

NPHL Arbovirus Surveillance Activities

by Tony Sambol

Through an agreement with the Nebraska Health and Human Services System (NHHS) and the Centers for Disease Control and Prevention (CDC), the Nebraska Public Health Laboratory (NPHL) has begun to develop diagnostic laboratory services for arbovirus detection. This activity is part of the CDC Cooperative Agreement for West Nile Virus Surveillance and Epidemiological Project that was announced by Nebraska State Medical Entomologist, Dr. Wayne Kramer. During the year 2000 mosquito season, Dr. Kramer directed the statewide collection of surveillance samples for arbovirus screening which included collection of both sera from chicken flocks and mosquitoes from targeted areas. At the NPHL Special Pathogens Laboratory, sera from "sentinel" chickens were tested for antibodies to arboviruses. Additionally, mosquito specimen "pools" (50 mosquitoes per pool) will also be tested for the presence of arbovirus RNA. It is believed that certain areas of Nebraska are at higher risk for the spread of arboviral diseases due to collection of water used in irrigation.

The arbovirus family consists of over 500 viruses that are transmitted by arthropod insects, most commonly the mosquito. Approximately 150 viruses in this group are associated with human illness. Symptoms of arbovirus infection range from 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. Arboviruses found in 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 collected in Scottsbluff County in 1994 and 1995. In 1995, 36 out of 2,788 mosquito specimen pools tested positive for WEE. Thirty of the 36 positive mosquito pools were collected in Scottsbluff County, with four from the City of Norfolk and two from the City of Grand Island.

To expand on arbovirus surveillance, West Nile virus (WNV) has now been included in the testing done in Nebraska. This virus, which had been previously 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 now been found in many areas of the Northeastern United States. Crows, house sparrows and other birds are susceptible to WNV and can act as carriers of the virus once infected. Epidemiologists are concerned that WNV may spread further west in the US via migratory birds within the next few years.

In the future, arbovirus surveillance for detection of SLE, WEE, and WNV activities in Nebraska will include the following: 1. active bird surveillance monitoring of chickens located throughout the state; 2. active surveillance sampling of mosquito populations located in higher risk areas; 3. the evaluation of dead birds; and 4. enhanced passive human surveillance by alerting health care providers to monitor for cases of encephalitis and aseptic meningitis. The combined efforts of these groups will assist various programs within the NHHS network to build upon the existing infrastructure of arbovirus surveillance. It is hoped that enhanced planning and development of a more effective arbovirus surveillance and response program will aid in the prevention and

control of arboviral outbreaks within
Nebraska.