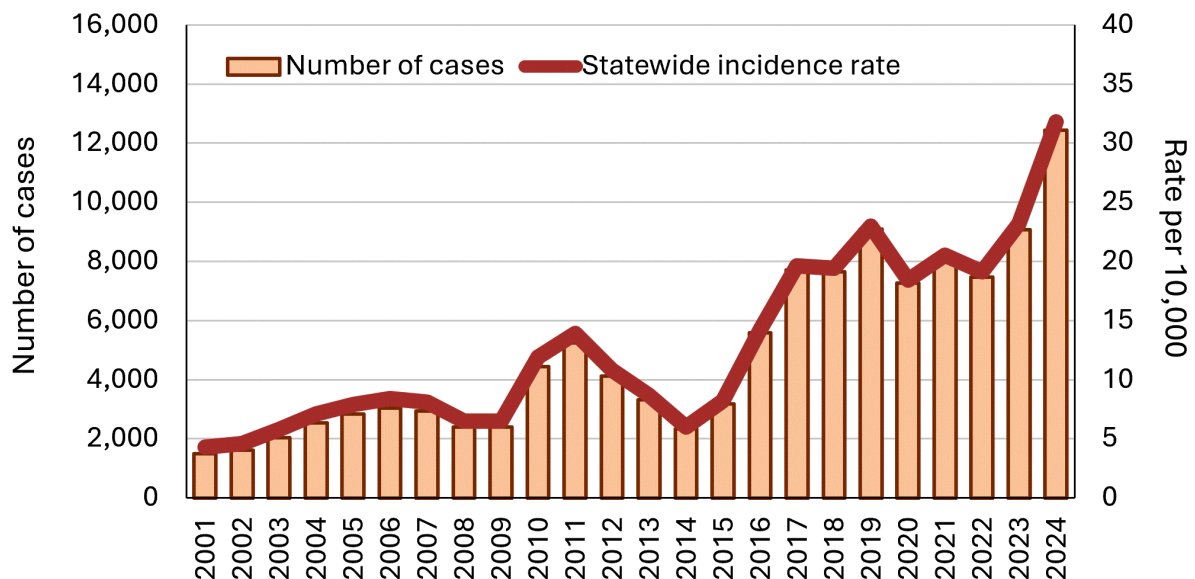


5.4 Valley Fever

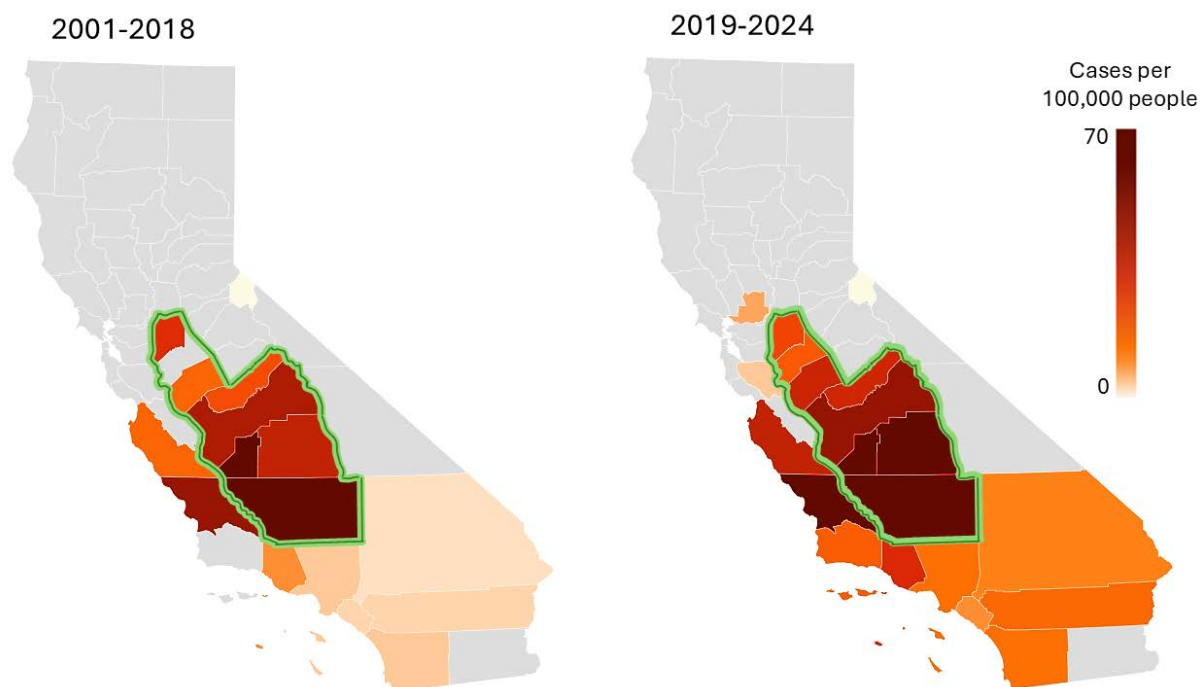
The incidence of *Coccidioidomycosis*, commonly known as Valley fever, has increased over the past 20 years. Valley fever is caused by inhaling spores of the *Coccidioides* fungus that is endemic to the soil in parts of southwestern United States. Approximately 97% of Valley fever cases in the United States are reported in California and Arizona. The fungus usually infects the lungs, causing respiratory symptoms. Pets and other animals can also be infected. Valley fever is impacted by climatic changes and is an increasing public health burden.

Figure 5.4.1. Valley Fever Annual Number of Cases and Incidence Rates (2001-2024).



Source: [CDPH Valley Fever Dashboard](#) (2026)



Figure 5.4.2. Valley Fever Incidence Rates by County.

The figure above shows average historical (2001-2018) and recent (2019-2024) incidence rates (cases per 100,000 people) by county in California. Counties in the historically endemic Central Valley are outlined by the green border. Darker colors indicate higher rates. Grey areas represent counties where there are too few cases to calculate reliable rates.

Source: CDPH Valley Fever Dashboard (2026)

What does the indicator show?

The number of Valley fever cases in California has greatly increased in recent years. As shown in [Figure 5.4.1](#), the annual incidence of reported cases of Valley fever has increased fivefold from 2001 (with a rate of 4.3 cases per 100,000 people) to 2024 (rate of 31.8 cases per 100,000 people). Notably, Valley fever cases tripled from 2014–2018, and from 2018–2022, between 7,000 and 9,000 cases were reported each year. In 2024, the number of new cases reported was the highest on record.

The geographic range of Valley fever appears to be expanding. Valley fever is named after the Central Valley, where most cases have been consistently reported. Kern County reported the highest number of new cases in 2023, with 3,012 cases. However,



over the last decade, increasing cases have been detected in surrounding counties, such as Monterey and San Joaquin (**Figure 5.4.2**; Sondermeyer Cooksey et al., 2020) and even more northerly locations like Washington state (Johnson et al., 2014).

A regional analysis of surveillance data from 2000 to 2018 suggested that, despite the consistently high rates of Valley fever in the Southern San Joaquin Valley, the largest increases in incidence have occurred outside of that region, primarily in Northern San Joaquin Valley, Central Coast, and Southern Coast regions (Sondermeyer Cooksey et al., 2020). From 2020 to 2024, the largest increases were seen in the northern San Joaquin Valley (253% increase, Merced, San Benito, San Joaquin, Stanislaus counties) and the Central Coast (107% increase, Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura counties).

Why is this indicator important?

Each year in California, around 80 deaths and over 1,000 hospitalizations are attributed to Valley fever. Valley fever can develop into a potentially debilitating disease. Inhaling only a few spores of the fungus may lead to infection, so even limited exposure, such as passing through dusty environments in the endemic regions, could result in infection. Although antifungal medications are available for treatment when it is clinically indicated, no vaccine currently exists (CDPH, 2015). Most people recover fully from Valley fever, experiencing only mild symptoms, but up to 10% exhibit more serious health consequences including severe respiratory disease and disseminated disease outside the lungs (Ampel et al., 2010; CDPH, 2015). Symptoms of disseminated disease include skin lesions, bone or joint pain, and severe headaches.

The financial burden is significant. From 2000 to 2011, reported Valley fever hospitalizations in California cost a total of \$2.2 billion in charges, with a median hospital stay of six days at \$6,800 per day (Sondermeyer et al., 2013). Lifetime costs in 2017 from Valley fever in California were estimated to be \$94,000 per hospitalized person – with \$58,000 in direct costs (including diagnosis, treatment, and follow-up) and \$36,000 in indirect costs (including productivity losses) – totaling \$700 million for the state (Wilson et al., 2019). In a 2025 interview, Dr. Manish Butte, of the Allergy and Immunology Department from the UCLA School of Medicine, estimated that California



spent around \$1 billion a year taking care of patients with Valley fever and disseminated disease (UCLA Health, 2025). The true impact of Valley fever on the economy and health is likely underestimated, as mild cases (which manifest as a mild self-limited respiratory illness or pneumonia) are less likely to be diagnosed and reported but can result in missed work and reduced productivity (Thompson et al., 2015).

Valley fever disproportionately affects historically marginalized communities in California, particularly outdoor workers and those who live or work in the San Joaquin Valley. Regions with relatively high rates of Valley fever cases, like the San Joaquin Valley and Central Coast, are home to large populations of low-income agricultural and construction workers, many of whom are Hispanic, immigrants, or undocumented. Farmworkers often lack adequate health insurance, paid sick leave, and legal protections (Rios, 2018; PPIC, 2022). Additionally, outbreaks have also arisen in endemic areas in prisons, and legal action has been taken against the state for failing to protect vulnerable incarcerated individuals—particularly Black and older adults—who are more susceptible to serious complications from the disease (Wheeler et al., 2015).

Understanding the dynamics among climatic, ecological niche, lifestyle, and demographic factors could help improve early detection and diagnosis of disease (Pearson et al., 2019). Tracking the incidence and geographic distribution of Valley fever provides valuable information to inform public health decisions, particularly given projected changes in climate-related factors. Since there is no commercially available test to determine whether the fungus is growing in an area's soil, the current understanding of the geographic risk for infection is largely based on human surveillance data.

What factors influence this indicator?

The rise in and geographic expansion of Valley fever cases is likely due to a combination of climatic, environmental, and human-related factors that impact *Coccidioides*. Climate-related phenomena such as drought, dust storms, aridity, and wildfires can affect the spread of and eventual infection with Valley fever (Pearson et al., 2019) and are projected to increase in frequency and severity with climate change



(Abatzoglou and Williams, 2016; Cook et al., 2015; Prein et al., 2016; Seager et al., 2007; Tong et al., 2017).

Drought

Valley fever cases are initially suppressed during droughts and then spike in the following years (Head et al., 2022). Limited winter precipitation suppresses fungal proliferation in the soil. However, droughts may allow heat-resistant *Coccidioides* spores to outlast their less-hardy competitors. When rain returns, the fungus can proliferate in the soil with less competition for moisture and nutrients (Coates and Fox, 2018; Fisher et al., 2000; Kirkland and Fierer, 1996; Zender et al., 2006). When dry, hot conditions follow, the fungus is released into air when soil is disturbed (Gorris et al., 2018; Johnson et al., 2014; Lewis et al., 2015).

Aridity

Valley fever incidence is greater in warm, dry areas (Gorris et al., 2018), such as Antelope Valley, a desert in southern California where the fungal pathogen was detected in 40% of soil samples (Colson et al., 2017).

Dust Storms

Increased winds linked to global climate change (Tong et al., 2017) could also drive Valley fever infections. Dust storms, particularly those attributed to Santa Ana winds in southern California during the fall, could help spread the spores to farther locations. Evidence shows that a dust storm in 1978 in the Central Valley carried the pathogen hundreds of miles, infecting individuals in Sacramento County, for example (Williams et al., 1979). Santa Ana winds and the ensuing dust storm after the 1994 Northridge earthquake have been linked to distributing *Coccidioides* spores to local communities, triggering a Valley fever outbreak in Simi Valley (Schneider et al., 1997). In Arizona, researchers found a moderate correlation ($r = 0.51$) between frequency of dust storms and Valley fever incidence in Maricopa County (Tong et al., 2017).

Wildfires

With the increasing risk of wildfires (see *Wildfires* chapter), researchers have begun investigating the potential influence of wildfires on Valley fever. The link between Valley fever and wildfires is not yet well understood. Anecdotal evidence and interviews with firefighters have provided insight into this relatively new area of research. Santa Ana



winds, which occur in the fall, coincide with Valley fever's seasonality and when fire danger is also highest, particularly in coastal Central and Southern California. The creation of fire lines by firefighters and post-wildfire cleanup and construction may disturb the soil and disperse *Coccidioides* spores through the air.

Valley fever incidences significantly increased in the San Joaquin Valley following three wildfires (2006 Midway Fire in San Joaquin, 2015 Park Hill Fire in San Luis Obispo, and 2011 Canyon Fire in Kern) where there were relatively large adjacent populations, high transmission before the fire, and a burn area exceeding 5,000 acres (Phillips et al., 2023). Valley fever outbreaks have also occurred among wildland firefighters, particularly among those involved in soil disruptive activities used to contain wildfires (Laws et al., 2021), in regions with historically high incidence of Valley fever, and among those who do not wear adequate respiratory protection (Donnelly et al., 2022).

Seasonality

Valley fever surveillance data in California are primarily based on reports from positive laboratory tests and assigned to the date when the test was conducted. While cases identified seem to peak between September and November, the end of California's dry season, it is important to note that the incubation period for Valley fever (i.e., time from infection to symptom onset) is typically 1-3 weeks and delays in diagnosis are common. Patients may not be tested for weeks after becoming sick, and with those delays, the peak seen in Valley fever cases in the fall is likely indicative that most people are infected in the summer and early fall months. As mentioned, drought temporarily dampens seasonal peaks but leads to spikes once rain returns (Head et al., 2022). With climate change experts predicting an earlier start to summer and a later beginning for fall/winter (Wang et al., 2021), there is the potential for an extension of Valley fever season, leaving residents and summer visitors in endemic areas more vulnerable to infection for more extended periods.

Sensitive populations

Certain groups are more likely to develop severe disease if infected, including pregnant women, adults over 65, immunocompromised individuals, and people who are Black or Filipino (CDPH, 2022; CDPH, 2026). Although most people develop immunity after a primary illness, Valley fever is complex and not fully understood. Even people who have



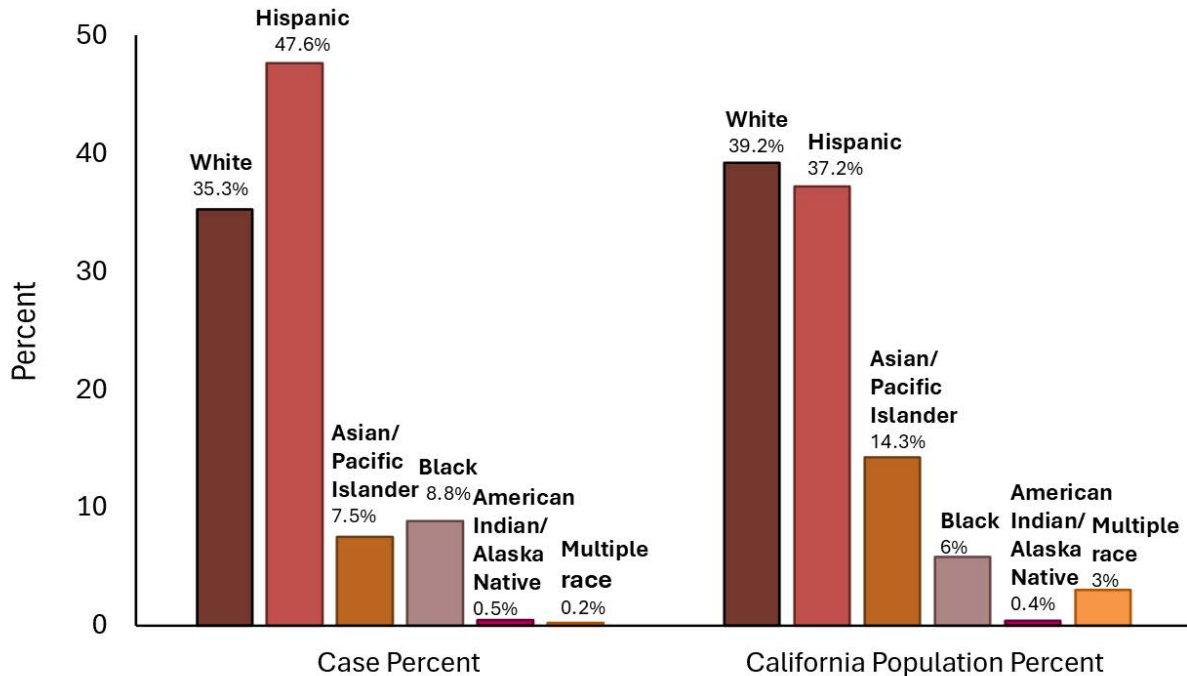
lived in highly endemic areas for years can develop diseases. Compromised immunity, due to age, comorbidities, or certain medications, can lead to reactivation of disease (i.e. developing symptoms again later) (CDPH, 2018).

Work or recreational activities that disturb the soil increase the chance of inhaling fungal spores. Outbreaks have most often been linked to jobs like construction, military service, firefighting, archaeology, and corrections – where high attack rates have been seen even among relatively young people. (“Attack rates” refers to the proportion of people in a population who experience an acute health event during a limited period, such as during an outbreak.)

Racial-ethnic disparities in Valley fever cases are not well understood and are likely due to a variety of factors, including occupation, genetics, underlying health conditions, and social determinants of health such as access to healthcare and socioeconomic status. To better evaluate the breakdown of racial/ethnic groups among Valley fever case-patients in California, **Figure 5.4.3** shows Valley fever cases and statewide population distributions by racial and ethnic groups. A high percentage of cases (35.4%) are reported without racial/ethnic information, so data from this graph should be interpreted with caution. The proportion of Valley fever cases that reported Black race/ethnicity (8.8%) was substantially higher than would be expected given that only 6% of the California population report Black race/ethnicity. Additionally, a higher proportion of Hispanics are reported among Valley fever cases. Hispanics make up 47.6% of reported Valley fever cases from 2001 to 2024 despite comprising only 37.2% of the total population. Cases of Valley Fever were more prevalent in Hispanic populations in San Joaquin Valley (Fresno, Kern, Kings, Madera, Tulare, Merced, San Benito, San Joaquin, and Stanislaus counties), and among Black populations across all regions in California (Sondermeyer Cooksey et al., 2020).



Figure 5.4.3. Coccidioidomycosis, Cases and Population by Race/Ethnicity, 2001-2024.



Source: CDPH Valley Fever Dashboard (2026)

Incarcerated individuals are also at higher risk for Valley fever. Outbreaks among incarcerated individuals imprisoned in endemic areas have been ongoing during the last twenty years. Prisons include a continual rotation of new inmates who may have no previous exposure to Valley fever. In one outbreak, exposure likely stemmed from fugitive dust from building construction near where prisoners were housed or engaging in outdoor physical activity; despite mitigation efforts, such as planting vegetation, high Valley fever attack rates continued (Wheeler et al., 2015). The prison population includes a disproportionate number of Black people (Lofstrom et al., 2020) – a group identified above as bearing a disproportionately poor outcome burden from Valley fever, as Black race/ethnicity is a risk factor for disseminated disease. In addition, many inmates engage in wildland firefighting (comprising approximately 30% of California’s firefighting workforce), which puts them at a greater risk of exposure.



Technical considerations

Data characteristics

The California Department of Public Health (CDPH) Infectious Diseases Branch maintains a statewide reporting system for Valley fever and other communicable diseases. From 2001 to 2018, confirmed cases required both clinical and laboratory evidence for reporting. Since 2019, laboratory confirmation alone has been sufficient. Data was from CDPH's [Valley Fever in California Year-end Data Dashboard](#). Data in this dashboard were quality checked with only the first report of Valley fever per person included.

Strengths and limitations of the data

The number of reported cases of Valley fever likely underestimates the true magnitude of the disease. Factors contributing to underreporting include ill people who do not seek health care, misdiagnoses, not ordering diagnostic tests, and limited reporting by clinicians and laboratories. Factors that may enhance disease reporting include increased exposure and disease severity, recent media or public attention, and active surveillance activities.

In addition, race/ethnicity information was missing or incomplete for 35.4% of all cases, so that incidence rates for race/ethnicity couldn't be calculated. Case data are assigned to the patient's county of residence, which may not reflect the location of exposure or diagnosis. Reporting delays and differences in data definitions over time may affect year-to-year comparisons.

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References

- Abatzoglou JT and Williams AP (2016). Impact of anthropogenic climate change on wildfire across western US forests. *Proceedings of the National Academy of Science* **113**(42): 11770-11775.
- Ampel NM (2010). What's behind the increasing rates of coccidioidomycosis in Arizona and California? *Current Infectious Disease Reports* **12**(3): 211–216.
- CDPH (2015). California Department of Public Health. *Guidance for Managing Select Communicable Diseases: Coccidioidomycosis (Valley Fever)*. Center for Infectious Diseases, Division of Communicable Disease Control, Infectious Diseases Branch. Fresno, CA.
- CDPH (2018). California Department of Public Health. *Guidance for Managing Select Communicable Diseases: Coccidioidomycosis*. Center for Infectious Diseases, Division of Communicable Disease Control, Infectious Diseases Branch.
- CDPH (2022). *Epidemiologic Summary of Valley fever (Coccidioidomycosis) in California, 2022*. Center for Infectious Diseases, California Department of Public Health.
- CDPH (2026). California Department of Public Health. [Valley Fever Dashboard](#). Retrieved July 2026.
- Coates SJ and Fox LP (2018). Disseminated coccidioidomycosis as a harbinger of climate change. *Journal of the American Academy of Dermatology Case Reports* **4**(5): 424-425.
- Colson AJ, Vredenburg L, Guevara RE, Rangel NP, Kloock CT, and Lauer A (2017). Large-Scale Land Development, Fugitive Dust, and Increased Coccidioidomycosis Incidence in the Antelope Valley of California, 1999-2014. *Mycopathologia* **182**(5-6):439-458.
- Cook BI, Ault TR, and Smerdon JE (2015). Unprecedented 21st century drought risk in the American southwest and central plains. *Science Advances* **1**(1): e1400082.
- Donnelly MA, Maffei D, Sondermeyer Cooksey GL, Ferguson TJ, Jain S, et al. (2022). Notes From the Field: Coccidioidomycosis Outbreak Among Wildland Firefighters — California, 2021. *MMWR Morbidity and Mortality Weekly Report* **71**(34): 1095–1096.
- Fisher MC, Koenig GL, White TJ, and Taylor JW (2000). Pathogenic clones versus environmentally driven population increase: analysis of an epidemic of the human fungal pathogen *Coccidioides immitis*. *Journal of Clinical Microbiology* **38**(2): 807–813.
- Gorris ME, Cat LA, Zender CS, Treseder KK and Randerson JT (2018). Coccidioidomycosis dynamics in relation to climate in the southwestern United States. *Geohealth* **2**(1): 6-24.
- Head JR, Sondermeyer Cooksey GL, Heaney AK, Alexander TY, Jones I, et al. (2022). Effects of precipitation, heat, and drought on incidence and expansion of coccidioidomycosis in western USA: a longitudinal surveillance study. *The Lancet Planetary Health* **6**(10):e793-803.
- Johnson L, Gaab EM, Sanchez J, Bui PQ, Nobile CJ, et al. (2014). Valley fever: danger lurking in a dust cloud. *Microbes and Infections* **16**(8): 591–600.
- Kirkland TN and Fierer J (1996). Coccidioidomycosis: a reemerging infectious disease. *Emerging Infectious Diseases* **2**(3):192–199.



- Laws RL, Jain S, Sondermeyer Cooksey GL, Mohle-Boetani J, McNary J, et al. (2021). Coccidioidomycosis outbreak among inmate wildland firefighters: California. *American Journal of Industrial Medicine* **64**: 266- 273.
- Lewis ER, Bowers JR, and Barker BM (2015). Dust devil: the life and times of the fungus that causes valley fever. *PLoS Pathogens* **11**(5): e1004762.
- Lofstrom M, Martin B, and Raphael S (2020). *Proposition 47's Impact on Racial Disparity in Criminal Justice Outcomes*. Public Policy Institute of California. San Francisco, CA.
- Pearson D, Ebisu K, Wu X, and Basu R (2019). A review of coccidioidomycosis in California: exploring the intersection of land use, population movement, and climate change. *Epidemiologic Reviews* **41**(1): 145-157.
- Phillips S, Jones I, Sondermeyer Cooksey GL, Alexander TY, Heaney AK, et al. (2023). Association between wildfires and coccidioidomycosis incidence in California, 2000–2018: a synthetic control analysis. *Environmental Epidemiology* **7**(4): e254.
- PPIC (2022). [Policy Brief: Health Care Access among California's Farmworkers](#). Public Policy Institute of California. San Francisco, CA. Retrieved August 2026.
- Prein AF, Holland GJ, Rasmussen RM, Clark MP, and Tye MR (2016). Running dry: the U.S. Southwest's drift into a drier climate state. *Geophysical Research Letters*. **43**(3): 1272–1279.
- Rios SM (2018). Valley Fever: Environmental Racism and Health Justice. Doctoral dissertation. University of California, Santa Barbara.
- Schneider E, Hajjeh RA, Spiegel RA, Jibson RW, Harp EL, et al. (1997). A coccidioidomycosis outbreak following the Northridge, Calif, earthquake. *JAMA* **277**(11): 904–908.
- Seager R, Ting M, Held I, Kushnir Y, Lu J, et al. (2007). Model projections of an imminent transition to a more arid climate in southwestern North America. *Science* **316**(5828): 1181–1184.
- Sondermeyer Cooksey GL, Nguyen A, Vugia D, and Jain S (2020). Regional Analysis of Coccidioidomycosis Incidence — California, 2000–2018. *Morbidity and Mortality Weekly Report* **69**: 1817–1821.
- Sondermeyer GL, Lee L, Gilliss D, Tabnak F, and Vugia D (2013). Coccidioidomycosis-associated hospitalizations, California, USA, 2000–2011. *Emerging Infectious Diseases* **19**(10): 1590.
- Thompson GR 3rd, Stevens DA, Clemons KV, Fierer J, Johnson RH, et al. (2015). Call for a California coccidioidomycosis consortium to face the top ten challenges posed by a recalcitrant regional disease. *Mycopathologia* **179**(1-2): 1–9.
- Tong DQ, Wang JXL, Gill TE, Lei H, and Wang B (2017). Intensified dust storm activity and valley fever infection in the southwestern United States. *Geophysical Research Letters* **44**(9): 4304–4312.
- UCLA Health (2025). Valley Fever cases climbing statewide. University of California, Los Angeles Health.
- Wang J, Guan Y, Wu L, Guan X, Cai W, et al. (2021). Changing lengths of the four seasons by global warming. *Geophysical Research Letters* **48**: e2020GL091753.
- Wheeler C, Lucas KD, and Mohle-Boetani JC (2015). Rates and Risk Factors for Coccidioidomycosis among Prison Inmates, California, USA, 2011. *Emerging Infectious Diseases* **21**(1): 70-75.



Williams PL, Sable DL, Mendez P, and Smyth LT (1979). Symptomatic coccidioidomycosis following a severe natural dust storm. An outbreak at the Naval Air Station, Lemoore, California. *Chest* **76**(5): 566–570.

Wilson L, Ting J, Lin H, Shah R, MacLean M, et al. (2019). The Rise of Valley Fever: Prevalence and Cost Burden of Coccidioidomycosis Infection in California. *International Journal of Environmental Research and Public Health* **16**(7): 1113.

Zender CS and Talamantes J (2006). Climate controls on valley fever incidence in Kern County, California. *International Journal of Biometeorology* **50**(3): 174–182.

