Public Health Department
Alameda County Health

Vaccine-Preventable Diseases in Alameda County, 2019-2023

Background

Medical providers in California are required to report cases of vaccine-preventable diseases to the local public health department as specified by Title 17 of the California Code of Regulations.

This fact sheet summarizes confirmed, probable, and suspect cases of: invasive meningococcal disease, diphtheria, mumps, rubella, *Haemophilus influenzae*, measles, pertussis, and tetanus from 2019—2023.

Case Counts, Rates, and Demographics

One-hundred fifty-six cases of vaccine-preventable diseases were reported in Alameda County from 2019-2023. The majority of cases (79%) reported were pertussis, followed by mumps (13%) and *H. influenzae* (5%, Table 1). None of the *H. influenzae* cases were serotype B. Pertussis had the highest case rate, with 7.97 cases per 100,000 people over a 5-year period. No cases of measles or rubella were reported during this timeframe. In 2019 there were 16 exposure events to out-of-jurisdiction measles cases, resulting in 102 Alameda County contacts investigated during this time period. No contacts became cases.

Table 1. Vaccine-Preventable Disease 5-year Rates and Counts

Disease	Number of Cases	5-year Case Rate (per 100,000)	Percent Known to be Vaccinated
Pertussis	123	7.97	88%
Mumps	20	1.3	60%
Haemophilus influenzae[1]	8	0.52	63%
Invasive Meningococcal Disease	<5	—	33%
Diphtheria	<5	—	100%
Tetanus	<5	—	—
Measles	0	0	—
Rubella	0	0	—
Total	156	10.1	

[1]Only reportable in those < 5 years old

Hispanic and Latino/a/x/e residents had the highest percent and case rate of vaccine-preventable diseases. The majority of vaccine-preventable disease cases were among children ages 6-18 years old (51%), and most of the cases in this age group were pertussis (95%). Case rates were highest among children less than one year of age, with a rate of 101.7 cases per 100,000 infants over a five-year period (Table 2). The majority of these cases were pertussis (61%) and *H. influenzae* (21%). Almost two-thirds (63%) of the infant pertussis cases had mothers who were not known to have received the vaccine during pregnancy.

Table 2. Demographics of Vaccine-Preventable Disease Cases, 2019—2023

Characteristic	Cases	Percent	5-Year Case Rate (per 100,000)
Age Group			
<1 yrs	18	12%	101.7
1-5 yrs	34	22%	36.6
6-18 yrs	79	51%	31.5
19-59 yrs	21	13%	2.5
60+ yrs	< 10	—	—
Race/Ethnicity			
African American/Black	10	6.4%	6.6
Asian	35	22%	7
Hispanic/Latino/a/x/e	42	27%	11.8
Multiracial	< 10	—	—
Pacific Islander	< 10	—	—
White	29	19%	6.5
Other/Unknown	35	22%	—
Gender			
Female	83	53%	10.6
Male	73	47%	9.6

Table 3. Epidemiologic and Clinical Characteristics of Vaccine-Preventable Disease Cases, 2019-2023

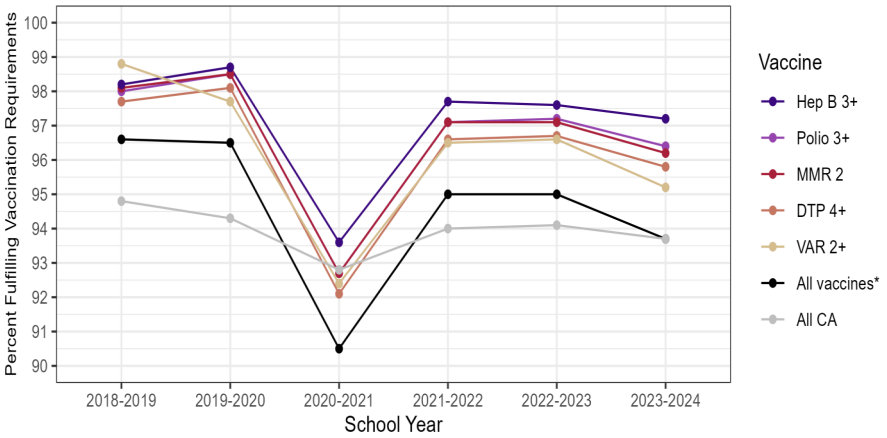
Characteristic	Pertussis Cases N = 123	All Other Disease Cases N = 33
Immunocompromised	0 (0%)	2 (6.1%)
Hospitalized	1 (0.8%)	12 (36%)
Died	0 (0%)	0 (0%)
Travel During Incubation Period	6 (4.9%)	5 (15%)
Immunized for Disease		
Yes	108 (88%)	18 (55%)
Unknown	8 (6.5%)	11 (33%)
No	7 (5.7%)	4 (12%)
Reasons for Not Being Vaccinated[1]		
Under age for vaccination	0 (0%)	3 (9.1%)
Personal Beliefs Exemption	3 (2.4%)	0 (0%)
Permanent Medical Exemption	2 (1.6%)	0 (0%)
Delay in series	2 (1.6%)	0 (0%)
Unknown	3 (2.4%)	1 (3%)

[1]Not mutually exclusive

Clinical Characteristics and Epidemiology

Among pertussis cases, no patients died, and only one was hospitalized; 88% of pertussis cases were immunized for the disease (Table 3). Of these cases, 46% of those with a date on record had been vaccinated 3 or more years prior to disease onset. Immunity to pertussis is known to wane by the next booster, and 41% of vaccinated cases were between the ages of 13-18 years old. Outbreaks in schools among this age group often occur. The reason for outbreaks of pertussis despite high vaccination rates remains unknown; however, for this age group timeliness of testing may have contributed to transmission in school/childcare settings. The average number of days between symptom onset and testing was 18 days. The average number of days between onset and treatment was 19 with a minimum of 7 days between onset and treatment recorded. It is important to note that there was only one hospitalization for pertussis during this 5 year time period, highlighting the effectiveness of the vaccine in preventing severe disease. Of the seven pertussis cases that were unvaccinated, the most common reasons were personal belief exemptions.

Figure 1. Kindergarten Vaccine Coverage in Alameda County, 2019-2023



*Received all required immunizations, including: 5 or more of Diphtheria, Tetanus and Pertussis (DTaP) vaccine (4 doses are acceptable if at least 1 dose was received on or after the fourth birthday); 4 or more of Polio vaccine (3 doses are acceptable if at least 1 dose was received on or after the fourth birthday); 2 doses of Measles, Mumps and Rubella (MMR) vaccine or two doses of Measles, two doses of Mumps, and one dose of Rubella vaccine, separately or combined, on or after the first birthday; 3 or more of Hepatitis B (Hep B) vaccine; and 2 or more of Varicella.

Among the other disease cases, no patients died, 12 (36%) were hospitalized, and two were immunocompromised. Only 57% of these cases were known to be immunized against the disease. Being under the recommended age of vaccination was the most common reason for not being vaccinated (75%). Among mumps cases, only 5 (25%) had buccal PCR tests and none had paired acute and convalescent IgG testing. Meanwhile, 11 (55%) cases had mumps serum IgM tests collected, which was the only test for nine of these cases. For the eight cases with parotitis that were tested by IgM only, all were tested within 9 days of swelling onset, highlighting a missed opportunity for PCR testing, which can occur up to 10 days after parotitis onset.

While Alameda County generally has higher Kindergarten vaccination rates than the state as a whole, vaccination coverage decreased during the COVID-19 pandemic, and remained lower than pre-pandemic years (Figure 1).

Provider Recommendations:

- Over the five-year period, Alameda County had low case counts and rates of vaccine-preventable diseases due to high vaccination coverage, as evidenced by Kindergarten vaccination rates. Providers can use these data to emphasize the effectiveness of childhood vaccinations.
- If mumps is suspected, the ideal sample for confirming diagnosis is a mumps PCR. Specimens should be collected ideally within 3 days post-onset of parotitis, but can be collected up to 10 days after onset. Please refer to this flow chart for healthcare providers.
- Timely testing and treatment of pertussis cases can prevent transmission, protect high-risk individuals such as infants, and prevent outbreaks in school/childcare settings. The preferred method for the diagnosis of pertussis is PCR. Healthcare providers should test patients within the first 3 weeks of cough onset.
- It is recommended that pregnant persons receive the Tdap vaccine during pregnancy. Evidence shows that infants are less likely to develop pertussis early in life if their mother received Tdap during pregnancy.
- It is still important to encourage childhood vaccinations and address misinformation and disinformation.

For questions or additional information, contact:
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