

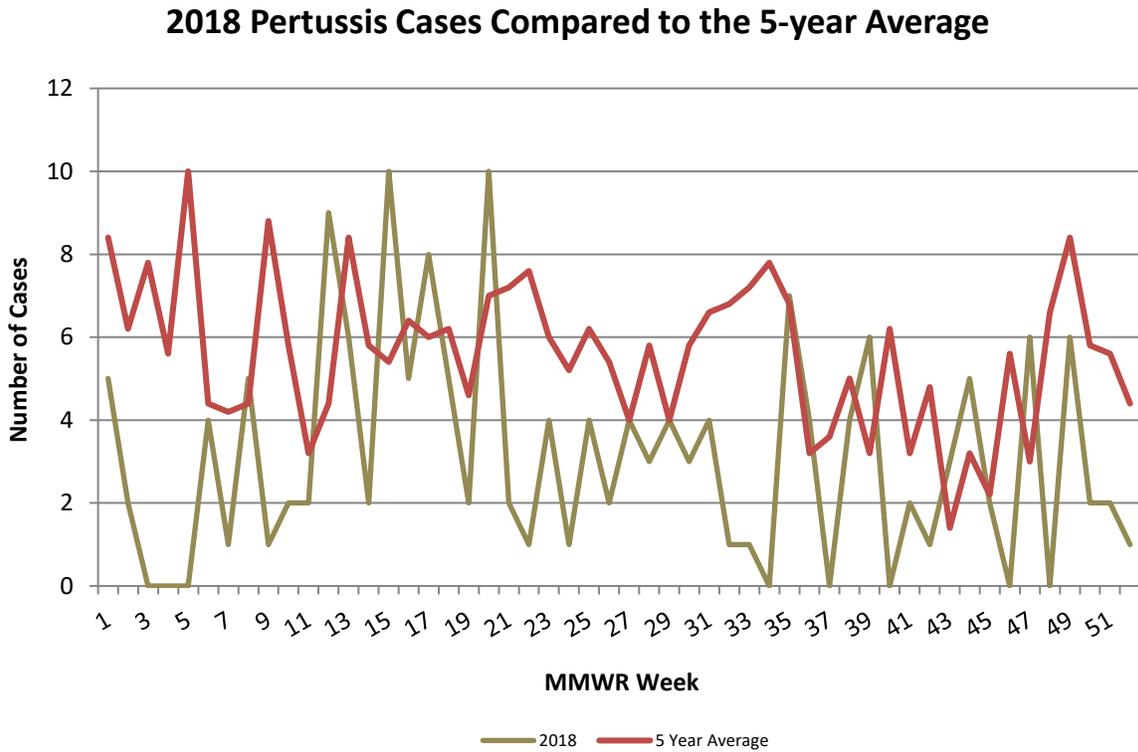


Pertussis: 2018 Year End Report

This report characterizes primary surveillance data collected by the Salt Lake County Health Department from questions on the Utah Pertussis Investigation Form and incorporates secondary data from the state of Utah (same form) and the United States (Centers for Disease Control and Prevention).

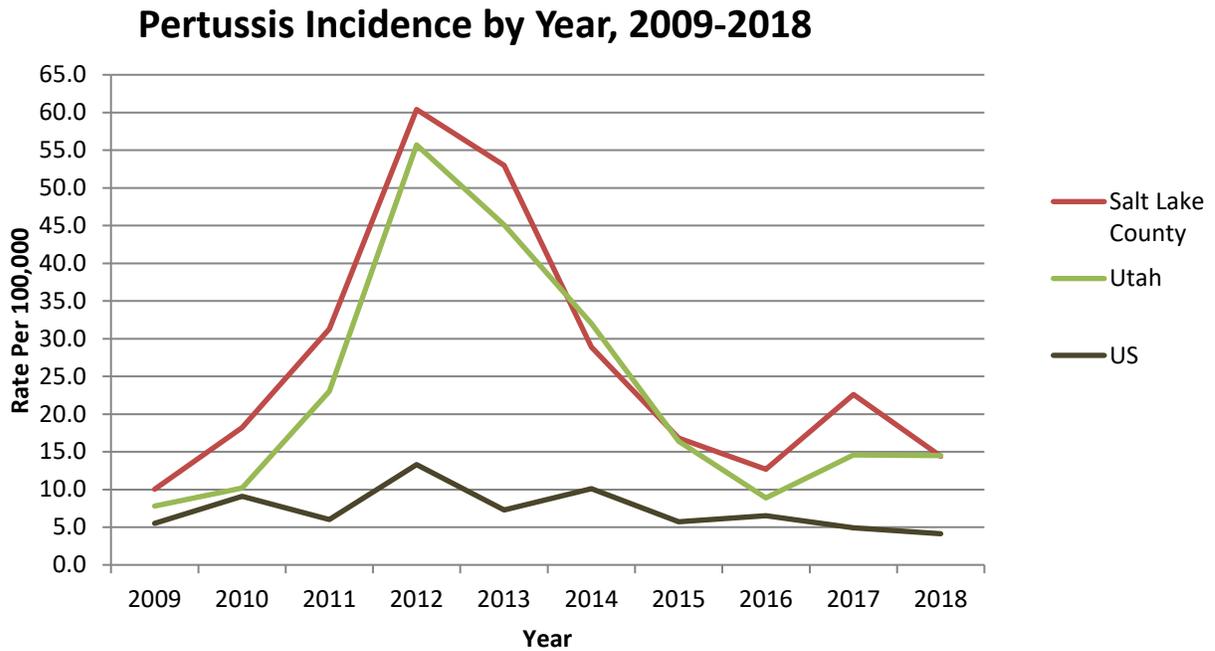
There were 164 confirmed and probable pertussis cases in Salt Lake County in 2018. Compared to the five-year average, case counts typically fell below the five-year average for the majority of 2018 (Figure 1).

Figure 1



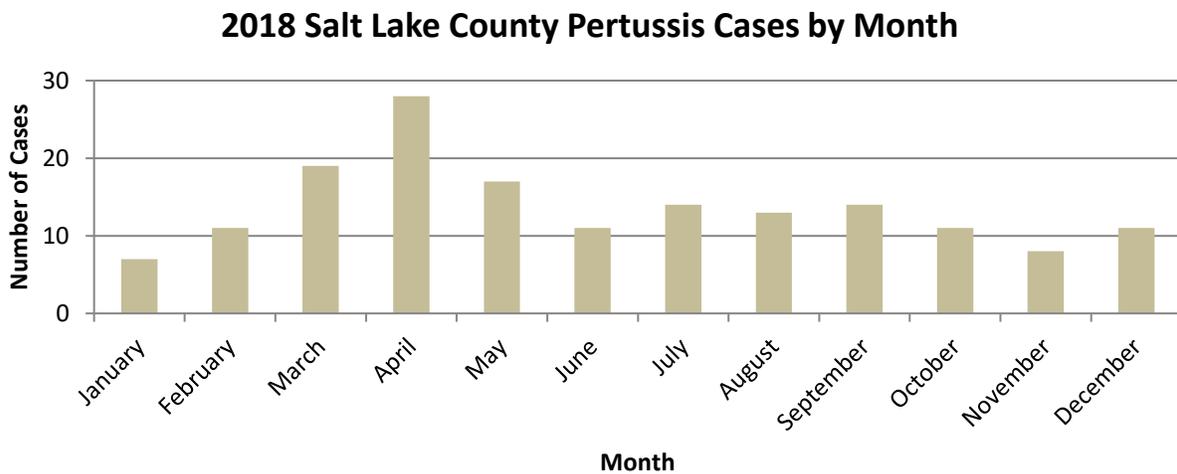
The incidence rate for Salt Lake County was 14.4 per 100,000 population. Over a ten-year period, Salt Lake County has had higher incidence rates than the US; however, Salt Lake County and Utah follow a similar trend (Figure 2).

Figure 2



During 2018, monthly trends show that the pertussis cases peaked in April (Figure 3).

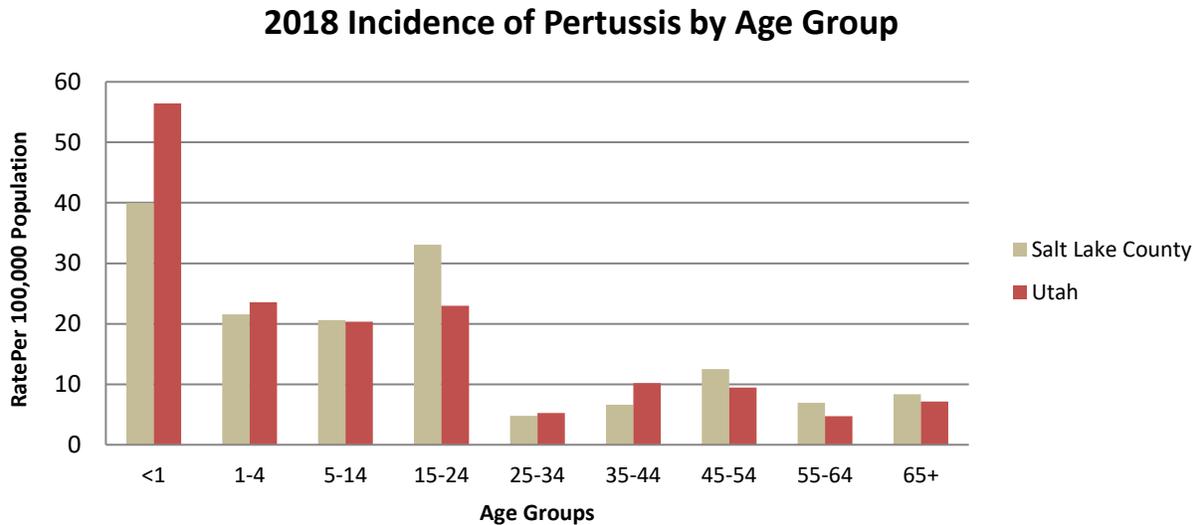
Figure 3



Demographics

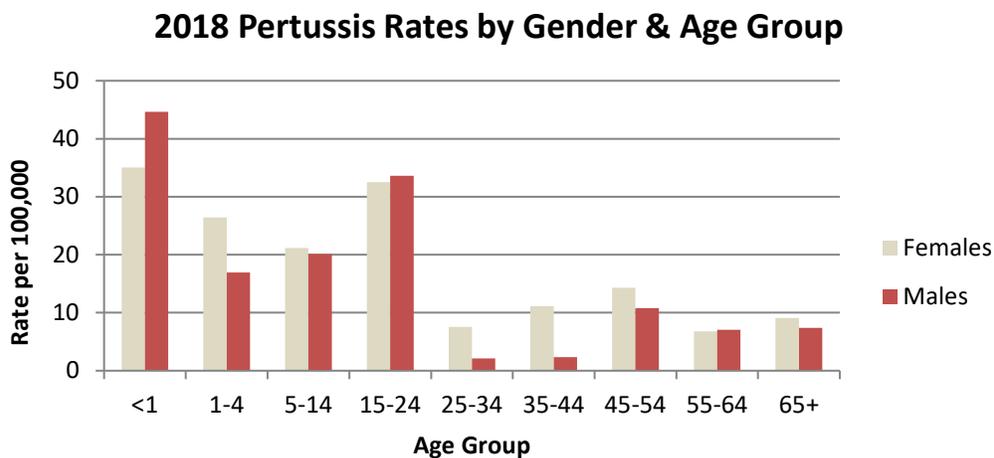
Pertussis surveillance for age is broken into nine standard age categories as shown in Figure 4. Incidence for pertussis in Salt Lake County is highest among the less than one age group at 40 per 100,000 population. Utah follows the same trend.

Figure 4



In 2018 females had a higher rate than males among total cases (16 per 100,000 population compared to 13). However, the rate for males in the <1 age group was higher than females for the fifth consecutive year. The only other age group where the rate for males was higher than females was the 15-24 age group (Figure 5).

Figure 5



As shown in Figures 6 and 7, pertussis rates are highest among the White and non-Hispanic populations of Salt Lake County.

Figure 6

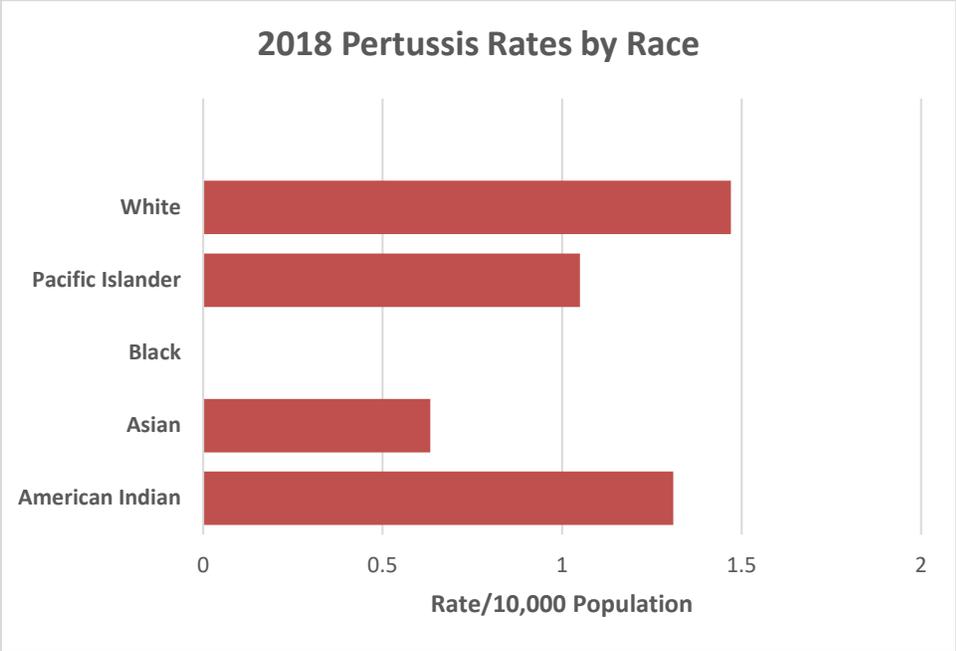
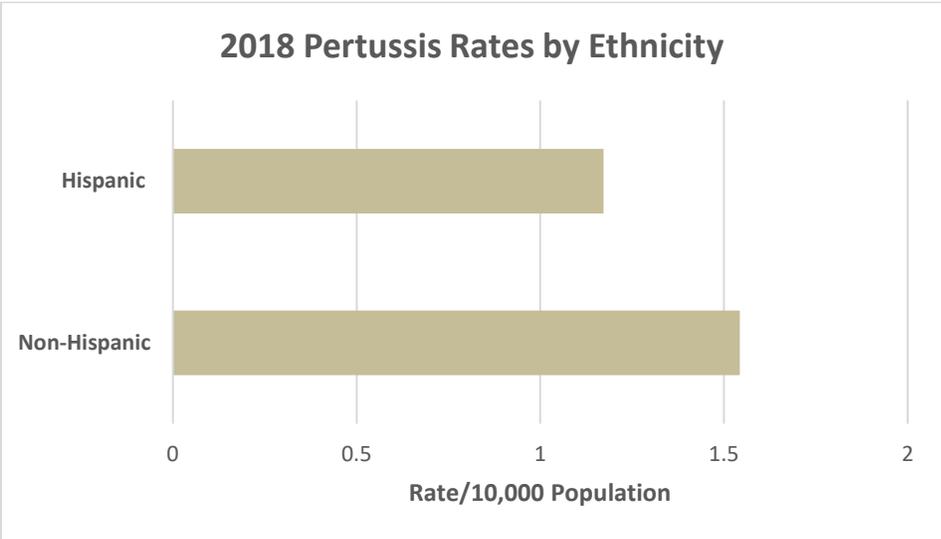


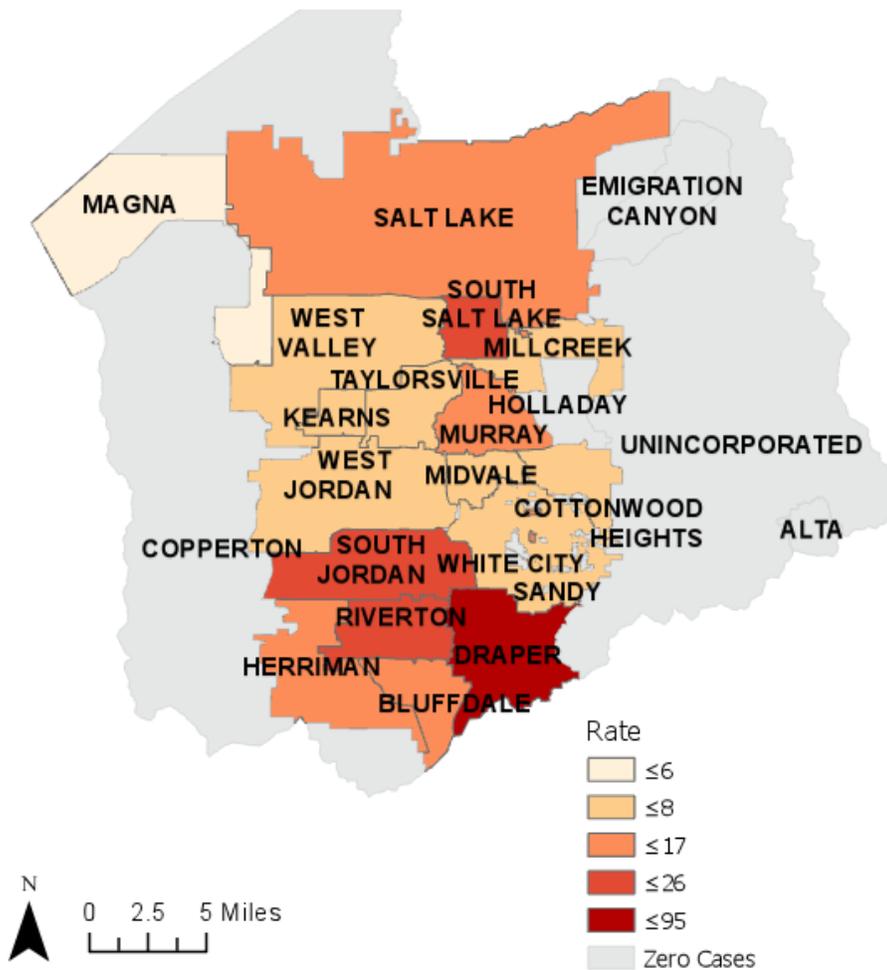
Figure 7



In 2018 nearly all cities in Salt Lake County saw a decrease in rate when compared to 2017. The exceptions to this were South Salt Lake which had the same rate in 2018 as it did in 2017, Salt Lake City and Magna which saw a slight increase in rate, and Draper which had a rate three times greater in 2018 than it did in 2017.

Figure 8

2018 Pertussis Rates by City per 100,000 Population



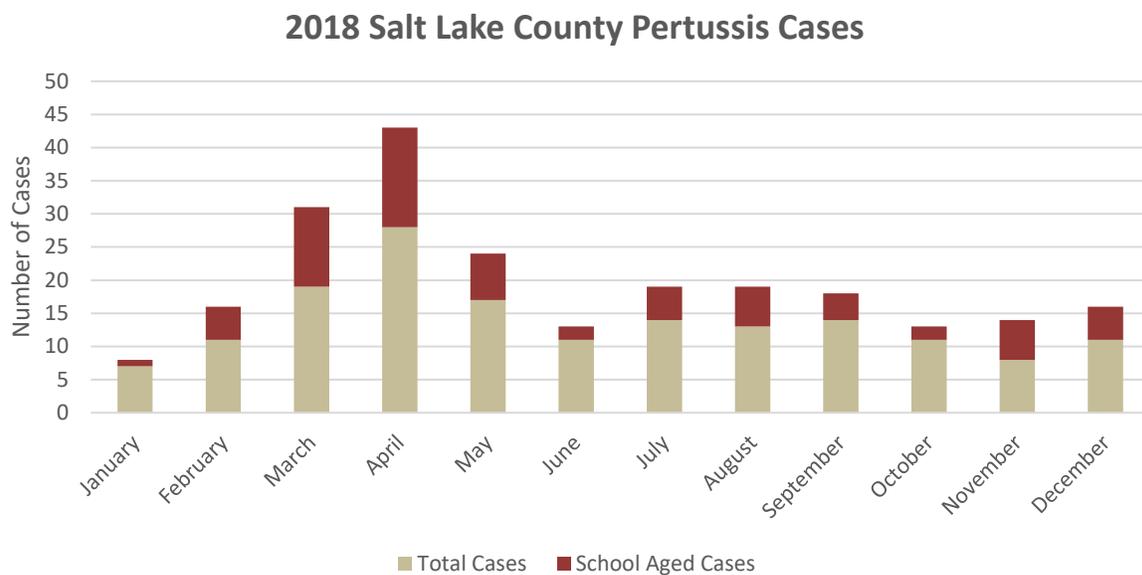
*Rate for Unincorporated areas of Salt Lake County is 16.3-not shown on map
 *Rates calculated using American Community Survey (ACS) 2016 5-year population estimates, except Census Designated Places (Copperton, Emigration Canyon, Kearns, Magna, Millcreek, White City; ACS 2015) and unincorporated Salt Lake County (Census 2010), U.S. Census Bureau.

Outbreaks

There were six pertussis outbreaks identified in Salt Lake County in 2018. Outbreaks occurred at two high schools, one middle school, an elementary school, a group home, and a performing arts center. The largest outbreak was at a high school that ended up with 23 cases across all grade levels. The school had an exemption rate of 5%. Subsequently a middle school and elementary school where younger siblings of the high school students attended also saw outbreaks. The middle school had five cases and the elementary had three. An outbreak was detected through retrospective surveillance at a high school while the kids were out for winter recess. A total of six cases were linked to it.

Forty-three percent of cases occurred in school aged children. Figure 9 shows the number of cases reported each month in school aged children (ages 5-18) compared to total cases.

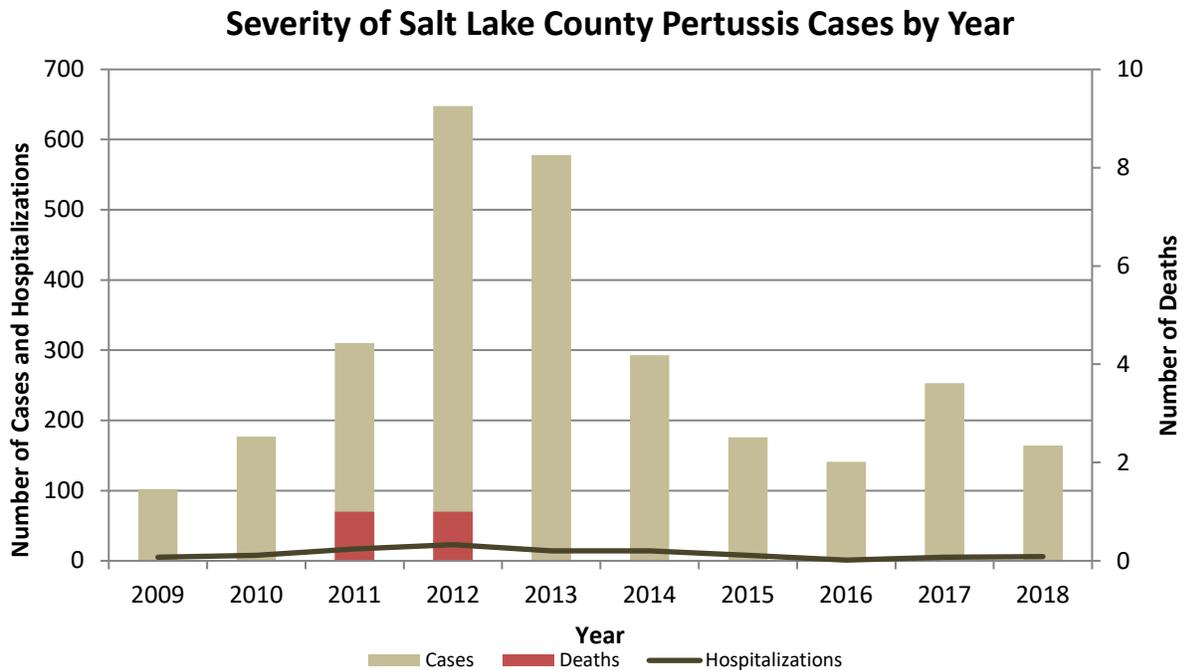
Figure 9



Severity

Severity remained low among 2018 pertussis cases (Figure 10). There were no deaths from pertussis in 2018 in Salt Lake County. There were two people in Utah that died after testing positive for pertussis, but pertussis was not listed as a primary cause of death.

Figure 10



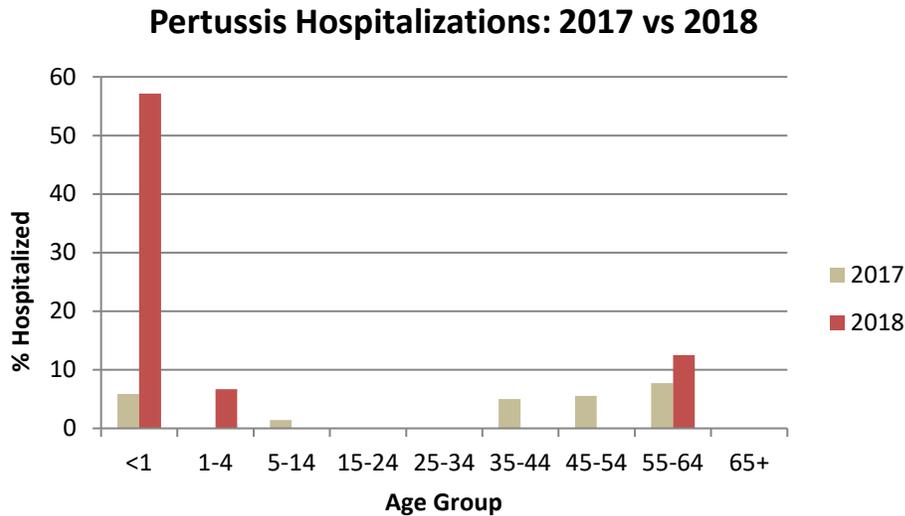
Salt Lake County saw a lower percentage of hospitalized cases when compared to Utah in 2018 with 4% of cases compared to 5% (Table 1).

Table 1

Year	% Hospitalized SLCO	% Hospitalized Utah
2009	5	5
2010	5	5
2011	5	4
2012	4	3
2013	2	2
2014	5	4
2015	5	3
2016	1	5
2017	2	4
2018	4	5

Contrary to 2017, where the highest percentage of hospitalizations occurred in the 55-64 age group, in 2018 the highest percentage was in the <1 age group (Figure 11). The increase in percentage of hospitalized cases in those <1 year of age from 2017 to 2018 was nearly ten times.

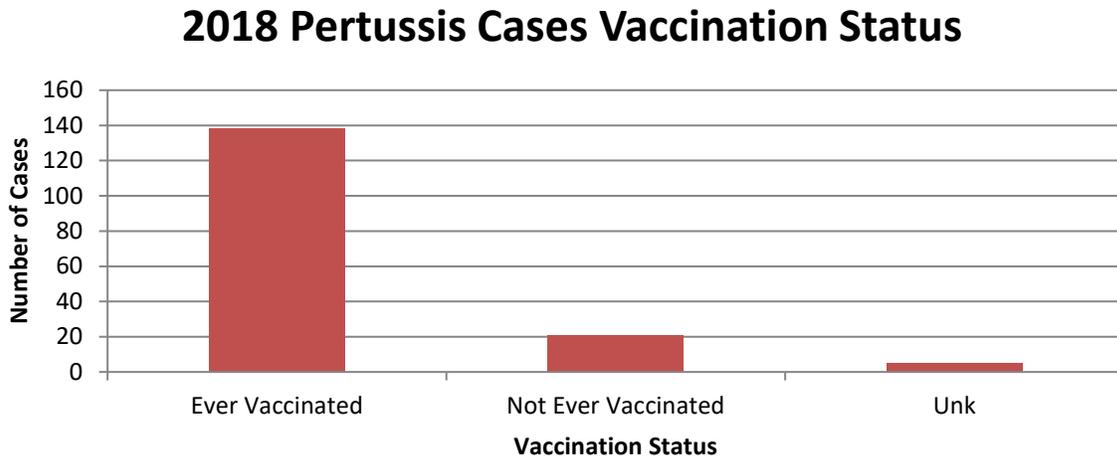
Figure 11



Vaccination

The percentage of cases that were vaccinated in 2018 was 84%. Of those cases, 80% were considered up to date. Out of the 164 pertussis cases in Salt Lake County, 13% of cases had never been vaccinated (Figure 12).

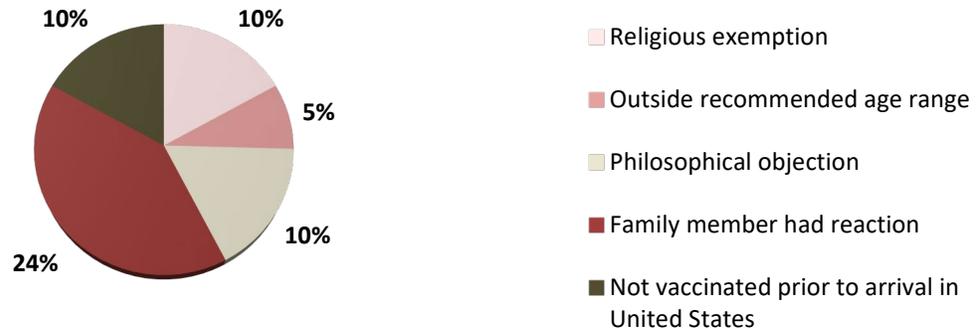
Figure 12



The most common reason for never having received a vaccine was adverse reaction in a family member. Other reasons given were religious exemption, philosophical objection, not vaccinated prior to arrival in United States, and being outside recommended age range (Figure 13).

Figure 13

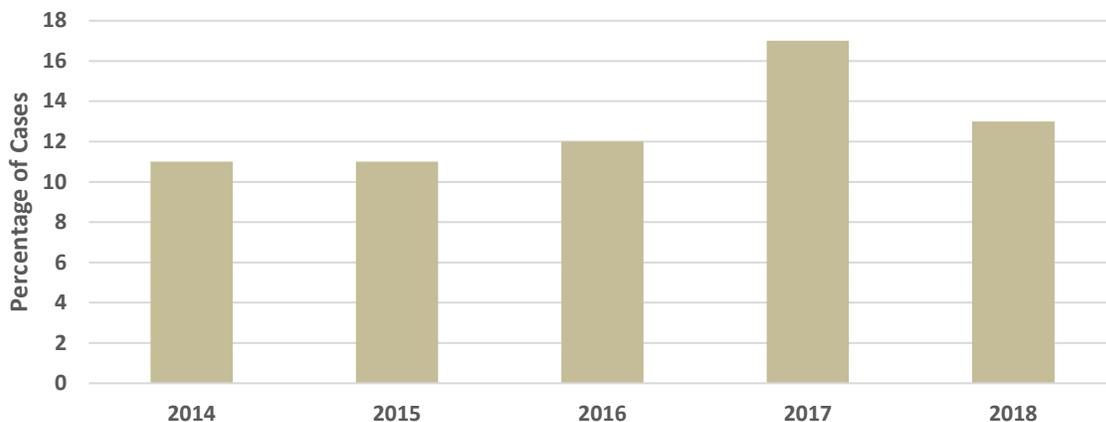
Salt Lake County 2018 Pertussis Cases Reasons for Not Receiving Vaccine



The percent of cases that have never been vaccinated decreased in 2018 from 17 percent in 2017 to 13 percent (Figure 14).

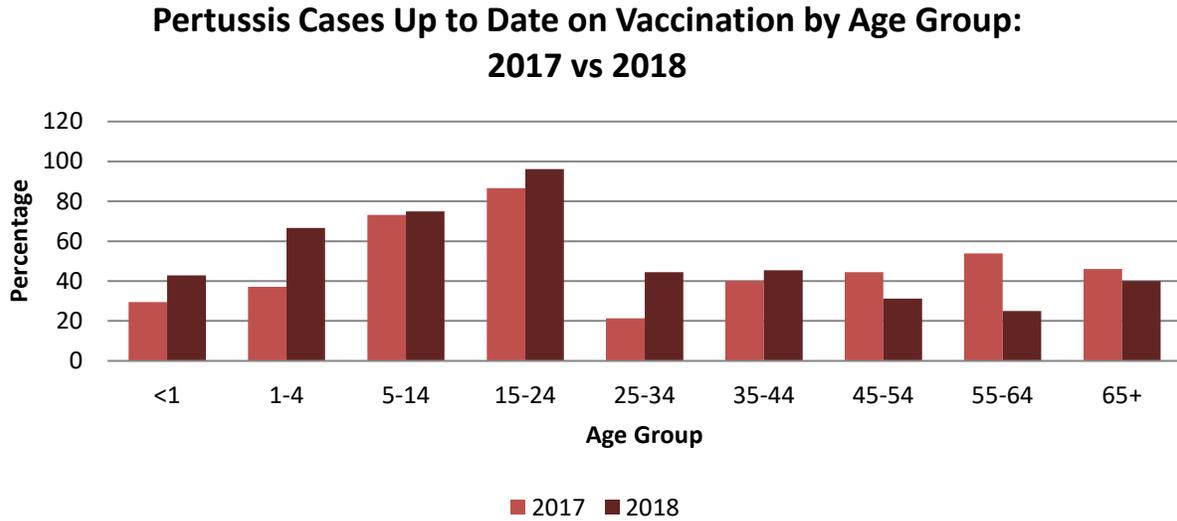
Figure 14

Percent of Unvaccinated Pertussis Cases Salt Lake County 2014-2018



Vaccination rates were highest for those 15-24 years of age in both 2017 and 2018 (Figure 15). Considerable improvement was made in the <1, 1-4, and 25-34 age groups, while the 45-54, 55-64, and 65+ age groups all saw a decline between 2017 and 2018 regarding up to date status.

Figure 15



Conclusion

After seeing an increase in cases for the first time since 2012 in 2017, 2018 again saw a decrease in cases. The percentage of cases that were vaccinated increased from 81% in 2017 to 84% in 2018. Of the unvaccinated cases, 55% were ages 16 and younger, with 25% being ages 5 and under. Cases under the age of one had the highest incidence rate. Of these cases 43% were either unvaccinated or not up to date, and 14% were too young to have received the vaccine. They also had the highest percentage of hospitalizations when compared to the other age groups.

Nearly all cities saw a decrease in rate in 2018 when compared with 2017. There were only three cities that saw an increase in rate. These were Salt Lake City, Magna and Draper. Salt Lake City and Magna saw slight increases, while Drapers rate was three times higher in 2018 as it was in 2017.

Our pertussis investigator followed up with all 164 cases. Of the 164 cases, 95% required treatment. There were 433 contacts of the cases that were also treated to prevent spread.