

Vaccine-Preventable Disease Surveillance in California, 2017



2017

Annual Report

California Department of Public Health
Center for Infectious Diseases
Division of Communicable Disease Control
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Vaccine-Preventable Diseases Epidemiology Section



Edmund G. Brown Jr., Governor
State of California
Michael Wilkening, Secretary
California Health and Human Services Agency
Karen L. Smith, MD, MPH, Director and State Health Officer
California Department of Public Health



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We are grateful to California local health department (LHD) staff for their continued support and tireless efforts in communicable disease surveillance and control and outbreak investigation. We also thank the healthcare providers and laboratorians who diligently reported case information to their LHDs.

PROGRAM OVERVIEW

The Immunization Branch of the California Department of Public Health (CDPH) is responsible for collecting surveillance data on vaccine-preventable diseases (VPDs) for the purposes of determining disease impact, assessing trends in disease occurrence, characterizing affected populations, prioritizing control efforts, and evaluating prevention strategies in California.

VACCINE-PREVENTABLE DISEASE SUMMARIES

Title 17 of the California Code of Regulations (CCR) (Sections 2500, 2505, 2593, 2641-2643, 2800-2812) requires healthcare providers and laboratories to report known or suspected cases of specified communicable diseases and conditions to the local health officer. LHDs in turn report cases to CDPH, and CDPH reports cases to the Centers for Disease Control and Prevention (CDC). Provisions of the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule allow for the disclosure of patient health information without patient authorization for public health activities and purposes (e.g., routine disease reporting). Prompt reporting allows outbreaks to be recognized when control measures are most likely to be effective in preventing additional cases.

In this report, we describe the epidemiology of the following reportable VPDs in California: diphtheria, invasive *Haemophilus influenzae* disease, hepatitis A, acute and perinatal hepatitis B, measles, invasive meningococcal disease, mumps, pertussis, polio, rubella and congenital rubella syndrome, tetanus, and varicella. Vaccine-preventable conditions such as zoster, rotavirus gastroenteritis, human papillomavirus (HPV) infection, and invasive pneumococcal disease (other than pneumococcal meningitis) are not currently reportable under State reporting regulations. Influenza is covered in a separate report available on the [CDPH Influenza Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx>).

Unless otherwise noted, the data in this summary are final annual totals for reported cases of VPDs, as prepared by the CDPH Immunization Branch. Case rates were calculated using population estimates provided by the California Department of Finance (DOF) Demographic Research Unit. To address potential confidentiality concerns with small numbers, county level data are not presented for the following diseases: *Haemophilus influenzae* disease in persons <5 years of age, perinatal hepatitis B, and congenital rubella syndrome. Surveillance case definitions were adapted from position statements published by the Council of State and Territorial Epidemiologists (CSTE).

Last updated on December 20, 2018

Diphtheria

Although respiratory diphtheria is now extraordinarily rare in the United States, it remains endemic in many parts of the world, and unimmunized or incompletely immunized travelers can contract diphtheria when visiting endemic areas (Table 1). The countries with the most reported cases of diphtheria in 2017 were Nigeria and India. The last reported case in the U.S. occurred in 2014. However, *C. diphtheriae* may continue to circulate in areas of the U.S. with previously endemic diphtheria.

Table 1. Countries with endemic diphtheria

Region	Countries
Africa	Algeria, Angola, Egypt, Eritrea, Ethiopia, Guinea, Madagascar, Niger, Nigeria, Sudan, Zambia, and other sub-Saharan countries
Americas	Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Haiti, Paraguay, and Venezuela
Asia/South Pacific	Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Thailand, and Vietnam
Middle East	Afghanistan, Iran, Iraq, Saudi Arabia, Syria, Turkey, and Yemen
Eastern Europe (including some countries in Asia)	Albania, Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan

Surveillance Case Definition (2010)

California healthcare providers and laboratories are required to report known or suspected cases of diphtheria to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable and confirmed diphtheria cases to CDPH using the following case definition:

Case Classification

Probable:

In the absence of a more likely diagnosis, an upper respiratory tract illness with:

- An adherent membrane of the nose, pharynx, tonsils, or larynx; AND
- Absence of laboratory confirmation; AND
- Lack of epidemiologic linkage to a laboratory-confirmed case of diphtheria.

Confirmed:

An upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils, or larynx; and any of the following:

- Isolation of *Corynebacterium diphtheriae* from the nose or throat; OR
- Histopathologic diagnosis of diphtheria; OR
- Epidemiologic linkage to a laboratory-confirmed case of diphtheria.

Epidemiologic Summary

No cases of diphtheria were reported in California in 2017. Only three cases of diphtheria have been reported in California since 1994. The most recent case was reported in 2002.

For more information about diphtheria, please visit the [CDPH Diphtheria Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/diphtheria.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/diphtheria.aspx>).

Haemophilus influenzae Disease

There are six types of *H. influenzae* (types a-f) as well as nontypeable strains, but only *H. influenzae* type b (Hib) is vaccine-preventable. Hib disease is now rare in the United States; the majority of invasive *H. influenzae* cases reported in children in recent years have been caused by non-type b strains.

Surveillance Case Definition (2015)

California healthcare providers and laboratories are required to report known or suspected cases of invasive *Haemophilus influenzae* disease caused by all serotypes in persons <5 years of age to the LHD, in accordance with Title 17 of the California Code of Regulations. In 2016, the reportable age changed from <15 years of age to <5 years of age. The LHDs report all probable and confirmed invasive *Haemophilus influenzae* cases <5 years of age to CDPH using the following case definition:

Clinical Description

Invasive disease may manifest as pneumonia, bacteremia, meningitis, epiglottitis, septic arthritis, cellulitis, or purulent pericarditis; less common infections include endocarditis and osteomyelitis.

Case Classification

Probable:

Meningitis with detection of *Haemophilus influenzae* type b antigen in cerebrospinal fluid (CSF)

Confirmed:

- Isolation of *Haemophilus influenzae* from a normally sterile body site (e.g., blood or CSF, or, less commonly, joint, pleural, or pericardial fluid); OR
- Detection of *Haemophilus influenzae*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., CSF, blood, joint, pleural, or pericardial fluid), using a validated polymerase chain reaction (PCR) assay

Epidemiologic Summary

In 2017, 55 confirmed and probable invasive *Haemophilus influenzae* disease cases in persons <5 years of age were reported statewide. Of the 55 cases, 1 (2%) was fatal. The fatality occurred in an infant < 12 months of age. Serotyping was attempted on 35 (64%) isolates and none were identified as Hib (Table 2).

Of the 35 isolates that were serotyped, 5 (14%) were serotype a, 1 (3%) was serotype c, 1 (3%) was serotype e, 4 (11%) were serotype f, 2 (6%) were identified only as other [a, c-f (non-b)], and 22 (63%) were nontypeable. The isolate for the fatal case-patient had an unknown serotype. The last case of Hib in a child < 15 years of age in California occurred in 2016; this case-patient was a 4-year-old male diagnosed with epiglottitis who had received the recommended 3 doses of Hib vaccine at 2, 4 and 6 months, but did not receive the recommended fourth dose between 12-18 months; dose 4 was given after the onset of illness. Hib vaccine failures occur rarely; more than 95% of infants will develop protective antibody levels after receiving the Hib vaccine series.

For more information about *Haemophilus influenzae* type b (Hib), please visit the [CDPH *Haemophilus influenzae* type b \(Hib\) Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Haemophilus-Influenzae-type-B.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Haemophilus-Influenzae-type-B.aspx>).

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Table 2. Number of reported invasive *Haemophilus influenzae* disease cases <5 years of age by age, sex, race/ethnicity and serotype – California, 2017

	Cases	Percent of Cases
Total		
California	55	
Age, in years		
< 1	27	49
1-4	28	51
Sex		
Female	23	42
Male	32	58
Race/Ethnicity*		
American Indian or Alaskan Native	0	0
Asian or Pacific Islander	6	11
Black or African American	6	11
Hispanic or Latino	15	27
White	14	25
Other or Multiple Race	5	9
Serotype		
a	5	9
b (Hib)	0	0
c	1	2
e	1	2
f	4	7
Other [a, c-f (non-b)]	2	4
Nontypeable	22	40
Unknown	20	36

*9 cases had unknown race/ethnicity

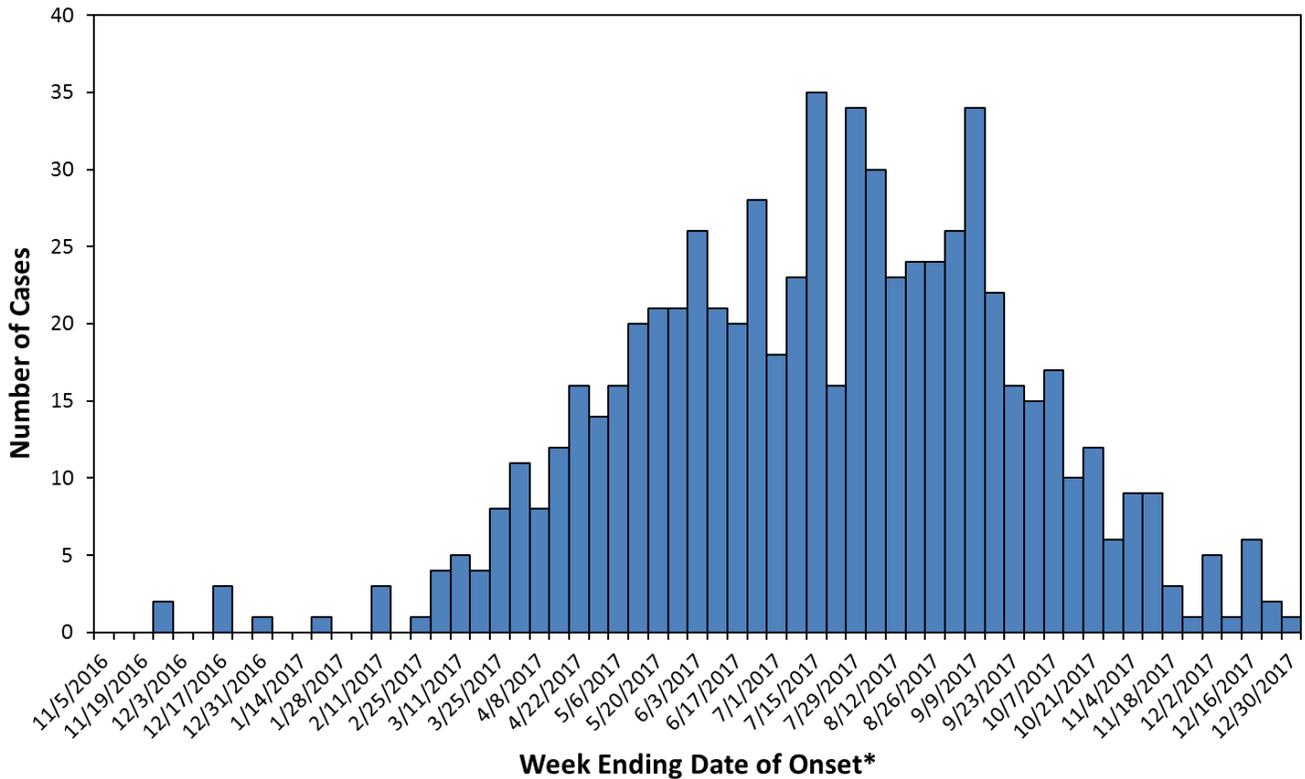
Hepatitis A Infection

Hepatitis A virus (HAV) infection rates have declined significantly since the introduction of hepatitis A vaccine in 1995. Hepatitis A vaccine is routinely recommended for children 12-24 months of age. Vaccination is also recommended for persons at increased risk of HAV infection, including travelers to countries where HAV is endemic, men who have sex with men, users of illicit injection and non-injection drugs, people with chronic liver disease or clotting-factor disorders, and people who are close contacts of infected persons.

In 2017, several states experienced outbreaks primarily among persons who use injection and non-injection drugs, and persons who are experiencing homelessness and their close direct contacts (Figure 1). In California, the outbreak began in San Diego County in November 2016 and spread to Santa Cruz, Los Angeles, and Monterey counties. [A summary of the outbreak and CDPH response is available at: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-A-Outbreak.aspx.](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-A-Outbreak.aspx)

Unrelated to this outbreak, California has also experienced an increase of HAV cases among men who have sex with men (MSM). Two different genotypes have circulated in California related to these outbreaks: genotype 1B, which is associated with the outbreak among persons who are experiencing homelessness or using illicit drugs; and genotype 1A, which includes strains associated with increases in HAV disease among MSM in Western Europe and the United States (New York City, Colorado).

Figure 1. Hepatitis A cases related to the outbreak among persons who are experiencing homelessness or using illicit drugs – California, 2016–2017



*Episode date used if onset unknown.

Surveillance Case Definition (2012)

California healthcare providers are required to report known or suspected cases of hepatitis A infection to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all confirmed hepatitis A cases to CDPH using the following case definition:

Clinical Case Definition

An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) or aspartate aminotransferase (AST) levels.

Laboratory Criteria for Diagnosis

Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive.

Case Classification

Confirmed:

- A case that meets the clinical case definition and is laboratory confirmed; OR
- A case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)

Epidemiologic Summary

In 2017, 948 confirmed hepatitis A cases were reported statewide in 37 (61%) of 61 LHJs (Table 3). The statewide incidence of reported HAV infection in 2017 was 2.39 cases per 100,000 population (Table 4). This was a 309% increase in cases from the previous year, when 232 cases were reported in 35 (57%) of 61 LHJs at a rate of 0.59 cases per 100,000 population. Of the 948 case-patients with disease onset in 2017, 496 (52%) were hospitalized and 21 (2%) deaths were reported.

The median age of all cases in 2017 was 41 years (range: 2-93 years). Persons aged 31-40 years had the highest rate of HAV infection per 100,000 population (5.14), followed by persons aged 41-50 years (4.07). Hepatitis A vaccine has been recommended routinely for all California children since 1999. In a 2017 survey, 87% of California children aged 19-35 months had received at least one dose of the two dose hepatitis A vaccine series. Therefore, pediatric hepatitis A cases are uncommon in California; only 12 cases less than 18 years of age were reported, accounting for 1% of all confirmed cases. Of these, five (42%) were hospitalized. Although all were old enough to be vaccinated, only three reported a previous history of hepatitis A vaccination.

Hepatitis A infection rate was highest among males; the HAV infection rate among males was almost two times higher than females (3.17 and 1.61 per 100,000 persons, respectively). Non-Hispanic whites had the highest rate of HAV infection per 100,000 population (3.58), followed by persons reported in the "other" race/ethnicity group, which includes American Indians, Alaskan Natives, multi-racial and other race/ethnicities (3.20), and black or African Americans (2.42).

Homelessness and illicit drug use were the most common risk factors identified in 2017 cases. Among the 948 reported cases in 2017, 347 (37%) were experiencing homelessness and 333 (35%) reported illicit drug use [Figure 2]. Other risk factors included foreign travel to hepatitis A endemic areas within the exposure period (2-7 weeks prior to disease onset) (105; 11%), MSM (67 of 625 reported male cases; 11%), consuming raw or undercooked shellfish (90; 9%), and close contact with a person with hepatitis A infection (85; 9%). These categories are not mutually exclusive as some cases had more than one known risk factor. Of all cases reported in 2017, 255 (27%) had no known reason for infection or significant risk factors.

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Table 3. Reported hepatitis A cases by local health jurisdiction – California, 2016–2017

	2016	2017
CALIFORNIA	232	948
Alameda	9	14
City of Berkeley*	0	1
Alpine	0	0
Amador	0	0
Butte	2	1
Calaveras	1	0
Colusa	0	0
Contra Costa	6	7
Del Norte	0	0
El Dorado	1	1
Fresno	10	10
Glenn	0	0
Humboldt	1	2
Imperial	3	1
Inyo	0	0
Kern	0	0
Kings	0	0
Lake	1	0
Lassen	0	0
Los Angeles	67	86
City of Long Beach*	4	0
City of Pasadena*	2	3
Madera	0	0
Marin	0	8
Mariposa	0	0
Mendocino	0	0
Merced	1	0
Modoc	0	0
Mono	1	0
Monterey	0	11
Napa	0	2
Nevada	0	0
Orange	26	19
Placer	2	1
Plumas	0	0
Riverside	9	17
Sacramento	12	10
San Benito	0	1
San Bernardino	5	12
San Diego	26	584
San Francisco	3	20
San Joaquin	3	1
San Luis Obispo	2	1
San Mateo	1	3
Santa Barbara	1	3
Santa Clara	8	20
Santa Cruz	1	77
Shasta	1	1
Sierra	0	0
Siskiyou	1	4
Solano	5	4
Sonoma	4	2
Stanislaus	3	4
Sutter	0	0
Tehama	0	0
Trinity	0	3
Tulare	1	1
Tuolumne	0	0
Ventura	8	8
Yolo	1	3
Yuba	0	2

*City health jurisdictions not included in county total.

For more information about hepatitis A infection, please visit the [CDPH Hepatitis A Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-A.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-A.aspx>).

Table 4. Reported hepatitis A cases by age, sex, and race/ethnicity – California, 2017

	Cases	Percent of Cases	Rate per 100,000 pop.
Total			
California	948	100	2.39
Age, in years*			
<2	0	0	0.00
2-5	3	<1	0.15
6-10	2	<1	0.08
11-20	18	2	0.33
21-30	159	17	2.90
31-40	275	29	5.14
41-50	210	22	4.07
≥51	281	30	2.24
Sex			
Female	321	34	1.61
Male	625	66	3.17
Other†	2	0	-
Race/Ethnicity‡			
Asian or Pacific Islander	42	4	0.80
Black or African American	55	6	2.42
Hispanic or Latino	150	16	0.96
White	543	57	3.58
Other§	42	4	3.20

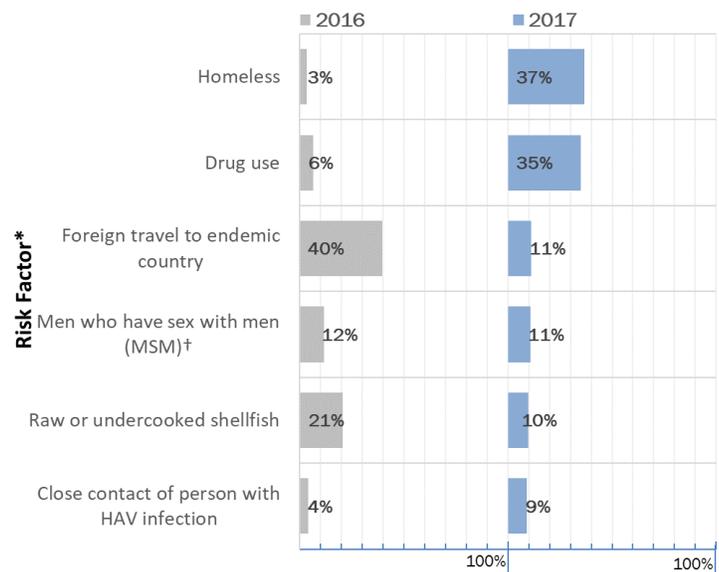
* Most persons 2-18 years old should have been vaccinated according to previous and current ACIP recommendations.

† Other includes transgender persons. Data on transgender identity are inconsistently reported, and California population data for transgender persons are uncertain; therefore, rates are not calculated.

‡ 116 cases had unknown race/ethnicity.

§ Other includes American Indian or Alaskan Native, multiple race, and other race/ethnicity.

Figure 2. Reported risk factors of hepatitis A cases – California, 2016–2017



* Categories are not mutually exclusive; some cases had more than one risk factor.

† The denominator for MSM is the number of male hepatitis A cases reported in a given year.

Hepatitis B Infection, Acute

Hepatitis B vaccine has been recommended for all U.S. born infants since 1991. Vaccination is also recommended for people at increased risk for hepatitis B virus (HBV) infection, including: household or sexual contacts of infected persons, people with multiple sex partners, men who have sex with men, injection-drug users, healthcare and public safety personnel with occupational risk of exposure, dialysis patients, persons with diabetes mellitus, HCV infection, chronic liver disease, HIV infection, incarcerated persons, and travelers to countries where HBV infection is common.

Although the incidence of acute HBV infection has decreased dramatically due to universal childhood vaccination, it remains a major health issue in the United States. More than 850,000 persons are estimated to have chronic HBV infection and many persons with acute HBV infection are asymptomatic and undiagnosed. Therefore, data on reported acute HBV cases do not represent the complete burden or the actual number of new HBV infections. The current epidemic of substance abuse is of concern and has resulted in transmission of HBV via the use of contaminated needles.

Surveillance Case Definition (2012)

California healthcare providers are required to report known or suspected cases of acute HBV infection to the LHD, in accordance with Title 17 of the California Code of Regulations.

Clinical Description

An acute illness with a discrete onset of any sign or symptom* consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), and either a) jaundice, or b) elevated serum alanine aminotransferase (ALT) levels >100 IU/L.

Laboratory Criteria

- Hepatitis B surface antigen (HBsAg) positive; AND
- Immunoglobulin M (IgM) antibody to hepatitis B core antigen (IgM anti-HBc) positive (if done)

Case Classification

Confirmed:

- Case that meets the clinical case definition, is laboratory confirmed, and is not known to have chronic hepatitis B

*A documented negative HBsAg laboratory test result within 6 months prior to a positive test (either HBsAg, HBeAg, or hepatitis B virus nucleic acid testing (HBV NAT) including genotype) result does not require an acute clinical presentation to meet the surveillance case definition.

Epidemiologic Summary

In 2017, 126 confirmed cases of acute HBV infection were reported statewide in 28 (46%) of 61 LHJs, a 7% increase from the previous year (Table 5). The overall incidence rate for 2017 was 0.32 cases per 100,000 population (Table 6), compared to 0.30 cases per 100,000 population in 2016. In 2017, rates were highest for persons aged 50–59 years (0.76 cases per 100,000 population) and 40–49 years (0.66 cases per 100,000 population). Four acute HBV cases were reported among patients aged ≤19 years; two of the patients were unvaccinated and two had unknown vaccination histories. Perinatal hepatitis B cases are summarized separately on page 14. The median age of the 126 patients was 49 years (range: 3–88 years); 76 (60%) were male. Non-Hispanic white and Hispanic persons accounted for 40% and 21% of cases, respectively. Of the 126 patients, 74 (59%) were hospitalized and 2 (2%) died.

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Table 5. Reported acute hepatitis B cases by local health jurisdiction – California, 2016–2017

	2016	2017
CALIFORNIA	118	126
Alameda	11	7
City of Berkeley*	0	0
Alpine	0	0
Amador	0	0
Butte	1	1
Calaveras	0	0
Colusa	0	0
Contra Costa	6	4
Del Norte	0	0
El Dorado	1	0
Fresno	4	3
Glenn	0	0
Humboldt	1	0
Imperial	0	1
Inyo	0	0
Kern	3	4
Kings	0	0
Lake	0	0
Lassen	0	0
Los Angeles†	42	32
City of Long Beach*	3	3
City of Pasadena*	2	0
Madera	0	2
Marin	1	1
Mariposa	0	0
Mendocino	0	1
Merced	0	0
Modoc	0	0
Mono	0	0
Monterey	0	0
Napa	0	0
Nevada	0	0
Orange	5	13
Placer	0	1
Plumas	0	0
Riverside	2	0
Sacramento	9	5
San Benito	0	0
San Bernardino	4	9
San Diego	3	12
San Francisco	2	1
San Joaquin	3	5
San Luis Obispo	0	2
San Mateo	1	0
Santa Barbara	1	1
Santa Clara	4	6
Santa Cruz	0	0
Shasta	0	1
Sierra	0	0
Siskiyou	1	0
Solano	1	0
Sonoma	2	2
Stanislaus	0	1
Sutter	0	0
Tehama	0	1
Trinity	0	0
Tulare	0	0
Tuolumne	0	0
Ventura	4	3
Yolo	1	1
Yuba	0	3

*City health jurisdictions not included in county total.

Of the 126 patients, 56 (48%) reported one or more exposures or behaviors associated with acute HBV infection during their exposure period (45–160 days prior to illness onset) [Figure 3]. These exposures or behaviors included: multiple sex partners (22; 17%), being a man who has sex with men (16 of 76 reported male cases; 21%), injection-drug use (15; 12%), sexual contact with a person with confirmed or suspected HBV infection (9; 7%), and household contact of a person with confirmed or suspected HBV infection (2; 2%).

In addition, 15 (12%) cases reported a history of an accidental needlestick/puncture or other percutaneous injury involving exposure to blood. Five patients only reported health care exposures, including surgery (5), blood transfusion (4), and hemodialysis (1); the source of infection for these patients could not be determined.

For more information about acute HBV infection, please visit the [CDPH Hepatitis B Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-B.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Hepatitis-B.aspx>).

Table 6. Number and incidence rate of reported acute hepatitis B cases, by age, sex, and race/ethnicity – California, 2017

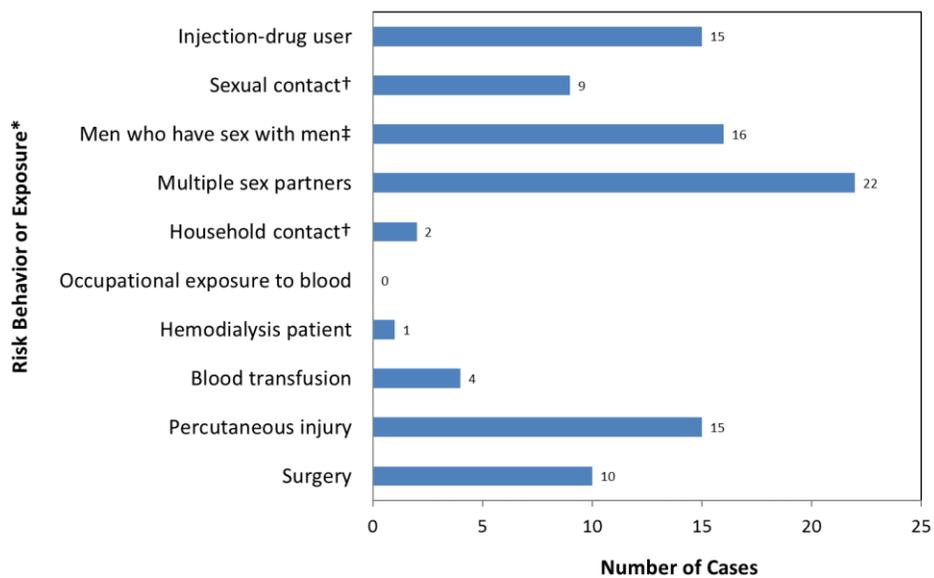
	Cases	Percent of	Rate per
		Cases	100,000 pop.
Total			
California	126	100	0.32
Age, in years*			
< 10	1	1	0.02
10-19	3	2	0.06
20-29	5	4	0.09
30-39	21	17	0.39
40-49	34	27	0.66
50-59	39	31	0.76
≥ 60	23	18	0.29
Sex			
Female	49	39	0.25
Male	76	60	0.39
Other†	1	1	--
Race/Ethnicity‡			
American Indian or Alaskan Native	0	0	0.00
Asian or Pacific Islander	11	9	0.21
Black or African American	18	14	0.79
Hispanic or Latino	26	21	0.17
White	51	40	0.34
Other or Multiple Race	9	7	0.79

* Most persons born after 1990 should have been vaccinated according to current and previous ACIP recommendations. ACIP began recommending hepatitis B vaccine for all infants in 1991.

† Other includes transgender persons. Data on transgender identity are inconsistently reported, and California population data for transgender persons are uncertain; therefore, rates are not calculated.

‡ 11 cases had unknown race/ethnicity.

Figure 3. Reported risk behaviors/exposures for acute hepatitis B cases – California, 2017



* Categories are not mutually exclusive; some cases had more than one risk behavior/exposure

† Contact with a person with confirmed or suspected hepatitis B

‡ A total of 76 acute hepatitis B cases were reported among males in 2017

Perinatal Hepatitis B Infection

Administration of postexposure prophylaxis (PEP) at birth to infants of women with chronic HBV infection has reduced the number of infants infected with HBV. Unfortunately, even with appropriate PEP, a small percentage of infants born to infected women become infected and develop chronic hepatitis B infection. It is now thought that a high maternal HBV viral load during pregnancy can result in perinatal transmission even when appropriate PEP is administered to the infant. To ensure that HBV-infected pregnant women with high viral loads are identified, the American Congress of Obstetricians and Gynecologists (ACOG) now recommends HBV DNA screening of all HBV-infected pregnant women and referral of women with HBV DNA >20,000 IU/mL to a specialist for possible antiviral treatment during pregnancy. For more information, see page 2 of the [ACOG Screening and Referral Algorithm for HBV Infection among Pregnant Women](http://immunizationforwomen.org/uploads/Prenatal%20HBsAg%20Testing%20Guide%20and%20Algorithm_Final.pdf)

(http://immunizationforwomen.org/uploads/Prenatal%20HBsAg%20Testing%20Guide%20and%20Algorithm_Final.pdf).

Infected infants are reported to CDPH using the criteria as outlined below.

Surveillance Case Definition (2017)

California healthcare providers are required to report known or suspected cases of perinatal hepatitis B infection to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable and confirmed perinatal hepatitis B infection cases to CDPH using the following case definition:

Case Classification

Confirmed:

- Child born in the U.S. to a HBV-infected mother and positive for HBsAg at ≥ 1 month of age and ≤ 24 months of age **OR** positive for HBeAg or HBV DNA ≥ 9 months of age and ≤ 24 months of age.

Probable:

- Child born in the U.S. and positive for HBsAg at ≥ 1 month of age and ≤ 24 months of age **OR** positive for HBeAg or HBV DNA ≥ 9 months of age and ≤ 24 months of age, but whose mother's hepatitis B status is unknown (i.e. epidemiologic linkage not present).

Epidemiologic Summary

In 2017, 5 confirmed cases and 1 probable case of perinatal hepatitis B infection were reported statewide. Two of the six children were born in 2017, three were born in 2016, and one was born in 2015. The range of ages for the case-patients at the time of diagnosis was 3 to 16 months of age. Five of the children received appropriate PEP at birth, and four children received at least three doses of hepatitis B vaccine.

For more information about perinatal hepatitis B infection, please visit the [CDPH Perinatal Hepatitis B Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Perinatal.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Perinatal.aspx>).

Measles

Measles virus is highly contagious via the airborne route. Two doses of measles-containing vaccine are recommended as part of the routine childhood immunization schedule. After one dose of vaccine, approximately 95% of people will be protected against measles, and after two doses more than 99% will be protected against measles. Although endemic transmission of measles was declared eliminated in the United States in 2000, measles still circulates in many parts of the world and continues to be imported into the United States by susceptible persons traveling from measles-endemic areas.

In 2016 and early 2017 a measles outbreak involving a religious community occurred in California, resulting in 24 confirmed cases of measles. The majority of patients were unvaccinated. Transmission occurred in schools, households, and during religious events.

Surveillance Case Definition (2013)

California healthcare providers are required to report known or suspected cases of measles to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable and confirmed measles cases to CDPH using the following case definition:

Clinical Description

An acute illness characterized by:

- Generalized, maculopapular rash lasting ≥ 3 days; AND
- Temperature $\geq 101^\circ\text{F}$ or 38.3°C ; AND
- Cough, coryza, or conjunctivitis.

Case Classification

Probable:

In the absence of a more likely diagnosis, an illness that meets the clinical description with:

- No epidemiologic linkage to a laboratory-confirmed measles case; AND
- Noncontributory or no measles laboratory testing.

Confirmed:

An acute febrile rash illness[†] with:

- Isolation of measles virus[‡] from a clinical specimen; OR
- Detection of measles-virus specific nucleic acid[‡] from a clinical specimen using polymerase chain reaction; OR
- Immunoglobulin G (IgG) antibody seroconversion[‡] or a significant rise in measles IgG antibody[‡] using any evaluated and validated method; OR
- A positive serologic test for measles immunoglobulin M (IgM) antibody^{‡§}; OR
- Direct epidemiologic linkage to a case confirmed by one of the methods above.

[†] Temperature does not need to reach $\geq 101^\circ\text{F}/38.3^\circ\text{C}$ and rash does not need to last ≥ 3 days.

[‡] Not explained by MMR vaccination during the previous 6-45 days.

[§] Not otherwise ruled out by other confirmatory testing or more specific measles testing in a public health laboratory.

Epidemiologic Summary

In 2017, 15 confirmed measles cases were reported statewide from 7 of 61 LHJs (Table 7). Seven (47%) of the 15 cases were outbreak-associated; four of these were associated with an outbreak among members of a religious group that started in 2016 and three cases were part of a cluster including an imported case.

Vaccine-Preventable Disease Surveillance in California, 2017

Table 7. Reported measles cases by local health jurisdiction† – California, 2016–2017

	2016	2017
CALIFORNIA	24	15
Alameda*	0	0
City of Berkeley*	0	0
Alpine	0	0
Amador	0	0
Butte	0	0
Calaveras	0	0
Colusa	0	0
Contra Costa	0	0
Del Norte	0	0
El Dorado	0	0
Fresno	0	0
Glenn	0	0
Humboldt	0	0
Imperial	0	0
Inyo	0	0
Kern	0	0
Kings	0	0
Lake	0	0
Lassen	0	0
Los Angeles*	18	3
City of Long Beach*	0	0
City of Pasadena*	0	0
Madera	0	0
Marin	0	0
Mariposa	0	0
Mendocino	0	1
Merced	0	0
Modoc	0	0
Mono	0	0
Monterey	0	0
Napa	0	0
Nevada	3	0
Orange	0	3
Placer	0	0
Plumas	0	0
Riverside	0	0
Sacramento	0	0
San Benito	0	0
San Bernardino	0	0
San Diego	0	2
San Francisco	0	0
San Joaquin	0	0
San Luis Obispo	0	2
San Mateo	0	0
Santa Barbara	1	0
Santa Clara	1	1
Santa Cruz	0	0
Shasta	0	0
Sierra	0	0
Siskiyou	0	0
Solano	0	0
Sonoma	0	0
Stanislaus	0	0
Sutter	0	0
Tehama	0	0
Trinity	0	0
Tulare	1	0
Tuolumne	0	0
Ventura	0	3
Yolo	0	0
Yuba	0	0

†Local health jurisdiction where case was identified.

*City health jurisdictions not included in county total.

Of the remaining eight cases not associated with an outbreak: one had international travel, three were each linked to a confirmed case of measles, and four patients had unknown source.

The median age of the cases was 19 years (range: 0–59 years). Dates of rash onset ranged from January 1, 2017 to December 25, 2016.

13 (87%) of 15 cases had measles virus detected in a clinical specimen.

Of the 15 cases with disease onset in 2017, 4 (27%) were hospitalized (Table 9); one case had pneumonia. The last fatal measles case in California was reported in 2003.

Vaccination status was known for 10 (67%) of the 2017 measles cases; all 10 were unvaccinated, including 8 case-patients who were age-eligible for vaccination (Table 10).

For more information about measles, please visit the [CDPH Measles Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/measles.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/measles.aspx>).

Table 8. Countries/regions visited during incubation period reported by measles cases with history of international travel – California, 2017

Country/Region	Number Reporting Travel
Southeast Asia	1
Thailand	1

Vaccine-Preventable Disease Surveillance in California, 2017

Table 9. Characteristics of measles cases – California, 2017

	Cases	Percent of Cases
Total		
California	15	100
Age, in years		
< 1	1	7
1-4	1	7
5-19	6	40
≥ 20	7	47
Sex		
Female	9	60
Male	6	40
Hospitalized		
Yes	4	27
No	11	73
MMR Status		
≥ 2 MMR	0	0
1 MMR	0	0
0 MMR	10	67
Unknown	5	33
Source*		
International	2	13
Indigenous	13	87
Genotype†		
D8	13	100

* Definition for importation status can be found here:

<https://www.cdc.gov/nndss/conditions/measles/case-definition/2013/>

† Viral specimens were available for 13 patients; two remaining patients were confirmed by PCR only.

Table 10. Measles cases by age and vaccination status – California, 2017

Age, in years	≥ 2 MMR	1 MMR	0 MMR	Unknown	Total Cases
< 2	0	0	2	0	2
2-5	0	0	0	0	0
6-17	0	0	5	0	5
18-54	0	0	1	5	6
≥ 55	0	0	2	0	2

Meningococcal Disease

As many as 10% of adolescents and adults are asymptomatic carriers of the bacterium *Neisseria meningitidis*, however in some cases the bacteria can invade the body and manifest as meningitis or sepsis (meningococemia), or both. Almost all invasive meningococcal disease (IMD) is caused by one of five serogroups of *N. meningitidis*: A, B, C, Y, and W. A quadrivalent conjugate vaccine (MenACWY) which provides protection against infection due to serogroups A, C, Y, and W is routinely recommended for adolescents and other high risk persons. Two vaccines for serogroup B meningococcal disease (MenB) are available for children and adults 10-25 years of age and are routinely recommended for high-risk persons and for use during outbreaks. Adolescents and young adults 16-23 years of age may also be immunized with MenB vaccine.

The incidence of meningococcal disease in the United States is at an all-time low. However, outbreaks of meningococcal disease still occur. A serogroup C meningococcal disease outbreak among men who have sex with men occurred in southern California in 2016-2017, and serogroup B meningococcal disease outbreaks have occurred among college students in recent years.

Surveillance Case Definition (2015)

California healthcare providers and laboratories are required to report known or suspected cases of meningococcal disease to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all suspect, probable, and confirmed meningococcal disease cases to CDPH using the following case definition:

Case Classification

Confirmed:

- Detection of *N. meningitidis*-specific nucleic acid in a specimen obtained from a normally sterile body site (e.g., blood or cerebrospinal fluid [CSF]), using a validated polymerase chain reaction (PCR) assay; OR
- Isolation of *N. meningitidis*:
 - From a normally sterile body site (e.g., blood or CSF, or, less commonly, synovial, pleural, or pericardial fluid); OR
 - From purpuric lesions.

Probable:

- Detection of *N. meningitidis* antigen:
 - In formalin-fixed tissue by immunohistochemistry (IHC); OR
 - In CSF by latex agglutination.

Suspected:

- Clinical purpura fulminans in the absence of a positive blood culture; OR
- Gram-negative diplococci, not yet identified, isolated from a normally sterile body site (e.g., blood or CSF).

Epidemiologic Summary

The incidence of IMD in California has declined over the past several decades (Figure 4). In 2017, 61 confirmed and probable IMD cases were reported statewide, for an incidence rate of 0.15 cases per 100,000 population (Table 11). Of the 61 cases, 57 (93%) were serogrouped; serogroup B (30; 52%) was most frequently identified (Figure 5; Table 12). Seven (11%) fatalities were reported in 2017.

Vaccine-Preventable Disease Surveillance in California, 2017

Eighteen (30%) IMD cases occurred in infants and children less than 18 years of age, including one fatality. The highest incidence of disease occurred in infants less than one year of age. Of the pediatric IMD cases with known serogroup, most (11; 61%) were serogroup B (Figure 6). None of the pediatric patients had been previously immunized against the serogroup that was the cause of their meningococcal infection.

For more information about meningococcal disease, please visit the [CDPH Meningococcal Disease Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/meningococcal.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/meningococcal.aspx>).

Figure 4. Incidence of reported invasive meningococcal disease by year of onset – California, 1995–2017

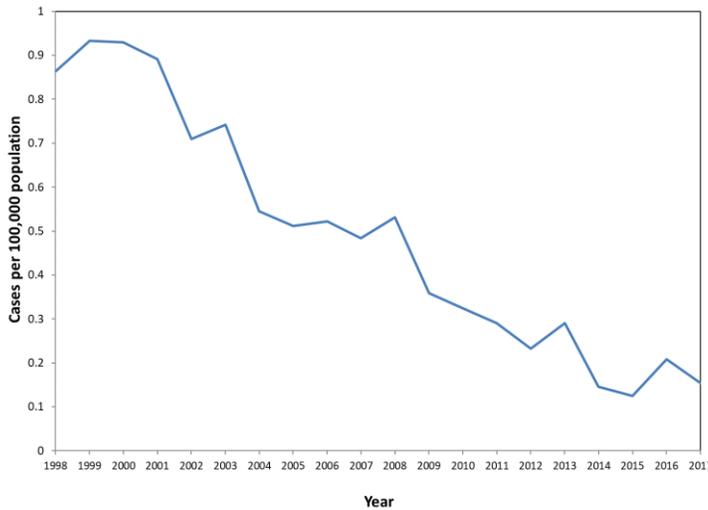
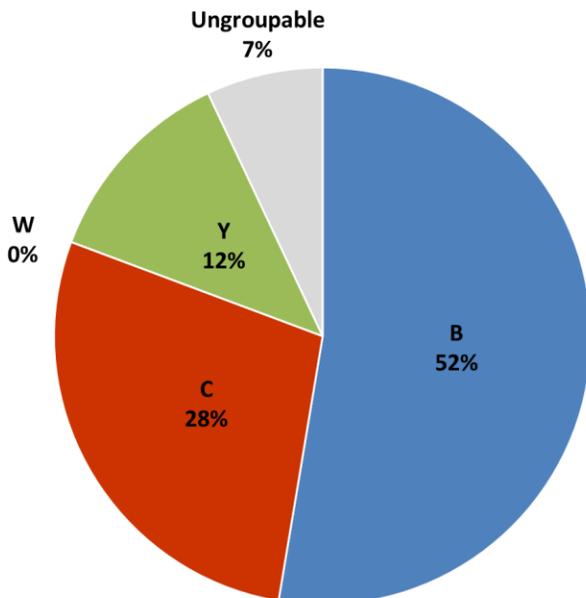


Figure 5. Invasive meningococcal disease cases by serogroup – California, 2017



*An additional 4 cases had unknown serogroup

Vaccine-Preventable Disease Surveillance in California, 2017

Table 11. Reported invasive meningococcal disease by local health jurisdiction – California, 2016–2017

	2016	2017
CALIFORNIA	80	61
Alameda*	5	4
City of Berkeley*	0	1
Alpine	0	0
Amador	0	0
Butte	1	1
Calaveras	0	0
Colusa	0	0
Contra Costa	1	2
Del Norte	0	1
El Dorado	0	1
Fresno	1	3
Glenn	0	0
Humboldt	0	1
Imperial	0	0
Inyo	0	0
Kern	1	2
Kings	0	0
Lake	0	1
Lassen	0	0
Los Angeles*	20	11
City of Long Beach*	8	2
City of Pasadena*	0	0
Madera	1	0
Marin	0	0
Mariposa	0	0
Mendocino	1	0
Merced	0	0
Modoc	0	0
Mono	0	0
Monterey	1	0
Napa	0	1
Nevada	0	2
Orange	11	1
Placer	0	3
Plumas	0	0
Riverside	0	5
Sacramento	7	5
San Benito	0	0
San Bernardino	1	2
San Diego	2	1
San Francisco	3	1
San Joaquin	1	0
San Luis Obispo	1	2
San Mateo	2	2
Santa Barbara	2	2
Santa Clara	2	1
Santa Cruz	0	1
Shasta	2	1
Sierra	0	0
Siskiyou	1	0
Solano	1	1
Sonoma	1	0
Stanislaus	0	0
Sutter	0	0
Tehama	0	0
Trinity	0	0
Tulare	0	0
Tuolumne	0	0
Ventura	1	0
Yolo	1	0
Yuba	1	0

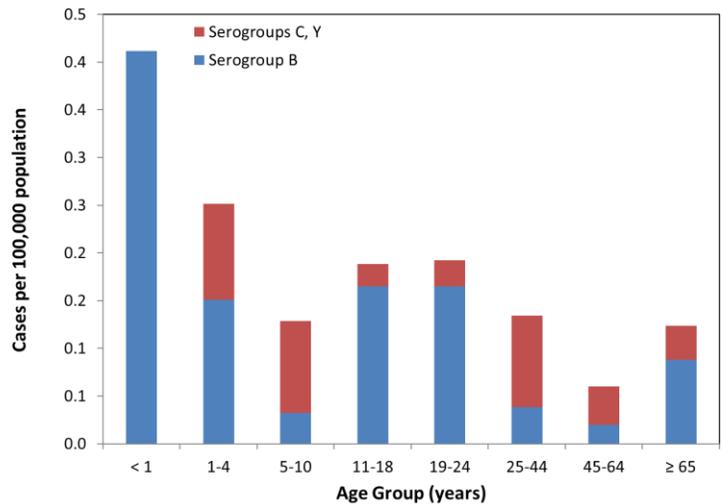
* City health jurisdictions not included in county total.

Table 12. Number of reported invasive meningococcal disease cases by age, sex, race/ethnicity and serogroup – California, 2017

	All Serogroups	B	C	Y	Ungroupable	Unknown
Total						
California	61	30	16	7	4	4
Age, in years						
<1	3	2	0	0	0	1
1-4	5	3	2	0	0	0
5-10	4	1	3	0	0	0
11-18	9	7	0	1	1	0
19-24	8	6	1	0	1	0
25-44	14	4	8	2	0	0
45-64	9	2	2	2	1	2
≥65	9	5	0	2	1	1
Sex						
Female	29	14	6	4	3	2
Male	32	16	10	3	1	2
Race/Ethnicity*						
American Indian or Alaskan Native	0	0	0	0	0	0
Asian or Pacific Islander	5	2	1	1	0	1
Black or African American	6	2	2	0	2	0
Hispanic or Latino	13	4	7	0	0	1
White	29	16	5	5	2	1
Other or Multiple Race	1	1	0	0	0	0

* 7 cases had unknown race/ethnicity.

Figure 6. Invasive meningococcal disease cases by age and serogroup* – California, 2017



*No serogroup A or serogroup W disease cases were identified.

Mumps

Although mumps vaccine is recommended as part of the routine childhood vaccination schedule, protection may wane over time. Large mumps outbreaks among college students, most of whom have received two doses of measles, mumps and rubella (MMR) vaccine continue to occur in the United States.

Surveillance Case Definition (2012)

California healthcare providers are required to report known or suspected cases of mumps to the LHD, in accordance with Title 17 of the California Code of Regulations. LHDs report all suspect, probable, and confirmed mumps cases to CDPH using the following case definition:

Case Classification

Suspected:

- Parotitis, acute salivary gland swelling, orchitis, or oophoritis unexplained by another more likely diagnosis, OR
- A positive lab result with no mumps clinical symptoms (with or without epidemiological-linkage to a confirmed or probable case).

Probable:

- Acute parotitis or other salivary gland swelling lasting at least 2 days, or orchitis or oophoritis unexplained by another more likely diagnosis, in:
 - A person with a positive test for serum anti-mumps immunoglobulin M (IgM) antibody; OR
 - A person with epidemiologic linkage to another probable or confirmed case or linkage to a group/community defined by public health during an outbreak of mumps.

Confirmed:

- A positive mumps laboratory confirmation for mumps virus with reverse transcription polymerase chain reaction (RT-PCR) or culture in a patient with an acute illness characterized by any of the following:
 - Acute parotitis or other salivary gland swelling, lasting at least 2 days
 - Aseptic meningitis
 - Encephalitis
 - Hearing loss
 - Orchitis
 - Oophoritis
 - Mastitis
 - Pancreatitis

Epidemiologic Summary

In 2017, 88 confirmed and 101 probable mumps cases were reported statewide (Table 13). A marked increase in mumps cases was observed nationally and in California in 2016 and this trend has continued into 2017.

In California, three outbreaks involving 73 patients were identified in 2017. Among these three outbreaks, two were associated with universities and one was a community-based outbreak. Nineteen cases reported orchitis, a common complication of mumps. Only seventeen of the confirmed and probable cases reported international travel in their possible exposure period. Epidemiologic characteristics of probable and confirmed mumps cases appear in Table 14.

For more information about mumps, please visit the [CDPH Mumps Webpage](http://www.cdph.ca.gov/HealthInfo/discond/Pages/Mumps.aspx) (<http://www.cdph.ca.gov/HealthInfo/discond/Pages/Mumps.aspx>).

Vaccine-Preventable Disease Surveillance in California, 2017

Table 13. Reported confirmed and probable mumps cases by local health jurisdiction – California, 2016–2017

	2016	2017
CALIFORNIA	93	189
Alameda*	4	8
City of Berkeley*	4	2
Alpine	0	0
Amador	0	0
Butte	0	0
Calaveras	0	0
Colusa	0	0
Contra Costa	3	2
Del Norte	0	0
El Dorado	3	0
Fresno	0	0
Glenn	0	0
Humboldt	1	0
Imperial	1	1
Inyo	0	0
Kern	0	0
Kings	0	0
Lake	0	0
Lassen	0	0
Los Angeles*	17	81
City of Long Beach*	1	2
City of Pasadena*	0	0
Madera	0	1
Marin	0	3
Mariposa	0	0
Mendocino	0	0
Merced	0	0
Modoc	0	0
Mono	0	1
Monterey	1	0
Napa	0	1
Nevada	0	2
Orange	6	27
Placer	0	1
Plumas	0	0
Riverside	3	2
Sacramento	2	10
San Benito	0	0
San Bernardino	1	2
San Diego	23	15
San Francisco	9	11
San Joaquin	0	4
San Luis Obispo	1	1
San Mateo	1	6
Santa Barbara	2	0
Santa Clara	3	2
Santa Cruz	0	0
Shasta	0	0
Sierra	0	0
Siskiyou	0	0
Solano	1	0
Sonoma	1	2
Stanislaus	0	0
Sutter	0	0
Tehama	0	0
Trinity	0	0
Tulare	0	0
Tuolumne	0	0
Ventura	5	2
Yolo	0	0
Yuba	0	0

* City health jurisdictions not included in county total.

Table 14. Characteristics of mumps cases – California, 2017

	Cases	Percent of Cases
Total		
California	189	100
Age, in years		
< 1	1	1
1-4	6	3
5-19	27	14
≥ 20	155	82
Sex		
Female	59	31
Male	130	69
Case Classification		
Probable	101	53
Confirmed	88	47
Hospitalized*		
Yes	9	5
No	168	95
Source†‡		
International	17	10
Indigenous	157	90

* 12 cases had unknown hospitalization status.

† 15 cases had unknown source.

‡ Importation status definition is located here:
<https://wwwn.cdc.gov/nndss/conditions/mumps/case-definition/2012/>

Pertussis

Pertussis peaks every 3 to 5 years. In 2014, California experienced an epidemic of pertussis that caused over 11,000 cases, including 3 infant deaths. This was the highest number of pertussis cases reported in California in over 60 years. An increase in pertussis incidence in the United States has occurred in recent years, especially among teenagers. Cases among teens 14-17 years of age more than doubled from 2016 to 2017, from 489 to 1073, respectively. One factor thought to be associated with this increase is the use of acellular pertussis vaccines, which have been in use since the late 1990s. It is now known that the immunity conferred by acellular pertussis vaccines does not provide protection as long as the whole cell vaccines that preceded them.

Surveillance Case Definition (2014)

California healthcare providers are required to report known or suspected cases of pertussis to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all suspect, probable, and confirmed pertussis cases to CDPH using the following case definition:

Clinical Case Definition

In the absence of a more likely diagnosis, a cough illness lasting ≥ 2 weeks with at least one of the following:

- Paroxysms of coughing; OR
- Inspiratory “whoop”; OR
- Post-tussive vomiting; OR
- Apnea (with or without cyanosis) (FOR INFANTS AGED <1 YEAR ONLY)

Case Classification

Confirmed:

- An acute cough illness of any duration with isolation of *B. pertussis* from a clinical specimen; OR
- A case that meets the clinical case definition and is confirmed by detection of *B. pertussis*-specific nucleic acid by polymerase chain reaction (PCR); OR
- A case that meets the clinical case definition and is epidemiologically-linked directly to a laboratory-confirmed case of pertussis.

Probable:

- A case that meets the clinical case definition and is not laboratory-confirmed with culture or PCR and is not epidemiologically-linked directly to a confirmed case;

OR, FOR INFANTS AGED <1 YEAR ONLY:

- Acute cough illness of any duration, with at least one of the following:
 - Paroxysms of coughing; OR
 - Inspiratory “whoop”; OR
 - Post-tussive vomiting; OR
 - Apnea (with or without cyanosis); AND at least one of the following:
 - PCR positive for pertussis
 - Contact to a laboratory-confirmed case of pertussis

Suspect (reportable in California, only):

- An acute cough illness of any duration with detection of *B. pertussis*-specific nucleic acid by PCR;
OR

- An acute cough illness of any duration with at least one of the following: paroxysms of coughing, inspiratory “whoop”, or post-tussive vomiting, that is epidemiologically-linked directly to a confirmed case.

Epidemiologic Summary

In 2017, 3,155 confirmed, probable, and suspect pertussis cases were reported statewide in 47 (77%) of 61 LHJs. This was a 60% increase in pertussis cases reported from the previous year, when 1,938 cases were reported in 50 (82%) LHJs (Table 15). The statewide incidence of reported pertussis in 2017 was 8.0 cases compared to 4.9 cases per 100,000 population in 2016.

Of the 3,155 cases with disease onset in 2017, 122 (4%) were hospitalized. One fatality with disease onset in 2017 was reported in a seven year old with multiple underlying conditions. The median age of all cases in 2017 was 12 years (range: 1 day–101 years). The majority of cases (2,681; 85%) occurred in children less than 18 years of age. Of the 2,681 pediatric cases, 127 (5%) were in infants less than 4 months of age who are too young to be fully vaccinated (Figure 7). Pregnant women are recommended to receive Tdap at the earliest opportunity between 27 and 36 weeks gestation of each pregnancy to protect their infants from pertussis.

Among the 91 mothers of case infants less than 4 months of age with complete information, 55 (56%) did not receive a maternal Tdap during the correct timeframe of their pregnancy. Of the 127 cases less than 4 months of age, 56 (44%) were hospitalized (Table 16). Only nine (16%) mothers among the 56 hospitalized cases less than 4 months of age were known to receive a maternal Tdap between 27 and 36 weeks gestation. Adolescents 14–17 years of age accounted for a majority of the pediatric cases (1,073; 40%) of the pediatric cases; however only 4 (<1%) required hospitalization.

Of 2,554 pediatric cases aged 4 months–17 years, 2,242 (88%) were known to have previously received at least one dose of pertussis vaccine prior to illness onset, 181 (7%) were unimmunized against pertussis, and 131 (5%) had unknown pertussis vaccine history information. Incidence rates were highest for Hispanic infants less than 4 months of age (Figure 8). Among older infants, children and adolescents, the highest rates were in non-Hispanic whites.

Of the 3,155 cases reported in 2017, 2,169 (69%) were classified as confirmed, 416 (13%) as probable, and 570 (18%) as suspect. Among cases with complete information, the most commonly reported symptoms were paroxysmal coughing (83%), post-tussive vomiting (41%), and inspiratory “whoop” (27%).

For more information about pertussis, please visit the [CDPH Pertussis Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/pertussis.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/pertussis.aspx>).

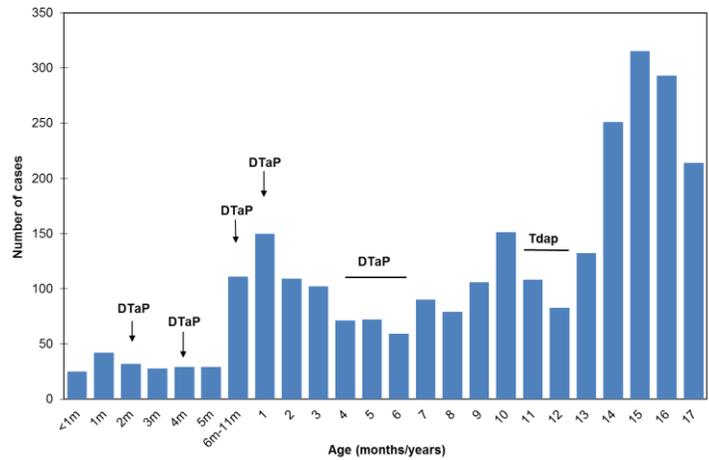
Vaccine-Preventable Disease Surveillance in California, 2017

Table 15. Reported pertussis cases by local health jurisdiction – California, 2016–2017

	2016	2017
California	1938	3155
Alameda*	77	115
City of Berkeley*	4	8
Alpine	0	0
Amador	2	0
Butte	2	4
Calaveras	2	1
Colusa	0	0
Contra Costa	46	48
Del Norte	0	0
El Dorado	9	5
Fresno	16	37
Glenn	1	0
Humboldt	1	0
Imperial	3	1
Inyo	0	4
Kern	27	18
Kings	7	0
Lake	1	9
Lassen	0	0
Los Angeles*	309	558
City of Long Beach*	13	19
City of Pasadena*	4	5
Madera	3	7
Marin	31	40
Mariposa	1	0
Mendocino	8	3
Merced	1	2
Modoc	0	0
Mono	0	0
Monterey	16	28
Napa	5	12
Nevada	42	2
Orange	69	198
Placer	17	82
Plumas	0	0
Riverside	82	136
Sacramento	69	67
San Benito	9	3
San Bernardino	32	44
San Diego	395	1163
San Francisco	10	35
San Joaquin	4	9
San Luis Obispo	29	15
San Mateo	109	64
Santa Barbara	10	9
Santa Clara	234	188
Santa Cruz	46	45
Shasta	25	2
Sierra	0	0
Siskiyou	0	3
Solano	14	14
Sonoma	42	19
Stanislaus	13	5
Sutter	1	4
Tehama	4	1
Trinity	1	0
Tulare	13	11
Tuolumne	0	5
Ventura	35	71
Yolo	43	5
Yuba	1	31

* City health jurisdictions not included in county total.

Figure 7. Pediatric pertussis cases by age – California, 2017

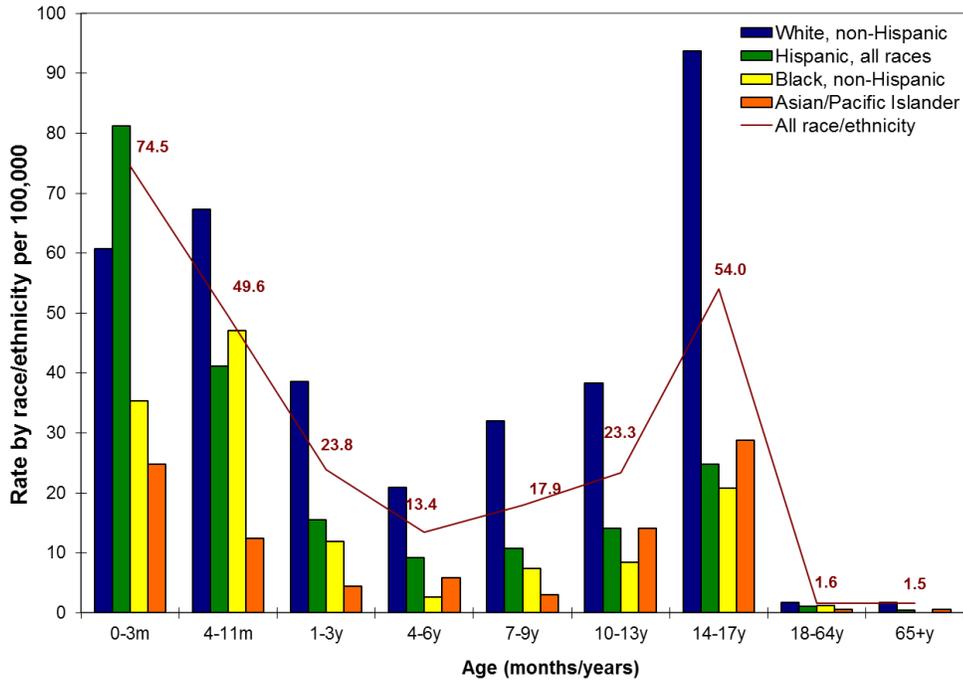


Annotations in black indicate recommended vaccine doses
 DTaP=Diphtheria, tetanus, and acellular pertussis vaccine
 Tdap=Tetanus, diphtheria, and acellular pertussis vaccine

Table 16. Number and proportion of pertussis hospitalizations and deaths reported among cases <4 months of age – California, 2015–2017

	2015		2016		2017	
	Cases	Percent of Cases	Cases	Percent of Cases	Cases	Percent of Cases
Total						
California	324		118		127	
Hospitalizations	177	55	51	43	56	44
Deaths	1	<1	2	2	0	0

Figure 8. Pertussis incidence rates by age and race/ethnicity – California, 2017*



*Denominators adjusted to account for partial birth cohort

Polio

Although poliovirus has been eradicated from most of the world, small numbers of wild polio cases are still being identified in Afghanistan, Nigeria, and Pakistan.

Surveillance Case Definitions (2010)

California healthcare providers and laboratories are required to report known or suspected cases of poliovirus infection to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable and confirmed poliovirus infection cases to CDPH using the following case definition:

Case Definition (Nonparalytic poliovirus infection)

Case Classification

Confirmed:

Any person without symptoms of paralytic poliomyelitis in whom a poliovirus isolate was identified in an appropriate clinical specimen, with confirmatory typing and sequencing performed by the CDC Poliovirus Laboratory, as needed.

Case Definition (Paralytic poliovirus infection)

Case Classification

Confirmed:

- Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss; AND in which the patient has:
- A neurologic deficit 60 days after onset of initial symptoms; OR
- Died; OR
- Unknown follow-up status.

Probable:

Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss.

Epidemiologic Summary

No cases of poliovirus infection were reported in California in 2017. There has been no indigenous transmission of wild poliovirus in California since at least 1978. The last imported wild poliovirus case in California occurred in 1986 and the last indigenous vaccine-associated paralytic poliomyelitis (VAPP) case in California occurred in 1998.

For more information about poliovirus infection, please visit the [CDPH Polio Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/polio.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/polio.aspx>).

Rubella and Congenital Rubella Syndrome

Rubella was eliminated from the United States in 2004. In 2015, the Pan-American Health Organization of the World Health Organization announced that endemic transmission of rubella in the Americas had ended and that the Americas are rubella-free. However, rubella continues to circulate in other parts of the world and susceptible travelers may become infected. One dose of rubella containing vaccine is sufficient to confer protection to rubella infection. The two-dose MMR vaccine series is recommended as part of the routine U.S. childhood immunization schedule.

Rubella Surveillance Case Definition (2013)

California healthcare providers are required to report known or suspected cases of rubella to the LHD, in accordance with Title 17 of the California Code of Regulations. LHDs report all suspect, probable, and confirmed rubella cases to CDPH using the following case definition:

Case Classification

Confirmed:

- A case with or without symptoms who has laboratory evidence of rubella infection confirmed by one or more of the following laboratory tests:
 - Isolation of rubella virus; OR
 - Detection of rubella-virus specific nucleic acid by polymerase chain reaction; OR
 - IgG seroconversion[†] or a significant rise between acute- and convalescent-phase titers in serum rubella IgG antibody level by any standard serologic assay; OR
 - Positive serologic test for rubella IgM antibody^{†*}; **OR**
- An illness characterized by all of the following:
 - Acute onset of generalized maculopapular rash; AND
 - Temperature greater than 99.0°F or 37.2°C; AND
 - Arthralgia, arthritis, lymphadenopathy, or conjunctivitis; AND
 - Epidemiologic linkage to a laboratory-confirmed case of rubella.

Probable:

In the absence of a more likely diagnosis, an illness characterized by all of the following:

- Acute onset of generalized maculopapular rash; AND
- Temperature greater than 99.0°F or 37.2°C, if measured; AND
- Arthralgia, arthritis, lymphadenopathy, or conjunctivitis; AND
- Lack of epidemiologic linkage to a laboratory-confirmed case of rubella; AND
- Noncontributory or no serologic or virologic testing.

Suspected:

Any generalized rash illness of acute onset that does not meet the criteria for probable or confirmed rubella or any other illness.

[†] Not explained by MMR vaccination during the previous 6-45 days.

^{*} Not otherwise ruled out by more specific testing in a public health laboratory.

Congenital Rubella Syndrome Case Definition (2010)

California healthcare providers are required to report known or suspected cases of congenital rubella syndrome to the LHD, in accordance with Title 17 of the California Code of Regulations. LHDs report all suspect, probable, and confirmed congenital rubella syndrome cases to CDPH using the following case definition:

Case Classification

Confirmed:

- An infant with at least one symptom (listed below) that is clinically consistent with congenital rubella syndrome; and laboratory evidence of congenital rubella infection as demonstrated by:
 - Isolation of rubella virus; OR
 - Detection of rubella-specific immunoglobulin M (IgM) antibody; OR
 - Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titer that does not drop at the expected rate of a twofold dilution per month); OR
 - A specimen that is PCR positive for rubella virus

Probable:

- An infant without an alternative etiology that does not have laboratory confirmation of rubella infection but has at least 2 of the following*:
 - Cataracts or congenital glaucoma*;
 - Congenital heart disease (most commonly patent ductus arteriosus or peripheral pulmonary artery stenosis);
 - Hearing impairment; OR
 - Pigmentary retinopathy; **OR**
- An infant without an alternative etiology that does not have laboratory confirmation of rubella infection but has at least one or more of the following:
 - Cataracts or congenital glaucoma*;
 - Congenital heart disease (most commonly patent ductus arteriosus or peripheral pulmonary artery stenosis);
 - Hearing impairment; OR
 - Pigmentary retinopathy; **AND one or more of the following:**
 - Purpura
 - Microcephaly
 - Meningoencephalitis
 - Hepatosplenomegaly
 - Developmental delay
 - Radiolucent bone disease
 - Jaundice

Suspected:

- An infant that does not meet the criteria for a probable or confirmed case but who has one or more of the following clinical findings:
 - Cataracts or congenital glaucoma
 - Pigmentary retinopathy
 - Microcephaly;
 - Purpura
 - Developmental delay
 - Congenital heart disease
 - Hepatosplenomegaly
 - Meningoencephalitis
 - Hearing impairment
 - Jaundice
 - Radiolucent bone disease

Other Criteria (Infection Only):

- An infant without any clinical symptoms or signs but with laboratory evidence of infection as demonstrated by:
 - Isolation of rubella virus; OR
 - Detection of rubella-specific IgM antibody; OR
 - Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e. rubella titer that does not drop at the expected rate of a twofold dilution per month); OR
 - A specimen that is PCR positive for rubella virus.

* In probable cases, either or both of the eye-related findings (cataracts and congenital glaucoma) count as a single complication. In cases classified as infection only, if any compatible signs or symptoms (e.g., hearing loss) are identified later, the case is reclassified as confirmed.

Epidemiologic Summary

In 2017, there were two infants reported with confirmed congenital rubella syndrome. These infants were born to mothers who had travelled to areas where rubella is endemic. One mother was diagnosed with rubella while pregnant, and the second was asymptomatic throughout her pregnancy.

Both infants experienced congenital anomalies consistent with CRS. The anomalies included hearing loss, microcephaly and respiratory distress in one infant, and cataracts, congenital heart disease, persistent pulmonary hypertension, pre-term birth and low birth weight in the second infant. Wild type rubella virus was detected in clinical specimens from both infants.

One confirmed rubella case was reported in 2017. The patient had symptoms of rash and low grade fever along with a rubella IgM positive laboratory result. However, the patient had not travelled outside of the United States and was previously vaccinated with MMR, making the likelihood of true rubella infection low. Unfortunately, no viral specimens were available for additional testing.

For more information about rubella, please visit the [CDPH Rubella Webpage](http://www.cdph.ca.gov/HealthInfo/discond/Pages/Rubella.aspx) (<http://www.cdph.ca.gov/HealthInfo/discond/Pages/Rubella.aspx>).

Tetanus

Since the introduction of tetanus vaccines in the 1930s and 1940s, the number of tetanus cases reported in the U.S. has declined significantly. However, sporadic cases continue to be reported among adults, especially those who are unimmunized or who have not received a booster dose of tetanus toxoid containing vaccine within the prior 10 years.

Surveillance Case Definition (2010)

California healthcare providers are required to report known or suspected cases of tetanus to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable tetanus cases to CDPH using the following case definition:

Case Classification

Probable:

In the absence of a more likely diagnosis, an acute illness with:

- Muscle spasms or hypertonia; AND
- Diagnosis of tetanus by a healthcare provider;

OR:

- Death, with tetanus listed on the death certificate as the cause of death or a significant condition contributing to death

Epidemiologic Summary

Two probable tetanus cases were reported in California in 2017 in Alameda (1) and Riverside (1) counties. Both patients were adults over 60 years of age with unknown vaccination histories.

For more information about tetanus, please visit the [CDPH Tetanus Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Tetanus.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Tetanus.aspx>).

Varicella Hospitalizations and Deaths

Although the incidence of varicella and varicella hospitalizations have decreased markedly since widespread use of varicella vaccine, hospitalizations and deaths due to varicella continue to occur, most often in children too young to be vaccinated or in susceptible, often immunocompromised, adults.

Surveillance Case Definition (2010)

California healthcare providers are required to report known or suspected varicella hospitalizations and deaths to the LHD, in accordance with Title 17 of the California Code of Regulations. The LHDs report all probable and confirmed cases of varicella hospitalizations and deaths to CDPH using the following case definition:

Case Classification

Confirmed:

An acute illness with diffuse (generalized) maculo-papulovesicular rash, AND

- Epidemiologic linkage to another probable or confirmed case; OR
- Laboratory confirmation by any of the following:
 - Isolation of varicella-zoster virus (VZV) from a clinical specimen; OR
 - Varicella antigen detected by direct fluorescent antibody test (DFA); OR
 - Varicella-specific nucleic acid detected by polymerase chain reaction (PCR); OR
 - Significant rise in serum anti-varicella immunoglobulin G (IgG) antibody level by any serologic assay.

Probable:

An acute illness with diffuse (generalized) maculo-papulovesicular rash; AND

- Lack of laboratory confirmation; AND
- Lack of epidemiologic linkage to another probable or confirmed case.

Epidemiologic Summary

In 2017, 42 confirmed and probable varicella-associated hospitalizations, including one death, were reported statewide (Table 17). The varicella death occurred in an immunosuppressed adult with an unknown history of varicella.

For more information about varicella, please visit the [CDPH Varicella Webpage](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Varicella.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Varicella.aspx>).

Vaccine-Preventable Disease Surveillance in California, 2017

Table 17. Reported varicella hospitalizations and deaths by local health jurisdiction – California, 2016–2017

	2016	2017
CALIFORNIA	48	42
Alameda*	0	2
City of Berkeley*	0	0
Alpine	0	0
Amador	0	0
Butte	0	0
Calaveras	0	0
Colusa	0	0
Contra Costa	2	0
Del Norte	0	0
El Dorado	0	0
Fresno	3	1
Glenn	0	0
Humboldt	0	0
Imperial	2	0
Inyo	0	0
Kern	0	0
Kings	0	0
Lake	0	0
Lassen	0	0
Los Angeles*	12	16
City of Long Beach*	1	1
City of Pasadena*	0	0
Madera	0	0
Marin	0	0
Mariposa	0	0
Mendocino	0	1
Merced	0	0
Modoc	0	0
Mono	0	0
Monterey	1	0
Napa	0	0
Nevada	0	0
Orange	5	8
Placer	1	0
Plumas	1	0
Riverside	0	1
Sacramento	5	4
San Benito	0	0
San Bernardino	4	1
San Diego	1	1
San Francisco	0	3
San Joaquin	2	1
San Luis Obispo	0	0
San Mateo	1	0
Santa Barbara	0	0
Santa Clara	4	2
Santa Cruz	0	0
Shasta	0	0
Sierra	0	0
Siskiyou	0	0
Solano	0	0
Sonoma	0	0
Stanislaus	0	0
Sutter	0	0
Tehama	0	0
Trinity	0	0
Tulare	1	0
Tuolumne	0	0
Ventura	2	0
Yolo	0	0
Yuba	0	0

*City health jurisdictions not included in county total.

Table 18. Number of reported varicella hospitalizations and deaths by age and sex – California, 2017

	Cases	Percent of Cases
Total		
Hospitalizations	42	100
Deaths	1	2
Age, in years		
< 1	2	5
1-4	2	5
5-19	3	7
20-29	11	26
30-39	9	21
40-49	8	19
≥ 50	7	17
Sex		
Female	18	43
Male	24	57

SELECTED RESOURCES

The California Department of Public Health Immunization Branch's Website

<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/immunize.aspx>

Visit the Immunization Branch website for information related to immunizations or vaccine-preventable diseases.

CDC Pink Book

<http://www.cdc.gov/vaccines/pubs/pinkbook/index.html>

Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Hamborsky J, Kroger A, Wolfe S, eds. 13th ed. Washington D.C. Public Health Foundation, 2015.

This CDC resource provides comprehensive information on routinely used vaccines and the diseases they prevent.

CDC Yellow Book

<https://wwwnc.cdc.gov/travel/page/yellowbook-home>

Centers for Disease Control and Prevention. CDC Yellow Book 2018: Health Information for International Travel. New York: Oxford University Press; 2017.

This CDC resource provides helpful guidance about health risks associated with international travel and travel vaccines.

CDC Manual for the Surveillance of Vaccine-Preventable Diseases

<http://www.cdc.gov/vaccines/pubs/surv-manual/index.html>

Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention, Atlanta, GA, 2008.

This CDC resource provides current guidelines for those directly involved in surveillance of vaccine-preventable diseases, including local health department personnel.

VACCINE-PREVENTABLE DISEASE SUMMARY TABLES

Vaccine-Preventable Disease Surveillance in California, 2017

Table 19. Hepatitis A infection cases and incidence rates per 100,000 population, by local health jurisdiction and year of disease onset – California, 2013–2017

Jurisdiction	2013		2014		2015		2016		2017	
	Cases	Rates								
CALIFORNIA	254	0.66	146	0.38	181	0.46	232	0.59	948	2.39
Alameda	6	0.41	9	0.61	6	0.40	9	0.59	14	0.92
City of Berkeley*	1	0.85	0	0.00	0	0.00	0	0.00	1	0.82
Alpine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Amador	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Butte	0	0.00	2	0.89	1	0.45	2	0.89	1	0.44
Calaveras	0	0.00	0	0.00	1	2.23	1	2.23	0	0.00
Colusa	1	4.55	0	0.00	0	0.00	0	0.00	0	0.00
Contra Costa	10	0.92	3	0.27	6	0.54	6	0.53	7	0.62
Del Norte	0	0.00	0	0.00	1	3.69	0	0.00	0	0.00
El Dorado	5	2.74	0	0.00	1	0.55	1	0.54	1	0.54
Fresno	3	0.31	0	0.00	0	0.00	10	1.01	10	1.00
Glenn	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Humboldt	3	2.22	1	0.74	1	0.74	1	0.74	2	1.47
Imperial	0	0.00	0	0.00	1	0.54	3	1.61	1	0.53
Inyo	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Kern	4	0.46	3	0.34	5	0.57	0	0.00	0	0.00
Kings	0	0.00	0	0.00	1	0.67	0	0.00	0	0.00
Lake	1	1.54	1	1.54	1	1.54	1	1.55	0	0.00
Lassen	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Los Angeles	60	0.64	42	0.44	33	0.35	67	0.70	86	0.89
City of Long Beach*	6	1.26	5	1.04	3	0.62	4	0.83	0	0.00
City of Pasadena*	0	0.00	3	2.13	1	0.71	2	1.41	3	2.09
Madera	1	0.66	0	0.00	1	0.65	0	0.00	0	0.00
Marin	0	0.00	1	0.38	1	0.38	0	0.00	8	3.05
Mariposa	1	5.51	0	0.00	0	0.00	0	0.00	0	0.00
Mendocino	2	2.27	0	0.00	0	0.00	0	0.00	0	0.00
Merced	0	0.00	0	0.00	0	0.00	1	0.37	0	0.00
Modoc	1	10.41	0	0.00	0	0.00	0	0.00	0	0.00
Mono	0	0.00	1	7.17	0	0.00	1	7.25	0	0.00
Monterey	2	0.47	0	0.00	1	0.23	0	0.00	11	2.48
Napa	0	0.00	0	0.00	9	6.37	0	0.00	2	1.41
Nevada	2	2.05	1	1.02	0	0.00	0	0.00	0	0.00
Orange	24	0.77	14	0.45	17	0.54	26	0.82	19	0.59
Placer	0	0.00	0	0.00	3	0.81	2	0.53	1	0.26
Plumas	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Riverside	9	0.40	7	0.30	13	0.56	9	0.38	17	0.71
Sacramento	4	0.27	3	0.20	3	0.20	12	0.80	10	0.66
San Benito	0	0.00	0	0.00	0	0.00	0	0.00	1	1.71
San Bernardino	10	0.48	2	0.09	4	0.19	5	0.23	12	0.55
San Diego	40	1.25	14	0.43	22	0.67	26	0.79	584	17.59
San Francisco	4	0.47	6	0.70	5	0.58	3	0.34	20	2.27
San Joaquin	3	0.42	2	0.28	7	0.96	3	0.41	1	0.13
San Luis Obispo	2	0.73	0	0.00	0	0.00	2	0.72	1	0.36
San Mateo	9	1.20	1	0.13	2	0.26	1	0.13	3	0.39
Santa Barbara	1	0.23	2	0.45	2	0.45	1	0.22	3	0.67
Santa Clara	7	0.37	10	0.53	6	0.31	8	0.41	20	1.03
Santa Cruz	7	2.59	3	1.10	0	0.00	1	0.36	77	27.85
Shasta	3	1.68	2	1.12	0	0.00	1	0.56	1	0.56
Sierra	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Siskiyou	1	2.24	0	0.00	0	0.00	1	2.25	4	9.04
Solano	3	0.71	0	0.00	1	0.23	5	1.15	4	0.91
Sonoma	2	0.40	1	0.20	3	0.60	4	0.79	2	0.40
Stanislaus	4	0.76	3	0.56	3	0.56	3	0.55	4	0.73
Sutter	0	0.00	1	1.03	1	1.02	0	0.00	0	0.00
Tehama	0	0.00	0	0.00	1	1.56	0	0.00	0	0.00
Trinity	0	0.00	0	0.00	0	0.00	0	0.00	3	22.30
Tulare	4	0.88	1	0.22	5	1.08	1	0.21	1	0.21
Tuolumne	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ventura	7	0.83	2	0.24	3	0.35	8	0.94	8	0.93
Yolo	1	0.48	0	0.00	4	1.88	1	0.46	3	1.37
Yuba	0	0.00	0	0.00	2	2.65	0	0.00	2	2.61

* City health jurisdictions not included in county total.

Vaccine-Preventable Disease Surveillance in California, 2017

Table 20. Acute hepatitis B infection cases and incidence rates per 100,000 population, by local health jurisdiction and year of disease onset – California, 2013–2017

Jurisdiction	2013		2014		2015		2016		2017	
	Cases	Rates								
CALIFORNIA	140	0.36	109	0.28	158	0.40	118	0.30	126	0.32
Alameda	6	0.41	5	0.34	2	0.13	11	0.73	7	0.46
City of Berkeley*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Alpine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Amador	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Butte	2	0.90	1	0.45	3	1.34	1	0.44	1	0.44
Calaveras	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Colusa	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Contra Costa	2	0.18	2	0.18	6	0.54	6	0.53	4	0.35
Del Norte	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
El Dorado	0	0.00	0	0.00	2	1.09	1	0.54	0	0.00
Fresno	4	0.42	3	0.31	4	0.41	4	0.40	3	0.30
Glenn	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Humboldt	0	0.00	0	0.00	0	0.00	1	0.74	0	0.00
Imperial	2	1.11	1	0.55	0	0.00	0	0.00	1	0.53
Inyo	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Kern	3	0.35	3	0.34	7	0.79	3	0.34	4	0.45
Kings	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lake	0	0.00	1	1.54	0	0.00	0	0.00	0	0.00
Lassen	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Los Angeles†	54	0.57	41	0.43	51	0.53	42	0.44	32	0.33
City of Long Beach*	5	1.05	3	0.63	4	0.83	3	0.62	3	0.62
City of Pasadena*	3	2.14	1	0.71	1	0.71	2	1.41	0	0.00
Madera	2	1.31	1	0.65	2	1.29	0	0.00	2	1.27
Marin	0	0.00	0	0.00	0	0.00	1	0.38	1	0.38
Mariposa	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Mendocino	0	0.00	0	0.00	0	0.00	0	0.00	1	1.12
Merced	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Modoc	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Mono	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Monterey	0	0.00	0	0.00	3	0.69	0	0.00	0	0.00
Napa	1	0.72	0	0.00	0	0.00	0	0.00	0	0.00
Nevada	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Orange	12	0.39	7	0.22	10	0.32	5	0.16	13	0.41
Placer	2	0.55	0	0.00	2	0.54	0	0.00	1	0.26
Plumas	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Riverside	3	0.13	4	0.17	2	0.09	2	0.08	0	0.00
Sacramento	4	0.27	0	0.00	3	0.20	9	0.60	5	0.33
San Benito	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
San Bernardino	7	0.33	9	0.43	13	0.61	4	0.19	9	0.42
San Diego	9	0.28	7	0.22	12	0.37	3	0.09	12	0.36
San Francisco	4	0.47	0	0.00	4	0.46	2	0.23	1	0.11
San Joaquin	2	0.28	4	0.56	4	0.55	3	0.41	5	0.67
San Luis Obispo	0	0.00	1	0.36	0	0.00	0	0.00	2	0.72
San Mateo	2	0.27	1	0.13	5	0.65	1	0.13	0	0.00
Santa Barbara	1	0.23	1	0.23	0	0.00	1	0.22	1	0.22
Santa Clara	4	0.21	4	0.21	4	0.21	4	0.21	6	0.31
Santa Cruz	0	0.00	1	0.37	0	0.00	0	0.00	0	0.00
Shasta	1	0.56	1	0.56	0	0.00	0	0.00	1	0.56
Sierra	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Siskiyou	0	0.00	1	2.24	0	0.00	1	2.25	0	0.00
Solano	0	0.00	0	0.00	1	0.23	1	0.23	0	0.00
Sonoma	0	0.00	1	0.20	2	0.40	2	0.40	2	0.40
Stanislaus	5	0.95	2	0.38	4	0.74	0	0.00	1	0.18
Sutter	0	0.00	0	0.00	1	1.02	0	0.00	0	0.00
Tehama	0	0.00	0	0.00	0	0.00	0	0.00	1	1.56
Trinity	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Tulare	0	0.00	3	0.65	1	0.22	0	0.00	0	0.00
Tuolumne	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ventura	0	0.00	0	0.00	3	0.35	4	0.47	3	0.35
Yolo	0	0.00	0	0.00	1	0.47	1	0.46	1	0.46
Yuba	0	0.00	0	0.00	1	1.32	0	0.00	3	3.91

* City health jurisdictions not included in county total.

† One 2014 acute hepatitis B case was identified retrospectively in 2015.

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Table 21. Confirmed measles cases, by local health jurisdiction† and year of disease onset – California, 2013–2017

Jurisdiction	2013	2014	2015	2016	2017
CALIFORNIA	18	75	125	24	15
Alameda	0	5	5	0	0
City of Berkeley*	1	1	1	0	0
Alpine	0	0	0	0	0
Amador	0	0	0	0	0
Butte	0	0	0	0	0
Calaveras	0	0	0	0	0
Colusa	0	0	0	0	0
Contra Costa	0	4	1	0	0
Del Norte	0	0	0	0	0
El Dorado	0	0	0	0	0
Fresno	0	0	0	0	0
Glenn	0	0	0	0	0
Humboldt	0	1	0	0	0
Imperial	0	0	0	0	0
Inyo	0	0	0	0	0
Kern	0	0	0	0	0
Kings	0	0	0	0	0
Lake	0	0	0	0	0
Lassen	0	0	0	0	0
Los Angeles	3	13	28	18	3
City of Long Beach*	0	0	2	0	0
City of Pasadena*	0	1	3	0	0
Madera	0	0	0	0	0
Marin	0	0	2	0	0
Mariposa	0	0	0	0	0
Mendocino	1	0	0	0	1
Merced	0	0	1	0	0
Modoc	0	0	0	0	0
Mono	0	0	0	0	0
Monterey	1	2	0	0	0
Napa	0	0	0	0	0
Nevada	0	0	0	3	0
Orange	2	24	33	0	3
Placer	0	0	0	0	0
Plumas	0	0	0	0	0
Riverside	1	6	7	0	0
Sacramento	0	0	0	0	0
San Benito	0	0	0	0	0
San Bernardino	0	1	11	0	0
San Diego	2	6	12	0	2
San Francisco	3	0	0	0	0
San Joaquin	0	1	0	0	0
San Luis Obispo	0	0	0	0	2
San Mateo	0	4	4	0	0
Santa Barbara	0	0	0	1	0
Santa Clara‡	0	2	3	1	1
Santa Cruz	3	0	0	0	0
Shasta	0	1	0	0	0
Sierra	0	0	0	0	0
Siskiyou	0	0	0	0	0
Solano	0	0	1	0	0
Sonoma	0	0	0	0	0
Stanislaus	0	0	0	0	0
Sutter	0	0	0	0	0
Tehama	0	0	0	0	0
Trinity	0	0	0	0	0
Tulare	0	0	0	1	0
Tuolumne	0	0	0	0	0
Ventura	1	3	10	0	3
Yolo	0	0	1	0	0
Yuba	0	0	0	0	0

† County of residence or county where case was identified.

* City health jurisdictions not included in county total.

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Table 22. Invasive meningococcal disease cases and incidence rates per 100,000 population, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013		2014		2015†		2016		2017	
	Cases	Rates								
CALIFORNIA	111	0.29	55	0.14	44	0.11	80	0.20	61	0.15
Alameda	5	0.34	5	0.34	2	0.13	5	0.33	4	0.26
City of Berkeley*	0	0.00	0	0.00	0	0.00	0	0.00	1	0.82
Alpine	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Amador	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Butte	0	0.00	0	0.00	0	0.00	1	0.44	1	0.44
Calaveras	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Colusa	1	4.55	0	0.00	1	4.49	0	0.00	0	0.00
Contra Costa	4	0.37	1	0.09	0	0.00	1	0.09	2	0.18
Del Norte	0	0.00	0	0.00	0	0.00	0	0.00	1	3.72
El Dorado	0	0.00	1	0.55	0	0.00	0	0.00	1	0.54
Fresno	4	0.42	2	0.21	1	0.10	1	0.10	3	0.30
Glenn	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Humboldt	0	0.00	0	0.00	1	0.74	0	0.00	1	0.73
Imperial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Inyo	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Kern	1	0.12	4	0.46	0	0.00	1	0.11	2	0.22
Kings	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Lake	0	0.00	1	1.54	0	0.00	0	0.00	1	1.54
Lassen	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Los Angeles	18	0.19	12	0.13	11	0.12	20	0.21	11	0.11
City of Long Beach*	1	0.21	0	0.00	0	0.00	8	1.66	2	0.42
City of Pasadena*	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Madera	3	1.97	0	0.00	0	0.00	1	0.64	0	0.00
Marin	2	0.77	0	0.00	0	0.00	0	0.00	0	0.00
Mariposa	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Mendocino	3	3.41	1	1.13	0	0.00	1	1.13	0	0.00
Merced	3	1.13	0	0.00	0	0.00	0	0.00	0	0.00
Modoc	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Mono	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Monterey	1	0.23	1	0.23	2	0.46	1	0.23	0	0.00
Napa	0	0.00	0	0.00	1	0.71	0	0.00	1	0.71
Nevada	0	0.00	0	0.00	0	0.00	0	0.00	2	2.03
Orange	5	0.16	3	0.10	2	0.06	11	0.35	1	0.03
Placer	0	0.00	0	0.00	0	0.00	0	0.00	3	0.79
Plumas	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Riverside	3	0.13	2	0.09	2	0.09	0	0.00	5	0.21
Sacramento‡	4	0.27	3	0.20	1	0.07	7	0.47	5	0.33
San Benito	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
San Bernardino	9	0.43	1	0.05	1	0.05	1	0.05	2	0.09
San Diego	15	0.47	9	0.28	3	0.09	2	0.06	1	0.03
San Francisco	4	0.47	2	0.23	5	0.58	3	0.34	1	0.11
San Joaquin	1	0.14	0	0.00	1	0.14	1	0.14	0	0.00
San Luis Obispo	0	0.00	0	0.00	1	0.36	1	0.36	2	0.72
San Mateo	1	0.13	1	0.13	2	0.26	2	0.26	2	0.26
Santa Barbara	6	1.38	0	0.00	1	0.22	2	0.45	2	0.44
Santa Clara	3	0.16	4	0.21	1	0.05	2	0.10	1	0.05
Santa Cruz	2	0.74	0	0.00	0	0.00	0	0.00	1	0.36
Shasta	1	0.56	0	0.00	0	0.00	2	1.13	1	0.56
Sierra	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Siskiyou	1	2.24	0	0.00	0	0.00	1	2.25	0	0.00
Solano	0	0.00	1	0.24	1	0.23	1	0.23	1	0.23
Sonoma	3	0.61	0	0.00	0	0.00	1	0.20	0	0.00
Stanislaus	0	0.00	0	0.00	1	0.19	0	0.00	0	0.00
Sutter	2	2.07	0	0.00	0	0.00	0	0.00	0	0.00
Tehama	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Trinity	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Tulare	3	0.66	1	0.22	1	0.22	0	0.00	0	0.00
Tuolumne	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ventura	1	0.12	0	0.00	1	0.12	1	0.12	0	0.00
Yolo	1	0.48	0	0.00	1	0.47	1	0.46	0	0.00
Yuba	0	0.00	0	0.00	0	0.00	1	1.31	0	0.00

* City health jurisdictions not included in county total.

† In 2015, CSTE changed the meningococcal disease case definition.

‡ One 2014 meningococcal disease case was identified as not a case retrospectively in 2016.

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Table 23. Confirmed and probable mumps cases, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013	2014	2015	2016	2017
CALIFORNIA	30	39	30	93	189
Alameda	1	1	0	4	8
City of Berkeley*	0	0	0	4	2
Alpine	0	0	0	0	0
Amador	0	0	0	0	0
Butte	0	1	0	0	0
Calaveras	1	0	0	0	0
Colusa	0	0	0	0	0
Contra Costa	2	1	2	3	2
Del Norte	0	0	0	0	0
El Dorado	0	0	0	3	0
Fresno	1	1	0	0	0
Glenn	0	0	0	0	0
Humboldt	0	0	0	1	0
Imperial	0	0	0	1	1
Inyo	0	0	0	0	0
Kern	0	0	0	0	0
Kings	0	0	0	0	0
Lake	0	0	0	0	0
Lassen	0	0	0	0	0
Los Angeles	9	10	14	17	81
City of Long Beach*	0	0	2	1	2
City of Pasadena*	0	1	0	0	0
Madera	0	0	0	0	1
Marin	0	0	0	0	3
Mariposa	0	0	0	0	0
Mendocino	0	0	0	0	0
Merced	0	0	0	0	0
Modoc	0	0	0	0	0
Mono	0	0	0	0	1
Monterey	0	0	1	1	0
Napa	0	0	0	0	1
Nevada	0	0	0	0	2
Orange	2	8	5	6	27
Placer	1	0	0	0	1
Plumas	0	0	0	0	0
Riverside	2	4	0	3	2
Sacramento	0	1	0	2	10
San Benito	0	0	0	0	0
San Bernardino	1	3	4	1	2
San Diego	2	2	0	23	15
San Francisco	2	0	2	9	11
San Joaquin	1	0	0	0	4
San Luis Obispo	0	0	0	1	1
San Mateo	1	0	0	1	6
Santa Barbara	1	0	0	2	0
Santa Clara	0	1	0	3	2
Santa Cruz	0	1	0	0	0
Shasta	0	0	0	0	0
Sierra	0	0	0	0	0
Siskiyou	0	0	0	0	0
Solano	0	0	0	1	0
Sonoma	0	0	0	1	2
Stanislaus	1	1	0	0	0
Sutter	0	0	0	0	0
Tehama	0	0	0	0	0
Trinity	0	0	0	0	0
Tulare	0	0	0	0	0
Tuolumne	0	0	0	0	0
Ventura	1	2	0	5	2
Yolo	1	1	0	0	0
Yuba	0	0	0	0	0

* City health jurisdictions not included in county total.

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Table 24. Pertussis disease cases and incidence rates per 100,000 population, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013		2014		2015		2016		2017	
	Cases	Rates								
CALIFORNIA	2538	6.6	11206	28.9	4703	12.0	1938	4.9	3155	8.0
Alameda	124	8.5	364	24.6	179	11.9	77	5.1	115	7.5
City of Berkeley*	13	11.1	55	46.4	10	8.3	4	3.3	8	6.6
Alpine	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Amador	2	5.3	1	2.7	2	5.4	2	5.4	0	0.0
Butte	33	14.9	33	14.8	8	3.6	2	0.9	4	1.8
Calaveras	2	4.4	17	37.8	1	2.2	2	4.5	1	2.2
Colusa	0	0.0	0	0.0	4	18.0	0	0.0	0	0.0
Contra Costa	69	6.3	474	43.0	181	16.2	46	4.1	48	4.2
Del Norte	0	0.0	2	7.4	0	0.0	0	0.0	0	0.0
El Dorado	4	2.2	36	19.7	27	14.7	9	4.9	5	2.7
Fresno	43	4.5	392	40.4	57	5.8	16	1.6	37	3.7
Glenn	0	0.0	1	3.5	2	6.9	1	3.4	0	0.0
Humboldt	5	3.7	148	109.9	56	41.5	1	0.7	0	0.0
Imperial	3	1.7	10	5.5	10	5.4	3	1.6	1	0.5
Inyo	0	0.0	0	0.0	0	0.0	0	0.0	4	21.5
Kern	30	3.5	167	19.1	146	16.5	27	3.0	18	2.0
Kings	2	1.3	16	10.7	6	4.0	7	4.7	0	0.0
Lake	3	4.6	3	4.6	6	9.3	1	1.5	9	13.9
Lassen	0	0.0	5	15.7	0	0.0	0	0.0	0	0.0
Los Angeles	347	3.7	2003	21.1	1141	11.9	309	3.2	558	5.8
City of Long Beach*	16	3.4	181	37.8	36	7.5	13	2.7	19	3.9
City of Pasadena*	2	1.4	22	15.6	7	5.0	4	2.8	5	3.5
Madera	10	6.6	47	30.5	6	3.9	3	1.9	7	4.4
Marin	183	70.7	273	104.6	53	20.3	31	11.8	40	15.2
Mariposa	0	0.0	0	0.0	0	0.0	1	5.5	0	0.0
Mendocino	6	6.8	10	11.3	9	10.2	8	9.0	3	3.4
Merced	1	0.4	9	3.4	13	4.8	1	0.4	2	0.7
Modoc	0	0.0	6	62.7	0	0.0	0	0.0	0	0.0
Mono	2	14.4	0	0.0	0	0.0	0	0.0	0	0.0
Monterey	49	11.5	129	30.0	76	17.5	16	3.6	28	6.3
Napa	13	9.3	137	97.5	49	34.7	5	3.5	12	8.5
Nevada	71	72.7	16	16.3	3	3.1	42	42.7	2	2.0
Orange	113	3.6	447	14.2	162	5.1	69	2.2	198	6.2
Placer	83	22.8	120	32.6	49	13.2	17	4.5	82	21.5
Plumas	1	5.1	1	5.1	2	10.2	0	0.0	0	0.0
Riverside	80	3.5	469	20.3	182	7.8	82	3.5	136	5.7
Sacramento	71	4.9	446	30.3	286	19.2	69	4.6	67	4.4
San Benito	1	1.8	11	19.2	7	12.2	9	15.5	3	5.1
San Bernardino	38	1.8	206	9.8	91	4.3	32	1.5	44	2.0
San Diego	408	12.7	2019	62.2	895	27.3	395	12.0	1163	35.0
San Francisco	59	7.0	131	15.3	69	8.0	10	1.1	35	4.0
San Joaquin	26	3.7	214	29.8	81	11.1	4	0.5	9	1.2
San Luis Obispo	17	6.2	45	16.3	21	7.6	29	10.4	15	5.4
San Mateo	104	13.9	128	16.9	40	5.2	109	14.2	64	8.3
Santa Barbara	29	6.7	120	27.3	66	14.8	10	2.2	9	2.0
Santa Clara	253	13.6	537	28.4	149	7.8	234	12.1	188	9.7
Santa Cruz	54	20.0	166	61.1	79	28.8	46	16.7	45	16.3
Shasta	7	3.9	33	18.4	15	8.4	25	14.1	2	1.1
Sierra	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Siskiyou	5	11.2	7	15.7	6	13.5	0	0.0	3	6.8
Solano	15	3.6	144	33.8	42	9.8	14	3.2	14	3.2
Sonoma	51	10.3	704	141.4	34	6.8	42	8.3	19	3.8
Stanislaus	16	3.0	92	17.3	38	7.1	13	2.4	5	0.9
Sutter	2	2.1	8	8.2	2	2.0	1	1.0	4	4.1
Tehama	0	0.0	38	59.5	5	7.8	4	6.2	1	1.6
Trinity	0	0.0	6	44.1	6	44.2	1	7.4	0	0.0
Tulare	25	5.5	37	8.0	86	18.5	13	2.8	11	2.3
Tuolumne	2	3.6	16	29.3	9	16.5	0	0.0	5	9.3
Ventura	37	4.4	347	40.9	107	12.6	35	4.1	71	8.3
Yolo	4	1.9	147	70.0	83	39.0	43	19.8	5	2.3
Yuba	4	5.4	10	13.3	3	4.0	1	1.3	31	40.4

* City health jurisdictions not included in county total.

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Table 25. Confirmed rubella cases, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013	2014	2015	2016	2017
CALIFORNIA	0	2	0	0	1
Alameda	0	1	0	0	0
City of Berkeley*	0	0	0	0	0
Alpine	0	0	0	0	0
Amador	0	0	0	0	0
Butte	0	0	0	0	0
Calaveras	0	0	0	0	0
Colusa	0	0	0	0	0
Contra Costa	0	0	0	0	0
Del Norte	0	0	0	0	0
El Dorado	0	0	0	0	0
Fresno	0	0	0	0	0
Glenn	0	0	0	0	0
Humboldt	0	0	0	0	0
Imperial	0	0	0	0	0
Inyo	0	0	0	0	0
Kern	0	0	0	0	0
Kings	0	0	0	0	0
Lake	0	0	0	0	0
Lassen	0	0	0	0	0
Los Angeles	0	0	0	0	0
City of Long Beach*	0	0	0	0	0
City of Pasadena*	0	0	0	0	0
Madera	0	0	0	0	0
Marin	0	0	0	0	0
Mariposa	0	0	0	0	0
Mendocino	0	0	0	0	0
Merced	0	0	0	0	0
Modoc	0	0	0	0	0
Mono	0	0	0	0	0
Monterey	0	0	0	0	0
Napa	0	0	0	0	0
Nevada	0	0	0	0	0
Orange	0	0	0	0	0
Placer	0	0	0	0	0
Plumas	0	0	0	0	0
Riverside	0	0	0	0	1
Sacramento	0	0	0	0	0
San Benito	0	0	0	0	0
San Bernardino	0	0	0	0	0
San Diego	0	0	0	0	0
San Francisco	0	0	0	0	0
San Joaquin	0	0	0	0	0
San Luis Obispo	0	0	0	0	0
San Mateo	0	1	0	0	0
Santa Barbara	0	0	0	0	0
Santa Clara	0	0	0	0	0
Santa Cruz	0	0	0	0	0
Shasta	0	0	0	0	0
Sierra	0	0	0	0	0
Siskiyou	0	0	0	0	0
Solano	0	0	0	0	0
Sonoma	0	0	0	0	0
Stanislaus	0	0	0	0	0
Sutter	0	0	0	0	0
Tehama	0	0	0	0	0
Trinity	0	0	0	0	0
Tulare	0	0	0	0	0
Tuolumne	0	0	0	0	0
Ventura	0	0	0	0	0
Yolo	0	0	0	0	0
Yuba	0	0	0	0	0

* City health jurisdictions not included in county total.

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Table 26. Probable tetanus cases, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013	2014	2015	2016	2017
CALIFORNIA	4	4	3	1	2
Alameda	0	0	0	0	1
City of Berkeley*	0	0	0	0	0
Alpine	0	0	0	0	0
Amador	0	0	0	0	0
Butte	0	0	0	0	0
Calaveras	0	0	0	0	0
Colusa	0	0	0	0	0
Contra Costa	0	0	0	0	0
Del Norte	0	0	0	0	0
El Dorado	0	0	0	0	0
Fresno	0	0	0	0	0
Glenn	0	0	0	0	0
Humboldt	0	0	0	0	0
Imperial	0	1	0	0	0
Inyo	0	0	0	0	0
Kern	0	0	0	0	0
Kings	0	0	0	0	0
Lake	0	0	0	0	0
Lassen	0	0	0	0	0
Los Angeles	1	0	1	0	0
City of Long Beach*	0	1	0	0	0
City of Pasadena*	0	0	0	0	0
Madera	0	0	0	0	0
Marin	0	0	0	0	0
Mariposa	0	0	0	0	0
Mendocino	0	0	0	0	0
Merced	1	0	0	0	0
Modoc	0	0	0	0	0
Mono	0	0	0	0	0
Monterey	0	0	0	0	0
Napa	0	0	0	0	0
Nevada	0	0	0	0	0
Orange	0	2	1	0	0
Placer	0	0	0	0	0
Plumas	0	0	0	0	0
Riverside	0	0	1	1	1
Sacramento	0	0	0	0	0
San Benito	0	0	0	0	0
San Bernardino	0	0	0	0	0
San Diego	0	0	0	0	0
San Francisco	0	0	0	0	0
San Joaquin	0	0	0	0	0
San Luis Obispo	0	0	0	0	0
San Mateo	0	0	0	0	0
Santa Barbara	0	0	0	0	0
Santa Clara	1	0	0	0	0
Santa Cruz	0	0	0	0	0
Shasta	0	0	0	0	0
Sierra	0	0	0	0	0
Siskiyou	0	0	0	0	0
Solano	0	0	0	0	0
Sonoma	0	0	0	0	0
Stanislaus	0	0	0	0	0
Sutter	0	0	0	0	0
Tehama	0	0	0	0	0
Trinity	0	0	0	0	0
Tulare	0	0	0	0	0
Tuolumne	0	0	0	0	0
Ventura	1	0	0	0	0
Yolo	0	0	0	0	0
Yuba	0	0	0	0	0

* City health jurisdictions not included in county total.

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Table 27. Confirmed and probable varicella hospitalizations and deaths, by local health jurisdiction and year of disease onset – California, 2013–2017

	2013	2014	2015 [†]	2016 [‡]	2017 [†]
CALIFORNIA	32	41	60	48	42
Alameda	1	5	10	0	2
City of Berkeley*	0	0	2	0	0
Alpine	0	0	0	0	0
Amador	0	0	0	0	0
Butte	0	0	1	0	0
Calaveras	0	0	0	0	0
Colusa	0	0	0	0	0
Contra Costa	2	1	0	2	0
Del Norte	0	0	0	0	0
El Dorado	0	0	0	0	0
Fresno	2	5	0	3	1
Glenn	0	0	0	0	0
Humboldt	0	1	0	0	0
Imperial	0	0	0	2	0
Inyo	0	0	0	0	0
Kern	0	1	0	0	0
Kings	0	0	0	0	0
Lake	0	0	1	0	0
Lassen	0	0	0	0	0
Los Angeles	8	9	12	12	16
City of Long Beach*	0	0	0	1	1
City of Pasadena*	1	0	0	0	0
Madera	0	0	0	0	0
Marin	0	0	1	0	0
Mariposa	0	0	0	0	0
Mendocino	0	0	0	0	1
Merced	0	0	0	0	0
Modoc	0	0	0	0	0
Mono	0	0	0	0	0
Monterey	0	0	1	1	0
Napa	0	0	0	0	0
Nevada	0	0	0	0	0
Orange	5	4	10	5	8
Placer	0	0	0	1	0
Plumas	0	0	0	1	0
Riverside	2	3	5	0	1
Sacramento	1	1	2	5	4
San Benito	0	0	0	0	0
San Bernardino	1	3	3	4	1
San Diego	2	2	1	1	1
San Francisco	2	1	0	0	3
San Joaquin	0	2	0	2	1
San Luis Obispo	0	1	0	0	0
San Mateo	1	0	4	1	0
Santa Barbara	1	0	0	0	0
Santa Clara	1	0	3	4	2
Santa Cruz	0	0	1	0	0
Shasta	0	0	0	0	0
Sierra	0	0	0	0	0
Siskiyou	0	0	0	0	0
Solano	1	0	2	0	0
Sonoma	0	1	0	0	0
Stanislaus	0	0	0	0	0
Sutter	0	0	0	0	0
Tehama	0	0	0	0	0
Trinity	0	0	0	0	0
Tulare	0	1	0	1	0
Tuolumne	1	0	0	0	0
Ventura	0	0	0	2	0
Yolo	0	0	0	0	0
Yuba	0	0	1	0	0

* City health jurisdictions not included in county total.

† Includes one death.

‡ Includes two deaths.