

Valley Fever in California Dashboard: 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 Valley fever (or coccidioidomycosis), mandated by state law and regulation.¹ 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 dashboard provide important health information on the magnitude and burden of Valley fever 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 the *Valley Fever in California Dashboard* are incident cases of Valley fever with estimated illness onset dates from January 1, 2001 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.² 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 a set data closeout date. Data used in this dashboard were quality checked and duplicate records were removed based on a data matching algorithm. Since Valley fever may occur as a chronic condition and be reported more than once, only the first report of Valley fever 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 *Valley Fever in California Dashboard*, State of California, Department of Finance projections and estimations population data were used.^{3, 4, 5, 6, 7}

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.² Valley fever cases included 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 Valley fever 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 and not included in the dashboard.

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. Cases with Other or Unknown race and ethnicity were not included in the dashboard.

Data analyses

Within this surveillance data overview, incidence rates, or "rates" as shown on the dashboard, indicate the number of cases per 100,000 people per year and 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.

Incidence rate (IR) = (Number of cases in specified year(s)/population) x 100,000

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

Relative standard error = $SE/IR \times 100$

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).⁸ A substantial portion of race/ethnicity data were missing, thus incidence rates by race/ethnicity were not calculated. However, case totals and California population totals by race/ethnicity were depicted for comparison.

Limitations

Completeness of reporting

The number of reported cases of Valley fever summarized in this dashboard 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.

Because race/ethnicity information was missing or incomplete for 35.5 percent of all cases included in this dashboard, 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 indicated surveillance period. Cases reporting “Other non-Hispanic” race/ethnicity (4.8 percent of total cases) were not included due to an absence of population counts for a corresponding population in California. Overall, race/ethnicity information based on a high percentage of missing data should be interpreted with caution.

Data presented in this dashboard 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.

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References

- ¹ [Reportable Diseases and Conditions, 17 CCR §2500, §2593, §2641.5-2643.20, and §2800-2812 \(2022\)](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>
- ² [Coccidioidomycosis / Valley Fever \(*Coccidioides* spp.\) Case Definition\(s\)](https://ndc.services.cdc.gov/conditions/coccidioidomycosis/). National Notifiable Diseases Surveillance System, U.S. Centers for Disease Control and Prevention. Accessed July 2023. <https://ndc.services.cdc.gov/conditions/coccidioidomycosis/>
- ³ State of California, Department of Finance, Race/Hispanics Population with Age and Gender Detail, 2000–2010. Sacramento, California, March 2013.
- ⁴ 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*)
- ⁵ 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.
- ⁶ 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.
- ⁷ 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.
- ⁸ 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.