

# Vaccine-Preventable Disease Surveillance

March 2018

## Summary

### Pertussis

- Pertussis activity decreased from last month and is consistent with trends seen in previous years at this time.
- There were 18 cases and no outbreaks reported in March.
- Incidence remains 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 is slightly higher than activity levels seen in previous years at this time.
- There were 73 total cases and an outbreak in a school reported in March, to date 17 cases have been identified as a part of the outbreak.
- Incidence remains highest among infants less than one year old, who are too young to be vaccinated
- This month, 60% of cases were not up to date on their varicella vaccinations or had unknown vaccination status, a slight increase from last month.

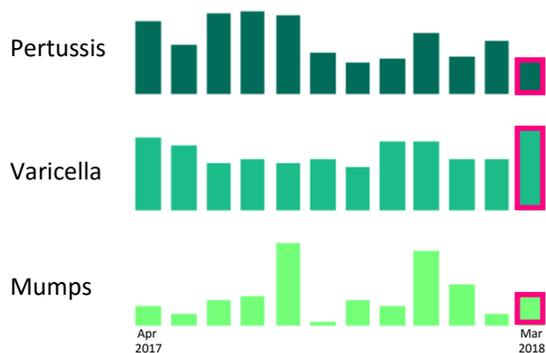
### Mumps

- Mumps activity increased from last month and is higher than activity levels seen in previous years at this time.
- There were seven cases and no outbreaks reported in March.
- Incidence was highest among children age 1-5 years old.
- This month, 57% of cases were not up-to-date on their mumps vaccinations or had an unknown vaccination status, a decrease from last month.

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## Monthly Activity Trends Apr. 2017-Mar. 2018



**For all vaccine-preventable diseases, 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.**

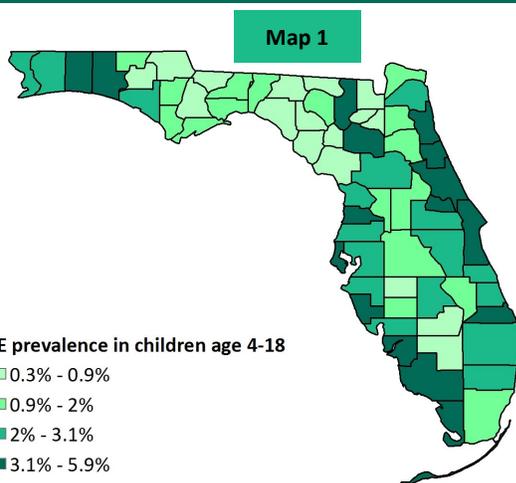
## Vaccination

**Map 1** shows the prevalence of children age 4-18 who have a registered religious exemption (RE) to vaccination in Florida SHOTS\* as of April 1, 2018.

Statewide, the estimated prevalence of REs among children age 4-18 is 2.7% with individual counties ranging from 0.3% to 5.9%. This is an increase from April 1, 2017 when the statewide prevalence was 2.3% and individual counties ranged from 0.2% to 5.1%.

**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 April 4, 2018 on the Bureau of Epidemiology (BOE) website: [www.floridahealth.gov/VPD](http://www.floridahealth.gov/VPD)

Produced by the BOE, Florida Department of Health

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Summary

March 2018

**State pertussis activity:**

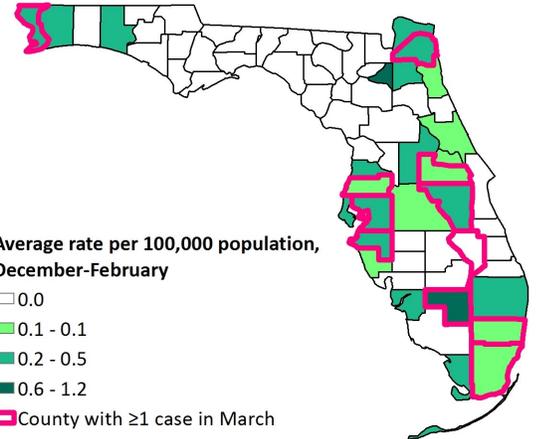
- **Eighteen confirmed and probable pertussis cases** were reported among 11 counties in March.
  - Pertussis activity decreased from the previous month and remains consistent with trends observed in previous years at this time.
  - From January 1, 2018 through March 31, 2018, 66 confirmed and probable cases of pertussis were reported among 23 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 March.**
  - For most pertussis cases, exposure to other known cases is never identified, and they are not able to be linked to outbreaks.
- **In March, for every pertussis case identified, there was an average of two 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 February, 56% 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 March, those who were under-vaccinated were most likely to visit the emergency department.
- 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

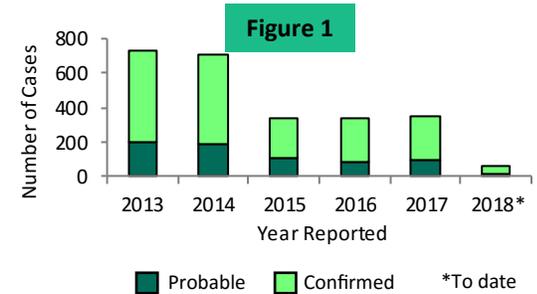
Map 2 shows the previous three-month average of pertussis incidence rates per 100,000 population, December 2017 through February 2018 (green shading). Counties that have had a recent case in March 2018 are highlighted in pink.



Average rate per 100,000 population, December-February

- 0.0
- 0.1 - 0.1
- 0.2 - 0.5
- 0.6 - 1.2
- County with ≥1 case in March

Figure 1 shows the number of confirmed and probable cases of pertussis reported into Merlin, 2013 through March 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 11. ▶

Pertussis Cases by Month Reported

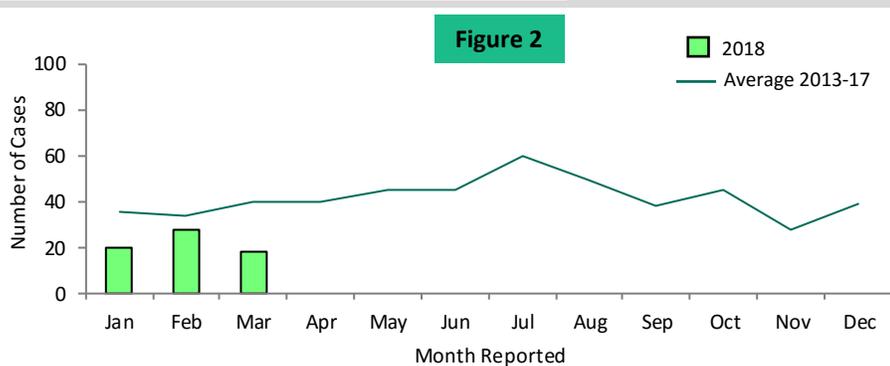


Figure 2 shows the number of confirmed and probable cases of pertussis reported into Merlin, January 2018 through March 2018 and the previous five-year average.

In March, the number of reported pertussis cases decreased from February 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

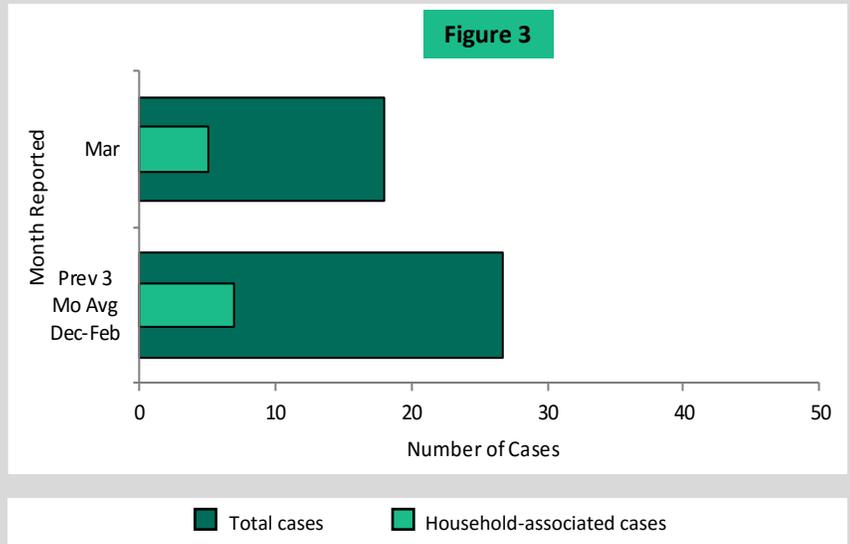
**Figure 3** shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, March 2018 and the previous three-month average.

**In March, five (28%) cases were associated with transmission within households.**

### Outbreak Summary:

**In March, no outbreaks of pertussis were reported.** No pertussis outbreaks have been reported thus far in 2018.

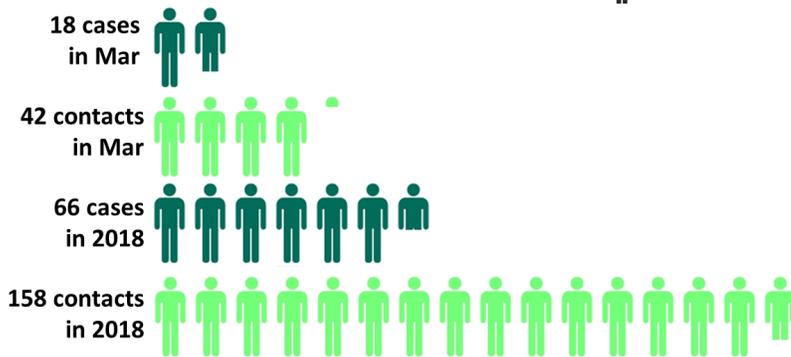
See [page 11](#) for outbreak definitions.



## Pertussis Treatment and Contacts

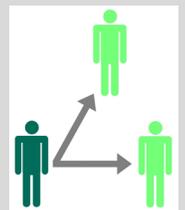
**Figure 4**

=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, March 2018 and 2018 to date.

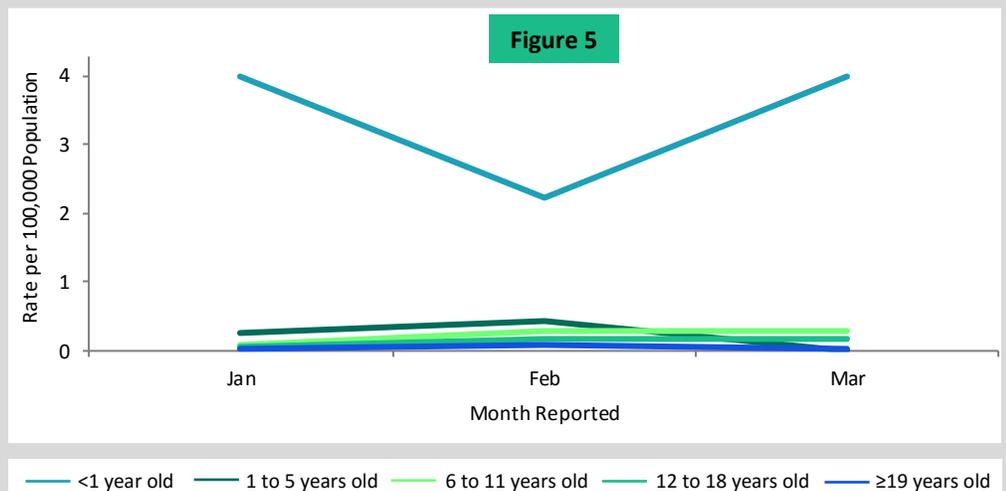
**On average, for each case reported in March there were two people exposed to the case who were recommended antibiotics to prevent illness.**



## Pertussis Age-Specific Incidence Rates

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

**In March, the incidence rate was highest among infants less than one 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 grandparents, parents, siblings, and other age groups is so important to help prevent infection in infants.



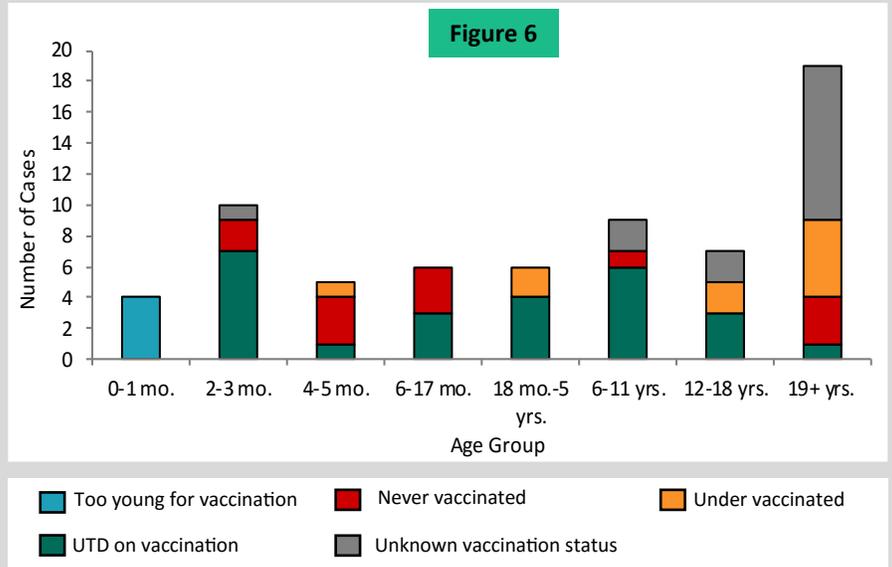
## Vaccination History for Pertussis Cases

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 March 2018 (n=66).

**Half or more of individuals in the 4-5 months and 6-17 months age groups 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 11](#) for links to the CDC recommended vaccination schedules.

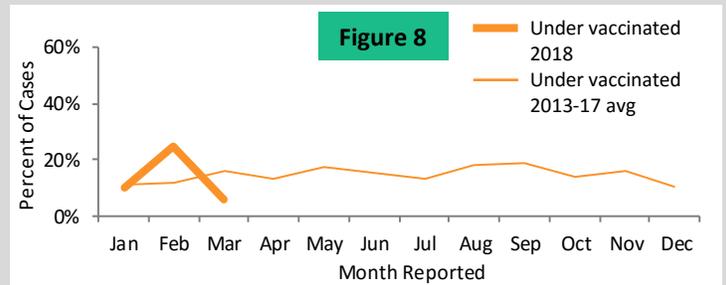
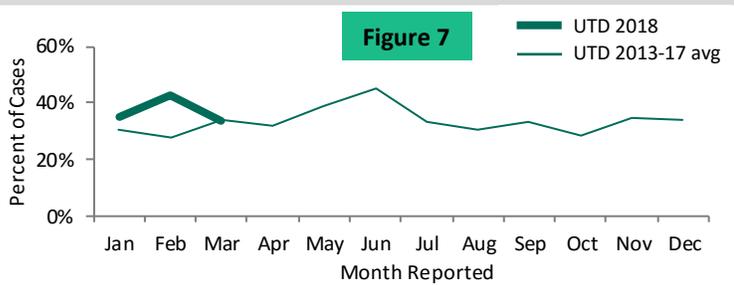


## Pertussis Cases in Vaccinated Individuals

UTD = up-to-date

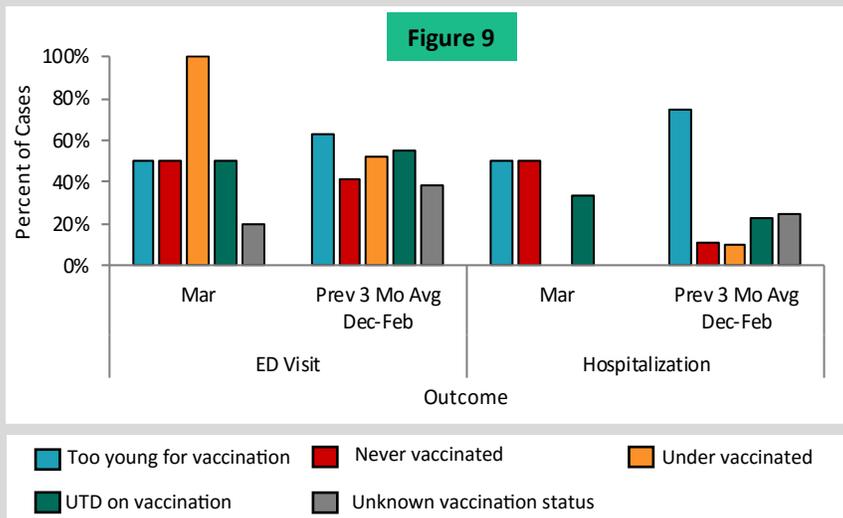
**Figure 7** shows the percent of confirmed and probable pertussis cases who were up-to-date on their pertussis vaccinations, as reported into Merlin, January through March 2018 and the previous five-year average. **Figure 8** shows the percent of these cases who were under vaccinated during the same 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 9** shows the percent of confirmed and probable cases of pertussis with select outcomes by vaccination status, as reported into Merlin, March 2018 and the previous three-month average.

**In March, cases who were under-vaccinated were more likely to visit the emergency department. Those who were never vaccinated and 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.

Summary

March 2018

**State varicella activity:**

- **Seventy-three confirmed and probable varicella cases were reported among 26 counties in March.**
  - The number of reported varicella cases increased from February and is slightly above the March five-year average.
  - From January 1, 2018 through March 31, 2018, 164 cases of varicella were reported among 39 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. Although the number of cases was higher than the previous five years, overall fewer cases have been reported in 2018 than 2017. Increased varicella activity is expected for the next two months.
- **In March, an outbreak of varicella was reported in a school; to date 17 cases have been identified.**
- **In March, children age less than one year old had the highest incidence of varicella.** This is consistent with what has been observed thus far in 2018.
- **Vaccination is the best way to prevent varicella infection.** In March, 60% 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. In March, cases who were not up to date on their vaccinations or had unknown vaccination status were most likely to require inpatient hospitalization.
- Though rare, deaths from varicella do occur. **In March, a varicella case previously reported in February was confirmed to have died; the deceased had multiple underlying conditions and varicella vaccination status was unknown.**
- To learn more about varicella, please visit <http://www.floridahealth.gov/varicella>.

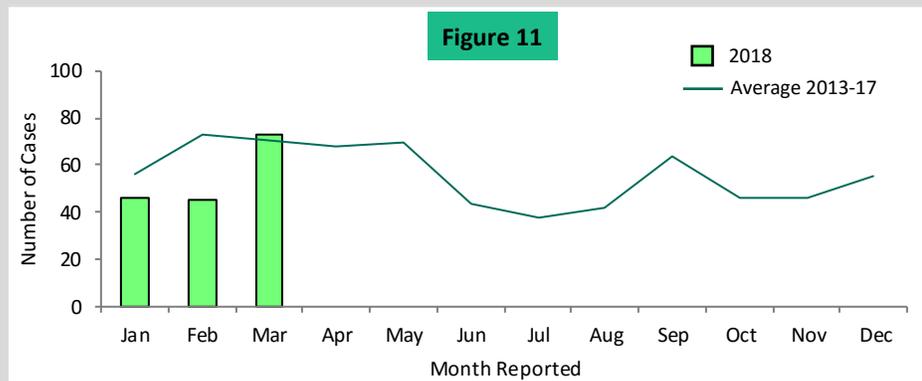
**National varicella activity:**

- 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 CDC, based on available data the number of varicella cases nationally has steadily decreased each year from 2012-2015.

**Surveillance goals:**

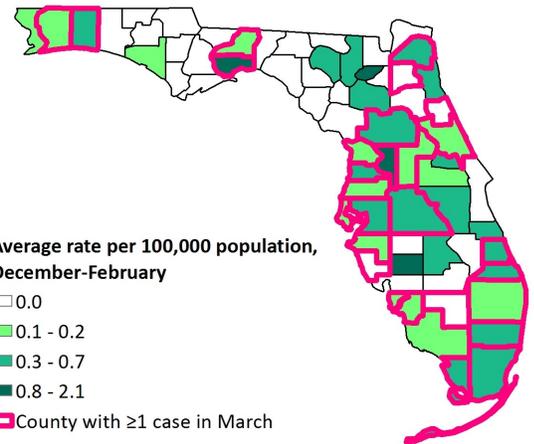
- Varicella surveillance is conducted to identify and control outbreaks and monitor trends and severe outcomes.
- Surveillance is also conducted to monitor effectiveness of immunization programs and vaccines. For more information on the data sources used in Florida for varicella surveillance, see page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

Varicella Cases by Month Reported



Map 3

Map 3 shows the previous three-month average of varicella incidence rates per 100,000 population, December 2017 through February 2018 (green shading). Counties that have had a recent case in March 2018 are highlighted in pink.



Average rate per 100,000 population, December-February

- 0.0
- 0.1 - 0.2
- 0.3 - 0.7
- 0.8 - 2.1
- County with ≥1 case in March

Figure 10 shows the number of confirmed and probable cases of varicella reported into Merlin, 2013 through March 2018.

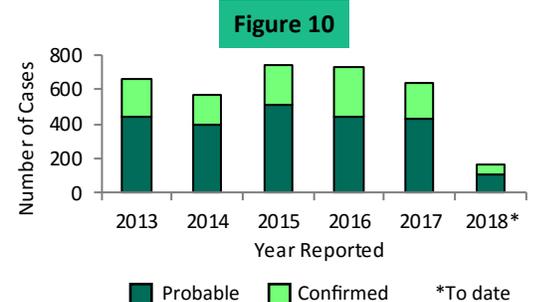


Figure 11 shows the number of confirmed and probable cases of varicella reported into Merlin, January through March 2018 and the previous five-year average.

**In March, the number of reported varicella cases increased from February and was slightly above the previous five-year average. In general, varicella activity is highest during the late winter and spring.**

## Varicella Outbreaks

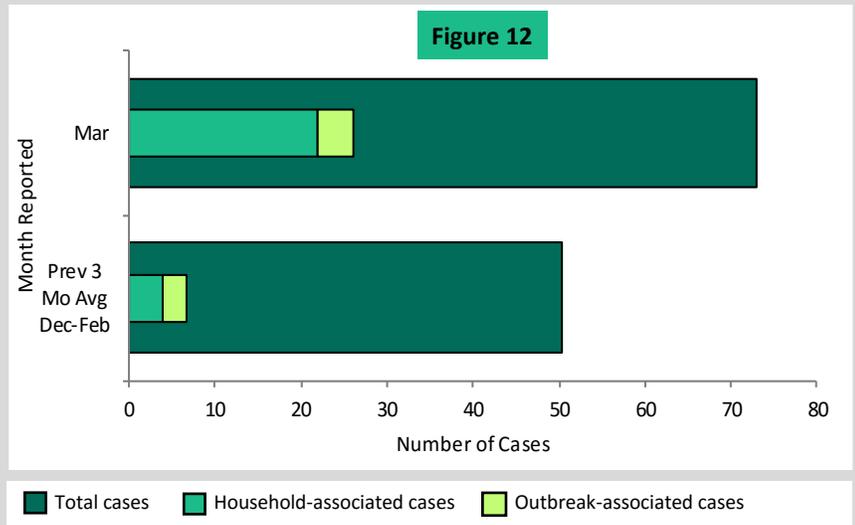
**Figure 12** shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, March 2018 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

**In March, 22 (30%) cases were associated with transmission within households and four (5%) cases were part of a school outbreak.**

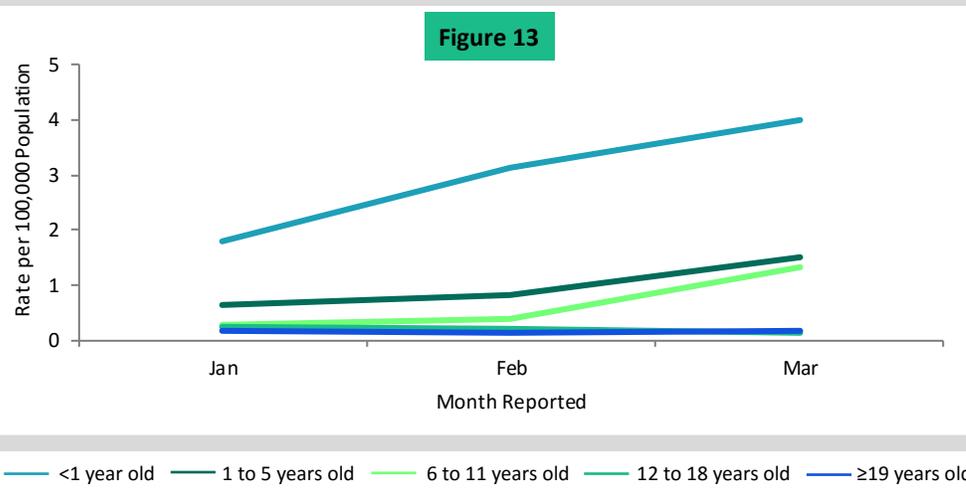
### Outbreak Summary:

**In March, an outbreak of varicella was reported in a Palm Beach County school. While four cases were reported in March, a total of 17 cases have been identified to date; the investigation is ongoing.** Earlier in 2018, two varicella outbreaks were reported in correctional facilities.

See [page 11](#) for outbreak definitions.



## Varicella Age-Specific Incidence Rates



**Figure 13** shows the age-specific incidence rates of confirmed and probable cases of varicella, as reported into Merlin, January through March 2018.

**In March, the varicella incidence rate was highest among infants less than one year old.** This is consistent with trends seen earlier in 2018. 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.

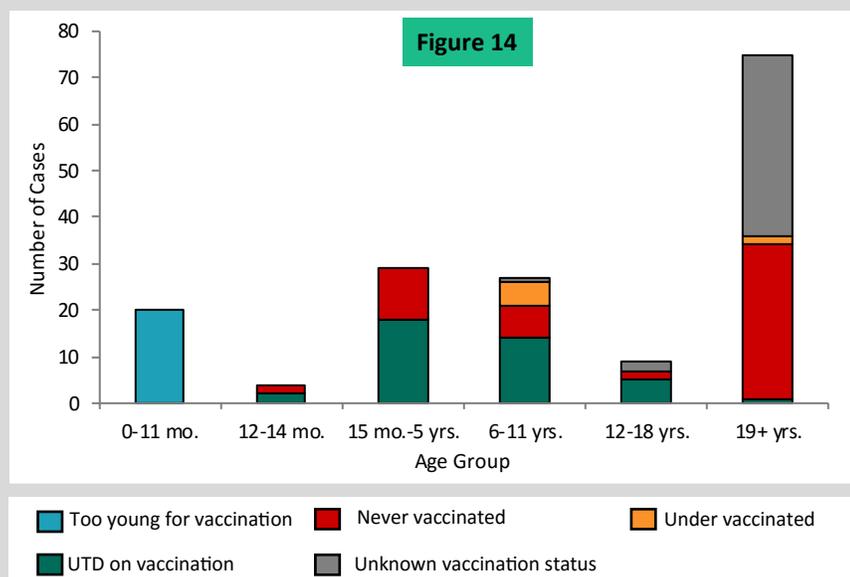
## Vaccination History for Varicella Cases

UTD = up-to-date

**Figure 14** shows the vaccination status of varicella cases by age group for confirmed and probable cases of varicella, as reported into Merlin, January through March 2018 (n=164).

**Varicella vaccinations are recommended at 12-15 months of age and 4-6 years of age. Thirty-five (47%) individuals age 19 and older were not up-to-date on their varicella vaccinations, while the majority of those age 1-11 years were up-to-date on their vaccinations.**

See [page 11](#) for links to CDC recommended vaccination schedules.

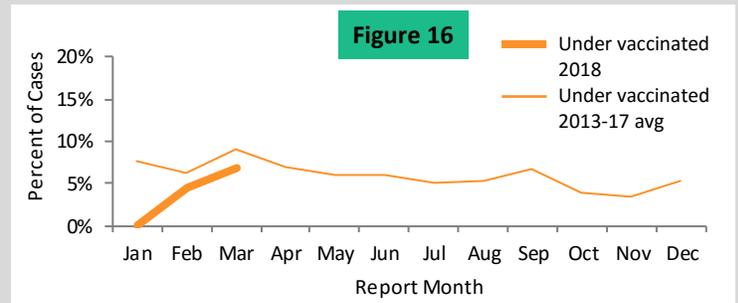
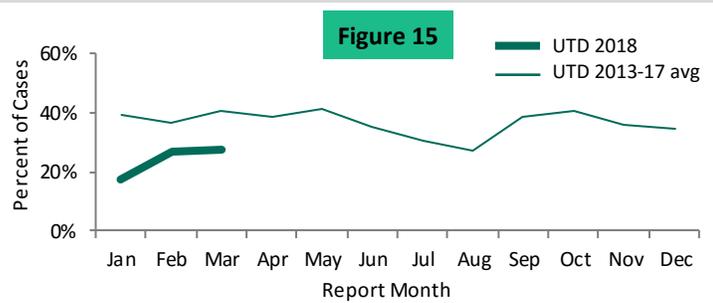


## Varicella Cases in Vaccinated Individuals

UTD = up-to-date

**Figure 15** shows the percent of confirmed and probable varicella cases who were up to date on their varicella vaccinations, as reported into Merlin, January through March 2018 and the previous five-year average. **Figure 16** 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.**



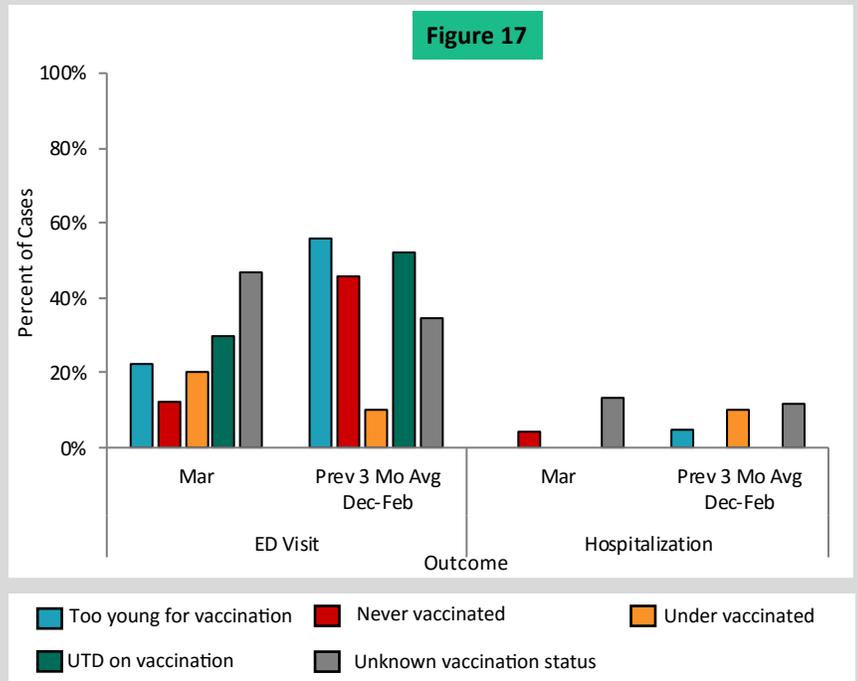
## Varicella Outcomes

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

**Figure 17** shows the percent of confirmed and probable cases of varicella with select outcomes by vaccination status, as reported into Merlin, March 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 March, individuals with unknown vaccination status were most likely to visit the emergency department. Few varicella cases 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

March 2018

### State mumps activity:

- **One confirmed and six probable mumps cases were reported among five counties in March.**
  - Mumps cases have remained 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 March 31, 2018, 10 confirmed and 10 probable cases of mumps were reported among seven 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 March.**
  - 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 March, the highest incidence of mumps was in children age 1-5 years old.**
- **Vaccination is the best way to prevent mumps infections.** In March, 57% of cases were not up-to-date on their mumps vaccinations or had an unknown vaccination status.
- In recent months, individuals 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 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 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. 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>.

### 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

Map 4 shows the cumulative mumps incidence rates per 100,000 population, January through March 2018 (green shading). Counties that have had a recent case in March 2018 are highlighted in pink.

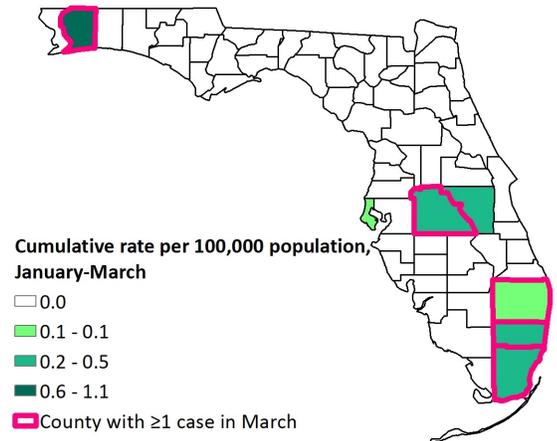
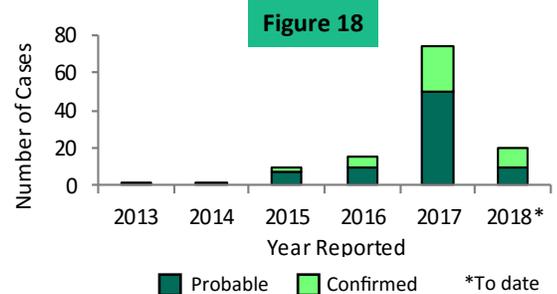


Figure 18 shows the number of confirmed and probable cases of mumps reported into Merlin, 2013 through March 2018.



## Mumps Cases by Month Reported

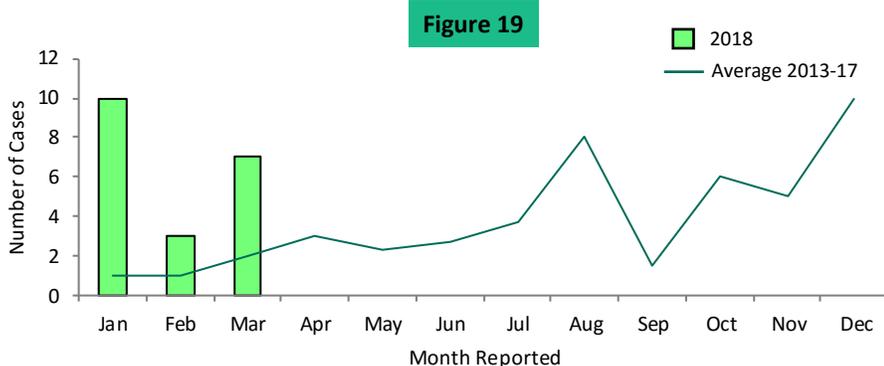


Figure 19 shows the number of confirmed and probable cases of mumps reported into Merlin, January through March 2018 and the previous five-year average.

In March, the number of reported mumps cases increased from that in February, and remained above the previous five-year average. Cases have been elevated since the summer months of 2017, particularly in August and December when several cases associated with outbreaks and household clusters were reported.

## Mumps Outbreaks

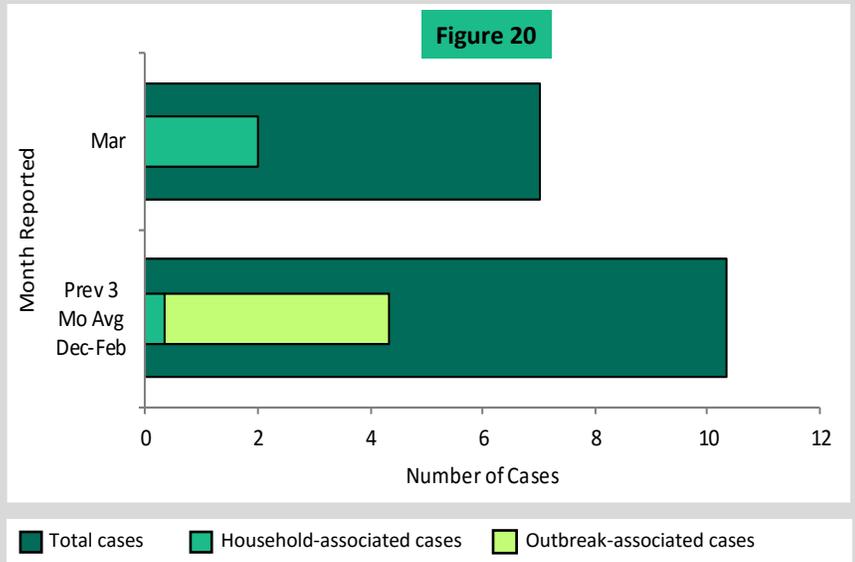
**Figure 20** shows the number of confirmed and probable cases that were associated with at least one other case and the total number of confirmed and probable cases as reported into Merlin, March 2018 and the previous three-month average. Cases associated with at least one other case are shown by type of association.

**In March, two (29%) cases were associated with transmission within a household.**

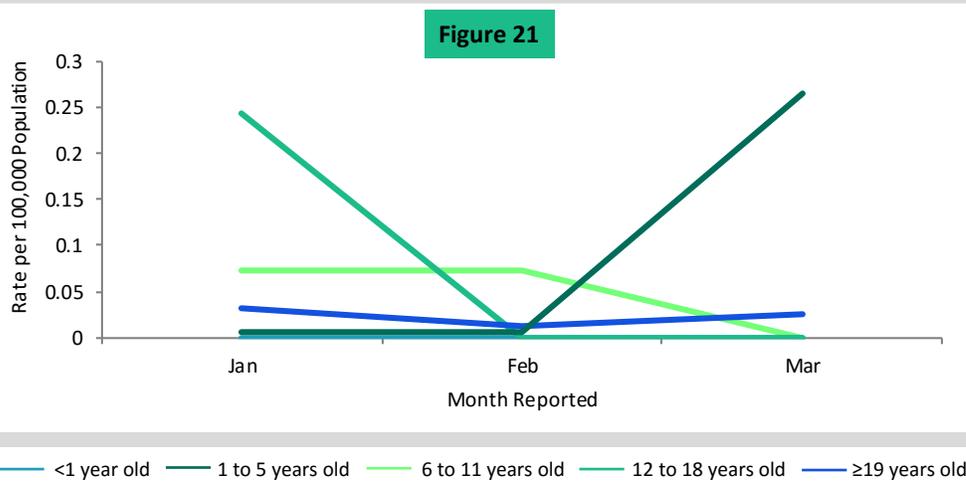
### Outbreak Summary:

**No mumps outbreaks were reported in March.** There have been no mumps outbreaks reported thus far in 2018; however, cases associated with outbreaks reported in 2017 were reported in January 2018.

See [page 11](#) for outbreak definitions.



## Mumps Age-Specific Incidence Rates



**Figure 21** shows the age-specific incidence rates of confirmed and probable cases of mumps, as reported into Merlin, January through March 2018.

**In March, the mumps incidence rate was highest among children age 1-5 years old.** Although the incidence rate was low among adults age 19 and older, 55% of cases reported in 2018 were in this age group.

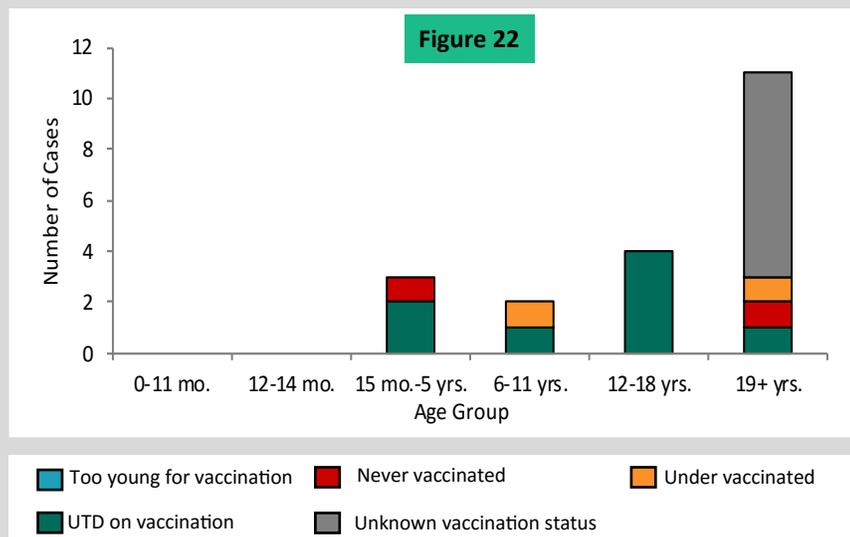
## Vaccination History for Mumps Cases

UTD = up-to-date

**Figure 22** shows the vaccination status of mumps cases by age group for confirmed and probable cases of mumps, as reported into Merlin, January through March 2018 (n=20).

**Mumps vaccinations are recommended at 12-15 months of age and 4-6 years of age. Two (18%) individuals age 19 years and older were not up-to-date on their mumps vaccinations, while the majority of individuals age 15 months-18 years old were up-to-date on their vaccinations.**

See [page 11](#) for links to CDC recommended vaccination schedules.

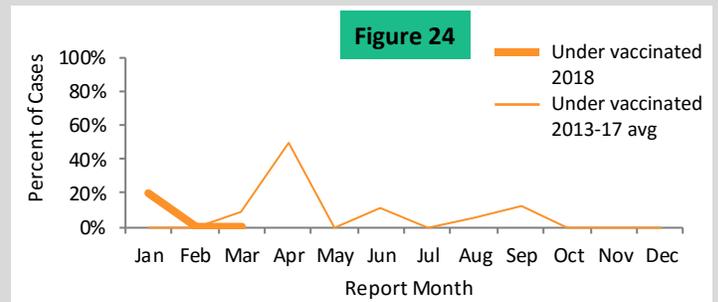
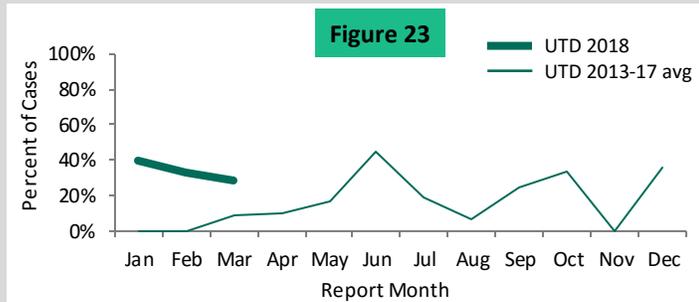


## Mumps Cases in Vaccinated Individuals

UTD = up-to-date

**Figure 23** shows the percent of confirmed and probable mumps cases who were up to date on their mumps vaccinations, as reported into Merlin, January through March 2018 and the previous five-year average. **Figure 24** 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

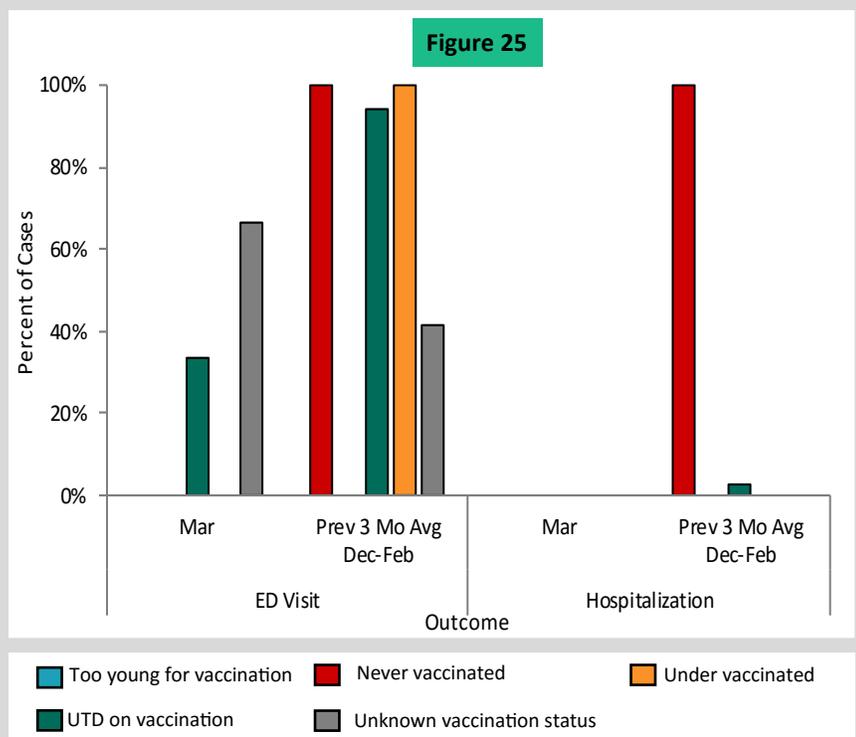
UTD = up-to-date, ED = emergency department

**Figure 25** shows the percent of confirmed and probable cases of mumps with select outcomes by vaccination status, as reported into Merlin, March 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 March 2018, three (15%) 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.**



## 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.
  - 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.
- 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](http://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](http://www.Floridahealth.gov/gsi).

## 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](http://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>.