

## West Nile Virus: How Much Should You Worry?

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With West Nile Virus (WNV) in the news almost daily, it is time to put this mosquito-borne disease in perspective and discuss the importance of pests in human history. There is no doubt the course of human history has been altered by insect and rodent-borne diseases. The following examples easily illustrate the point:

- In the fourteenth century, 25% of the European population (25 million people) died from plague, a bacterial disease spread by rats and rat fleas.
- Napoleon's war campaign into Russia in 1812 was defeated — not by another army — but by disease. In one year's time (1812–13), the French army dwindled from 500,000 soldiers to 3,000. Some deaths were due to exposure and other factors, but more than 220,000 soldiers died from epidemic typhus, caused by a microscopic organism, *Rickettsia prowazekii*, transmitted by body lice.
- Because of yellow fever, a mosquito-vector disease, the French were unable to hold onto Haiti in 1801 and 1802, influencing Napoleon's decision to sell the Louisiana Purchase to the United States for the paltry sum of \$15 million.
- At the turn of the twentieth century, the Panama Canal couldn't be completed until mosquito breeding sites were eliminated to prevent yellow fever and malaria that were killing thousands of canal workers.

Closer to home, most Americans don't realize that insect-borne diseases were common on this continent until early in the twentieth century.

- Devastating epidemics of yellow fever occurred in New York, Philadelphia, Memphis and New Orleans. In its early history, Philadelphia suffered 20 yellow fever epidemics — 10% of Philadelphia's population died in the 1793 epidemic.

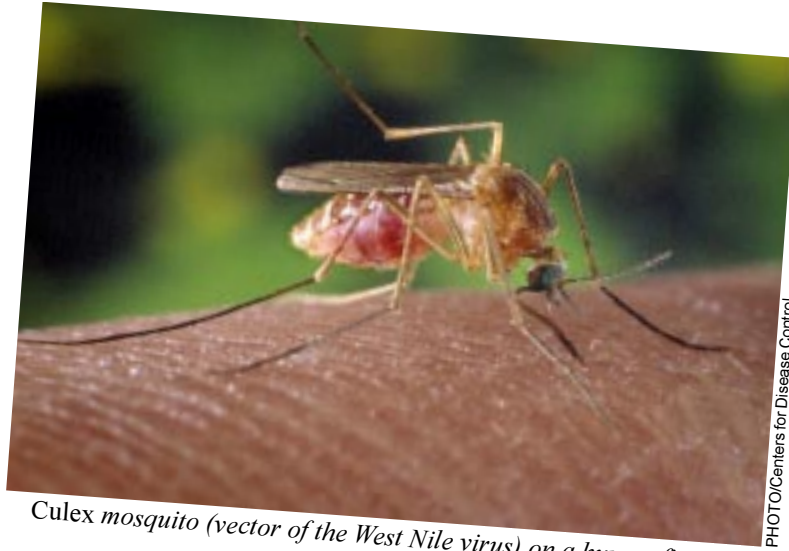
Today, outbreaks of insect vectored diseases are fairly common in more tropical countries. Since May, 500 people in Bangladesh died from malaria and dengue fever and, in Kenya, an outbreak of highland malaria killed several hundred people. It couldn't happen here? Many Americans don't realize that malaria was the number one insect-borne disease in the U.S. until the late 1940's.

The historical impact of these diseases was great because the causes weren't really understood until the twentieth century. For example, it was 1898 before Simond, a French scientist, discovered the rat flea could transmit plague from a sick rat to a healthy one. These diseases are complicated because most have several components that must be studied. Depending on the disease, these components can include:

- 1) An insect or tick that carries or transmits the disease. Medical entomologists call this a "competent" vector.
- 2) A wildlife reservoir that can harbor the disease.
- 3) A susceptible human host.
- 4) And finally, for a disease outbreak to occur, conditions must favor the insect and the wildlife reservoir or bring populations of these elements into the vicinity of susceptible humans.

### West Nile Virus

The disease caused by WNV is actually called West Nile encephalitis. It is primarily a disease of horses and related



*Culex mosquito (vector of the West Nile virus) on a human finger.*

PHOTO/Centers for Disease Control

animals. The USDA-APHIS reported that most horses recover, but about 25% of horses that contracted the virus died or were euthanized.

The reservoir hosts are birds — more than 80 species of birds have been found to carry this disease. Some bird species are more susceptible than others: blue jays, crows and related birds may die from the disease. Exotic birds may also be susceptible. After a mosquito feeds on an infected bird, it can transmit the virus to larger animals, including horses and humans.

Compared with many other insect-vector diseases, humans are not very susceptible to West Nile encephalitis. Less than one out of 100 people who become infected will get seriously ill. Of the few who become infected, most people will have no symptoms at all or display only mild symptoms, according to the Centers for Disease Control (CDC). Those who do become ill, usually see some symptoms within three to 15 days after the mosquito bite. Mild symptoms include fever, headache, and body aches, occasionally with a skin rash on the trunk of the body and swollen lymph glands.

### High-Risk Individuals

According to the CDC, high-risk individuals are persons over 60 years of age, especially persons who have chronic health conditions or compromised immunological systems. Symptoms of seriously ill persons can include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis.

### Horse Owners

People who own horses, donkeys or mules should be very concerned about WNV because the mortality is significant. Once a horse has been bitten, symp-

toms may occur in five to 15 days. Horses can suffer loss of appetite, depression, weakness of the hind limbs, partial paralysis, fever, impaired vision, ataxia, head pressing, aimless wandering, convulsion, inability to swallow, circling, hyperexcitability, coma and death. If symptoms are present, a veterinarian should be contacted immediately. There is no specific treatment for WNV other than supportive veterinary care standard.

### Vaccination

A horse vaccine is available, which must be administered by a veterinarian. The initial vaccine is a two-injection series given three weeks apart. Both injections must be given to provide protection from WNV. Foals may be vaccinated at 12 weeks of age and require a second dose three weeks later. If foals are vaccinated prior to 12 weeks of age, a three-dose series is recommended. Other equine "encephalitic" diseases (sleeping sickness: eastern equine encephalitis, western equine encephalitis and Venezuelan equine encephalitis) belong to a different family of viruses. Therefore, horses must be vaccinated specifically for WNV.

At the present time, there is no human vaccine.

### Prevent Mosquito Bites

It makes sense that, if you are in the high risk group or are worried about your horses, reducing mosquitoes in your vicinity will be helpful. Some precautions include:

- Discourage mosquito populations around your home:
  - At least once or twice a week, empty water from flower pots, pet food and water dishes, birdbaths,

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## Risk Comparison

Compare the chances of contracting WNV with being hurt or killed in a car accident:

- You have a 30% chance of being involved in a serious automobile accident in your lifetime.
- There are 2.7 million Americans injured each year from automobile accidents.
- There are 40,000 Americans killed each year in automobile accidents.
- 80% of the deaths occur in cars traveling less than 40 miles per hour and less than 25 miles from home.

The chance of dying in an automobile accident is a lot greater than dying from West Nile virus, but how many of us don't drive or ride in a vehicle because of the risk?

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