

# 2021 Annual Tuberculosis Report

## Fresno County

**Fresno County Department of Public Health (FCDPH)  
Tuberculosis Control Program**



**2021 Annual Tuberculosis Report Fresno County**  
**March 2023**

**This report was produced by:  
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## **List of Abbreviations**

**3HP** – Once-weekly Isoniazid-Rifapentine for 12 Weeks  
**AFB** – Acid-Fast Bacilli  
**CDC** – Centers of Disease Control and Prevention  
**CDPH** – California Department of Public Health  
**DOT** – Direct Observed Therapy  
**Dx** – Diagnosis  
**EMB** – Ethambutol  
**ETH** – Ethionamide  
**FCDPH** – Fresno County Department of Public Health  
**HIV** – Human Immunodeficiency Virus  
**INH** – Isoniazid  
**LTBI** – Latent Tuberculosis Infection  
**MDR-TB** – Multi-Drug-Resistant Tuberculosis  
**MOX** – Moxifloxacin  
**NHPI** – Native Hawaiian Pacific Islander  
**NTIP** – National Tuberculosis Indicators Project  
**Pre-XDR-TB** – Pre-Extensively Drug-Resistant Tuberculosis  
**PZA** – Pyrazinamide  
**RIB** – Rifabutin  
**RIF** – Rifampin  
**RIP** – Rifapentine  
**RR-TB** – Rifampicin-Resistant Tuberculosis  
**Rx** – Prescription  
**SM** – Streptomycin  
**TB** – Tuberculosis  
**TNF-Alpha** – Tumor Necrosis Factor Alpha  
**WHO** – World Health Organization  
**XDR-TB** – Extensively Drug-Resistant Tuberculosis

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## **Tuberculosis Burden Summary**

### **Globally**<sup>1,2</sup>

The latest World Health Organization (WHO) estimates for global deaths by cause are from 2019. Out of all causes of death in 2019, Tuberculosis (TB) ranked as thirteenth and was the leading cause of death due to infectious disease. When final data is available for 2020 and 2021, the WHO anticipates that TB will rank as the second leading cause of death due to infectious disease behind COVID-19. Estimates for the number of TB deaths in 2021 are 1.6 million (range, 1.5–1.7), an increase from 2020. This is the second annual increase in TB deaths since 2005, and is a result of decreased TB care during the COVID-19 pandemic. During 2021, an estimated 10.6 million people (range, 9.9 – 11) became sick with TB, resulting in an incident of 134 cases (range, 125 – 143) per 100,000 population. These numbers represent an increase in TB disease burden reversing many years of decline.

Tuberculosis is a leading killer of people who are HIV-infected, and in 2021 around 187,000 (range, 158,000 – 218,000) people with HIV died from TB. Despite this high number, there is a 72.1% reduction in HIV deaths from 2000- 2021. During the same time span, the deaths among HIV – negative people dropped by 17.6%. Unfortunately, this trend was reversed in the most recent two years for both TB and HIV–TB patients due to the COVID-19 pandemic.

Worldwide, most TB cases are in adults (90%) that are male (56.5%). Two thirds of TB cases originate from eight countries: India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, and the Democratic Republic of the Congo.

The WHO asserts that drug resistant TB is of great public health concern. From 2015-2020, the proportion of new TB cases that are rifampicin-resistant TB (RR-TB) or multi-drug resistant TB (MDR–TB) has been relatively stable. In 2021, this trend was reversed, and the number of MDR/RR-TB cases grew by 3% when compared to 2020. In 2021, there were an estimated 450,000 (range, 399,000 – 501,000) new MDR/RR-TB cases. The estimated number of new TB cases that were MDR/RR-TB was 3%, and 18% among those previously treated. In 2021, 25,038 extensively drug-resistant (XDR) or pre-XDR cases were reported globally.

### **Nationally**<sup>3,4</sup>

A total of 7,882 TB cases (an incidence of 2.4 cases per 100,000 people) were reported in the United States in 2021. Compared to 2020, in 2021 the incidence increased by 9.8% and the number of cases increased by 9.9%. In 2021, California, Texas, New York, and Florida accounted for about half of all TB cases reported.

Minority populations continue to have the highest incidence of TB in the United States. The 2021 foreign-born TB incidence per 100,000 population for Native Hawaiians/Pacific Islanders, Asians, Blacks, Hispanics/Latinos, American Indians/Alaska

Natives, and Whites is 21.1, 22.9, 14.3, 8.8, 1.3, and 2.8 respectively. The 2021 incidence per 100,000 population for native-born TB cases who are Native Hawaiians/Pacific Islanders, Asians, Blacks, Hispanics/Latinos, American Indians/Alaska Natives, and White is 5.8, 1.5, 2.0, 1.3, 3.7 and 0.3 respectively.

Foreign-born people represent 71% of all TB cases in 2021 and the top 5 countries of birth for foreign-born TB cases are Mexico, the Philippines, India, Vietnam, and China. In addition to being foreign-born, other top risk factors for TB infection include HIV, substance abuse, diabetes, kidney disease, organ transplantation, homelessness, and institutionalization (prisons, shelters, nursing homes).

There were 77 MDR-TB cases in 2021, and the number of MDR-TB cases increased by 19 when compared to 2020. There were two XDR-TB cases in 2021.

### **California**<sup>5,6</sup>

In 2021, a total of 1,750 new TB cases were reported compared to 1,706 cases in 2020. California reported 22.2% of the nation's TB cases in 2021. The California TB incidence during 2021 is 4.4 per 100,000 people, a increase of 2.3% compared to 2020. TB cases are reported in 42 (69%) of California's 61 local health jurisdictions.

Like the United States as a whole, minority populations continue to have the highest incidence of TB in California. The incidence of TB per 100,000 population for Asians, Native Hawaiian/Pacific Islanders, Hispanics, Blacks, and Whites is 16.8, 4.2, 4.6, 2.8, and 0.6 respectively.

Foreign-born people represent 84% of all TB cases and well over half of these cases were born in Mexico, the Philippines, Vietnam, China, and India.

It is estimated that 2 million Californians have a latent TB infection (LTBI) and are at risk of developing active TB if not properly diagnosed and treated. Many people with LTBI are unaware of their infection. Latent TB treatment is critical because an estimated 87% of active TB cases develop from LTBI.

In California, MDR-TB has remained a small proportion of TB cases (1-2%) during 1993-2021 despite the growth of MDR-TB cases throughout the world. A total of 11 (0.6%) MDR-TB cases are reported in California during 2021. No Extensively Drug Resistant (XDR-TB) cases are reported in California during 2021, and 25 XDR-TB cases are reported from 1993-2021.



### **Fresno County**

A total of 45 TB cases (an incidence of 4.4 cases per 100,000 people) were reported in Fresno County during 2021. Compared to 2020, in 2021 the incidence increased by 22.2% and the number of cases increased by 25%.

In 2021, most TB cases occurred in older adults (average age 50.8 years old), and more TB cases were male than female (57.8% vs. 42.2%). Over half of TB cases were not employed when they received their diagnosis.

Racial and ethnic disparities continue to exist among populations with TB disease in Fresno County. During 2021, the incidence of TB for Asians/Native Hawaiians-Pacific Islanders, Blacks, Hispanics/Latinos, and Whites is: 20.2, 4.0, 4.3, and 0 per 100,000 people respectively.

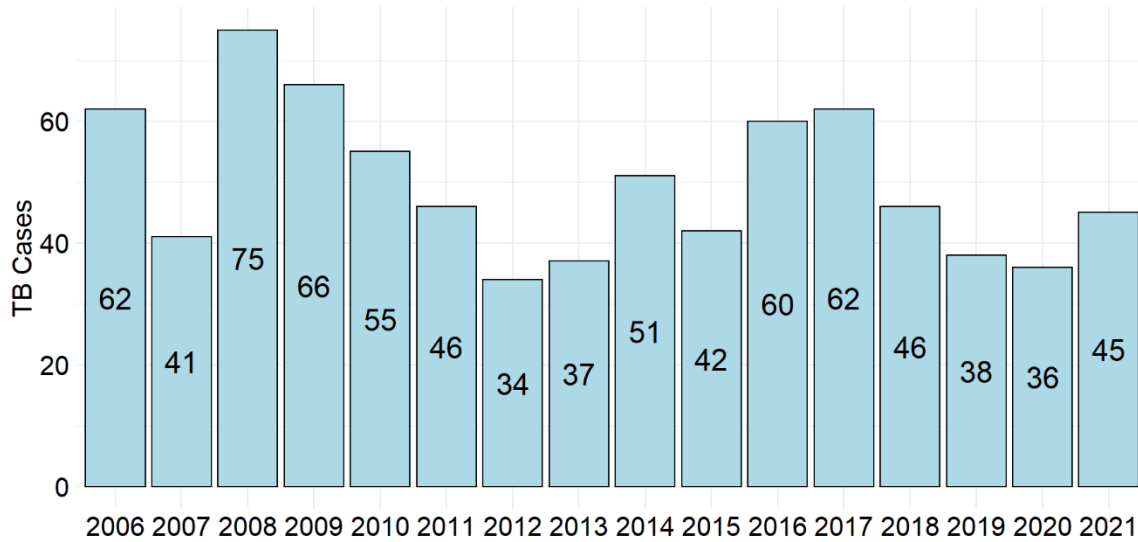
Foreign-born people represent well over half of all TB cases in 2021, and 87.9% of these cases arrived from Mexico, Laos, India, and the Philippines. Social and behavioral risk factors identified in 2021 TB cases include alcohol and drug abuse, contact with an active TB case, migrant/seasonal work, institutionalism (correctional and long-term care residencies), and homelessness. Medical risk factors identified in 2021 TB cases include diabetes, HIV, immunosuppression, end stage renal disease, and a prior TB diagnosis.

As in 2020, the MDR-TB incidence in 2021 remained 0.0 per 100,000 people.

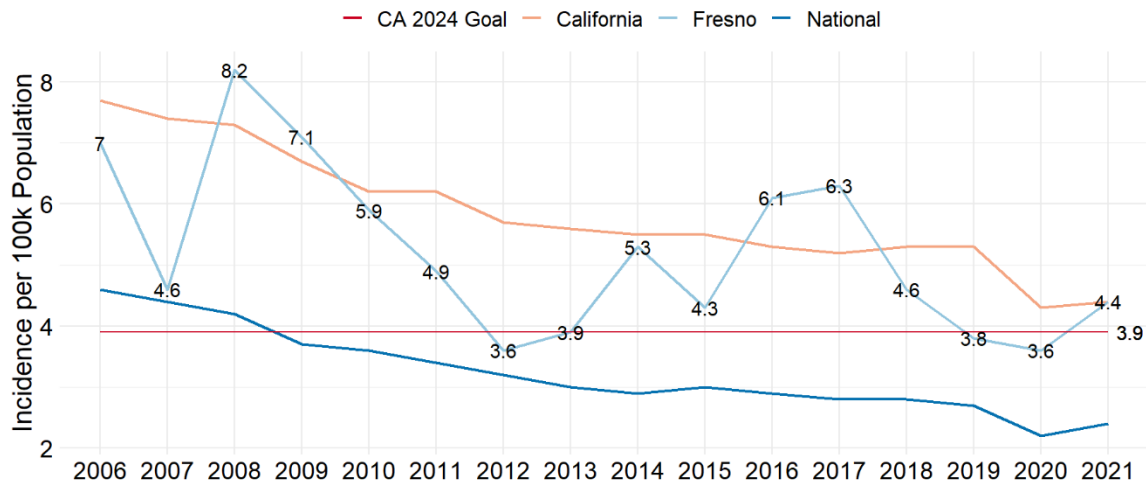
## Tuberculosis Cases and Incidence in Fresno County

Tuberculosis (TB) is a common communicable disease caused by the bacterium *Mycobacterium tuberculosis*.<sup>7</sup> It most commonly infects the lungs, but can infect almost any organ system. In 2021, 45 new cases of active TB were diagnosed in Fresno County (4.4 per 100,000 population), a 25% increase in the annual number of cases from 2020 (Figures 1-2). During 2021, out of the 61 health jurisdictions in California, the active TB incidence in Fresno County ranked 14, and Fresno County reported 2.6% of the total number of TB cases reported in California.<sup>5</sup>

**Figure 1. Annual New Active TB Case Counts in Fresno County – 2006-2021**



**Figure 2. Annual National and State TB Incidence Compared to Fresno County – 2006- 2021\***



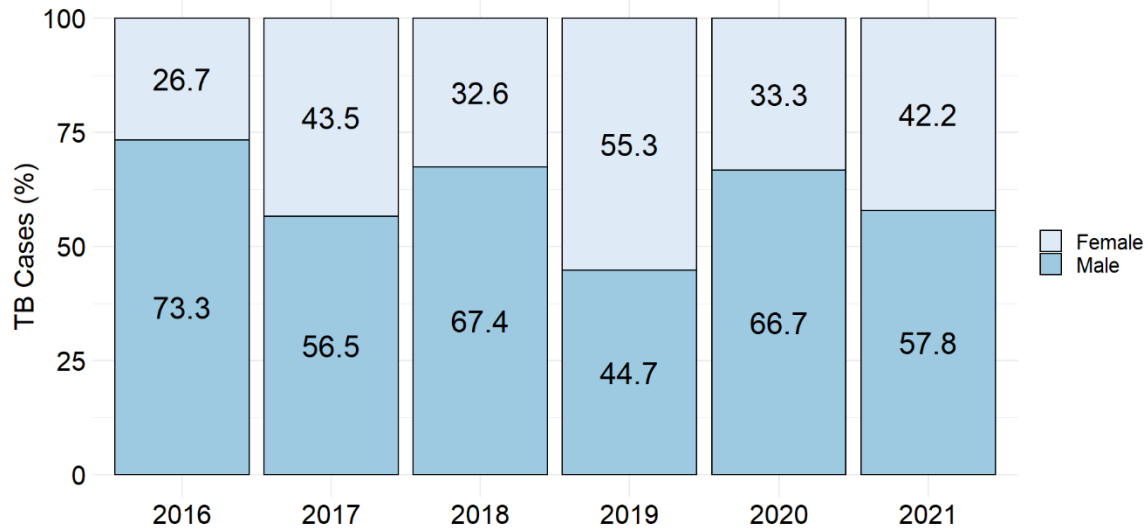
\*Data Sources:  
Tuberculosis Control Branch, Provisional California Tuberculosis Data Tables, California Department of Public Health, Richmond, CA, November 2022.  
Filardo TD, Feng P, Pratt RH, Price SF, Self JL. Tuberculosis — United States, 2021. MMWR Morb Mortal Wkly Rep 2022;71:441–446.

## Demographic Characteristics in Fresno County

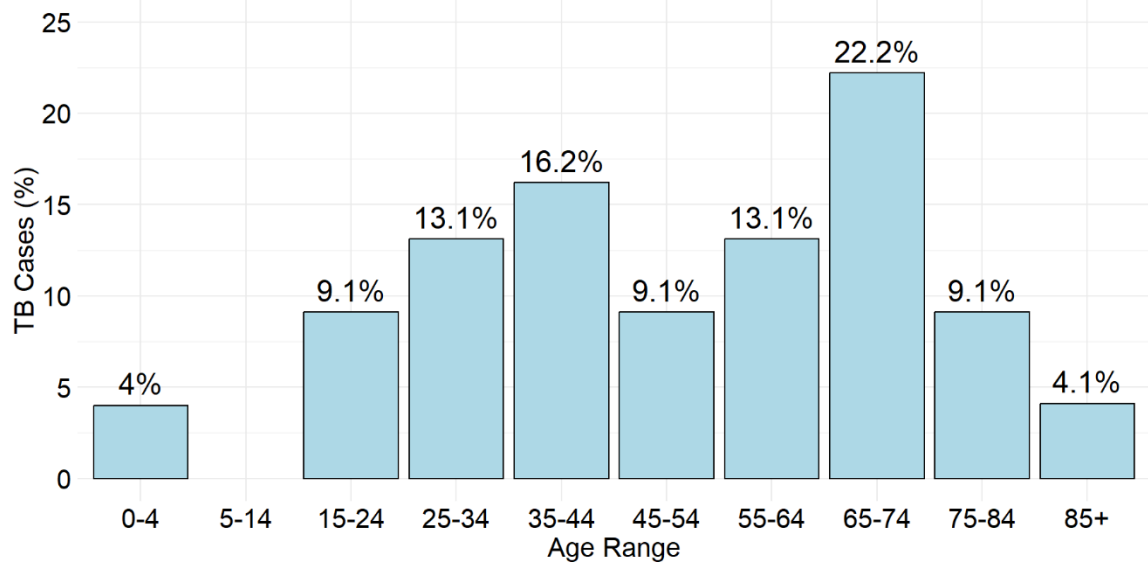
### Sex and Age

In 2021, 26 (57.8%) cases were male and 19 (42.2%) were female (Figure 3). Most TB cases in Fresno County occurred in older adults (Figure 4), and 24 (53.3%) cases during 2021 were over age fifty (data not shown). The average age of TB patients in Fresno County during 2021 was 50.8 years with a range from 1 to 89 years (Figure 5).

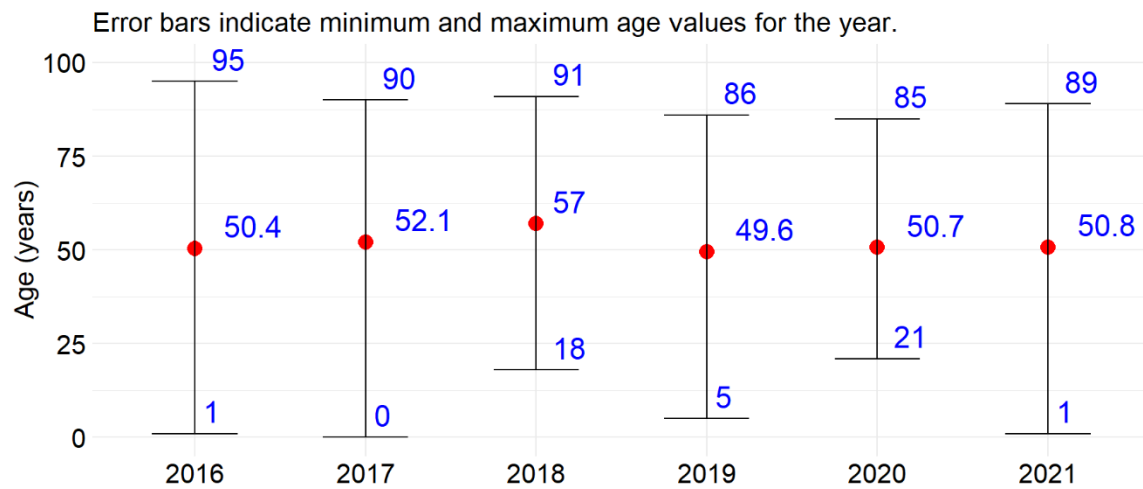
**Figure 3. Percent Male vs Female TB Cases in Fresno County – 2016-2021**



**Figure 4. Age Distribution of TB Cases in Fresno County – 2021**



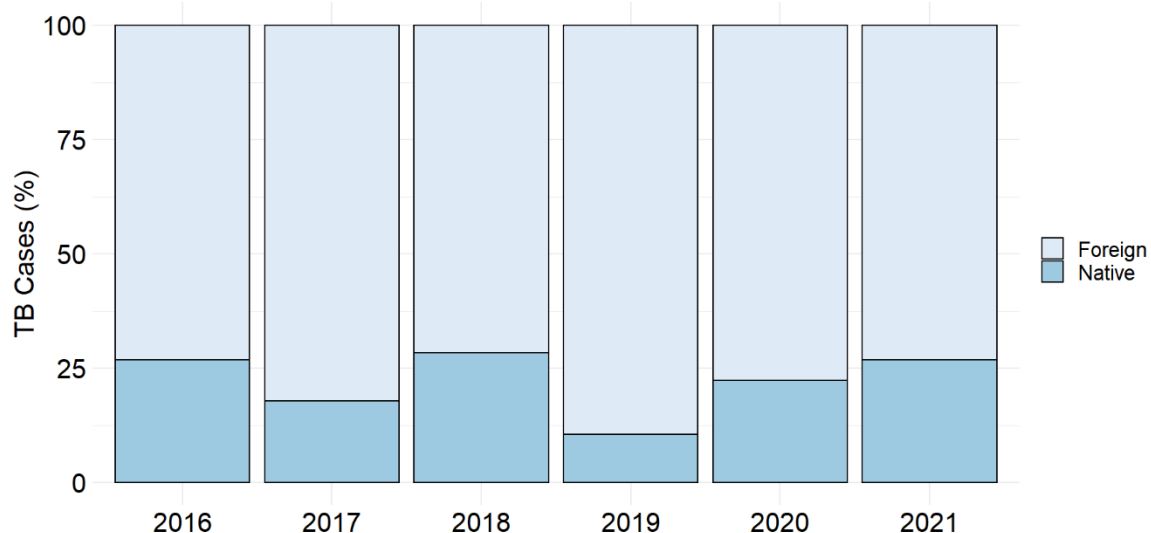
**Figure 5. Average Minimum and Maximum Age at TB Diagnosis in Fresno County – 2016-2021**



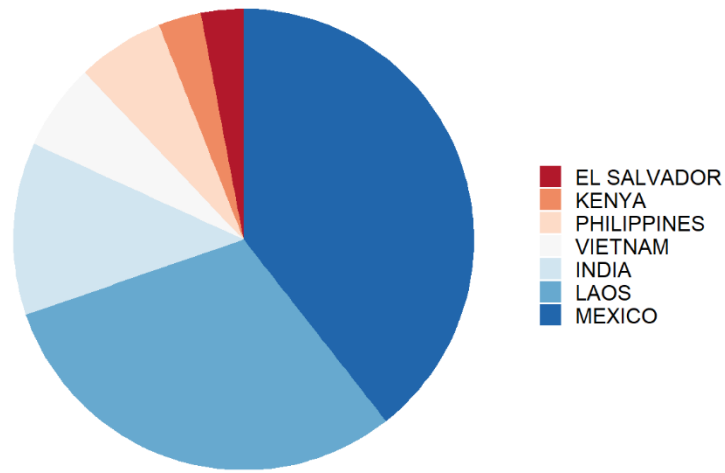
### Nativity

Similar to prior years, during 2021 a smaller percentage of TB cases were among US-born residents compared to foreign-born people (Figure 6). The top four countries represented by foreign-born TB cases, accounting for 87.9% of all foreign-born cases, are Mexico, Laos, India, and the Philippines. Other countries represented by 2021 TB cases include Vietnam, El Salvador, and Kenya (Figure 7). During 2021, foreign-born TB patients spent an average of 24.1 years in the US prior to their TB diagnosis (Figure 8).

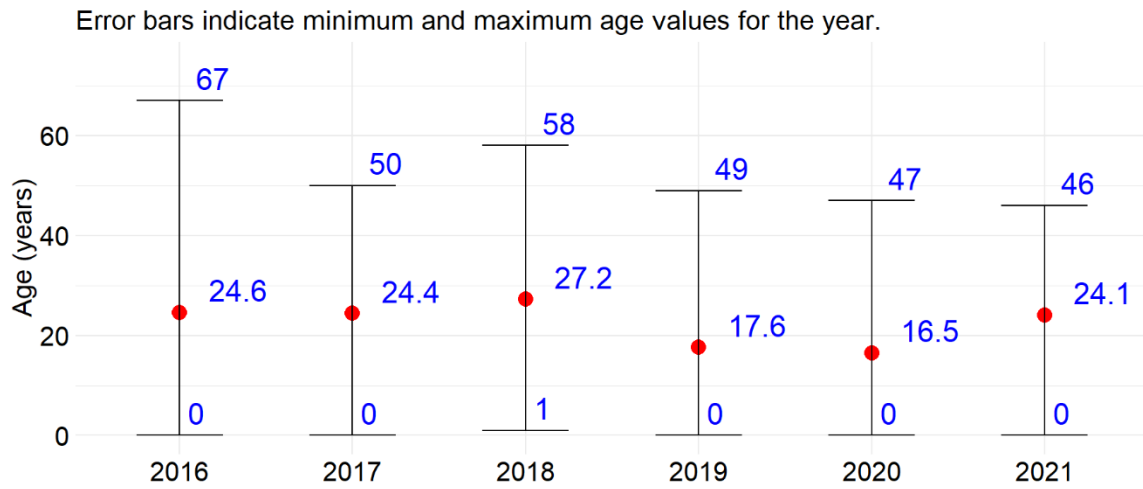
**Figure 6. Nativity of TB cases in Fresno County – 2016-2021**



**Figure 7. Birth Country for Foreign-Born TB Cases in Fresno County – 2021**



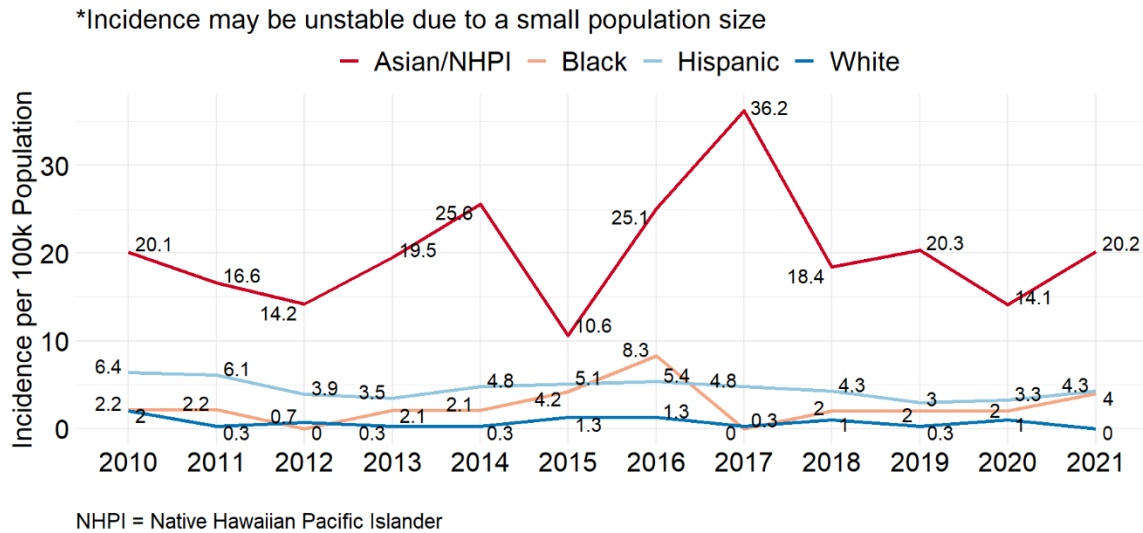
**Figure 8. Average Minimum and Maximum Time from United States Arrival to Diagnosis for Foreign-Born TB Cases in Fresno County – 2016-2021**



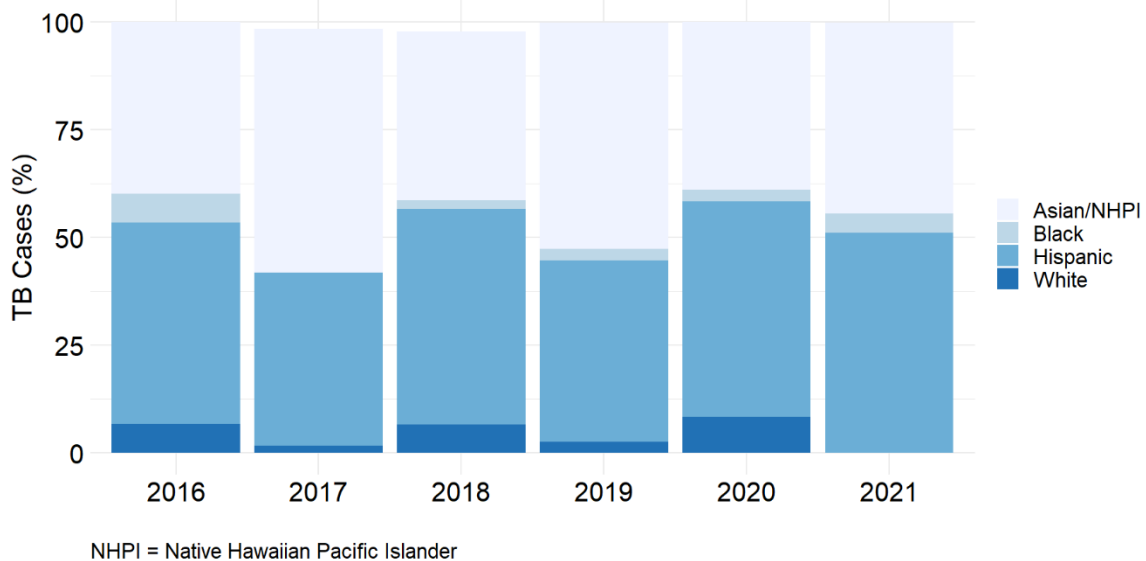
## **Race/Ethnicity**

Racial and ethnic disparities exist among populations with TB disease in Fresno County (Figure 9 & Figure 10). The crude TB incidence in Fresno County for 2021 is 4.4 per 100,000 people (Figure 2). The race/ethnicity specific incidence for Asians/NHPI, Hispanics/Latinos, Blacks/African Americans, and Whites is 20.2, 4.3, 4.0, and 0 per 100,000 people respectively (Figure 9).

**Figure 9. TB Incidence\* by Race/Ethnicity in Fresno County – 2010-2021**



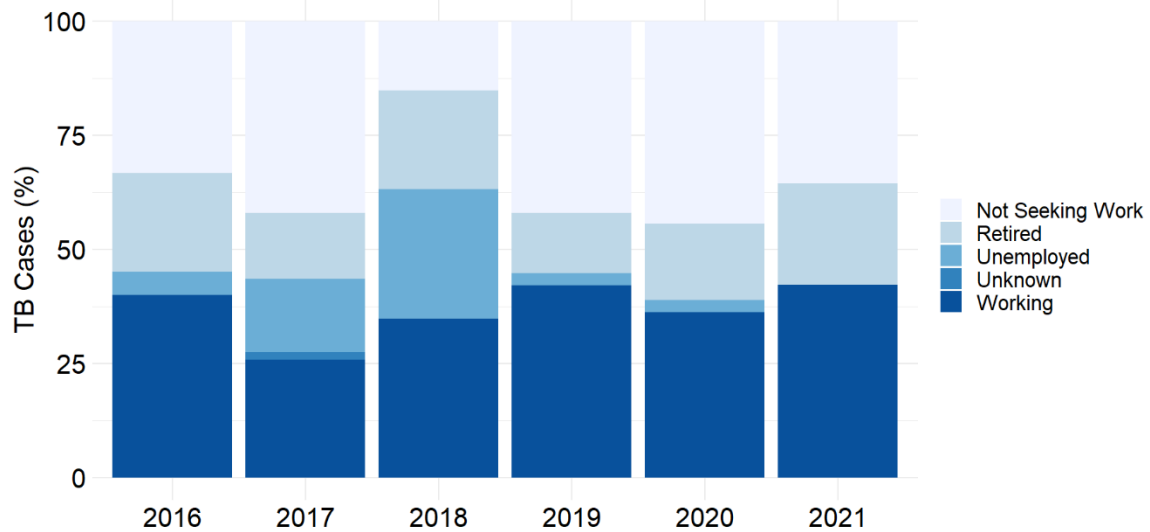
**Figure 10. Percent of TB Cases by Race/Ethnicity in Fresno County – 2016-2021**



## Occupational Status in Fresno County

Figure 11 shows the occupational status of those with TB disease in Fresno County during 2021. Most cases, 26 (57.8%), were not employed because they were not seeking work or retired. Those with a TB diagnosis who were employed (19) represent 42.2% of cases.

**Figure 11. Occupational Status of TB Cases in Fresno County – 2016-2021**

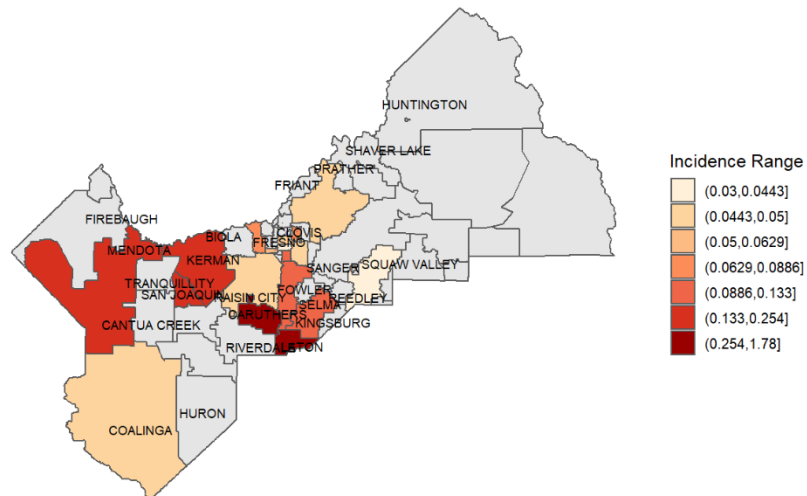


### Geographic Distribution in Fresno County

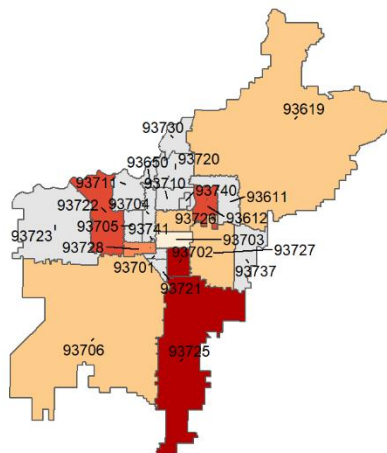
Figure 12 shows the geographic distribution of TB cases within Fresno County by zip code. During 2021, the highest incidence of TB was located in zip codes: 93652, 93609, 93242, 93660, and 93630 (Figure 12).

**Figure 12. TB Incidence by Zip Code per 1000 Population in Fresno County-2021\***

\*\*Incidence per 100K residents may be unstable due to a small sample size.



Fresno and Clovis Metropolitan area.

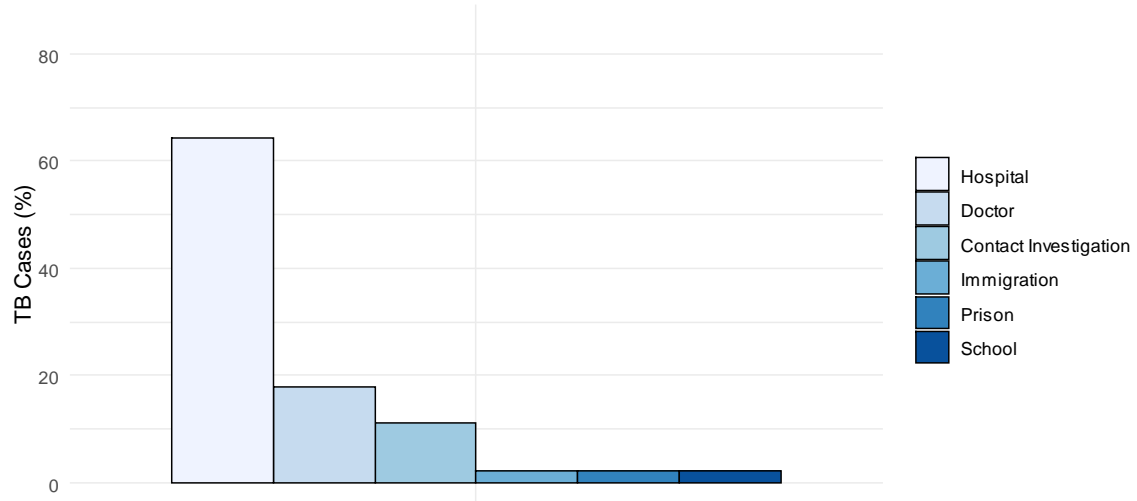




### Case Referral by Source in Fresno County

Cases of TB were identified and referred to the Fresno County Department of Public Health for treatment from different sources. During 2021, the top 3 referral sources accounting for 93.3% of the TB cases were: hospitals, doctors, and contact investigations. (Figure 13).

**Figure 13. Referral Sources for TB Patients in Fresno County – 2021**

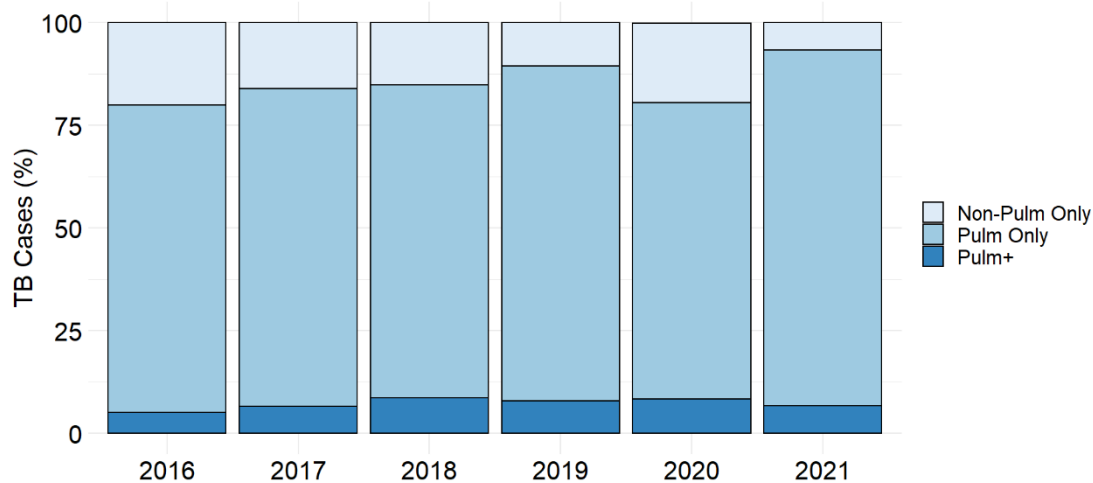


## Pathology and Organism Characteristics in Fresno County

### Infection Location

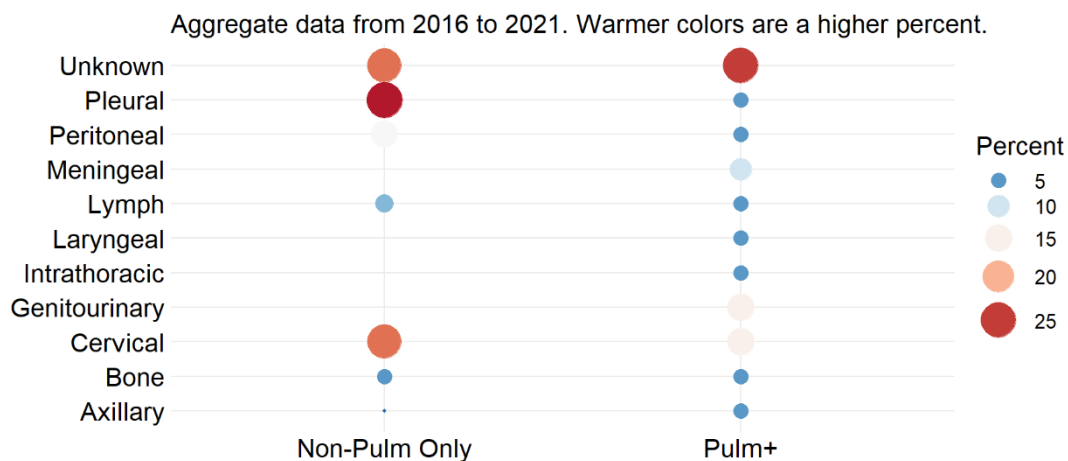
During 2021, 42 (93.4%) patients had lung involvement, of which 39 (86.7%) had lung involvement only (Figure 14). Pulmonary infection combined with infection in genitourinary, laryngeal, and unknown tissues occurred in less than 15 patients (Data not shown). Extrapulmonary infections also occurred in less than 15 patients and were found in lymph and peritoneal tissues (Data not shown). Figure 15 shows the distribution of extrapulmonary TB infections using aggregate data from 2016 to 2021.

**Figure 14. Pulmonary versus Extrapulmonary TB in Fresno County – 2016-2021\***



\*Pulm+ infections occur in both the lung and other tissues, while Non-Pulm Only infections occur outside the lung.

**Figure 15. Infection Location for Extrapulmonary TB in Fresno County – 2016-2021\***

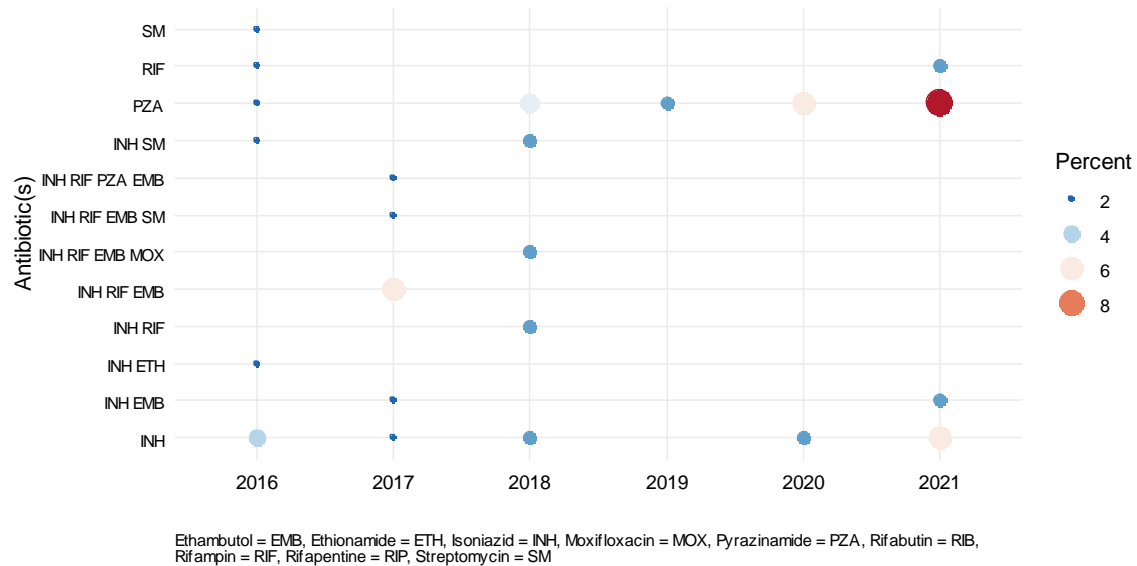


\*Pulm+ infections occur in both the lung and other tissues, while Non-Pulm Only infections occur outside the lung.

## Drug Resistance

Culture positive results were obtained from 31 (68.9%) of the 45 TB patients. No drug resistance was observed among culture positive cases with initial drug susceptibility results. Initial drug resistance to isoniazid, pyrazinamide, rifampin, and ethambutol was observed in cases that were not culture positive. The initial drug resistance profile of TB cases from 2016-2021 is shown in Figure 16.

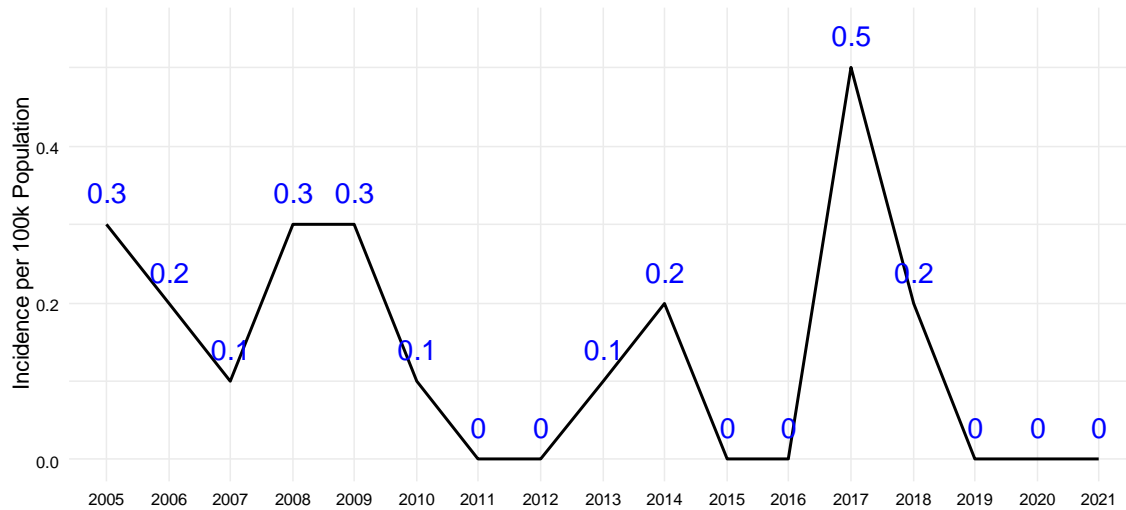
**Figure 16. Initial Drug Resistance as a Percentage of TB Cases Tested for Initial Drug Resistance by Year in Fresno County – 2016-2021**



### **Multidrug-Resistant Tuberculosis (MDR-TB)**

Multidrug-resistant TB (MDR-TB) is resistant to the strongest two primary anti-tuberculosis medications (Isoniazid and Rifampin), and extensively drug resistant TB (XDR-TB) organisms are resistant to these medications plus at least two of the principal secondary medications. Patients with XDR-TB have few treatment options because the drugs most effective against TB are ineffective against their disease. In 2021, the incidence of MDR-TB per 100,000 population was 0 and there were no XDR-TB cases in Fresno County (Figure 17).

**Figure 17. Incidence of MDR-TB\* in Fresno County – 2005-2021**

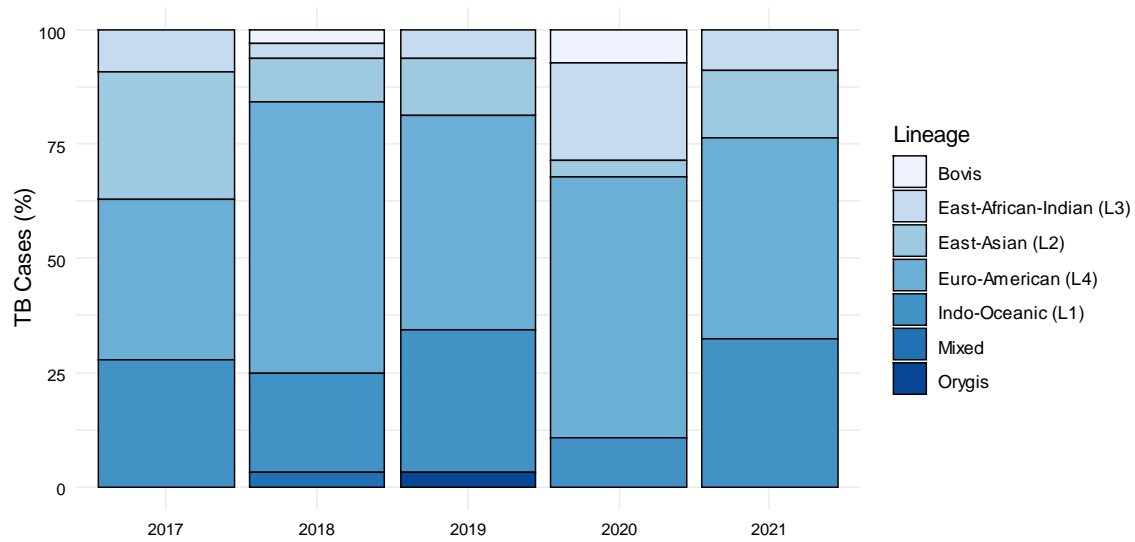


\*Multidrug-resistant TB (MDR-TB) is resistant to the strongest two primary anti-tuberculosis medications (Isoniazid and Rifampin).

## Genotype

The TB program can use genetic links between TB cases to investigate and stop common sources of transmission. Figure 18 shows the proportion of each lineage in TB cases sent for genotyping from 2017-2021. During 2021, 34 (75.6%) cases were genotyped and composed of five lineages: East-African-Indian, Euro-American, East-Asian, and Indo-Oceanic.

**Figure 18. TB Lineage by Year in Fresno County – 2017-2021**



## Contributing Risk Factors and Comorbidities in Fresno County

### Risk Factors

During 2021, 44 (97.8%) of the 45 TB cases had at least one or more underlying factor that increased risk for TB infection or progression of infection to disease whether it be occupational, social, or medical. The proportion of TB cases by risk factor and nativity from 2017 to 2021 is in Table 1.

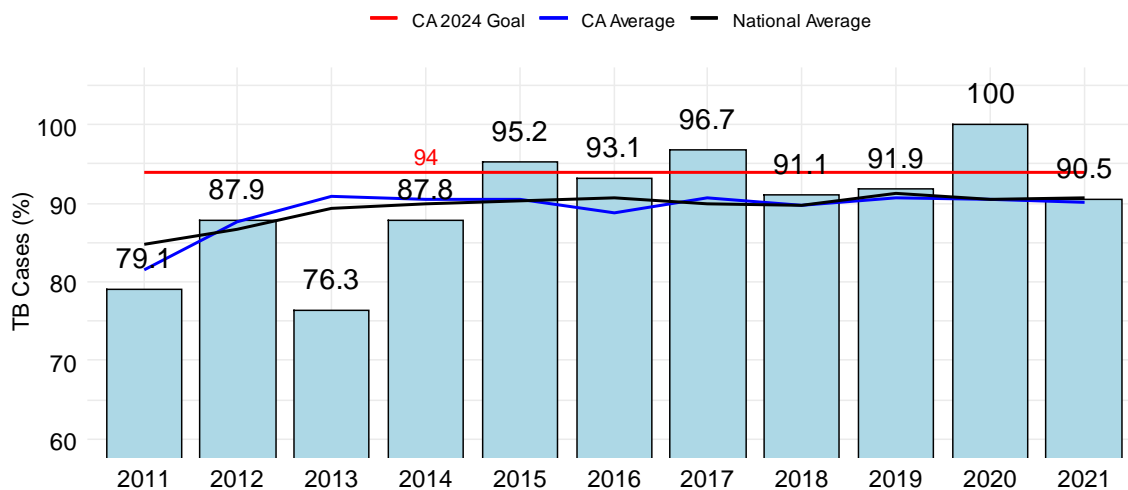
**Table 1. Percent of TB Cases by Risk Factor and Nativity in Fresno County – 2017-2021**

<b>Risk Factor</b>	<b>Foreign Born %</b>	<b>US Born %</b>
<b>Alcohol Abuse</b>	22 (12.4)	6 (12.5)
<b>Correctional Facility Employee</b>	0 (0.0)	0 (0.0)
<b>Correctional Facility Resident</b>	0 (0.0)	2 (4.2)
<b>Diabetes</b>	59 (33.1)	3 (6.2)
<b>End Stage Renal Disease</b>	4 (2.2)	2 (4.2)
<b>Health Care Worker</b>	0 (0.0)	0 (0.0)
<b>HIV Positive</b>	4 (2.3)	1 (2.1)
<b>Homeless</b>	4 (2.2)	5 (10.4)
<b>Immunosuppression</b>	5 (2.8)	5 (10.4)
<b>Infectious Contact</b>	4 (2.2)	8 (16.7)
<b>Injection Drugs</b>	1 (0.6)	2 (4.2)
<b>Long Term Care Facility Resident</b>	1 (0.6)	2 (4.2)
<b>LTBI Incomplete Rx</b>	4 (2.2)	1 (2.1)
<b>MDR Contact</b>	0 (0.0)	1 (2.1)
<b>Migrant/Seasonal Worker</b>	20 (11.2)	2 (4.2)
<b>Missed Contact</b>	0 (0.0)	0 (0.0)
<b>Non-Injection Drugs</b>	5 (2.8)	4 (8.3)
<b>Post Organ Transplant</b>	0 (0.0)	0 (0.0)
<b>Previous TB Dx</b>	4 (2.2)	2 (4.2)
<b>TNF Antagonist Rx</b>	0 (0.0)	0 (0.0)

### HIV Testing

Of the 45 TB patients in 2020, 42 were eligible for HIV testing and of the eligible patients (90.5%) completed testing (Figure 19).<sup>8</sup> Cases of TB are excluded from testing when they are very young or very old and do not have risk factors for HIV.

**Figure 19. Patients with Known \*HIV Status in Fresno County – 2011-2021**



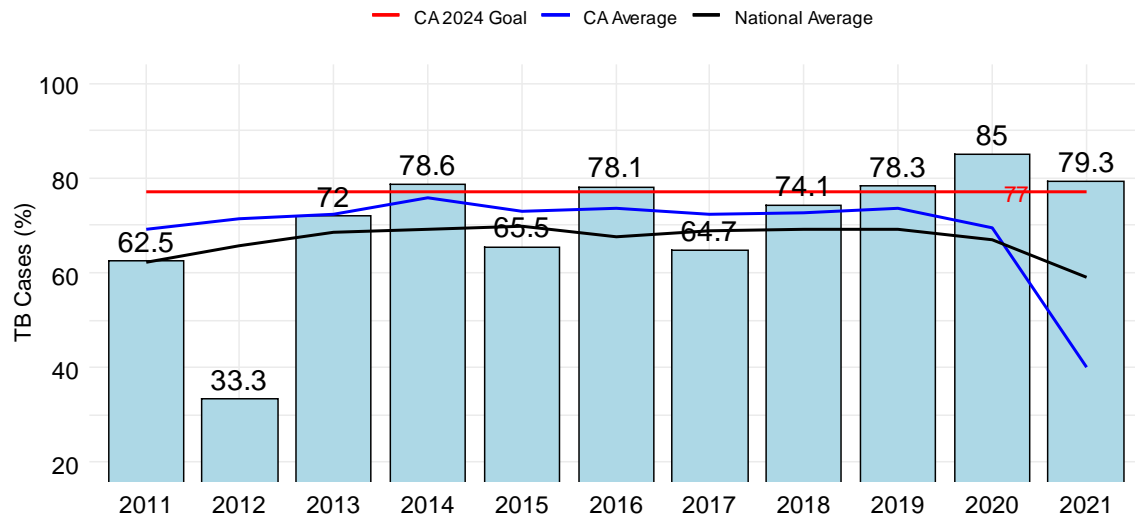
\*HIV Status is Either Positive or Negative

## Treatment Outcomes in Fresno County

### Sputum Culture Conversion

Of the 45 cases of TB in Fresno County during 2021, 29 had positive sputum culture results at the time of treatment initiation. After 60 days of treatment, 23 (79.3%) patients had sputum-culture negative results indicating they were no longer contagious for TB (Figure 20).<sup>8</sup>

**Figure 20. Sputum Culture Conversion Within 60 Days in Fresno County – 2011-2021**

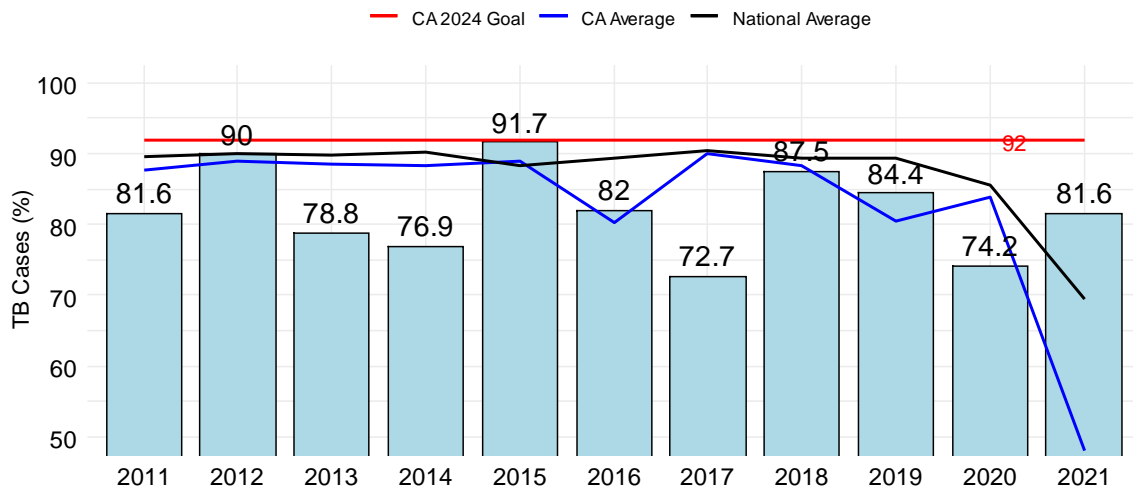




### Active Tuberculosis Treatment Completion

Out of the 45 TB patients, 36 (80%) were eligible to complete treatment. Patients became ineligible to complete therapy if they died before treatment completion, had to stop treatment due to medication side effects, or moved outside Fresno County. As of the publication of this report, 34 (94.4%) of the eligible patients have finished treatment and 2 (5.6%) have not. Those patients that did not finish their TB treatment were uncooperative or refused treatment. During 2021, 38 (84.4%) of the 45 TB patients were eligible to complete their treatment within a 12 month period as defined by CDC criteria from the National Tuberculosis Indicators Project (NTIP).<sup>8</sup> Examples of ineligible patients include those with rifampin-resistant TB, meningeal TB, TB in the skeletal system, TB in the central nervous system, and children less than 15 years old with disseminated TB. Patients who moved out of the U.S within 366 days of initiating treatment are also ineligible to complete treatment within 12 months. Of those 38 patients, 31 (81.6%) completed their treatment within the 12 month period (Figure 21).<sup>8</sup> Delays or intermittent interruptions in treatment can result from factors such as: MDR-TB, patient non-compliance, underlying health conditions, and adverse effects of medication.

**Figure 21. TB Patients Completing Treatment within 12 Months\* in Fresno County – 2011-2021**

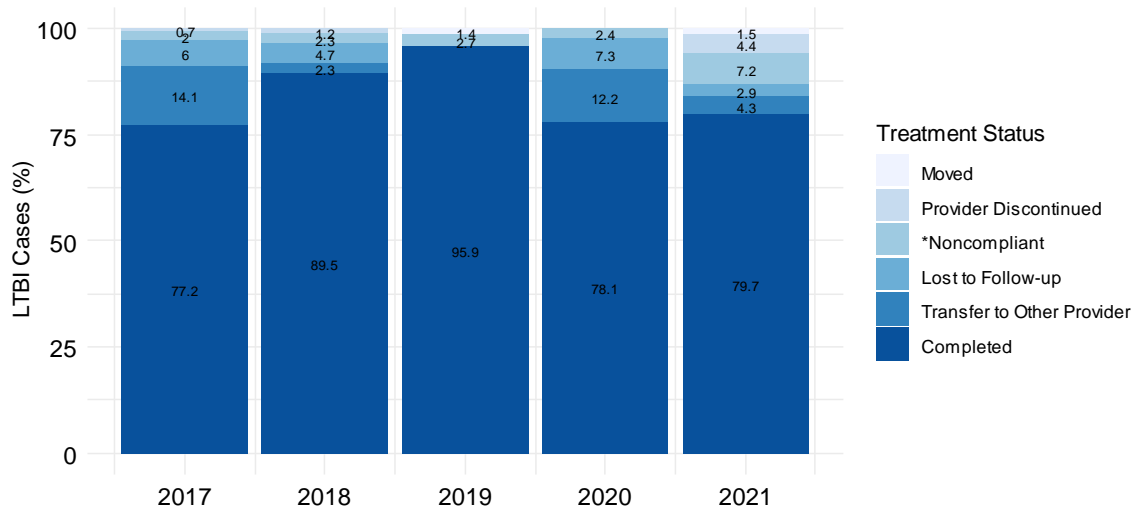


\*For patients with TB in which 12 months or less of treatment was indicated per NTIP criteria.

### **Latent Tuberculosis (LTBI) Treatment**

Someone with latent tuberculosis (LTBI) has a TB infection, but their immune system suppresses the TB bacteria so they are asymptomatic. Without treatment, those with LTBI are at risk for developing active TB in the future. In California, about 80% of active TB cases result from patients with untreated LTBI.<sup>6</sup> The Fresno County Department of Public Health TB Control Program uses different LTBI treatment regimens depending on provider judgment and the availability of medication. Common treatment plans for LTBI patients in Fresno County include: once-weekly isoniazid-rifapentine for 12 weeks (3HP), rifampin daily for 4 months (4R), isoniazid-rifampin daily for three months (3HR), and isoniazid for either 6 or 9 months taken daily or twice weekly (6H/9H). In 2021, 69 patients began LTBI treatment in the TB Control Program and 79.7% (n=55) of these patients completed their treatment within the program. Patients did not complete their treatment within the TB program during 2021 because they were either noncompliant with therapy 7.2% (n=5), continued their treatment with another provider 4.4% (n=3), had their treatment discontinued due to medical reasons 4.3% (n=3), were lost to follow-up 2.9% (n=2), or moved away from the county 1.5% (n=1) (Figure 22).

**Figure 22. LTBI Treatment Status in Fresno County – 2017-2021**

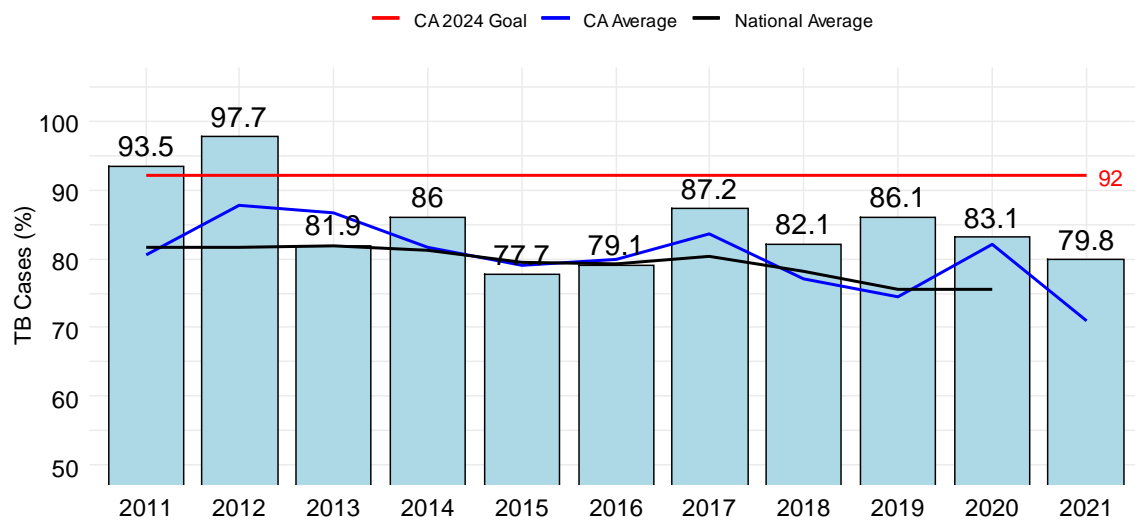


\*Patient chose to not start or finish treatment.

## Contact Investigation in Fresno County

During 2021, 19 (44.2%) of the 45 TB cases were AFB smear-positive and all of these cases had contacts elicited for investigation. Out of the 124 AFB smear-positive contacts elicited, 99 (79.8%) of these contacts were examined for TB infection (Figure 23).<sup>8</sup> Out of those examined in 2021, 31 (31.3%) were discovered to have LTBI infection and 25 (80.6%) of these patients began treatment (Figure 24).<sup>8</sup> Treatment completion for the AFB Smear+ contacts with LTBI is available for years prior to 2021 (Figure 25).<sup>8</sup>

**Figure 23. Contacts to AFB Smear+ Cases Examined for TB in Fresno County – 2011-2021**



**Figure 24. AFB Smear+ Contacts Who Started LTBI Treatment in Fresno County – 2011-2021**

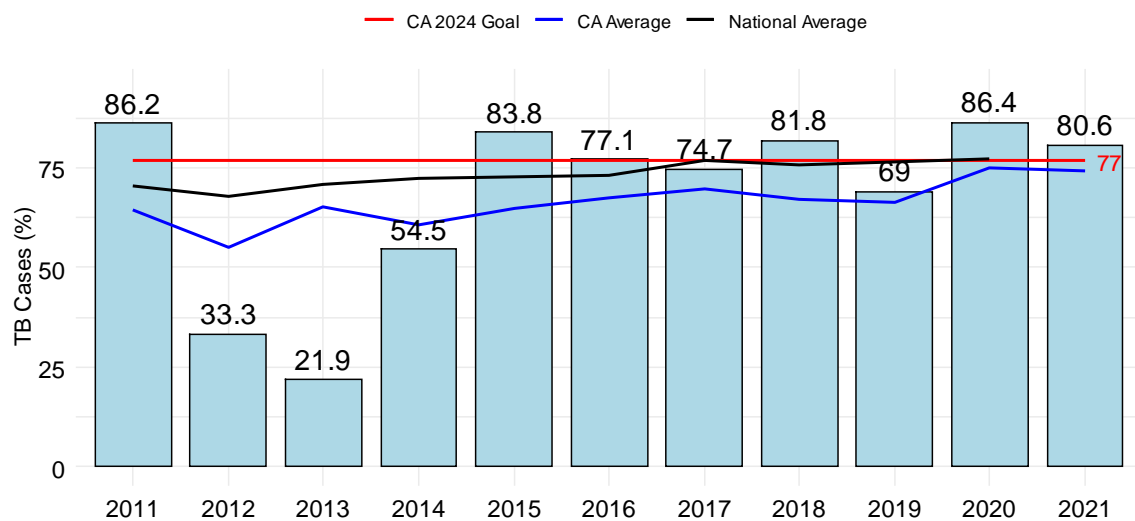
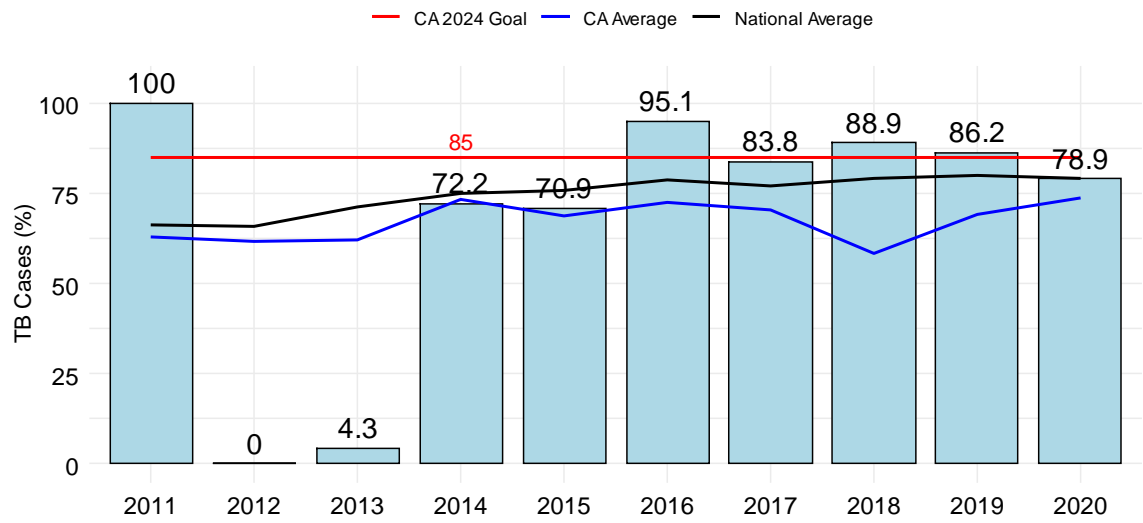


Figure 25. AFB Smear+ Contacts Who Completed LTBI Treatment in Fresno County – 2011-2020



## **Public Health Strategies to Control, Prevent, and Eliminate Tuberculosis**

In 2021, the Fresno County Department of Public Health (FCDPH) TB Control Program provided treatment, contact investigation, and follow-up for all the 45 newly diagnosed active TB cases. The TB program staff continued to simultaneously provide care for patients diagnosed prior to 2021 who had not yet completed treatment (standard treatment regimens are 6-12 months; drug resistant TB patients may be treated for two years, and all treated patients require at least monthly visits). To ensure TB medication is taken correctly, department staff visit pulmonary TB patients daily to observe them take their medications; this is also known as Direct Observed Therapy (DOT).

Strategies to Control, Prevent, and Eliminate Tuberculosis Include:

- 1- Finding and adequately treating people that have active disease.
- 2- Identifying individuals who have been exposed to someone with TB disease, evaluating them for LTBI or active TB disease, and treating them if they have either of these.
- 3- Screening individuals for TB infection that are known to be at higher risk for infection with TB or at higher risk for developing TB disease if infected.
- 4- Applying control measures in high-risk settings.

The FCDPH TB Control Program identifies and treats TB disease, identifies and evaluates exposures to TB, and offers treatment if needed. FCDPH also screens certain high risk populations, and assists the public with the application of control measures in high risk environments.

Title 17 of California Code of Regulations requires that notification be given to the county health department of all diagnosed or suspected cases of TB by telephone or fax within one working day of identification. California Health and Safety Code 121362 also require that providers treating people with active TB report to the local health officer any pertinent information the health officer requests.

### **Additional Information Available**

If you have any questions regarding TB infection, the disease, or the control of TB in Fresno County please contact our FCDPH Community Liaison Nurse at 559-600-3413.

## References

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2. Global tuberculosis report 2021. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.
3. Filardo TD, Feng P, Pratt RH, Price SF, Self JL. Tuberculosis — United States, 2021. MMWR Morb Mortal Wkly Rep 2022;71:441–446..
4. CDC. Drug – Reported Tuberculosis in the United States at, 2021 [https://www.cdc.gov/tb/statistics/reports/2021/exec\\_commentary.html#treatment](https://www.cdc.gov/tb/statistics/reports/2021/exec_commentary.html#treatment) Published 11/29/2022. Accessed 12/6/2022.
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6. Tuberculosis Control Branch, 2021 TB Snapshot. California Department of Public Health, Richmond, CA.
7. CDC. Basic TB Facts. <https://www.cdc.gov/tb/topic/basics/default.htm>. Published 3/20/2016. Accessed 12/6/2022.
8. National Tuberculosis Indicators Project (NTIP) Division of Tuberculosis Elimination National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention Centers for Disease Control and Prevention, Atlanta, Georgia, USA 30329

## Technical Notes

### Population Data

Population data used to calculate incidence comes from the following sources:

- California Department of Finance. Demographic Research Unit. Report P-2D: Population Projections by Total Hispanic and Non-Hispanic Race, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. March 2021.
- State of California, Department of Finance, E-6. Population Estimates and Components of Change by County — July 1, 2010–2020, December 2020.
- State of California, Department of Finance, Revised County Population Estimates and Components of Change by County, July 1, 2000-2010. Sacramento, California, December 2011.
- U.S. Census Bureau. (2020). 2016–2020 American Community Survey 5-Year Estimates by ZCTA for Fresno County.

### Equations

$$Incidence = \frac{New\ Cases\ in\ Population\ at\ Specified\ Time}{Population\ at\ Risk} \times 100,000$$