



NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Developed by the North Carolina Division of Public Health, Communicable Disease Branch

West Nile Encephalitis Surveillance, North Carolina, 2012—2018

Background

West Nile virus (WNV) is transmitted to humans and horses by the bite of an infected mosquito. It is in the genus *Flavivirus*, family *Flaviviridae*.

Transmission

Over 150 species of mosquitoes have been known to carry West Nile virus, but the main vector species in the U.S. are *Culex pipiens*, *Culex tarsalis*, and *Culex quinquefasciatus*. These mosquitoes are active at night, and most cases of infection occur during the summer and early fall months. In a very small number of cases, WNV also has been spread through blood transfusions, organ transplants, breastfeeding and even during pregnancy from mother to baby. It is not spread person-to-person or from animal-to-person by casual contact.

Symptoms

Most people infected with WNV will have no apparent symptoms. About 1 in 5 people who are infected will have mild symptoms such as fever, headache, body aches, vomiting, diarrhea, and rash. A small percentage of people will develop serious disease that can include high fever, convulsions, paralysis and sometimes lasting neurological effects. Severe WNV neuroinvasive disease may include encephalitis (inflammation of the brain) or meningitis (inflammation of the membranes that surround the brain and spinal cord). Ten percent of severe WNV cases are fatal. Severe disease occurs most often in people over 60 years of age.

Epidemiology

WNV is the most common arboviral disease in the United States. Since its introduction to the U.S. in 1999, WNV has spread throughout the continental U.S. with most cases occurring in the upper Midwestern states and the northern Plains states. In North Carolina, neuroinvasive WNV was first documented in 2002. Since 2003, there have been a total of 77 confirmed and probable encephalitic WNV cases in North Carolina, distributed across the state with no geographic predilection. Cases of WNV have been reported in 40% of North Carolina Counties since 2003. Additionally, there were 143 reported equine cases of WNV between 2003 and 2018.

Diagnosis and Treatment

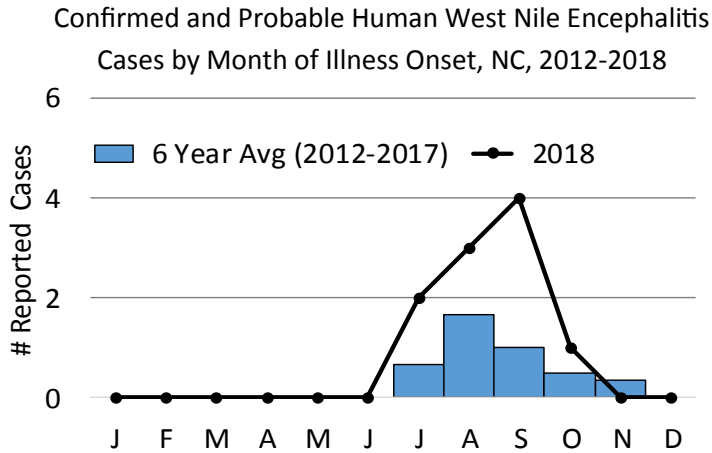
Diagnosis of encephalitic WNV is usually based on signs and symptoms as well as presence of IgM antibodies in serum and cerebrospinal fluid (CSF). Antibodies begin to be detectable 3 to 8 days after onset of illness, so testing before that time may result in a false negative test. The presence of antibodies in blood or CSF provides good evidence of WNV infection, however cross-reactivity with other flaviviruses is possible. No specific anti-viral treatments for WNV are available. Therefore, in severe cases necessitating hospitalization the only available treatment is supportive care.

Prevention

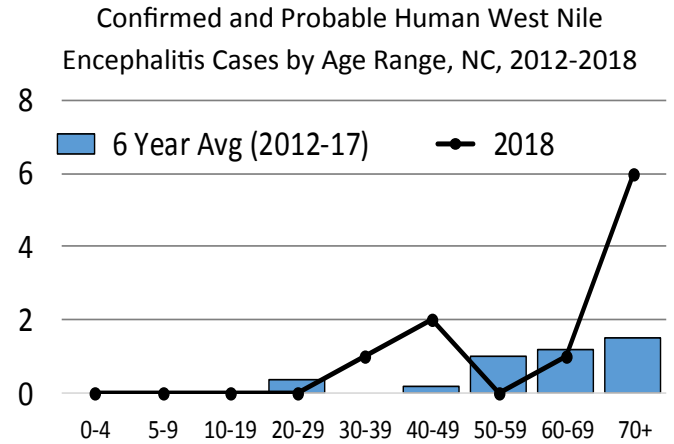
There are no vaccines available for WNV in humans, however a vaccine is available for horses. The best method to prevent WNV infection is to avoid mosquito bites, such as:

- Using repellents containing DEET, picaridin, IR3535, or oil of lemon eucalyptus
- Eliminating mosquito breeding sites by emptying standing water from flower pots, buckets, barrels, tires and other containers at least weekly, or by drilling holes so water drains out;
- Wearing long sleeves, pants and socks when weather permits;
- Having secure intact screens on windows and doors to keep mosquitoes out.

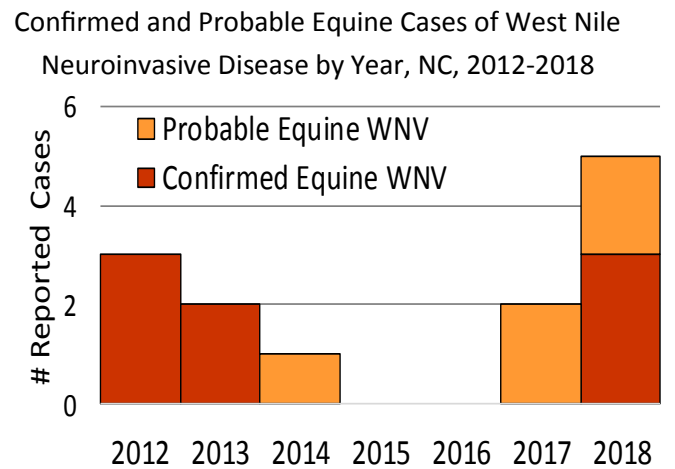
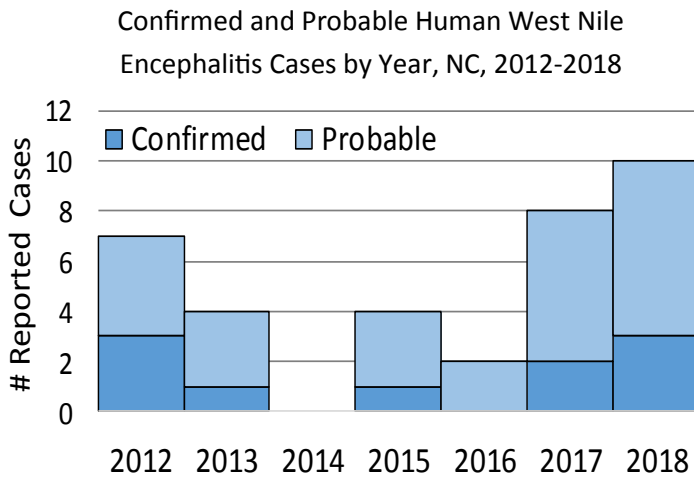
Cases by Month



Case Demographics

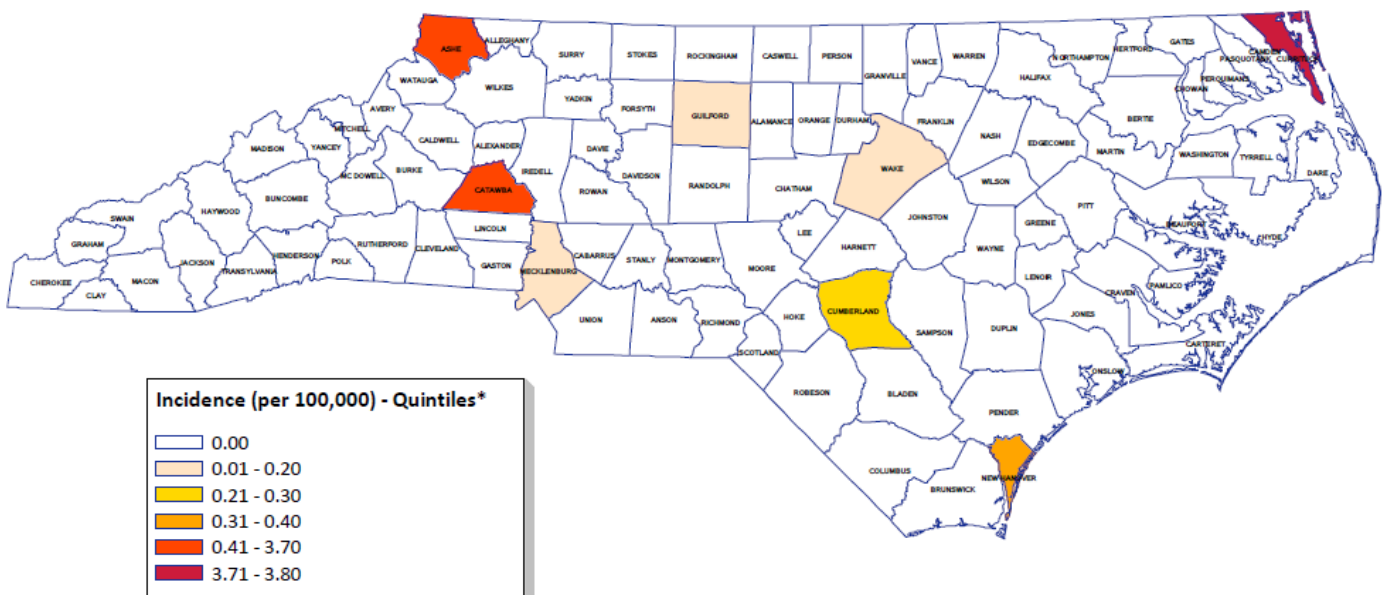


Cases by Year



Geographic Distribution

Confirmed and Probable Cases of West Nile Encephalitis by County of Residence, NC, 2018



*Counties with at least one case were ranked by incidence rate and placed into quintiles (5 roughly equal groups divided at 20-percentile intervals).