Program Activity Report (PAR)

FAD Competence in North American Wildlife & Surveillance

The increasing movement of people, animals, and commodities in the non-stop globalization of the world, enhances the potential for infectious diseases to be transported to and established in the United States. There is potential with every transcontinental voyage for a pathogen or vector host infected with a pathogen to be introduced into the United States. Although it is important to understand the risks or potential for foreign infectious diseases to enter the United States, it is equally important to know if there are potential hosts in the United States that once infected can maintain a pathogen's life and transmission cycles. A recent example was when West Nile Virus invaded the United States during 1999 and has since become endemic. NWDP staff is collaboratively working on a project to determine if wild animal species in the United States, particularly those closely related to host reservoir species in other countries, can become infected by and then serve as host to maintain certain Foreign Animal Diseases (FAD's).

The NWDP and Colorado State University are assessing the risk for Japanese encephalitis and chikungunya viruses to become established in the United States, by investigating whether wildlife and domestic reservoirs are present and, along with determining, the potential for either virus to be introduced into North America. For Japanese encephalitis (which is a Flavivirus), we discovered that a variety of wild bird species are susceptible to infection. Interestingly, birds known to be amplifying host for West Nile virus, also a Flavivirus, have not been susceptible to infection by Japanese encephalitis virus. To date, no overt disease has been observed in any of the birds tested. Recent results also have ascertained that some exotic mammal species in the United States, in additional to swine, can become infected and possibly amplify Japanese encephalitis virus without apparent symptoms. Chikungunya virus, on the other hand, has not been shown to infect any of the eleven bird or mammal species tested to date.

We plan to continue evaluating wildlife for susceptibility to both viruses. *Culex* and *Aedes* species that are prolific in the United States have already been implicated to be competent vectors for both viruses. Manuscripts reporting the results of these data are in preparation. We are now starting a baseline sero-surveillance project by collecting serum samples from birds, mammals, and reptiles collected in Guam, Hawaii, and nearby islands. The serum samples will be tested for neutralizing antibodies to Japanese encephalitis and chikungunya viruses. If positives are found, additional samples and testing could occur.

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The original artwork on this page was created by the National Wildlife Disease Program's Erika Kampe and Sarah Goff