

Vaccine-Preventable Disease Surveillance

May 2018

Summary

Pertussis

- Pertussis activity increased slightly from last month. Overall, the total number of cases remained below the previous five-year average.
- There were 24 cases and one outbreak in a workplace reported in May.
- Incidence remained highest among infants less than one year old; 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 this highly vulnerable group.

Varicella

- Varicella activity increased from last month and remained above the previous five-year average for the third month in a row.
- There were 82 total cases and no outbreaks reported in May.
- Incidence was highest among children age six to 11 years old in May.
- This month, 62% of cases were not up to date on their varicella vaccinations or had unknown vaccination status, about the same as last month.

Mumps

- Mumps activity increased from last month and remained above the previous five-year average for the eighth month in a row.
- There were six cases and no outbreaks reported in May.
- Incidence was highest among children age six to 11 years old.
- This month, 67% of cases were not up-to-date on their mumps vaccinations, an increase from last month.

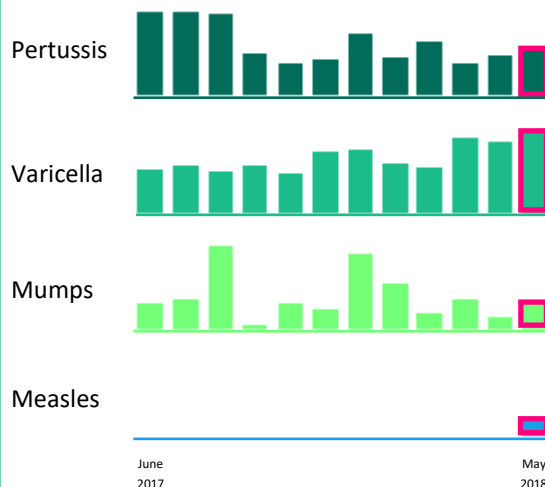
Measles

- Four confirmed measles cases associated with international travel were investigated in May.
- Two cases were never vaccinated against measles and two cases had unknown vaccination status.
- A total of 944 contacts who had potential exposure to a measles case were identified. None of these contacts developed measles.

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Monthly Activity Trends June 2017-May 2018



For all vaccine-preventable diseases, timely and complete vaccination is the best way to prevent infection. In general, those who are at least partially vaccinated against a disease, even if they later develop that disease, have less severe outcomes than those who have never been vaccinated.

Vaccination

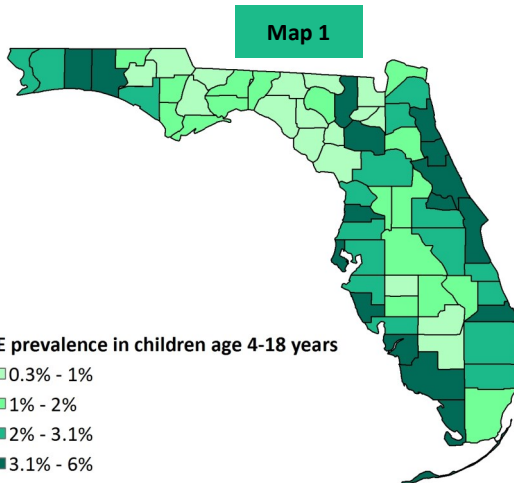
RE = religious exemption

Map 1 shows the prevalence of children age four to 18 years who have a registered religious exemption (RE) to vaccination in Florida SHOTS* as of May 31, 2018.

Statewide, the estimated prevalence of REs among children age four to 18 years is 2.7% with individual counties ranging from 0.3% to 6.0%. This is an increase from last year at this time, May 2017, when the statewide prevalence was 2.3% and individual counties ranged from 0.2% to 5.2%.

Unvaccinated children are at increased risk of vaccine-preventable diseases like pertussis, varicella, and mumps. Additionally, communities with a higher proportion of RE are at increased risk of vaccine preventable disease transmission.

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



Posted June 7, 2018 on the Bureau of Epidemiology (BOE) website: www.floridahealth.gov/VPD

Produced by the BOE, Florida Department of Health

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Summary

May 2018

State activity:

- **Twenty-four pertussis cases were reported among 12 counties in May.**
 - Pertussis activity increased slightly from the previous month but remained consistent with trends observed in previous years at this time.
 - From January 1, 2018 through May 31, 2018, 110 cases of pertussis were reported among 27 of Florida's 67 counties.
- Since 2014, an overall decrease in the annual number of cases of pertussis reported has been observed. Pertussis is cyclic in nature with peaks in disease every 3-5 years.
- **There was one outbreak of pertussis reported in May.**
 - The outbreak was in a workplace setting and consisted of two cases.
 - For most pertussis cases, exposure to other known cases is never identified, and they are not able to be linked to outbreaks.
- **In May, 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. 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 May, 50% of reported cases had not received the recommended number of pertussis vaccinations for their age or had unknown vaccination status. In general, those who have received at least one pertussis vaccination have less severe outcomes than those who have never been vaccinated. **In May, those who were never vaccinated were most likely to visit the emergency department and require hospitalization.**
- To learn more about pertussis, please visit <http://www.floridahealth.gov/pertussis>.

National 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

Map 2 shows the previous three-month average of pertussis incidence rates per 100,000 population, February through April 2018 (green shading). Counties with one or more cases reported in May 2018 are highlighted in pink.

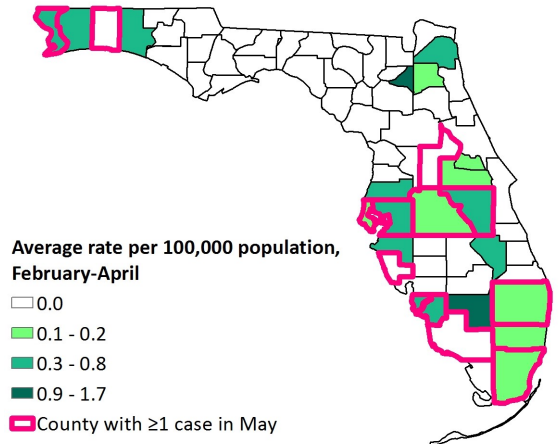
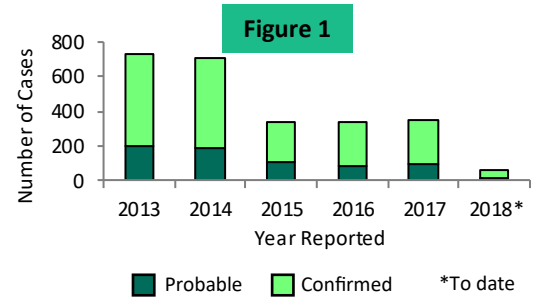


Figure 1 shows the number of confirmed and probable cases of pertussis reported into Merlin, 2013 through May 2018.



Pertussis surveillance goals:

- Pertussis surveillance is conducted to identify cases to 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 13. ▶

Pertussis Cases by Month Reported

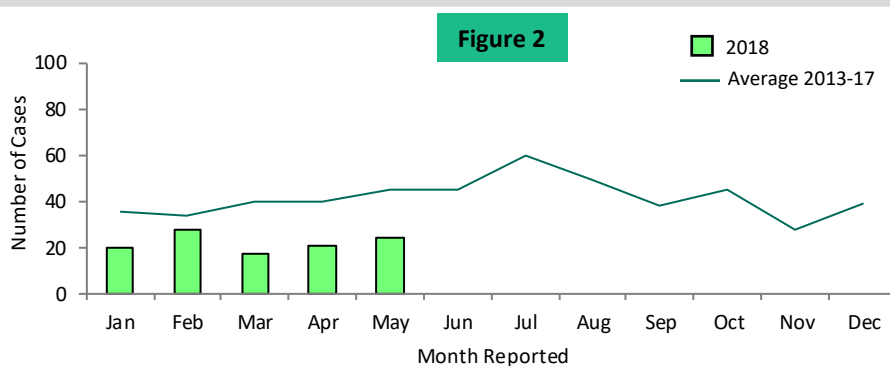


Figure 2 shows the number of confirmed and probable cases of pertussis reported into Merlin, January 2018 through May 2018 and the previous five-year average.

In May, the number of reported pertussis cases increased slightly from April and remained below the five-year average. In general, the number of reported pertussis cases tends to be highest during the summer months.

Pertussis Outbreaks

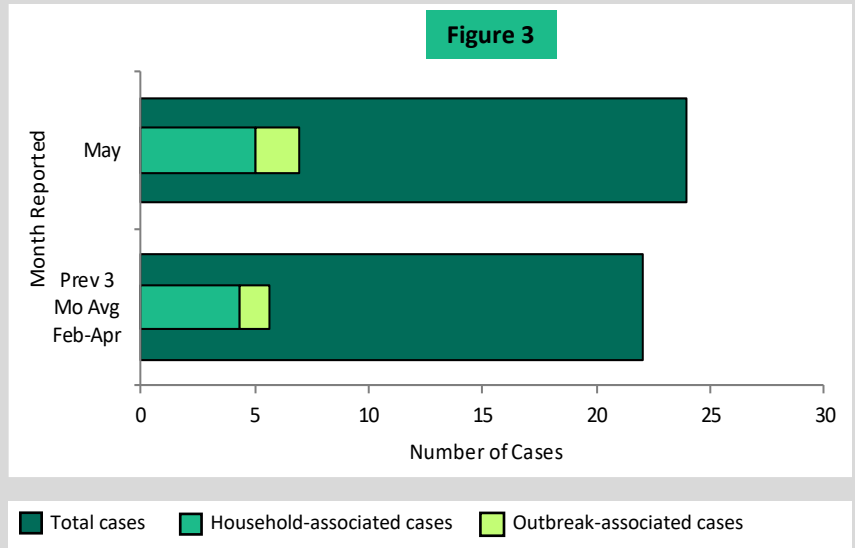
Figure 3 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, May 2018 and the previous three-month average.

In May, five (21%) cases were associated with transmission within households and two (8%) cases were outbreak associated.

Outbreak Summary:

In May, one outbreak of pertussis was reported. The outbreak consisted of two cases, and transmission occurred in a workplace setting in Pinellas County. There were two pertussis outbreaks reported earlier in 2018, both in schools.

See [page 13](#) for outbreak definitions.



Pertussis Treatment and Contacts

Figure 4

=10 individuals

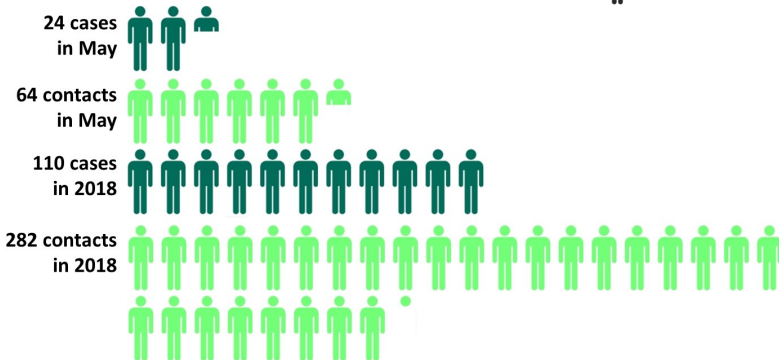
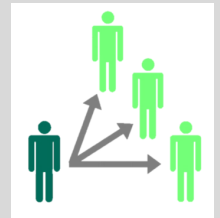


Figure 4 shows the number of confirmed and probable cases of pertussis, as reported into Merlin, and the number of contacts who were recommended antibiotics to prevent illness, May 2018 and 2018 to date.

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

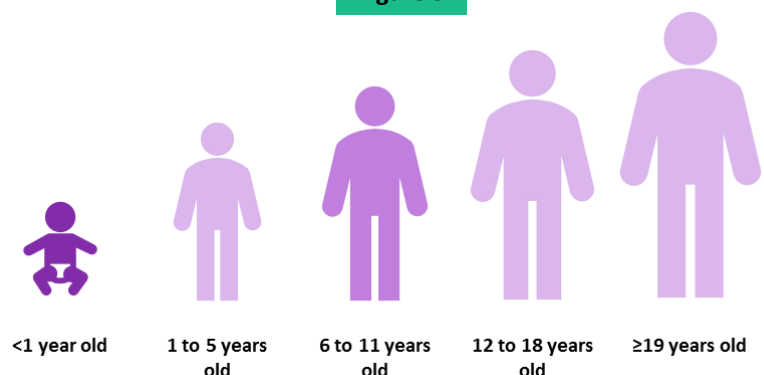


Pertussis Age-Specific Incidence Rates

Figure 5 shows the age-specific incidence rates of confirmed and probable cases of pertussis, as reported into Merlin, May 2018.

In May, the incidence rate was highest among infants less than one year old at 3.6 cases per 100,000 population, 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 grandparents, parents, siblings, and other age groups is so important to help prevent infection in infants.

Figure 5



Age-specific incidence rate per 100,000 population

Legend: 0.01-0.20, 0.21-0.49, 0.50-1.00, 1.01-4.00

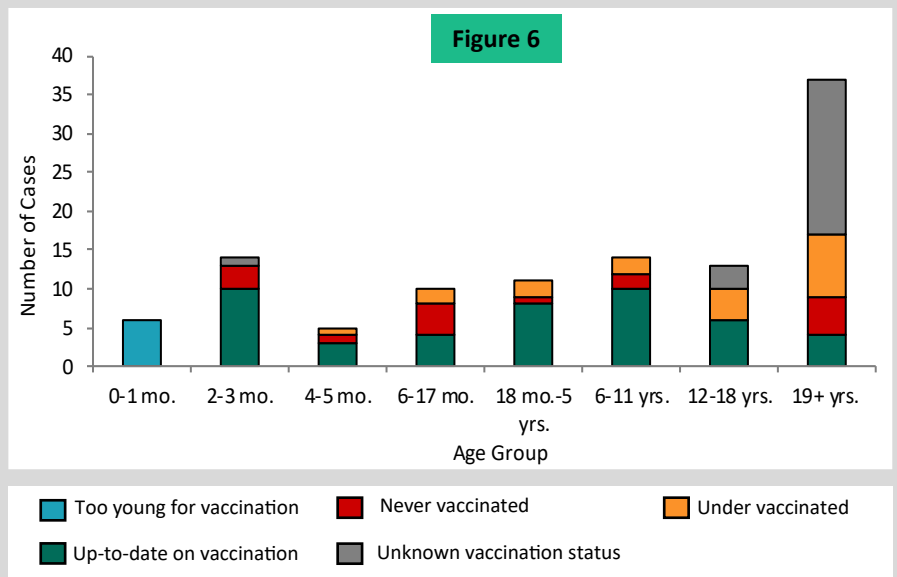
Vaccination History for Pertussis Cases

UTD = up-to-date

Figure 6 shows the vaccination status of pertussis cases by age group for confirmed and probable cases of pertussis, as reported into Merlin, January through May 2018 (n=110).

More than half of individuals in the 6-17 months age group were not up-to-date on their pertussis vaccinations. In general, those who have received at least one pertussis vaccination have less severe outcomes than those who have never been vaccinated.

See [page 13](#) for links to CDC recommended vaccination schedules.

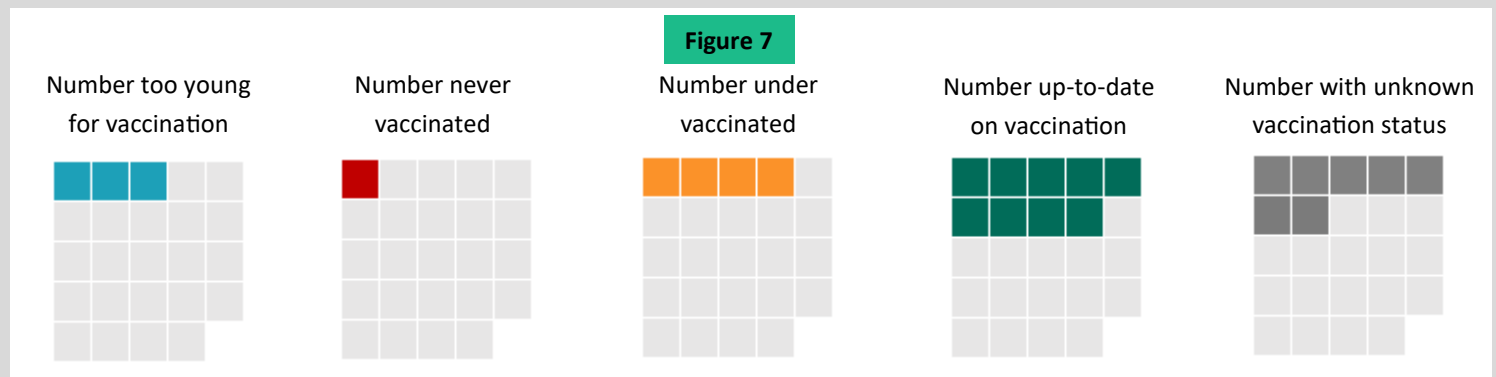


Pertussis Cases by Vaccination Status

UTD = up-to-date

Figure 7 shows the number of confirmed and probable pertussis cases for each vaccination status, as reported into Merlin, May 2018. Each square represents one case, with the colored squares representing a case with a given vaccination status.

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



Pertussis Outcomes

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

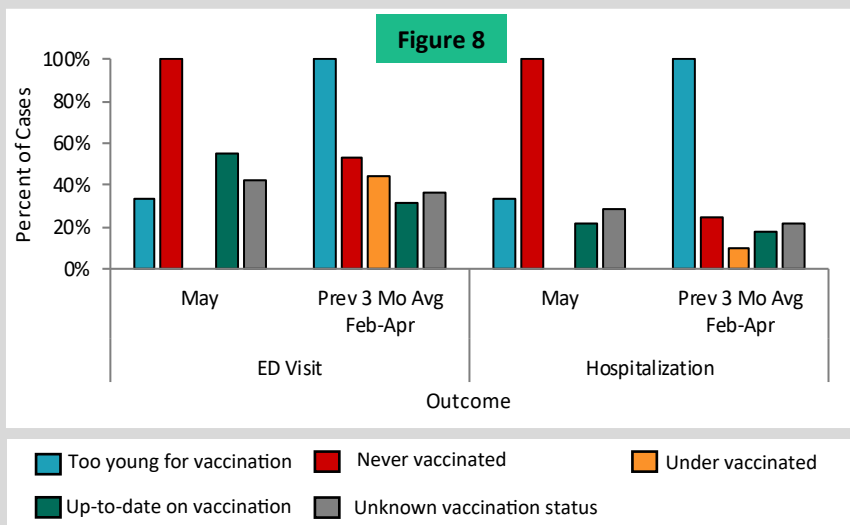


Figure 8 shows the percent of confirmed and probable cases of pertussis with select outcomes by vaccination status, as reported into Merlin, May 2018 and the previous three-month average.

In May, cases who were never vaccinated were more likely to visit the emergency department and 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.

Summary

May 2018

State activity:

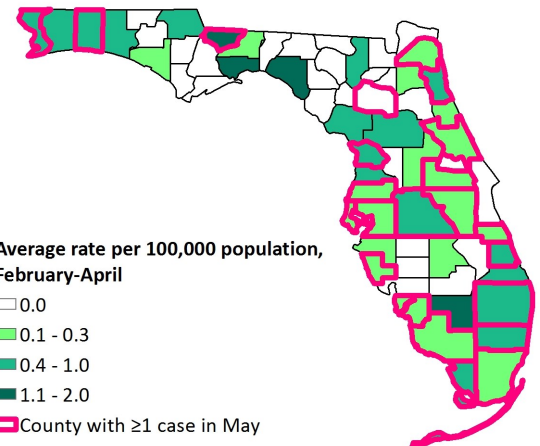
- **Eighty-two varicella cases were reported among 24 counties in May.**
 - Varicella activity increased from last month and remained above the five-year average for the third month in a row.
 - From January 1, 2018 through May 31, 2018, 320 cases of varicella were reported among 44 of Florida's 67 counties.
- A decreasing trend in the number of cases of varicella reported annually in Florida was observed from 2008-2014. Although the number of cases was higher than the previous five years, overall the number of cases reported thus far in 2018 is similar to that seen in 2017 at this time.
- **In May, no varicella outbreaks were reported.**
- **In May, children age six to 11 years old had the highest incidence of varicella.** Previously in 2018, children less than one year old had the highest incidence.
- **Vaccination is the best way to prevent varicella infection.** In April, 62% of cases were not up to date on their varicella vaccinations or had unknown vaccination status. In general, those who receive at least one dose of varicella vaccination, even if they later develop disease, have less severe outcomes than those who have never been vaccinated. Although cases who were up to date on their vaccinations were most likely to visit the emergency department in May, those who have never been vaccinated were more likely to require hospitalization.
- To learn more about varicella, please visit <http://www.floridahealth.gov/varicella>.

National activity:

- Varicella incidence decreased significantly following the vaccine becoming 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 Centers for Disease Control (CDC), based on available data the number of varicella cases nationally has steadily decreased each year from 2012-2015.

Map 3

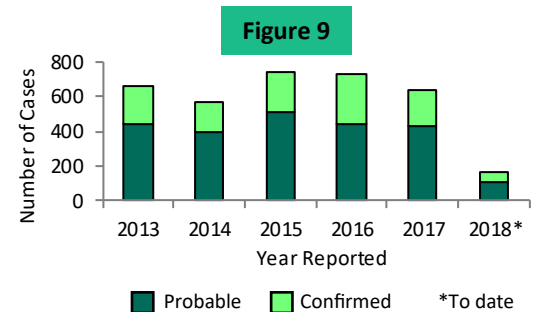
Map 3 shows the previous three-month average of varicella incidence rates per 100,000 population, February through April 2018 (green shading). Counties with one or more cases reported in May 2018 are highlighted in pink.



Average rate per 100,000 population, February-April

- 0.0
- 0.1 - 0.3
- 0.4 - 1.0
- 1.1 - 2.0
- ▭ County with ≥1 case in May

Figure 9 shows the number of confirmed and probable cases of varicella reported into Merlin, 2013 through May 2018.



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 13 ►

Varicella Cases by Month Reported

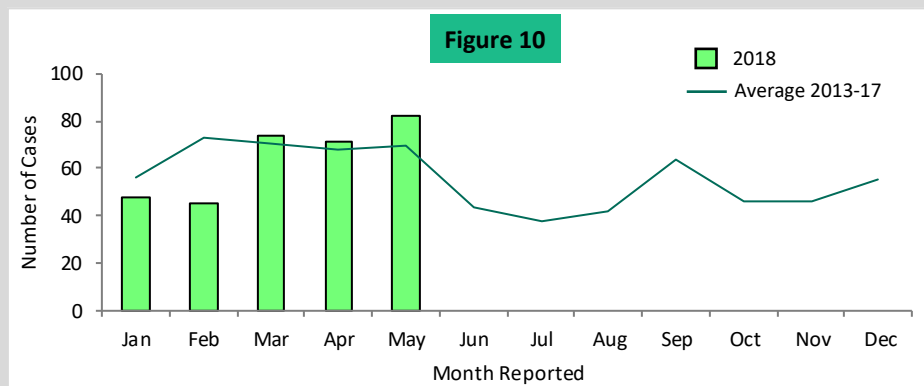


Figure 10 shows the number of confirmed and probable cases of varicella reported into Merlin, January through May 2018 and the previous five-year average.

In May, the number of reported varicella cases increased from that reported in April and remained above the previous five-year average for the third month in a row. In general, varicella activity is highest during the late winter and spring.

Varicella Outbreaks

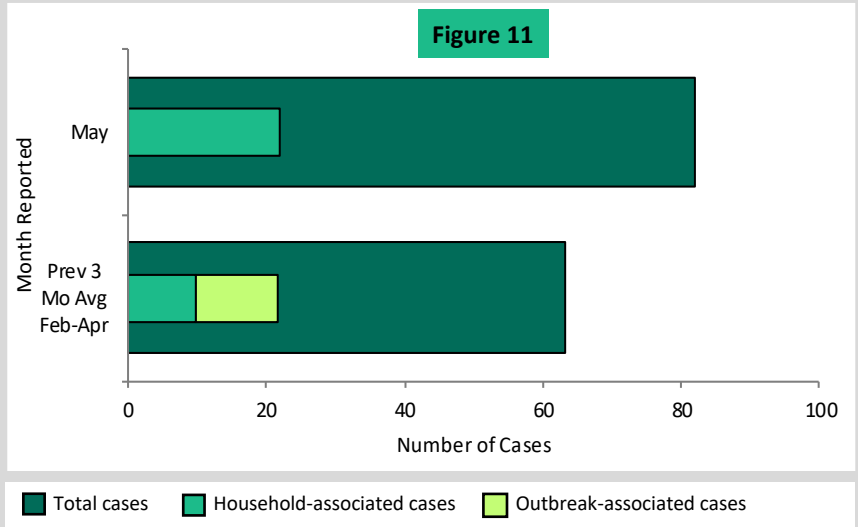
Figure 11 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, May 2018 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

In May, 22 (27%) cases were associated with transmission within households.

Outbreak Summary:

No new outbreaks were reported in May 2018. Thus far in 2018, two varicella outbreaks have been reported, one in a correctional facility and one in a school.

See [page 13](#) for outbreak definitions.



Varicella Age-Specific Incidence Rates

Figure 12

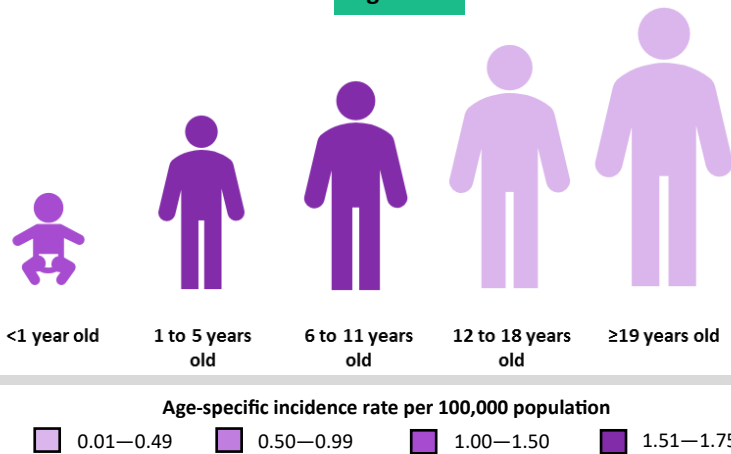


Figure 12 shows the age-specific incidence rates of confirmed and probable cases of varicella, as reported into Merlin, May 2018.

In May, the varicella incidence rate was highest among children six to 11 years old at 1.7 cases per 100,000 population. Previously in 2018, the incidence has been highest among infants less than one year old. Infants less than one year old are too young to receive varicella vaccination, which is why vaccination of grandparents, parents, siblings, and other age groups is so important to help prevent infection in infants.

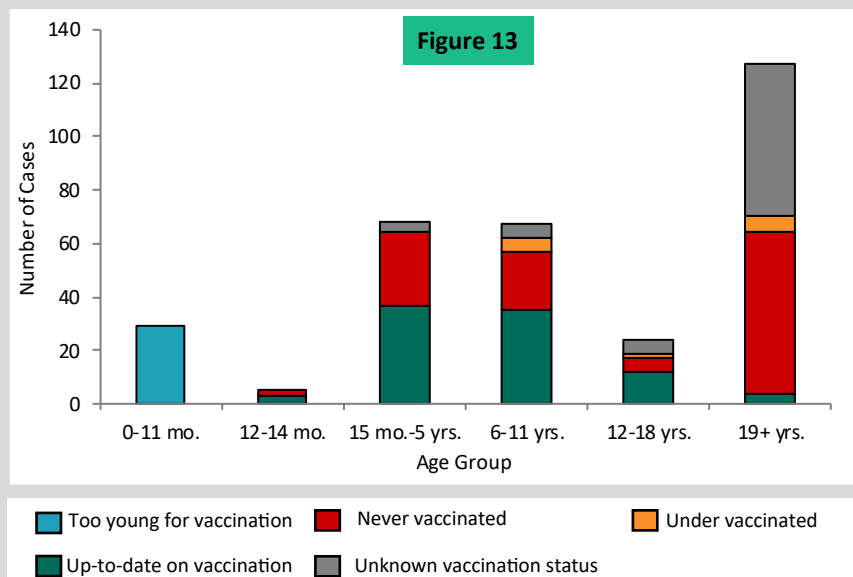
Vaccination History for Varicella Cases

UTD = up-to-date

Figure 13 shows the vaccination status of varicella cases by age group for confirmed and probable cases of varicella, as reported into Merlin, January through May 2018 (n=320).

Varicella vaccinations are recommended at 12-15 months of age and four to six years of age. Of the 127 cases in adults aged 19 and older, 66 (52%) were not up-to-date on their varicella vaccinations.

See [page 13](#) for links to CDC recommended vaccination schedules.

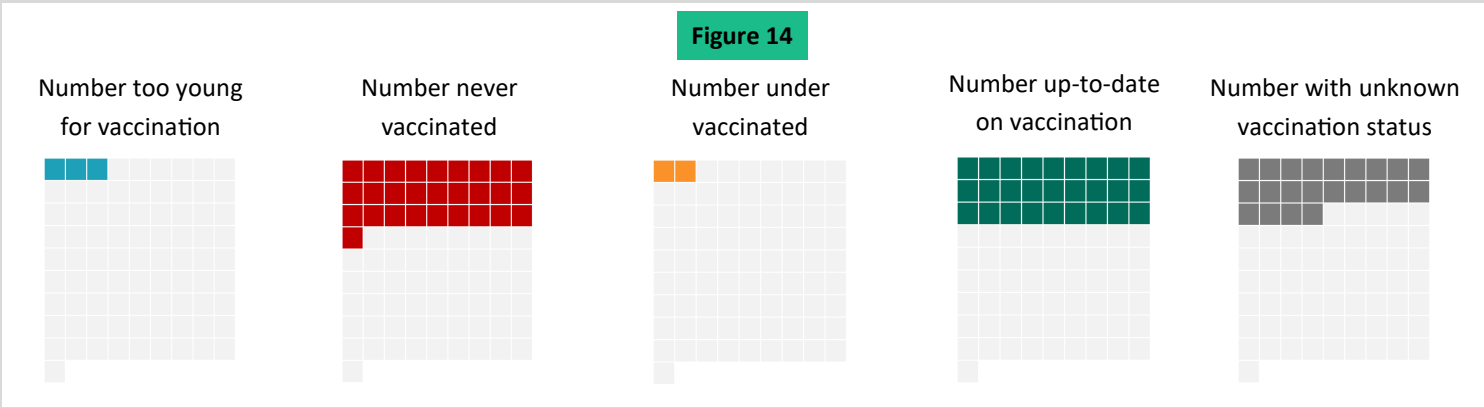


Varicella Cases by Vaccination Status

UTD = up-to-date

Figure 14 shows the number of confirmed and probable varicella cases for each vaccination status, as reported into Merlin, May 2018. Each square represents one case, with the colored squares representing a case with a given vaccination status.

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



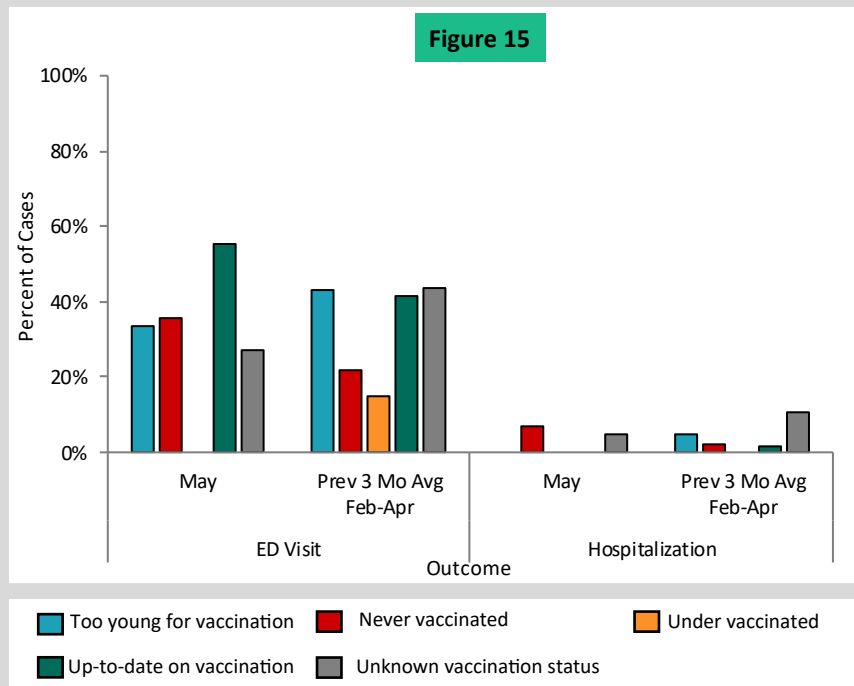
Varicella Outcomes

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, May 2018 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 May, those who have never received a varicella vaccination were more likely to require inpatient hospitalization. In general, those who received at least one dose of varicella vaccination, even if they later develop disease, have less severe outcomes than those who have never been vaccinated.



Summary

May 2018

State activity:

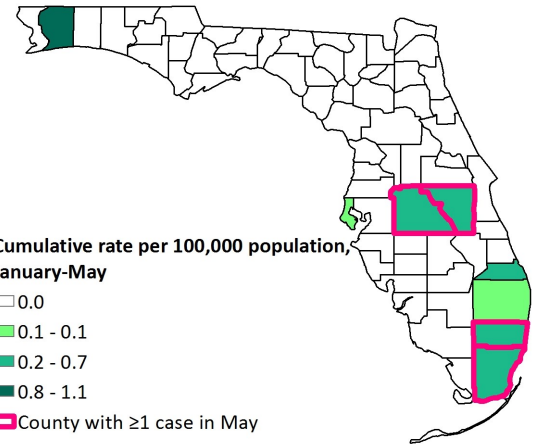
- **Six mumps cases were reported among four counties in May.**
 - Mumps cases have been elevated since April 2017 with a peak of 20 cases reported in August 2017; trends for 2018 will continue to be monitored closely.
 - From January 1, 2018 through May 31, 2018, 31 cases of mumps were reported among eight of Florida's 67 counties.
- In Florida, the number of reported mumps cases has remained relatively low over the past five years but has steadily increased since 2015 (10 cases), with a large spike in 2017 (70 cases). The last time the number of reported cases reached 2017 levels was in the 1990s.
- **No outbreaks of mumps were reported in May.**
 - In 2017, the majority of mumps cases were 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 May, the highest incidence of mumps was in children age 6-11 years old.**
- **Vaccination is the best way to prevent mumps infections.** In May, 67% of cases were not up-to-date on their mumps vaccinations.
- In recent months, cases not up to date on mumps vaccinations were more likely to visit the emergency department and require inpatient hospitalization. In general, those who have received at least one mumps vaccination even if they later develop disease suffer less severe outcomes than those who have never been vaccinated.
- To learn more about mumps, please visit <http://www.floridahealth.gov/mumps>.

National 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 were over 5,600 cases reported. Since 2013, the 18-22 year age group has had the highest incidence of mumps, largely driven by outbreaks and waning immunity among this age group. About half of the outbreaks reported since 2016 have been associated with colleges and universities, primarily affecting young adults.
- The Advisory Committee on Immunization Practices recently recommended a third mumps virus-containing vaccine for certain populations identified by public health authorities as being at increased risk of mumps because of an outbreak. To learn more, please visit <https://www.cdc.gov/mmwr/volumes/67/wr/mm6701a7.htm>.

Map 4

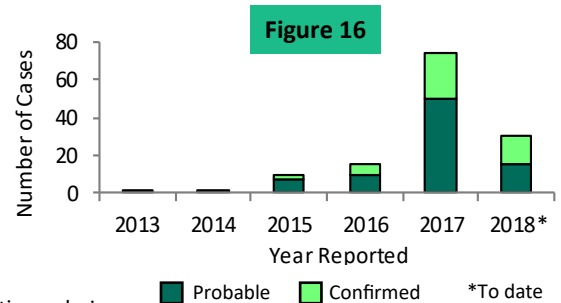
Map 4 shows the cumulative mumps incidence rates per 100,000 population, January through May 2018 (green shading). Counties with one or more cases reported in May 2018 are highlighted in pink.



Cumulative rate per 100,000 population, January-May

- 0.0
- 0.1 - 0.1
- 0.2 - 0.7
- 0.8 - 1.1
- County with ≥ 1 case in May

Figure 16 shows the number of confirmed and probable cases of mumps reported into Merlin, 2013 through May 2018.



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 13 ►

Mumps Cases by Month Reported

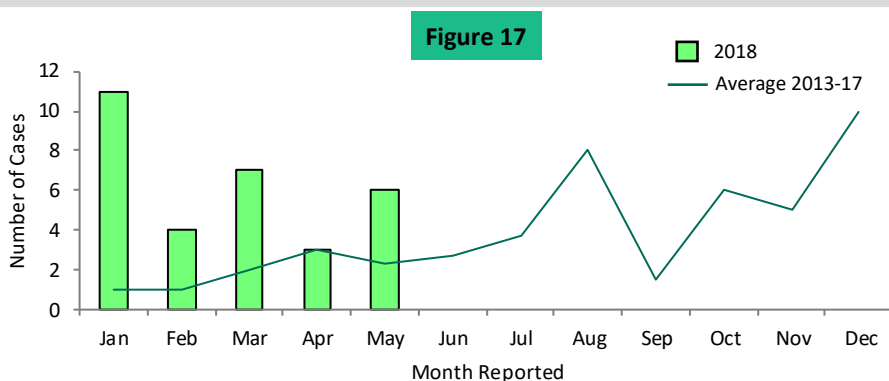


Figure 17 shows the number of confirmed and probable cases of mumps reported into Merlin, January through May 2018 and the previous five-year average.

In May, the number of reported mumps cases increased from that in April and was above the previous five-year average for the eighth month in a row. The number of cases have remained elevated since April 2017.

Mumps Outbreaks

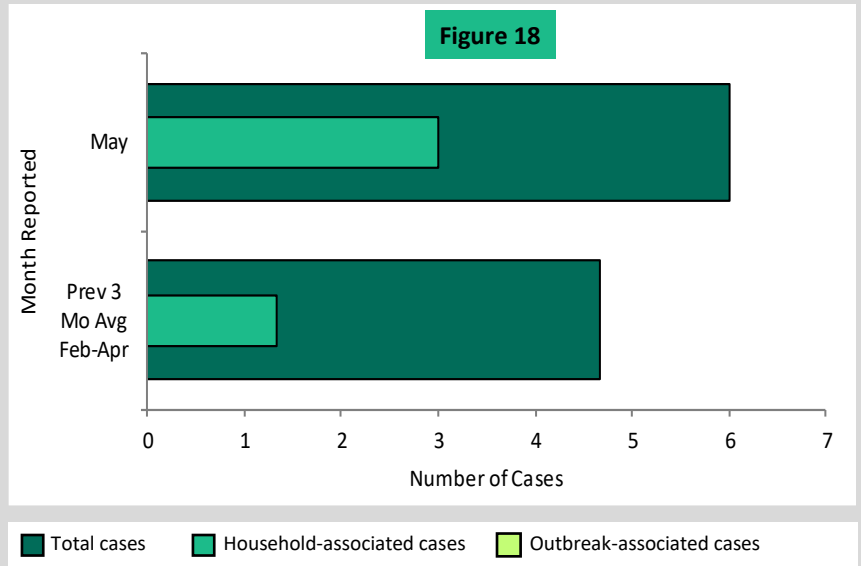
Figure 18 shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, May 2018 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

In May, three (50%) cases were associated with transmission within a household.

Outbreak Summary:

No outbreaks of mumps have been reported in 2018. All outbreak-associated cases reported in 2018 were identified during outbreak investigations that began in December 2017 and closed in January 2018.

See [page 13](#) for outbreak definitions.



Mumps Age-Specific Incidence Rates

Figure 19

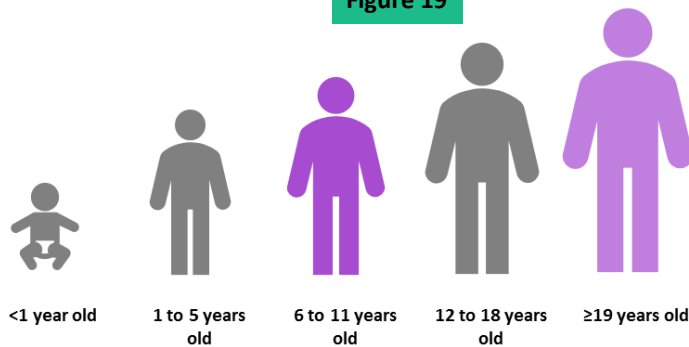


Figure 19 shows the age-specific incidence rates of confirmed and probable cases of mumps, as reported into Merlin, May 2018.

In May, the mumps incidence rate was highest among children age 6-11 years old at 0.07 cases per 100,000 population. There were no cases of mumps reported for three of the age groups in May 2018. Although the incidence rate was low among adults age 19 and older, 65% of cases reported so far in 2018 were in this age group.

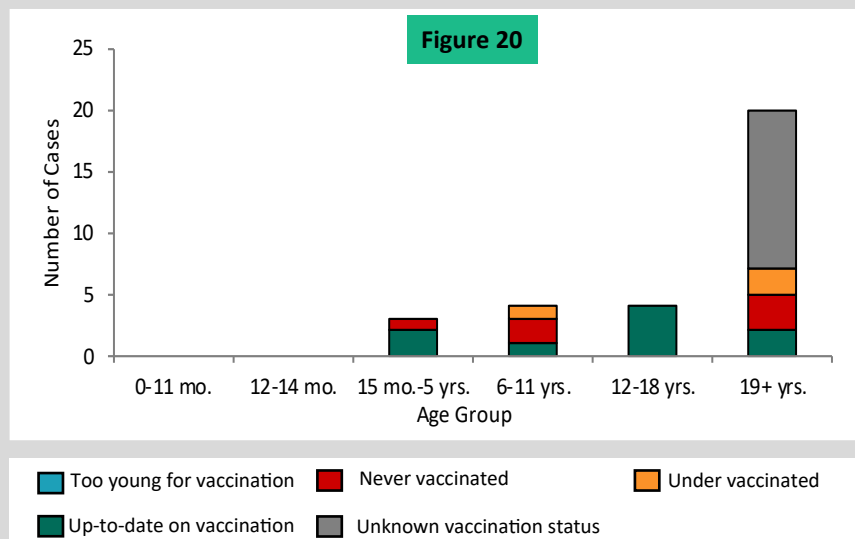
Vaccination History for Mumps Cases

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 through May 2018 (n=31).

Mumps vaccinations are recommended at 12-15 months of age and again at 4-6 years of age. Three (75%) individuals age 6-11 years were not up-to-date on mumps vaccinations and 18 (90%) individuals age 19 years or older were not up-to-date or had unknown vaccination status.

See [page 13](#) for links to CDC recommended vaccination schedules.



Mumps Cases by Vaccination Status

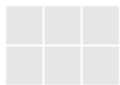
UTD = up-to-date

Figure 21 shows the number of confirmed and probable mumps cases for each vaccination status, as reported into Merlin, May 2018. Each square represents one case, with the colored squares representing a case with a given vaccination status.

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

Figure 21

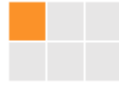
Number too young for vaccination



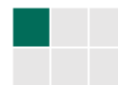
Number never vaccinated



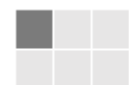
Number under vaccinated



Number up-to-date on vaccination



Number with unknown vaccination status



Mumps Outcomes

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

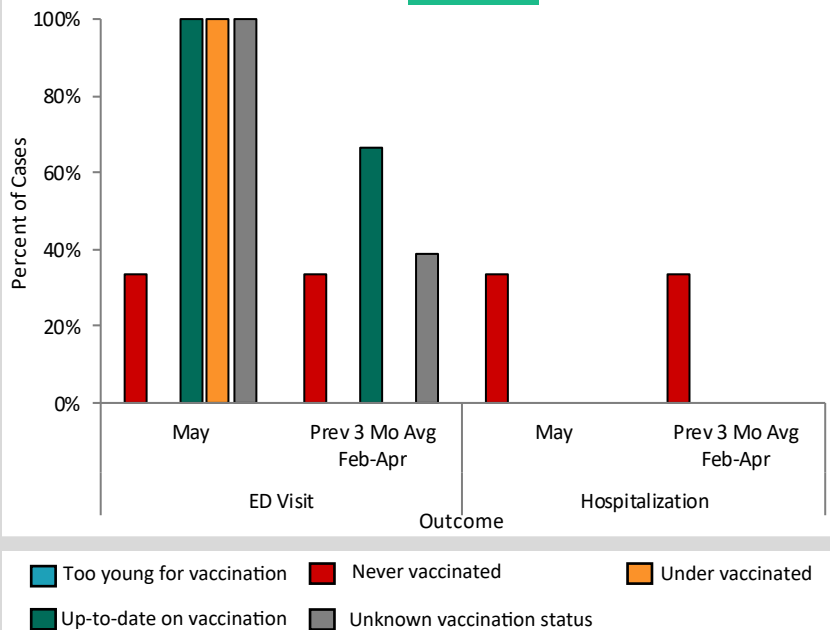
Figure 22 shows the percent of confirmed and probable cases of mumps with select outcomes by vaccination status, as reported into Merlin, May 2018 and the previous three-month average.

In recent months, individuals *not* up to date on their vaccinations were most likely to visit the emergency department and require inpatient hospitalization.

Orchitis (testicular inflammation) is the most common complication from mumps in males. From January through May 2018, three (10%) cases reported orchitis; one was never vaccinated and two had an unknown vaccination status.

In general, those who received at least one dose of mumps vaccination, even if they later develop disease, have less severe outcomes than those who have never been vaccinated.

Figure 22



Summary

May 2018

State activity:

- **Four confirmed measles cases associated with international travel were investigated among two counties in May.**
 - Two cases were in Florida residents with confirmed international travel and no measles vaccination.
 - Two cases were in *non-Florida* residents with confirmed international contacts and unknown vaccination status.
 - Two cases were in children less than 5 years old and two cases were in adults.
 - Measles cases and potentially exposed persons are monitored closely to limit spread of disease.
- In Florida, the number of reported measles cases has remained at less than 10 cases per year since 2010.
- **No outbreaks of measles were reported in May.**
 - Contact investigations are important for every case of measles to determine the vaccination status for those potentially exposed to measles and to detect and prevent transmission.
 - Contact investigations were completed for all cases who traveled within the state while infectious.
 - **In May, a total of 944 contacts were identified who had possible exposure to a case of measles.**
 - In 2017, all measles cases (n=3) were exposed to the measles virus outside of Florida.
- **Vaccination is the best way to prevent measles infections.** In May, two cases were never vaccinated against measles and two cases had unknown vaccination status.
- Due to the generally high vaccination rates in Florida, cases of measles are rare but occur every year and are most often associated with international travel.
 - Cases reported in May acquired infection from Afghanistan, France, Ukraine, and Venezuela.
- To learn more about measles, please visit <http://www.floridahealth.gov/measles>.

National activity:

- Even though measles has been eliminated in the United States, cases occur every year, mostly among unvaccinated individuals. As of April 21, the CDC has reported 63 confirmed cases of measles so far in 2018. In 2017, the CDC reported a total of 118 cases.
- In 2017, Minnesota experienced a large outbreak of measles in a community with low measles vaccination coverage that affected a total of 65 individuals. For detailed information on this outbreak see [page 13](#).
- The two dose measles vaccination schedule has been successful at decreasing cases, and measles was eliminated from the United States in 2000.

International activity:

- Recently, increased measles activity has been reported all over the world. In May 2018, multiple measles outbreaks were reported in the Americas, Asia, Africa, Europe, and the Pacific.
- The CDC has issued a Level 1 Travel Alert for several countries with measles outbreaks, including Greece, England, Serbia, Indonesia, Democratic Republic of the Congo, Italy, Ukraine, the Philippines, Romania, and France. Travelers to these countries should make sure they are vaccinated against measles with the MMR (measles, mumps, and rubella) vaccine. For more information, please visit <https://wwwnc.cdc.gov/travel/notices>.

Surveillance goals:

- Measles surveillance is conducted to prevent transmission and severe disease, and initiate control measures.
- Surveillance is also conducted to monitor effectiveness of immunization programs and vaccines. For more information on the data sources used in Florida for measles surveillance, see [page 13](#) ►

Measles Cases by Year Reported

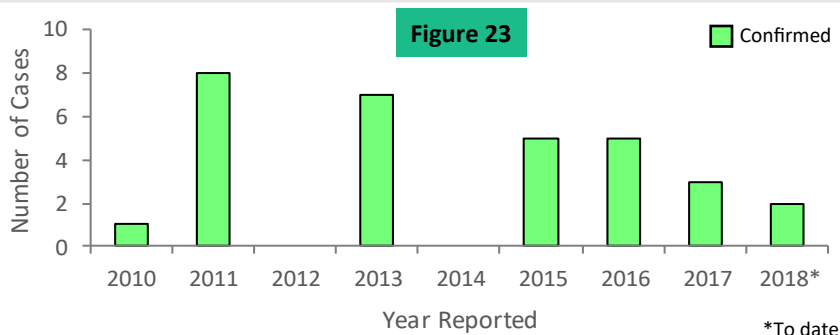


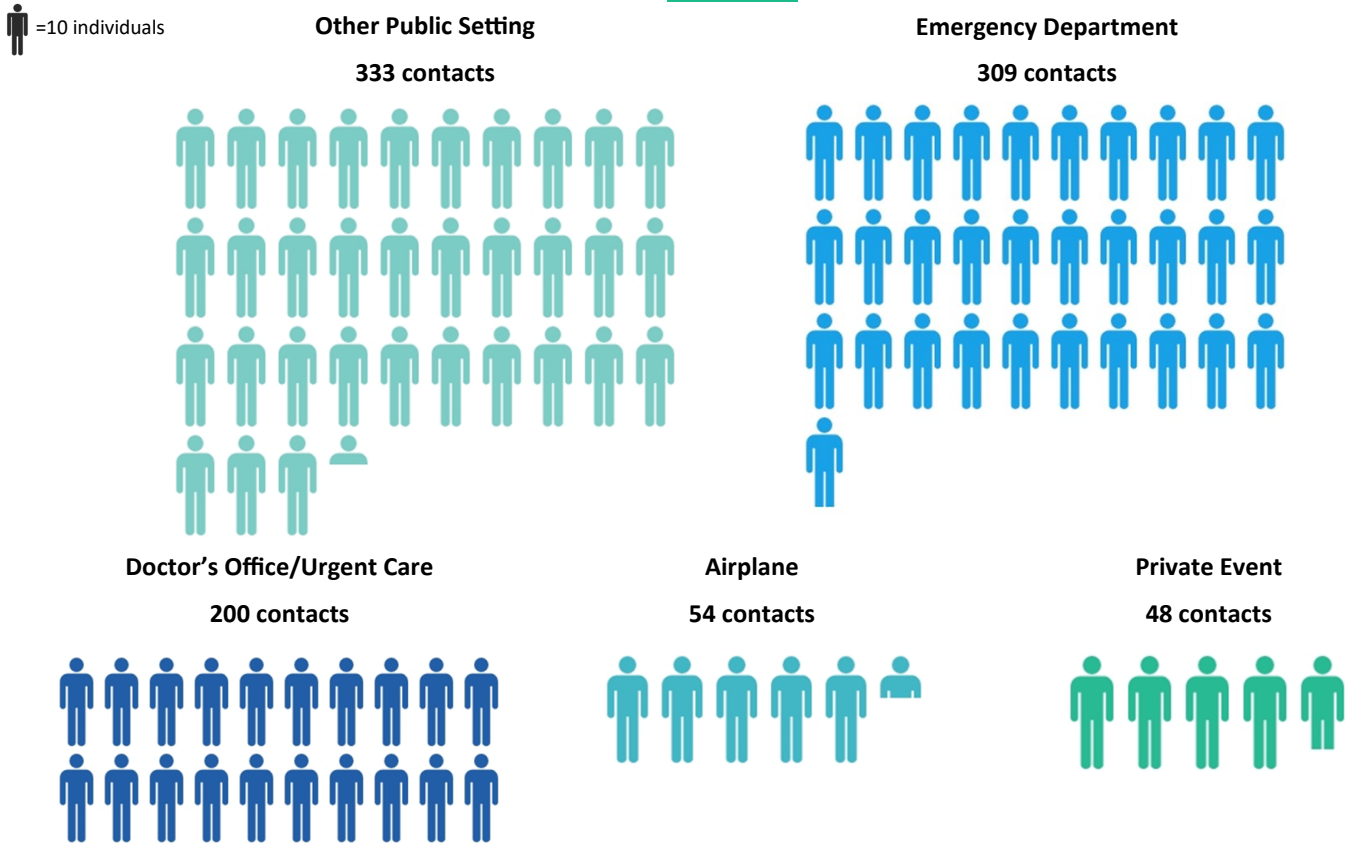
Figure 23 shows the number of confirmed and probable cases of mumps reported into Merlin, 2013 through May 2018.

Thus far in 2018, two confirmed measles cases have been reported in Florida residents. Neither of the cases were linked to each other. The swift identification and response to cases helped prevent disease transmission in Florida.

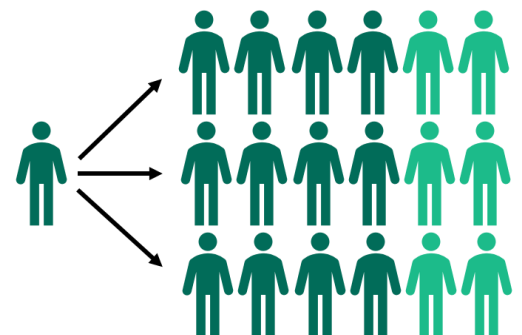
Measles Contact Investigation

Measles is a highly contagious disease among persons who are susceptible. It is important to identify all contacts of cases to determine if they are protected against measles through either vaccination or history of disease and to quickly determine if they develop symptoms of measles, indicating a possible infection. In addition to contacts of measles cases among Florida residents, contacts of cases from other states who visited Florida while infectious must also be investigated. **In May, Florida investigated a total of 944 contacts of four measles cases, including two cases in Florida residents and two cases in non-Florida residents.** Figure 24 shows the number of contacts by setting.

Figure 24



Due to strong public health efforts, 944 contacts were identified. **Among those reached, the majority were vaccinated against measles.** Measles is a highly infectious virus, and the lack of secondary measles cases signifies the importance of herd immunity. In a population with no immunity to measles, one case of measles could potentially lead to 12 to 18 more cases. High measles vaccination rates are especially important to prevent infection in those too young to be vaccinated.



Case Data

- Current case information is preliminary and will change as new data are gathered. The most recent data available are displayed in this report.
- 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.
 - Household-associated cases are defined as two or more cases exposed within the same household.
 - Pertussis and mumps outbreaks are defined as two or more cases associated with a specific setting outside of a household.
 - Varicella outbreaks are defined as five or more cases associated with a specific setting outside of a household.
- For more information about reportable diseases, please visit www.Floridahealth.gov/diseasereporting.
- For more information about Florida's guides to surveillance and investigation, including disease specific probable and confirmed case definitions, please visit www.Floridahealth.gov/gsi.
- For the full article on a Minnesota outbreak of measles, please visit <https://www.cdc.gov/mmwr/volumes/66/wr/mm6627a1.htm>

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, 2018.
- 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>.
- For a full text version of a new study on pertussis vaccination, please visit <http://www.cidid.org/publications-1/2018/3/29/the-impact-of-past-vaccination-coverage-and-immunity-on-pertussis-resurgence>