



Tuberculosis in Alameda County, 2010

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.

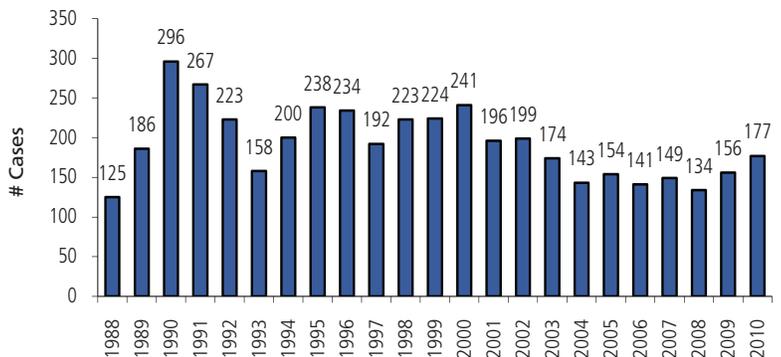
Approximately one-third of the world's population or over 2 billion people are infected with *Mycobacterium tuberculosis*, with more than 9 million becoming sick with TB disease annually. Both LTBI and TB disease are medically treatable. The treatment regimens can take at least six to nine months, possibly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

Alameda County TB Cases and Rates

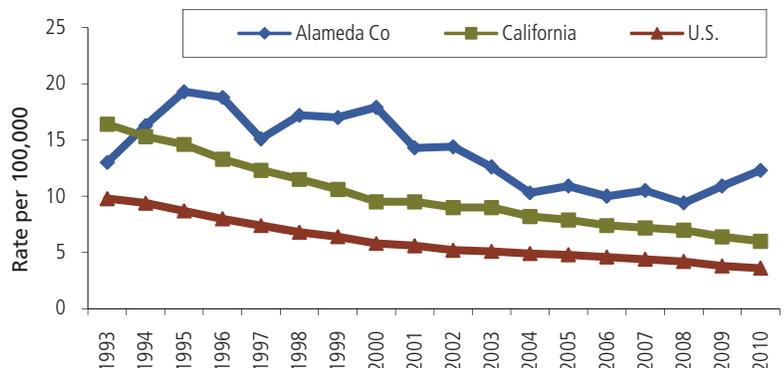
Past experience has shown that reductions in funding and de-emphasis of TB control across the country has typically been followed by marked increases in tuberculosis cases. In 1990, Alameda County peaked at nearly 300 cases, and Oakland ranked as having the third highest TB rate in the nation. In response to this national resurgence, the federal government refunded TB programs nationally. However, due to the current economy, funding reductions once again threaten TB programs and may contribute to diagnostic delays and increased transmission, with possible risk of increases in TB, MDR-TB, and XDR-TB cases.

In 2010, there were 177 cases of TB in Alameda County (excluding the city of Berkeley), a 13% increase from the previous year. Across the state, 11 of the 52 reporting jurisdictions experienced increased numbers of cases. However, Alameda County and the city of Berkeley were the only Bay Area jurisdictions with increases in TB cases. Contra Costa, San Francisco, Marin, San Joaquin, San Mateo, and Santa Clara County had decreases in TB cases. California overall experienced a decrease of 5.8% in the number of new TB cases from the previous year. Both California and the United States experienced decreases in TB cases and rates from the previous year.

Annual Tuberculosis Cases, 1988-2010
Alameda County

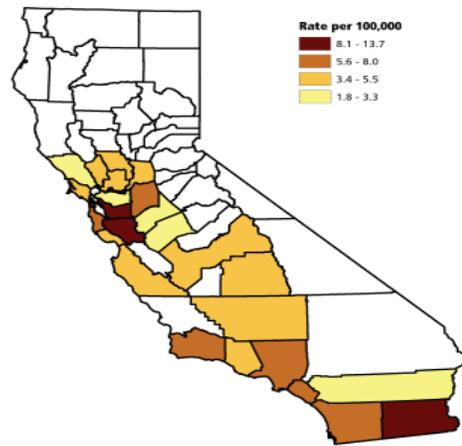


Annual TB Case Rates, 1993-2010
Alameda County, California and U.S.



Alameda County's TB case rate (excluding the city of Berkeley) for 2010 was 12.3 per 100,000 residents, twice the California rate of 6.0, ranking second among all jurisdictions in the state. The rate in Alameda County is more than three times the 2010 national rate of 3.6 per 100,000. Compared to other Bay Area jurisdictions, the rate in Alameda County is slightly higher than San Francisco, but is 1.5 times the rate of San Mateo and the city of Berkeley, and four times that of Contra Costa.

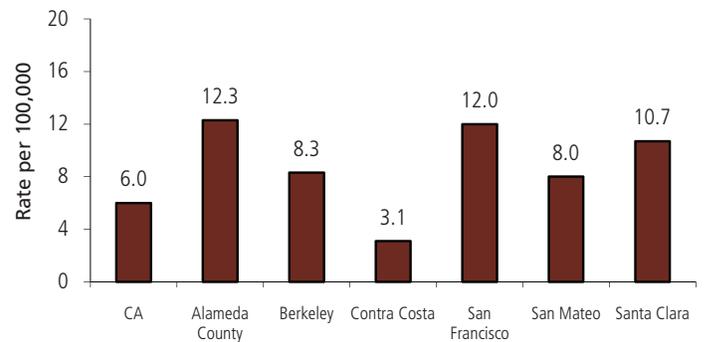
California County TB Case Rates, 2010



TB Cases by Gender

The gender distribution of annual TB cases in Alameda County has remained relatively stable over the past decade, with the majority of cases occurring among males. In 2010, there were three cases among males for every two cases among females. The average annual rate among males during 2008-2010 was 13.2 per 100,000, one and one half times the rate of 8.2 among females.

TB Case Rates for California and Selected Jurisdictions, 2010



TB Cases by Age Group

In 2010, the greatest proportion of incident tuberculosis cases occurred among those 25-44 years (30%) and 44-64 years (29%), with 85% of TB cases 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.

TB Cases and Average Case Rates, 2008-2010

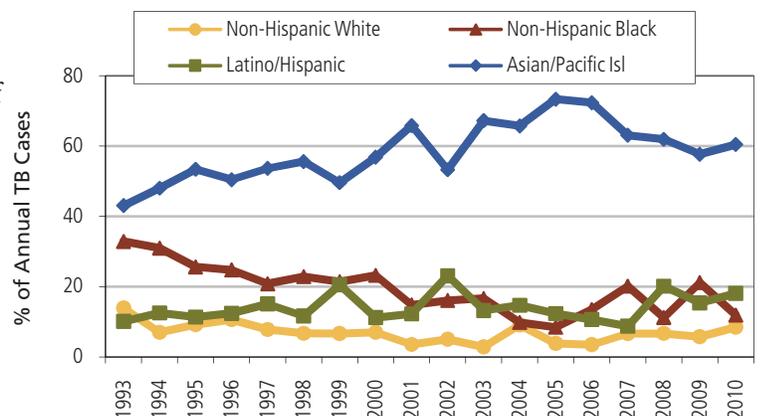
		Number of Cases	Average Case Rate
Sex	Males	285	13.2
	Females	182	8.2
Age Group	0-4 yrs	8	na
	5-14 yrs	6	na
	15-24 yrs	38	7.1
	25-44 yrs	150	11.5
	45-64 yrs	131	11.2
	65+ yrs	125	26.1

In 2010, there were three pediatric (children aged 0-4 years) cases of TB. Cases among young children often indicate a recent transmission of tuberculosis, and thus are of particular concern. 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 three cases were identified as a result of case contact investigation of other TB cases by TB Control staff.

Tuberculosis Cases by Race/Ethnicity

Racial/ethnic minorities bear a disproportionate load of reported TB cases in Alameda County, with the majority of cases occurring primarily among Asian/Pacific Islanders. In 2010, six of every 10 TB cases were among Asians/Pacific Islanders. Latinos accounted for 18% of cases in 2010, while Africans or African Americans and Whites comprised 12% and 8% of tuberculosis cases respectively.

Annual Percent of TB Cases by Race/Ethnicity, 1993-2010



In the period 2008-2010, Asian/Pacific Islanders had the highest average annual case rates (25.0 per 100,000), more than double the rates among Africans or African Ameri-

cans (12.3), three times that of Latinos (8.4), and 11 times the rate for Whites whose average annual case rate was 2.2.

In 2010, the majority of the foreign-born incident cases occurred among Asians/Pacific Islanders (70%) and Latinos (18%). However, among the U.S.-born individuals, African Americans accounted for 39% of incident cases, U.S.-born Asian/Pacific Islander 28%, U.S.-born Latinos 17% and Whites at 14%.

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. By 2010, four out of five 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 2008-2010 for foreign-born individuals in Alameda County was 28.2 per 100,000 residents, over twelve times the rate for individuals with TB born in the United States (2.2).

In 2010, increases in TB cases have been seen among our Burmese and Guatemalan populations, which warrants further close monitoring, outreach and education to these communities.

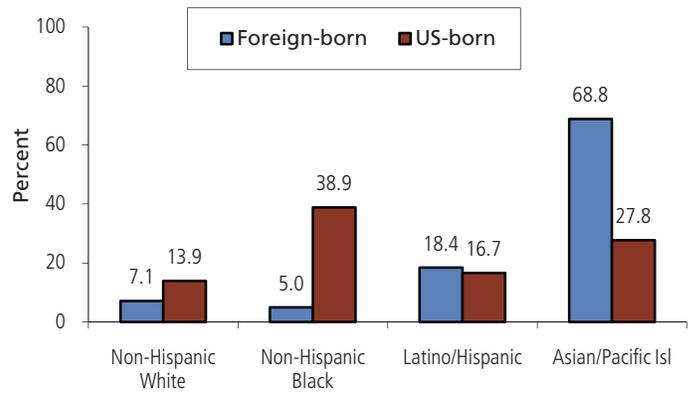
TB Drug Resistance

Drug resistance can occur when the bacteria become resistant in a person with TB disease who is non-compliant with their treatment regimen. Drug resistant cases undergo longer and more complicated courses of treatment. Nineteen (11%) of the TB cases in 2010 were resistant to at least one of the anti-tuberculosis medications. Three TB cases in 2010 were multi-drug resistant (MDR), that is, resistant to both Isoniazid and Rifampin, totalling in 33 MDR cases since 1993. Of these, 93% occurred among foreign-born individuals. 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.

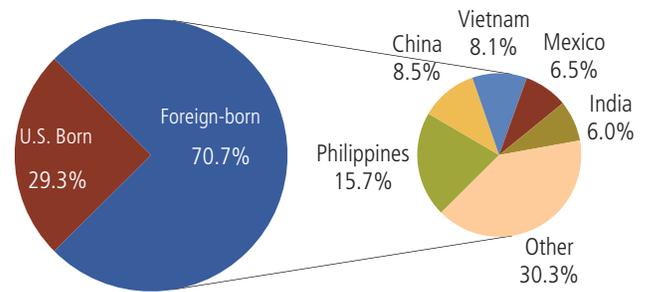
Other Characteristics of TB Cases

TB bacteria can cause disease in the lungs (pulmonary TB) or in other parts of the body (extra-pulmonary TB) such as lymph nodes, bones and joints, and the brain or

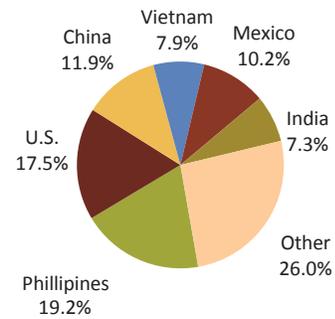
TB Cases by Place of Birth and Race/Ethnicity, 2010



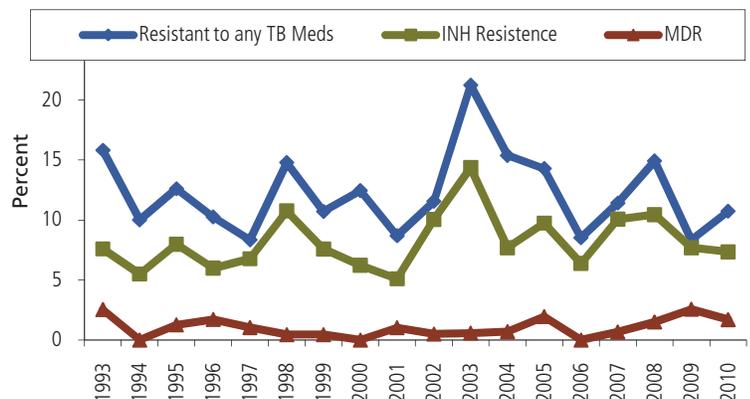
Cumulative TB Cases by Place of Birth Alameda County, 1993-2010



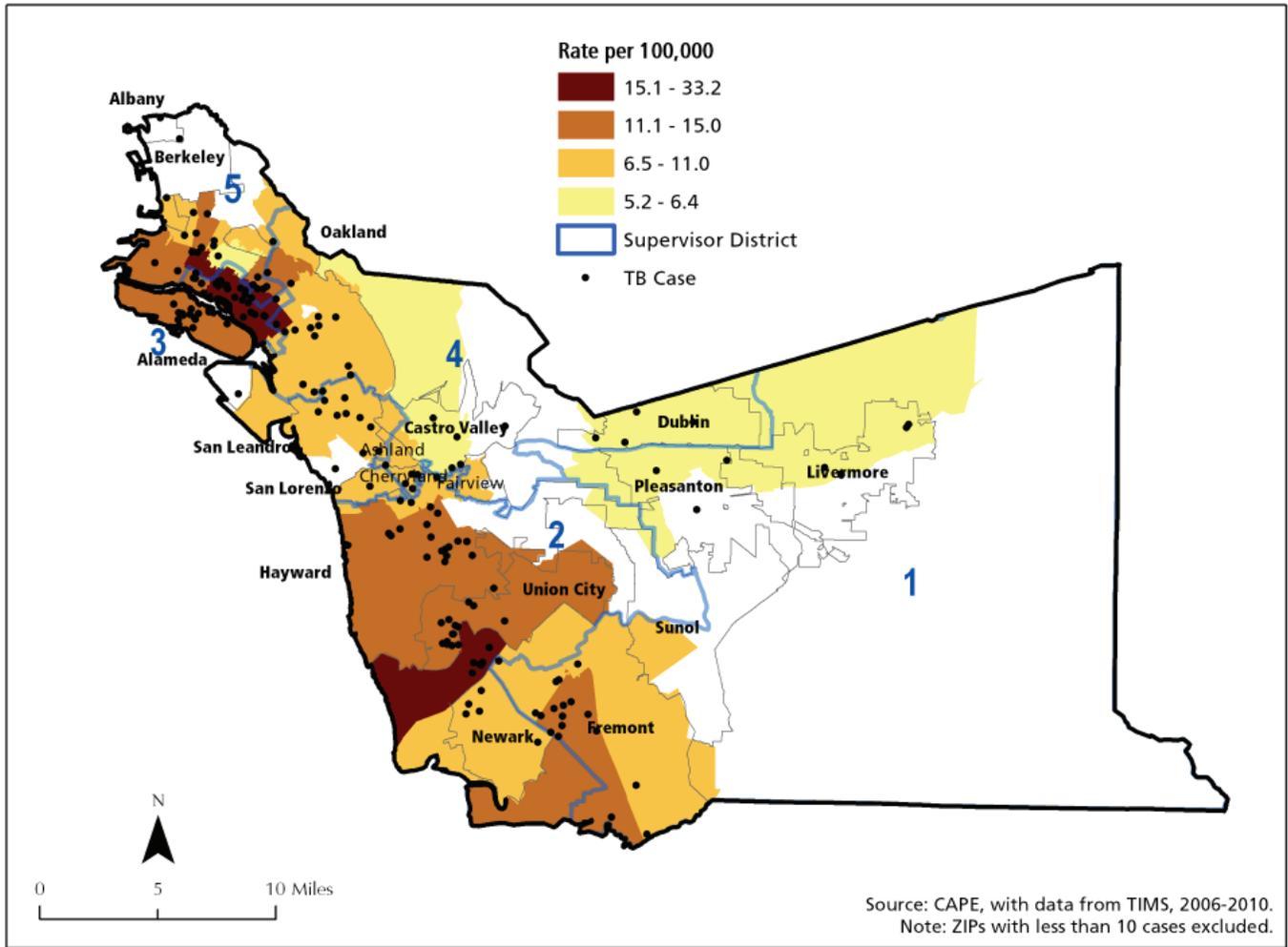
Incident TB Cases by Place of Birth Alameda County, 2010



Percent TB Cases Resistant to any TB Meds, INH and MDR Resistance, Alameda County, 1993-2010



Alameda County TB Cases and Rates by ZIP, 2006-2010



spinal cord. The majority of the TB cases reported in 2010 were pulmonary cases (65%), 22% were extra-pulmonary, and 7% were both pulmonary and extra-pulmonary.

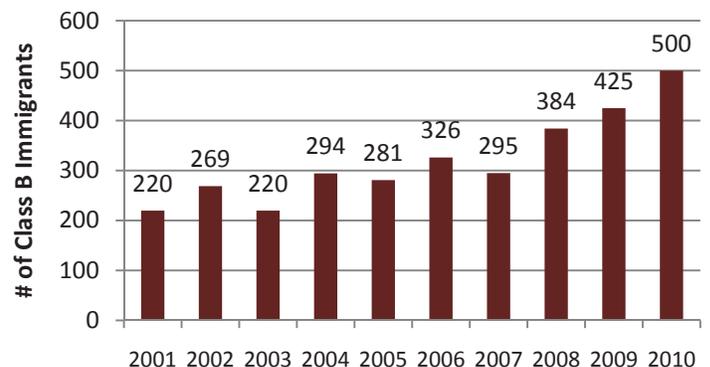
In the 12 months prior to their TB diagnosis, 3% of the 2010 cases had used alcohol excessively, 6% had used non-injection drugs, although none were injection drug users. Two percent had been in a long-term care facility within one year of diagnosis, 1% reported being homeless, and none of the TB cases in 2010 reported having been in correctional facilities in the previous year.

The largest proportion of 2010 TB cases were among residents of Oakland (32%). In the south county, the cities of Fremont and Hayward reported the greatest number of cases, with 15%, and 14% respectively. The east county (Dublin, Pleasanton, and Livermore) comprised 7% collectively. The areas in the county with the highest rates are in Oakland’s 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, 2001-2010



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 2010, 500 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. Of these B1/B2 immigrants, 289 had abnormal chest x-rays in their country of origin and were evaluated for TB in the U.S. Elimination of TB in Alameda County requires strengthened domestic TB control efforts coupled with intensified screening and follow-up of foreign-born Class B individuals.

TB Control Program in Action!

Late in 2010, the Alameda County TB Control Program was faced with a large TB case contact investigation in a high school requiring the screening of nearly 500 students and teachers, many of whom had graduated in June, 2010. The index case had been very infectious for at least 6 months

prior to diagnosis, had been associated with a large number of household, school and social contacts, and had been active in many school activities from Spring through early Fall terms. Investigation required two rounds of TB testing using Quantiferon Gold blood test and mobile chest x-rays were conducted at the school site. As a result of this extensive contact investigation, two additional cases of active TB were identified. Samples from two of the cases were submitted for subsequent genetic fingerprinting, allowing these to be linked to a cluster identified several years before. These efforts illustrate the difficulty and labor intensive work needed to contain a disease which has a latent period of infection that can persist for years or decades without symptoms or disease transmission before becoming active and transmissible.

The TB program continues 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.

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>