



Tuberculosis in Alameda County, 2009

Alameda County Public Health Department

Tuberculosis Overview

Tuberculosis (TB) is a communicable disease caused by the bacteria *Mycobacterium tuberculosis*. TB is spread from person to person when someone with active TB disease sings, laughs, or coughs, aerosolizing the bacteria. Transmission can occur when people breathe in the bacteria while in close and prolonged contact with a person with infectious TB. Although TB can affect any part of the body, it most often affects the lungs.

Once TB bacteria have been inhaled, that person may become infected with TB. In most cases, the body is able to keep the bacteria from growing, but will still show evidence of exposure or infection. In persons with latent TB infection (LTBI), the TB bacteria in the body remain alive but inactive, and cannot be spread to others. Individuals with latent TB infection have a 5-10% chance of developing TB over their lifetime. For some, TB infection can progress to TB disease when the immune system cannot fight off the bacteria. If TB disease goes untreated, it can cause serious illness or death.

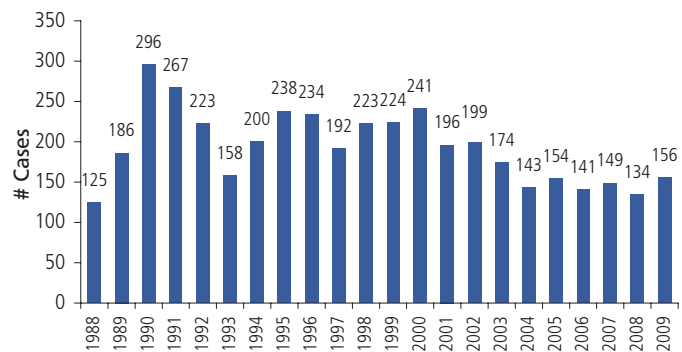
Approximately one-third of the world's population or over 2 billion people are infected with *Mycobacterium tuberculosis*, with more than 9 million becoming sick with TB disease annually. Both LTBI and TB disease are medically treatable. The treatment regimens can take at least six to nine months, possibly longer if the case is co-infected with other diseases or the strain is drug resistant.

Alameda County TB Cases and Rates

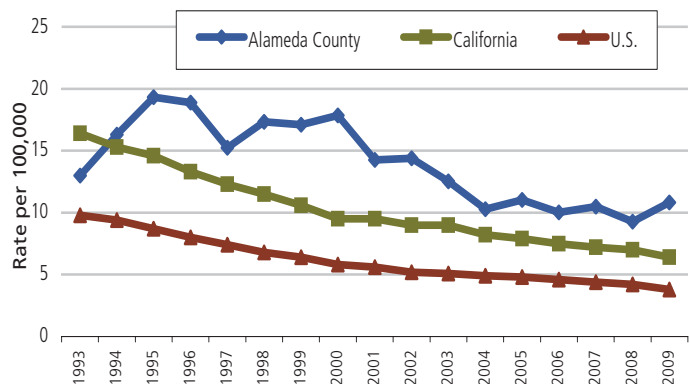
Tuberculosis in Alameda County, as in the rest of the United States, increased dramatically in the early 1990s because of federal funding cuts in the late 1970s and the dismantling of TB control program infrastructure in the 1980s. This, compounded with the emergence of HIV/AIDS resulted in outbreaks of TB and multi-drug resistant (MDR) TB in major cities across the nation. In 1990, Oakland ranked as having the third highest TB rate in the nation and Alameda County peaked at nearly 300 cases. In response to this resurgence, the federal government refunded TB programs nationally, once again resulting in TB coming under control, as it currently seems to be. However, due to the current economy, reductions in funding may occur. With loss of jobs, health insurance, and housing, it is likely that we will see delays in diagnosis and increased transmission, with a possible risk of increases in TB, MDR-TB, and possibly XDR-TB cases.

In 2009, there were 156 cases of TB in Alameda County (excluding the city of Berkeley), a 16% increase from the previous year. Across the state, 12 of the 52 reporting jurisdictions saw increased numbers of cases, including Bay Area counties San Joaquin, Marin, and San Mateo, with Santa Clara County experiencing no change and San Francisco showing a slight decline. California overall experienced an 8.3% decrease in the number of new cases of TB from the previous year.

Annual Tuberculosis Cases, 1988-2009
Alameda County



Annual TB Case Rates, 1993-2009
Alameda County, California and U.S.



Alameda County's case rate (excluding the city of Berkeley) was 10.8 per 100,000 residents in 2009, exceeding the California state rate of 6.4 and ranking third highest among all jurisdictions in the state. The rate in Alameda County is nearly three times the national rate of 3.8 per 100,000. Compared to other Bay Area jurisdictions, the rate in Alameda County is lower than San Francisco, but higher than the counties of Contra Costa, San Mateo, and Santa Clara. Both California and the United States experienced decreases in TB cases and rates from the previous year.

TB Cases by Gender

The gender distribution of annual TB cases in Alameda County has remained relatively stable over the past decade, with a greater proportion of cases occurring among males. In 2009, there were three cases among males for every two reported cases among females. The average annual rate among males during 2007-2009 was 12.3 per 100,000, one and one half times the rate of 8.1 among females.

TB Cases by Age Group

In 2009, the greatest proportion of incident tuberculosis cases occurred among those 25-44 years (36%), and 88% among individuals over the age of 25 years. However, individuals ages 65 and over have the greatest risk of having TB with an annual average case rate of 25.4 per 100,000.

In 2009, there were four pediatric (children aged 0-4 years) cases of TB. Cases among young children are of particular concern because they indicate recent transmission of tuberculosis. This can occur when the child is born in a country with high rates of TB, or from exposure to a foreign-born individual coming from a country with high TB rates. Two of the pediatric cases were born in the United States but travelled to countries with endemic TB. Two of the cases were epidemiologically linked to TB cases in other health jurisdictions.

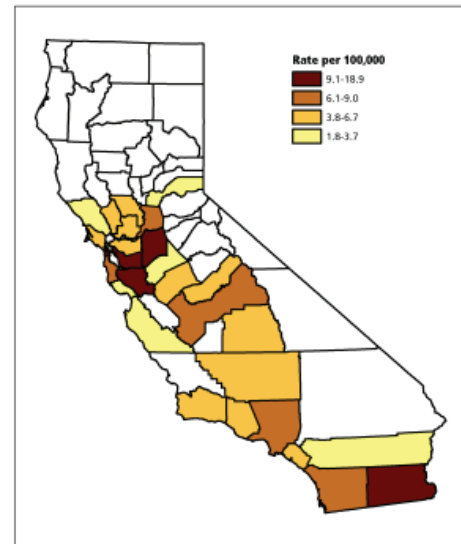
Tuberculosis Cases by Race/Ethnicity

Racial/ethnic minorities in Alameda County bear a disproportionate load of reported TB cases, with the majority of cases occurring primarily among Asian/Pacific Islanders. In 2009, 58% of TB cases were among Asians/Pacific Islanders, 21% among Africans or African Americans, and 15% among Latinos. Whites accounted for 6% of tuberculosis cases last year.

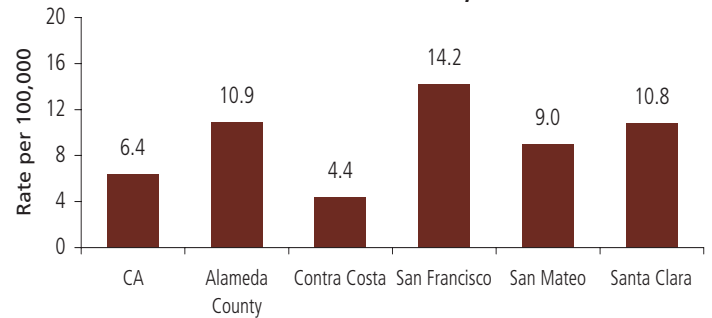
In the period 2007-2009, Asian/Pacific Islanders had the highest average annual case rates (26.0 per 100,000), more than double the rates among Africans or African Americans (12.1), four times that of Latinos (6.2), and 13 times the rate for Whites whose average annual case rate was 1.9.

In 2009, the majority of the foreign-born incident cases

California County TB Case Rates, 2009



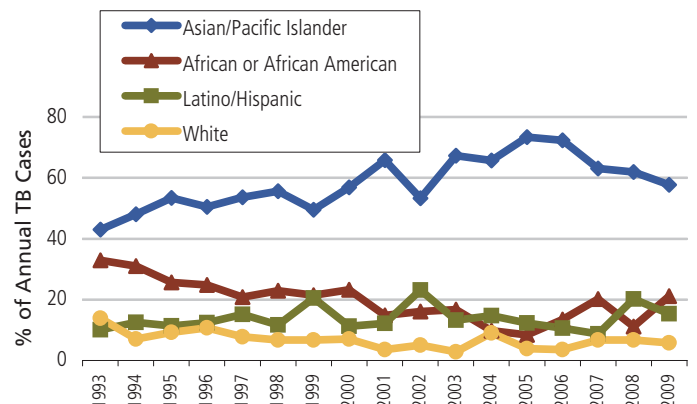
TB Case Rates for California and Selected Jurisdictions, 2009



TB Cases and Average Case Rates, 2007-2009

		Number of Cases	Average Case Rate
Sex	Male	260	12.3
	Female	179	8.1
Age group	0-4 yrs	8	n/a
	5-14 yrs	7	n/a
	15-24 yrs	36	6.8
	25-44 yrs	149	11.3
	45-64 yrs	123	10.8
	65+ yrs	116	25.4

Annual Percent of TB Cases by Race/Ethnicity, 1993-2009



occurred among Asians/Pacific Islanders (70%) and Latinos (18%). However, among the U.S.-born individuals, African Americans accounted for 62% of incident cases, Whites 22%, and U.S.-born Asian/Pacific Islander at 8%.

TB Cases by Place of Birth

TB among foreign-born residents of Alameda County has accounted for an increasing proportion of annual cases. In the early 1990s, cases were almost evenly split between foreign- and U.S.-born persons. In 2009, 76% of the newly reported TB cases occurred among individuals who migrated from countries with high tuberculosis rates. Individuals most often came from the Philippines, China, Vietnam, Mexico, and India.

The average annual case rate in 2007-2009 for foreign-born individuals in Alameda County was 28.1 per 100,000 residents, over eight times the rate for individuals with TB born in the United States (3.3).

Most recently, increases in TB cases have been seen among our Burmese, Cambodian, Afghani, and Ethiopian populations. The TB Control Program will continue to monitor closely and will outreach to these communities with education and information to effect early case finding and treatment.

TB Drug Resistance

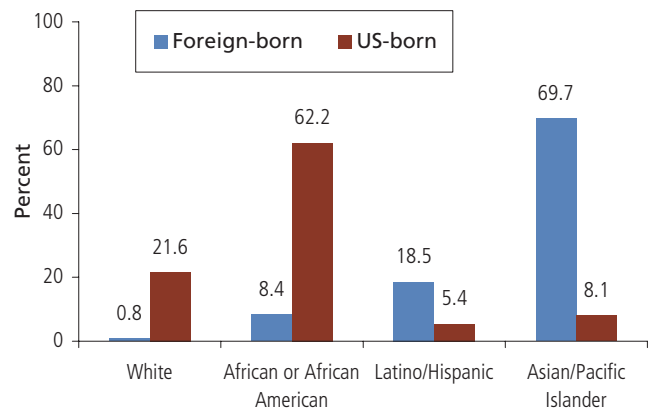
Drug resistance can occur if someone who has a drug resistant strain of TB infects others or when a person with TB infection or disease does not take their medicines as prescribed and the bacteria become resistant. Drug resistant cases have to undergo longer courses of treatment. Thirteen (8%) of the TB cases in 2009 were resistant to at least one of the anti-tuberculosis medications. Between 1993 and 2009, there have been 30 multi-drug resistant (MDR), that is, resistant to both Isoniazid and Rifampin, of which 93% occurred among foreign-born individuals. In 2009, four TB cases were MDR tuberculosis cases. All four were foreign-born, three have worked as day laborers, and two have been homeless at some point. The four MDR cases are epidemiologically linked, with documented transmission to others.

Other Characteristics of TB Cases

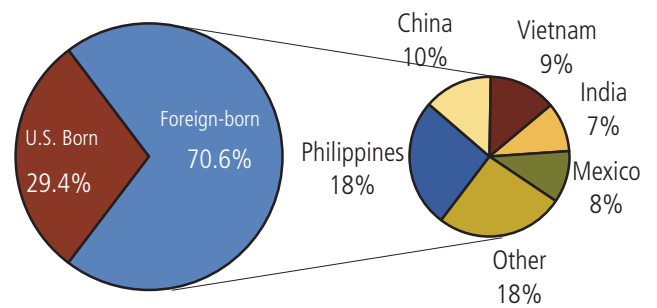
Most often, TB bacteria attacks the lungs, known as pulmonary TB, but can affect areas other areas (known as extra-pulmonary TB) such as lymph nodes, bones and joints, and brain or spinal cord. Of the incident cases in 2009, 76% were pulmonary TB, and the remaining cases were extra-pulmonary TB cases.

In the 12 months prior to their TB diagnosis, 5% of the 2009 cases had used alcohol excessively, 2% had used non-injection drugs, and 2% were injection drug users. Three percent

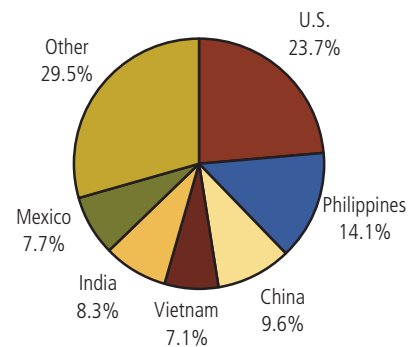
TB Cases by Place of Birth and Race/Ethnicity, 2009



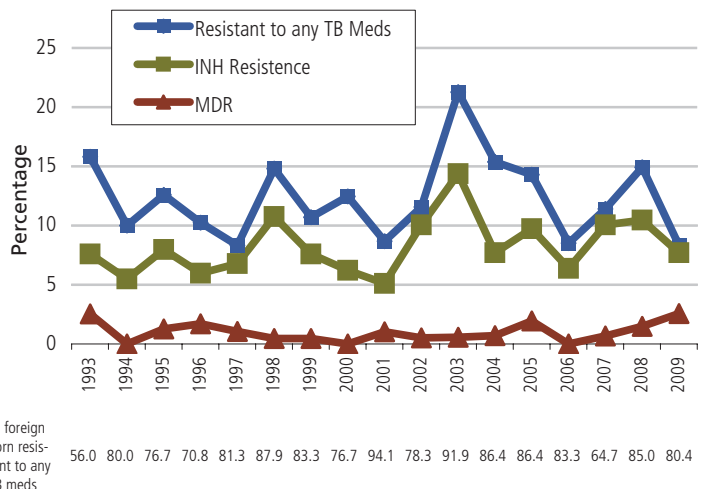
Cumulative TB Cases by Place of Birth Alameda County, 1993-2009



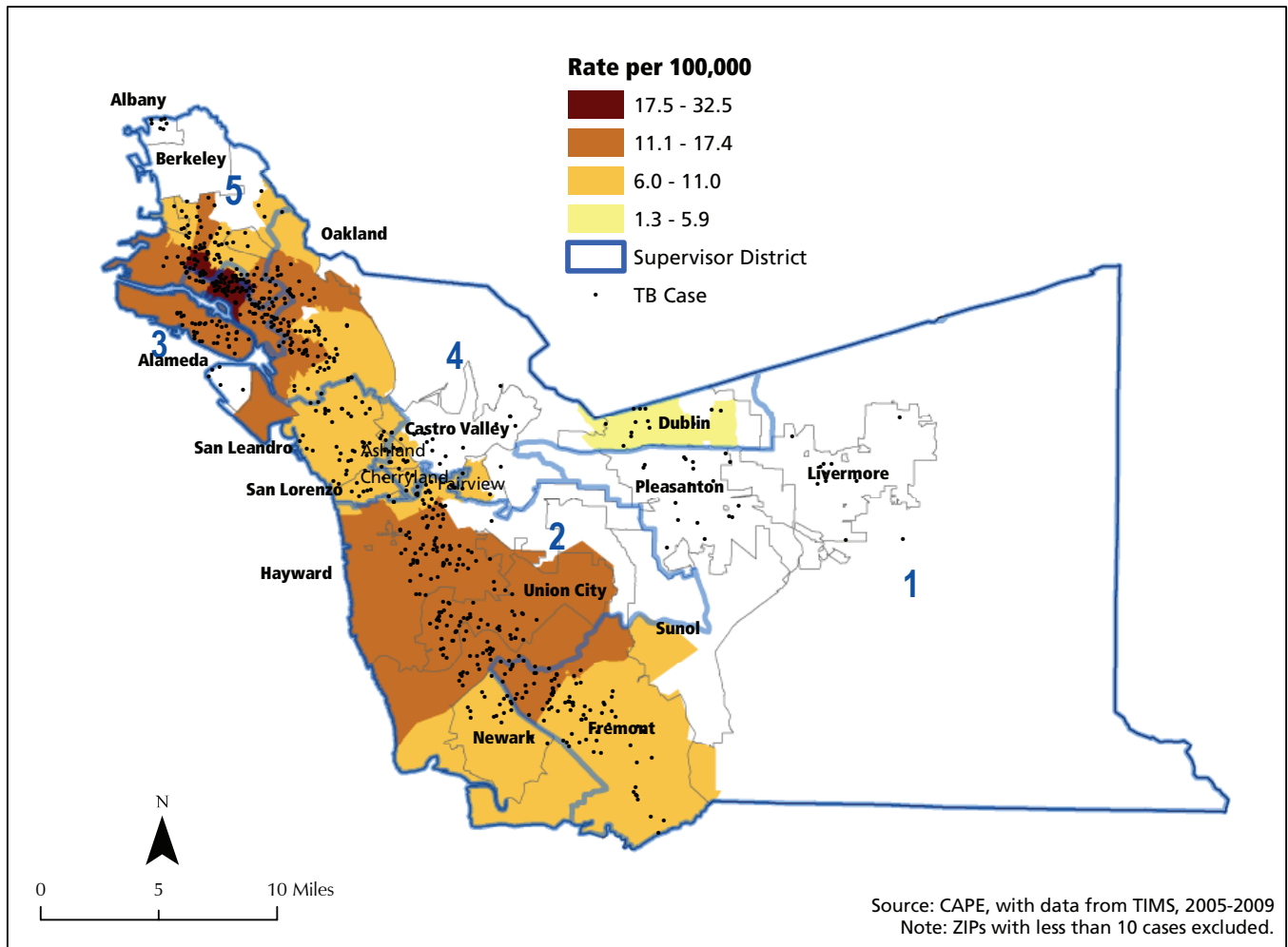
Incident TB Cases by Place of Birth Alameda County, 2009



Percent TB Cases Resistant to any TB Meds, INH and MDR Resistance, Alameda County, 1993-2009



Alameda County TB Cases and Rates by ZIP, 2005-2009



of the cases had been in correctional facilities within one year of diagnosis, 2% had been in a long-term care facility and one individual reported being homeless.

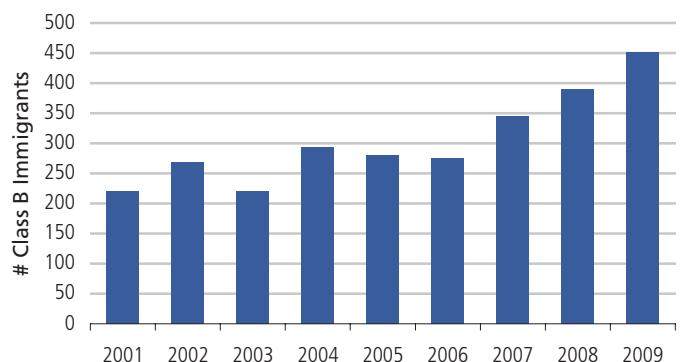
Eight of the 156 incident TB cases (6%) were known to be co-infected with HIV/AIDS. The majority of the cumulative 52 co-infected cases from the past 15 years were diagnosed with TB in the most recent five years. HIV is the most important risk factor for progression from latent TB infection to TB disease, and TB is the leading killer of HIV-infected individuals.

The largest proportion of 2009 TB cases were among residents of Oakland (36%). In the south county, the cities of Fremont and Hayward reported the greatest number of cases, with 20%, and 11% respectively. The east county (Dublin, Pleasanton, and Livermore) comprised 5% collectively. The areas in the county with the highest rates are in Oakland, in the downtown, Chinatown, and San Antonio neighborhoods.

B1/B2 Immigrants to Alameda County

Immigrants and refugees from countries with high rates of TB undergo a tuberculosis screening before obtaining a visa to enter the United States. Foreign-born applicants are classified as class A if they have infectious TB; class B1 if they have clinically active TB; Class B2 if the TB is not clinically

Class B1 and B2 Immigrants to Alameda County, 2001-2009



active; or class B3 if the TB is healed or old TB. The state or local health jurisdiction is notified of the arrival of each person with an A, B1, or B2 status, and the immigrant or refugee is advised to report to their local health department.

Alameda County continues to experience increases in the number of B1/B2 Immigrants coming into the county. Once identified, active cases are referred to TB case management for follow-up. In 2009, 452 class B immigrants were reported to Alameda County by the federal Division of Global Migration and Quarantine, more than double the 220 Class B immigrants in 2001. Three of these B1/B2 immigrants in 2009 were diagnosed with active TB prior to arrival or following medical evaluation. Elimination of TB in the county requires strengthened domestic TB control efforts coupled with intensified screening and follow-up of foreign-born Class B individuals.

TB Control Program Moving Forward

The TB program is working to strengthen partnerships with medical care providers and facilities in order to increase awareness of TB and assist with the early identification, diagnosis, and treatment of active cases. The TB program collaborates with providers to determine appropriate initiation of therapy, ensure best practices, best possible care, and successful patient completion of therapy.

Although cuts in federal funding to the CDC and the states for tuberculosis control coupled with California's own budgetary crisis threaten our successes, the Alameda County TB Control Program will continue to strive to reduce active TB cases within the county.

Acknowledgments

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Data Sources

For information on TB in California
<http://www.cdph.ca.gov/data/statistics/Pages/TuberculosisDiseaseData.aspx>

For national statistics on TB
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5910a2.htm>