

# EPIDEMIOLOGIC SUMMARY OF VALLEY FEVER (COCCIDIOIDOMYCOSIS) IN CALIFORNIA, 2022

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An accessible Excel data file of the  
[2022 Epidemiologic Summary of Valley Fever \(Coccidioidomycosis\) in California](#)  
is available for download

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# Epidemiologic Summary of Valley Fever (Coccidioidomycosis) in California, 2022



## Key Findings

Valley fever (also known as coccidioidomycosis or “cocci”) is a disease caused by a fungus that grows in the soil and dirt in some areas of California and the southwestern United States. People and animals can get sick when they breathe in dust that contains the Valley fever fungus. Valley fever can be serious and even fatal. Each year in California, there are around 80 deaths from Valley fever and more than 1,000 people are hospitalized with it.

### Valley Fever in California in 2022

**Total Cases:** A total of 7,451 new Valley fever cases were reported in 2022.

**Rate:** The rate of Valley fever in 2022 was about 19 cases per 100,000 people.

- **By County:** The number of new Valley fever cases was highest in Kern County, with a total of 2,407 cases (about 265 cases per 100,000 people). Counties with the next highest rates of Valley fever included Kings, Tulare, San Luis Obispo, Fresno, Madera, and Ventura. Overall, most cases of Valley fever in California are reported in people who live in the Central Valley and Central Coast regions, which include the counties listed above.
- **By Sex:** Similar to previous years, the rate of Valley fever in 2022 was higher in males (about 22 cases per 100,000 males) than in females (about 17 cases per 100,000 females).
- **By Age Group:** In 2022, the rates of Valley fever were highest in people aged 55-64 years (about 31 cases per 100,000 people), 65-74 years (about 30 cases per 100,000 people), and 75-84 years (about 29 cases per 100,000 people) than in any other age group. The lowest rates of Valley fever were reported in children.
- **By Race/Ethnicity:** For cases where race and ethnicity information were available, there was a higher percentage of Valley fever cases in people who reported Hispanic/Latino ethnicity (47%) and Black, non-Hispanic race (8%) than would be expected compared to the percentage of those groups living in California.

To decrease the risk of Valley fever, people who live, work, or travel in areas where Valley fever has been reported should avoid spending time outside in dusty areas as much as possible. Avoiding outdoor dust can help reduce the risk of breathing in the Valley fever fungus from dust in the air. On windy and dusty days, people should stay inside and keep windows and doors closed, especially if they live in the Central Valley or Central Coast of California where Valley fever is more common.

For more information about Valley fever, please visit [www.CouldBeValleyFever.org](http://www.CouldBeValleyFever.org). For additional data on Valley fever, please visit the [CDPH Valley Fever Data and Publications webpage](#).

## Background

Coccidioidomycosis (also known as Valley fever) results from inhaling spores of the dimorphic fungus *Coccidioides* spp. (*Coccidioides immitis* and *Coccidioides posadasii*) from soil or airborne dust in areas where this fungus grows. Coccidioidomycosis is not transmitted directly from person to person. The fungus *Coccidioides* spp. grows throughout much of the southwestern United States, and, in California, most cases of Valley fever are reported among people residing in counties of the southern Central Valley and Central Coast.

Following an incubation period of 1 to 3 weeks, clinical manifestations occur in 40 percent of persons infected with coccidioidomycosis and range from a relatively mild illness with symptoms such as cough, fever, or difficulty breathing, to severe pneumonia, and rarely, disseminated disease.

Disseminated infection, which can be fatal, most commonly involves skin and soft tissues, bones, and the central nervous system. Persons at increased risk for severe disease include persons who are Black or Filipino, pregnant women, adults of older age groups, and people with weakened immune systems.<sup>1</sup>

This report describes the epidemiology of reported coccidioidomycosis in California in 2022 and present surveillance and demographic data for years 2016 through 2022. Because some persons with coccidioidomycosis experience chronic infection and may be reported more than once, only the first report of coccidioidomycosis per person was included using a probabilistic de-duplication method spanning multiple surveillance reporting years. For a complete discussion of the definitions, methods, and limitations associated with this report, please refer to the Technical Notes at the end of this report.

## California Reporting Requirements and Surveillance Case Definition

California Code of Regulations (CCR), Title 17, Section 2500 requires health care providers to report suspected cases of coccidioidomycosis to their local health department (LHD) within 7 days or immediately by telephone if an outbreak is suspected. Since 2010, CCR, Title 17, Section 2505 has also mandated laboratories to report to the local health jurisdiction.<sup>2</sup>

California regulations require local health officers to report cases of coccidioidomycosis to the California Department of Public Health (CDPH). From 2016–2018, CDPH defined a confirmed coccidioidomycosis case per the Council of State and Territorial Epidemiologists (CSTE) as a person with clinically compatible illness and at least one of the following: culture, histopathologic, or molecular evidence of *Coccidioides* species; positive serologic test for coccidioidal antibodies in serum, cerebrospinal fluid, or other body fluids by detection of coccidioidal immunoglobulin M (IgM) by immunodiffusion, enzyme immunoassay (EIA), latex agglutination, or tube precipitin; detection of coccidioidal immunoglobulin G (IgG) by immunodiffusion, EIA, or complement fixation; or coccidioidal skin-test conversion from negative to positive after onset of clinical signs and symptoms. Clinically compatible illness includes one or more of the following: influenza-like signs and symptoms, pneumonia or other pulmonary lesion, erythema nodosum or multiforme rash, involvement of the bones, joints, or skin by dissemination, meningitis, or involvement of viscera or lymph nodes.<sup>3</sup> Since January 2019, confirmed cases need only laboratory evidence to be reported in California. As of January 2023, the CSTE coccidioidomycosis case definition was revised to require only laboratory evidence of coccidioidomycosis to confirm cases in residents of high-incidence jurisdictions, including California. As such, California's laboratory-only mechanism

of confirming reported coccidioidomycosis cases, starting in 2019, aligns with the CSTE coccidioidomycosis case definition as revised in 2023. Cases included in this report were confirmed by LHDs by either meeting the clinical and laboratory criteria of the CSTE case definition or just the laboratory criteria if clinical confirmation was not feasible; CDPH accepts all cases confirmed by LHDs.

## Epidemiology of Coccidioidomycosis in California

Incidence of coccidioidomycosis in 2022 was 19.1 per 100,000 population (7,451 case-patients). The incidence is a decrease by 6.8% percent from 2021 and a 16.6% decrease from 2019 when case rate was the highest (23.0 per 100,000 population; 9,095 cases). For most years prior to 2020, monthly case counts were lowest at the beginning of the year and gradually increased to peak in October or November. However, in 2020 from March to April, monthly case counts decreased by 28.4 percent. In 2021 and 2022, monthly case counts were fairly consistent throughout the year (Table 2).

In 2022, incidence among males was 21.5 per 100,000 population (4,164 case-patients) and was higher than incidence among females of 16.7 per 100,000 (3,279 case-patients) (Table 3). By age group, incidence was highest among people aged 55-64 years (30.7 per 100,000 population; 1,437 case-patients), 65-74 years (29.5 per 100,000 population; 1,122 case-patients), and 75-84 years (29.3 per 100,000 population; 585 case-patients) (Table 4 and Figure 2). Among children ages 17 years and younger, incidence was 4.2 per 100,000 population (381 case-patients).

Statewide in 2022, the incidence was highest in Kern County (264.9 per 100,000; 2,407 case-patients), followed by Kings County (111.0 per 100,000; 168 case-patients). Other counties with high incidence included Tulare (65.7 per 100,000; 312 case-patients), San Luis Obispo (51.5 per 100,000; 144 case-patients), Fresno (44.3 per 100,000; 448 case-patients), Madera (32.4 per 100,000; 51 case-patients), and Ventura (28.3 per 100,000; 235 case-patients) (Table 1 and Figure 3). Approximately 50.5 percent of all California case-patients in 2022 resided in these counties at the time of illness onset.

Incidence by race/ethnicity was not calculated due to missing race/ethnicity data for 35% of reported cases in 2016 through 2022. However, for cases with complete race/ethnicity data, a higher percentage of cases reported Hispanic ethnicity (46.9%) and Black non-Hispanic race (7.7%) than would be expected based on the overall demographic profile of California (39.5% Hispanic, 5.7% Black non-Hispanic) (Table 5 and Figure 4).

## Comments

Since 2019, the number and incidence of new Valley fever cases have decreased yet remained above 7,000 cases per year, which is substantially higher than annual historic case counts. In 2020, case counts began to decrease in April, which coincided with the beginning of the COVID-19 pandemic in California. Counts in 2021 slightly increased from 2020 and decreased again in 2022. Some additional cases for 2022 may be reported after this summary report due to delays in diagnosis and reporting; future coccidioidomycosis summary reports will have updated case numbers and incidence.

Age group, race/ethnicity, gender, and county epidemiologic profiles of incident cases with estimated illness onset dates in 2022 are similar to those reported in coccidioidomycosis

epidemiologic summaries from earlier years as described previously.<sup>4</sup> Rate ratios comparing males to females each year, however, have been slightly decreasing over time from a rate ratio of 1.7 in 2016 down to 1.3 in 2022. In addition, the age groups with the highest rates have become slightly older, shifting from 45-54 and 55-64-year-old residents having the highest rates in 2016–2018, to 55-64, 65-74, or 75-84-year-old residents having the highest rates in more recent years including 2022. These minor changes in the demographics of coccidioidomycosis case-patients in California may be partially due to shifting patterns in where *Coccidioides* grows and flourishes in the state as well as changes to the demographics of people living, working, and traveling in parts of California.

The causes of the increase of coccidioidomycosis in recent years are not well understood but contributing factors may include climatic and environmental factors favorable to *Coccidioides* proliferation and airborne release, increase in endemic areas of susceptible residents, and increase in disease recognition, testing, and reporting.

Coccidioidomycosis is most commonly reported among residents of the counties of the southern Central Valley and Central Coast of California and remains an important public health problem in the state. There is currently no vaccine to prevent coccidioidomycosis, but antifungal medications are available for treatment, particularly for severe disease. To decrease the risk of infection, persons living, working, or traveling in areas where coccidioidomycosis is common, especially those at increased risk for disseminated disease, should limit their exposure to outdoor dust as much as possible, including by staying inside and keeping windows and doors closed when it is windy and the air is dusty. Employers should inform outdoor workers about symptoms of coccidioidomycosis and take steps to limit workers' exposure to dust, such as watering down the soil before digging. It is important that health care providers be alert for coccidioidomycosis among patients who live in or have traveled to areas where the *Coccidioides* fungus may be present, especially those who work or participated in activities where soil is disturbed.<sup>1, 5</sup>

For more information on coccidioidomycosis, including education materials and data from previous years, please visit the [CDPH Coccidioidomycosis webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx>).

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# Coccidioidomycosis

Table 1. Coccidioidomycosis, Cases and Rates by Health Jurisdiction, California, 2016-2022

| JURISDICTION                    | YEAR OF ESTIMATED ILLNESS ONSET |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                 | 2016                            |       | 2017  |       | 2018  |       | 2019  |       | 2020  |       | 2021  |       | 2022  |       |
|                                 | CASES                           | RATE  | CASES | RATE  | CASES | RATE  | CASES | RATE  | CASES | RATE  | CASES | RATE  | CASES | RATE  |
| <b>CALIFORNIA TOTAL</b>         | 5,574                           | 14.2  | 7,713 | 19.6  | 7,641 | 19.4  | 9,095 | 23.0  | 7,267 | 18.4  | 8,047 | 20.5  | 7,451 | 19.1  |
| <b>ALAMEDA COUNTY TOTAL</b>     | 48                              | 2.9   | 66    | 4.0   | 76    | 4.6   | 97    | 5.8   | 68    | 4.1   | 99    | 6.0   | 79    | 4.8   |
| ALAMEDA                         | 48                              | 3.2   | 66    | 4.3   | 75    | 4.9   | 96    | 6.2   | 67    | 4.3   | 98    | 6.4   | 76    | 5.0   |
| BERKELEY                        | 0                               | -     | 0     | -     | 1     | 0.8*  | 1     | 0.8*  | 1     | 0.8*  | 1     | 0.8*  | 3     | 2.4*  |
| ALPINE                          | 0                               | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| AMADOR                          | 0                               | -     | 1     | 2.6*  | 7     | 17.5* | 5     | 12.4* | 7     | 17.3* | 3     | 7.5*  | 5     | 12.5* |
| BUTTE                           | 3                               | 1.3*  | 4     | 1.7*  | 1     | 0.4*  | 6     | 2.6*  | 11    | 5.2*  | 13    | 6.3*  | 2     | 1.0*  |
| CALAVERAS                       | 1                               | 2.2*  | 0     | -     | 1     | 2.2*  | 3     | 6.6*  | 8     | 17.7* | 1     | 2.2*  | 2     | 4.5*  |
| COLUSA                          | 1                               | 4.6*  | 0     | -     | 2     | 9.2*  | 3     | 13.8* | 1     | 4.6*  | 0     | -     | 1     | 4.6*  |
| CONTRA COSTA                    | 67                              | 5.9   | 89    | 7.7   | 109   | 9.4   | 134   | 11.5  | 145   | 12.4  | 135   | 11.6  | 87    | 7.6   |
| DEL NORTE                       | 1                               | 3.7*  | 1     | 3.7*  | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| EL DORADO                       | 2                               | 1.1*  | 5     | 2.7*  | 2     | 1.1*  | 5     | 2.7*  | 3     | 1.6*  | 3     | 1.6*  | 6     | 3.2*  |
| FRESNO                          | 614                             | 62.8  | 834   | 84.6  | 644   | 64.8  | 625   | 62.4  | 449   | 44.6  | 410   | 40.6  | 448   | 44.3  |
| GLENN                           | 0                               | -     | 2     | 7.1*  | 0     | -     | 2     | 7.0*  | 1     | 3.5*  | 3     | 10.4* | 2     | 7.0*  |
| HUMBOLDT                        | 0                               | -     | 2     | 1.5*  | 0     | -     | 2     | 1.5*  | 2     | 1.5*  | 2     | 1.5*  | 3     | 2.2*  |
| IMPERIAL                        | 11                              | 6.1*  | 15    | 8.3*  | 19    | 10.5  | 17    | 9.4*  | 5     | 2.8*  | 1     | 0.6*  | 20    | 11.2  |
| INYO                            | 0                               | -     | 0     | -     | 0     | -     | 0     | -     | 1     | 5.3*  | 3     | 15.9* | 1     | 5.3*  |
| KERN                            | 2,258                           | 256.4 | 2,793 | 314.5 | 2,951 | 329.5 | 3,385 | 374.8 | 2,631 | 290.6 | 2,819 | 310.4 | 2,407 | 264.9 |
| KINGS                           | 235                             | 159.2 | 273   | 183.3 | 173   | 114.5 | 220   | 145.0 | 157   | 103.2 | 168   | 110.9 | 168   | 111.0 |
| LAKE                            | 2                               | 3.0*  | 2     | 2.9*  | 1     | 1.5*  | 2     | 2.9*  | 2     | 3.0*  | 0     | -     | 0     | -     |
| LASSEN                          | 6                               | 18.6* | 0     | -     | 1     | 3.0*  | 0     | -     | 1     | 3.2*  | 0     | -     | 1     | 3.4*  |
| <b>LOS ANGELES COUNTY TOTAL</b> | 731                             | 7.2   | 934   | 9.2   | 1,013 | 10.0  | 1,154 | 11.5  | 1,081 | 10.8  | 1,450 | 14.6  | 1,536 | 15.7  |
| LOS ANGELES                     | 714                             | 7.5   | 906   | 9.5   | 996   | 10.4  | 1,093 | 11.5  | 1,023 | 10.7  | 1,378 | 14.7  | 1,461 | 15.8  |
| LONG BEACH                      | 15                              | 3.2*  | 19    | 4.0   | 12    | 2.5*  | 57    | 12.1  | 55    | 11.7  | 53    | 11.5  | 66    | 14.3  |
| PASADENA                        | 2                               | 1.4*  | 9     | 6.3*  | 5     | 3.5*  | 4     | 2.8*  | 3     | 2.1*  | 19    | 13.7  | 9     | 6.5*  |
| MADERA                          | 49                              | 32.0  | 64    | 41.5  | 58    | 37.3  | 64    | 41.2  | 22    | 14.1  | 38    | 24.2  | 51    | 32.4  |
| MARIN                           | 2                               | 0.8*  | 4     | 1.5*  | 5     | 1.9*  | 5     | 1.9*  | 6     | 2.3*  | 4     | 1.5*  | 2     | 0.8*  |
| MARIPOSA                        | 3                               | 17.0* | 3     | 17.1* | 1     | 5.8*  | 2     | 11.6* | 1     | 5.8*  | 2     | 11.8* | 1     | 5.9*  |
| MENDOCINO                       | 0                               | -     | 1     | 1.1*  | 0     | -     | 3     | 3.3*  | 2     | 2.2*  | 1     | 1.1*  | 3     | 3.4*  |
| MERCED                          | 81                              | 30.1  | 107   | 39.3  | 137   | 49.8  | 106   | 38.1  | 79    | 28.1  | 81    | 28.7  | 69    | 24.2  |
| MODOC                           | 0                               | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| MONO                            | 0                               | -     | 0     | -     | 1     | 7.6*  | 0     | -     | 0     | -     | 2     | 15.1* | 0     | -     |
| MONTEREY                        | 79                              | 18.1  | 191   | 43.6  | 238   | 54.1  | 188   | 42.6  | 116   | 26.4  | 120   | 27.4  | 113   | 26.0  |
| NAPA                            | 2                               | 1.4*  | 1     | 0.7*  | 1     | 0.7*  | 4     | 2.9*  | 1     | 0.7*  | 5     | 3.6*  | 1     | 0.7*  |
| NEVADA                          | 0                               | -     | 0     | -     | 1     | 1.0*  | 0     | -     | 4     | 3.9*  | 1     | 1.0*  | 1     | 1.0*  |
| ORANGE                          | 109                             | 3.4   | 230   | 7.2   | 195   | 6.1   | 287   | 9.0   | 240   | 7.5   | 284   | 9.0   | 297   | 9.4   |
| PLACER                          | 3                               | 0.8*  | 2     | 0.5*  | 3     | 0.8*  | 12    | 3.0*  | 10    | 2.5*  | 9     | 2.2*  | 9     | 2.2*  |
| PLUMAS                          | 0                               | -     | 0     | -     | 2     | 10.2* | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| RIVERSIDE                       | 64                              | 2.7   | 135   | 5.7   | 142   | 6.0   | 290   | 12.1  | 313   | 12.9  | 455   | 18.7  | 349   | 14.3  |
| SACRAMENTO                      | 27                              | 1.8   | 41    | 2.7   | 43    | 2.8   | 103   | 6.6   | 57    | 3.6   | 81    | 5.1   | 54    | 3.4   |
| SAN BENITO                      | 3                               | 5.0*  | 4     | 6.6*  | 3     | 4.9*  | 5     | 7.9*  | 2     | 3.1*  | 10    | 15.3* | 2     | 3.0*  |
| SAN BERNARDINO                  | 38                              | 1.8   | 88    | 4.1   | 97    | 4.5   | 229   | 10.5  | 233   | 10.7  | 250   | 11.4  | 229   | 10.5  |
| SAN DIEGO                       | 132                             | 4.0   | 274   | 8.4   | 276   | 8.4   | 417   | 12.7  | 461   | 14.0  | 448   | 13.6  | 415   | 12.7  |
| SAN FRANCISCO                   | 7                               | 0.8*  | 14    | 1.6*  | 12    | 1.4*  | 25    | 2.9   | 18    | 2.1*  | 29    | 3.5   | 18    | 2.2*  |
| SAN JOAQUIN                     | 191                             | 25.8  | 204   | 27.2  | 242   | 31.9  | 281   | 36.4  | 134   | 17.2  | 117   | 14.9  | 104   | 13.3  |
| SAN LUIS OBISPO                 | 259                             | 91.9  | 439   | 155.6 | 347   | 122.6 | 268   | 94.8  | 178   | 63.0  | 173   | 62.1  | 144   | 51.5  |
| SAN MATEO                       | 4                               | 0.5*  | 18    | 2.4*  | 16    | 2.1*  | 27    | 3.5   | 17    | 2.2*  | 22    | 2.9   | 22    | 3.0   |
| SANTA BARBARA                   | 62                              | 14.0  | 115   | 25.8  | 107   | 23.9  | 75    | 16.7  | 62    | 13.8  | 66    | 15.0  | 41    | 9.3   |
| SANTA CLARA                     | 39                              | 2.0   | 40    | 2.1   | 77    | 4.0   | 78    | 4.0   | 44    | 2.3   | 65    | 3.4   | 84    | 4.5   |
| SANTA CRUZ                      | 9                               | 3.3*  | 9     | 3.3*  | 14    | 5.1*  | 21    | 7.7   | 3     | 1.1*  | 17    | 6.5*  | 16    | 6.0*  |
| SHASTA                          | 2                               | 1.1*  | 0     | -     | 0     | -     | 0     | -     | 1     | 0.5*  | 0     | -     | 0     | -     |
| SIERRA                          | 0                               | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| SISKIYOU                        | 2                               | 4.5*  | 2     | 4.5*  | 0     | -     | 1     | 2.3*  | 2     | 4.5*  | 0     | -     | 1     | 2.3*  |
| SOLANO                          | 16                              | 3.6*  | 18    | 4.0*  | 17    | 3.8*  | 34    | 7.5   | 22    | 4.9   | 34    | 7.6   | 27    | 6.1   |
| SONOMA                          | 2                               | 0.4*  | 3     | 0.6*  | 3     | 0.6*  | 12    | 2.4*  | 7     | 1.4*  | 20    | 4.1   | 10    | 2.1*  |
| STANISLAUS                      | 81                              | 15.0  | 122   | 22.3  | 76    | 13.8  | 81    | 14.7  | 67    | 12.1  | 86    | 15.6  | 63    | 11.5  |
| SUTTER                          | 1                               | 1.0*  | 3     | 3.1*  | 0     | -     | 4     | 4.0*  | 1     | 1.0*  | 1     | 1.0*  | 0     | -     |
| TEHAMA                          | 1                               | 1.6*  | 0     | -     | 1     | 1.5*  | 2     | 3.1*  | 3     | 4.6*  | 2     | 3.1*  | 1     | 1.5*  |
| TRINITY                         | 0                               | -     | 0     | -     | 1     | 6.3*  | 0     | -     | 0     | -     | 0     | -     | 0     | -     |
| TULARE                          | 249                             | 53.9  | 290   | 62.3  | 287   | 61.4  | 418   | 88.8  | 309   | 65.4  | 317   | 66.8  | 312   | 65.7  |
| TUOLUMNE                        | 6                               | 10.9* | 6     | 10.9* | 2     | 3.6*  | 1     | 1.8*  | 2     | 3.6*  | 1     | 1.8*  | 2     | 3.7*  |
| VENTURA                         | 65                              | 7.6   | 257   | 30.2  | 231   | 27.2  | 371   | 43.9  | 266   | 31.5  | 186   | 22.2  | 235   | 28.3  |
| YOLO                            | 6                               | 2.8*  | 4     | 1.9*  | 3     | 1.4*  | 16    | 7.4*  | 9     | 4.1*  | 8     | 3.7*  | 5     | 2.2*  |
| YUBA                            | 0                               | -     | 3     | 3.8*  | 2     | 2.5*  | 5     | 6.2*  | 2     | 2.4*  | 2     | 2.4*  | 2     | 2.4*  |

Rates are expressed as cases per 100,000 jurisdiction population per year.

\*Potentially unreliable rate: relative standard error 23 percent or more.

For inclusion/exclusion criteria, please refer to the Technical Notes.

# Coccidioidomycosis

Table 2. Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2016-2022

| MONTH     | YEAR OF ESTIMATED ILLNESS ONSET |       |       |       |       |       |       |
|-----------|---------------------------------|-------|-------|-------|-------|-------|-------|
|           | 2016                            | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  |
| TOTAL     | 5,574                           | 7,713 | 7,641 | 9,095 | 7,267 | 8,047 | 7,451 |
| JANUARY   | 290                             | 373   | 1,036 | 744   | 717   | 769   | 593   |
| FEBRUARY  | 276                             | 288   | 619   | 683   | 730   | 681   | 534   |
| MARCH     | 235                             | 305   | 568   | 789   | 670   | 711   | 530   |
| APRIL     | 276                             | 282   | 487   | 656   | 480   | 584   | 618   |
| MAY       | 211                             | 337   | 545   | 692   | 444   | 601   | 678   |
| JUNE      | 309                             | 456   | 492   | 602   | 512   | 625   | 641   |
| JULY      | 389                             | 503   | 596   | 629   | 478   | 716   | 622   |
| AUGUST    | 616                             | 744   | 637   | 754   | 585   | 652   | 703   |
| SEPTEMBER | 734                             | 837   | 586   | 744   | 598   | 668   | 688   |
| OCTOBER   | 958                             | 1,223 | 709   | 995   | 727   | 682   | 578   |
| NOVEMBER  | 734                             | 1,242 | 724   | 969   | 671   | 704   | 661   |
| DECEMBER  | 546                             | 1,123 | 642   | 838   | 655   | 654   | 605   |

For inclusion/exclusion criteria, please refer to the Technical Notes.

Table 3. Coccidioidomycosis, Cases and Rates by Sex, California, 2016-2022

| SEX     | YEAR OF ESTIMATED ILLNESS ONSET |      |       |      |       |      |       |      |       |      |       |      |       |      |
|---------|---------------------------------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|         | 2016                            |      | 2017  |      | 2018  |      | 2019  |      | 2020  |      | 2021  |      | 2022  |      |
|         | CASES                           | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE |
| TOTAL   | 5,574                           | 14.2 | 7,713 | 19.6 | 7,641 | 19.4 | 9,095 | 23.0 | 7,267 | 18.4 | 8,047 | 20.5 | 7,451 | 19.1 |
| FEMALE  | 2,068                           | 10.5 | 2,753 | 13.9 | 2,935 | 14.8 | 3,726 | 18.7 | 3,143 | 15.8 | 3,355 | 17.0 | 3,279 | 16.7 |
| MALE    | 3,502                           | 18.0 | 4,952 | 25.3 | 4,699 | 23.9 | 5,356 | 27.2 | 4,111 | 20.9 | 4,684 | 24.0 | 4,164 | 21.5 |
| UNKNOWN | 4                               | -    | 8     | -    | 7     | -    | 13    | -    | 13    | -    | 8     | -    | 8     | -    |

Rates are expressed as cases per 100,000 jurisdiction population per year.

For inclusion/exclusion criteria, please refer to the Technical Notes.

Table 4. Coccidioidomycosis, Cases and Rates by Age Group, California, 2016-2022

| AGE GROUP | YEAR OF ESTIMATED ILLNESS ONSET |      |       |      |       |      |       |      |       |      |       |      |       |      |
|-----------|---------------------------------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
|           | 2016                            |      | 2017  |      | 2018  |      | 2019  |      | 2020  |      | 2021  |      | 2022  |      |
|           | CASES                           | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE | CASES | RATE |
| TOTAL     | 5,574                           | 14.2 | 7,713 | 19.6 | 7,641 | 19.4 | 9,095 | 23.0 | 7,267 | 18.4 | 8,047 | 20.5 | 7,451 | 19.1 |
| 0         | 3                               | 0.6* | 5     | 1.0* | 8     | 1.7* | 9     | 2.0* | 9     | 2.0* | 3     | 0.7* | 4     | 0.9* |
| 1-4       | 29                              | 1.5  | 56    | 2.8  | 50    | 2.6  | 39    | 2.0  | 27    | 1.4  | 13    | 0.7* | 23    | 1.3  |
| 5-14      | 303                             | 6.0  | 393   | 7.8  | 336   | 6.6  | 285   | 5.7  | 173   | 3.3  | 188   | 3.6  | 211   | 4.1  |
| 15-24     | 608                             | 11.0 | 818   | 14.9 | 745   | 13.8 | 847   | 15.9 | 605   | 10.7 | 606   | 10.9 | 573   | 10.4 |
| 25-34     | 827                             | 15.4 | 1,178 | 21.9 | 1,156 | 21.6 | 1,318 | 24.7 | 959   | 18.0 | 1,049 | 19.7 | 928   | 17.4 |
| 35-44     | 943                             | 18.3 | 1,257 | 24.3 | 1,261 | 24.4 | 1,455 | 28.1 | 1,257 | 25.5 | 1,231 | 25.3 | 1,143 | 23.8 |
| 45-54     | 1,070                           | 20.3 | 1,447 | 27.7 | 1,428 | 27.8 | 1,612 | 31.7 | 1,215 | 25.2 | 1,372 | 28.9 | 1,209 | 25.8 |
| 55-64     | 898                             | 18.8 | 1,321 | 27.1 | 1,269 | 25.6 | 1,609 | 32.2 | 1,353 | 27.9 | 1,572 | 33.0 | 1,437 | 30.7 |
| 65-74     | 538                             | 17.1 | 783   | 23.8 | 843   | 24.5 | 1,171 | 32.8 | 969   | 26.4 | 1,164 | 31.0 | 1,122 | 29.5 |
| 75-84     | 264                             | 16.9 | 337   | 20.8 | 420   | 24.4 | 548   | 30.5 | 509   | 27.8 | 621   | 32.9 | 585   | 29.3 |
| 85+       | 84                              | 11.5 | 114   | 15.2 | 116   | 14.2 | 188   | 22.5 | 181   | 21.6 | 215   | 25.2 | 208   | 23.8 |
| UNKNOWN   | 7                               | -    | 4     | -    | 9     | -    | 14    | -    | 10    | -    | 13    | -    | 8     | -    |

Rates are expressed as cases per 100,000 jurisdiction population per year.

For inclusion/exclusion criteria, please refer to the Technical Notes.

\*Potentially unreliable rate: relative standard error 23 percent or more.

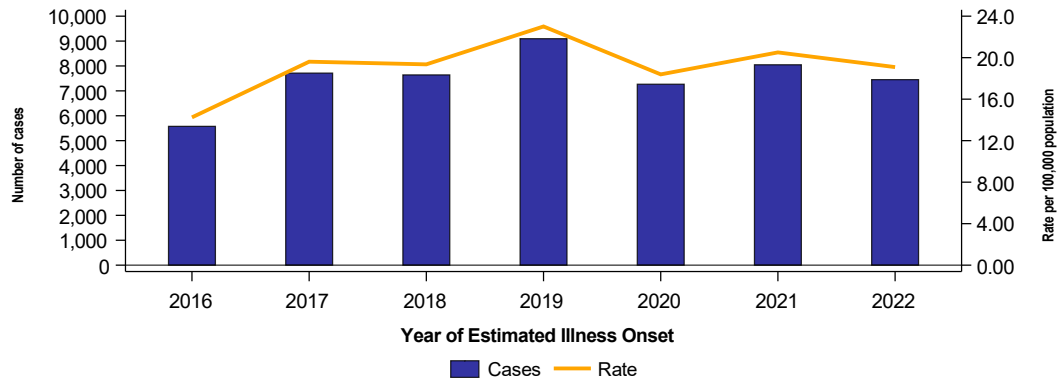
Table 5. Coccidioidomycosis, Cases by Race/Ethnicity, California, 2016-2022

| RACE/ETHNICITY                              | YEAR OF ESTIMATED ILLNESS ONSET |       |       |       |       |       |       |
|---|---------------------------------|-------|-------|-------|-------|-------|-------|
|   | 2016                            | 2017  | 2018  | 2019  | 2020  | 2021  | 2022  |
| TOTAL                                       | 5,574                           | 7,713 | 7,641 | 9,095 | 7,267 | 8,047 | 7,451 |
| WHITE, NON-HISPANIC                         | 1,250                           | 1,737 | 1,727 | 1,730 | 1,540 | 1,678 | 1,501 |
| HISPANIC/LATINO                             | 1,772                           | 2,276 | 2,254 | 2,066 | 1,832 | 2,133 | 1,980 |
| ASIAN/PACIFIC ISLANDER, NON-HISPANIC        | 273                             | 405   | 385   | 373   | 266   | 373   | 345   |
| BLACK, NON-HISPANIC, NON-HISPANIC           | 273                             | 356   | 385   | 341   | 290   | 384   | 317   |
| AMERICAN INDIAN/ALASKA NATIVE, NON-HISPANIC | 17                              | 38    | 18    | 46    | 19    | 27    | 16    |
| MULTIPLE RACE, NON-HISPANIC                 | 22                              | 16    | 10    | 19    | 10    | 11    | 9     |
| OTHER, NON-HISPANIC                         | 164                             | 561   | 501   | 734   | 622   | 570   | 656   |
| UNKNOWN                                     | 1,803                           | 2,324 | 2,361 | 3,786 | 2,688 | 2,871 | 2,627 |

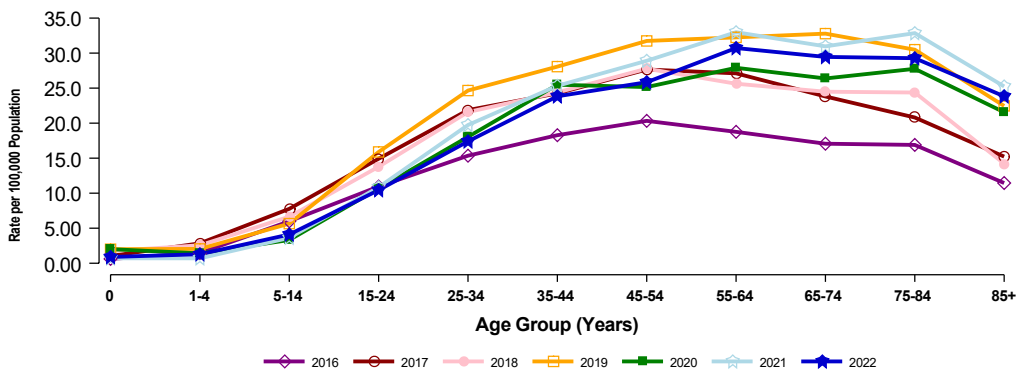
For inclusion/exclusion criteria, please refer to the Technical Notes.

# Coccidioidomycosis

**Figure 1. Coccidioidomycosis Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2016-2022**



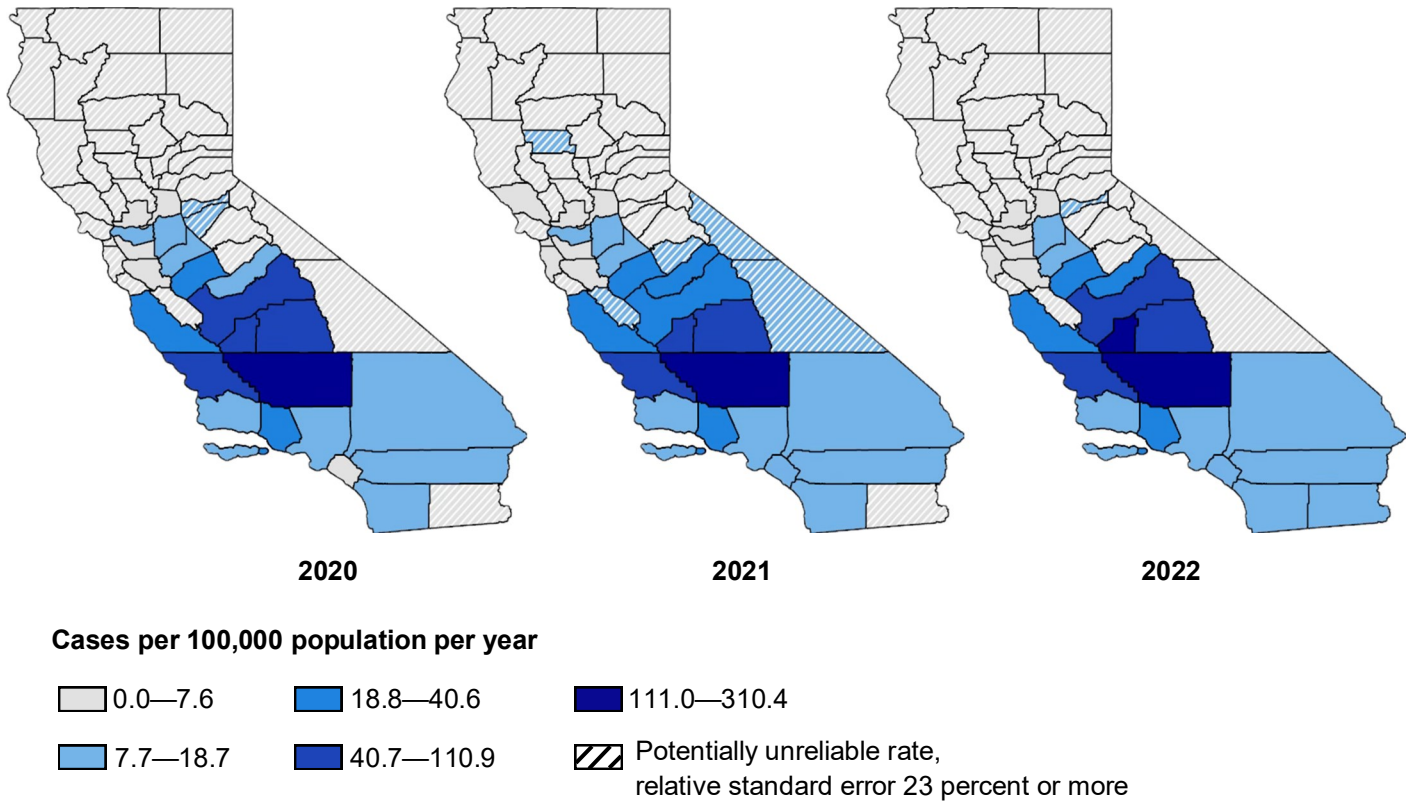
**Figure 2. Coccidioidomycosis Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2016-2022**



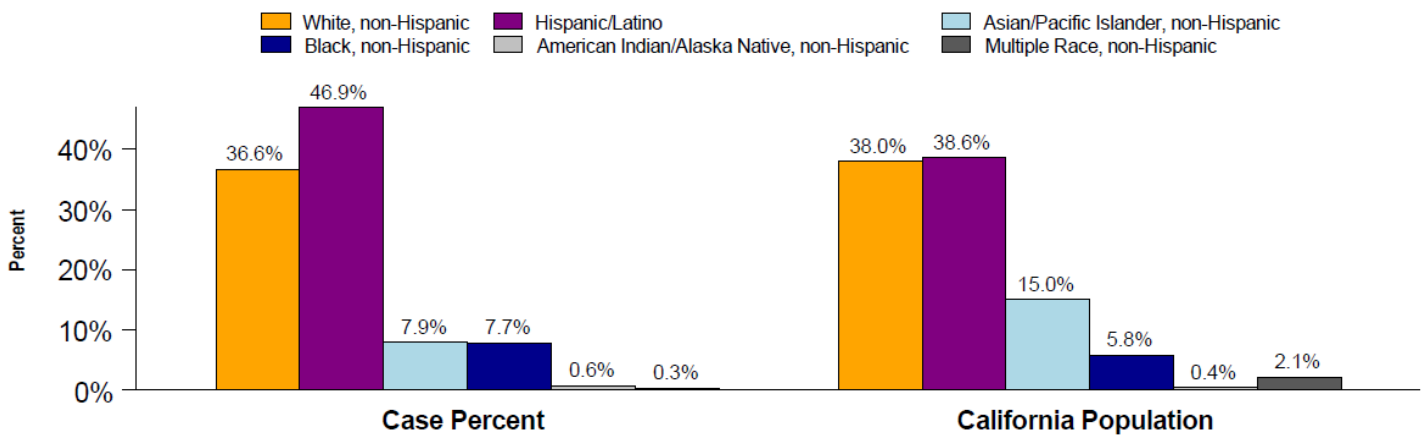


# Coccidioidomycosis

**Figure 3. Coccidioidomycosis, Annual Incidence by County, California, 2020-2022**



**Figure 4. Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2016—2022**



35% (n=18460) of reported incidents of Coccidioidomycosis did not identify race/ethnicity and 7.2% (n=3808) of reported incidents identified as 'Other' race/ethnicity and are not included in the Case Percent calculation. Information presented with a large percentage of missing data should be interpreted with caution.

## Technical Notes

### Background

The California Department of Public Health (CDPH) Infectious Diseases Branch maintains a passive reporting system for a list of communicable disease cases and outbreaks, including coccidioidomycosis, mandated by state law and regulation.<sup>2</sup> Healthcare providers and laboratories are required to report known or suspected cases of these communicable diseases to their local health department (LHD). LHDs in turn report these cases to CDPH.

The collection and distribution of information on the health of the community is a core function and essential service of public health. The data in this epidemiologic summary provide important health information on the magnitude and burden of coccidioidomycosis in California. Bearing in mind their limitations, these surveillance data can contribute to the identification of risk groups to whom intervention strategies and actions can be targeted, and aid in assessing the effectiveness of these control and prevention measures.

### Materials and methods

#### *Case data sources and inclusion criteria*

Included in this document-- Epidemiologic Summary of Coccidioidomycosis in California, 2022-- are incident cases of coccidioidomycosis with estimated illness onset dates from January 1, 2016 through December 31, 2022. These data were extracted from California Confidential Morbidity Reports that LHDs submitted to CDPH by July 31, 2023. The Council of State and Territorial Epidemiologists (CSTE) surveillance case definition requires both clinical and laboratory criteria for reporting cases as confirmed.<sup>3</sup> However, some LHDs used laboratory results only due to resource constraints; CDPH accepts all cases closed by LHDs as confirmed. Due to delays in provider reporting and time required for LHDs to complete clinical, laboratory, and epidemiologic investigation of reported cases, LHDs may continue to add and rescind cases with eligible illness onset dates after the closeout date of this summary. Data used in this report were quality checked and duplicate records were removed based on a data matching algorithm. Because coccidioidomycosis may occur as a chronic condition and be reported more than once, only the first report of coccidioidomycosis per person was included based on estimated illness onset using a probabilistic de-duplication method spanning multiple surveillance reporting years.

#### *Population data source*

For the 2022 Epidemiologic Summary of Coccidioidomycosis in California, State of California, Department of Finance projections and estimations population data were used.<sup>6, 7, 8, 9, 10, 11</sup>

#### *Definitions*

A case was defined as a person who had laboratory and/or clinical evidence of infection that satisfied the most recent surveillance case definition published by the CSTE. Coccidioidomycosis cases included in the report were closed by the LHDs either after having met case definition criteria for a confirmed case or using laboratory results only; CDPH accepts all cases closed by LHDs as confirmed.

Estimated date of illness onset was defined as the date closest to the time when symptoms first appeared. For cases for which an illness onset date was not explicitly reported, estimated date of illness onset was selected as the earliest of: date of diagnosis, date the case was reported to or received by CDPH, date of laboratory specimen collection, or date of patient death. Because illness onset of coccidioidomycosis is often insidious, estimated illness onset was frequently drawn from the diagnosis date.

Cases were classified to local health jurisdiction according to the case-patient's county of residence. This classification may not correspond to the county where the case-patient was exposed, sought medical care, or was diagnosed.

Sex categories were defined as follows: Female (including Male to Female transgender) and Male (including Female to Male transgender). Cases that did not report a sex were listed as Unknown.

Mutually exclusive race/ethnicity categories were defined as follows: Hispanic/Latino (of any, including unknown, race), and non-Hispanic White, Black, Asian/Pacific Islander, American Indian/Alaska Native, Multiple Race, and Other. Cases for which race and ethnicity were not reported were categorized as Unknown.

### ***Data analyses***

Within this epidemiologic summary, incidence rates (or the number of cases per 100,000 people per year) are used to convey how common a disease is in a place (such as a county) or a group (such as sex or age) compared to the number of people in that place or group (the population). Different places and groups have different population sizes, and the number of new cases in those places or groups can mean different things based on the size of the population. To understand which place or group has a higher risk of disease, it is better to compare their incidence rates than the number of cases.

Case totals and incidence rates per 100,000 population were reported and stratified by local health jurisdiction, year of estimated illness onset, sex, and age group.

$$\text{Incidence rate (IR)} = (\text{Number of cases in specified year(s)}/\text{population}) \times 100,000$$

$$\text{Standard error (SE)} = \text{IR}/\sqrt{\text{number of cases}}$$

$$\text{Relative standard error} = \text{SE}/\text{IR} \times 100$$

An incidence estimate was defined as unreliable if the relative standard error was 23 percent or more (a threshold recommended by the National Center for Health Statistics).<sup>10</sup> A substantial portion of race/ethnicity data were missing, thus incidence rates by race/ethnicity were not calculated. However, for comparison we depicted case totals and California population totals by race/ethnicity.

## Tables and figures

The following tables and figures are included in this report; please note that the tables and figures may be altered or suppressed to minimize depiction of unreliable IRs:

### Tables:

1. *Coccidioidomycosis, Cases and Incidence Rates by Health Jurisdiction, California, 2016-2022*
2. *Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2016-2022*
3. *Coccidioidomycosis, Cases and Incidence Rates by Sex, California, 2016-2022*
4. *Coccidioidomycosis, Cases and Incidence Rates by Age Group, California, 2016-2022*
5. *Coccidioidomycosis, Cases by Race/Ethnicity, California, 2016-2022*

### Figures:

1. *Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2016-2022*
2. *Coccidioidomycosis, Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2016-2022*
3. *Coccidioidomycosis, Annual Incidence Rate by County, California, 2020-2022*
4. *Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2016-2022*

## Limitations

### **Completeness of reporting**

The number of reported cases of coccidioidomycosis summarized in this report are likely to underestimate the true magnitude of the disease. Factors that may contribute to under-reporting include ill persons not seeking 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.

California is a diverse state, and different communities experience a wide range of factors that can increase or decrease health risks. To better assess health risk and identify health related disparities, CDPH collects demographic information, when available. In addition to general categories of sex, race, and ethnicity defined by national data standards, CDPH also collects data on sexual orientation and gender identity, and more detailed data on ethnicity. Presenting data disaggregated into more detailed groups can illuminate health disparities that may be masked when collapsing data only into general categories. When possible, data reports issued by the Center for Infectious Diseases (CID) will include disaggregated data. However, due to limitations in the data received by CID, disaggregated data may not always be available for presentation. Reasons that disaggregated data may not be presented include incomplete or missing data and patient data privacy requirements.

Because race/ethnicity information was missing or incomplete for 35 percent of all 2015-2022 cases included in this report, IRs by race/ethnicity were not calculated. However, the proportion of cases representing race/ethnicity categories are presented alongside statewide averages for these categories during the seven-year surveillance period. Nonetheless, race/ethnicity information based on a high percentage of missing data should be interpreted with caution.

Data presented in this report may differ from previously published data due to delays inherent to case reporting, laboratory reporting, and epidemiologic investigation.

### ***Small numbers and rate variability***

All IRs are subject to random variation. Random variation may be substantial when the number of cases is small (e.g., less than 20) and can obscure distinguishing random statistical fluctuations from true changes in the incidence of disease. Rates and proportions based on small numbers of cases should be interpreted with caution.

### ***Rate comparisons***

Incidence rate comparisons between local health jurisdictions and surveillance years should be done with caution.

## **References**

<sup>1</sup> Brown J, Benedict K, Park BJ, Thompson GR 3rd. Coccidioidomycosis: epidemiology. *Clinical Epidemiology* 2013;5; 185-197.

<sup>2</sup> [California Code of Regulations, Title 17, Sections 2500.](https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ReportableDiseases.pdf)  
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ReportableDiseases.pdf>

<sup>3</sup> Council of State and Territorial Epidemiologists. [Coccidioidomycosis \(Valley fever\) \(Coccidioides spp.\) position statement 10-ID-04, 2011](https://wwwn.cdc.gov/nndss/conditions/coccidioidomycosis/case-definition/2011/) [cited 29 Jun 2020].  
<https://wwwn.cdc.gov/nndss/conditions/coccidioidomycosis/case-definition/2011/>

<sup>4</sup> State of California, Department of Public Health. [Epidemiological Summaries of Selected General Communicable Diseases in California, 2001-2008, 2009-2012,](https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2019.pdf) and [Epidemiologic Summary of Valley Fever in California, 2019.](https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary09-12.pdf) Sacramento, California, November 2009; January 2014; September 2020.  
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2019.pdf>;  
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary09-12.pdf>; and  
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/EpiSummariesofSelectedCommDiseasesinCA2001-2008.pdf#page=17>

<sup>5</sup> [Preventing Work-Related Valley Fever \(Coccidioidomycosis\).](https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/Pages/Cocci.aspx) California Department of Public Health.  
<https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/Pages/Cocci.aspx>

<sup>6</sup> State of California, Department of Finance, Race/Hispanics Population with Age and Gender Detail, 2000–2010. Sacramento, California, March 2013.

<sup>7</sup> State of California, Department of Finance. Demographic Research Unit. Race/Ethnicity by Sex and Single Year of Age: 2010-2019, Custom run for CDPH. Sacramento, California, October 2023 (*Available by Request*).

<sup>8</sup> State of California, Department of Finance. P-3 State and County Total Population Projections by Race/Ethnicity and Detailed Age, 2020–2060. Sacramento, California, July 2023.

<sup>9</sup> State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties, and the State, 2011-2020, with 2010 Census Benchmark*. Sacramento, California, May 2022.

<sup>10</sup> State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties, and the State, 2021-2023, with 2020 Census Benchmark*. Sacramento, California, May 2023.

<sup>11</sup> Xu JQ, Murphy SL, Kochanek KD, Bastian B, Arias E. Deaths: Final data for 2016. *National Vital Statistics Reports*; vol 67 no 5. Hyattsville, MD: National Center for Health Statistics. 2018.

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