

### Key Points

- In 2022, Tuberculosis (TB) cases in Orange County increased to prepandemic level.
- TB disproportionately affects vulnerable populations in Orange County.
- On average, 14 cases of active TB disease are diagnosed in Orange County each month.
- Over 200,000 Orange County residents are infected with TB.
- TB is preventable.

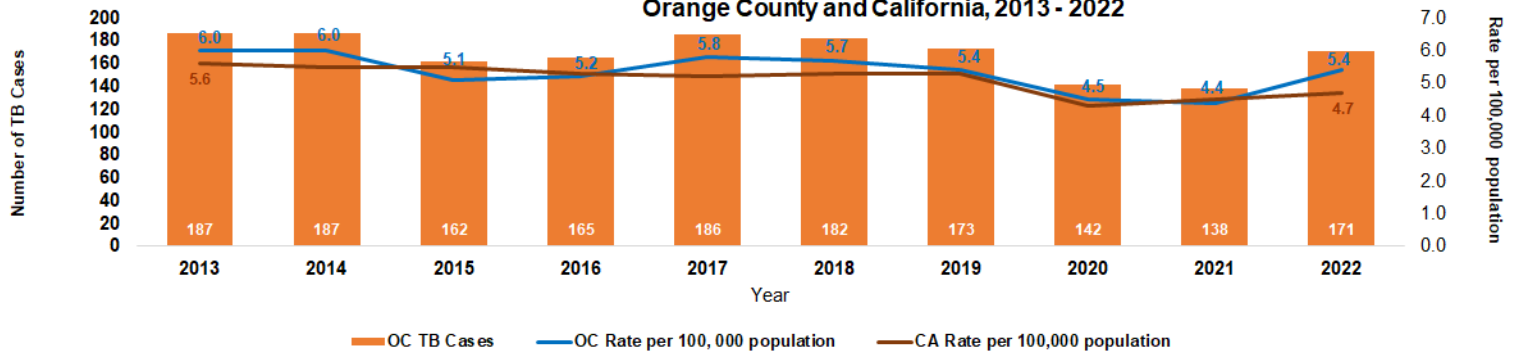
### Tuberculosis Trend

In 2022, Orange County reported 171 cases of active TB disease, which reflects a 23.9% increase in reported TB cases from 2021. This also reflects a 8.6% decrease since 2013 when a 10-year high of 187 cases were reported and a 60.2% decrease from a historic high of 430 cases reported in 1993. The TB case rate for Orange County was 5.4 per 100,000 population. This compares to a rate of 4.7 and 2.5 cases per 100,000 population for California and the United States, respectively. TB rates in California and the United States increased 4.4% and 4.2% respectively as compared to 2021.

After two consecutive years of decline in 2020 and 2021, the TB rate in Orange County increased 22.7% from 2021 (4.4 per 100,000 population) to 2022 (5.4 per 100,000 population) but was 10.3% lower than the 10-year high of 6.0 per 100,000 population in 2013 and 2014. Overall, since 2013, TB rates decreased 0.4% per year, on average. This slow 10-year annual decline is marked by substantial peaks and declines every two to three years. The highest annual rate of increase occurred in 2017 and 2022 with 12.7% and 22.7% increase from previous years respectively. The highest annual rates of decline occurred in 2015 and 2020 with 14.3% and 16.7% decrease from previous years respectively. The rebound in the number of reported TB cases in 2022 to pre-pandemic level might be explained by lessening of measures associated with the COVID-19 pandemic which may increase TB transmission. In addition, increase in immigration and more patients seeking care due to lifting of the stay-at-home restrictions may explain the increase in TB incidence in 2022.

The highest burden of disease continues to be among the elderly population. In 2022, persons aged 65 years and older had a TB case rate of 13.5 per 100,000 population. In 2022, Orange County TB cases were more likely to be male, Asian, non-U.S. born and 65 years and older. In 2022, Orange County ranked eight in the State based on TB case rate. Orange County reported the third highest number of TB cases in California behind Los Angeles and San Diego Counties. Orange County's 2022 TB case rate of 5.4 per 100,000 population remained higher than the 2025 national target of 1.3 TB cases per 100,000 population.

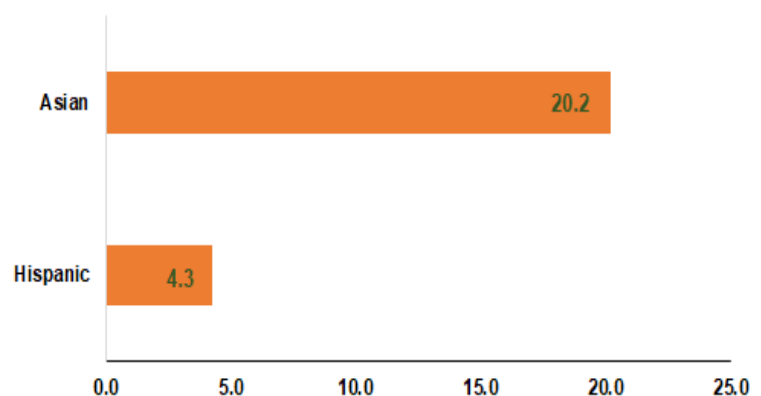
Tuberculosis Cases and Incidence Rates, Orange County and California, 2013 - 2022



### Race and Ethnicity

In Orange County, TB continues to disproportionately affect minorities. In 2022, the TB case rate among Asians was five times higher than the rate for Hispanics. The TB case rate among Asians was 20.2 per 100,000 population, which was a 26.3% increase from 16.0 per 100,000 population in 2021. The TB case rate among Hispanics was 4.3 per 100,000 population, which was an increase of 38.7% compared to 3.1 per 100,000 population in 2021. 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, 2022



### Age

In 2022, Orange County TB cases were reported among persons ranging from 1 to 94 years of age with 43.9% of all TB cases occurring among individuals 65 years and older. The median age of TB cases was 60 years. There were two pediatric TB cases (under 15 years of age).

### Gender

In 2022, 62.6% of TB cases in Orange County were male. The TB case rate in Orange County, among males and females, were 6.7 and 4.0 per 100,000 population, respectively.

### Country of Birth

Non-U.S. born persons continue to be disproportionately affected by TB. These persons predominately originate from countries with a high prevalence of TB. Of the 171 Orange County TB cases, 160 (93.6%) were non-U.S. born. By comparison, 83.0% of California and 73.0% of U.S. 2022 cases with known birthplace were non-U.S. born. The top five countries of birth of Orange County TB cases were Vietnam (33.5%), Mexico (21.8%), the Philippines (13.5%), U.S.A. (6.5%) and South Korea and China (5.3% each). Of the non-U.S. born persons with known U.S. arrival date, 136 (85.0%) were living in the U.S. for more than five years prior to TB diagnosis. This indicates reactivation of LTBI that was likely acquired before U.S. arrival rather than recent transmission. In 2022, the TB case rate for non-U.S. born persons living in Orange County was 16.9 per 100,000 population. This compares to a rate of 0.5 per 100,000 population among U.S. born-persons. The Orange County 2022 TB case rate for non-U.S. born persons is higher than the California rate of 14.4 and nearly double the national TB Program objective for 2025 of 8.8 per 100,000 non-U.S. born population.

### TB and HIV co-infection

HIV is the strongest risk factor for the progression of LTBI to active disease. Provisional 2022 data shows that 164 (98.8%) of TB cases alive at TB diagnosis had a known HIV status. Of these 164 TB cases, four (2.4%) were reported with TB/HIV co-infection. From 2013 to 2022, 41 cases were reported with TB/HIV co-infection.

### TB and Other Risk Factors

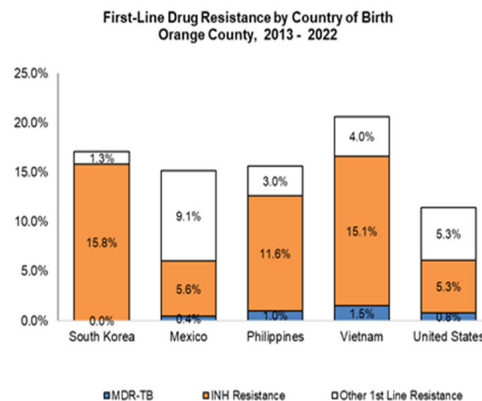
Diabetes and cigarette smoking increase the risk of progression from LTBI to active TB disease. In 2022, 36.3% of adult TB cases in Orange County had diabetes (up from 34.3% in 2021) and 26.8% (down from 31.4% in 2021) were current or past smokers.

### Drug Susceptibility Testing

In 2022, drug susceptibility results for Mycobacterium tuberculosis isolates were available for 155 (98.7%) of the 157 Orange County culture positive TB cases.

### Drug Resistance

Of the 155 culture positive TB cases with known susceptibility, 30 (19.4%) were resistant to one or more of the first-line drugs used to treat TB - isoniazid (INH), rifampin (RIF), ethambutol (EMB) and pyrazinamide (PZA). Multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (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 2022, there were no MDR-TB and XDR-TB cases reported in Orange County. Statewide in 2022, there were 16 MDR-TB cases and 3 XDR-TB cases reported from 2017-2022. In Orange County, drug resistance patterns vary by country of birth. From 2013 to 2022, the proportion of TB cases with INH drug resistance was highest in persons born in South Korea (15.8%) and Vietnam (15.1%). A higher proportion of MDR-TB cases with multidrug-resistance were born in Vietnam and Philippines (1.5% and 1.0%, respectively). In Orange County, 11.4 % of U.S. born persons with TB had first-line drug resistance.



### TB Elimination

According to the Centers for Disease Control and Prevention (CDC), TB elimination is defined as less than one case of active TB per one million population. A majority of TB cases in Orange County occur due to reactivation of LTBI. Treating LTBI will prevent TB cases in Orange County. Estimates by the California Department of Public Health indicate that over 200,000 Orange County residents have LTBI. This represents a very large reservoir of individuals from which future cases of TB disease will develop. Diagnosing and treating LTBI is an important strategy to accelerate the decline in TB cases in Orange County and achieve TB elimination. People at increased risk for TB should get tested. Focusing efforts to screen for and treat LTBI is key to eliminating TB disease in Orange County.

### Treatment Initiation and Completion

In 2021, (most recent year for which data is available), 83.8% of TB cases with positive acid-fast bacillus (AFB) sputum smear results initiated treatment within seven days of specimen collection. By comparison, 84.3% of California and 85.5% of U.S. 2021 TB cases with positive sputum smear results initiated treatment within seven days of specimen collection. In 2020 (most recent complete data), 75.4% of TB cases, for whom 12 months or less of treatment is indicated, completed their prescribed treatment within 12 months of diagnosis. This is lower than the national 2025 TB Program objective of 95.0%.

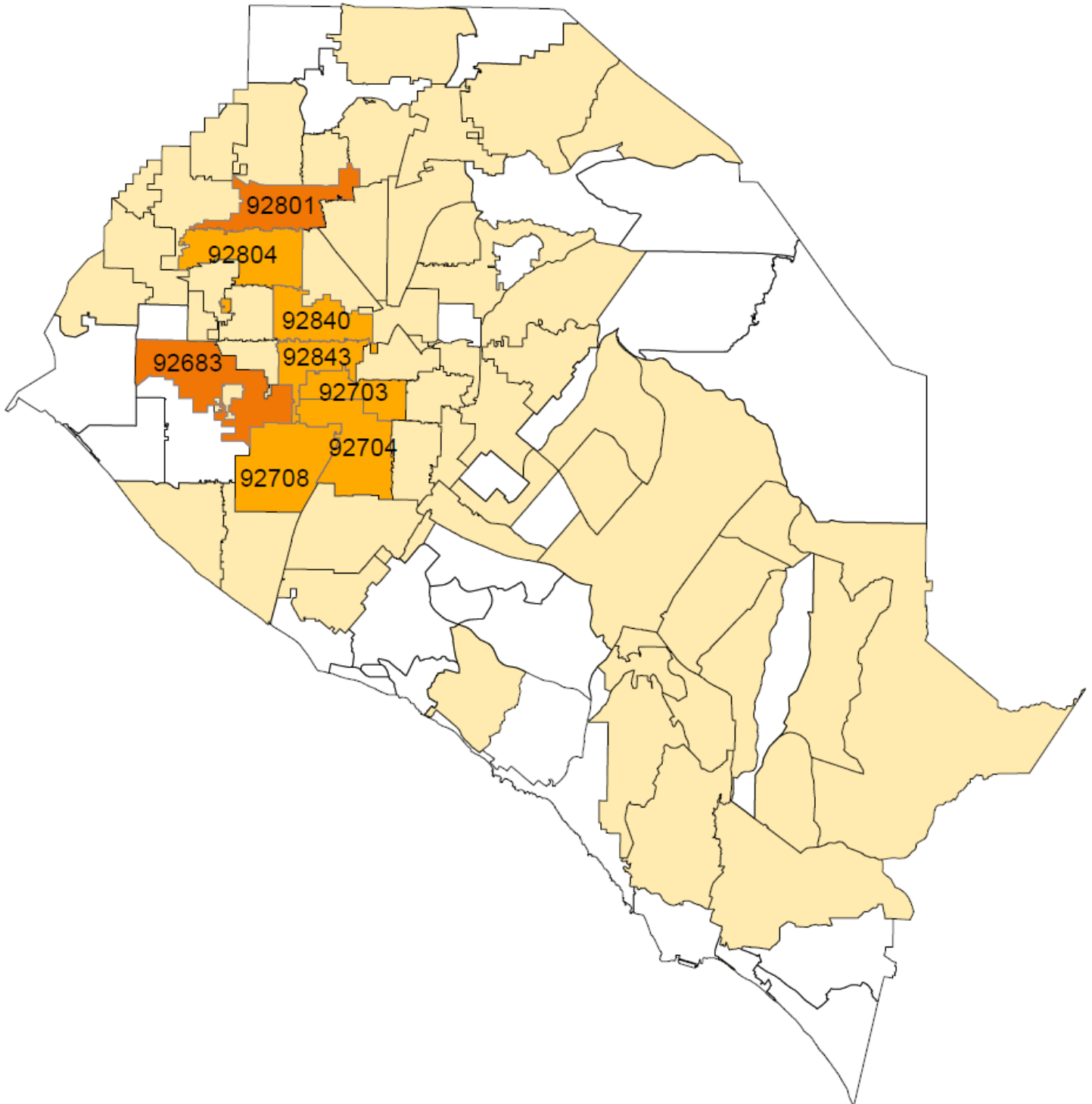
### TB Reporting

In Orange County, all suspected or confirmed TB cases are assigned to a Public Health nurse case manager who provides individualized case management services for the patient. In 2022, there were 769 persons with suspected or confirmed TB disease assigned to Public Health nurse case managers, up from 498 in 2021.

### TB Contact Investigation

Contact investigations are a key TB control strategy used to identify, find, and evaluate contacts to persons with infectious TB and provide appropriate treatment for LTBI or TB disease, if needed. Effective contact investigations interrupt the spread of TB in communities and help prevent transmission of TB. In Orange County, there are four high priority contacts identified for each person with infectious TB on the average. Twenty two percent of contacts to persons with infectious TB have LTBI and one percent have TB disease. The four key areas of contact investigations are contact identification, contact evaluation, contact treatment initiation and contact treatment completion. In 2021 (most recent data), Orange County performed as follows in these four keys areas: 95.9% for contact identification, 74.3% for contact evaluation, 73.9% for contact treatment initiation and 85.3% for contact treatment completion. This is lower than the national 2025 TB Program objective.

TB Cases by Zip Code of Residence, Orange County 2022



Number of TB Cases

- 0
- 1-5
- 6-10
- > 10