EPIDEMIOLOGIC SUMMARY OF COCCIDIOIDOMYCOSIS IN CALIFORNIA, 2018

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

Mark Ghaly, Secretary
Health and Human Services Agency

Susan Fanelli, Acting Director
Department of Public Health

Table of Contents

Epidemiologic Summary of Coccidioidomycosis in California, 2018

Key Findings and Public Health Messages 3

Background 3-4

California reporting requirements and surveillance case definition 4

Epidemiology of coccidioidomycosis in California 4

Comments 5

Appendix

Table 1. Coccidioidomycosis, Cases and Rates by Health Jurisdiction, California, 2011–2018 6

Table 2. Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2011–2018 7

Table 3. Coccidioidomycosis, Cases and Rates by Sex, California, 2011–2018 7

Table 4. Coccidioidomycosis, Cases and Rates by Age Group, California, 2011–2018 7

Table 5. Coccidioidomycosis, Cases by Race/Ethnicity, California, 2011–2018 7

Figure 1. Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2001–2018 8

Figure 2. Coccidioidomycosis Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2011—2018 8

Figure 3. Coccidioidomycosis, Annual Incidence by County, 2011–2018 9

Figure 4. Coccidioidomycosis Cases and Population by Race/Ethnicity, 2011–2018 9

Epidemiologic Summary of Coccidioidomycosis in California, 2018 : Technical Notes

Background 10

Materials and Methods 10-11

Limitations 11-12

References 12

Key Findings and Public Health Messages

The incidence of coccidioidomycosis in 2018 was 18.8 per 100,000 population (7,515 case-patients). This is the second highest annual incidence reported in California since coccidioidomycosis became individually reportable in 1995, with the highest incidence of 19.3 per 100,000 population (7,658 case-patients) occurring in 2017. Some additional cases for 2018 may be reported after April 2, 2019 due to delays in diagnosis and reporting; future reports will have updated case numbers and incidence.

Statewide in 2018, incidence was highest in Kern County (323.2 per 100,000; 2,937 case-patients), followed by San Luis Obispo (117.7 per 100,000; 330 case-patients), Kings (113.9 per 100,000; 173 case-patients), Fresno (62.6 per 100,000; 633 case-patients), Tulare (51.9 per 100,000; 248 case-patients), Monterey (51.2 per 100,000; 229 case-patients), and Merced (48.3 per 100,000; 135 case-patients) counties.

Consistent with previous years, incidence in 2018 was higher among males (23.2 per 100,000; 4,622 case-patients) than females, and among persons 40 to 59 years of age (25.8 per 100,000; 2,647 case-patients) than those in other age groups. More case-patients had an estimated illness onset in the month of January (1,035 case-patients) than in any other month.

The reasons for increasing incidence of coccidioidomycosis in California since 2015 are unclear but may be due to environmental factors including climate. Despite this, it is important that people who live, work, or travel in areas where coccidioidomycosis is common avoid spending time in dusty areas (as much as possible), to help reduce the risk of breathing in *Coccidioides* spores from dust in the air. This includes staying inside and keeping windows and doors closed when it is windy and dusty. Employers should inform outdoor workers about symptoms of coccidioidomycosis and take steps to limit workers' exposure to dust, such as wetting down the soil before digging. It is important that healthcare providers be alert for coccidioidomycosis among patients who live in or have traveled to areas where *Coccidioides* spp. may be present, especially those who work or participate in activities where soil is disturbed.

Background

Coccidioidomycosis (also known as Valley fever) results from directly inhaling spores of the dimorphic fungus *Coccidioides* spp. (*Coccidioides immitis* and *Coccidioides posadasii*) from soil or airborne dust. Coccidioidomycosis is not transmitted directly from person to person. The fungus *Coccidioides* spp. grows throughout much of the southwestern United States (U.S.), 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 African Americans, Filipinos, pregnant women, adults of older age groups, and people with weakened immune systems[1].

We describe the epidemiology of reported coccidioidomycosis in California in 2018 and present surveillance data for years 2001 through 2018 and demographic data for years 2011 through 2018. Because some persons with coccidioidomycosis experience chronic infection and may be reported more than once, we include only the first report of coccidioidomycosis per person 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[2].

California regulations require local health officers to report cases of coccidioidomycosis to the CDPH. During this surveillance period, the 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[3]. 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 2018 was 18.8 per 100,000 population (7,515 case-patients), which is similar to the incidence of 19.3 per 100,000 population (7,658 case-patients) in 2017 (Table 1 and Figure 1). More case-patients had estimated illness onset in the month of January (1,035 case-patients) than in any other month (Table 2).

In 2018, incidence among males was 23.2 per 100,000 population (4,622 case-patients) and is higher than incidence among females of 14.4 per 100,000 (2,888 case-patients) (Table 3). By age group, the incidence was highest among persons 40 to 59 years of age (25.8 per 100,000; 2,647 case-patients) (Table 4 and Figure 2). Incidence was 6.1 per 100,000 (568 case-patients) among children ages 17 years and younger and 22.6 per 100,000 (6,938 case-patients) among adults ages 18 years and older.

Statewide in 2018, the incidence was highest in Kern County (323.2 per 100,000; 2,937 case-patients). Other counties with high incidence included San Luis Obispo (117.7 per 100,000; 330 case-patients), Kings (114.0 per 100,000; 173 case-patients), Fresno (62.6 per 100,000; 633 case-patients), Tulare (51.9 per 100,000; 248 case-patients), Monterey (51.2 per 100,000; 229 case-patients), and Merced (48.3 per 100,000; 135 case-patients) (Figure 3). Approximately 62.3 percent of all California case-patients in 2018 resided in these counties at the time of illness onset.

Incidence by race/ethnicity was not calculated due to missing race/ethnicity data for 34.5% of reported cases in 2011 through 2018. However, for cases with complete race/ethnicity data, a higher percentage of cases reported Hispanic ethnicity (47.2%) and Black non-Hispanic race (8.8%) than would be expected based on the overall demographic profile of California (38.9% Hispanic, 5.7% Black non-Hispanic) (Table 5 and Figure 4).

Comments

In 2018, incidence of coccidioidomycosis was 18.8 per 100,000 population, which is the second highest annual incidence reported in California since coccidioidomycosis became individually reportable in 1995. Incidence of coccidioidomycosis in California has increased 213 percent from 2014 (6.0 per 100,000; 2,322) to 2018 (18.8 per 100,000; 7,515). Some additional cases for 2018 may be reported after April 2, 2019 due to delays in diagnosis and reporting; future 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 2018 are similar to those reported in coccidioidomycosis epidemiologic summaries from earlier years as described previously[4].

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 healthcare 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[1,5].

For more information on coccidioidomycosis, including education materials and data from previous years, please visit the CDPH Coccidioidomycosis webpage at:

https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx

Prepared by Alyssa Nguyen, Gail Sondermeyer Cooksey, Yanyi Djamba, Seema Jain, 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, 2011-2018

	YEAR OF ESTIMATED ILLNESS ONSET															
	2011		2012		2013		2014		2015		2016		2017		2018	
JURISDICTION	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
CALIFORNIA TOTAL	5,225	13.9	4,122	10.8	3,324	8.7	2,322	6.0	3,177	8.1	5,557	14.1	7,658	19.3	7,515	18.8
ALAMEDA COUNTY TOTAL	25	1.6	22	1.4	29	1.8	25	1.6	39	2.4	48	2.9	67	4.1	76	4.6
ALAMEDA	23	1.6	20	1.4	28	1.9	25	1.7	38	2.5	48	3.2	67	4.4	75	4.9
BERKELEY	2	1.8*	2	1.7*	1	0.9*	0	-	1	0.8*	0	-	0	-	1	0.8*
ALPINE	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
AMADOR	3	7.9*	1	2.6*	0	-	0	-	4	10.7*	0	-	1	2.7*	7	18.8*
BUTTE	4	1.8*	4	1.8*	4	1.8*	1	0.4*	0	-	3	1.3*	4	1.8*	1	0.4*
CALAVERAS	1	2.2*	2	4.4*	3	6.6*	1	2.2*	1	2.2*	1	2.2*	0	-	1	2.2*
COLUSA	1	4.6*	0	-	0	-	0	-	1	4.5*	1	4.5*	0	-	2	8.8*
CONTRA COSTA	31	2.9	30	2.8	39	3.6	29	2.6	50	4.5	66	5.8	89	7.8	108	9.4
DEL NORTE	0	-	0	-	0	-	0	-	0	-	1	3.7*	0	-	0	-
EL DORADO	0	-	1	0.6*	1	0.5*	2	1.1*	1	0.5*	2	1.1*	5	2.7*	2	1.1*
FRESNO	728	77.3	481	50.6	312	32.5	159	16.4	276	28.2	612	61.9	825	82.5	633	62.6
GLENN	0	-	0	-	0	-	0	-	0	-	0	-	2	6.8*	1	3.4*
HUMBOLDT	1	0.7*	0	-	0	-	0	-	1	0.7*	0	-	2	1.5*	0	-
IMPERIAL	5	2.8*	12	6.7*	5	2.8*	1	0.5*	2	1.1*	11	5.9*	15	8.0*	16	8.4*
INYO	0	-	0	-	0	-	1	5.4*	0	-	0	-	0	-	0	-
KERN	2,565	301.9	1,855	216.2	1,659	191.1	931	106.2	1,083	122.6	2,253	253.7	2,779	309.2	2,937	323.2
KINGS	375	247.6	242	161.3	108	71.8	78	52.2	104	69.4	235	157.5	273	181.3	173	113.9
LAKE	0	-	0	-	0	-	0	-	0	-	2	3.1*	2	3.1*	1	1.5*
LASSEN	0	-	0	-	0	-	0	-	9	29.1*	6	19.6*	0	-	1	3.3*
LOS ANGELES COUNTY TOTAL	316	3.2	335	3.4	345	3.4	403	4.0	558	5.5	731	7.2	932	9.1	1,014	9.8
LOS ANGELES	302	3.3	312	3.3	336	3.6	383	4.0	521	5.5	714	7.5	904	9.4	997	10.3
LONG BEACH	13	2.8*	21	4.5	8	1.7*	19	4.0	36	7.5	15	3.1*	19	4.0	12	2.5*
PASADENA	1	0.7*	2	1.4*	1	0.7*	1	0.7*	1	0.7*	2	1.4*	9	6.3*	5	3.5*
MADERA	44	29.0	24	15.9	46	30.2	35	22.7	55	35.5	50	32.2	65	41.3	58	36.4
MARIN	3	1.2*	1	0.4*	6	2.3*	1	0.4*	1	0.4*	2	0.8*	4	1.5*	3	1.1*
MARIPOSA	0	-	0	-	0	-	0	-	2	11.1*	3	16.6*	3	16.7*	1	5.6*
MENDOCINO	1	1.1*	0	-	1	1.1*	0	-	1	1.1*	0	-	1	1.1*	0	-
MERCED	53	20.4	61	23.2	54	20.4	51	19.1	90	33.3	78	28.6	104	37.6	135	48.3
MODOC	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
MONO	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	7.2*
MONTEREY	67	16.0	76	17.9	69	16.2	23	5.4	38	8.7	79	18.0	191	43.1	229	51.2
NAPA	1	0.7*	3	2.2*	0	-	0	-	0	-	2	1.4*	1	0.7*	1	0.7*
NEVADA	1	1.0*	2	2.0*	0	-	0	-	0	-	0	-	0	-	1	1.0*
ORANGE	83	2.7	115	3.7	72	2.3	77	2.5	172	5.4	109	3.4	231	7.2	196	6.1
PLACER	2	0.6*	7	1.9*	3	0.8*	0	-	5	1.3*	3	0.8*	2	0.5*	3	0.8*
PLUMAS	1	5.0*	0	-	2	10.1*	1	5.1*	0	-	0	-	0	-	2	10.3*
RIVERSIDE	72	3.2	56	2.5	34	1.5	38	1.6	59	2.5	64	2.7	133	5.6	137	5.6
SACRAMENTO	41	2.9	5	0.3*	9	0.6*	18	1.2*	23	1.5	27	1.8	40	2.6	42	2.7
SAN BENITO	2	3.6*	0	-	1	1.8*	1	1.7*	0	-	3	5.2*	4	6.8*	3	5.1*
SAN BERNARDINO	50	2.4	57	2.7	49	2.3	33	1.6	28	1.3	39	1.8	88	4.1	96	4.4
SAN DIEGO	148	4.7	139	4.4	93	2.9	88	2.7	113	3.5	132	4.0	274	8.3	273	8.2
SAN FRANCISCO	9	1.1*	3	0.4*	18	2.1*	4	0.5*	13	1.5*	7	0.8*	14	1.6*	12	1.4*
SAN JOAQUIN	111	16.0	73	10.4	51	7.2	61	8.5	98	13.5	193	26.1	201	26.8	240	31.6
SAN LUIS OBISPO	171	63.3	108	39.6	53	19.4	27	9.8	64	23.1	258	92.8	434	155.8	330	117.7
SAN MATEO	9	1.2*	16	2.2*	9	1.2*	3	0.4*	5	0.7*	4	0.5*	18	2.3*	13	1.7*
SANTA BARBARA	19	4.5	26	6.0	23	5.3	15	3.4*	25	5.6	62	13.9	116	25.8	105	23.1
SANTA CLARA	29	1.6	26	1.4	17	0.9*	12	0.6*	17	0.9*	39	2.0	39	2.0	76	3.9
SANTA CRUZ	3	1.1*	10	3.7*	5	1.8*	3	1.1*	1	0.4*	9	3.3*	8	2.9*	12	4.3*
SHASTA	2	1.1*	0	-	0	-	1	0.6*	0	-	2	1.1*	0	-	0	-
SIERRA	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
SISKIYOU	0	-	0	-	1	2.2*	0	-	0	-	2	4.5*	2	4.5*	0	-
SOLANO	15	3.6*	8	1.9*	6	1.4*	5	1.2*	19	4.4	16	3.7*	18	4.1*	17	3.8*
SONOMA	4	0.8*	4	0.8*	1	0.2*	5	1.0*	1	0.2*	2	0.4*	3	0.6*	3	0.6*
STANISLAUS	58	11.2	62	11.8	39	7.4	36	6.8	49	9.1	81	14.9	122	22.1	76	13.6
SUTTER	1	1.0*	1	1.0*	1	1.0*	0	-	0	-	1	1.0*	3	3.0*	0	-
TEHAMA	0	-	1	1.6*	1	1.6*	1	1.6*	0	-	1	1.6*	0	-	1	1.5*
TRINITY	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	7.4*
TULARE	128	28.6	154	34.1	115	25.2	107	23.3	116	25.0	241	51.5	281	59.4	248	51.9
TUOLUMNE	3	5.4*	6	10.9*	0	-	0	-	1	1.8*	6	11.1*	6	11.1*	2	3.7*
VENTURA	34	4.1	90	10.8	39	4.6	42	5.0	48	5.6	64	7.5	249	29.1	221	25.7
YOLO	4	2.0*	3	1.5*	0	-	3	1.4*	4	1.9*	6	2.8*	4	1.8*	2	0.9*
YUBA	1	1.4*	0	-	1	1.3*	0	-	0	-	0	-	3	3.9*	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, 2011-2018

	YEAR OF ESTIMATED ILLNESS ONSET							
MONTH	2011	2012	2013	2014	2015	2016	2017	2018
TOTAL	5,225	4,122	3,324	2,322	3,177	5,557	7,658	7,515
JANUARY	417	515	267	256	218	290	371	1,035
FEBRUARY	251	511	235	226	181	277	285	618
MARCH	284	385	218	158	202	236	303	562
APRIL	294	335	267	180	231	276	277	482
MAY	307	318	366	191	175	207	335	540
JUNE	349	312	285	168	212	307	450	490
JULY	441	296	286	199	295	388	498	589
AUGUST	554	323	284	169	259	616	737	628
SEPTEMBER	629	301	233	193	328	731	837	568
OCTOBER	634	269	293	192	405	957	1,214	704
NOVEMBER	554	301	323	185	351	727	1,238	702
DECEMBER	511	256	267	205	320	545	1,113	597

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

Table 3. Coccidioidomycosis, Cases and Rates by Sex, California, 2011-2018

	YEAR OF ESTIMATED ILLNESS ONSET															
	2011		2012		2013		2014		2015		2016		2017		2018	
SEX	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	5,225	13.9	4,122	10.8	3,324	8.7	2,322	6.0	3,177	8.1	5,557	14.1	7,658	19.3	7,515	18.8
FEMALE	1,775	9.4	1,372	7.2	1,180	6.1	865	4.4	1,170	6.0	2,054	10.4	2,728	13.7	2,888	14.4
MALE	3,439	18.4	2,719	14.4	2,129	11.2	1,455	7.5	2,004	10.3	3,498	17.9	4,921	25.0	4,622	23.2
UNKNOWN	11	-	31	-	15	-	2	-	3	-	5	-	9	-	5	-

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, 2011-2018

	YEAR OF ESTIMATED ILLNESS ONSET															
	2011		2012		2013		2014		2015		2016		2017		2018	
AGE GROUP	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	5,225	13.9	4,122	10.8	3,324	8.7	2,322	6.0	3,177	8.1	5,557	14.1	7,658	19.3	7,515	18.8
0-4	56	2.2	49	1.9	22	0.9	9	0.4*	18	0.7*	32	1.3	60	2.4	58	2.4
5-19	595	7.5	400	5.0	290	3.6	163	2.0	234	2.9	565	7.1	757	9.5	635	8.0
20-39	1,746	16.4	1,340	12.5	1,011	9.4	637	5.9	860	7.9	1,669	15.3	2,246	20.5	2,213	20.1
40-59	1,862	18.3	1,492	14.5	1,259	12.2	875	8.5	1,207	11.7	2,002	19.4	2,762	26.9	2,647	25.8
60-79	796	15.6	692	13.0	628	11.3	542	9.3	715	11.8	1,092	17.4	1,575	24.2	1,674	24.8
80+	150	12.1	132	10.5	96	7.5	86	6.6	131	9.7	190	13.7	254	17.8	279	19.0
UNKNOWN	20	-	17	-	18	-	10	-	12	-	7	-	4	-	9	-

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, 2011-2018

	YEAR OF ESTIMATED ILLNESS ONSET							
RACE/ETHNICITY	2011	2012	2013	2014	2015	2016	2017	2018
TOTAL	5,225	4,122	3,324	2,322	3,177	5,557	7,658	7,515
WHITE, NON-HISPANIC	916	857	725	577	800	1,247	1,707	1,681
HISPANIC	1,312	1,225	1,000	748	868	1,744	2,229	2,177
ASIAN/PACIFIC ISLANDER	171	166	132	112	160	270	396	381
BLACK, NON-HISPANIC	360	259	176	122	201	275	346	378
AMERICAN INDIAN/ALASKA NATIVE	13	15	18	13	12	17	38	15
MULTIPLE RACE	6	7	5	8	5	21	15	8
OTHER	53	56	45	35	107	163	571	506
UNKNOWN	2,394	1,537	1,223	707	1,024	1,820	2,356	2,369

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, 2001-2018

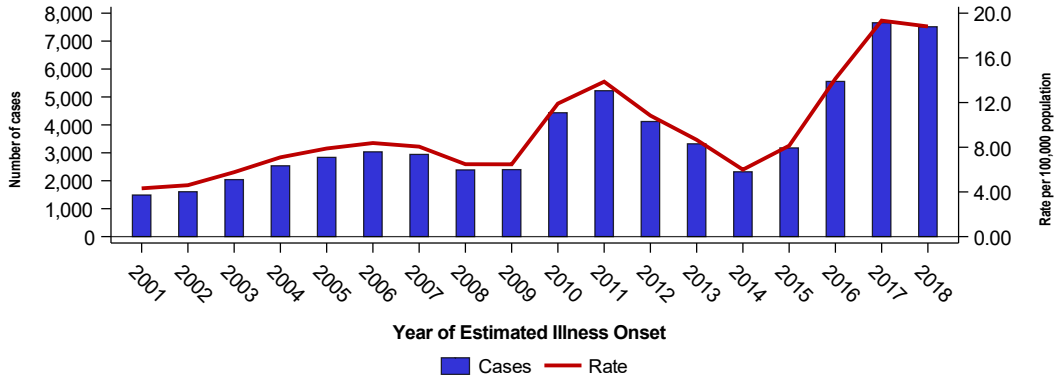
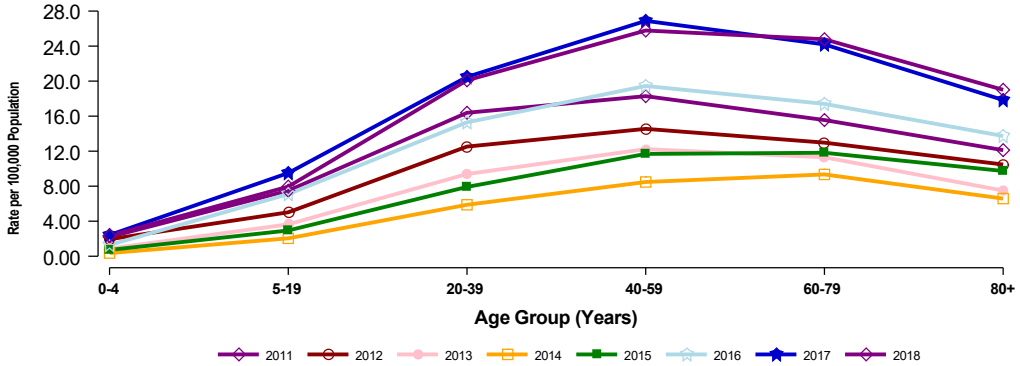


Figure 2. Coccidioidomycosis Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2011-2018



Coccidioidomycosis

Figure 3. Coccidioidomycosis, Annual Incidence by County, California, 2011-2018

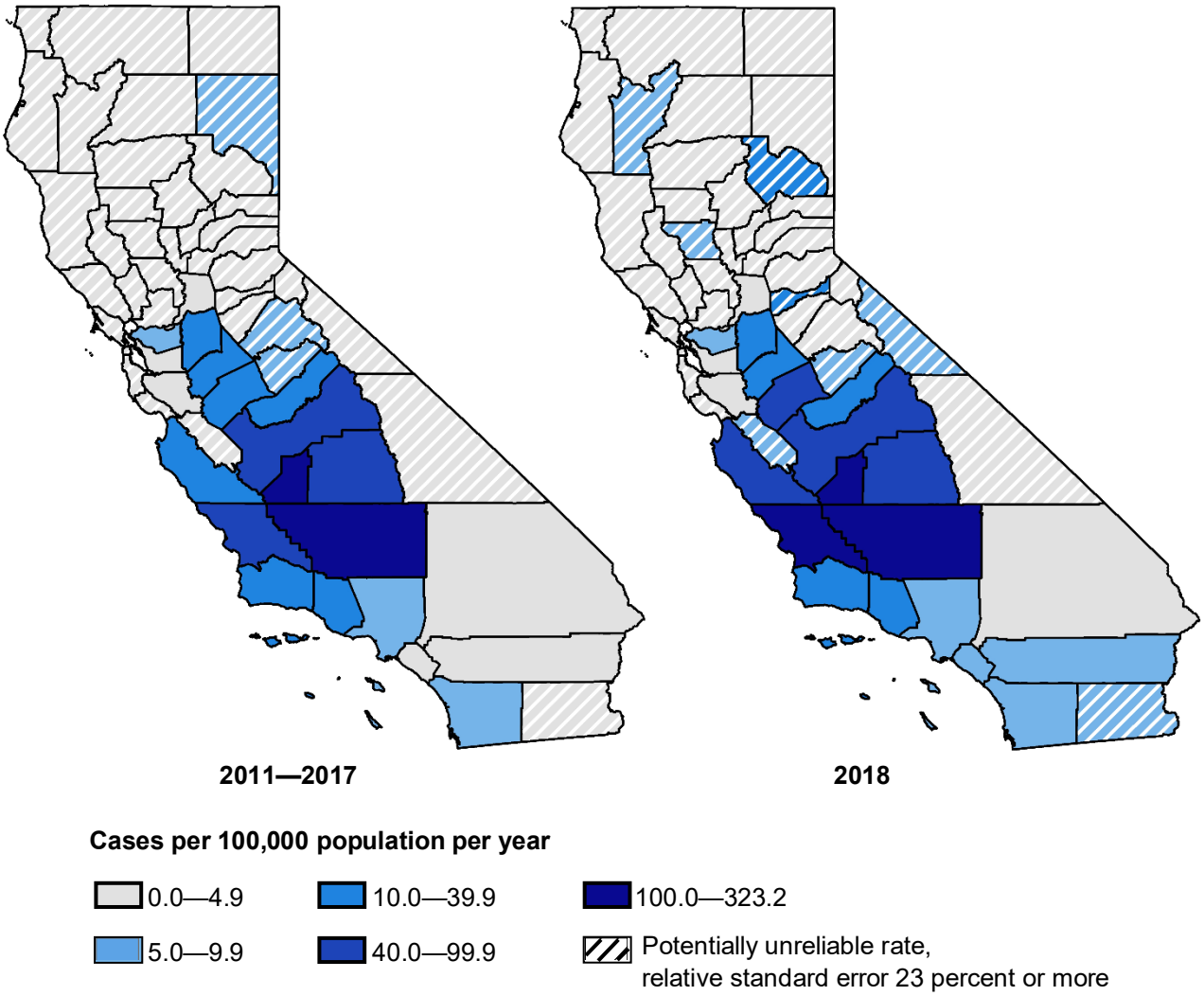
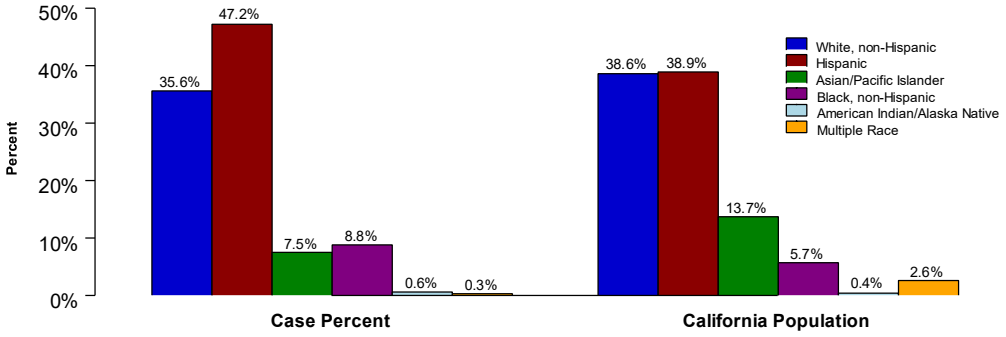


Figure 4. Coccidioidomycosis Cases and Population by Race/Ethnicity, California, 2011-2018



34.5% (n=13430) of reported incidents of Coccidioidomycosis did not identify race/ethnicity and 3.9% (n=1536) 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.

Epidemiologic Summary of Coccidioidomycosis in California, 2018: Technical Notes

Background

The California Department of Public Health (CDPH) Infectious Diseases Branch (IDB) maintains a passive reporting system for a list of communicable disease cases and outbreaks, including coccidioidomycosis, mandated by state law and regulation[2]. Health care 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-- CDPH Infectious Disease Branch Epidemiologic Summary of Coccidioidomycosis in California, 2018-- are incident cases of coccidioidomycosis with estimated illness onset dates from January 1, 2001 through December 31, 2018. These data were extracted from California Confidential Morbidity Reports that LHDs submitted to CDPH by April 2, 2019. The Council of State and Territorial Epidemiologists (CSTE) surveillance case definition, requires both clinical and laboratory criteria, for reporting cases as confirmed.[3] 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, we included only the first report of coccidioidomycosis per person based on estimated illness onset using a probabilistic de-duplication method spanning multiple surveillance reporting years.

Population data source

For the 2018 Epidemiologic Summary of Coccidioidomycosis in California, we used State of California, Department of Finance (DOF) projections and estimations population data. [6,7,8]

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

We defined mutually exclusive race/ethnicity categories as follows: Hispanic (of any, including unknown race); White, non-Hispanic; Black, non-Hispanic; 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

We reported case totals and incidence rates per 100,000 population 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/√number of cases
- Relative standard error = SE/IR x 100

We defined an incidence estimate as unreliable if the relative standard error was 23 percent or more (a threshold recommended by the National Center for Health Statistics)[9].

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 Rates by Health Jurisdiction, California, 2011-2018*
2. *Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2011-2018*
3. *Coccidioidomycosis, Cases and Rates by Sex, California, 2011-2018*
4. *Coccidioidomycosis, Cases and Rates by Age Group, California, 2011-2018*
5. *Coccidioidomycosis, Cases by Race/Ethnicity, California, 2011-2018*

Figures:

1. *Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2001-2018*
2. *Coccidioidomycosis, Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2011-2018*
3. *Coccidioidomycosis, Annual Incidence by County, California, 2011-2018*
4. *Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2011-2018*

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 2011-2018 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 eight-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

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

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

3. Council of State and Territorial Epidemiologists. Coccidioidomycosis (Valley fever) (Coccidiodes spp.) position statement 10-ID-04, 2011 [cited 9 Jul 2018]. http://wwwn.cdc.gov/nndss/script/casedef.aspx?CondYrID=643&DatePub=1/1/2011%2012:00:00%20AM

4. Epidemiological Summaries of Selected General Communicable Diseases in California, 2001-2008 & 2009-2012: Coccidioidomycosis: 2001-2008. https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CocciEpiSummary09-12.pdf

   https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/EpiSummariesofSelectedCommDiseasesinCA2001-2008.pdf#page=17

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

6. 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 2018.

7. State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011–2018, with 2010 Benchmark. Sacramento, California, May 2018.

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

9. 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** July 2019

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
https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/SSS.aspx