

Vaccine-Preventable Disease Surveillance

December 2017

Welcome to the first issue of Florida's Vaccine-Preventable Disease Surveillance Report. Each month this report will highlight vaccine-preventable diseases (VPDs) with notable activity, so keep an eye out for the inclusion of different VPDs as activity levels change. Vaccination is the best protection against VPDs. Community immunity, or herd immunity, is a situation in which enough people in a community are vaccinated against a disease to make its spread from person to person unlikely. This means that even those who can't be vaccinated because of age or medical conditions are offered some protection because the disease has little opportunity to spread in the community. Vaccination is important to protect not only yourself, but also those around you.

Summary

Pertussis

- Pertussis activity is starting to increase.
- There were 32 cases and no outbreaks reported in December.
- Incidence remains highest among infants less than one year old.

Varicella

- Varicella activity remains elevated.
- There were 61 cases and no outbreaks reported in December.
- Incidence remains highest among infants less than one year old.

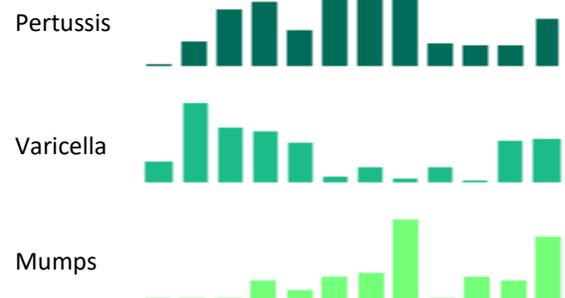
Mumps

- Mumps activity remains elevated.
- There were 15 cases and two outbreaks reported in December.
- Incidence was highest among children age 12-18 years.

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Monthly Activity Trends



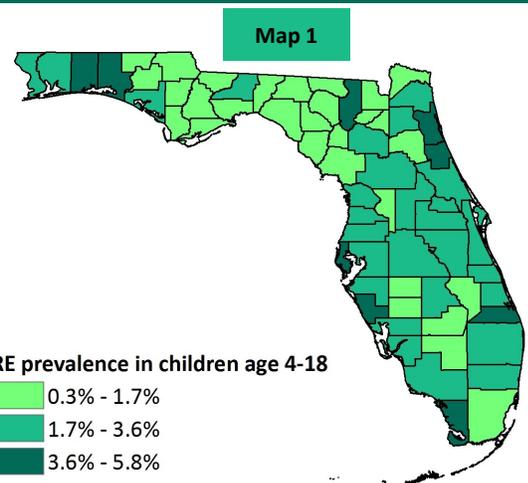
Vaccination Exemptions

Map 1 shows the prevalence of children age 4-18 who have a registered religious exemption (RE) to vaccination in Florida SHOTS* as of November 30, 2017.

Statewide, the prevalence of REs among children age 4-18 is 2.6% with individual counties ranging from 0.3% to 5.8%.

Unvaccinated children with a RE are at increased risk of vaccine-preventable diseases like pertussis, varicella, and mumps.

*FL SHOTS (State Health Online Tracking System) is Florida's statewide immunization registry. All REs are required to be entered into FL SHOTS.



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Produced by the BOE, Florida Department of Health

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Summary

December 2017

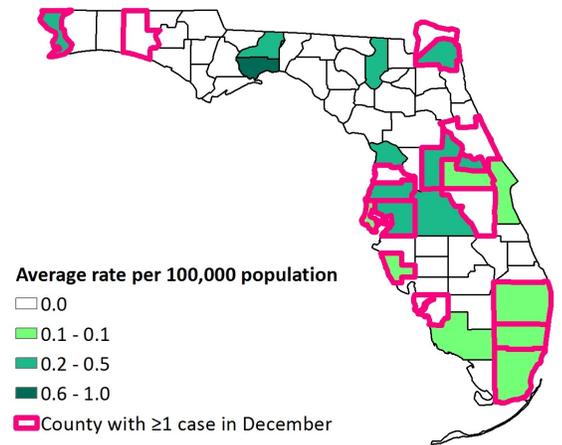
State pertussis activity:

- **Thirty-two confirmed and probable pertussis cases** were reported among 17 counties in December.
 - Pertussis activity is starting to increase after having been decreased during the fall months, which is consistent with trends observed in previous years at this time.
 - From January 1, 2017 through December 31, 2017, 368 confirmed and probable cases of pertussis were reported among 37 of Florida's 67 counties.
- Since 2014, an overall decrease in the annual number of confirmed and probable cases of pertussis reported has been observed. Pertussis is naturally cyclic in nature with peaks in disease every 3-5 years.
- **There were no outbreaks of pertussis reported in December.**
 - For most pertussis cases, exposure to other known cases is never identified, and they are not able to be linked to outbreaks.
- **In December, for every pertussis case identified, there was an average of three exposed contacts who were recommended antibiotics to prevent illness.** For those diagnosed with pertussis, antibiotics can shorten the amount of time they are contagious to others. Antibiotics can also be used to prevent illness in those who have been exposed to someone with pertussis while they are contagious.
- **Infants less than one year old had the highest incidence of pertussis.** This is consistent with national trends, which also show the highest incidence rate in infants less than one year old. **Infants less than two months old were also most severely affected by pertussis,** as measured by inpatient hospitalizations. Infants are at greatest risk for getting pertussis and having serious complications from infection. Infants less than two months old are too young to receive vaccinations against pertussis, which is why vaccination of other age groups is so important to help prevent infection in infants.
- **Vaccination is the best way to prevent pertussis infections.** In December, 12 (38%) reported cases had not received the recommended number of pertussis vaccinations for their age. In general, those who have received at least one pertussis vaccination have less severe outcomes than those who have never been vaccinated.
- To learn more about pertussis, please visit <http://www.floridahealth.gov/pertussis>.

National pertussis activity:

- The number of pertussis cases has been gradually increasing since the 1980s, peaking in 2012 at levels not seen since the 1950s. Since 2012, the number of pertussis cases has started to gradually decrease.
- Pertussis incidence has remained highest among infants less than one year old and lowest among those age 20 and older since the 1990s.

Map 2 Average Pertussis Incidence Rates per 100,000 Population, September 2017 through November 2017



Pertussis surveillance goals:

- Pertussis surveillance is conducted to identify cases for treatment to prevent death, limit transmission in settings with infants or others who may transmit pertussis to infants, and identify and prevent outbreaks.
- Surveillance is also conducted to identify contacts of cases and recommend appropriate prevention measures, including exclusion, antibiotic prophylaxis and immunization and to monitor the effectiveness of immunization programs and vaccines. For more information on the data sources used in Florida for pertussis surveillance, see page 11 ►

Pertussis Cases by Month Reported

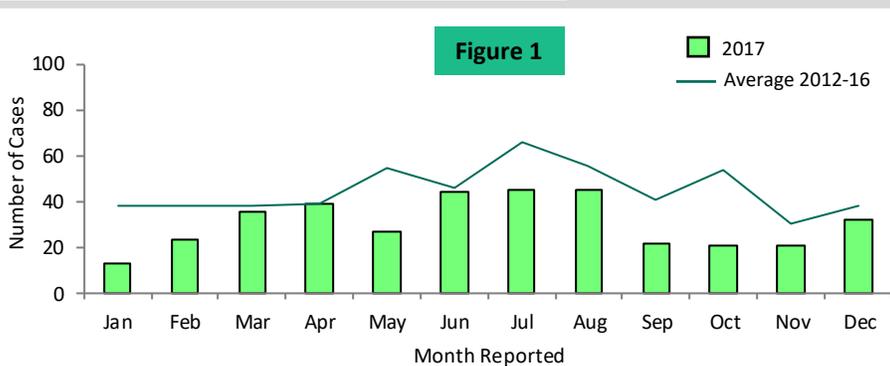


Figure 1 shows the number of confirmed and probable cases of pertussis reported into Merlin, January 2017 through December 2017 and the previous five-year average.

In 2017, the number of reported pertussis cases has been below average, except in April when two outbreaks occurred. In general, the number of reported pertussis cases tends to be highest during the summer months.

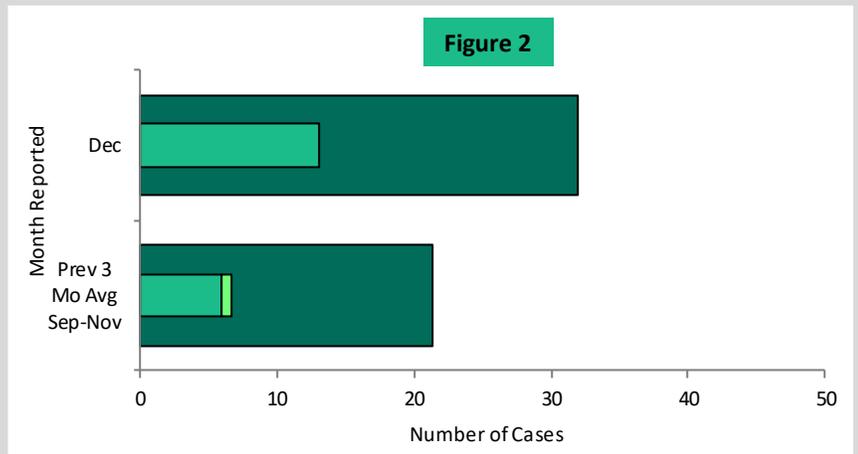
Pertussis Outbreaks

Figure 2 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, December 2017 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

In November, 13 (41%) cases were associated with other cases through living in the same household.

Outbreak Summary:

No outbreaks of pertussis were reported in December. In 2017, a total of five outbreaks of pertussis were reported, all in school settings.



Legend: Total cases (dark green), Household-associated cases (medium green), School-associated cases (light green)

Pertussis Treatment and Contacts

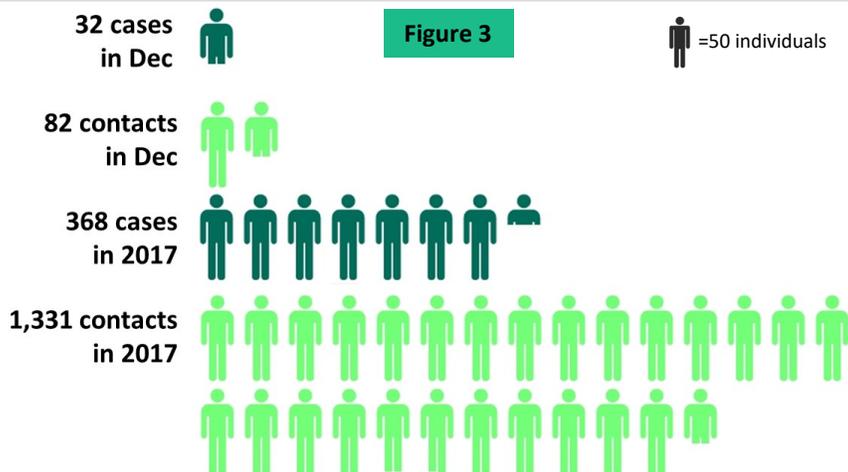
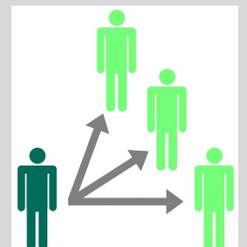


Figure 3 shows the number of confirmed and probable cases of pertussis, as reported into Merlin, and the number of contacts who were recommended antibiotics to prevent illness, December 2017 and 2017 to date.

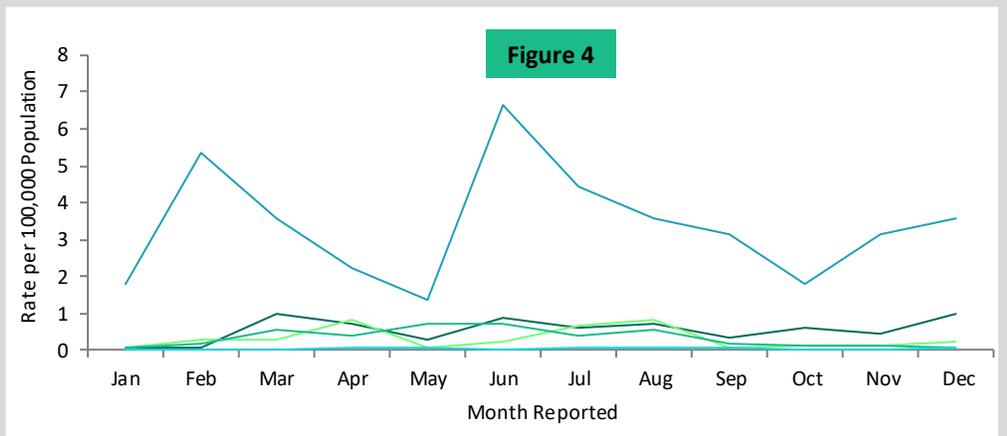
On average, for each case reported in December there were three people exposed to the case who were recommended antibiotics to prevent illness.



Pertussis Age-Specific Incidence Rates

Figure 4 shows the age-specific incidence rates of confirmed and probable cases of pertussis, as reported into Merlin, January 2017 through December 2017.

In December, the incidence rate was highest among infants <1 year old, which is consistent with previous months. Infants experience the greatest burden of pertussis infections, not only in number of cases but also in severity. Infants less than two months old are too young to receive vaccinations against pertussis, which is why vaccination of other age groups is so important to help prevent infection in infants.



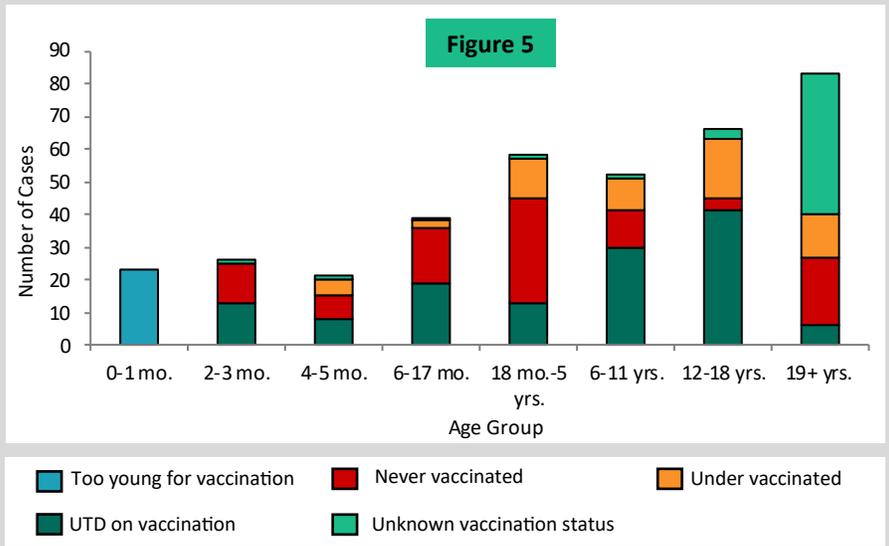
Legend: <1 year old (dark blue), 1 to 5 years old (medium blue), 6 to 11 years old (light blue), 12 to 18 years old (very light blue), ≥19 years old (lightest blue)

Vaccination History for Pertussis Cases

UTD = up-to-date

Figure 5 shows the vaccination status of pertussis cases by age group for confirmed and probable cases of pertussis, as reported into Merlin, January 2017 through December 2017 (n=368).

The majority of cases age 5 years and younger were not up to date on their pertussis vaccinations. The only age groups with more than half of cases up to date on pertussis vaccinations were school-aged children 6-18 years old.

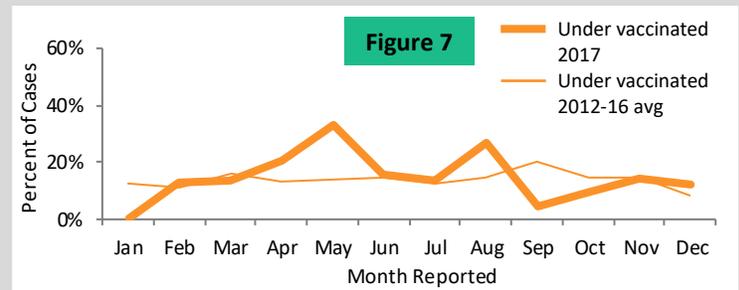
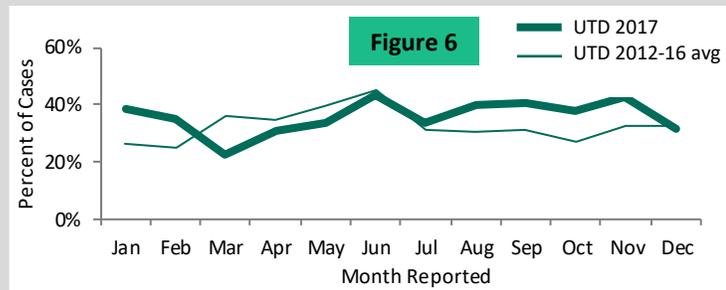


Pertussis Cases in Vaccinated Individuals

UTD = up-to-date

Figure 6 shows the percent of confirmed and probable pertussis cases who were up to date on their pertussis vaccinations, as reported into Merlin, January 2017 through December 2017 and the previous five-year average. **Figure 7** shows the percent of these cases who were under vaccinated during the same time periods.

Although individuals who have been vaccinated can still get pertussis, vaccination remains the best way to prevent pertussis and severe complications.



Pertussis Outcomes

UTD = up-to-date, ED = emergency department

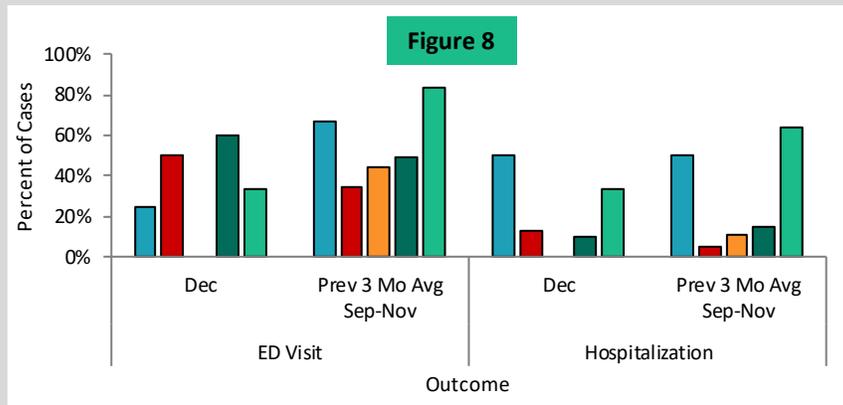


Figure 8 shows the percent of confirmed and probable cases of pertussis with select outcomes by vaccination status, as reported into Merlin, December 2017 and the previous three-month average.

In December, cases who were too young for vaccination were more likely to require inpatient hospitalization.

In general, older individuals are more likely to experience paroxysmal cough while younger individuals are more likely to experience posttussive vomiting and whoop. Primarily infants less than one year old experience apnea.

Legend for Figure 8:
 Too young for vaccination (light blue), Never vaccinated (red), UTD on vaccination (dark teal), Under vaccinated (orange), Unknown vaccination status (light green)

Summary

December 2017

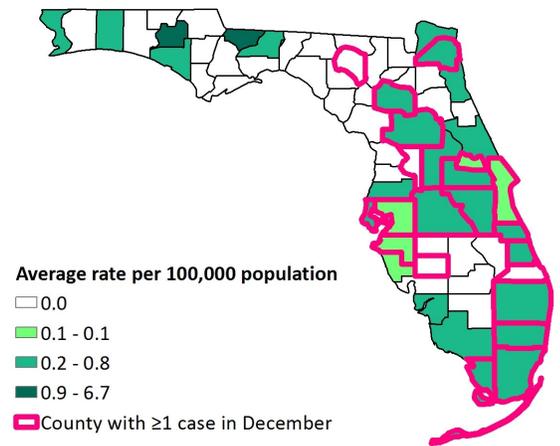
State varicella activity:

- **Sixty-one confirmed and probable varicella cases were reported among 21 counties in December.**
 - Reported varicella cases are starting to increase after having remained lower throughout the summer and fall. This is consistent with seasonal trends in past years.
 - From January 1, 2017 through December 31, 2017, 655 cases of varicella were reported among 53 of Florida's 67 counties.
- A decreasing trend in the number of confirmed and probable cases of varicella reported annually in Florida was observed from 2008-2014. Since then, the number of cases reported annually has remained elevated. In 2017, the number of varicella cases is slightly lower than the number observed in 2016.
- **No outbreaks of varicella were reported in December.**
- **In December, children age less than one years old had the highest incidence of varicella.** This is consistent with what was observed for the majority of months in 2017.
- **Vaccination is the best way to prevent varicella infections.** In December, 24 (39%) cases were not up to date on their varicella vaccinations. In general, those who have received at least one varicella vaccination even if they later develop disease have less severe outcomes than those who have never been vaccinated.
- In December, infants infected with varicella who were too young for vaccination were most likely to visit the emergency department. Few varicella cases require inpatient hospitalization.
- To learn more about varicella, please visit <http://www.floridahealth.gov/varicella>.

National varicella activity:

- Varicella incidence decreased significantly since a vaccine became available in 1995 and has continued to decrease since 2006 when recommendations changed from one to two doses of varicella vaccine.
 - From 2006 –2015 all age groups saw a significant decrease in incidence with the largest decline in children age 5-9 years and age 10-14 years.
- Although varicella is not reportable in all states and therefore not all states report varicella cases to the CDC, based on available data the number of varicella cases nationally has steadily decreased each year from 2012-2015.

Map 3 Average Varicella Incidence Rates per 100,000 Population, September 2017 through November 2017



Surveillance goals:

- Varicella surveillance is conducted to identify and control outbreaks and monitor trends and severe outcomes.
- Surveillance is also conducted to monitor effectiveness of immunization programs and vaccines. For more information on the data sources used in Florida for varicella surveillance, see page 11 ►

Varicella Cases by Month Reported

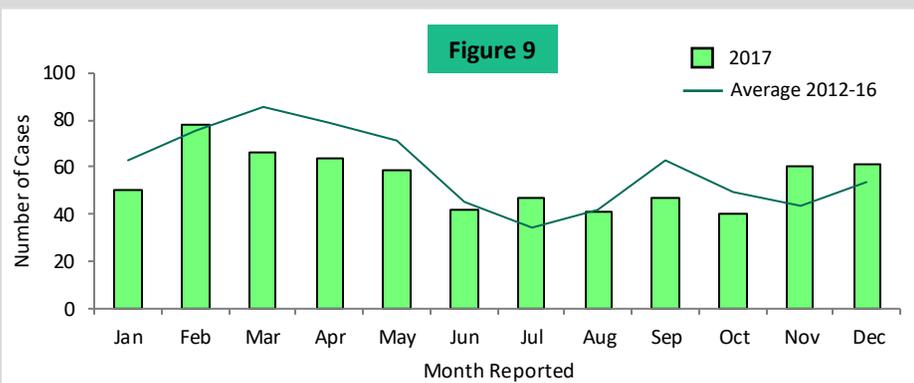


Figure 9 shows the number of confirmed and probable cases of varicella reported into Merlin, January 2017 through December 2017 and the previous five-year average.

In December, the number of reported varicella cases remained elevated. In 2017, the number of reported varicella cases has been below average except for peaks in February, July, November, and December which were around the same time as four outbreaks. In general, varicella cases peak in the spring and fall.

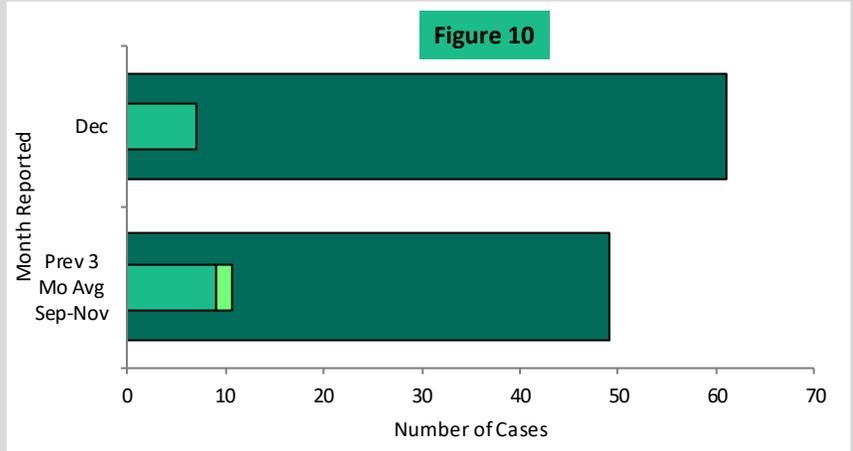
Varicella Outbreaks

Figure 10 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, December 2017 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

In December, 7 (11%) cases were associated with other cases through living in the same household.

Outbreak Summary:

No outbreaks of varicella were reported in December. In 2017, a total of five outbreaks of varicella were reported. Three outbreaks were in correctional facilities, one outbreak was in a daycare, and one outbreak was in a mental health hospital.



■ Total cases ■ Household-associated cases ■ Correctional facility-associated cases

Varicella Age-Specific Incidence Rates

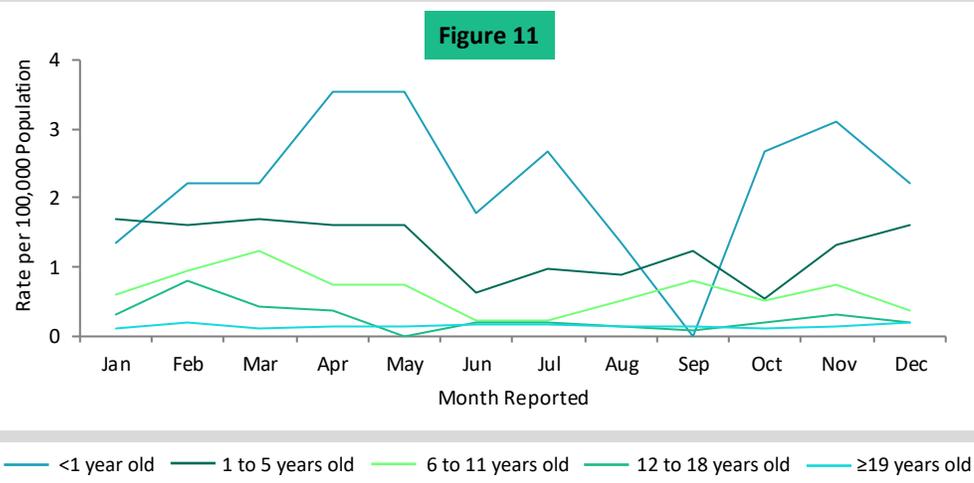


Figure 11 shows the age-specific incidence rates of confirmed and probable cases of varicella, as reported into Merlin, January 2017 through December 2017.

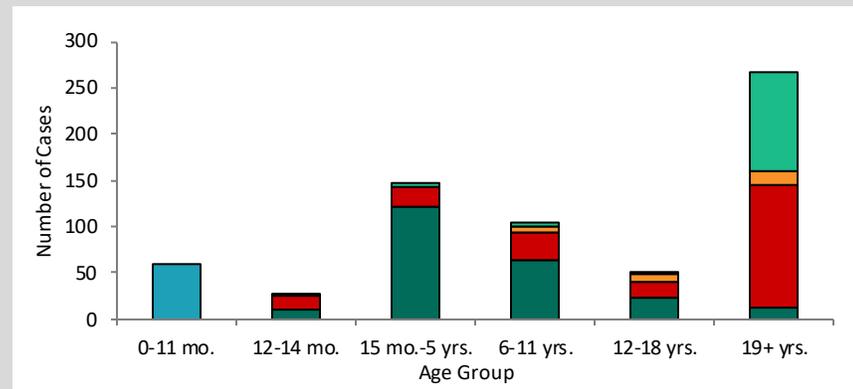
In December, the incidence rate was highest among infants less than one year old. This is consistent with trends seen earlier in 2017. Infants less than one year old are too young to receive vaccinations against varicella, which is why vaccination of other age groups is so important to help prevent infection in infants.

Vaccination History for Varicella Cases

UTD = up-to-date

Figure 12 shows the vaccination status of varicella cases by age group for confirmed and probable cases of varicella, as reported into Merlin, January 2017 through December 2017 (n=655).

Varicella vaccinations are recommended at 12-15 months of age and 4-6 years of age. Of the 147 cases reported in children aged 15 months-5 years, the majority (82%) were up to date on their varicella vaccinations, while about half (55%) of the cases in children aged 6 to 18 years were up to date.



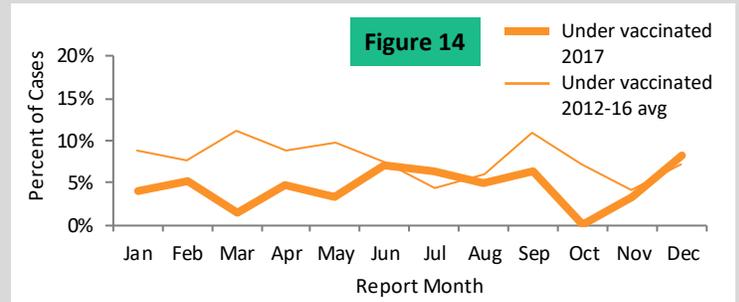
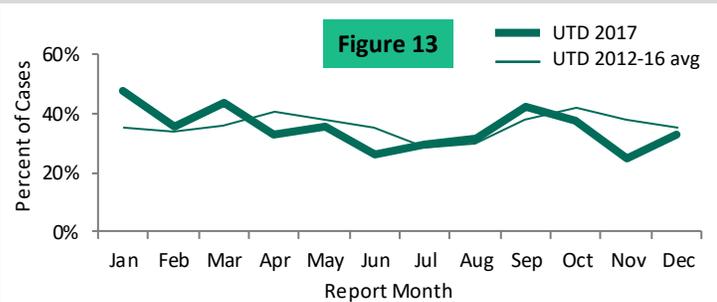
■ Too young for vaccination ■ UTD on vaccination ■ Never vaccinated ■ Under vaccinated ■ Unknown vaccination status

Varicella Cases in Vaccinated Individuals

UTD = up-to-date

Figure 13 shows the percent of confirmed and probable varicella cases who were up to date on their varicella vaccinations, as reported into Merlin, January 2017 through December 2017 and the previous five-year average. **Figure 14** shows the percent of these cases who were under vaccinated during the same time periods.

Although individuals who have been vaccinated can still get varicella, vaccination remains the best way to prevent varicella and severe complications.



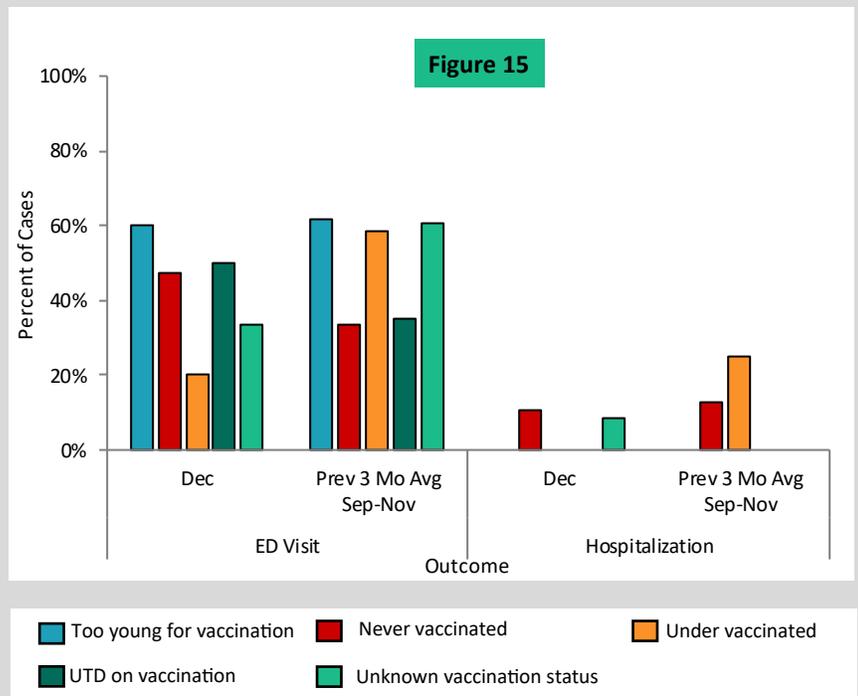
Varicella Outcomes

UTD = up-to-date, ED = emergency department

Figure 15 shows the percent of confirmed and probable cases of varicella with select outcomes by vaccination status, as reported into Merlin, December 2017 and the previous three-month average.

In general, cases who were UTD on their vaccinations were less likely to experience fever and vesicle lesions. Cases too young to be vaccinated or not yet vaccinated were more likely to experience papule lesions.

In December, infants too young for vaccination were most likely to visit the emergency department. Few varicella cases require inpatient hospitalization; recent cases requiring hospitalization were either never vaccinated or of unknown vaccination status.



Summary

December 2017

State mumps activity:

- **Six confirmed and nine probable mumps cases were reported among six counties in December.**
 - Mumps cases have remained elevated since April with a peak of 20 cases reported in August.
 - From January 1, 2017 through December 31, 2017, 23 confirmed and 47 probable cases of mumps were reported among 17 of Florida's 67 counties.
- In Florida, the number of reported mumps cases has remained relatively low over the past five years but started to increase in 2015 with ten cases and in 2016 with 16 cases. The last time the number of reported cases reached 2017 levels was in the 1990s.
- **Two outbreaks of mumps were reported in December. Broward County reported a mumps outbreak in a middle school and Hillsborough County reported a mumps outbreak in a university.**
 - In 2017, the majority of cases have been associated with outbreaks or household clusters.
 - While mumps outbreaks can occur in highly-vaccinated communities, high vaccination coverage limits the size, duration, and spread of outbreaks.
- **In December, the highest incidence of mumps was in children age 12-18 years.** This was largely driven by the previously mentioned outbreaks.
- **Vaccination is the best way to prevent mumps infections.** In December, four (27%) cases had unknown vaccination history.
- In December, ten (67%) cases visited the emergency department and one (7%) was hospitalized. In general, those who have received at least one mumps vaccination even if they later develop disease have less severe outcomes than those who have never been vaccinated.
- To learn more about mumps, please visit <http://www.floridahealth.gov/mumps>.

National mumps activity:

- Since 1989 when the two dose vaccination program was introduced, the number of mumps cases has fluctuated from a few hundred to a few thousand per year. Some years had higher numbers of cases than others mainly because of several large outbreaks in close-contact settings.
- In 2016, there were over 6,000 cases of mumps reported, and in 2017 there have been about 5,000 cases reported. Since 2013, the 18-22 year age group has had the highest incidence of mumps, largely driven by outbreaks. About half of the outbreaks reported since 2016 have been associated with colleges and universities, primarily affecting young adults.

Surveillance goals:

- Mumps surveillance is conducted to identify and control outbreaks and monitor trends and severe outcomes.
- Surveillance is also conducted to monitor effectiveness of immunization programs and vaccines. For more information on the data sources used in Florida for mumps surveillance, see page 11 ►

Map 4 Cumulative Mumps Incidence Rates per 100,000 Population, January through December 2017

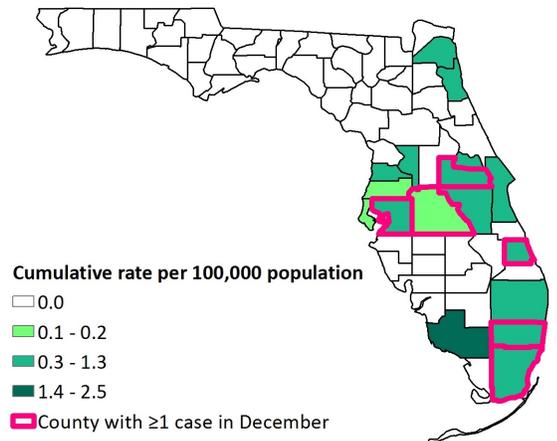
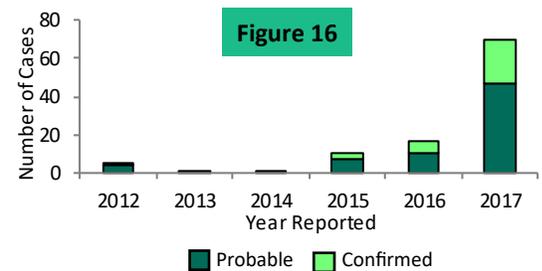


Figure 16 shows the number of confirmed and probable cases of mumps reported into Merlin, 2012 through 2017.



Mumps Cases by Month Reported

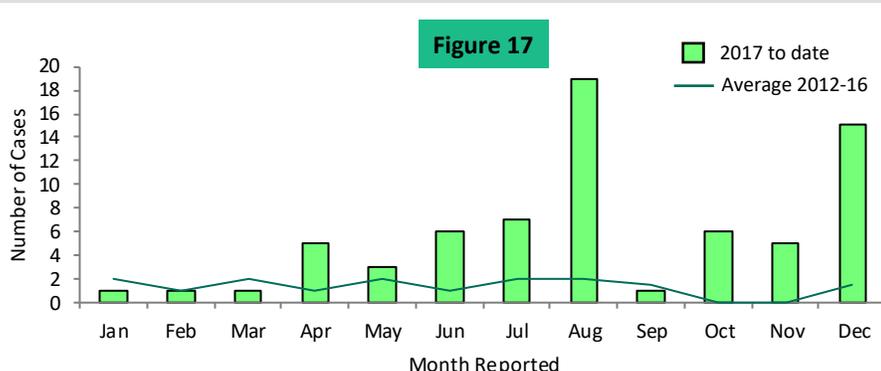


Figure 17 shows the number of confirmed and probable cases of mumps reported into Merlin, January 2017 through December 2017 and the previous five-year average.

In 2017, the number of reported mumps cases has been far above average. Cases have been elevated since the summer months, peaking in August and December when several cases associated with outbreaks and household clusters were reported.

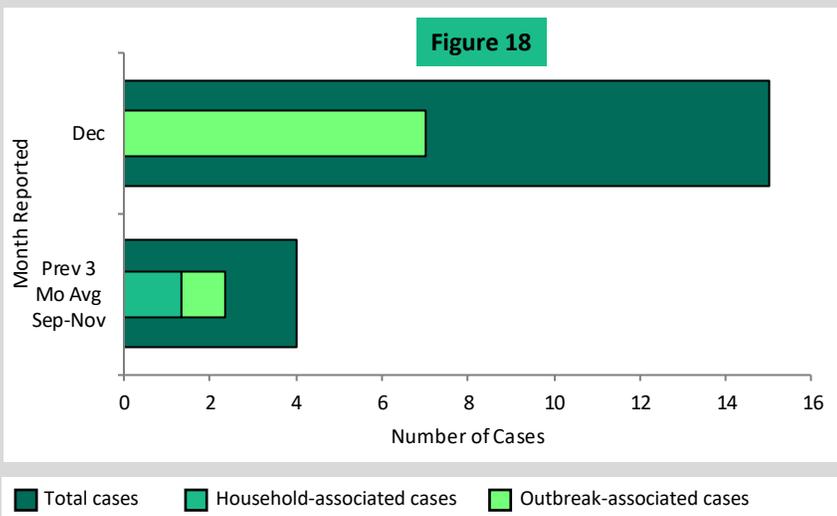
Mumps Outbreaks

Figure 18 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, December 2017 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

In December, about half of cases were associated with two outbreaks.

Outbreak Summary:

Two mumps outbreaks were reported in December. Broward County reported an outbreak in a middle school and Hillsborough County reported an outbreak in a university. Earlier in 2017, an outbreak involving transmission in both the community and a summer camp was reported in multiple counties, an outbreak in a close-knit religious community was reported in Collier County, and an outbreak among professional athletes was reported in multiple counties.



Mumps Age-Specific Incidence Rates

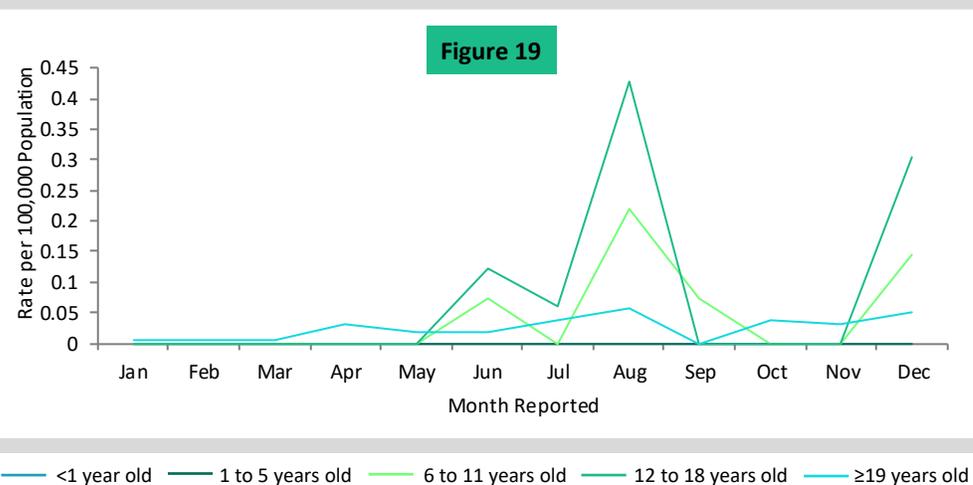


Figure 19 shows the age-specific incidence rates of confirmed and probable cases of mumps, as reported into Merlin, January 2017 through December 2017.

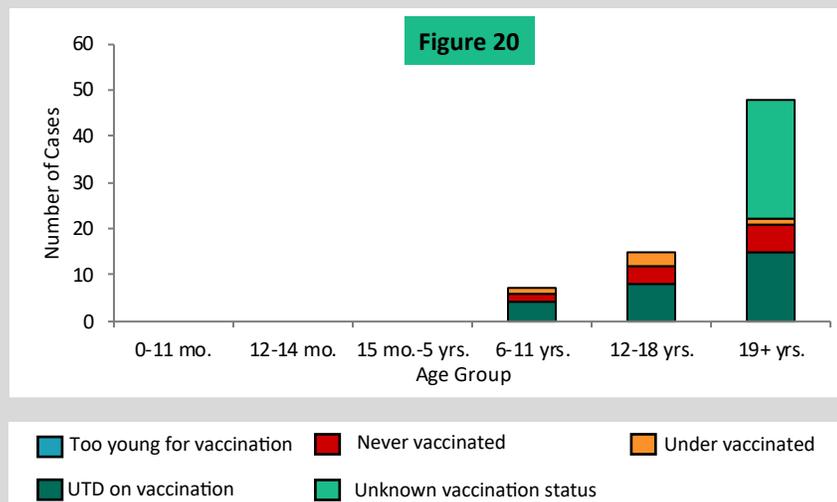
In December, the incidence rate was highest among children age 12 to 18, largely driven by an outbreak at a middle school. In 2017, the majority of cases have been in children age 12 to 18 and adults age 19 and older.

Vaccination History for Mumps Cases

UTD = up-to-date

Figure 20 shows the vaccination status of mumps cases by age group for confirmed and probable cases of mumps, as reported into Merlin, January 2017 through December 2017 (n=70).

Mumps vaccinations are recommended at 12-15 months of age and 4-6 years of age. More than half of cases 6 to 11 years old (57%) and 12 to 18 years old (53%) were up-to-date on their mumps vaccinations, while 15 (31%) cases 19 and older were up-to-date.

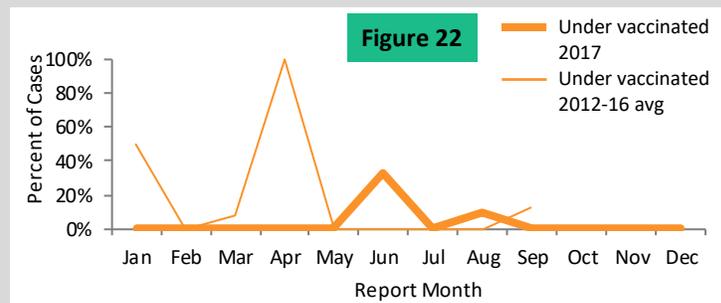
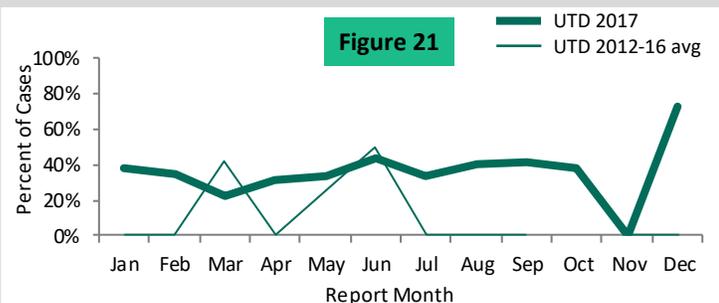


Mumps Cases in Vaccinated Individuals

UTD = up-to-date

Figure 21 shows the percent of confirmed and probable mumps cases who were up to date on their mumps vaccinations, as reported into Merlin, January 2017 through December 2017 and the previous five-year average. **Figure 22** shows the percent of these cases who were under vaccinated during the same time periods.

Although individuals who have been vaccinated can still get mumps, vaccination remains the best way to prevent mumps and severe complications.



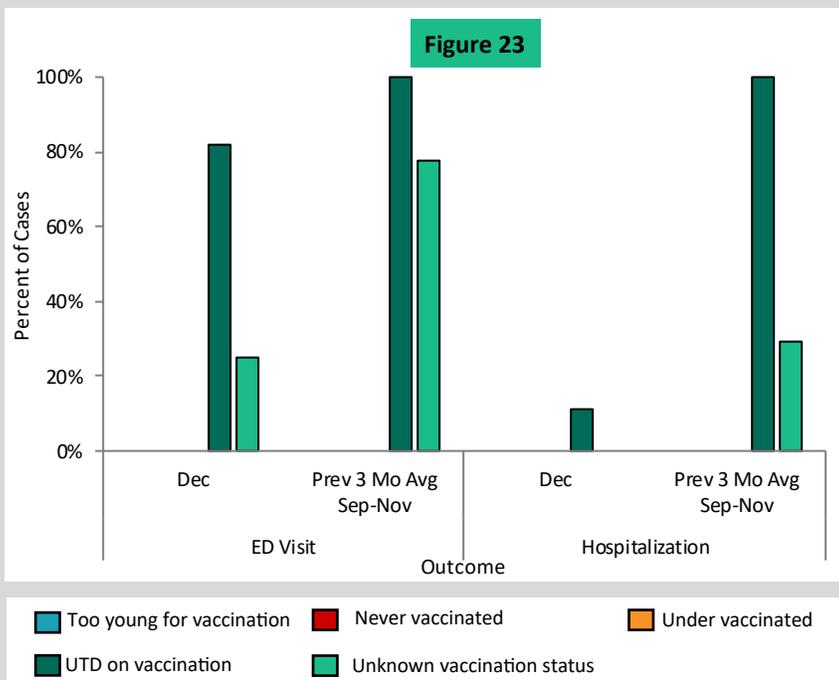
Mumps Outcomes

UTD = up-to-date, ED = emergency department

Figure 23 shows the percent of confirmed and probable cases of mumps with select outcomes by vaccination status, as reported into Merlin, December 2017 and the previous three-month average.

In December, ten (67%) cases visited the emergency department and one (7%) was hospitalized.

Orchitis (testicular inflammation) is the most common complication from mumps in males. From January 2017 through December 2017, 11 (16%) cases reported orchitis; two were never vaccinated, four were up to date on their vaccinations, and five had unknown vaccination status.



Case Data

- Pertussis, varicella, and mumps are reportable diseases in Florida. Case information is documented by county health department (CHD) epidemiologists in Merlin, Florida's reportable disease surveillance system.
- CHD epidemiologists also report outbreaks of pertussis, varicella, and mumps into Merlin. Outbreaks are defined as two or more cases associated with a specific setting outside of the home. Two or more cases among members of the same household are considered household-associated cases.
- Current case information is preliminary and may change as more data are received. The most recent data available are displayed in this report.
- For more information about reportable diseases, please visit www.Floridahealth.gov/diseasereporting.

Population Data

- Population data used to calculate incidence rates are from FLHealthCHARTS (Community Health Assessment Resource Tool Set).
- For more information about FLHealthCHARTS, please visit www.flhealthcharts.com.

Vaccination Data

- Vaccination data from cases are from Merlin, as identified by CHD epidemiologists.
- Vaccination status is determined using the Advisory Committee on Immunization Practices Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, 2017.
- Cases are considered up-to-date if they have received the recommended number of doses of vaccine for a particular disease for their age at the time of their illness onset. Cases are considered under vaccinated if they have received at least one but not all doses of vaccine recommended for a particular disease for their age at the time of their illness onset.
- For more information about immunization schedules, please visit <https://www.cdc.gov/vaccines/schedules/index.html>.