) are available for use by medical providers to identify persons at risk for LTBI for testing and treatment.

Estimated latent TB infection prevalence, awareness and treatment, California, 2017



Estimated using National Health and Nutrition Examination Survey, 2011-2012 applied to the 2017 California population.
*Percent among non-U.S.-born

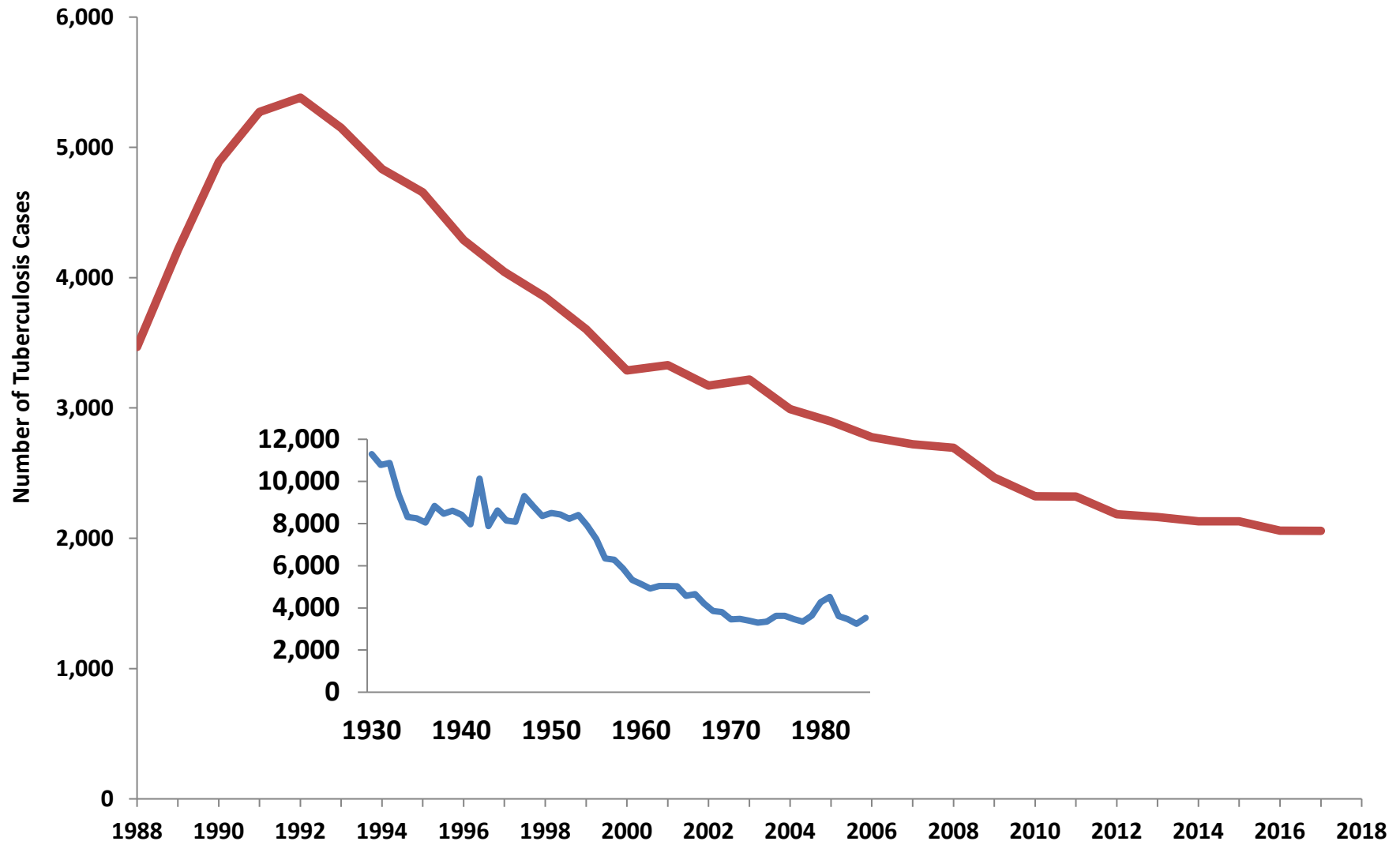
A Plan to Eliminate TB

CDPH, in collaboration with the California TB Elimination Advisory Committee and the California TB Controllers Association, developed a TB Elimination Plan which outlines actions over 5 years to make progress toward eliminating TB from California. The plan is supported by diverse stakeholders across the state. The plan calls for making TB prevention a routine part of medical care by finding and testing Californians who are at risk for TB, optimizing treatment for LTBI, monitoring and evaluating LTBI testing and treatment, and ensuring that patients, clinicians, and public health programs have the tools and resources they need to prevent TB.

More information about tuberculosis:

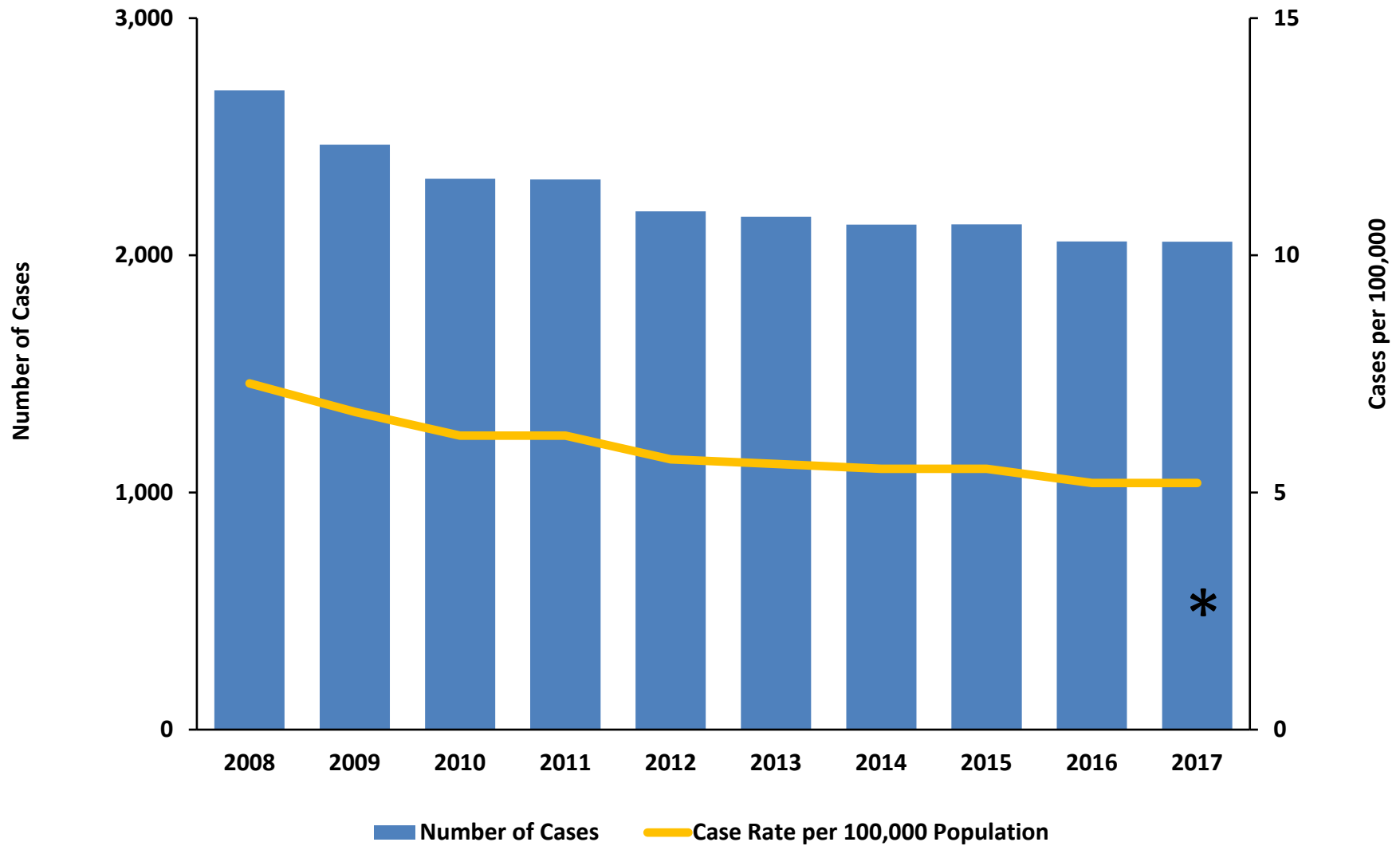
- Find more tuberculosis data, including performance trends on national and state TB objectives:
<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB-Disease-Data.aspx>
- Read more about the plan to eliminate TB from California:
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/TBCB-TB-Elimination-Plan-2016-2020.pdf>
- Who should be tested for LTBI? See the California TB Risk Assessment Tools:
<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB-Risk-Assessment.aspx>

Figure 1. Number of Tuberculosis Cases: California, 1930-2017



California Department of Public Health, Tuberculosis Control Branch

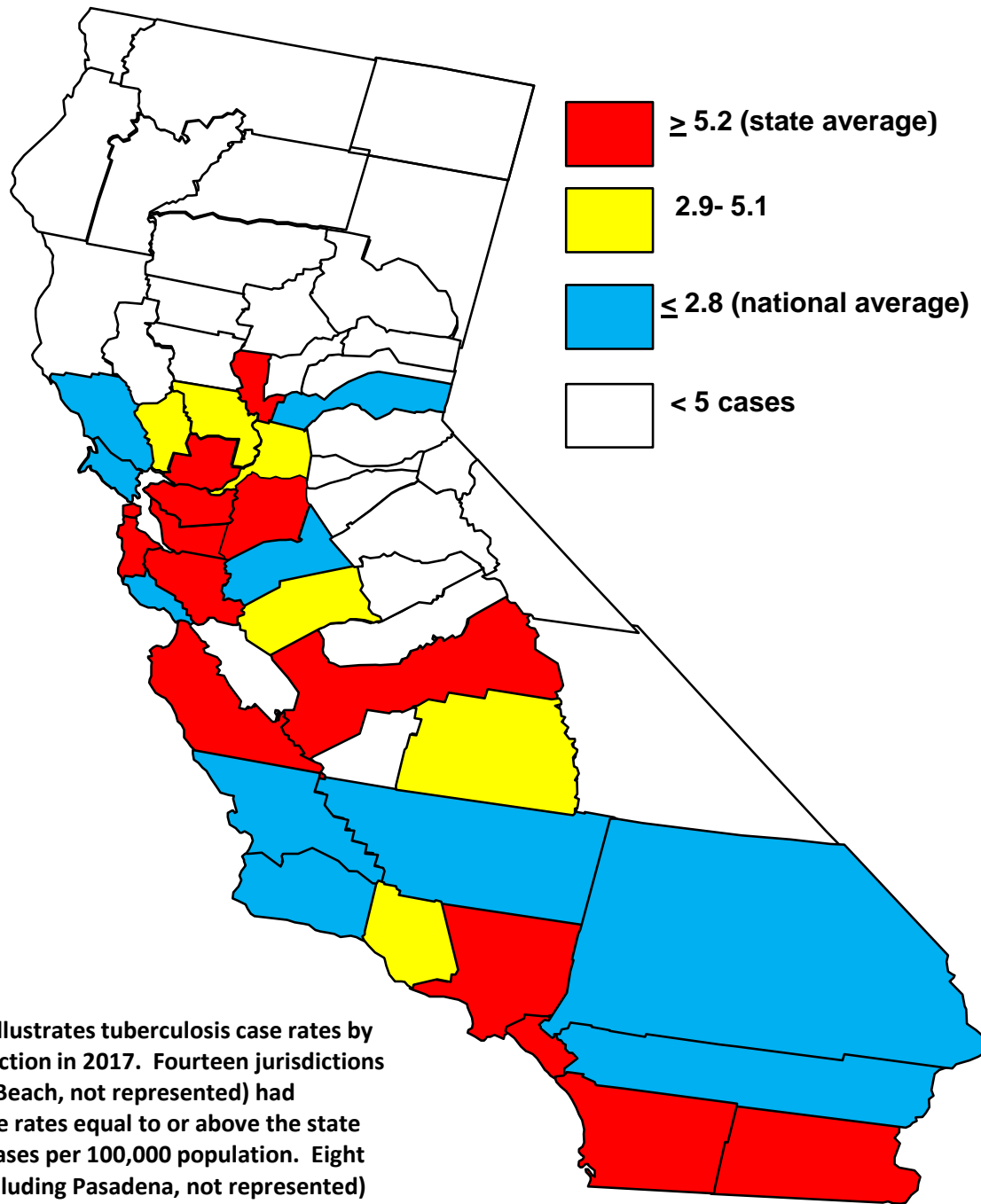
Figure 2. Number of Tuberculosis Cases and Case Rates: California: 2008-2017



* National Case Rate (2.8 per 100,000)

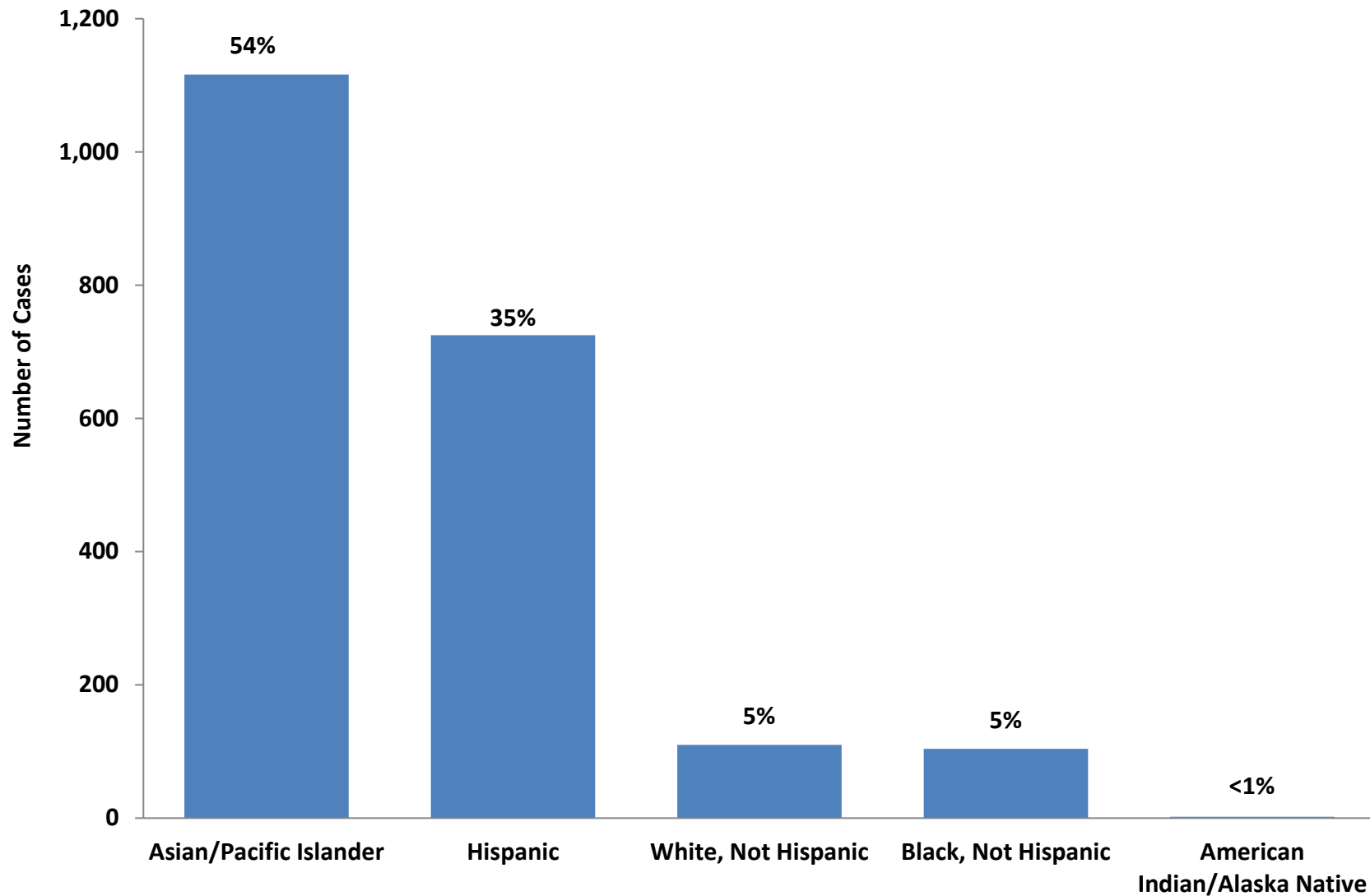
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Figure 3. Tuberculosis in California, 2017



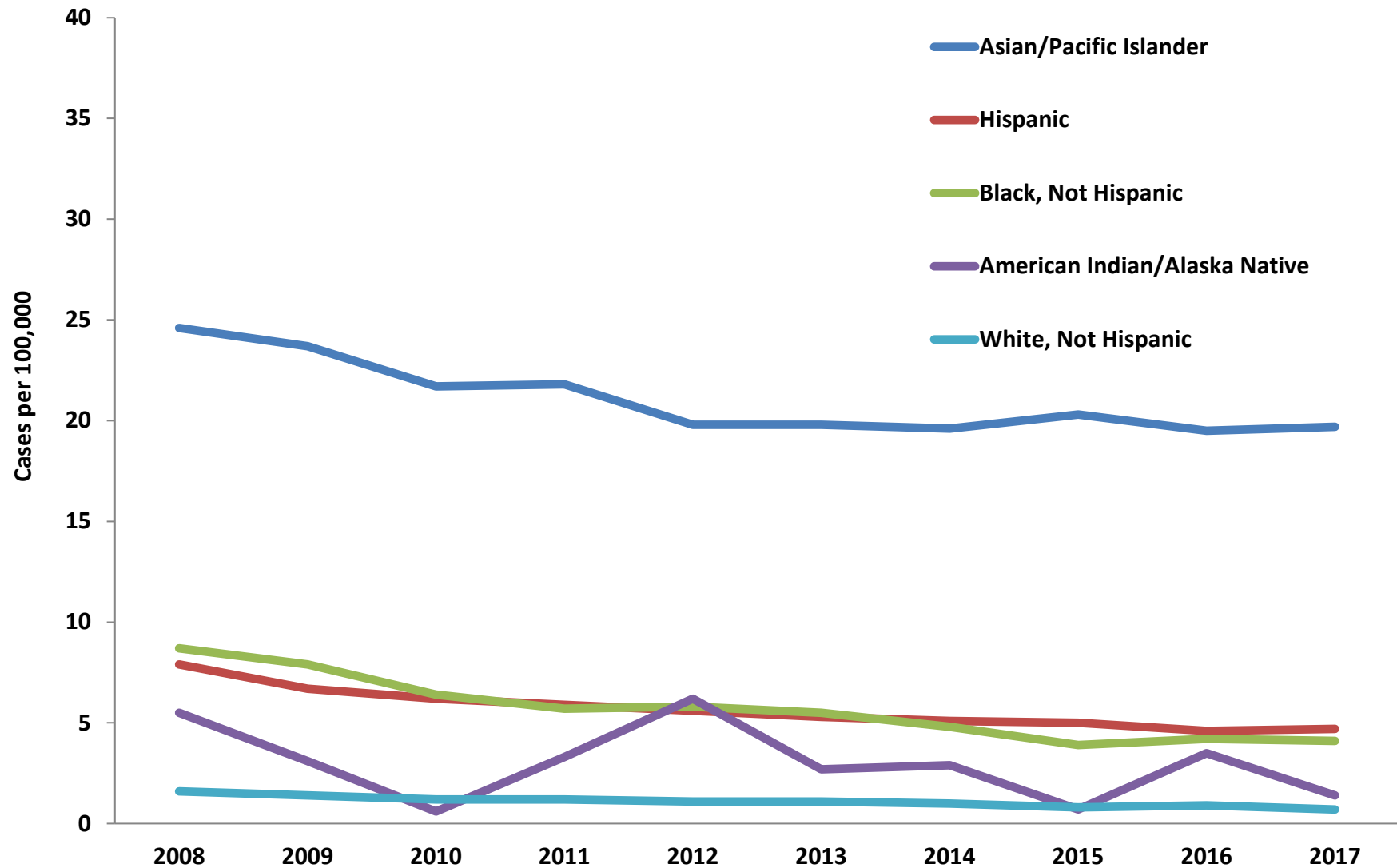
Note: The map illustrates tuberculosis case rates by reporting jurisdiction in 2017. Fourteen jurisdictions (including Long Beach, not represented) had tuberculosis case rates equal to or above the state average of 5.2 cases per 100,000 population. Eight jurisdictions (including Pasadena, not represented) had case rates greater than the national rate and less than the state rate (2.9 to 5.1 cases per 100,000 population). Ten jurisdictions had case rates less than or equal the national rate (2.8 cases per 100,000 population). Case rates were not calculated for 32 jurisdictions because there were fewer than five cases in these areas.

Figure 4. Tuberculosis Cases by Race/Ethnicity: California, 2017



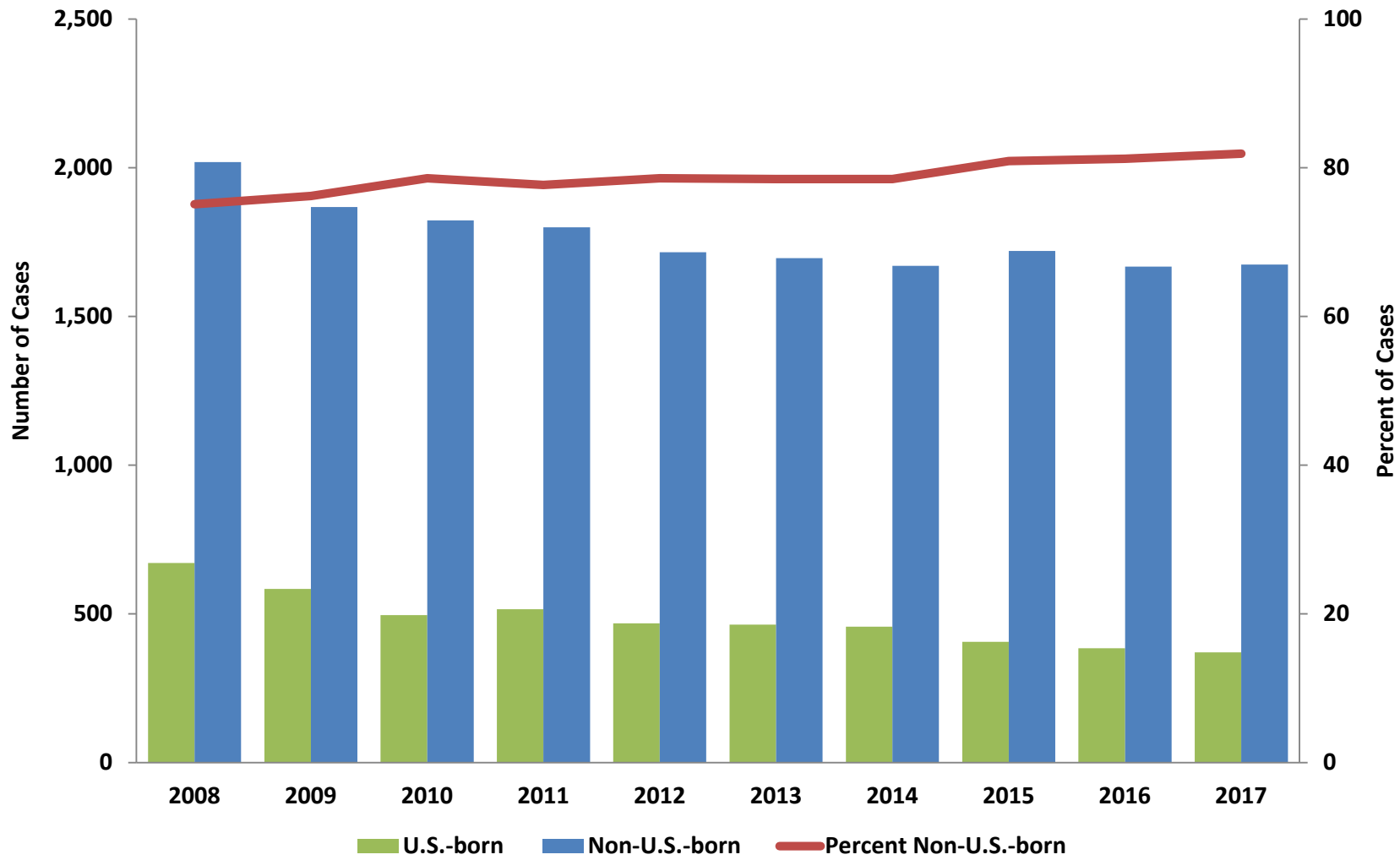
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Figure 5. Tuberculosis Case Rates by Race/Ethnicity: California, 2008-2017



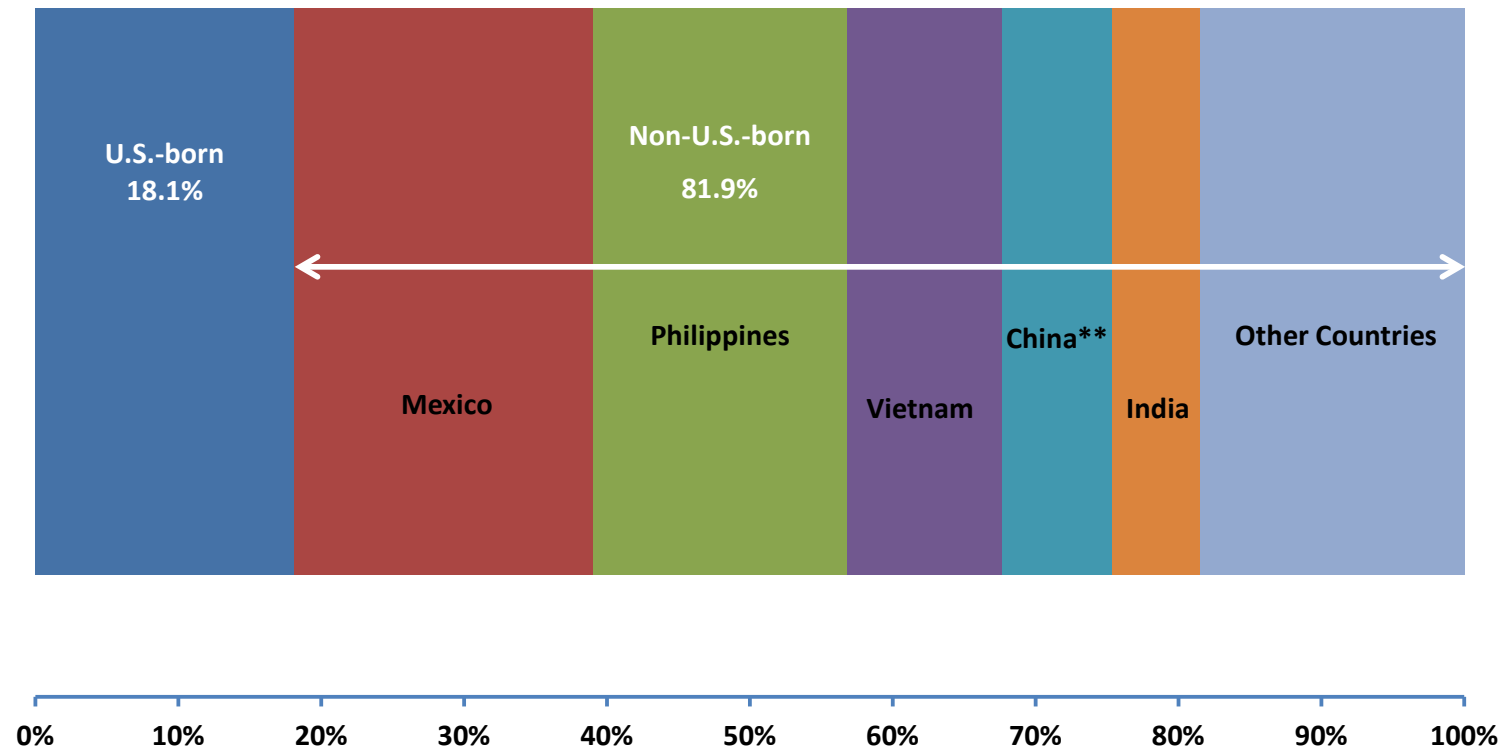
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Figure 6. Tuberculosis Cases in Non-U.S.-born and U.S.-born Persons: California, 2008-2017



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Figure 7. Tuberculosis Cases by Country of Origin:* California, 2017

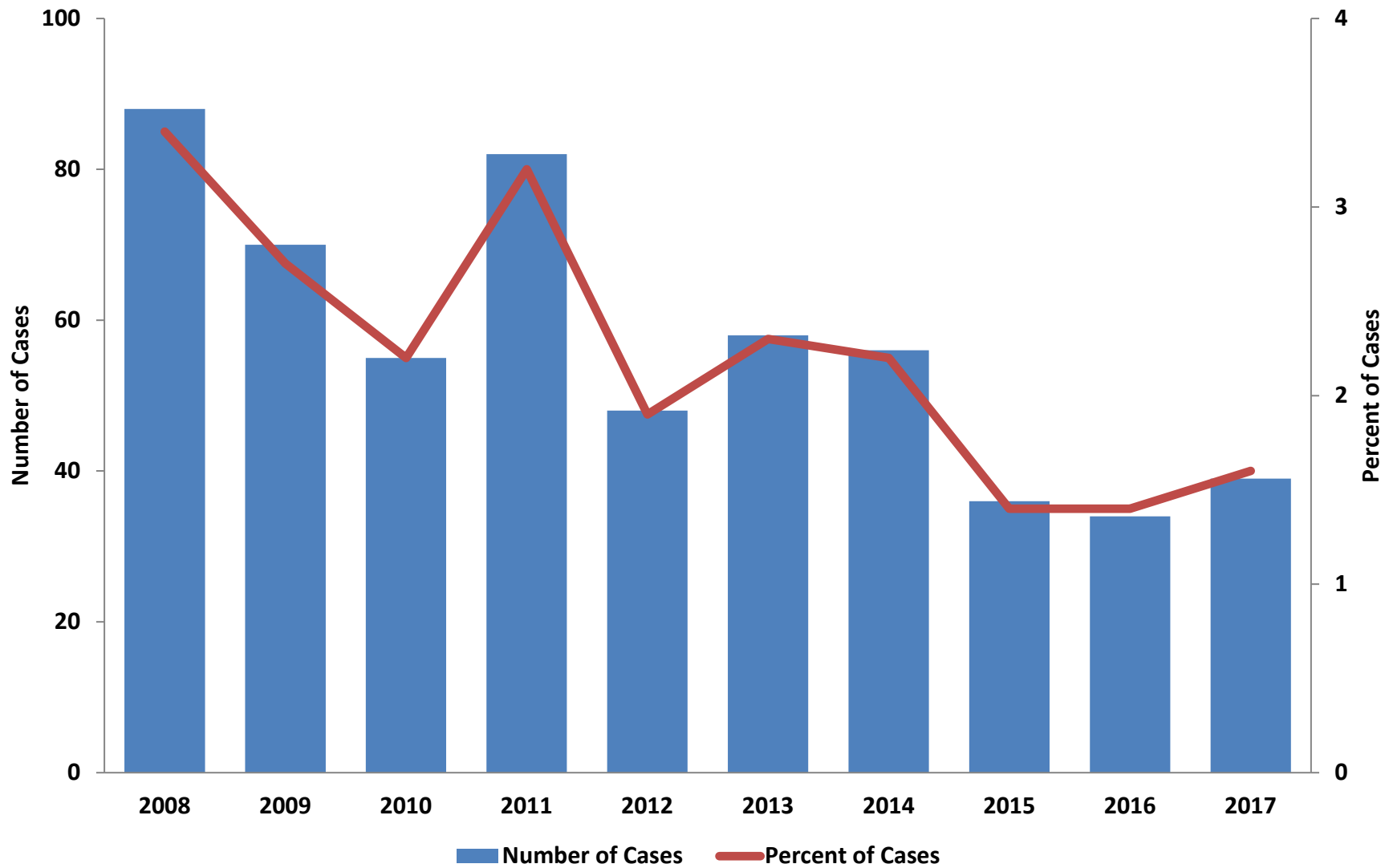


* Excludes cases for whom country of origin is unknown

** People's Republic of China includes Hong Kong

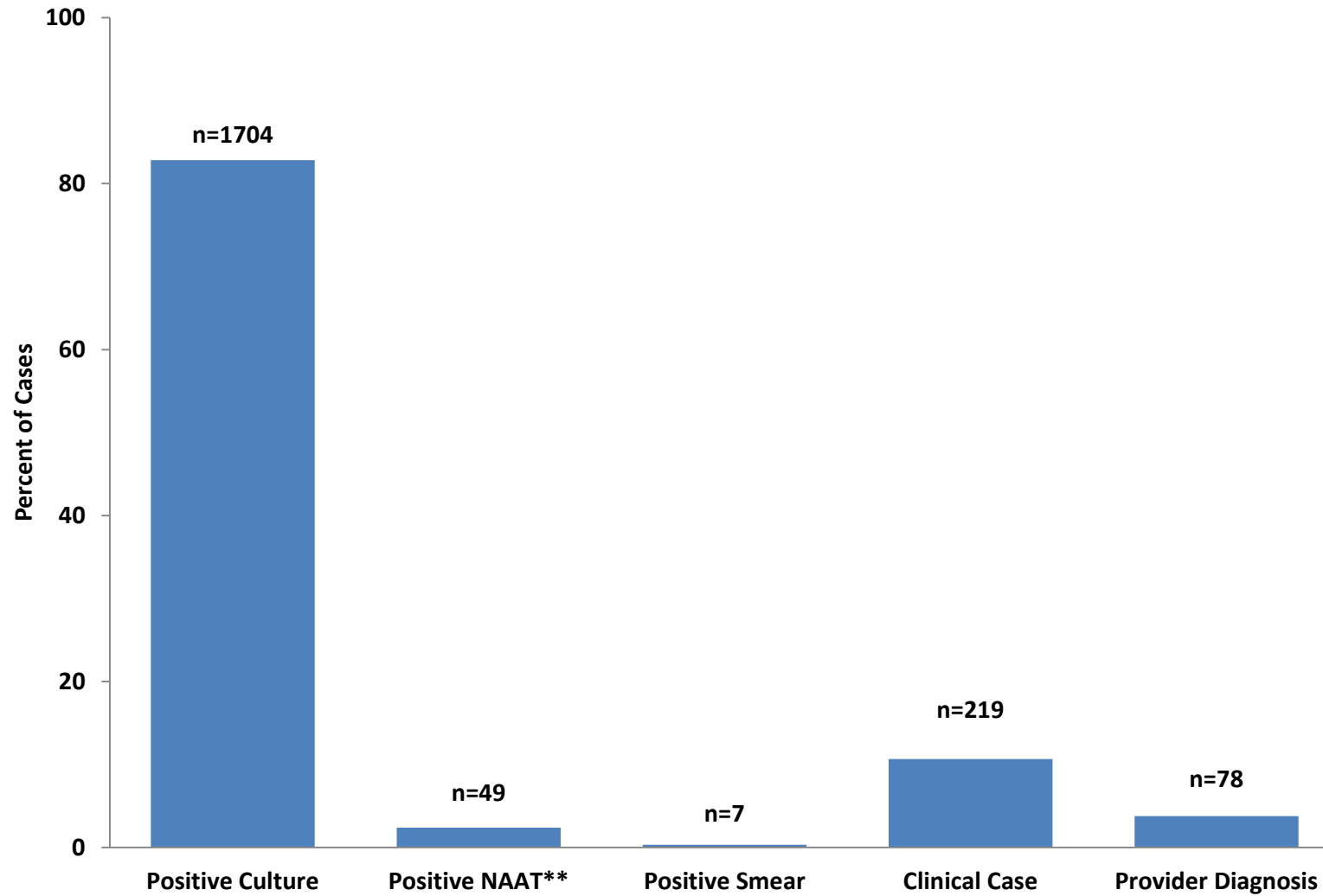
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Figure 8. Tuberculosis Cases in Persons 0-4 Years of Age: California, 2008-2017



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Figure 9. Tuberculosis Cases by Verification Criteria*: California, 2017

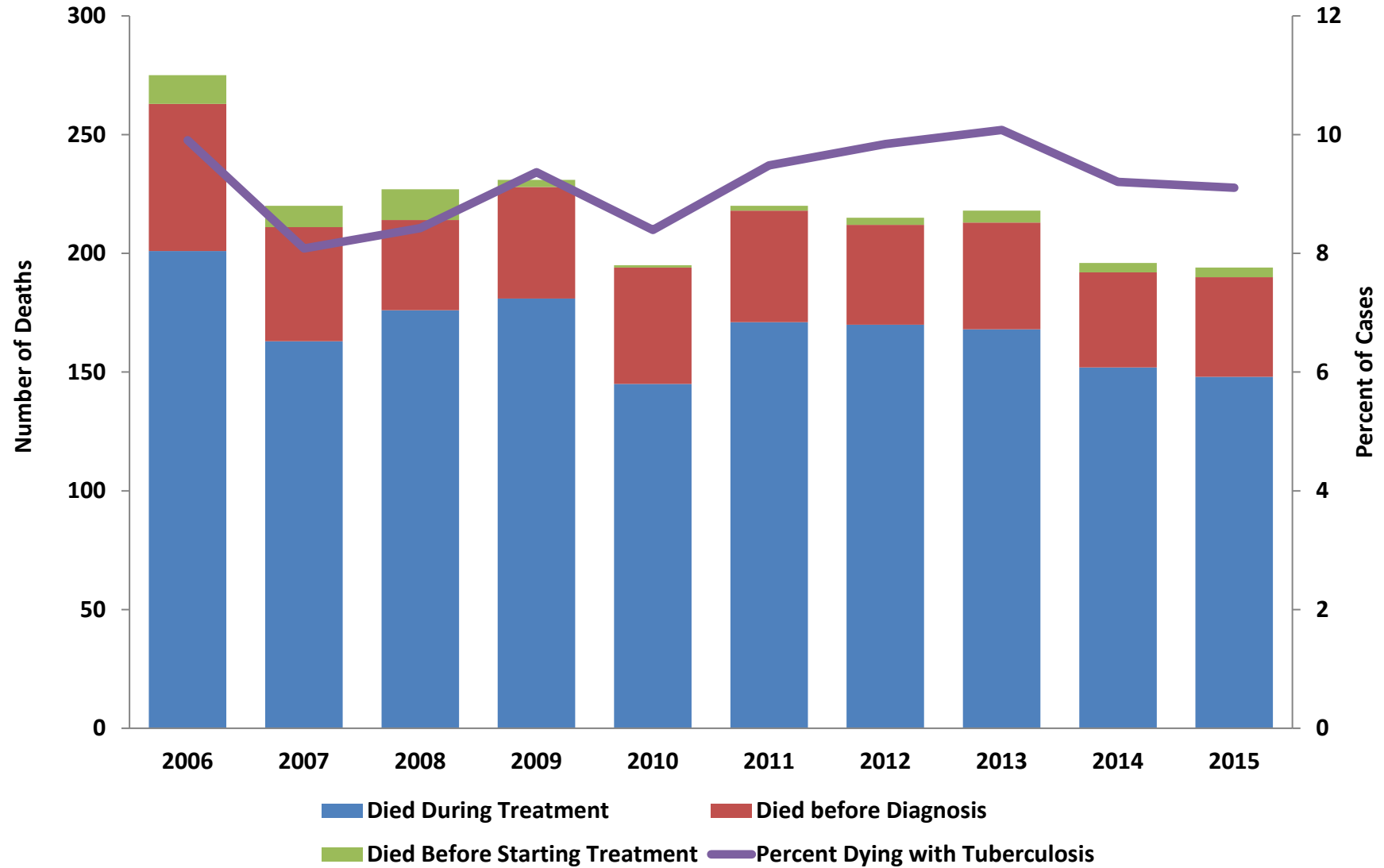


* See Technical Notes for description of verification criteria.

**NAAT = Nucleic Acid Amplification Test

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Figure 10. Deaths in Persons with Tuberculosis: California, 2006-2015



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Figure 11. Tuberculosis Cases by HIV/AIDS Diagnosis: California, 2008-2017

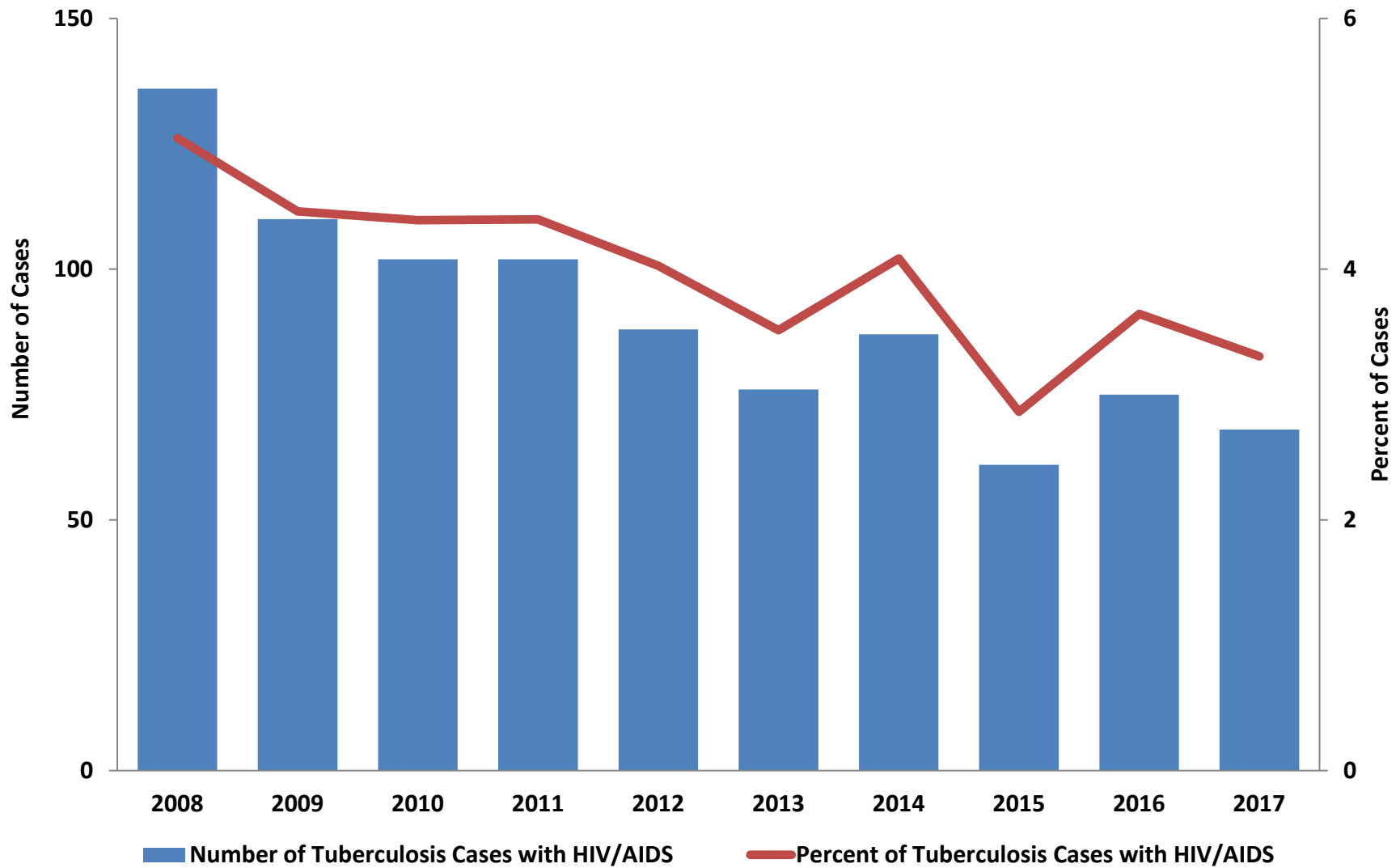


Figure 12. Tuberculosis Cases with Multidrug Resistance (MDR) on Initial or Final Drug Susceptibility Testing*: California, 2008-2017**



* Cases with resistance to at least isoniazid and rifampin on the Initial Drug Susceptibility Report (Follow-up 1) or on the Case Completion Report (Follow-up 2)

** Number of MDR cases may increase as additional drug susceptibility test results are received for 2017.

**Figure 13. Tuberculosis Cases with Initial Multidrug Resistance (MDR)*:
California, 2013-2017**

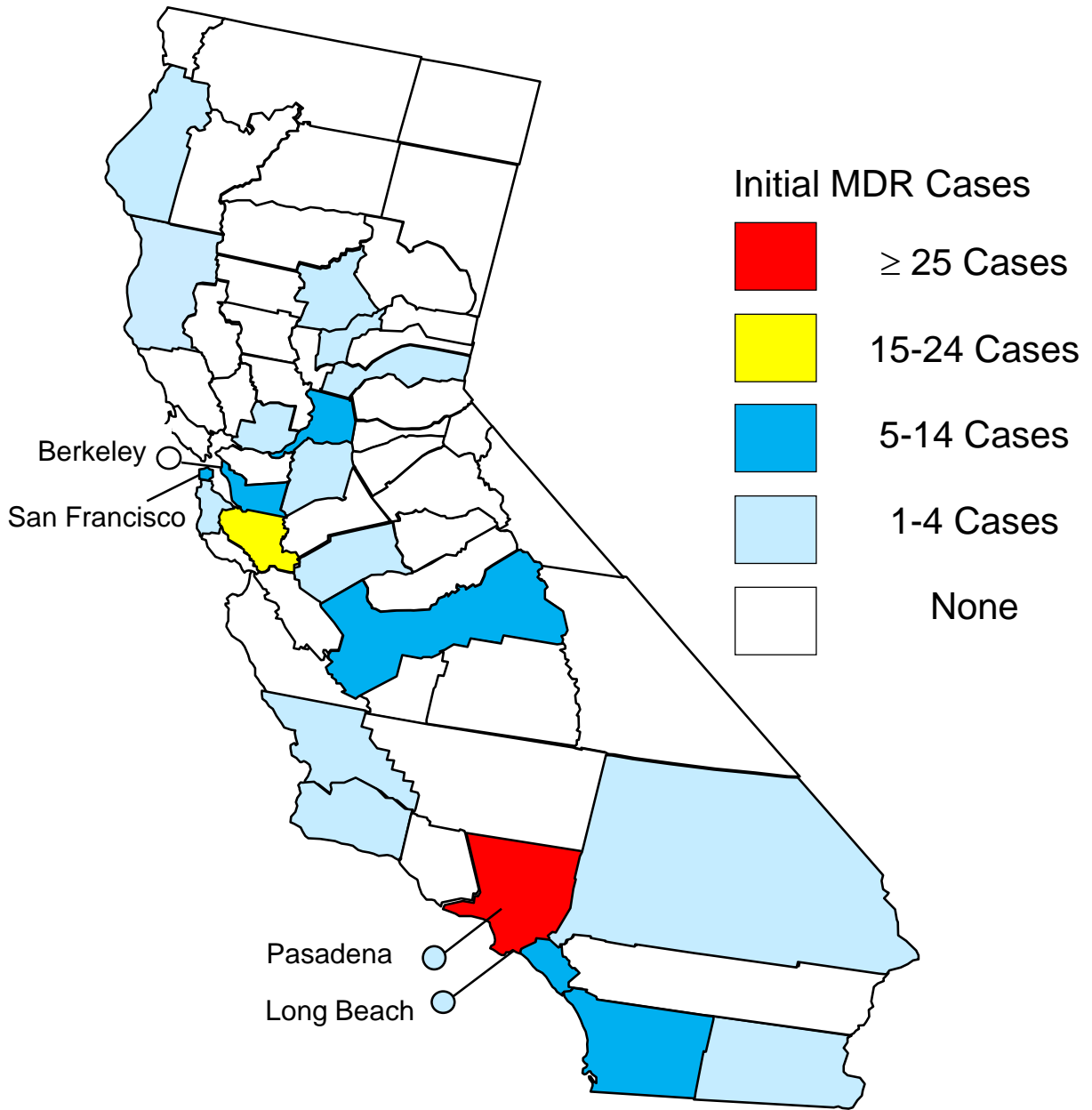
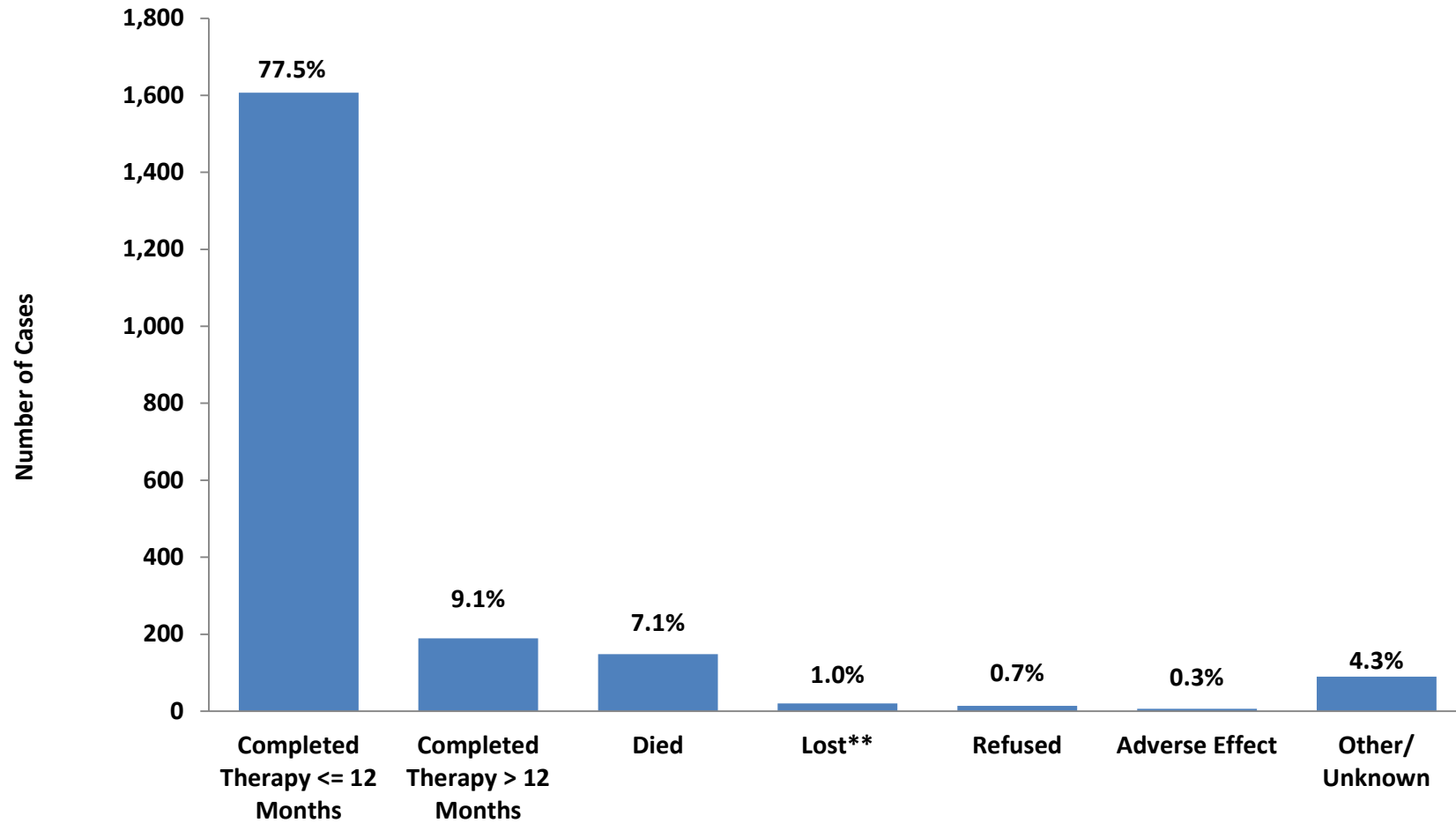


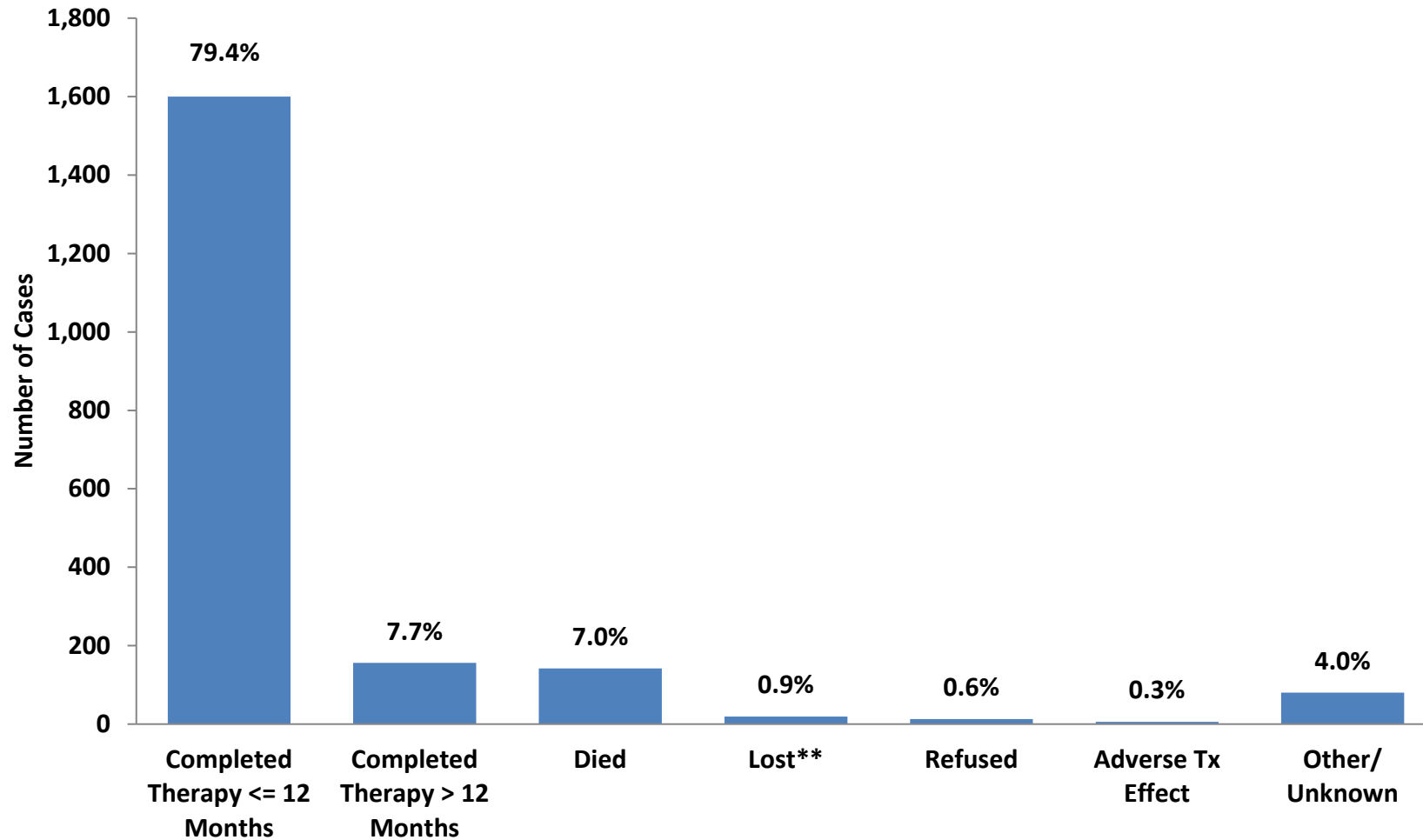
Figure 14. Tuberculosis Cases* by Outcome of Treatment: California, 2015



* Patient was alive at diagnosis and started on an initial drug regimen of two or more drugs.

** Patient could not be located prior to the completion of treatment.

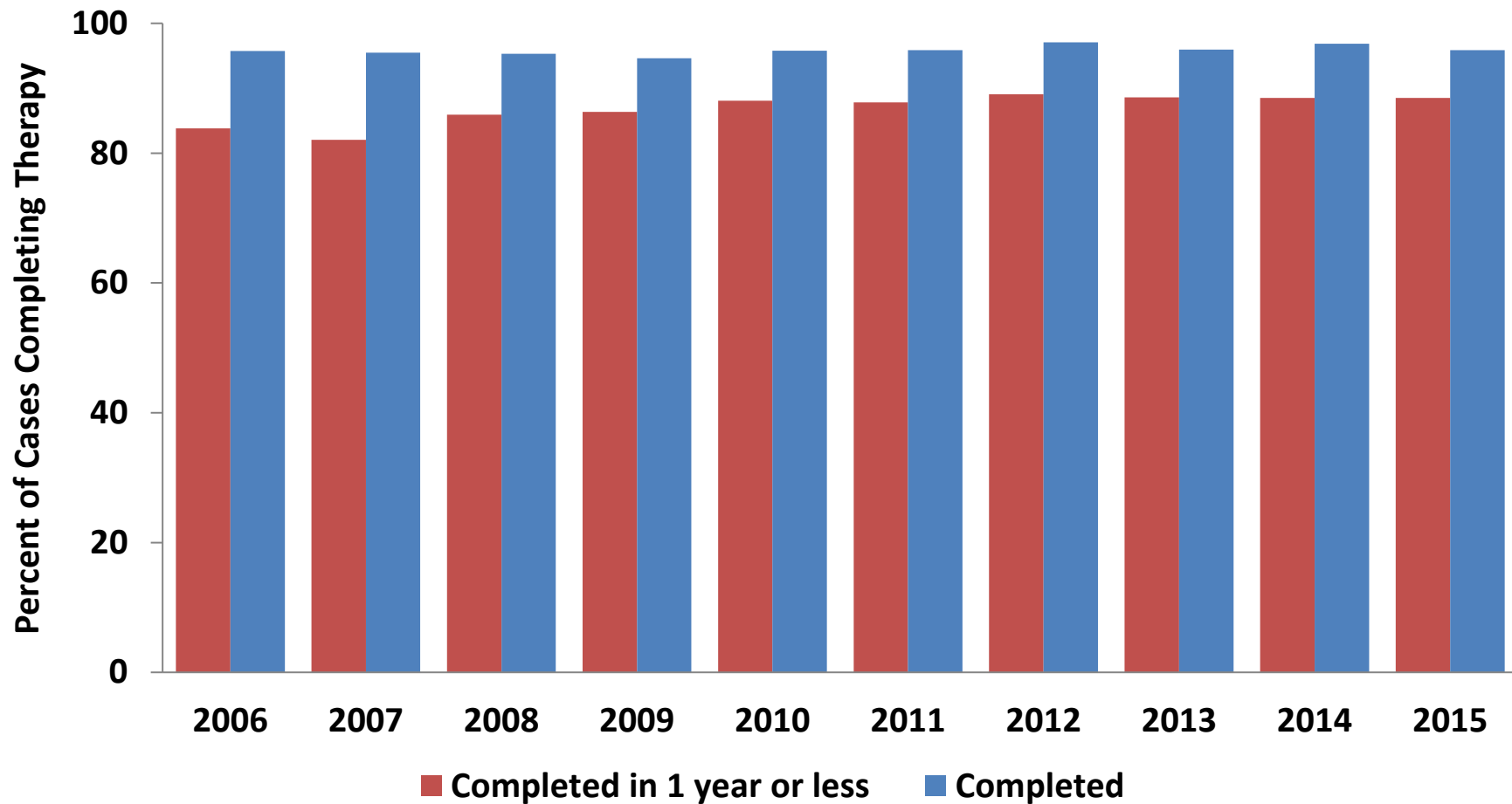
Figure 15. Outcome in Tuberculosis Cases for Whom One Year or Less of Treatment was Indicated*: California, 2015



* Excludes cases with rifampin resistant disease, cases with meningeal disease, and cases less than 15 years of age with disseminated tuberculosis disease.

** Patient could not be located prior to the completion of treatment.

Figure 16. Completion of Tuberculosis Therapy: California, 2006-2015



Note: Consistent with CDC's National Tuberculosis Indicators Project completion of therapy measure, excludes cases with rifampin resistant disease, cases with meningeal, bone and/or joint, or central nervous system disease, cases less than 15 years of age with disseminated tuberculosis disease, and cases that died or moved out of the United States less than one year after treatment initiation.

California Department of Public Health, Tuberculosis Control Branch