

Narratives for Uncommon Diseases and Conditions

Section 2



Section 2: Narratives for Uncommon Diseases/Conditions

Amebic Infection

Amebic infections are caused by free-living amoebas, including *Acanthamoeba* species, *Balamuthia mandrillaris* and *Naegleria fowleri*. These free-living amoebas are ubiquitous in the environment, most commonly found in soil and freshwater, but rarely cause disease in humans.

Primary amebic meningoencephalitis (PAM) is caused by *Naegleria fowleri*. The amoeba enters through the nose and travels to the brain. Generally, exposure to the amoeba occurs when individuals swim or dive in warm fresh water or use contaminated water for sinus irrigation. PAM is a rare disease with a high mortality rate.

Granulomatous amebic encephalitis (GAE) is caused by *Balamuthia mandrillaris* and *Acanthamoeba* species. The amoeba enters through a break in the skin or through the nose and travels to the spinal cord and brain. This illness is most common in immunocompromised people, children and older adults. GAE is a rare disease with a high mortality rate.

Four amebic infection cases (three *Balamuthia mandrillaris* infections, one *Acanthamoeba* species infection) were reported in Florida in 2018. The most common symptoms reported among cases were headache (four cases) and confusion (three cases).

Disease Facts



Caused by *Acanthamoeba* species, *Balamuthia mandrillaris*, *Naegleria fowleri* free-living amoebas



Illness varies by pathogen, causing meningoencephalitis or encephalitis, disseminated disease (affecting multiple organ systems) or cutaneous disease; clinical presentations include a wide range of signs and symptoms; infections often lead to death



Transmitted via direct contact with amoeba-containing water or soil that enters the body through the nose or a break in the skin

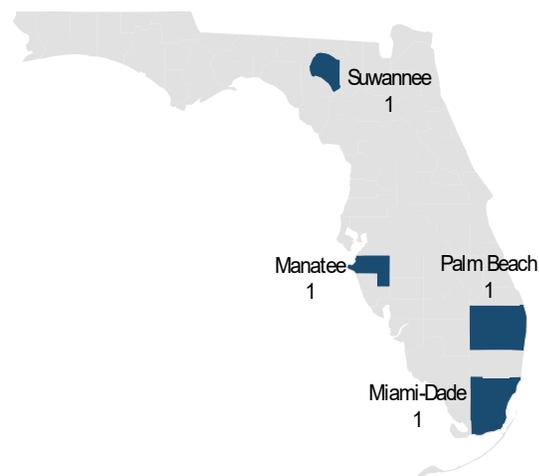


Under surveillance to monitor incidence and trends, target areas of incidence for prevention education

Amebic infection cases are rare, with typically no more than one case reported each year. Four cases were reported in 2018; all occurred in adult males and more commonly in non-Hispanics. All cases were hospitalized and resulted in death. All cases were sporadic and acquired in Florida.

Amebic infection cases were identified in residents of four Florida counties in 2018; each county had one case. No infections were known to have been acquired outside of Florida.

Summary		Case Classification		Outcome		Outbreak Status		State Where Exposed	
Number of cases in 2018	4	Confirmed	4	Interviewed	0	Sporadic	4	Florida	4
5-year trend (2014 to 2018)	---	Probable	0	Hospitalized	4	Outbreak-associated	0		
Age (in Years)		Outcome		Outbreak Status		State Where Exposed			
Mean	54	Interviewed	0	Sporadic	4	Florida	4		
Median	52	Hospitalized	4	Outbreak-associated	0				
Min-max	44 - 66	Died	4	Outbreak status unknown	0				
Gender		Outbreak Status		State Where Exposed					
Female	0	Sporadic	4	Florida	4				
Male	4	Outbreak-associated	0						
Unknown gender	0	Outbreak status unknown	0						
Race		State Where Exposed							
White	2	Florida	4						
Black	2								
Other	0								
Unknown race	0								
Ethnicity									
Non-Hispanic	3								
Hispanic	1								
Unknown ethnicity	0								



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

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Anaplasmosis

Anaplasmosis was previously known as human granulocytic ehrlichiosis (HGE), but was later renamed human granulocytic anaplasmosis (HGA) when the bacterium genus was changed from *Ehrlichia* to *Anaplasma*. Anaplasmosis is transmitted to humans by tick bites primarily from *Ixodes scapularis*, the black-legged tick, and *Ixodes pacificus*, the western black-legged tick. Co-infection with other pathogens found in these vectors is possible. Unlike ehrlichiosis, most anaplasmosis cases reported in Florida are exposed in the northeastern and midwestern U.S. Although uncommon, *Anaplasma* infections can be acquired in Florida.

Anaplasmosis incidence in Florida more than doubled in 2018 (19 cases) compared to 2017 (nine cases), driven largely by exposures in New York and Maine, which is consistent with increasing activity reported nationally. Exposure location was unknown for one case; all other cases were imported. Nationally, cases are most common in males and adults >40 years old. In Florida, males represented 63% of all cases in 2018. Only two (11%) of Florida's 19 cases were <40 years old and only three cases (16%) were <60 years old. Symptom onset dates ranged from May to October 2018, consistent with peak activity nationally. One case died; however, the primary cause of death was attributed to a chronic co-morbidity with anaplasmosis considered a contributing factor.

Case counts from this report may differ from those found in other vector-borne disease reports as different criteria are used to assemble the data.

In recent years, less than 10 anaplasmosis cases were reported each year; 19 cases were reported in 2018. Cases occurred in adults and more commonly in males. All 2018 cases were in whites and primarily non-Hispanics. All cases were sporadic.

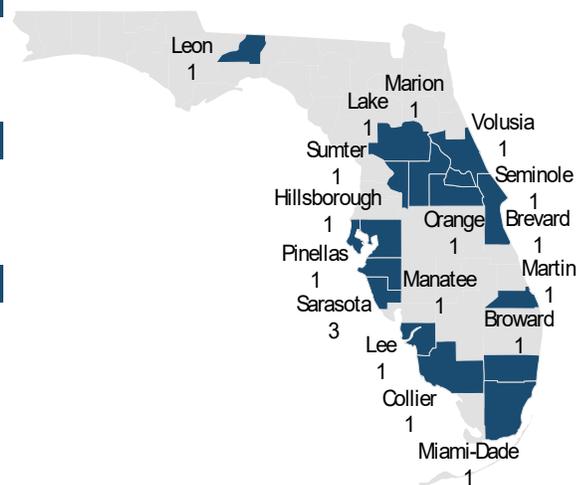
Summary		Case Classification		Outcome		Outbreak Status		Location Where Exposed	
Number of cases in 2018	19	Confirmed	19	Interviewed	15	Sporadic	19	New York	7
5-year trend (2014 to 2018)		Probable	0	Hospitalized	10	Outbreak-associated	0	Maine	4
Age (in Years)		Outcome		Died		Outbreak Status		Location Where Exposed	
Mean	65	Interviewed	15	Died	1	Sporadic	19	Massachusetts	2
Median	69	Hospitalized	10	Outbreak status unknown	0	Outbreak-associated	0	Connecticut	1
Min-max	18 - 90	Died	1	Outbreak status unknown	0	Outbreak status unknown	0	Minnesota	1
Gender		Outbreak Status		Location Where Exposed		Outbreak Status		Location Where Exposed	
Female	7	Sporadic	19	New York	7	Sporadic	19	Maine	4
Male	12	Outbreak-associated	0	Massachusetts	2	Outbreak-associated	0	Massachusetts	2
Unknown gender	0	Outbreak status unknown	0	Connecticut	1	Outbreak status unknown	0	Connecticut	1
Race		Location Where Exposed		Location Where Exposed		Location Where Exposed		Location Where Exposed	
White	19	New York	7	Minnesota	1	New York	7	Minnesota	1
Black	0	Maine	4	New Hampshire	1	Maine	4	New Hampshire	1
Other	0	Massachusetts	2	Wisconsin	1	Massachusetts	2	Wisconsin	1
Unknown race	0	Connecticut	1	Massachusetts or Maine	1	Connecticut	1	Massachusetts or Maine	1
Ethnicity		Location Where Exposed		Location Where Exposed		Location Where Exposed		Location Where Exposed	
Non-Hispanic	17	Massachusetts or Maine	1	Massachusetts or Maine	1	Massachusetts or Maine	1	Massachusetts or Maine	1
Hispanic	1	Unknown	1	Unknown	1	Unknown	1	Unknown	1
Unknown ethnicity	1	Unknown	1	Unknown	1	Unknown	1	Unknown	1

Disease Facts

- Caused by** *Anaplasma phagocytophilum* bacteria
- Illness** includes fever, headache, chills, malaise and muscle aches; more severe infections can occur in elderly and immunocompromised people
- Transmitted** via bite of infective tick
- Under surveillance** to monitor incidence over time, estimate burden of illness and target areas of high incidence for prevention education

Imported anaplasmosis cases were identified in residents of 17 Florida counties in 2018.

Sarasota County was the only one to have three cases identified in residents. All infections with known exposure location were acquired in other U.S. states.



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

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Arsenic Poisoning

Arsenic poisoning became a reportable condition in Florida in November 2008. Arsenic is a naturally occurring element that is widely distributed in the environment. It is usually found in conjunction with other elements like oxygen, chlorine and sulfur (inorganic arsenic). Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. Most arsenic-induced toxicity in humans is due to exposure to inorganic arsenic. Common sources of potential inorganic arsenic exposure are chromated copper arsenate (CCA)-treated wood, tobacco smoke, certain agricultural pesticides and some homeopathic and naturopathic preparations and folk remedies. In addition, inorganic arsenic is a naturally occurring contaminant found in water in certain areas of Florida, affecting private drinking wells (which are not regulated).

Arsenic poisoning incidence remained the same in 2018 (14 cases) compared to 2017 (14 cases). Most cases occurred in adults in their 60s and 70s. Arsenic poisoning cases occur year-round at low levels. Cumulatively over the past five years, there has been a small peak in June, though in 2018 activity peaked slightly in July with three cases. All cases reported in 2018 were sporadic. Nine cases had known exposures, including consumption of fish or shellfish (five cases), consumption of well/cistern water (one case), consumption of homeopathic medicines (one case), contact with CCA-treated wood (one case) and occupational contact (one case). For the remaining five cases, the source of exposure was unknown.

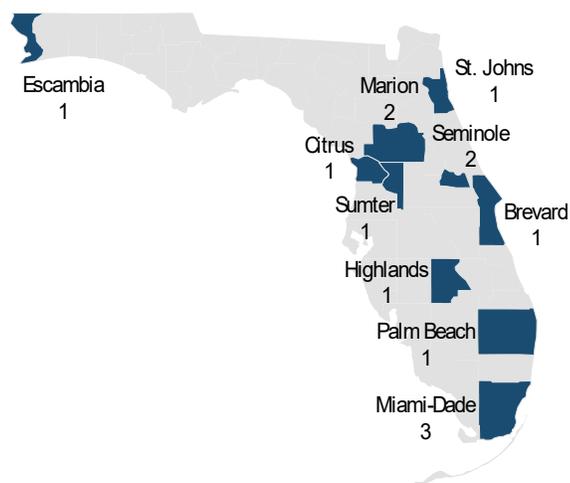
Between 2 and 21 arsenic poisoning cases have been identified each year from 2014 to 2018. Cases occurred in children and adults and more commonly in males. Most 2018 cases were in non-Hispanic whites. All cases were sporadic and most were acquired in Florida.

Summary		Case Classification	
Number of cases in 2018	14	Confirmed	14
5-year trend (2014 to 2018)		Probable	0
Age (in Years)		Outcome	
Mean	53	Interviewed	12
Median	65	Hospitalized	0
Min-max	4 - 77	Died	0
Gender		Outbreak Status	
Female	6	Sporadic	14
Male	8	Outbreak-associated	0
Unknown gender	0	Outbreak status unknown	0
Race		Location Where Exposed	
White	13	Florida	13
Black	0	Unknown	1
Other	0		
Unknown race	1		
Ethnicity			
Non-Hispanic	10		
Hispanic	2		
Unknown ethnicity	2		

Disease Facts

- Caused** by inorganic arsenic
- Illness** can include severe gastrointestinal signs and symptoms (e.g., vomiting, abdominal pain and diarrhea) which may lead rapidly to dehydration and shock, dysrhythmias (prolonged QT, T-wave changes), altered mental status, and multisystem organ failure may follow, which can ultimately result in death
- Transmitted** via ingestion of arsenic or inhalation of air containing arsenic
- Under surveillance** to identify sources of arsenic exposure that are of public health concern (e.g., water source, workplace exposure, homeopathic medicines), prevent further exposure

Arsenic poisoning cases occurred in residents of 10 Florida counties in 2018. Only three counties identified more than one case (Miami-Dade [three cases], Marion [two cases] and Seminole [two cases]).



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

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Babesiosis

Babesiosis became nationally notifiable in 2011 and became reportable in Florida in October 2016. Most U.S. reported cases have been *B. microti* infections acquired in parts of the northeastern and north central regions. Sporadic U.S. cases may be caused by other *Babesia* species, such as *B. duncani* and related organisms in several western states, as well as *B. divergens*-like variant M01 in various states. Zoonotic *Babesia* species have also been reported in Europe, Africa, Japan, Taiwan, India and Mexico. Some infections may be asymptomatic and can lead to transfusion-associated cases in both endemic and non-endemic areas like Florida.

B. microti circulates between *Ixodes scapularis* (blacklegged tick) and animal reservoir hosts, primarily small mammals like *Peromyscus leucopus* (white-footed mouse). In regions where this enzootic cycle is shared by the etiologic agents of Lyme disease (*Borrelia burgdorferi*) and human anaplasmosis (*Anaplasma phagocytophilum*), co-infections can occur. Babesiosis appears to have increasing case numbers and an expanding endemic range in some areas, though U.S. incidence and the geographic extent of *B. microti* and novel *Babesia* agents are unknown. Those at greater risk for severe infection include immunosuppressed, asplenic and older persons as well as those with serious chronic illnesses.

Florida's incidence doubled in 2018 compared to 2017 due to increased activity nationally and better provider awareness of updated reporting requirements. In 2018, most cases (84%) were >60 years old. The single death was in a case >60 years old with multiple risk factors for severe infection including immunosuppression, asplenia and other co-morbidities. Preliminary genetic sequencing data suggest a *Babesia* species associated with deer may have been involved. Two cases were

asymptomatic blood donors (donated blood in 2017, case reported in 2018). Neither case donation resulted in recipient infection. Three cases were co-infected with *B. burgdorferi*.

No cases were reported in 2016. Nineteen cases were identified in 2018, twice that reported in 2017 (nine). Cases occurred in white adults and more commonly in males and non-Hispanics. Eight cases were hospitalized; one death occurred.

Disease Facts



Caused by *Babesia* parasites



Illness includes hemolytic anemia and influenza-like symptoms (e.g., fever, chills, body aches, weakness, fatigue); complications can include thrombocytopenia, disseminated intravascular coagulation, hemodynamic instability, acute respiratory distress, myocardial infarction, renal failure, hepatic dysfunction, altered mental status, death; can be asymptomatic



Transmitted via bite of infective tick; less commonly by blood transfusion and rare congenital infections



Under surveillance to monitor incidence over time, estimate burden of illness and target areas of high incidence for prevention education

Summary

Number of cases in 2018	19
3-year trend (2016 to 2018)	

Age (in Years)

Mean	69
Median	68
Min-max	46 - 91

Gender

Female	6
Male	13
Unknown gender	0

Race

White	19
Black	0
Other	0
Unknown race	0

Ethnicity

Non-Hispanic	17
Hispanic	1
Unknown ethnicity	1

Case Classification

Confirmed	17
Probable	2

Outcome

Interviewed	17
Hospitalized	8
Died	1

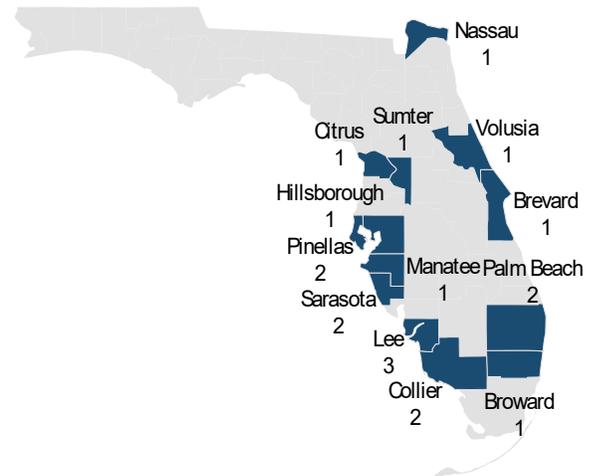
Outbreak Status

Sporadic	19
Outbreak-associated	0
Outbreak status unknown	0

Location Where Exposed

New York	5
Massachusetts	4
Rhode Island	3
Connecticut	2
Maine	1
Pennsylvania	1
Maine or Rhode Island	1
Connecticut, Maine, or Pennsylvania	1
Unknown	1

Babesiosis cases occurred in residents of 13 Florida counties in 2018. Each of the 13 counties had one or two cases identified, except for Lee County with three cases. One infection had an unknown exposure location; the remaining 18 infections were all acquired in other U.S. states.



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

Section 2: Narratives for Uncommon Diseases/Conditions

Brucellosis

Human infections in Florida are most commonly associated with exposure to feral swine infected with *B. suis*. Dogs and domestic livestock may also be infected with *B. suis*. Although dogs and other animals, such as dolphins, may be infected with their own *Brucella* species, human illness is not commonly associated with those species. Outside the U.S., unpasteurized milk products from goats, sheep and cattle infected with *B. melitensis* and *B. abortus* are important sources of human infections. *Brucella* cattle vaccine RB51 infections have also been associated with consumption of raw milk. Laboratorians can be at risk for exposure to *Brucella* species while working with human or animal cultures.

Eleven (85%) of the 13 brucellosis cases in 2018 had reference laboratory-confirmed *Brucella*-positive culture (nine), PCR (one) or serology (one) results. The remaining two cases had positive serology results at commercial laboratories but neither required confirmatory testing at a reference laboratory. Most *Brucella* infections were caused by *B. suis* (seven cases), one case was caused by *B. abortus* and five cases by undetermined species. Of the 12 cases with known exposures, the most commonly reported were hunting feral swine or butchering pigs (seven cases), consuming raw milk products (four), living on a farm (three), hunting without specifying feral swine contact (one) and eating undercooked pork (one). Chronic infection is not uncommon in untreated brucellosis cases. The *B. abortus* case was >80 years old and reported drinking raw milk decades ago when the disease was still common in U.S. cattle, but had not consumed these products in recent decades.

While cases in non-Florida residents are not included in counts in this report, two brucellosis cases with reference laboratory-confirmed positive cultures were identified in non-Florida residents while traveling in Florida in 2018 (one *B. suis* infection in an Alabama resident [exposure: unknown], one *B. melitensis* infection in a Bolivia resident [suspected exposure: drinking or eating raw milk products]). The 11 *Brucella* culture isolates from both Florida and non-Florida residents resulted in at least 65

The number of brucellosis cases reported varies by year with no clear trend. Cases occurred in adults and more commonly in males, whites and non-Hispanics. Nine cases were hospitalized; no deaths occurred.

Summary

Number of cases in 2018 13
5-year trend (2014 to 2018) 

Age (in Years)

Mean	60
Median	60
Min-max	25 - 91

Gender

Gender	Number
Female	3
Male	10
Unknown gender	0

Race

Race	Number
White	10
Black	3
Other	0
Unknown race	0

Ethnicity

Ethnicity	Number
Non-Hispanic	9
Hispanic	4
Unknown ethnicity	0

Case Classification

Case Classification	Number
Confirmed	9
Probable	4

Outcome

Outcome	Number
Interviewed	10
Hospitalized	9
Died	0

Outbreak Status

Outbreak Status	Number
Sporadic	13
Outbreak-associated	0
Outbreak status unknow	0

Location Where Exposed

Location Where Exposed	Number
Florida	10
Mexico	1
Florida, Cuba or Mexico	1
Unknown	1

Disease Facts



Caused by *Brucella* bacteria



Illness includes fever, sweats, headaches, back pain, weight loss and weakness; long-lasting or chronic symptoms can include recurrent fevers, joint pain and fatigue; relapses can occur



Transmitted primarily via ingestion of raw milk products or less commonly undercooked meat, inhalation of bacteria or skin/mucous membrane contact with infected animals

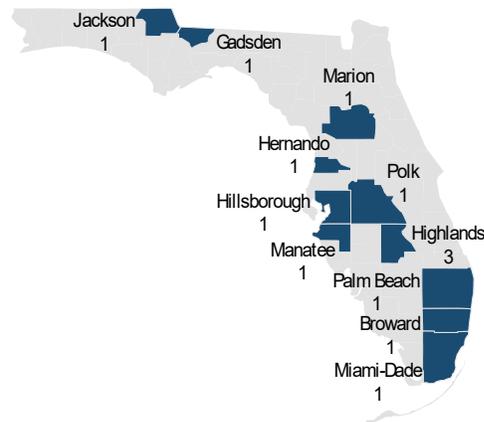


Under surveillance to target areas of high risk for prevention education, identify potentially contaminated products (e.g., food, transfusion, organ transplant products), provide prophylaxis to prevent laboratory exposure-related infections, identify and respond to a bioterrorism incident

potential exposures in laboratory or surgical settings, including 12 laboratorians in other states. Ten of those exposures were caused by non-Florida resident isolates.

Brucellosis cases occurred in residents of 11 Florida counties in 2018.

Highlands County was the only one to have three cases identified in residents. Most infections were acquired in Florida; contact with feral swine was the most commonly reported exposure risk.



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

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Chikungunya Fever

Chikungunya virus is most often spread to people in endemic areas by *Aedes aegypti* and *Aedes albopictus* mosquitoes (the same mosquitoes that transmit dengue and Zika viruses). The first autochthonous transmission of chikungunya virus in the Americas was reported on the island of St. Martin in December 2013. Since then, local transmission has been identified in countries throughout the Caribbean and the Americas. In 2014, 442 cases were identified in Florida residents. Florida was the only continental U.S. state to report local cases of chikungunya fever, with 12 cases reported. No locally acquired cases have been identified since 2014.

Disease Facts

-  **Caused** by chikungunya virus
-  **Illness** is acute febrile with joint and muscle pain, headache, joint swelling and rash; joint pain can persist for months to years and relapse can occur
-  **Transmitted** via bite of infective mosquito, rarely by blood transfusion or organ transplant
-  **Under surveillance** to identify individual cases and implement control measures to prevent endemicity, monitor incidence over time, estimate burden of illness

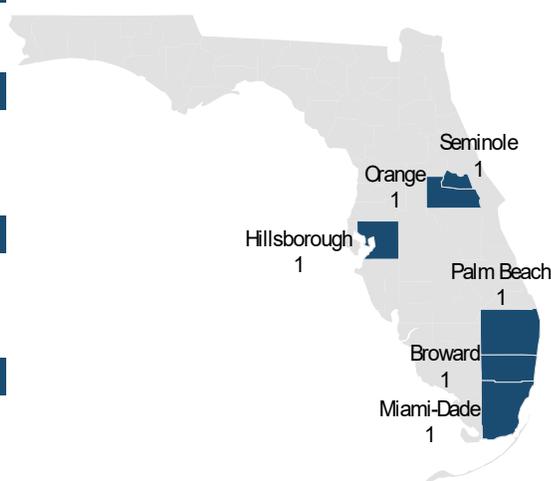
Extensive spread in Central and South America and the Caribbean in 2014 resulted in immunity for many people in those areas. Infection with chikungunya virus is believed to lead to lifetime immunity, which is considered to be the primary reason for the substantial decrease in incidence in endemic countries and subsequent decreased risk for introduction in non-endemic areas such as Florida. Overall incidence in Florida decreased dramatically in 2015 (121 cases) and 2016 (10 cases), but has remained relatively stable since (2017: four cases; 2018: six cases).

Case counts from this report may differ from those found in other vector-borne disease reports as different criteria are used to assemble the data. One case reported in 2018 was initially identified in 2017.

Over 400 chikungunya fever cases were identified in 2014; activity has decreased dramatically since. Six cases occurred in 2018 in adults who were infected in India (three cases), Brazil (two cases) and Kenya (one case). Half of the cases were confirmed.

Imported chikungunya cases occurred in residents of six Florida counties in 2018. Each county had one case identified. All infections were acquired outside the U.S.

Summary		Case Classification		Number	
Number of cases in 2018	6	Confirmed	3		
5-year trend (2014 to 2018)		Probable	3		
Age (in Years)		Outcome		Number	
Mean	44	Interviewed	5		
Median	39	Hospitalized	1		
Min-max	26 - 80	Died	0		
Gender		Outbreak Status		Number	
Female	3	Sporadic	6		
Male	3	Outbreak-associated	0		
Unknown gender	0	Outbreak status unknown	0		
Race		Country Where Exposed		Number	
White	2	India	3		
Black	0	Brazil	2		
Other	3	Kenya	1		
Unknown race	1				
Ethnicity					
Non-Hispanic	4				
Hispanic	1				
Unknown ethnicity	1				



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

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Hansen's Disease (Leprosy)

With early diagnosis and treatment, Hansen's disease can be cured. However, if left untreated, the nerve damage can be permanent. Leprosy was once feared as a highly contagious and devastating disease. However, it is now recognized that the disease is not spread through casual contact, and most people (about 95%) are resistant to infection. For those who do become infected, effective treatment is available. Historically, the disease was not thought to be endemic in Florida. More recently in Florida and other parts of the southern U.S., infections have been identified in both people and armadillos believed to have been exposed in the region.

Due to the long incubation period for Hansen's disease and a mobile population, location of exposure is often difficult to identify. However, five cases reported living in Florida for at least 20 years or all of their lives and were reported as infections acquired in Florida. Of these five cases, two reported a history of living in other states and three reported only living in Florida during their lifetimes. Only two cases reported direct contact with armadillos, including one case who reported eating armadillo meat in Argentina. The median age of cases was 58 years old; all but four cases (78%) were ≥ 50 years old. Thirteen cases (72%) were diagnosed within one year of symptom onset, two cases (11%) within two years, two cases (11%) within three years and one case (6%) more than five years after symptom onset.

The number of Hansen's disease cases ranges from 10 to 30 cases each year; 18 cases were reported in 2018. Cases occurred in adults and more commonly in females. Most cases were in non-Hispanic whites. No cases were known to be outbreak-associated; no cases were hospitalized or died.

Summary

Number of cases in 2018	18
5-year trend (2014 to 2018)	

Age (in Years)

Mean	60
Median	58
Min-max	40 - 82

Gender

Female	10
Male	8
Unknown gender	0

Race

White	17
Black	0
Other	1
Unknown race	0

Ethnicity

Non-Hispanic	15
Hispanic	3
Unknown ethnicity	0

Case Classification

Confirmed	18
Probable	0

Outcome

Interviewed	16
Hospitalized	0
Died	0

Outbreak Status

Sporadic	16
Outbreak-associated	0
Outbreak status unknown	2

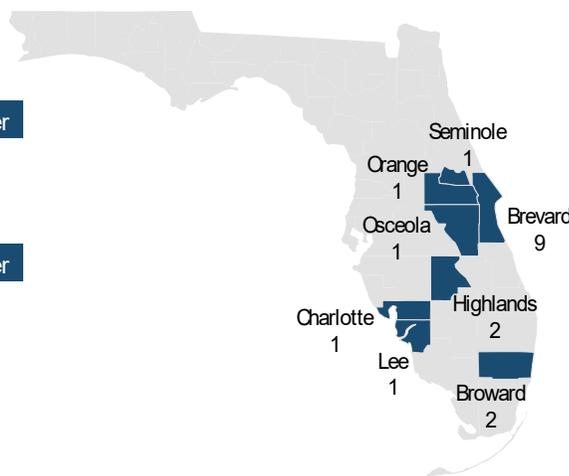
Location Where Exposed

Unknown	11
Florida	5
Colombia	1
New York	1

Disease Facts

- Caused by** *Mycobacterium leprae* bacteria
- Illness** mainly affects the skin (e.g., discolored patches of skin, nodules under the skin, flaky or dry skin, loss of hair in eyebrows), nerves (e.g., numbness in affected areas, vision impairment) and mucous membranes (e.g., stuffy nose, nosebleeds)
- Transmission** thought to be person to person via respiratory droplets following extended close contact with an infected person (still not clearly defined, but it is hard to spread)
- Under surveillance** to facilitate early diagnosis and appropriate treatment by an expert to minimize permanent nerve damage and prevent further transmission

Infected people primarily resided in counties in the central and southern part of the state, with infections attributed to exposure in Florida located in the central part of the state. It is unclear if this distribution is due to enhanced regional training and outreach efforts, population demographics or other factors.



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Hepatitis D

The hepatitis D virus, also known as hepatitis delta, is an incomplete virus and cannot replicate in the absence of the hepatitis B virus. Infection with hepatitis D can only occur in people experiencing hepatitis B infection. Hepatitis D can be acquired at the same time as hepatitis B (co-infection) or be acquired by people already living with chronic hepatitis B (superinfection). Hepatitis D co-infection is usually indistinguishable from hepatitis B alone, but a superinfection can convert an asymptomatic or otherwise mild chronic hepatitis B infection into a more severe infection. Similarly to hepatitis B, hepatitis D can occur as an acute infection or can persist as a chronic infection. Although there is no vaccine for hepatitis D, the hepatitis B vaccine can help protect against hepatitis D infection.

Disease Facts

-  **Caused** by hepatitis D virus (HDV) in the presence of hepatitis B virus
-  **Illness** includes inflammation of the liver, fever, malaise, loss of appetite, nausea, vomiting, abdominal discomfort and jaundice (can be asymptomatic)
-  **Transmitted** via blood exposure, anal or vaginal sex, percutaneous exposure (e.g., tattooing, needle sticks)
-  **Under surveillance** to prevent HDV transmission, identify and prevent outbreaks, improve allocation of resources for treatment services, assist in evaluating the impact of public health interventions, monitor effectiveness of hepatitis B immunization programs

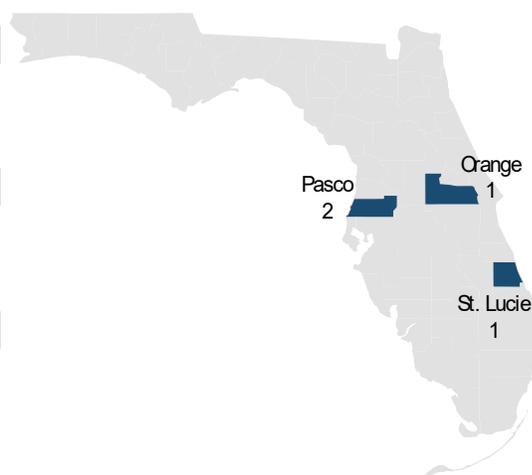
Hepatitis D is uncommon in the U.S., and national case counts may be an underestimation as not all states and territories report hepatitis D infections to the Centers for Disease Control and Prevention.

The number of hepatitis D cases reported each year has increased slightly, but remained low in 2018 with only four cases reported. Cases occurred in adults and more commonly in males. All 2018 cases were in non-Hispanic whites. All cases were sporadic. Most cases were hospitalized; no deaths occurred.

Summary	
Number of cases in 2018	4
5-year trend (2014 to 2018)	
Age (in Years)	
Mean	56
Median	59
Min-max	40 - 66
Gender	
Female	1
Male	3
Unknown gender	0
Race	
White	4
Black	0
Other	0
Unknown race	0
Ethnicity	
Non-Hispanic	4
Hispanic	0
Unknown ethnicity	0

Case Classification	Number
Confirmed	4
Probable	0
Outcome	
Interviewed	2
Hospitalized	3
Died	0
Outbreak Status	
Sporadic	4
Outbreak-associated	0
Outbreak status unknown	0
Location Where Exposed	
Florida	3
Unknown	1

Hepatitis D cases occurred in residents of three Florida counties in 2018. Pasco County had two cases; the other two counties had one case each. No infections were known to be acquired outside of Florida.



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Hepatitis E

Hepatitis E is usually self-limiting, but some cases may develop into acute liver failure, particularly among pregnant woman and persons with preexisting liver disease. HEV may also cause chronic infection, primarily in immunocompromised persons. Although rare in developed countries, individual cases and outbreaks have been linked to exposure to pigs, consumption of undercooked pork, wild game, or shellfish; and blood transfusions. Most locally acquired infections report no specific risk factors. Surveillance for hepatitis E worldwide is important because it is a significant cause of morbidity and mortality with an estimated 20 million HEV infections and tens of thousands of deaths each year. Pregnant women with hepatitis E, particularly those in the second or third trimester, are at an increased risk of acute liver failure, fetal loss and death.

In 2018, five (71%) cases reported travel outside the U.S. during their exposure period. No common risk factors for infection were identified among the 2018 cases.

Less than 10 hepatitis E cases are reported each year; seven cases were reported in 2018. All cases occurred in adults and most commonly in females. Most cases were in whites and non-Hispanics. All cases were sporadic. All 2018 cases were hospitalized; no deaths occurred.

Summary

Number of cases in 2018 7
5-year trend (2014 to 2018) 

Age (in Years)

Mean 51
Median 57
Min-max 22 - 67

Gender

Female 5
Male 2
Unknown gender 0

Race

White 4
Black 0
Other 2
Unknown race 1

Ethnicity

Non-Hispanic 4
Hispanic 2
Unknown ethnicity 1

Case Classification

Confirmed 7
Probable 0

Outcome

Interviewed 6
Hospitalized 7
Died 0

Outbreak Status

Sporadic 5
Outbreak-associated 0
Outbreak status unknown 2

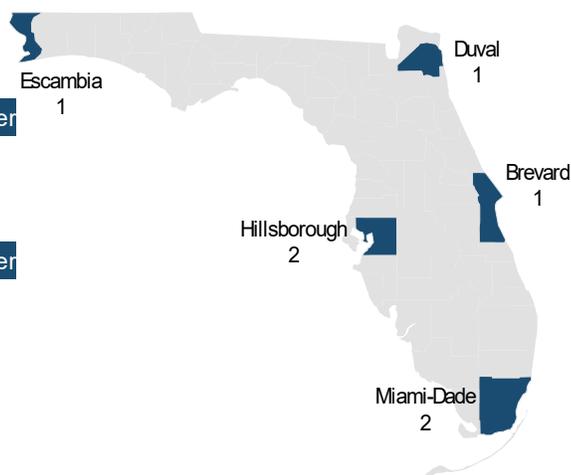
Location Where Exposed

Costa Rica 1
Florida 1
Portugal 1
Florida or India 1
Florida or Indiana 1
Florida or Italy 1
Florida, Korea or Vietnam 1

Disease Facts

-  **Caused** by hepatitis E virus (HEV)
-  **Illness** includes inflammation of the liver, fever, malaise, loss of appetite, nausea, vomiting, abdominal discomfort and jaundice (can be asymptomatic)
-  **Transmitted** via fecal-oral route, including foodborne and waterborne
-  **Under surveillance** to monitor incidence and trends

Hepatitis E cases occurred in residents of five Florida counties in 2018. Hillsborough and Miami-Dade counties each had two cases; the remaining three counties had one case each. A definitive exposure location was not able to be determined for half of the infections.



Section 2: Narratives for Uncommon Diseases/Conditions

Leptospirosis

Leptospirosis is caused by spirochete bacteria in the genus *Leptospira*. The bacteria can be present in the urine of infected animals such as rodents, dogs, livestock, pigs, horses and wildlife. Most human exposures are thought to occur through ingestion of urine-contaminated water or food as well as by direct contact of urine-contaminated water with mucous membranes or wounds.

Activities that can result in swallowing of untreated fresh water, or that can lead to skin abrasions with water or soil contamination to wounds, can significantly increase risk of exposure. Adventure races have resulted in cases of leptospirosis in Florida in the past.

Of the four leptospirosis cases imported from other countries in 2018, two were attributed to an outbreak linked to freshwater exposure in northern Israel while the other two were associated with tubing or swimming in fresh water in Jamaica or Panama. Three leptospirosis cases were acquired in Florida in 2018 (two cases reported exposures in north Florida, one case spent time in both north and south Florida). Of these three cases, one case reported occupational exposure to a pond while another case frequently swam in a creek near their home and also reported animal contact through hunting and cleaning a rodent cage. The last case was experiencing homelessness; a detailed exposure history could not be obtained.

Less than 10 leptospirosis cases are reported each year. Cases occurred in adolescents and adults and more commonly in males. Cases were primarily in whites and more commonly in non-Hispanics. Most cases were sporadic. Most cases were hospitalized; no deaths occurred.

Leptospirosis cases occurred in residents of five Florida counties in 2018. Broward and Hillsborough counties each had two cases; the remaining three counties had one case each. More infections were acquired in other countries.

Disease Facts



Caused by *Leptospira* bacteria



Illness includes abrupt onset of fever, headache, muscle aches, vomiting or diarrhea; severe presentations may include kidney failure, liver failure, pulmonary hemorrhage or meningitis; may be asymptomatic



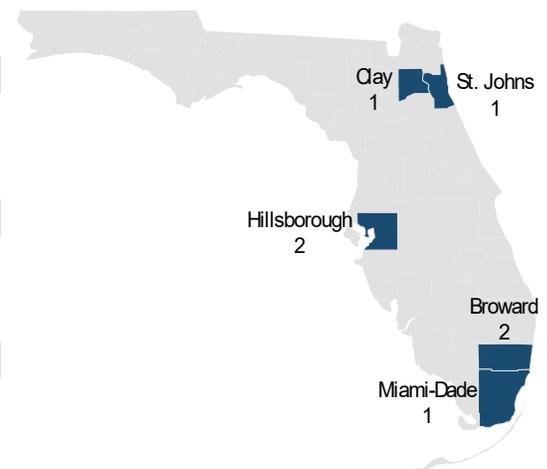
Transmitted indirectly through ingestion or contact with contaminated water, soil or food; less frequently, animal to person by direct contact with urine or other body fluids from an infected animal; rarely by animal bites and breastfeeding



Under surveillance to monitor incidence over time, estimate burden of illness, identify activities and groups at increased risk for exposure to target prevention education

Summary	
Number of cases in 2018	7
5-year trend (2014 to 2018)	
Age (in Years)	
Mean	31
Median	30
Min-max	13 - 56
Gender	
Female	2
Male	5
Unknown gender	0
Race	
White	6
Black	0
Other	0
Unknown race	1
Ethnicity	
Non-Hispanic	4
Hispanic	2
Unknown ethnicity	1

Case Classification	Number
Confirmed	3
Probable	4
Outcome	
Interviewed	5
Hospitalized	4
Died	0
Outbreak Status	
Sporadic	5
Outbreak-associated	2
Outbreak status unknown	0
Location Where Exposed	
Florida	3
Israel	2
Jamaica	1
Panama	1



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

Section 2: Narratives for Uncommon Diseases/Conditions

Measles (Rubeola)

Measles, also known as rubeola, is a vaccine-preventable respiratory disease. Before a routine vaccination program was introduced in the U.S., measles was a common illness in infants, children and young adults. As most people have now been vaccinated in the U.S., the disease was declared eliminated in the U.S. in 2000. Measles is still common in many parts of the world where vaccination rates are low, including countries in Africa, Asia, Europe and South America. In recent years, measles has been imported into Florida from frequently visited countries, including Brazil, Venezuela and Ukraine, where large outbreaks have been reported. Most imported measles cases occur among unvaccinated U.S. residents who were infected while traveling abroad, became symptomatic after returning to Florida, and in some cases infected others in their communities, causing small localized outbreaks.

Disease Facts

-  **Caused** by measles virus
-  **Illness** includes high fever, cough, runny nose and red watery eyes; possibly followed by tiny white spots inside the mouth and a red generalized maculopapular rash
-  **Transmitted** through aerosolized droplets of saliva or mucus from the mouth, nose or throat of an infected person, usually when they cough, sneeze or talk
-  **Under surveillance** to take immediate public health actions in response to every suspected measles case to prevent further transmission, monitor effectiveness of immunization programs and vaccines

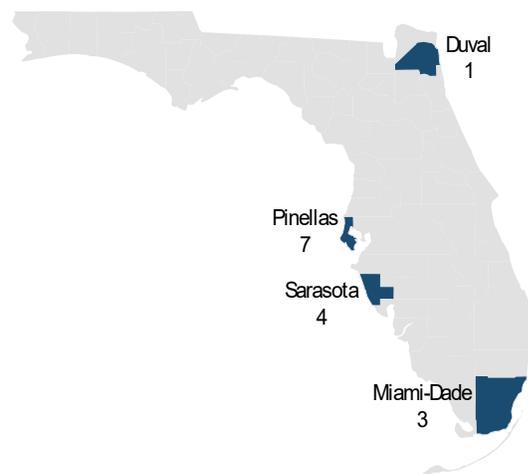
Florida reported 15 cases of measles in 2018, all of which were in unvaccinated persons. The 11 outbreak-associated cases were a result of two known outbreaks. The first outbreak occurred in a household of four family members with an unidentified exposure to the virus. The second outbreak occurred after an infected child returned from the Ukraine and infected at least four other persons in their close-knit community. These cases were linked through laboratory testing to another household cluster of two cases in the same county. For more information on this outbreak, see Section 3: Notable Outbreaks and Case Investigations.

Five or less measles cases were reported each year from 2014 to 2017; measles incidence increased notably in 2018 with 15 cases reported.

Cases occurred in people <30 years old and more commonly in females. Most cases were in whites and non-Hispanics. Most cases were outbreak-associated. Four cases were hospitalized; no deaths occurred.

Measles cases occurred in residents of four Florida counties in 2018. Almost half of the cases were identified in Pinellas County. Most infections were acquired in Florida.

Summary		Case Classification		Outcome		Outbreak Status		Location Where Exposed	
Number of cases in 2018	15	Confirmed	15	Interviewed	14	Sporadic	4	Florida	11
5-year trend (2014 to 2018)		Probable	0	Hospitalized	4	Outbreak-associated	11	Afghanistan	1
Age (in Years)		Gender		Outbreak Status		Location Where Exposed			
Mean	6	Female	9	Outbreak status unknown	0	Florida	11	Brazil	1
Median	4	Male	6			Afghanistan	1	Ukraine	1
Min-max	1 - 27	Unknown gender	0			Ukraine	1	Venezuela	1
Race		Ethnicity							
White	14	Non-Hispanic	13						
Black	0	Hispanic	2						
Other	1	Unknown ethnicity	0						
Unknown race	0								



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

Section 2: Narratives for Uncommon Diseases/Conditions

Meningococcal Disease

Five *Neisseria meningitidis* serogroups cause almost all invasive disease (A, B, C, Y and W). Vaccines are available to provide protection against these serogroups. In 2016, the incidence of meningococcal disease reached a historic low in Florida. The number of cases reported each year since has remained relatively stable.

The most commonly identified serogroup causing meningococcal disease can vary year to year. In 2018, serogroup B was the most frequently identified serogroup in Florida, which aligns with national trends.

Disease Facts

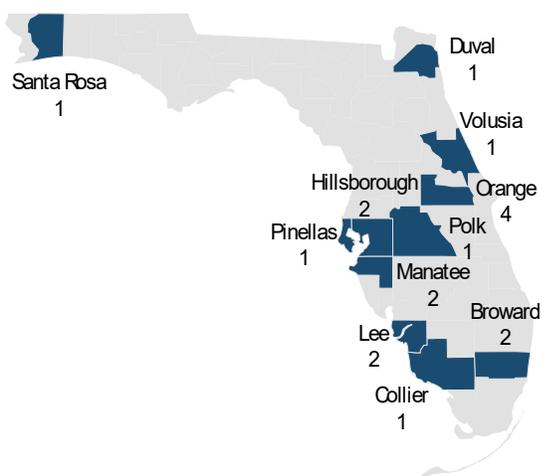
-  **Caused by** *Neisseria meningitidis* bacteria
-  **Illness** is most commonly neurological (meningitis) or bloodstream infections (septicemia)
-  **Transmitted** person to person by direct contact with respiratory droplets from nose or throat of colonized or infected person
-  **Under surveillance** to take immediate public health actions in response to every suspected meningococcal disease case to prevent secondary transmission, monitor effectiveness of immunization programs and vaccines

The number of meningococcal disease cases reported decreased notably in 2015. Less than 20 cases were reported each year since. Cases were mostly in females, whites and non-Hispanics. All cases were sporadic. Most cases were hospitalized; one death occurred.

Meningococcal disease cases occurred in residents of 11 Florida counties in 2018. Each of the 11 counties had one or two cases identified, except for Orange County which had four cases. Most infections were acquired in Florida.

Summary	
Number of cases in 2018	18
5-year trend (2014 to 2018)	
Age (in Years)	
Mean	38
Median	40
Min-max	0 - 82
Gender	
Female	11
Male	7
Unknown gender	0
Race	
White	14
Black	2
Other	2
Unknown race	0
Ethnicity	
Non-Hispanic	16
Hispanic	2
Unknown ethnicity	0

Case Classification	
Confirmed	18
Probable	0
Outcome	
Interviewed	18
Hospitalized	17
Died	1
Outbreak Status	
Sporadic	18
Outbreak-associated	0
Outbreak status unknown	0
Location Where Exposed	
Florida	16
Florida or Colombia	1
Florida or Colorado	1



Section 2: Narratives for Uncommon Diseases/Conditions

Ricin Toxin Poisoning

Ricin is a poison found naturally in castor beans. If castor beans are chewed and swallowed, the released ricin can cause injury. Ricin can be extracted from the waste material left over from processing castor beans. It takes a deliberate act to extract and purify ricin from castor beans and use it to poison people. Intentional ingestion of castor beans to attempt self-harm has been observed. Unintentional exposure to ricin is unlikely, except through the ingestion of castor beans.

The major symptoms of ricin poisoning depend on the route of exposure and the dose received; many organs may be affected in severe cases. Onset of ricin poisoning symptoms occurs within hours of exposure. Ricin is less toxic by oral ingestion than by other routes; it is the most common exposure route for intentional and unintentional exposures reported in Florida. Symptoms associated with ingestion include nausea, vomiting, abdominal pain, fever and diarrhea that may become bloody. Severe intoxications through ingestion may involve vascular collapse, shock and death.

Four ricin toxin poisoning cases were reported in Florida in 2018. Three cases were the result of persons intentionally consuming crushed castor beans in a tea for supposed health benefits. One case consumed castor beans from a garden prior to knowing they were toxic.

The number of ricin toxin poisoning cases reported varies by year with no clear trend. Cases occurred in adults and most commonly in blacks and non-Hispanics. Most cases were outbreak-associated. Two cases were hospitalized; no deaths occurred.

Ricin toxin poisoning cases occurred in residents of Palm Beach county in 2018. All cases were exposed in Florida.

Disease Facts

-  **Caused by** ricin
-  **Illness** includes nausea, vomiting, abdominal pain, fever and diarrhea that may become bloody; severe presentations may include vascular collapse, shock and death
-  **Transmitted** via inhalation, injection or ingestion of ricin, direct skin or eye contact with ricin
-  **Under surveillance** to identify and respond to a self-harm, criminal or bioterrorism incident (as exposures are intentional)

Summary

Number of cases in 2018	4
5-year trend (2014 to 2018)	

Age (in Years)

Mean	35
Median	35
Min-max	21 - 49

Gender

Gender	Number
Female	2
Male	2
Unknown gender	0

Race

Race	Number
White	1
Black	3
Other	0
Unknown race	0

Ethnicity

Ethnicity	Number
Non-Hispanic	4
Hispanic	0
Unknown ethnicity	0

Case Classification

Case Classification	Number
Confirmed	2
Probable	2

Outcome

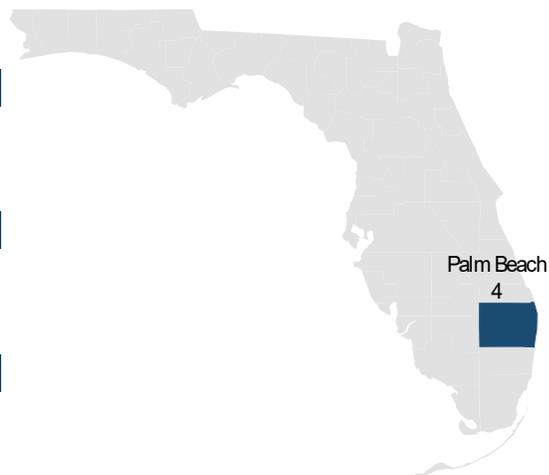
Outcome	Number
Interviewed	4
Hospitalized	2
Died	0

Outbreak Status

Outbreak Status	Number
Sporadic	1
Outbreak-associated	3
Outbreak status unknown	0

State Where Exposed

State Where Exposed	Number
Florida	4



Section 2: Narratives for Uncommon Diseases/Conditions

Saxitoxin Poisoning (Paralytic Shellfish Poisoning)

Saxitoxin poisoning, more commonly known as paralytic shellfish poisoning (PSP), is caused by an extremely potent neurotoxin called saxitoxin. Saxitoxin is typically found in bivalves (e.g., mussels, clams, oysters, scallops) but can also be found in gastropods (e.g., conch, snails, whelk) and puffer fish. PSP cases have a high mortality rate in situations where medical treatment is not available. Medical treatment typically consists of respiratory support and fluid therapy. For people surviving 24 hours, prognosis is considered good with no lasting side effects anticipated.

The first case of PSP in the U.S. was reported in 2002.

The case was associated with consumption of puffer fish harvested from Florida's east coast, where saxitoxin has since been detected in the southern, checkered and bandtail puffer fish. As a result, harvesting of all puffer fish (genus *Spherooides*) in Volusia, Brevard, Indian River, St. Lucie and Martin counties is banned per Florida Administrative Code Rule 68B-3.007.

Four PSP cases were reported in Florida from 2009 to 2017, all associated with consumption of puffer fish. In 2018, three outbreaks involving four PSP cases were investigated. Three cases were associated with consumption of recreationally harvested puffer fish (checkered: two cases; unknown species: one case) and one with consumption of clams from a restaurant. The most common symptoms reported among cases were numbness and tingling of the face (four cases), difficulty breathing (three cases), vomiting (three cases) and difficulty speaking (two cases). Two cases were hospitalized for their symptoms with one case requiring the use of a respirator. All cases recovered with no reported lasting side effects.

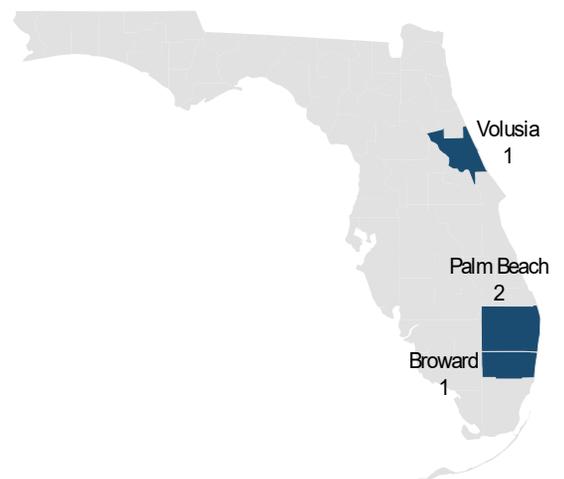
The number of PSP cases reported varies by year with no clear trend. In 2018, cases were in non-Hispanic adults and more commonly in whites. Two cases were hospitalized; no deaths occurred.

Summary	
Number of cases in 2018	4
5-year trend (2014 to 2018)	
Age (in Years)	
Mean	39
Median	39
Min-max	26 - 50
Gender	
Female	2
Male	2
Unknown gender	0
Race	
White	3
Black	1
Other	0
Unknown race	0
Ethnicity	
Non-Hispanic	4
Hispanic	0
Unknown ethnicity	0
Case Classification	
Confirmed	0
Probable	4
Outcome	
Interviewed	4
Hospitalized	2
Died	0
Outbreak Status	
Sporadic	2
Outbreak-associated	2
Outbreak status unknown	0
State Where Exposed	
Florida	4

Disease Facts

-  **Caused by saxitoxin**
-  **Illness** is primarily neurological (numbness or tingling of the face, arms and legs; headache, weakness, ataxia, vertigo, parasthesias, respiratory distress); some gastroenteritis (diarrhea, vomiting) may also occur; in severe presentations, muscle paralysis can lead to respiratory failure and death
-  **Transmitted** via ingestion of certain fish or molluscan shellfish containing saxitoxin in their tissues
-  **Under surveillance** to identify sources of transmission (e.g., puffer fish or shellfish collection area) and mitigate source, monitor incidence over time, estimate burden of illness

PSP cases occurred in residents of three Florida counties in 2018. Palm Beach County had two cases; the other two counties had one case each. All cases were exposed in Florida.



See Appendix III: Report Terminology for explanations of case classification, outcome and outbreak status.

Section 2: Narratives for Uncommon Diseases/Conditions

Typhoid Fever

(*Salmonella* Serotype Typhi)

Typhoid fever is common in most parts of the world except in industrialized regions such as the U.S., Canada, Western Europe, Australia and Japan. Good sanitation and aggressive case follow-up help prevent typhoid fever from becoming endemic in industrialized regions.

Most *Salmonella* serotype Typhi (*S. Typhi*) infections are acquired in other countries, but infections can be acquired in Florida. In 2018, only five cases (38%) were known to be imported from other countries. Four cases (31%) were acquired in Florida; however, it is noteworthy that one of those cases had relevant travel to India just outside the standard 30-day exposure period used to determine the imported status of a typhoid fever case.

Of the five cases known to be acquired in other countries, all reported visiting friends or relatives as their reason for travel. Routine typhoid vaccination is not recommended in the U.S., but the Centers for Disease Control and Prevention does recommend vaccination for travelers to parts of the world where typhoid fever is common, people in close contact with a chronic carrier of *S. Typhi* and laboratory staff who work with *S. Typhi* bacteria. None of the interviewed typhoid fever cases in 2018 reported being vaccinated.

Four outbreak-associated cases were reported in 2018. One case was linked to an ill relative in Bangladesh. The three remaining outbreak-associated cases were in a group of refugees from the Democratic Republic of the Congo who recently arrived from a refugee camp in Burundi. Unique epidemiological factors made it difficult to determine where these three infections were acquired. For more information on this investigation, see Section 3: Notable Outbreaks and Case Investigations.

Typically less than 20 typhoid fever cases are reported in Florida each year; 13 cases were reported in 2018. Cases occurred more commonly in males, blacks and non-Hispanics. Most 2018 cases were hospitalized, but no deaths occurred. All but one case was confirmed.

Typhoid fever cases occurred in residents of five Florida counties in 2018. About two-thirds of the cases were identified in Hillsborough (five cases) and Miami-Dade (four cases) counties.

Disease Facts

-  **Caused by** *Salmonella* serotype Typhi bacteria
-  **Illness** includes fever and possibly weakness, stomach pain, headache, loss of appetite, diarrhea or constipation, cough or rash
-  **Transmitted** via fecal-oral route, including person to person, foodborne and waterborne
-  **Under surveillance** to identify sources of public health concern (e.g., an infected food handler or contaminated commercially distributed food product), prevent transmission from infected people, identify other unrecognized cases

Summary

Number of cases in 2018	13
5-year trend (2014 to 2018)	

Age (in Years)

Mean	33
Median	28
Min-max	2 - 83

Gender

Female	 5
Male	 8
Unknown gender	0

Race

White	 3
Black	 6
Other	 4
Unknown race	0

Ethnicity

Non-Hispanic	 10
Hispanic	 3
Unknown ethnicity	0

Case Classification

Case Classification	Number
Confirmed	 12
Probable	 1

Outcome

Outcome	Number
Interviewed	 12
Hospitalized	 9
Died	0

Outbreak Status

Outbreak Status	Number
Sporadic	 9
Outbreak-associated	 4
Outbreak status unknown	0

Location Where Exposed

Location Where Exposed	Number
Florida	 4
Florida or Burundi	 3
Bangladesh	 1
Haiti	 1
India	 1
Pakistan	 1
India or Indonesia	 1
Unknown	 1

