EPIDEMIOLOGIC SUMMARY OF
COCCIDIOIDOMYCOSIS IN CALIFORNIA, 2017

INFECTIOUS DISEASES BRANCH
DIVISION OF COMMUNICABLE DISEASE CONTROL
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CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

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Epidemiologic Summary of Coccidioidomycosis in California, 2017

Key Findings and Public Health Messages

As of May 31, 2018, the California Department of Public Health (CDPH) received 7,466 reports of incident cases of coccidioidomycosis with estimated illness onset dates in 2017.

The incidence of coccidioidomycosis in 2017 was 18.8 per 100,000 population, which is the highest annual incidence reported in California since coccidioidomycosis became individually reportable in 1995. Following a 73 percent increase in the incidence of coccidioidomycosis from 2015 (8.1 per 100,000; 3,154 case-patients) to 2016 (14.0 per 100,000; 5,509 case-patients), the incidence of coccidioidomycosis increased another 34 percent from 2016 to 2017 (18.8 per 100,000; 7,466 case-patients).

Statewide, incidence was highest in 2017 in Kern (305.7 per 100,000; 2,748 case-patients), Kings (172.7 per 100,000; 260 case-patients), San Luis Obispo (150.4 per 100,000; 419 case-patients), Fresno (82.4 per 100,000; 824 case-patients), Tulare (58.2 per 100,000; 275 case-patients), Madera (41.3 per 100,000; 65 case-patients), and Monterey (41.1 per 100,000; 182 case-patients) counties.

Consistent with previous years, the highest incidence in 2017 was among males (24.4 per 100,000; 4,806 case-patients) and persons 40 to 59 years of age (26.3 per 100,000; 2,704 case-patients). The highest number of incident cases had an estimated illness onset in the month of November (1,204 case-patients) with 66.9 percent of case-patients having illness onset between August and December 2017.

To decrease the risk of infection, persons living, working, or traveling in coccidioidomycosis endemic areas, 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 endemic areas, 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* grows throughout much of the southwestern United States (U.S.), and, in California, it is endemic in the 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 influenza-like illness, 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 2017 and present surveillance data for years 2001 through 2017 and demographic data for years 2012 through 2017. 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 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. The CDPH defines a confirmed case per the Council of State and Territorial Epidemiologists (CSTE) case definition 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]. Some local health departments confirm cases using laboratory results only; CDPH accepts all cases confirmed by local health departments.

Epidemiology of coccidioidomycosis in California

As of May 31, 2018, the CDPH received reports of 7,466 incident cases of coccidioidomycosis with estimated illness onset dates in 2017. Incidence of coccidioidomycosis in 2017 was 18.8 per 100,000 population, an increase of 34 percent compared to the incidence of 14.0 per 100,000 population (5.509 case-patients) in 2016. (Table 1 and Figure 1). The highest number of incident cases had estimated illness onset in the month of November (1,204 case-patients), with 66.9 percent of cases having onset between August and December 2017 (Table 2).

In 2017, incidence among males was 24.4 per 100,000 population (4,806 case- patients) as compared to 13.3 per 100,000 in females (2,648 case-patients) (Table 3). The highest incidence occurred among persons 40 to 59 years of age (26.3 per 100,000; 2,704 case-patients) (Table 4 and Figure 2). Incidence was 7.0 per 100,000 (645 case-patients) among the pediatric population (ages 17 years and younger) and 22.5 per 100,000 among adults (ages 18 years and older) (6,816 case-patients). Incidence by race/ethnicity was not calculated due to missing race/ethnicity data for one third of reported cases (33.2 percent). However, for 5,156 cases with complete race/ethnicity data, a higher percentage of cases reported Hispanic ethnicity (44.4%) and Black non-Hispanic race (7.9%) than would be expected based on the overall demographic profile of California (38.9% Hispanic, 5.7% Black non-Hispanic) (Table 5 and Figure 3).

Statewide, incidence was highest in Kern County (305.7 per 100,000; 2,748 case-patients). Other counties with high incidence included Kings (172.7 per 100,000; 260 case-patients), San Luis Obispo (150.4 per 100,000; 419 case-patients), Fresno (82.4 per 100,000; 824 case-patients), Tulare (58.2 per 100,000; 275 case-patients), Madera (41.3 per 100,000; 65 case-patients), and Monterey (41.1 per 100,000; 182 case-patients) (Figure 4). These counties are in *Coccidioides*-endemic areas and approximately 63.9 percent of case-patients resided in these counties at the time of illness onset.

Comments

Incidence of coccidioidomycosis in 2017 was 18.8 per 100,000 population, which is the 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; 2,316) to 2017 (18.8 per 100,000; 7,466).

Age group, race/ethnicity, gender, and county epidemiologic profiles of incident cases with estimated illness onset dates in 2017 are similar to those reported in coccidioidomycosis epidemiologic summaries from earlier years as described previously[4].

The causes of the increase of coccidioidomycosis in 2017 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 highly endemic in 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 of severe cases. To decrease the risk of infection, persons living, working, or traveling in coccidioidomycosis endemic areas, 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 endemic areas, 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

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Table 1. Coccidioidomycosis, Cases and Rates by Health Jurisdiction, California, 2012–2017

	YEAR OF ESTIMATED ILLNESS ONSET											
	2012		**2013**		**2014**		**2015**		**2016**		**2017**	
JURISDICTION	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
CALIFORNIA TOTAL	4,120	10.8	3,318	8.6	2,316	6.0	3,154	8.1	5,509	14.0	7,466	18.8
ALAMEDA COUNTY TOTAL	23	1.5	28	1.8	25	1.6	39	2.4	47	2.9	64	3.9
ALAMEDA	21	1.5	27	1.8	25	1.7	38	2.5	47	3.1	64	4.2
BERKELEY	2	1.7*	1	0.9*	0	-	1	0.8*	0	-	0	-
ALPINE	0	-	0	-	0	-	0	-	0	-	0	-
AMADOR	1	2.6*	0	-	0	-	4	10.7*	0	-	1	2.7*
BUTTE	4	1.8*	4	1.8*	1	0.4*	0	-	3	1.3*	4	1.8*
CALAVERAS	2	4.4*	3	6.6*	1	2.2*	0	-	1	2.2*	0	-
COLUSA	0	-	0	-	0	-	1	4.5*	1	4.5*	0	-
CONTRA COSTA	30	2.8	39	3.6	29	2.6	50	4.5	65	5.8	87	7.6
DEL NORTE	0	-	0	-	0	-	0	-	1	3.7*	0	-
EL DORADO	1	0.6*	1	0.5*	2	1.1*	1	0.5*	2	1.1*	4	2.1*
FRESNO	480	50.5	311	32.4	159	16.4	274	28.0	611	61.8	824	82.4
GLENN	0	-	0	-	0	-	0	-	0	-	2	6.8*
HUMBOLDT	0	-	0	-	0	-	1	0.7*	0	-	2	1.5*
IMPERIAL	12	6.7*	5	2.8*	1	0.5*	2	1.1*	9	4.8*	12	6.4*
INYO	0	-	0	-	1	5.4*	0	-	0	-	0	-
KERN	1,855	216.2	1,659	191.1	931	106.2	1,082	122.5	2,250	253.4	2,748	305.7
KINGS	241	160.6	107	71.2	78	52.2	104	69.4	235	157.5	260	172.7
LAKE	0	-	0	-	0	-	0	-	2	3.1*	2	3.1*
LASSEN	0	-	0	-	0	-	9	29.1*	6	19.6*	0	-
LOS ANGELES COUNTY TOTAL	335	3.4	344	3.4	403	4.0	558	5.5	732	7.2	934	9.1
LOS ANGELES	312	3.3	335	3.5	383	4.0	521	5.4	715	7.5	906	9.4
LONG BEACH	21	4.5	8	1.7*	19	4.0	36	7.5	15	3.1*	19	4.0
PASADENA	2	1.4*	1	0.7*	1	0.7*	1	0.7*	2	1.4*	9	6.3*
MADERA	24	15.9	46	30.2	35	22.7	55	35.5	50	32.2	65	41.3
MARIN	1	0.4*	6	2.3*	1	0.4*	0	-	2	0.8*	4	1.5*
MARIPOSA	0	-	0	-	0	-	2	11.1*	3	16.6*	2	11.1*
MENDOCINO	0	-	1	1.1*	0	-	1	1.1*	0	-	1	1.1*
MERCED	60	22.8	54	20.4	48	17.9	77	28.5	46	16.9	47	17.0
MODOC	0	-	0	-	0	-	0	-	0	-	0	-
MONO	0	-	0	-	0	-	0	-	0	-	0	-
MONTEREY	76	17.9	69	16.2	23	5.4	38	8.7	79	18.0	182	41.1
NAPA	3	2.2*	0	-	0	-	0	-	2	1.4*	1	0.7*
NEVADA	2	2.0*	0	-	0	-	0	-	0	-	0	-
ORANGE	115	3.7	72	2.3	77	2.5	172	5.4	108	3.4	226	7.1
PLACER	7	1.9*	3	0.8*	0	-	5	1.3*	3	0.8*	2	0.5*
PLUMAS	0	-	2	10.1*	1	5.1*	0	-	0	-	0	-
RIVERSIDE	56	2.5	34	1.5	38	1.6	59	2.5	63	2.7	133	5.6
SACRAMENTO	5	0.3*	9	0.6*	18	1.2*	22	1.5	25	1.7	38	2.5
SAN BENITO	0	-	1	1.8*	1	1.7*	0	-	3	5.2*	3	5.1*
SAN BERNARDINO	57	2.7	49	2.3	33	1.6	28	1.3	39	1.8	85	3.9
SAN DIEGO	139	4.4	93	2.9	88	2.7	112	3.4	132	4.0	274	8.3
SAN FRANCISCO	3	0.4*	18	2.1*	4	0.5*	13	1.5*	7	0.8*	13	1.5*
SAN JOAQUIN	74	10.6	52	7.4	61	8.5	99	13.6	193	26.1	200	26.7
SAN LUIS OBISPO	108	39.6	52	19.0	25	9.1	63	22.8	258	92.8	419	150.4
SAN MATEO	16	2.2*	9	1.2*	3	0.4*	3	0.4*	4	0.5*	15	1.9*
SANTA BARBARA	26	6.0	23	5.3	15	3.4*	25	5.6	62	13.9	104	23.1
SANTA CLARA	26	1.4	17	0.9*	12	0.6*	17	0.9*	39	2.0	38	2.0
SANTA CRUZ	9	3.4*	5	1.8*	3	1.1*	1	0.4*	9	3.3*	7	2.5*
SHASTA	0	-	0	-	1	0.6*	0	-	2	1.1*	0	-
SIERRA	0	-	0	-	0	-	0	-	0	-	0	-
SISKIYOU	0	-	1	2.2*	0	-	0	-	2	4.5*	2	4.5*
SOLANO	8	1.9*	6	1.4*	4	0.9*	19	4.4	13	3.0*	9	2.1*
SONOMA	4	0.8*	1	0.2*	5	1.0*	1	0.2*	2	0.4*	3	0.6*
STANISLAUS	62	11.8	39	7.4	36	6.8	49	9.1	81	14.9	118	21.4
SUTTER	1	1.0*	1	1.0*	0	-	0	-	1	1.0*	3	3.0*
TEHAMA	1	1.6*	1	1.6*	1	1.6*	0	-	1	1.6*	0	-
TRINITY	0	-	0	-	0	-	0	-	0	-	0	-
TULARE	154	34.1	113	24.8	107	23.3	115	24.8	240	51.3	275	58.2
TUOLUMNE	6	10.9*	0	-	0	-	1	1.8*	6	11.1*	6	11.1*
VENTURA	90	10.8	39	4.6	42	5.0	48	5.6	64	7.5	240	28.0
YOLO	3	1.5*	0	-	3	1.4*	4	1.9*	5	2.3*	4	1.8*
YUBA	0	-	1	1.3*	0	-	0	-	0	-	3	3.9*

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 Technical Notes.

Table 2. Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2012–2017

MONTH OF ESTIMATED ONSET	YEAR OF ESTIMATED ILLNESS ONSET					
	2012	2013	2014	2015	2016	2017
TOTAL	4,120	3,318	2,316	3,154	5,509	7,466
JANUARY	517	266	253	217	286	370
FEBRUARY	510	235	225	181	271	280
MARCH	385	216	158	199	236	297
APRIL	335	267	179	228	272	270
MAY	318	366	191	171	206	326
JUNE	311	284	168	212	305	436
JULY	296	285	199	294	382	489
AUGUST	323	283	169	258	610	719
SEPTEMBER	301	233	193	325	729	817
OCTOBER	268	293	191	403	948	1,186
NOVEMBER	300	323	185	348	723	1,204
DECEMBER	256	267	205	318	541	1,072

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

Table 3. Coccidioidomycosis, Cases and Rates by Sex, California, 2012–2017

	YEAR OF ESTIMATED ILLNESS ONSET											
	2012		2013		2014		2015		2016		2017	
SEX	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	4,120	10.8	3,318	8.6	2,316	6.0	3,154	8.1	5,509	14.0	7,466	18.8
FEMALE	1,370	7.2	1,181	6.1	863	4.4	1,160	5.9	2,039	10.3	2,648	13.3
MALE	2,716	14.4	2,121	11.1	1,449	7.5	1,990	10.2	3,465	17.7	4,806	24.4

Rates are expressed as cases per 100,000 population per year.
Case-patients who reported unknown or other sex accounted for 34 or fewer cases per year
For inclusion/exclusion criteria, please refer to Technical Notes.

Table 4. Coccidioidomycosis, Cases and Rates by Age Group, California, 2012–2017

	YEAR OF ESTIMATED ILLNESS ONSET											
	2012		2013		2014		2015		2016		2017	
AGE GROUP	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE	CASES	RATE
TOTAL	4,120	10.8	3,318	8.6	2,316	6.0	3,154	8.1	5,509	14.0	7,466	18.8
0-4	49	1.9	22	0.9	9	0.4*	18	0.7*	32	1.3	59	2.4
5-19	398	5.0	290	3.6	163	2.0	234	2.9	565	7.1	733	9.2
20-39	1,340	12.5	1,010	9.4	635	5.9	855	7.9	1,660	15.2	2,196	20.0
40-59	1,492	14.5	1,257	12.2	871	8.4	1,195	11.6	1,985	19.3	2,704	26.3
60-79	692	13.0	624	11.2	542	9.3	709	11.7	1,075	17.1	1,529	23.5
80+	132	10.5	96	7.5	85	6.5	131	9.7	185	13.4	240	16.9
UNKNOWN	17	-	19	-	11	-	12	-	7	-	5	-

Rates are expressed as cases per 100,000 age group population per year.
*Potentially unreliable rate, relative standard error 23 percent or more.
For inclusion/exclusion criteria, please refer to Technical Notes.

Table 5. Coccidioidomycosis, Cases by Race/Ethnicity, California, 2012–2017

| RACE/ETHNICITY	YEAR OF ESTIMATED ILLNESS ONSET					
	2012	2013	2014	2015	2016	2017
TOTAL	4,120	3,318	2,316	3,154	5,509	7,466
ASIAN/PACIFIC ISLANDER	165	132	111	160	268	393
BLACK, NOT HISPANIC	258	176	121	201	275	338
HISPANIC	1,220	991	747	856	1,729	2,124
AMERICAN INDIAN/ALASKAN NATIVE	15	18	13	12	17	35
WHITE, NOT HISPANIC	855	729	573	799	1,237	1,672
OTHER OR MULTI-RACE	64	49	42	110	185	594
UNKNOWN	1,543	1,223	709	1,016	1,798	2,310

33.2% of reported incidences of coccidioidomycosis did not identify race/ethnicity.
For inclusion/exclusion criteria, please refer to Technical Notes.

Figure 1. Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2001–2017
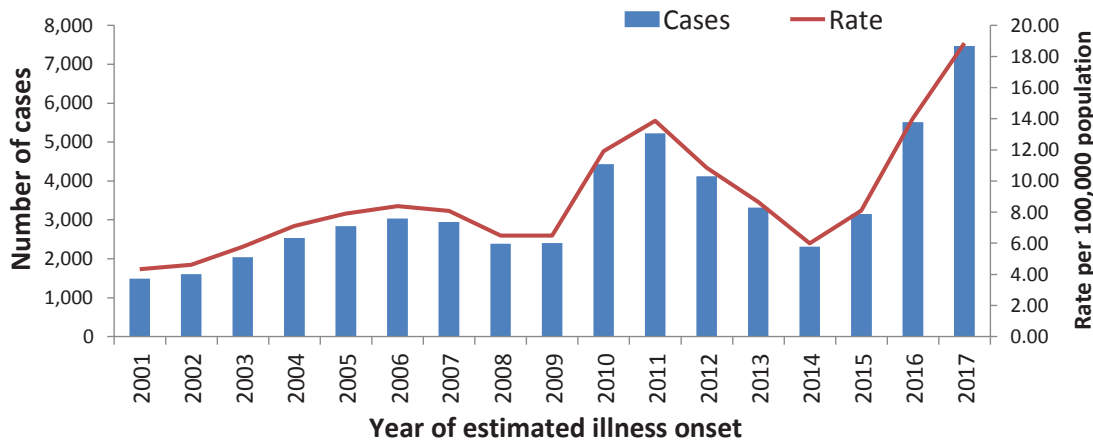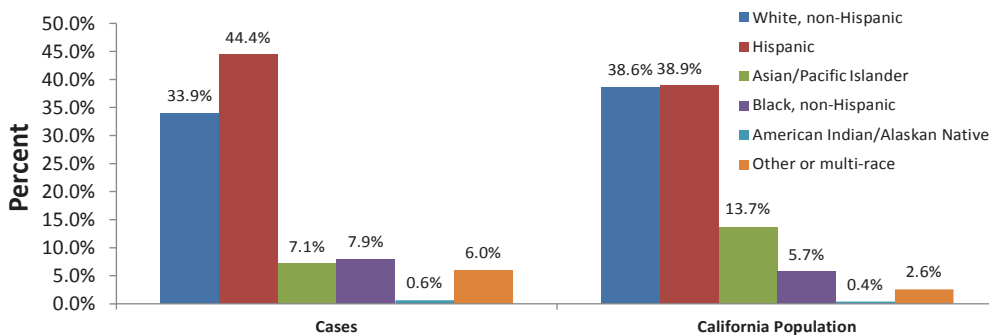

Figure 2. Coccidioidomycosis, Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2012–2017
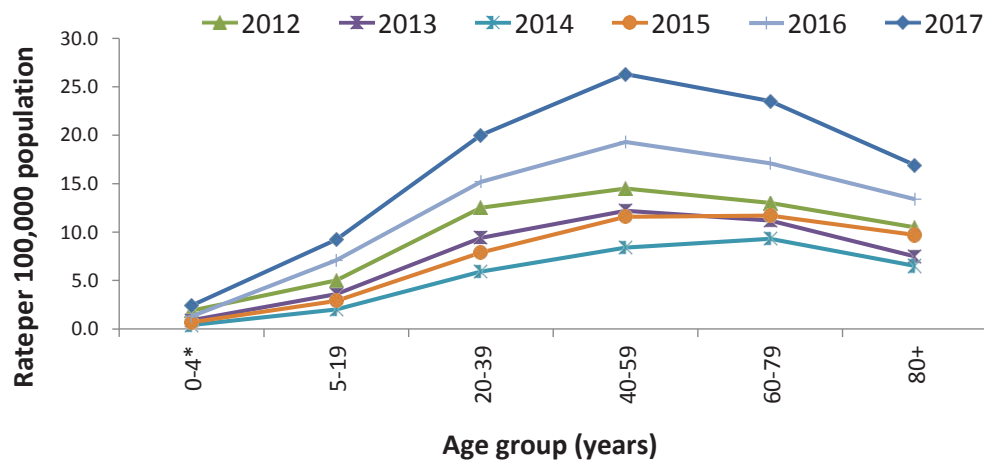
*Potentially unreliable rate, relative standard error 23 percent or more.

Figure 3. Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2012–2017

33.2 % (n=8,599) of reported incidents of Coccidioidomycosis did not identify race/ethnicity and are not included in the Cases calculation. Information presented with a large percentage of missing data should be interpreted with caution.

Figure 4. Coccidioidomycosis, Annual Incidence by County, California, 2012—2017

2012—2016

2017

Cases per 100,000 population per year

0.0—4.9	10.0—39.9	100.0—305.7
5.0—9.9	40.0—99.9	Potentially unreliable rate, relative standard error 23 percent or more

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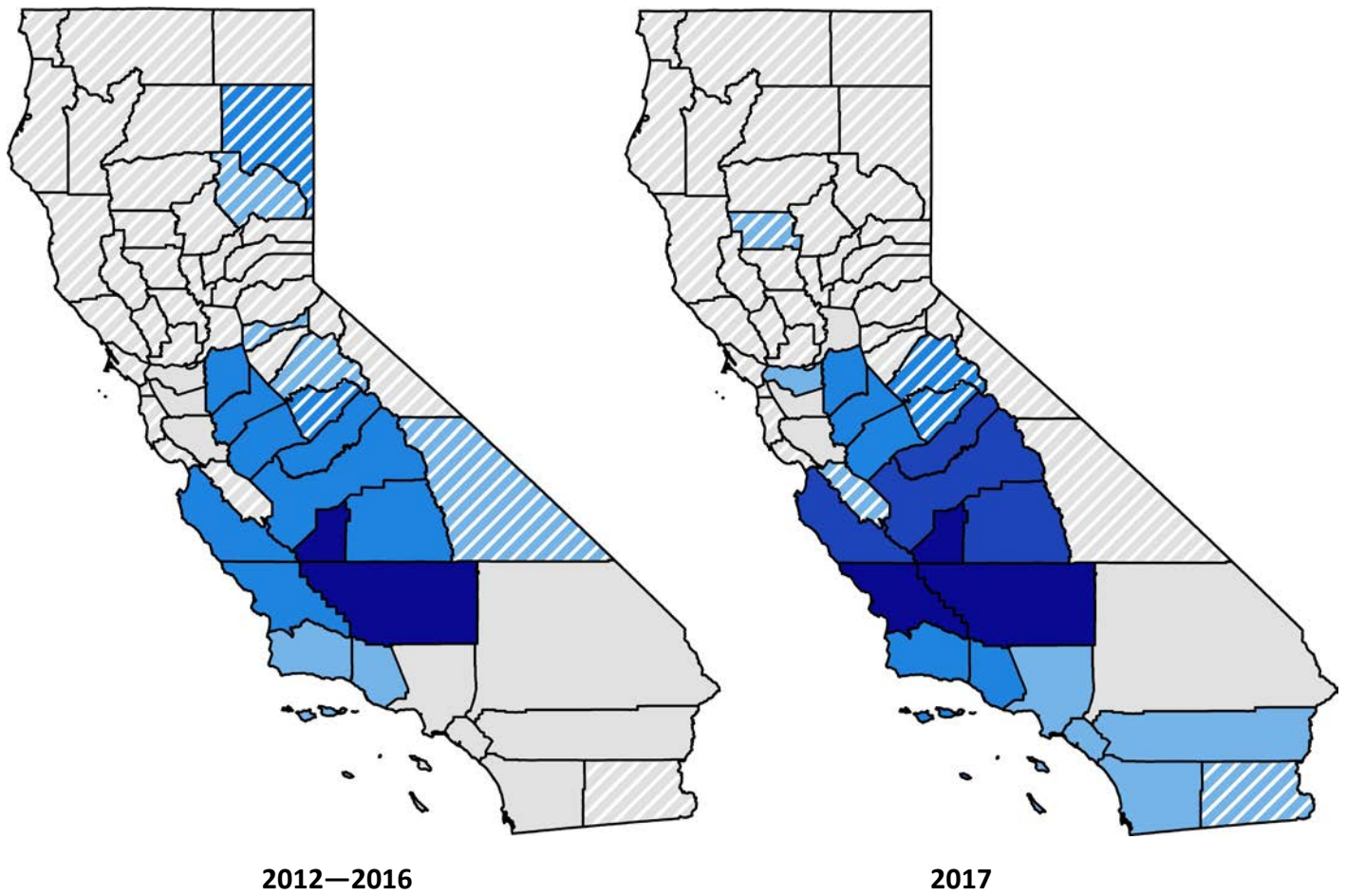
Background

The California Department of Public Health (CDPH) maintains a passive reporting system for a list[1] of communicable disease cases and outbreaks, including coccidioidomycosis. Health care providers and laboratories are mandated to report cases or suspected cases of these diseases to their local health department (LHD). LHDs are mandated in turn to report these cases to CDPH. The 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 data can contribute toward identifying populations at high risk, targeting prevention messages, and assessing the effectiveness of control and prevention measures.

Materials and methods

Case data sources and inclusion criteria

For the 2017 Epidemiologic Summary of Coccidioidomycosis in California, we extracted data on coccidioidomycosis incident cases with estimated illness onset dates from 2001 through 2017 from California Confidential Morbidity Reports that LHDs submitted to CDPH by May 31, 2018. LHDs followed the CSTE surveillance case definition to close and report cases,[2] although some used laboratory results only. 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 process. 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 2017 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 or disease that satisfied the most recent communicable disease surveillance case definition published by the CSTE. Coccidioidomycosis cases included in the report were closed by the LHDs having met case definition criteria for a confirmed case. Some LHDs confirmed cases using laboratory results only; CDPH accepts all cases confirmed by local health departments.

We defined the estimated illness onset date for each case as the date closest to the time when symptoms first appeared. Because date of illness onset may not be recorded, the estimated date of illness onset can range from the first appearance of symptoms to the date the report was made to CDPH. Because illness onset of coccidioidomycosis is often insidious, estimated illness onset was frequently drawn from the diagnosis date.

We defined single race/ethnicity categories as follows: Hispanic (of any, including unknown, race); White, non-Hispanic; Black, non-Hispanic; Asian/Pacific Islander; and American Indian/Alaska Native. Cases with other and unknown race and ethnicity were listed as other/unknown.

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). The formulas used to calculate the relative standard error were:

- 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 x 100

Data analyses

We reported case totals and rates per 100,000 population stratified by estimated year of illness onset, age group, sex, and county.

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 some data in the tables and figures may have been suppressed to minimize depiction of unreliable incidence estimates:

Tables:

1. *Coccidioidomycosis, Cases and Rates by Health Jurisdiction, California, 2012-2017*

2. *Coccidioidomycosis, Cases by Month of Estimated Illness Onset, California, 2012-2017*

3. *Coccidioidomycosis, Cases and Rates by Sex, California, 2012-2017*

4. *Coccidioidomycosis, Cases and Rates by Age Group, California, 2012-2017*

5. *Coccidioidomycosis, Cases by Race/Ethnicity, California, 2012-2017*

Figures:

1. *Coccidioidomycosis, Cases and Incidence Rates by Year of Estimated Illness Onset, California, 2001-2017*

2. *Coccidioidomycosis, Incidence Rates by Age Group and Year of Estimated Illness Onset, California, 2012-2017*

3. *Coccidioidomycosis, Cases and Population by Race/Ethnicity, California, 2012-2017*

4. *Coccidioidomycosis, Annual Incidence by County, California, 2012-2017*

Limitations

Completeness of reporting

The number of reported cases of disease summarized in this report are likely to underestimate the true magnitude of the disease. Among factors that may contribute to under-reporting are: delays in notification, limited collection or appropriate testing of specimens, health care seeking behavior among ill persons, limited resources and competing priorities in LHDs, and lack of reporting by clinicians and laboratories. Among factors that may contribute to an increase in reporting are increased exposure and disease severity, increased disease recognition and testing, increased reporting, recent media or public attention, and active surveillance activities.

From 2012–2017, the proportion of coccidioidomycosis cases with incomplete race/ethnicity data varied from 31 to 37 percent. Race/ethnicity information based on a high percentage of missing data should be interpreted with caution.

Small numbers and incidence estimate variability

All incidence estimates are subject to random error. Random error may be substantial when the number of cases is small (e.g., less than 20) and can obscure differentiation of random fluctuations from true changes in the underlying risk of disease. Incidence estimates based on small numbers should be interpreted with caution.

Incidence estimate comparisons

Comparisons of incidence estimates between geographic entities and over time should be done with caution. Additionally, the limitations previously listed (especially the completeness of reporting and random variability of rates) should be considered when interpreting and comparing incidence estimates.

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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.

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