

Arboviral Infection

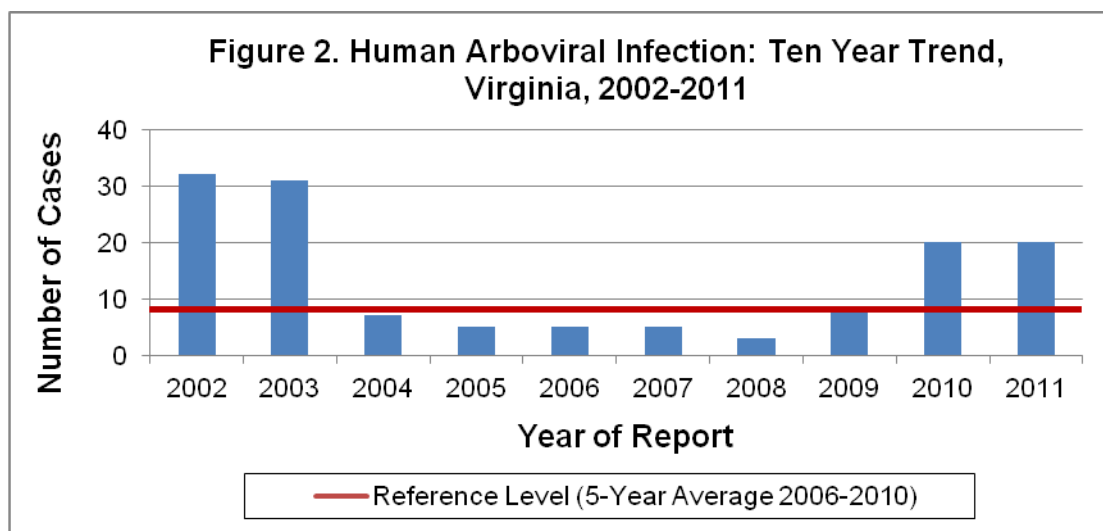
Agent(s): In Virginia, the agents of arboviral infection, from most to least common, are the mosquito-borne West Nile virus (WNV), LaCrosse encephalitis (LAC) virus, St. Louis encephalitis (SLE) virus and Eastern equine encephalitis (EEE) virus. Other arboviral agents causing illness in Virginians include the imported dengue virus and chikungunya virus, which typically infect travelers to endemic regions of the tropics and subtropics. Powassan (POW) virus, which is a tick-borne encephalitis virus, was recently discovered in Virginia.

Mode of Transmission: Most commonly through the bite of an infected mosquito. WNV may also be transmitted by blood products via transfusion or transplanted organs from infected donors, or by cuts or punctures with contaminated scalpels or needles and, more rarely, through inhalation or ingestion of dust or particles from infected bird feces.

Signs/Symptoms: Severity of symptoms differs depending on the particular virus and characteristics of the infected person. Most infections are asymptomatic. Mild cases may appear as fever with headache or as aseptic meningitis. More severe disease can cause encephalitis (i.e., inflammation of the brain) or meningitis (i.e., inflammation of the lining of the brain and spinal cord) and may lead to permanent neurological impairment or death.

Prevention: Minimize bites by avoiding areas infested by mosquitoes or ticks, and, when in those areas, use mosquito or tick repellents on skin and wear long-sleeved, light-colored clothing with pants legs tucked into socks. Additional control measures include maintaining screens on all open windows and doors and eliminating or regularly dumping all containers that could hold water and breed mosquitoes including buckets, birdbaths and discarded tires. After visiting tick habitats, a person should thoroughly check all body surfaces for ticks and, if found, carefully remove attached ticks as soon as possible.

Other Important Information: WNV and SLE infections are more likely to cause severe disease in persons over the age of 50, but the majority of infections are asymptomatic. LAC is seen primarily in individuals less than 16 years of age. EEE has a high fatality rate and is more likely to affect children under the age of 15 and adults over the age of 50.



Human

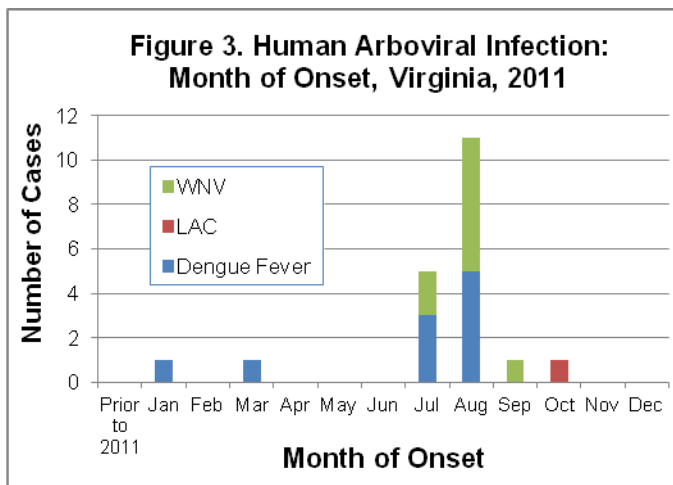
The twenty human arboviral infections reported in 2011 is significantly higher than the five-year average of 8.2 cases per year, but the same as the number reported in 2010 (Figure 2). In 2011, half of the arboviral infections were imported cases of dengue fever. Among the other ten infections, nine were WNV and one was LAC, all acquired in Virginia.

WNV activity has decreased significantly since 2002 and 2003 when the virus first appeared in Virginia. The nine cases identified in 2011 represent an increase from the previous five-year average of 4.2 WNV cases per year. Eight of the nine WNV infections reported during 2011 occurred in males. All of the cases occurred in adults ranging from 30 to 90 years of age. One death was attributed to WNV infection during 2011 and occurred in an adult male over 80 years of age from the northwest region. Eight of the nine WNV cases occurred in urban areas including three from northern Virginia (one each from Arlington, Fairfax, and Prince William Counties), two from central Virginia (Richmond City), one from northwest Virginia (Rockingham County) and two from southwest Virginia (Roanoke City and Roanoke County). The one case which occurred in a rural area was reported from northwest Virginia in Augusta County. Most of Virginia's WNV infections identified since 2002 have occurred in urbanized sections of northern Virginia.

The one reported case of LAC in 2011 occurred in a male child less than ten years of age from the southwest region.

Among the 10 imported cases of dengue fever, all were seen in travelers returning from dengue endemic areas in the American tropics and south Asia. Dengue cases occurred in persons ranging from 10 to 73 years of age, and were evenly divided between males and females. Based on clinically compatible illness, one case was further diagnosed as dengue hemorrhagic fever. The hemorrhagic illness occurred in a female from the 40-49 year age group who had traveled to South America just prior to onset of symptoms.

The majority of WNV infections occurred in July and August, which is typical for WNV in Virginia (Figure 3). Onset dates for the imported dengue fever cases also occurred mostly in July and August. However, since these infections were acquired out of the country, any seasonality would be based on travel patterns and not local disease risk. The one LAC case had onset in October.



Animal

Zoonotic surveillance for WNV and EEE is conducted each year by a limited number of jurisdictions in northern Virginia, the Richmond area, and Hampton Roads. These surveillance programs test for the presence of arboviruses in collected mosquitoes and sentinel chickens. Sentinel chicken flocks are only maintained in the Hampton Roads area. There is also an effort to search veterinary records for equine cases of arboviral infection statewide. There is no mosquito/zoonotic testing program for LAC or SLE viruses.

During 2011, a total of 249,059 mosquitoes were tested for WNV. These mosquitoes were tested as “pools” (i.e., batches of up to 50 mosquitoes). Of the 9,599 pools tested for WNV, 208 were positive, indicating that each of these pools contained at least one WNV positive mosquito. Of these 208 positive pools, 173 were collected from northern Virginia, 27 were from central Virginia, and eight were from Hampton Roads. In 2011, one WNV infection was seen in an equine in the northwestern region. Sentinel chicken testing revealed only four WNV positive chickens in the Hampton Roads area.

Surveillance for EEE is conducted only in the Hampton Roads area of the state. In 2011, there was a very low level of EEE activity in the area. Of the 39,909 mosquitoes (855 pools) tested in that region, only one pool was positive for EEE. In addition, 10 sentinel chickens tested positive for EEE in the Hampton Roads area.