SACRAMENTO COUNTY

Pertussis, also known as whooping cough, is a highly contagious respiratory disease. It is known for uncontrollable, violent coughing which often makes it hard to breathe. After coughing fits, someone with pertussis often needs to take in deep breaths, which may result in a "whooping" sound. Pertussis can affect people of all ages, but can be very serious, even deadly, for infants less than a year old. The best way to protect against pertussis is by getting vaccinated. *Source: CDC*

Pertussis follows a cyclical pattern with peaks in disease every three to five years. In Sacramento County, a peak in cases last occurred in 2014, following state [Figure 1] and national trends. Although there was a 41.8% increase in cases in Sacramento County between 2017 and 2018, 2018 was not considered a peak year. An increase is expected to occur soon. Between 2012 and 2018, pertussis cases were also higher during the spring/summer months [Figure 2].

Pertussis mainly affected children and adolescents. Between 2012 and 2018, most cases were reported among children 10 to 14 years old (26.4%) followed by those 15 to 19 years old (22.9%) [Figure 3]. Adults 20 years and older accounted for the least cases (8.6%). Infants less than one year old are at a higher risk of developing more severe disease; they accounted for 10.6% of cases.

Overall, females accounted for slightly more than half of all cases (55.7%) reported during this seven year period [Figure 4]. Females made up at least half of all cases across each age group, with the most among those 20 years and older (62.6%) [data not shown].

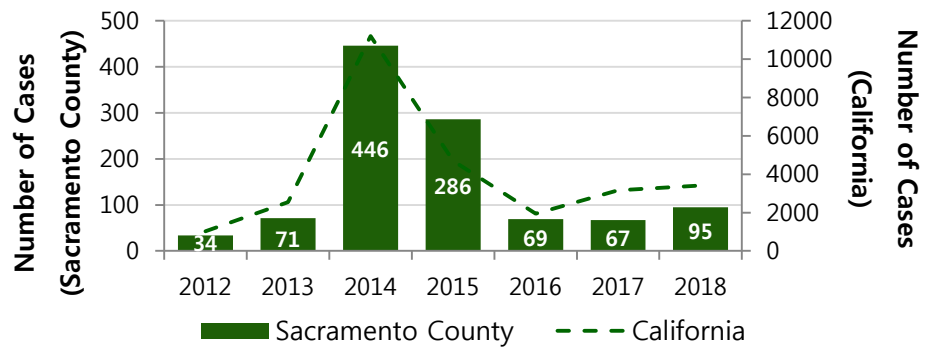**Figure 1. Number of Pertussis Cases* by Year, Sacramento County (N=1,068) vs. California (N=27,981), 2012-2018**

Figure 2. Number of Pertussis Cases* by Month and Year, Sacramento County, 2012-2018 (N=1,068)
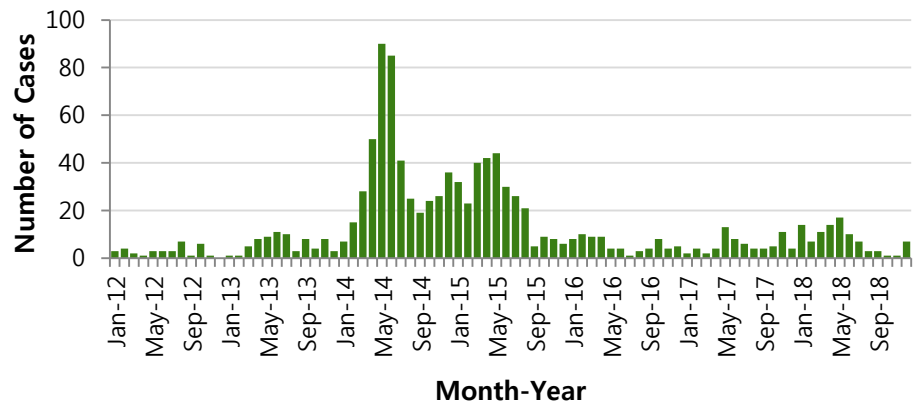

Figure 3. Percent of Pertussis Cases* by Age Group, Sacramento County, 2012-2018 (N=1,068)
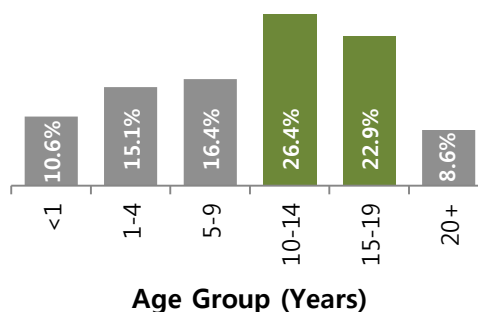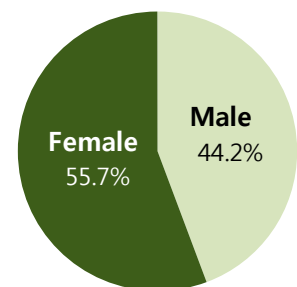

Figure 4. Percent of Pertussis Cases* by Sex, Sacramento County, 2012-2018 (N=1,068)

*Includes confirmed, probable, and suspect cases

Among those where data on race was available (70.1%), the majority of cases were White (62.5%) [Figure 5]. Other/Multiple Races represented the second largest group (22.7%). Only a small percent were Asian (8.3%) or Black (6.5%).

Among cases reported between 2016 and 2018, almost one fifth (19.1%) were seen in the emergency department (ED) [Figure 6]. Among those seen in the ED, 31.8% were hospitalized. One additional case was hospitalized but not seen in the ED for a total of 15 (6.5%) hospitalized cases during this three year period. Among those hospitalized, 6 (40.0%) were also admitted to the intensive care unit (ICU) [data not shown]. Almost all of the cases that were hospitalized and/or admitted to the ICU were less than one year old.

In addition to prolonged cough, most cases reported during this period also experienced at least one other symptom. This included 77.1% with paroxysmal cough (fits of violent coughing), 48.2% with posttussive vomiting (vomiting after cough), 26.4% with a high-pitched whooping sound after coughing, 21.5% with fever, and 7.9% with cyanosis (turning blue) [Figure 7]. Among those less than one year old, 31.3% experienced apnea (pause in breathing). Those who were seen in the ED and/or hospitalized were more likely to experience these symptoms compared to those who were not seen in the ED or hospitalized.

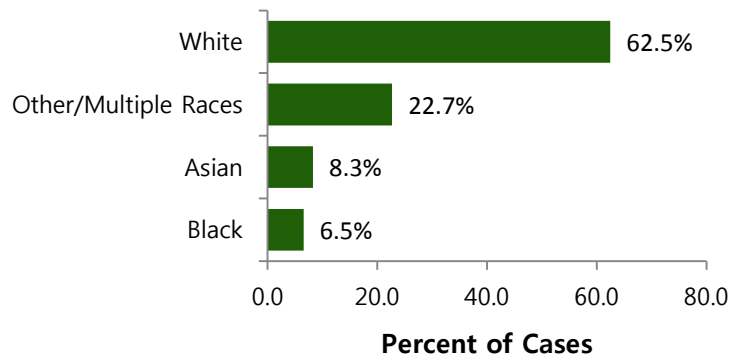**Figure 5. Percent of Pertussis Cases* by Race, Sacramento County, 2012-2018**

Figure 6. Percent of Pertussis Cases* Seen at the Emergency Department (ED) and/or Hospitalized, Sacramento County, 2016-2018 (N=231)
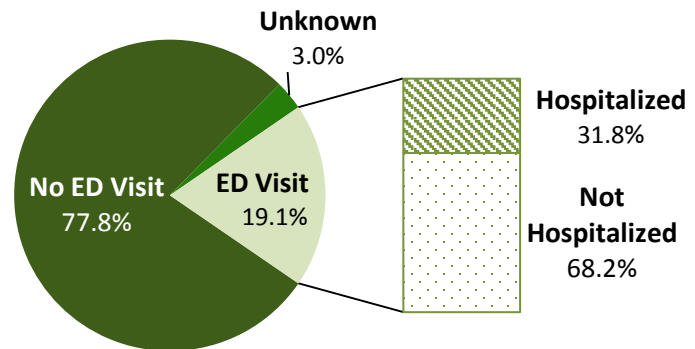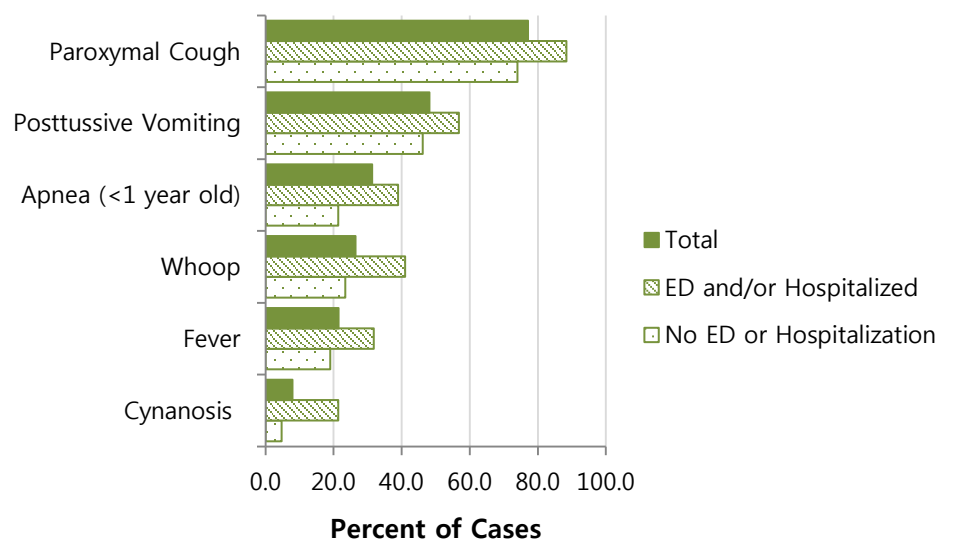

Figure 7. Symptoms Experienced by Pertussis Cases*, Sacramento County, 2016-2018

A small percent of cases experienced complications. Among those where data on complications was available, 9 (4.4%) had pneumonia, 7 (3.9%) had other respiratory diseases, 4 (1.8%) had encephalopathy (disease of the brain), and 1 (0.5%) had seizures [data not shown].

Among cases reported between 2016 and 2018, 29.0% were not vaccinated [Figure 8]. Those who were vaccinated but still got sick were among the older age groups (5-19 years old) [Figure 9], which correspond with decreased protection from vaccination over time and the need for boosters as adults. However those who were vaccinated but still got sick experienced less symptoms compared to those who were not vaccinated [data not shown].

The number of pertussis cases reported between 2012 and 2018 by zip code tabulation area (ZCTA) of residency is shown in Figure 10. The most cases were reported among residents within ZCTA in Elk Grove and other incorporated areas. Over 50 cases were reported in these ZCTAs during this seven year period.

Data Source: California Reportable Disease Information Exchange (CalREDIE)

Notes: Data are provisional. Counts may be influenced by surveillance artifacts and outbreaks. Cases are classified according to the most recent case definitions as published by the Centers for Disease Control and Prevention or the Council of State and Territorial Epidemiologists. Case definition for pertussis was updated in 2014.

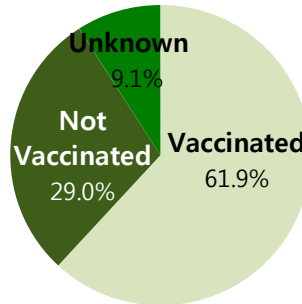**Figure 8. Percent of Pertussis Cases* by Vaccination Status, Sacramento County, 2016-2018 (N=231)**

Unknown 9.1%
Not Vaccinated 29.0%
Vaccinated 61.9%

Figure 9. Percent of Vaccinated Pertussis Cases* by Age Group, Sacramento County, 2016-2018

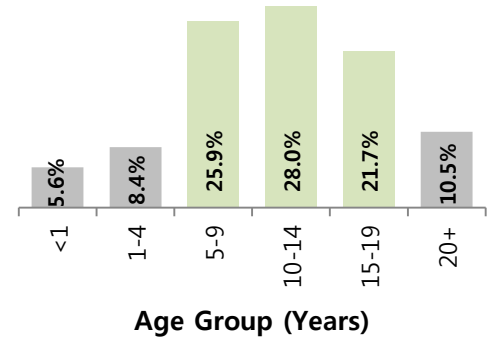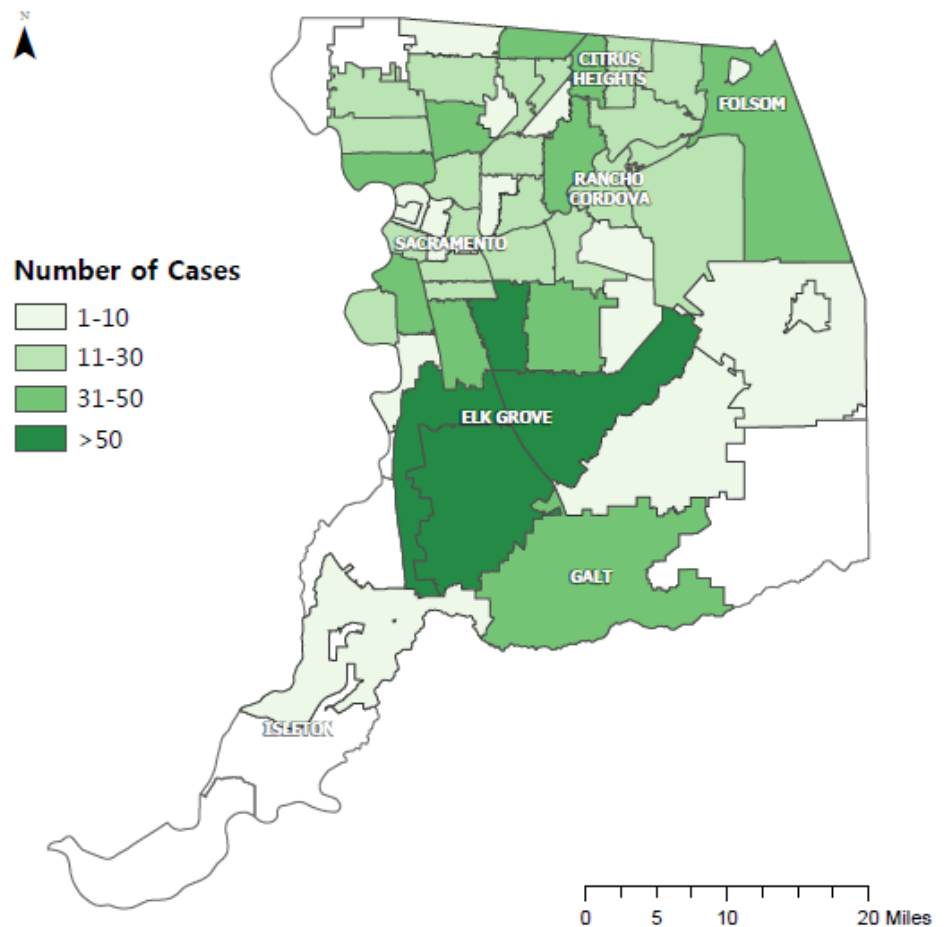| Age Group	Percent
<1	5.6%
1-4	8.4%
5-9	25.9%
10-14	28.0%
15-19	21.7%
20+	10.5%

Age Group (Years)

Figure 10. Number of Pertussis Cases* by Zip Code Tabulation Area of Residency, Sacramento County, 2012-2018

Number of Cases
- 1-10
- 11-30
- 31-50
- >50

More information can be found on the Centers for Disease Control and Prevention's website at https://www.cdc.gov/pertussis/index.html, California Department of Public Health's website at https://www.cdph.ca.gov/Programs/CID/DCDC/pages/immunization/pertussis.aspx, and Sacramento County Public Health's website at http://www.dhs.saccounty.net/PUB/Pages/Communicable-Disease-Control/Facts-About-Pertussis.aspx.