



ScienceWatch –West Nile Facts & Fears

Deadly West Nile Strikes California!

Accomplishing what many feared, the deadly West Nile flavivirus (WNV) is now present from coast to coast. Forty-two of the lower states-up from 28 last year-and four of Canada's 10 provinces have been hit. The Centers for Disease Control and Prevention (CDC) in Atlanta fear that the outbreak in the U.S. and other countries may be caused by a mutant flavivirus that is particularly virulent.

Now that I have sufficiently frightened you let's discuss the facts about WNV without the hysterical hype of most news stories as exemplified above. If truth be told about the story, a woman was diagnosed with WNV in September 2002. To date no one has died of the disease in California and the mutant business is pure speculation.

WNV was first isolated from a woman in Uganda in 1937. Since then the virus has been found in other African countries, Europe, the Middle East and Asia. In 1999 seven people in Queens died from the disease, which was traced back to birds in the Bronx Zoo. How it got there remains a mystery. WNV is closely related to other flavivirus, mosquito-borne diseases like St. Louis encephalitis. In the northern U.S. the vector is the common mosquito *Culex pipiens*, while in the south it is *C. quinquefasciatus*. Infectious mosquitoes carry virus particles in their salivary glands and infect birds when they take a blood meal. The virus multiplies to high levels in the bloodstream of birds so they (but not humans) also serve as a reservoir for the disease 1-4 days after they are infected. Thus any uninfected mosquito that feeds during this time becomes a new vector. In birds the disease is often fatal, and because they migrate they have helped to quickly spread it. The disease has also proven fatal in horses and can infect other vertebrates.

In humans most cases are mild, with people having flu-like symptoms or none at all. Other symptoms may include a mild rash, swollen lymph glands, severe headache, high fever, stiff neck, confusion, seizures, light aversion, muscle weakness and loss of consciousness. The most serious manifestation of the disease is an inflammation of the brain (encephalitis), which can be fatal. Those most vulnerable are the immunocompromised, i.e., very young, very old and AIDS patients.

Most of the fatalities have been among the elderly. However, the disease is usually not fatal and it is thought that infected people develop a lifelong immunity to the disease. As of November 15, 2002 only 212 fatalities have occurred out of a total of 3,619 cases reported in the U.S. this year, according to the CDC. In other words only 6% of the people bitten by infected mosquitoes have died. Many cases are so mild they are probably not reported, so the true death rate is undoubtedly even lower. The CDC has estimated that up to 200,000 American have been exposed to WNV. If true, the death rate drops to about 0.1%.

Yet news stories abound with hysterical headlines as if we were dealing with the bubonic plague. From 1999 through 2001, when headlines screamed across the country, and New York City began aerial spraying of mosquitoes (and every other flying insect) with

malathion, 149 cases were reported with only 18 deaths. To provide a bit of perspective, in each of those years approximately 65,000 people, mostly elderly, died from pneumonia, and 42,000 Americans died in auto crashes. So even the upsurge of WNV fatalities in 2002 pales in comparison to these risks. Each life is precious and should not be discounted, but fear of WNV should be proportional to the risk. Few will ever get WNV and most of those who do won't even know they had it.

In contrast to the relative resistance of humans, at least 100,000 birds have succumbed to the disease. WNV has proven fatal to 125 native species from bald eagles to hummingbirds. Corvids in general and American crows in particular have been hard hit. Laboratory experiments show that infected corvids suffer almost 100% mortality. In Rockville, MD, for example, where thousands of crows once gathered to roost each night in strip malls, only a handful can now be found. Why crows are especially sensitive remains a mystery. But if we can determine the reason it might provide a clue for prevention in humans.

Certainly it is prudent to avoid mosquito bites by using DEET-containing repellent, wearing long sleeve shirts and avoiding areas where mosquitoes are numerous, especially at dusk. However, life is full of risks and each one must be calmly evaluated as to its seriousness. No one would intentionally walk in front of a speeding auto, but each of us takes a risk when we get into one.



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