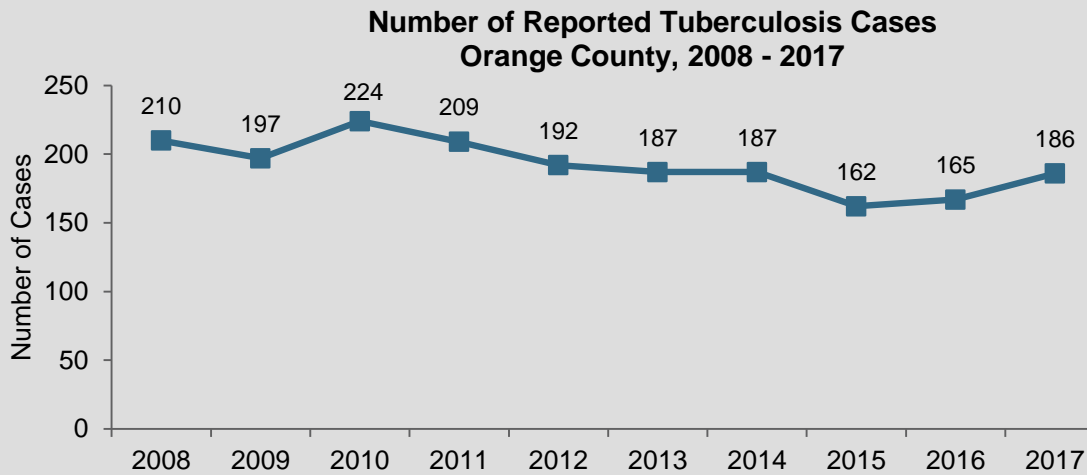


Tuberculosis Trend in Orange County

In 2017, Orange County reported 186 cases of tuberculosis (TB). This represents a 16.96% decrease since 2010 when a 10-year high of 224 cases were reported and a 56.7% decrease from a historic high of 430 cases reported in 1993. The TB case rate for 2017 was 5.8 cases for every 100,000 Orange County residents. This compares to a rate of 5.2 and 2.8 cases per 100,000 population for California and the United States, respectively. TB rates in California remained unchanged as compared to 2016 and the TB rates in United States decreased 2.5% as compared to 2016 while the TB rate in Orange County increased 11.5% from 2016.

The highest burden of disease continues to be among older adults. In 2017, persons aged 65 years and older had a TB case rate of 13.1 cases per 100,000 population. In 2017, Orange County TB cases were more likely to be male, Asian, non-U.S. born and 65 years and older.

In 2017, Orange County ranked eleventh in the State based on TB case rate. Orange County and Santa Clara counties had the third highest number of TB cases in California behind Los Angeles and San Diego Counties. Orange County's 2017 rate of 5.8 cases per 100,000 remained higher than the national Healthy People 2020 objective of one (1) TB case per 100,000.



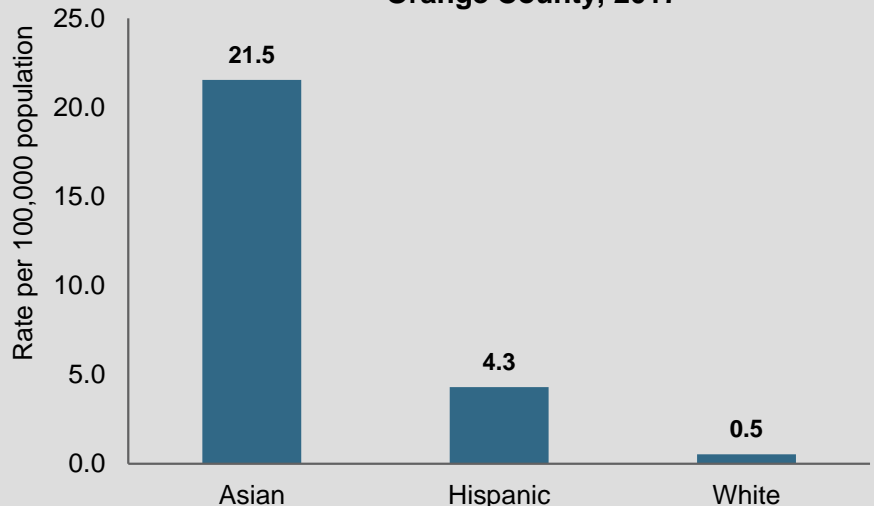
Year	Rate*
2008	7.0
2009	6.6
2010	7.4
2011	6.9
2012	6.2
2013	6.0
2014	6.0
2015	5.1
2016	5.2
2017	5.8

* Rate per 100,000 population

Race and Ethnicity

In Orange County, TB continues to disproportionately affect minorities. In 2017, the TB case rate among Asians was five times higher than the TB case rate for Hispanics and forty-three times higher than the TB case rate for Whites. The Asian TB case rate was 21.5 cases per 100,000 population; a 12.6% increase from 19.1 cases per 100,000 in 2016. The Hispanic TB case rate was 4.3 cases per 100,000 population; an increase of 7.5% compared to 4.0 cases per 100,000 in 2016. The TB case rate for Whites was 0.5 per 100,000. Case counts for other races were less than five; case rates are not calculated for case counts less than five.

Tuberculosis Rates by Race/Ethnicity Orange County, 2017



Age

In 2017, Orange County TB cases were reported among persons ranging from 1 to 101 years of age with 88.7% of all TB cases occurring among individuals 25 years and older. The median age of non-U.S. born cases was 56 years compared to 24 years for U.S. born TB cases. Of the five pediatric cases (under 15 years of age), three were younger than five years of age. Persons aged 19 years and younger had the lowest rate at 1.7 case per 100,000 population.

Gender

In 2017, 63.4% of persons with TB in Orange County were male; this compares to 62.0% male California TB cases. In 2017, the TB case rate in Orange County was 7.4 and 4.2 cases per 100,000 population among males and females, respectively.

Drug Resistant TB

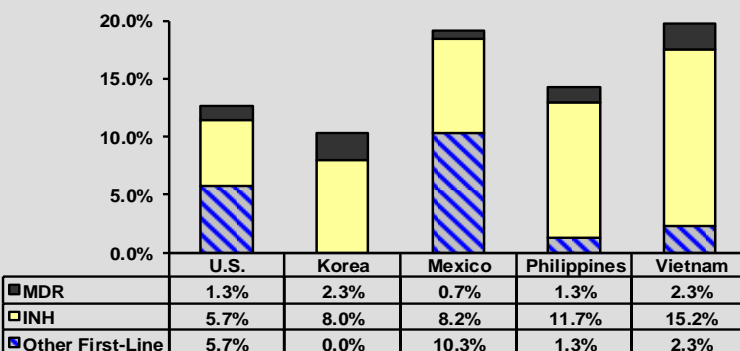
In 2017, drug susceptibility results for *Mycobacterium tuberculosis* isolates were available for 162 (99.4%) of the 163 Orange County culture positive TB cases. Of these 162 cases, 17 (10.5%) were resistant to one or more of the first-line drugs used to treat TB (isoniazid (INH), rifampin (RIF), ethambutol (EMB) and pyrazinamide (PZA).

Multi-drug-resistant (MDR) and extensively drug-resistant (XDR) TB cases greatly complicate TB control. MDR-TB is TB that is resistant to at least INH and RIF, while XDR-TB is MDR-TB plus resistance to any fluoroquinolone (e.g. ciprofloxacin, levofloxacin, moxifloxacin or ofloxacin) and resistance to at least one second-line injectable drug (e.g., amikacin, capreomycin, or kanamycin).

In 2017, four MDR-TB and no XDR-TB cases were reported in Orange County. As compared to 2016, the incidence of MDR-TB in Orange County increased from one to four cases. In comparison, in 2017, there were 29 MDR-TB cases and one XDR-TB cases in California.

In Orange County, drug resistance patterns vary by country of birth. During the 10-year time period 2008-2017, the proportion of TB cases with INH drug resistance was highest in persons born in Vietnam (15.2%) and the Philippines (11.7%). A higher proportion of Korean-born and Vietnamese cases were multidrug-resistant (2.3% each). In Orange County, first-line drug resistance among U.S. born persons with TB was 12.7% (1.3% MDR-TB, 5.7% INH resistant-not MDR-TB, and 5.7% other first-line drug resistance).

**First-Line Drug Resistance by Country of Birth
Orange County, 2008 - 2017**



Non-U.S. Born Cases

Non-U.S. born persons continue to be disproportionately affected by TB; these persons predominately originate from countries with a high prevalence of tuberculosis. Of the 186 Orange County TB cases reported in 2017, 166 (89.2%) were among persons born outside the United States. The top five countries of origin of non-U.S. born persons with TB were Vietnam (41.6%), Mexico (19.9%), Philippines (15.7%), India (6.6%), and Korea (4.8%). By comparison, 81.9% of California and 70.2% of U.S. 2017 cases with known birthplace were non-U.S. born. Of the non-U.S. born persons with known U.S. arrival date, 126 (68.9%) were living in the United States for more than 5 years prior to TB diagnosis. This indicates reactivation of latent TB infection that was likely acquired before U.S. arrival rather than recent transmission. In 2017, the TB rate for non-U.S. born persons living in Orange County was 17.4 cases per 100,000. This compares to a rate of 0.9 cases per 100,000 population among U.S. born-persons. The Orange County 2017 TB rate for non-U.S. born persons is higher than the California rate of 15.6 and the national Healthy People 2020 objective of 14.0 TB cases per 100,000 non-U.S. born population.

TB and HIV co-infection

HIV is the strongest risk factor for the progression of TB infection to active disease. In Orange County, the epidemiology of TB/HIV co-infection reflects the population at high risk for TB: non-U.S. born persons from countries with high prevalence of TB. From 2008 to 2017, 31 cases were reported with TB/HIV co-infection in Orange County. Approximately 90.3% of these TB cases were non-U.S. born, and 53.6% of these non-U.S. born TB/HIV co-infected cases were Hispanic.

TB and Diabetes

Diabetes increases the risk of active TB disease. Overall, in 2017, 29.9% of adult Orange County TB cases had diabetes as a co-morbidity. Nearly a third (31.7%) of adult, non-U.S. born, Orange County TB cases had diabetes; this is in comparison to 7.7% of adult, U.S. born Orange County TB cases with diabetes. Focusing efforts to screen for and treat latent TB infection among non-U.S. born persons with diabetes may be a feasible and efficient way to make progress toward TB elimination in Orange County.

**Percentage of Adult TB cases with Diabetes
Orange County, 2017**

