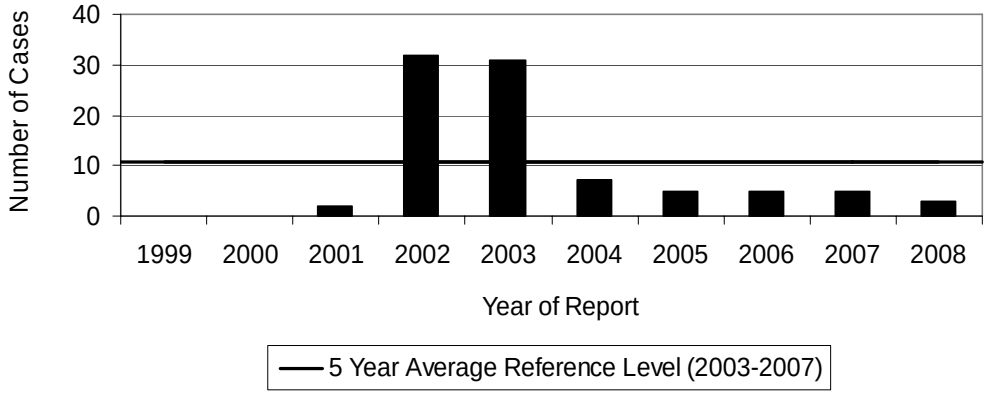
Arboviral Infection

Agent(s): In Virginia, the most common endemic mosquito-borne agents of arboviral infection are West Nile virus (WNV), LaCrosse encephalitis (LAC) virus, St. Louis encephalitis (SLE) virus and Eastern equine encephalitis (EEE) virus.
Mode of Transmission: Most commonly transmitted by the bite of an infected mosquito. WNV may also be transmitted by blood transfusion or transplanted organs from infected donors, by cuts or punctures with contaminated scalpels or needles and, more rarely, by 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. Many infections are asymptomatic. Mild cases may appear as fever with headache, or as aseptic meningitis. More severe disease can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord) and may lead to permanent neurological sequelae or death.
Prevention: Avoid being bitten by mosquitoes. Avoid areas infested by mosquitoes and when in those areas, use mosquito repellents and wear long-sleeved, loose fitting, light-colored clothing because mosquitoes are not attracted to light colors. Maintain screens on all open windows and doors. Around your home, eliminate or dump all containers that could hold water and breed mosquitoes including buckets, birdbaths and discarded tires.
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 result in no symptoms. 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.

Figure 2. Human Arboviral Infection: Ten Year Trend, Virginia, 1999-2008



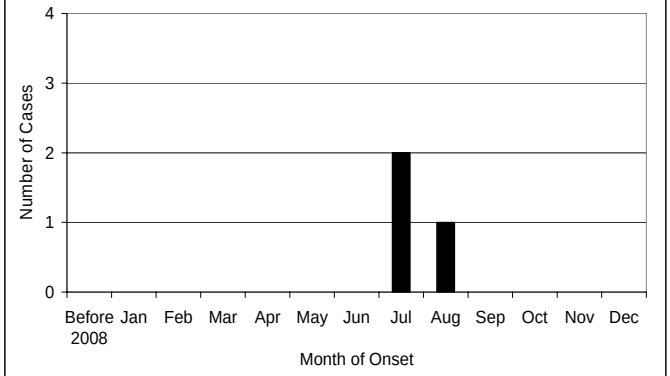
Human

Three cases of human arboviral infection were reported in 2008. This is slightly lower than the five cases reported in the previous three years, and is 90% less than the 31 cases reported in 2003 (Figure 2). The elevated levels of arboviral activity in 2002 and 2003

were largely attributable to the emergence of WNV in Virginia and the increased testing for human arboviral infections spurred by elevated concern. Since that time, WNV has been the most common cause of arboviral infections in Virginia. In 2008, only one WNV infection and two LAC infections in humans were reported in Virginia. The WNV case occurred in a resident of northern Virginia, the area of the state where most of Virginia's WNV infections have been identified since 2002. The individuals with LAC lived in western sections of the state including a new LAC-endemic area identified in 2003, which encompasses the upper Shenandoah Valley.

The WNV infection occurred in a male in the 60 year and older age group. Onset occurred in August (Figure 3). WNV infections typically increase during mid to late summer months or early fall when the mosquito population has its highest level of infection.

Figure 3. Human Arboviral Infection: Month of Onset, Virginia, 2008



The two cases of LAC reported in 2008 occurred in a boy and a girl in the 1-9 year age group. Both cases occurred in July. The last reported LAC cases occurred in 2005 when there were four human cases. It is unknown why LAC activity declined in 2006 and 2007.

Animal

Zoonotic surveillance for WNV and EEE is conducted each year using mosquitoes, sentinel chickens and horses. During 2008, over 364,363 mosquitoes were tested for WNV. As usual, mosquitoes were tested as "pools" (batches of up to 50 mosquitoes), and of the 11,216 pools tested for WNV, 686 pools (6.1%) were positive (i.e., contained at least one WNV positive mosquito). In 2008, levels of WNV activity were lower in the tested mosquito pools monitored by mosquito surveillance programs in northern Virginia localities than in any year since 2005.

Of the 132,034 mosquitoes (3,385 pools) tested for EEE, only 10 pools (0.3%) were positive. There is no mosquito testing program for LAC or SLE.

In 2008, no horses were found to have WNV infection, but one horse died from EEE in Virginia Beach. Two sentinel chickens in one Hampton flock tested positive for exposure to WNV, and five sentinel chickens in five different flocks in Chesapeake, Norfolk and Virginia Beach were positive for exposure to EEE.