

## **NPHL Arbovirus Surveillance Activities**

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In 2001, the Nebraska Public Health Laboratory (NPHL) finished the second year of diagnostic laboratory testing for arbovirus detection in Nebraska. The Nebraska Health and Human Services System (NHSS), in cooperation with the Centers for Disease Control and Prevention (CDC), had contracted with the NPHL to provide this service.

This activity is part of the CDC Cooperative Agreement for West Nile Virus Surveillance and Epidemiological Project that was started in July 2000 by the Nebraska State Medical Entomologist, Dr. Wayne Kramer.

The arbovirus family is a group of over 500 viruses that are transmitted by arthropod insects, most commonly the mosquito, with approximately 150 associated with human illness. Symptoms of arbovirus infection range from subclinical, to a mild febrile illness with headache, to encephalitis. Severe infections can cause lingering neurological sequelae, which can rarely result in death of the infected individual. WNV, which had been restricted to Africa, west Asia and southern Europe, was detected in the summer of 1999 for the first time in North America in the New York City area it has been associated with crows, house sparrows and other birds which are susceptible to WNV and can act as carriers of the virus once infected. WNV has now been detected in approximately twenty-four states, ranging from New York to Florida, and has traveled as far west as the Mississippi River. WNV was detected in a diseased crow in Davenport, IA last Fall. (See Figure 1) Epidemiologists will continue to watch the further spread in of WNV into the western United States.

Arboviruses that are indigenous to Nebraska include the St. Louis encephalitis (SLE) and Western equine encephalitis (WEE) viruses. According to the CDC, there have been 27 laboratory-confirmed human cases of WEE and 14 cases of SLE in Nebraska since 1964. Dr. Kramer, using funds provided by the CDC, detected SLE in two mosquito specimen pools out of 1,359 pools collected in Scotts Bluff County in 1994 and 1995. In 1995, 36 out

of 2,788 mosquito specimen pools tested were positive for WEE. Thirty of the 36 positive mosquito pools were collected in Scotts Bluff County, with four from the City of Norfolk and two from the City of Grand Island.

Arbovirus surveillance for SLE, WEE, and WNV will continue to be included in the testing done in Nebraska. During the past two years, Dr. Kramer directed the statewide collection of surveillance samples for testing. Mosquito trapping and "sentinel" chicken sera specimens were conducted in seven cities throughout Nebraska including Omaha, Bellevue, Lincoln, Norfolk, Grand Island, North Platte and Scottsbluff.

During the 2001 season, the NPHL Special Pathogens Laboratory tested 706 "sentinel" chicken sera for arbovirus antibodies. Approximately 40,000 mosquitoes were trapped and identified for testing, with approximately 36,000 of these being *Culex tarsalis*, the mosquito species capable of transmitting WNV.

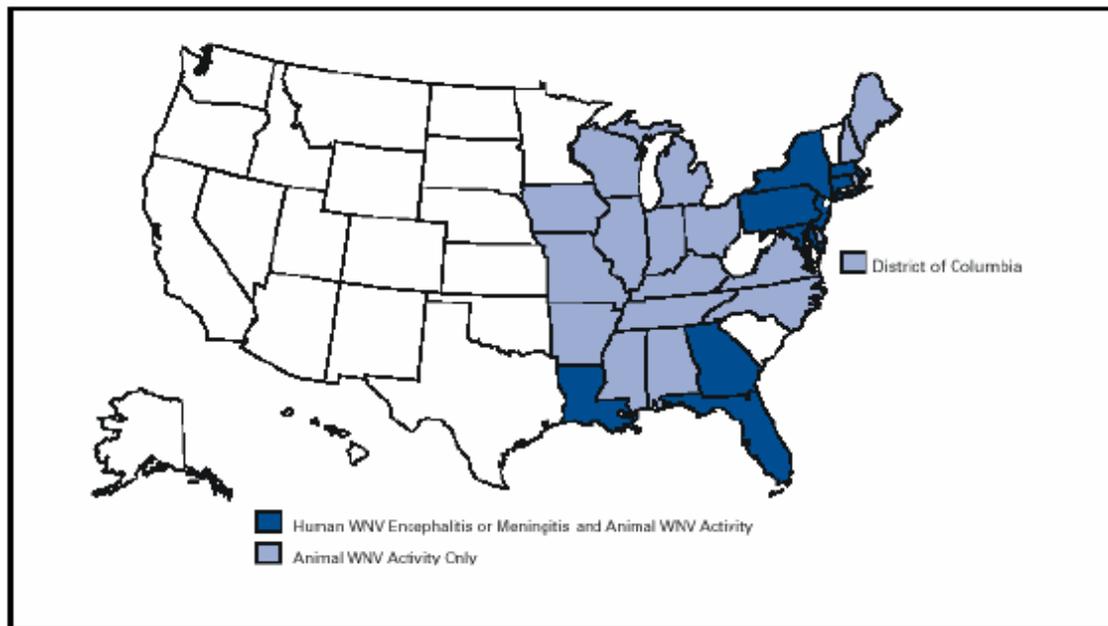
Following the CDC's recommendations, arbovirus surveillance activities for the detection of SLE, WEE, and WNV in Nebraska will include the following:

- ◆ active bird surveillance monitoring of chickens "sentinel camps" located throughout the state,
- ◆ active surveillance sampling of mosquito populations located near these "sentinel camps",
- ◆ enhanced veterinary surveillance by alerting veterinarians to monitor the presence of neurological diseases in birds, horses, and other animals,
- ◆ enhanced human surveillance by alerting health care providers to monitor for cases of encephalitis and aseptic meningitis
- ◆ dead bird surveillance and testing of appropriate specimens.

One goal of Dr. Kramer is to enhance statewide educational efforts concerning arbovirus detection and surveillance. These efforts will be directed towards the public, physicians, veterinarians, local health department personnel, and the agencies involved in mosquito and animal control. It is important that clinical laboratory personnel have a general understanding of the WNV surveillance program, as they may be contacted by the public. In this

regard, the public should be told that large birds found dead are usually not appropriate for testing because fresh tissue is needed. Specific questions can be directed to Dr. Kramer. The combined efforts of all laboratories will assist various programs within the NHHSS network to build upon the existing infrastructure of arbovirus surveillance. Through the continuing work that is being done, the enhanced planning and development of an arbovirus surveillance and response program will aid in the prevention and/or control of arboviral outbreaks within Nebraska.

**FIGURE 1. Areas reporting West Nile virus (WNV) activity — United States, 2001\***



\* As of November 20, 2001.