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Authors

Chavez Perez, Sheila

Abudu, Blossom

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Tuberculosis in California: Comparative Analysis of Santa Clara, Alameda, and Merced Counties

Sheila Chavez Perez and Blossom Abudu

Introduction and County Overview

Tuberculosis (TB) remains a persistent communicable disease and an ongoing public health concern in California. Most notably in counties shaped by socioeconomic inequality, high housing costs, and diverse immigrant populations. Although TB is preventable and treatable, transmission and poor outcomes continue to occur disproportionately among vulnerable populations, including low-income communities, racial and ethnic minorities, foreign-born residents, and individuals experiencing housing instability. Structural factors such as crowded housing, limited healthcare access, language barriers, and occupational exposure play a significant role in shaping TB risk and outcomes across counties.

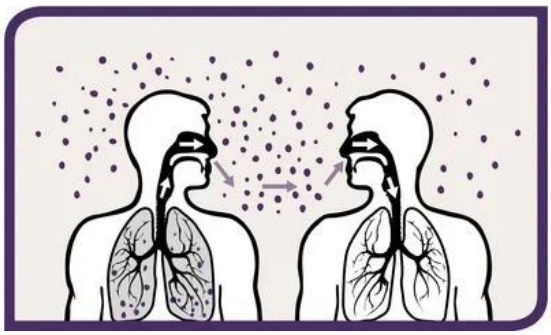


Figure 1.Illustration showing how tiny airborne droplets containing TB bacteria are inhaled into anotherperson's lungs.

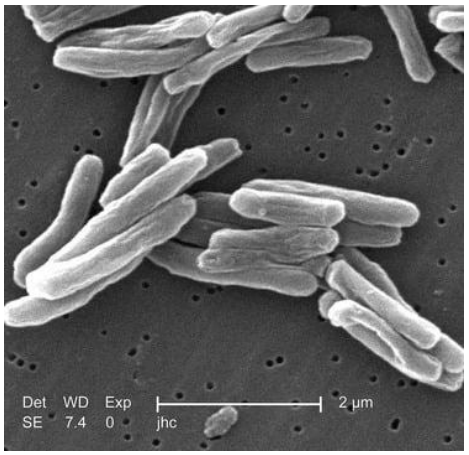


Figure 2. Mycobacterium tuberculosisisthebacterium that causes TB and primarily infects the lungs.

This report examines TB trends and disparities across Santa Clara, Alameda, and Merced Counties using secondary data sources and a key informant interview. These counties were selected for comparison because Santa Clara and Alameda are highly urbanized Bay Area counties with high housing costs and large immigrant populations, whereas Merced County is a Central Valley county with higher poverty

levels and a mixed rural–urban composition. Comparing these counties highlights how differing structural and demographic conditions influence TB burden and access to care.

County Identification and Geographic Context

Santa Clara County (Northern California) is the core of Silicon Valley and had an estimated population of 1,926,325 (2022). Merced County (Central Valley/San Joaquin Valley) had an estimated population of 296,774 (2024) and spans 1,938 square miles, with 76.5% of residents living in urban areas and 23.5% in rural areas (U.S. Census Bureau, 2024; UCLA Center for Health Policy Research, 2023). Alameda County (East Bay, Northern California) had an estimated population of 1,628,997 in 2022. At the time of the data being collected, residents lived in densely populated, largely urban/suburban spreads (U.S. Census Bureau, 2022). Santa Clara County and Alameda County are predominantly urban and suburban counties in Northern California, whereas Merced County is in the Central Valley and includes both urban and rural communities.

Demographic and Social Determinants of Health Profile

Race/ethnicity (percentages for comparisons): Santa Clara County's population is approximately 47.9% White and 37.8% Asian, with 26.3% identifying as Latino/Hispanic; other single races comprise about 6% (UCLA Center for Health Policy Research, 2023). Merced County is majority Latino (62.5%), with White residents at 25.1% and other racial/ethnic groups (including Asian communities) at around 6.4% (UCLA Center for Health Policy Research, 2023). Alameda County is highly diverse, with approximately 32% Asian, 28% White, 23% Latino, and

10% Black/African American (U.S. Census Bureau, 2022; UCLA Center for Health Policy Research, 2023). Together, these demographic and socioeconomic differences illustrate how education, income, occupation, and housing conditions may contribute to unequal TB risk and health outcomes across counties (see Figure 1).

Education

Santa Clara shows high educational attainment (89% high school completion; ~82% some college or higher), while Alameda reports nearly half of adults with a bachelor's degree or higher (County Health Rankings & Roadmaps, 2023). Merced reports lower attainment (15.7% bachelor's degree or higher; 29.6% high school diploma/equivalent) (U.S. Census Bureau, 2024).

Income/poverty

Santa Clara has both high incomes and high costs- 14.3% below 100% of the federal poverty level and a median gross rent of $2,985/month (U.S. Census Bureau, 2023). Merced's median household income is $64,980, with 18.7% poverty overall and 25.2% child poverty; median gross rent is $1,462/month (U.S. Census Bureau, 2024). Alameda has a high median income overall, but ~9% of residents live below the poverty line, with median gross rent exceeding $2,300/month (U.S. Census Bureau, 2022).

Occupation/industry

Santa Clara is dominated by professional, scientific, and technical work tied to the technology sector, while Merced employment is led by educational services/healthcare/social assistance

(26.4%), agriculture (12.2%), and retail trade (9.5). Alameda's workforce is concentrated in professional/technical services, healthcare/social assistance, and production-related sectors (Employment Development Department, 2023).

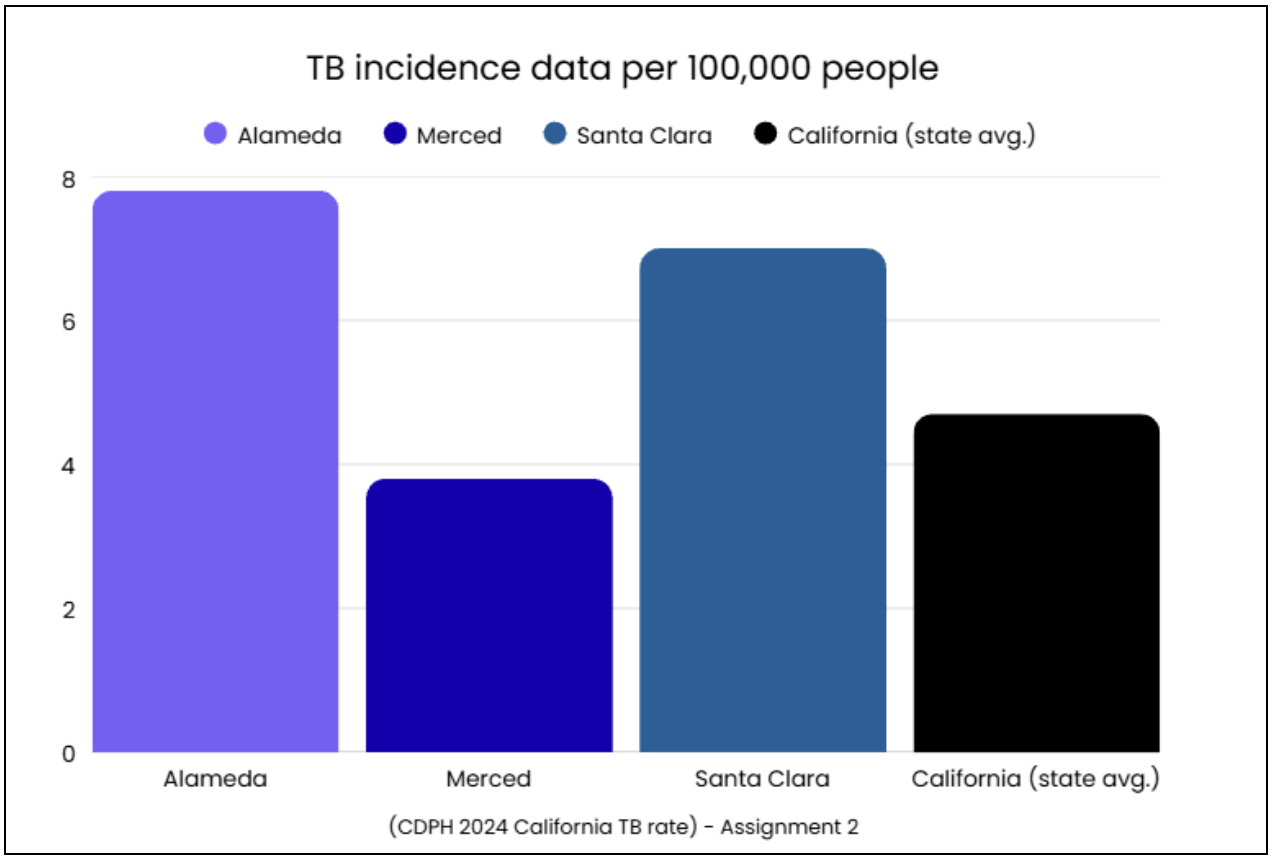


Figure 3. Compares racial/ethnic composition, educational attainment, and poverty indicators across counties to illustrate how structural conditions may shape TB risk and outcomes.

Health Issue and Importance: Presentation of Secondary Data

TB is an infectious airborne disease caused by Mycobacterium tuberculosis. It spreads through prolonged exposure to respiratory droplets and most often affects the lungs. While TB is preventable and curable, it remains a public health concern due to ongoing transmission and inequities in diagnosis, linkage to care, treatment completion (especially among foreign-born residents), among people experiencing crowded living conditions, and individuals with limited healthcare access (California Department of Public Health [CDPH], 2025).

Comparative Analysis of Secondary Data

TB incidence differs across the three counties. In 2024, Alameda County reported the highest TB incidence (7.8 per 100,000), followed closely by Santa Clara (7.4 per 100,000), while Merced reported a lower rate (3.8 per 100,000) (CDPH, 2025). These differences suggest that the two Bay Area counties have a higher TB burden than Merced, despite Merced's notable socioeconomic barriers to access to prevention and care.

Trends over time

Over 2015–2024, Alameda shows a peak–dip–rebound pattern: 9.2 per 100,000 (2015), rising to 10.0 (2018), dropping to 6.3 (2020), and increasing again to 7.8 (2024) (CDPH, 2025).

Santa Clara demonstrates an overall decline from 10.3 (2015) to 7.4 (2024), despite a temporary increase to 8.8 (2023) (CDPH, 2025). Merced shows an early decline followed by a stable low plateau, falling from 7.1 (2015) to 2.6 (2017) and then fluctuating within a narrower range (e.g., 3.2–4.0) through 3.8 (2024) (CDPH, 2025). Together, these trends indicate that county TB patterns are not uniform over time, reinforcing the need for county-tailored strategies. While Merced's rate (3.8 per 100,000) is lower than those of Santa Clara and Alameda, the sustained higher rates in Santa Clara and Alameda reflect California's continued concentration of TB in large, diverse, urban counties (CDPH, 2025). Mortality patterns align with incidence: in 2022, Alameda reported 6 TB deaths and Santa Clara 4, while Merced reported no documented TB deaths, likely due to smaller population size and lower case burden (CDPH, 2022).

Health Disparities

Alameda County (race/ethnicity + nativity disparity): TB burden is concentrated among Asian and foreign-born populations. In 2024, 61.9% of Alameda TB cases occurred among Asian residents, and TB incidence among foreign-born residents averaged 20.2 per 100,000, about 26× higher than U.S.-born residents (<1 per 100,000) (Alameda County Public Health Department, 2024). Santa Clara County (nativity disparity): Santa Clara's TB burden is disproportionately concentrated among non–U.S.-born residents, consistent with the county's large immigrant

population and elevated Latent Tuberculosis Infection prevalence. County reporting indicates that a majority of TB cases occur among non–U.S.-born residents, highlighting a disparity tied to nativity and related barriers (e.g., language access, healthcare navigation, and delayed care) (County of Santa Clara Public Health Department, 2025). Merced County (income/access disparity): In Merced County, TB risk and care barriers disproportionately affect individuals with limited access to healthcare. Merced has a higher uninsured rate (9% under age 65) compared with Santa Clara (4%) and Alameda (4%) (County Health Rankings & Roadmaps, 2025).

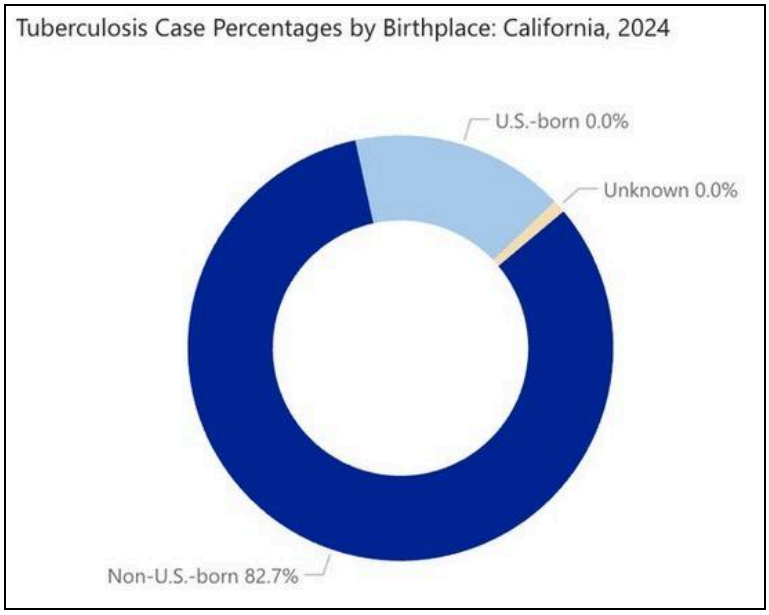


Figure 4.Compares case percentages by birthplace to demonstrate how birthplace may influence tuberculosis risk and outcomes.

Key Informant Interview

April Brewer, Merced County Public Health Department, Supervising Public Health Nurse (supervises TB program and other nursing programs; leads state reporting) (Brewer, 2025).

Major Takeaways

Brewer emphasized that effective TB prevention requires treating both active TB and LTBI. She noted that continuity of care is challenging for mobile and economically vulnerable populations. She explained that "people who are uninsured or underinsured face major barriers," and that "many of our local cases are among migrant farm workers… who travel between Merced and Oaxaca, Mexico." Brewer also highlighted stigma, contact-tracing barriers, and noted the high cost of rifapentine (Priftin), which can complicate treatment completion (Brewer, 2025).

Alignment With Secondary Data

The interview supports the secondary data: Merced's higher uninsured rate (9% under 65) and weaker provider access (primary care physician ratio 2,390:1) compared with Santa Clara (930:1) and Alameda (890:1) indicate structural barriers that can delay TB care and disrupt follow-up (County Health Rankings & Roadmaps, 2025). Brewer's focus on uninsured/underinsured barriers and mobile farmworker populations provides a clear qualitative

explanation for how TB disparities can remain substantial in Merced even when the overall county incidence is lower than Bay Area counties (CDPH, 2025; Brewer, 2025).

Forces of Change

Merced: Social/environmental trend, migrant farmworker mobility, and crowded living conditions support mobile/community-based TB/LTBI outreach and continuity-of-care supports. This strategy is supported by evidence from the Community Guide and has been identified as an effective, evidence-based approach for reducing TB transmission and improving treatment completion.

Santa Clara: Social/scientific factor- large non–U.S.-born population and LTBI reservoir supports LTBI prevention and culturally responsive linkage-to-care (including CHW-enabled outreach). This strategy is supported by evidence from the Community Guide and has been identified as an effective, evidence-based approach for reducing TB transmission and improving

treatment completion.

Alameda: Political/economic event, Measure W and significant homelessness/housing funding support integrating TB screening and follow-up into homelessness response systems and low-barrier mobile services. This strategy is supported by evidence from the Community Guide and has been identified as an effective, evidence-based approach for reducing TB transmission and improving treatment completion.

This strategy demonstrates a strong fit with the community, given its geographic context, population demographics, and cultural appropriateness. It aligns with the county's high proportion of foreign-born residents, mobile populations, and individuals experiencing housing instability, and was also supported by insights from the key informant interview.

Goal Statements and Key Partners

The goal of this strategy is to reduce TB incidence among high-risk adults aged 18 and older by improving early detection, linkage to care, and treatment completion through targeted, community- based interventions.

Santa Clara County

Goal: Reduce TB incidence among high-risk adults (18+) by expanding CHW-supported TB/LTBI outreach in shelters/encampments and correctional settings, reducing incidence from 7.4 per 100,000 (2024) toward ≤6.5 per 100,000 by 2028 (CDPH, 2025; County of Santa Clara

Public Health Department, 2025). Partner: County of Santa Clara Public Health Department (SCCPHD), coordination of TB surveillance, outreach integration, and linkage-to-care (County of Santa Clara Public Health Department, 2025).

Merced County

Goal: Improve TB control among high-risk adults (18+), especially uninsured/underinsured and mobile agricultural workers, reducing incidence from 3.8 per 100,000 (2024) toward ≤3.0 per 100,000 by 2028 and improving LTBI treatment completion (CDPH, 2025; Brewer, 2025). Partner: Merced County Public Health Department, TB/LTBI case management, culturally adapted education, provider training, and follow-up systems (Brewer, 2025).

Alameda County

Goal: Reduce TB transmission and late diagnosis among high-risk adults (18+), reducing incidence from 7.8 per 100,000 (2024) toward ≤7.0 per 100,000 by 2028 through mobile screening and follow-up in high-burden areas (CDPH, 2025; Alameda County Public Health Department, 2024). Partner: Alameda County Public Health Department (ACPHD) TB Control Program, mobile/community partnerships, multilingual outreach, linkage-to-care, and adherence supports (Alameda County Public Health Department, 2024).

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