

## **Section 3**

# **Narratives for Selected Reportable Diseases/Conditions of Infrequent Occurrence**



### Anaplasmosis

Anaplasmosis is a tick-borne bacterial disease caused by *Anaplasma phagocytophilum*. It was previously known as human granulocytotropic ehrlichiosis (HGE), but was later renamed human granulocytic anaplasmosis (HGA) when the bacterium genus was changed from *Ehrlichia* to *Anaplasma*. Typical symptoms of anaplasmosis include fever, headache, chills, and muscle aches. More severe infections can be seen in those who are immunosuppressed. Anaplasmosis is transmitted to humans by tick bites primarily from *Ixodes scapularis*, the black-legged tick, and *I. pacificus*, the western black-legged tick. Unlike ehrlichiosis, most HGA cases reported in Florida are due to infections acquired in the Northeastern and Midwestern U.S. Surveillance for anaplasmosis is intended to monitor incidence over time, estimate burden of illness, understand the epidemiology of each species, and target areas of high incidence for prevention education.

Anaplasmosis was grouped with ehrlichiosis in previous reports, but is summarized separately in the *2014 Florida Morbidity Statistics Report* due to its different vectors, ecology, and geographic distribution. In Florida, less than 12 anaplasmosis cases are reported each year. Seven cases were reported in 2014; five were confirmed cases and two were probable, based on the type of laboratory test results available. Two cases were hospitalized, but no deaths were reported. Four cases were in women, three were in men. Six cases were in non-Hispanic white people; race and ethnicity were unknown for one person. Ages ranged from 55 to 83 years old (average age was 67 years, median was 64 years). Cases were reported in residents of Brevard, Broward, Collier, Hillsborough, Manatee, Pinellas, and Sumter counties. All seven cases were interviewed. Infections were acquired in Massachusetts (2), New Hampshire (2), Wisconsin (2), and Arkansas (1) which is consistent with historical trends.

### Brucellosis

Brucellosis is a systemic illness caused by several species of *Brucella* bacteria that can cause a range of symptoms in humans that may include fever, sweats, headaches, back pain, weight loss, and weakness. Brucellosis can also cause long-lasting or chronic symptoms that include recurrent fevers, joint pain, and fatigue. These bacteria are primarily transmitted among animal reservoirs, but people can be exposed when they come into contact with infected animals or animal products contaminated with the bacteria. Laboratorians can be at risk for exposure to *Brucella* species while working with human or animal cultures. Human infections in Florida are most commonly associated with exposure to feral swine infected with *Brucella suis*. Dogs and domestic livestock may also be infected with *B. suis*. Although dogs and dolphins may be infected with their own *Brucella* species, human illness is not commonly associated with them. Outside the U.S., unpasteurized milk products from infected goats, sheep, and cattle infected with *B. melitensis* and *B. abortus* are important sources of human infections. Brucellosis is reportable to public health authorities because there are a number of public health actions that can be taken to help reduce incidence of this infection. These actions include identifying populations at risk to allow for targeted prevention outreach; increasing health care provider awareness for earlier diagnosis and treatment of infected persons; intervening early and providing prophylaxis to prevent laboratory exposure-related infections from developing; detecting potentially contaminated products including food, transfusion, and organ transplant products; and detecting and responding to a bioterrorist event.

Over the past 10 years, between 3 and 17 brucellosis cases were reported annually in Florida residents. In 2014, three sporadic cases were reported in Florida residents; two were confirmed, one was probable. The two confirmed cases were both culture-positive for *B. suis*. A fourth case was identified in a non-Florida resident from Mexico (note that this report only includes Florida residents in case counts). Two of the three Florida residents were hospitalized, but no deaths were reported. All three Florida resident cases were in non-Hispanic white men, aged 23, 65, and 70. Cases occurred throughout the year, as is expected for a disease with an extended incubation period (up to several months) and the potential to cause chronic illness. Cases were reported in residents of Osceola, St. Lucie, and Volusia counties. All three cases were interviewed, and all three infections were acquired in Florida. Pig hunting was the likely route of exposure for all three Florida residents. Exposure for the non-resident case was attributed to ingesting raw milk products while in Mexico.

In addition to human brucellosis cases, four dogs tested positive for *B. suis* in 2014. In December 2013, a brucellosis case was reported in 1-year-old child in Polk County. Three dogs linked to that child were positive for *B. suis* by serology in 2014. The Florida Department of Agriculture and Consumer Services also identified a *Brucella*-positive pig at the farm and both parents were avid hog hunters. A second event in 2014 involved one dog that was culture-positive for *B. suis*. No human illnesses were associated with this dog. In addition, 26 laboratorians reported exposures to *B. suis* culture isolates in 2014 (15 high-risk exposures and 9 low-risk exposures). Four of those exposures were associated with the positive culture from the dog.

### Hansen's Disease (Leprosy)

Hansen's disease, commonly known as leprosy, is a bacterial disease of the skin and peripheral nerves caused by *Mycobacterium leprae*. Approximately 95% of people are resistant to infection. Those who do develop clinical illness can experience a wide range of clinical manifestations, but typically develop symptoms related to the skin, peripheral nerves, and nasal mucosa. Although the mode of transmission of Hansen's disease is not clearly defined, most investigators believe that *M. leprae* is usually spread person-to-person in respiratory droplets following extended close contact with an infected person, such as living in the same household. The incubation period is typically years, making it difficult to determine the source of infection. Some armadillos in the southern U.S. are naturally infected with *M. leprae*; it is not clear if armadillos are simply sentinels or true reservoirs of the bacteria. It is possible to get infected through contact with armadillos, but the risk is low. Transmission of Hansen's disease in the U.S. is rare. Most U.S. cases occur in immigrants, typically from Asia, the Asian Pacific Islands, and Latin America where the disease is endemic. Surveillance for Hansen's disease is intended to facilitate early diagnosis and appropriate treatment by an expert in order to minimize permanent nerve damage and prevent further transmission.

In Florida, less than 12 Hansen's disease cases are reported each year. Ten cases were reported in 2014, all of which were laboratory-confirmed cases. The median time from symptom onset to laboratory diagnosis was 38 months, including two cases with symptoms reported more than 10 years prior to diagnosis. None of the people were known to be hospitalized and no deaths were reported. No cases were outbreak-associated. Three of the cases were in women and seven were in men; nine cases were in non-Hispanic white people and one was in a Hispanic white person. Ages ranged from 45 to 75 years old (average age was 63 years, median was 67 years). Cases were reported in residents of Brevard (3), Polk (2), Volusia (2), Clay (1), Miami-Dade (1), and Orange (1) counties. No linkages between the cases were identified. Eight of the cases were interviewed. Five infections were reported as acquired in Florida (in Polk, Volusia, Clay, Miami-Dade, and Orange county residents). Of the 10 people with known travel history, only two reported international travel (Ecuador, Iceland, and Italy), including one person who was born in Ecuador. One of the infected people recalled direct contact with armadillos; three people reported seeing but not touching armadillos. The origin of the remaining seven infections was unknown.

### Mercury Poisoning

Mercury is a naturally occurring element distributed in the environment as a result of both natural and man-made processes. There are three forms of mercury (i.e., elemental or metallic mercury, organic mercury compounds, inorganic mercury compounds), each with unique characteristics and potential health threats. Mercury exposures are typically due to ingestion of mercury or inhalation of mercury vapors. Forms of mercury most likely encountered by the general public include elemental mercury vapor (found in some thermometers and dental amalgam), methylmercury, ethylmercury (found in some medical preservatives), and inorganic mercury (mercuric salts). Methylmercury is created when microorganisms in the environment convert inorganic mercury into its organic form, which can build up in the environment and accumulate in fish and marine mammals. Methylmercury is the most likely source of mercury leading to adverse health effects in the general population and can cause impaired

neurological development; impaired peripheral vision; disturbed sensations (e.g., “pins and needles feelings” usually in the hands, feet, and around the mouth); lack of coordinated movements; impaired speech, hearing, and walking; and muscle weakness. Surveillance for mercury poisoning is important to determine if there is a source of mercury exposure of public health concern (e.g., fish, broken thermometer, dental amalgams), prevent further or continued exposure through remediation or elimination of sources when possible, and to inform the public about how to reduce the risk of exposure.

The mercury poisoning case definition changed in late 2008 to require symptoms related to mercury poisoning, so the number of cases decreased starting in 2009. An average of 10 cases per year have been reported since 2009 (ranging from 21 cases in 2009 to five cases in 2013); 15 cases were reported in 2014. All 15 cases were sporadic and laboratory-confirmed in urine ( $\geq 10$  micrograms per liter [ $\mu\text{g/L}$ ]) or whole blood ( $\geq 10$   $\mu\text{g/L}$ ). No one was hospitalized and no deaths were reported. Eight cases were in women and seven were in men. Nine cases were in non-Hispanic white people, two were in non-Hispanic black people, one was in a non-Hispanic person of other race, and one person’s race and ethnicity were unknown. Ages ranged from 37 to 78 years old (average age was 58 years, median was 63 years). Cases were reported in residents of Palm Beach (6), Collier (2), Pinellas (2), Gadsden (1), Miami-Dade (1), Pasco (1), and Sarasota (1) counties. Fourteen people were directly interviewed, and risk factor data were collected from the reporting physician for the remaining person. Fourteen people were exposed in Florida and one was exposed in Massachusetts. All people reported fish consumption within a month of illness identification. Two people reported having dental amalgam as another possible source of mercury exposure.

### ***Staphylococcus aureus* Infection, Intermediate Resistance to Vancomycin**

*Staphylococcus aureus* is a type of bacteria commonly found on the skin and in the noses of healthy people. Most *S. aureus* infections are minor, but sometimes serious or fatal bloodstream infections, wound infections, or pneumonia can occur. *S. aureus* is also an important cause of health care-associated infections, especially among chronically ill patients who have recently had invasive procedures or who have indwelling medical devices. *S. aureus* is transmitted person-to-person by direct contact. *S. aureus*, commonly found among health care workers, is spread by hands that become contaminated by contact with colonized or infected patients; colonized or infected body sites of the health care workers themselves; or devices, items, or other environmental surfaces contaminated with body fluids containing *S. aureus*.

Methicillin-resistant *S. aureus* (MRSA) is typically resistant to many antibiotics and has become more common in the last decade. Consequently, physicians rely heavily on vancomycin as the primary antibiotic for treating patients with serious MRSA infections and thus, resistance to vancomycin limits the available treatment options for MRSA. Vancomycin-intermediate *S. aureus* (VISA) and vancomycin-resistant *S. aureus* (VRSA) have acquired intermediate or complete resistance to vancomycin. VISA emerges when a patient with preexisting MRSA infection or colonization is exposed to repeated vancomycin use and the *S. aureus* strain develops a thicker cell wall. This resistance mechanism is not transferrable to susceptible strains. In contrast, VRSA emerges when a strain of *S. aureus* acquires the *vanA* gene from a vancomycin-resistant *Enterococcus* (VRE) organism. Recent exposure to vancomycin is not necessary. This type of gene-mediated resistance is theoretically transferable to susceptible strains or organisms, so there is potential for person-to-person transmission. No VRSA infection has ever been detected in Florida. Surveillance for VISA and VRSA is intended to identify infected people, evaluate their risk factors for infection, assess the risk of a patient transmitting infection to others, and to prevent such transmission. Additionally, it is important to track the emergence of a relatively new and rare clinically important organism.

Typically, between one and seven VISA cases are reported in Florida annually. Four cases were reported in 2014, all of which were sporadic and laboratory-confirmed. All four cases were hospitalized

and one person died, though not necessarily from VISA infection (the person had multiple co-morbidities). One case was in a woman and three were in men; two cases were in non-Hispanic white people and two were in non-Hispanic black people. Ages ranged from 34 to 79 years old (average age was 60 years, median was 64 years). Cases were reported in residents of Manatee (2), Clay (1), and St. Lucie (1) counties. All cases were investigated, though only one case was able to be interviewed.

### Typhoid Fever

Typhoid fever is a systemic illness caused by *Salmonella enterica* serotype Typhi (*Salmonella* Typhi) bacteria. People with typhoid fever typically have a sustained high fever and may also experience weakness, stomach pains, headache, loss of appetite, or rash. Typhoid fever can be severe. *Salmonella* Typhi lives only in humans. People get typhoid fever after eating food or drinking beverages that have been handled by a person who is shedding *Salmonella* Typhi in their stool or when sewage contaminated with *Salmonella* Typhi bacteria gets into the water used for drinking or washing food. 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. Surveillance for typhoid fever is intended to determine if there is a source of infection of public health concern (e.g., an infected food handler or contaminated commercially distributed food product) and to stop transmission from such a source, assess the risk of infected people transmitting infection to others and prevent such transmission, and identify other unrecognized cases.

Typically, between 10 and 20 typhoid fever cases are reported in Florida residents annually, with incidence peaking in summer months. Approximately 80% of infections are acquired in other countries where the disease is endemic. Thirteen cases were reported in 2014, all of which were sporadic, laboratory-confirmed cases. Eleven people were hospitalized, but no deaths were reported. Five cases were in females and eight were in males. All cases were in non-Hispanic; six were in Asian/Pacific Islanders, two were white, two were black, and three were people of other races. Ages ranged from 8 to 75 years old (average age was 34 years, median was 35 years). Cases were reported in residents of Broward (2), Palm Beach (2), Alachua (1), Brevard (1), Collier (1), Manatee (1), Miami-Dade (1), Nassau (1), Orange (1), Pasco (1), and Sarasota (1) counties. All 13 cases were interviewed; 12 infections were acquired outside of the U.S. in India (7), Haiti (2), Bangladesh (1), Pakistan (1), and the Philippines (1). One infection was acquired in Florida (Nassau County resident).

### West Nile Virus Disease

West Nile virus (WNV) is a mosquito-borne flavivirus that was first introduced to the northeastern U.S. in 1999 and first detected in Florida in 2001. Since its initial detection, WNV activity has been reported in all 67 Florida counties. People infected with WNV can experience a wide range of symptoms. Approximately 80% of those infected show no clinical symptoms, 20% have mild symptoms (headache, fever, pain, fatigue), and less than 1% suffer from the neuroinvasive form of illness, which may involve meningitis and encephalitis and can cause irreversible neurological damage, paralysis, coma or death. Several species of *Culex* mosquitoes, animals (particularly wild birds and horses), and humans are all documented hosts for WNV. People become infected when they are bitten by a mosquito infected with WNV. WNV can also be transmitted to humans via contaminated blood transfusions and less frequently through organ transplantation. Since 2003, all blood donations are screened for the presence of WNV prior to transfusion. Symptoms typically appear from 2 to 14 days after the exposure. People spending large amounts of time outside (due to occupation, hobbies or homelessness) or not using insect repellent or other forms of prevention are at higher risk of becoming infected. Surveillance for WNV disease is important to identify areas where WNV is being transmitted to target prevention education for the public, monitor incidence over time, and estimate the burden of illness.

The incidence of WNV disease in Florida varies greatly from year to year but the incidence consistently peaks between July and September. The largest number of cases (94) was reported in 2003; from 2006 to 2009, only three cases were reported each year. Incidence peaked again in 2012 with 74 reported cases, then decreased in 2013 to seven cases. Seventeen cases were reported in 2014, of which 12 were neuroinvasive. All cases were sporadic, 16 were confirmed and one was probable, meaning that less supportive laboratory evidence was available. Fifteen people were hospitalized and one person died. Six cases were in women and eleven were in men. All cases were in non-Hispanic people; one person was black and the remaining 16 people were white. Ages ranged from 7 to 80 years old (average age was 46 years, median was 43 years). Cases were reported in residents of Escambia (4), Volusia (4), Duval (2), Alachua (1), Clay (1), Leon (1), Marion (1), Monroe (1), Pasco (1), and Polk (1) counties. Consistent with past years, cases occurred in July (1), August (8), September (6), and October (2). All 17 infected people were interviewed. One infection was acquired in the Bahamas and the remaining 16 infections were acquired in Florida.

Asymptomatic WNV infections do occur, though they do not meet the Florida surveillance case definitions. Four asymptomatic infections in blood donors were identified in Florida residents in 2014. Asymptomatic blood donors were reported from Duval (September), Polk (November), Santa Rosa (July), and St. Johns (September) counties. An additional blood donor was initially identified through the blood screening process and later developed non-neuroinvasive symptoms, meeting the case definition. Also of interest, two cases of St. Louis encephalitis (SLE) were identified in Duval County residents in 2014. Similar to WNV, SLE virus is a flavivirus with the same mosquito vectors and it is hypothesized that WNV may have replaced SLEV in Florida and other parts of the U.S. These were the first cases of SLE reported in Florida since 2003. For more information about these SLE cases, please see Section 4: Notable Outbreaks and Case Investigations.

