

# EPIDEMIOLOGIC SUMMARY OF VALLEY FEVER (COCCIDIOIDOMYCOSIS) IN CALIFORNIA, 2020-2021

Surveillance and Statistics Section  
Infectious Diseases Branch  
Division of Communicable Disease Control  
Center for Infectious Diseases  
California Department of Public Health



Gavin Newsom  
Governor  
State of California

An [accessible Excel data file of the 2020-2021 Epidemiologic Summary of Valley Fever \(Coccidioidomycosis\) in California](#) is available for download

Mark Ghaly, Secretary  
Health and Human Services Agency

Tomás J. Aragón, MD, DrPH, Director  
Department of Public Health

# Epidemiologic Summary of Valley Fever (Coccidioidomycosis) in California, 2020 - 2021



## 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 2020-2021

**Total Cases:** A total of 7,252 and 8,030 new Valley fever cases were reported in 2020 and 2021, respectively.

**Rate:** The rate of Valley fever in 2020 was about 18 cases per 100,000 people, and the rate in 2021 was about 20 cases per 100,000 people.

- **By County:** The number of new Valley fever cases was highest in Kern County, with a total of 2,626 cases (about 288 cases per 100,000 people) in 2020 and 2,819 cases (about 306 cases per 100,000 people) in 2021. Counties with the next highest rates of Valley fever in 2021 included Kings, Tulare, San Luis Obispo, Fresno, Merced, and Monterey. 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 rates of Valley fever in both 2020 and 2021 were higher in males (2020: about 21 cases per 100,000 males; 2021: about 23 cases per 100,000 males) than in females (2020: about 16 cases per 100,000 females; 2021: about 17 cases per 100,000 females).
- **By Age Group:** In both 2020 and 2021, the rates of Valley fever were highest in people aged 55-64 and 75-84 years (2020: both about 28 cases per 100,000 people; 2021: both about 32 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 2020-2021 and present surveillance and demographic data for years 2015 through 2021. 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). During this surveillance period, 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. 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 2020 was 18.2 per 100,000 population (7,252 case-patients) and 20.1 per 100,000 population in 2021 (8,030 case-patients). The incidence decreased by 20.5 percent from 2019 to 2020 and increased by 10.4 percent from 2020 to 2021. 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, monthly case counts were fairly consistent throughout the year (Table 2).

In 2020, incidence among males was 20.7 per 100,000 population (4,102 case-patients) and was higher than incidence among females of 15.7 per 100,000 (3,136 case-patients). Similarly in 2021, incidence among males was 23.4 per 100,000 (4,673 case-patients) and was higher than incidence among females of 16.7 per 100,000 (3,347 case-patients) (Table 3). By age group in both 2020 and 2021, incidence was highest and equal among people aged 55-64 and 75-84 years (2020: about 28 cases per 100,000 people; 2021: about 32 cases per 100,000 people) (Table 4 and Figure 2). Among children ages 17 years and younger, incidence was 3.8 per 100,000 in both 2020 (334 case-patients) and 2021 (336 case-patients). Among adults ages 18 years and older, incidence was 22.4 per 100,000 in 2020 (6,898 case-patients) and 24.8 per 100,000 in 2021 (7,681 case-patients).

Statewide in both 2020 and 2021, the incidence was highest in Kern County (2020: 287.6 per 100,000; 2626 case-patients, 2021: 306.2 per 100,000; 2819 case-patients), followed by Kings County (2020: 101.5 per 100,000; 157 case-patients, 2021: 108.3 per 100,000; 168 case-patients). Other counties with high incidence included Tulare (2020: 64.3 per 100,000; 309 case-patients), 2021: 65.8 per 100,000; 317 case-patients), San Luis Obispo (2020: 64.5 per 100,000; 178 case-patients, 2021: 61.0 per 100,000; 170 case-patients), Fresno (2020: 43.6 per 100,000; 448 case-patients, 2021: 39.8 per 100,000; 407 case-patients), Merced (2020: 27.4 per 100,000; 78 case-patients, 2021: 28.3 per 100,000; 81 case-patients), and Monterey (2020: 25.2 per 100,000; 111 case-patients, 2021: 27.0 per 100,000; 120 case-patients) (Table 1 and Figure 3). Approximately 56.5 and 52.1 percent of all California case-patients in 2020 and 2021, respectively, resided in these counties at the time of illness onset.

Incidence by race/ethnicity was not calculated due to missing race/ethnicity data for 34.9% of reported cases in 2015 through 2021. However, for cases with complete race/ethnicity data, a higher percentage of cases reported Hispanic ethnicity (46.5%) and Black non-Hispanic race (7.8%) than would be expected based on the overall demographic profile of California (39.1% 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 in 2020 and increased slightly in 2021 although still lower than in 2019. In 2020, case counts began to decrease in April, which coincided with the beginning of the COVID-19 pandemic in California. Some additional cases for 2020 and 2021 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 2020 and 2021 are similar to those reported in

coccidioidomycosis epidemiologic summaries from earlier years as described previously.<sup>4</sup>

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. In particular, reporting completeness likely improved following the initiation of automatic electronic laboratory reporting in 2014.

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>).

Prepared by Alyssa Nguyen, Gail Sondermeyer Cooksey, Yanyi Djamba, Allyx Nicolici, and Duc Vugia — Infectious Diseases Branch, Division of Communicable Disease Control, Center for Infectious Diseases, California Department of Public Health.

# Coccidioidomycosis

Table 1. Coccidioidomycosis, Cases and Rates by Health Jurisdiction, California, 2015-2021

JURISDICTION	YEAR OF ESTIMATED ILLNESS ONSET													
	2015		2016		2017		2018		2019		2020		2021	
	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
<b>CALIFORNIA TOTAL</b>	3,183	8.2	5,571	14.2	7,704	19.5	7,636	19.2	9,090	22.9	7,252	18.2	8,030	20.1
<b>ALAMEDA COUNTY TOTAL</b>	39	2.4	48	2.9	66	4.0	76	4.6	97	5.8	68	4.1	99	5.9
ALAMEDA	38	2.5	48	3.2	66	4.3	75	4.9	96	6.2	67	4.3	98	6.4
BERKELEY	1	0.8*	0	-	0	-	1	0.8*	1	0.8*	1	0.8*	1	0.8*
ALPINE	0	-	0	-	0	-	0	-	0	-	0	-	0	-
AMADOR	4	11.1*	0	-	1	2.7*	7	18.5*	5	13.3*	7	18.6*	3	7.9*
BUTTE	0	-	3	1.3*	4	1.8*	1	0.4*	6	2.8*	11	5.3*	13	5.7*
CALAVERAS	1	2.2*	1	2.2*	0	-	1	2.2*	3	6.8*	8	18.1*	1	2.3*
COLUSA	1	4.6*	1	4.6*	0	-	2	9.1*	3	13.6*	1	4.5*	0	-
CONTRA COSTA	50	4.5	68	6.0	89	7.8	109	9.5	134	11.7	144	12.5	134	11.6
DEL NORTE	0	-	1	3.7*	1	3.8*	0	-	0	-	0	-	0	-
EL DORADO	1	0.5*	2	1.1*	5	2.7*	2	1.1*	5	2.6*	3	1.6*	1	0.5*
FRESNO	280	28.6	614	62.1	832	83.4	643	63.7	625	61.4	448	43.6	407	39.8
GLENN	0	-	0	-	2	7.0*	0	-	2	6.9*	1	3.4*	3	10.3*
HUMBOLDT	1	0.7*	0	-	2	1.5*	0	-	2	1.5*	2	1.5*	2	1.5*
IMPERIAL	2	1.1*	11	5.9*	15	8.0*	19	10.1	17	9.0*	5	2.7*	1	0.5*
INYO	0	-	0	-	0	-	0	-	0	-	1	5.4*	3	16.5*
KERN	1,083	122.9	2,258	255.3	2,793	312.8	2,949	327.2	3,384	372.0	2,626	287.6	2,819	306.2
KINGS	104	69.6	235	158.0	273	181.6	173	113.3	220	143.3	157	101.5	168	108.3
LAKE	0	-	2	3.1*	2	3.1*	1	1.5*	2	3.1*	2	3.1*	0	-
LASSEN	9	29.8*	6	20.2*	0	-	1	3.4*	0	-	1	3.5*	0	-
<b>LOS ANGELES COUNTY TOTAL</b>	558	5.5	730	7.2	932	9.1	1,013	9.9	1,154	11.3	1,081	10.6	1,447	14.2
LOS ANGELES	521	5.5	713	7.5	904	9.5	996	10.4	1,093	11.5	1,023	10.7	1,378	14.8
LONG BEACH	36	7.6	15	3.2*	19	4.0	12	2.5*	57	12.1	55	11.7	52	11.3
PASADENA	1	0.7*	2	1.4*	9	6.3*	5	3.5*	4	2.8*	3	2.1*	17	12.2*
MADERA	54	35.0	49	31.7	64	41.0	58	36.8	64	40.6	22	13.9	38	23.6
MARIN	1	0.4*	2	0.8*	4	1.5*	5	1.9*	5	1.9*	6	2.3*	4	1.5*
MARIPOSA	2	11.1*	3	16.6*	3	16.7*	1	5.6*	2	11.2*	1	5.6*	1	5.7*
MENDOCINO	1	1.1*	0	-	1	1.1*	0	-	3	3.4*	2	2.3*	1	1.1*
MERCED	91	33.8	78	28.8	105	38.2	137	49.3	105	37.3	78	27.4	81	28.3
MODOC	0	-	0	-	0	-	0	-	0	-	0	-	0	-
MONO	0	-	0	-	0	-	1	7.4*	0	-	0	-	2	14.5*
MONTEREY	38	8.7	79	18.0	191	43.4	238	53.9	186	41.9	111	25.2	120	27.0
NAPA	0	-	2	1.4*	1	0.7*	1	0.7*	4	2.9*	1	0.7*	5	3.6*
NEVADA	0	-	0	-	0	-	1	1.0*	0	-	4	4.1*	1	1.0*
ORANGE	172	5.5	109	3.4	231	7.2	195	6.1	287	9.0	240	7.5	284	8.8
PLACER	5	1.3*	3	0.8*	2	0.5*	3	0.8*	12	3.0*	10	2.5*	9	2.3*
PLUMAS	0	-	0	-	0	-	2	10.9*	0	-	0	-	0	-
RIVERSIDE	57	2.4	64	2.7	134	5.6	142	5.9	290	11.9	311	12.7	455	18.4
SACRAMENTO	23	1.5	27	1.8	40	2.6	43	2.8	103	6.7	57	3.6	81	5.2
SAN BENITO	0	-	3	5.1*	4	6.7*	3	4.9*	5	8.1*	2	3.2*	8	13.0*
SAN BERNARDINO	29	1.4	38	1.8	88	4.1	97	4.5	229	10.5	233	10.7	250	11.4
SAN DIEGO	113	3.5	132	4.0	274	8.3	276	8.3	417	12.5	461	13.8	450	13.5
SAN FRANCISCO	13	1.5*	7	0.8*	14	1.6*	12	1.3*	25	2.8	18	2.0*	29	3.2
SAN JOAQUIN	97	13.3	191	25.9	204	27.3	242	32.0	281	36.6	134	17.3	117	15.1
SAN LUIS OBISPO	65	23.5	259	93.2	438	157.7	346	124.4	268	96.7	178	64.5	170	61.0
SAN MATEO	5	0.7*	4	0.5*	18	2.3*	16	2.1*	27	3.5	17	2.2*	22	2.8
SANTA BARBARA	25	5.6	62	13.9	115	25.7	107	23.8	75	16.6	62	13.7	66	14.6
SANTA CLARA	17	0.9*	39	2.0	39	2.0	76	3.9	78	4.0	44	2.2	65	3.3
SANTA CRUZ	1	0.4*	9	3.3*	9	3.3*	14	5.1*	21	7.7	3	1.1*	17	6.2*
SHASTA	0	-	2	1.1*	0	-	0	-	0	-	1	0.6*	0	-
SIERRA	0	-	0	-	0	-	0	-	0	-	0	-	0	-
SISKIYOU	0	-	2	4.5*	2	4.5*	0	-	1	2.3*	2	4.6*	0	-
SOLANO	19	4.4	16	3.7*	18	4.1*	17	3.9*	34	7.7	22	5.0	35	7.9
SONOMA	1	0.2*	2	0.4*	3	0.6*	3	0.6*	12	2.4*	7	1.4*	20	4.0
STANISLAUS	48	8.9	81	14.9	122	22.3	76	13.8	80	14.4	67	12.1	86	15.3
SUTTER	0	-	1	1.0*	3	3.0*	0	-	4	3.9*	1	1.0*	1	1.0*
TEHAMA	0	-	1	1.6*	0	-	1	1.6*	2	3.1*	3	4.6*	2	3.1*
TRINITY	0	-	0	-	0	-	1	7.5*	0	-	0	-	0	-
TULARE	120	25.9	249	53.3	290	61.6	287	60.6	418	87.5	309	64.3	317	65.8
TUOLUMNE	1	1.9*	6	11.3*	6	11.4*	2	3.8*	1	1.9*	2	3.8*	1	1.9*
VENTURA	48	5.7	65	7.7	257	30.3	231	27.2	371	43.9	266	31.6	181	21.3
YOLO	4	1.9*	6	2.8*	4	1.8*	3	1.4*	16	7.2*	9	4.1*	8	3.5*
YUBA	0	-	0	-	3	3.9*	2	2.6*	5	6.4*	2	2.5*	2	2.6*

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, 2015-2021**

MONTH	YEAR OF ESTIMATED ILLNESS ONSET						
	2015	2016	2017	2018	2019	2020	2021
TOTAL	3,183	5,571	7,704	7,636	9,090	7,252	8,030
JANUARY	217	290	371	1,034	743	715	768
FEBRUARY	182	276	288	619	684	730	682
MARCH	202	235	304	569	789	669	710
APRIL	231	276	281	485	656	479	582
MAY	175	211	337	545	692	440	601
JUNE	215	309	454	492	601	511	624
JULY	295	388	503	595	629	478	713
AUGUST	259	615	744	636	753	584	649
SEPTEMBER	328	733	838	586	745	595	665
OCTOBER	407	958	1,221	709	993	728	680
NOVEMBER	351	734	1,242	724	968	669	703
DECEMBER	321	546	1,121	642	837	654	653

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

**Table 3. Coccidioidomycosis, Cases and Rates by Sex, California, 2015-2021**

SEX	YEAR OF ESTIMATED ILLNESS ONSET													
	2015		2016		2017		2018		2019		2020		2021	
	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	3,183	8.2	5,571	14.2	7,704	19.5	7,636	19.2	9,090	22.9	7,252	18.2	8,030	20.1
FEMALE	1,171	6.0	2,066	10.5	2,749	13.9	2,933	14.8	3,723	18.7	3,136	15.7	3,347	16.7
MALE	2,009	10.3	3,501	17.9	4,947	25.1	4,696	23.7	5,354	27.0	4,102	20.7	4,673	23.4
UNKNOWN	3	-	4	-	8	-	7	-	13	-	14	-	10	-

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, 2015-2021**

AGE GROUP	YEAR OF ESTIMATED ILLNESS ONSET													
	2015		2016		2017		2018		2019		2020		2021	
	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	3,183	8.2	5,571	14.2	7,704	19.5	7,636	19.2	9,090	22.9	7,252	18.2	8,030	20.1
0	3	0.6*	3	0.6*	5	1.0*	8	1.7*	9	2.0*	9	2.0*	3	0.7*
1-4	15	0.7*	29	1.5	55	2.8	50	2.5	39	2.0	27	1.4	13	0.7*
5-14	105	2.0	303	5.9	393	7.6	336	6.5	285	5.6	172	3.4	187	3.7
15-24	314	5.4	608	10.4	818	14.1	745	12.9	847	14.8	603	10.6	604	10.6
25-34	448	8.5	827	15.8	1,175	22.6	1,156	22.2	1,316	25.4	958	18.6	1,046	20.1
35-44	536	10.4	942	18.3	1,257	24.2	1,260	24.1	1,455	27.7	1,256	23.9	1,229	23.4
45-54	578	11.0	1,070	20.4	1,446	27.7	1,426	27.6	1,612	31.6	1,212	24.0	1,369	27.2
55-64	559	12.0	897	18.9	1,317	27.3	1,268	25.9	1,608	32.7	1,349	27.5	1,569	32.0
65-74	356	11.8	538	17.0	783	23.8	843	24.7	1,169	33.0	967	26.4	1,162	30.7
75-84	192	12.5	263	16.7	337	20.6	419	24.6	548	30.9	508	27.5	620	32.1
85+	65	9.5	84	12.0	114	16.0	116	16.0	188	25.0	181	23.2	215	26.6
UNKNOWN	12	-	7	-	4	-	9	-	14	-	10	-	13	-

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.

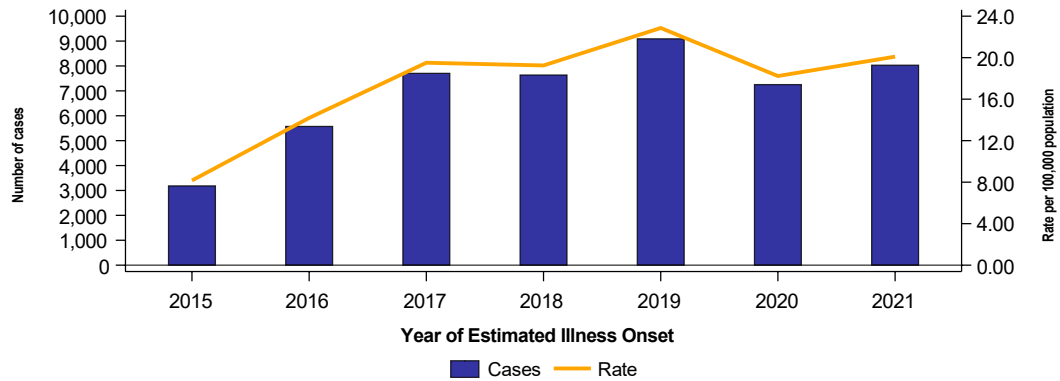
**Table 5. Coccidioidomycosis, Cases by Race/Ethnicity, California, 2015-2021**

RACE/ETHNICITY	YEAR OF ESTIMATED ILLNESS ONSET						
	2015	2016	2017	2018	2019	2020	2021
TOTAL	3,183	5,571	7,704	7,636	9,090	7,252	8,030
WHITE, NON-HISPANIC	803	1,249	1,736	1,724	1,719	1,534	1,666
HISPANIC/LATINO	870	1,769	2,268	2,249	2,055	1,822	2,103
ASIAN/PACIFIC ISLANDER, NON-HISPANIC	163	273	402	384	370	264	371
BLACK, NON-HISPANIC, NON-HISPANIC	198	273	354	383	340	286	381
AMERICAN INDIAN/ALASKA NATIVE, NON-HISPANIC	12	17	38	18	46	19	26
MULTIPLE RACE, NON-HISPANIC	5	22	16	10	19	8	10
OTHER, NON-HISPANIC	106	165	559	501	736	617	569
UNKNOWN	1,026	1,803	2,331	2,367	3,805	2,702	2,904

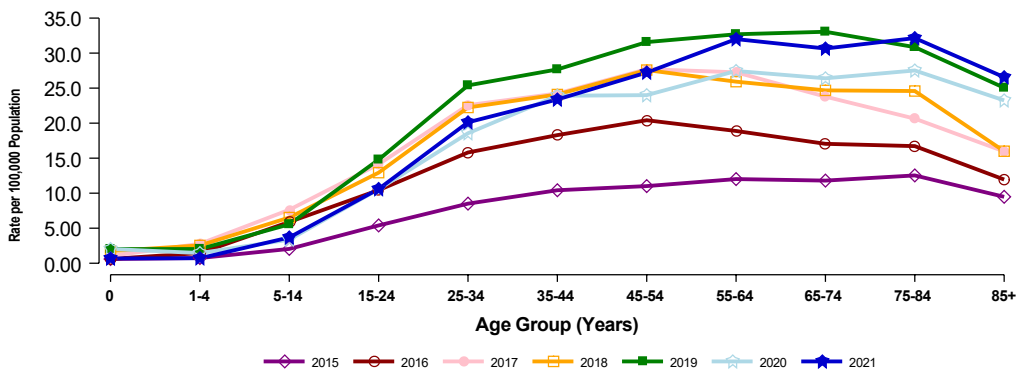
For inclusion/exclusion criteria, please refer to the Technical Notes.

# Coccidioidomycosis

**Figure 1. Coccidioidomycosis Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2015-2021**

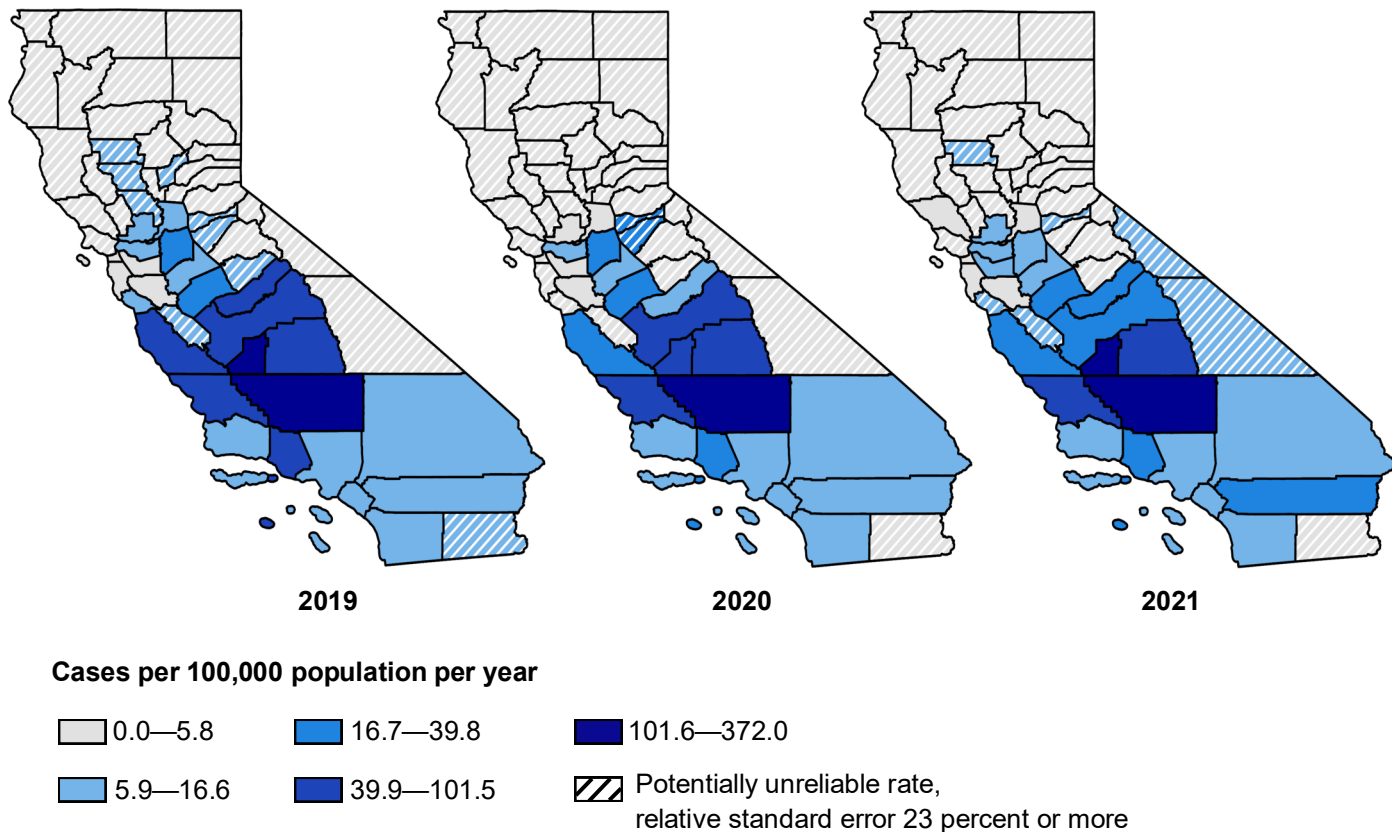


**Figure 2. Coccidioidomycosis Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2015-2021**

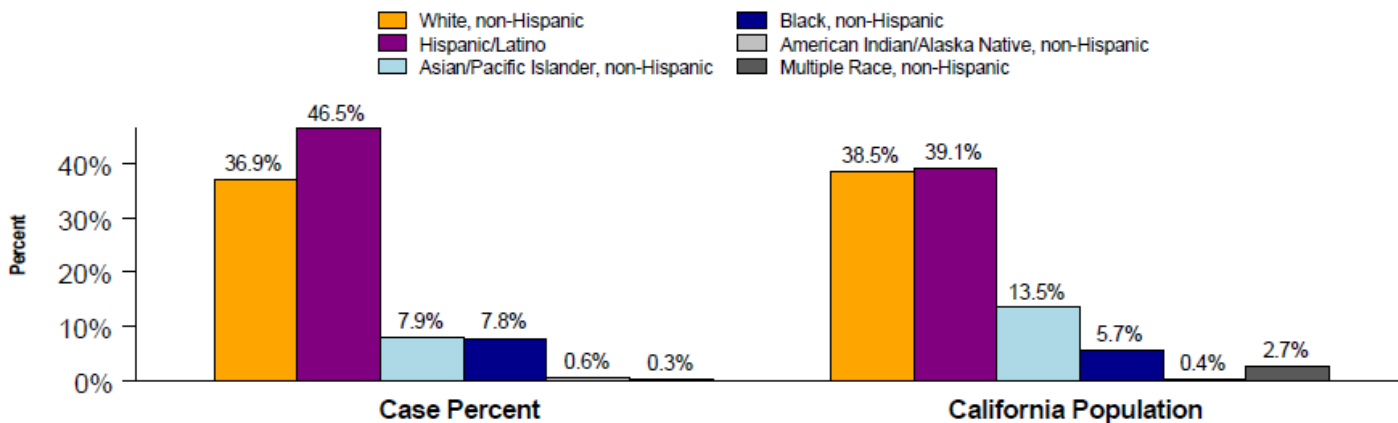




**Figure 3. Coccidioidomycosis, Annual Incidence by County, California, 2019—2021**



**Figure 4. Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2015—2021**



34.9% (n=16938) of reported incidents of Coccidioidomycosis did not identify race/ethnicity and 6.7% (n=3253) 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, 2020-2021-- are incident cases of coccidioidomycosis with estimated illness onset dates from January 1, 2015 through December 31, 2021. These data were extracted from California Confidential Morbidity Reports that LHDs submitted to CDPH by July 20, 2022. 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 2020-2021 Epidemiologic Summary of Coccidioidomycosis in California, State of California, Department of Finance projections and estimations population data were used.<sup>6, 7, 8, 9</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, 2015-2021*
2. *Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2015-2021*
3. *Coccidioidomycosis, Cases and Incidence Rates by Sex, California, 2015-2021*
4. *Coccidioidomycosis, Cases and Incidence Rates by Age Group, California, 2015-2021*
5. *Coccidioidomycosis, Cases by Race/Ethnicity, California, 2015-2021*

## Figures:

1. *Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2015-2021*
2. *Coccidioidomycosis, Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2015-2021*
3. *Coccidioidomycosis, Annual Incidence Rate by County, California, 2015-2021*
4. *Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2015-2021*

## **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.

Because race/ethnicity information was missing or incomplete for 34.5 percent of all 2015-2021 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, and Epidemiologic Summary of Valley Fever in California, 2019.](https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary2019.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/CCDC/DEODC/OHB/Pages/Cocci.aspx) California Department of Public Health. <https://www.cdph.ca.gov/Programs/CCDC/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. P-3 State and County Total Population Projections by Race/Ethnicity and Detailed Age, 2010–2060. Sacramento, California, January 2022.
- <sup>8</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>9</sup> State of California, Department of Finance, *E-4 Population Estimates for Cities, Counties, and the State, 2021-2022, with 2020 Census Benchmark.* Sacramento, California, May 2022.
- <sup>10</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.

Report published on the [Surveillance and Statistics Section website](#)

December 2022

Surveillance and Statistics Section  
Infectious Diseases Branch  
Division of Communicable Disease Control  
Center for Infectious Diseases  
California Department of Public Health

1616 Capitol Avenue, MS 7306  
P.O. Box 997377, Sacramento, CA 95899-7377  
(916) 552-9720

