

The "Dark Side" of Mosquitoes

All who hike or camp in the Adirondacks have a particularly bad mosquito story. Many of us return from a few days in the woods with arms and necks covered with mementos of our visits. We do not, however, view mosquito bites as serious health threats. Should we?

On its surface, the answer would seem to be "yes." Sharing syringes and needles is a very efficient way to spread blood-borne infections. Most mosquitoes are promiscuous, taking blood from several individuals of many species, with no mechanism for sterilizing themselves. So, mosquitoes might be considered very dangerous disease vectors.

There certainly are diseases that depend upon mosquito transmission. In fact, it is fair to say that more humans are killed by mosquitoes than by any other animal. Viruses transmitted by mosquitoes generally are not passed "passively" from bug to person, but must infect the insect before transmission. Thus, transmission is limited to the specific species of mosquito that are susceptible to specific infections. New York has about seventy species of mosquitoes, only a few of which transmit disease.

Mosquito-borne viruses are called "arboviruses," and there are several that cause infection in New York State. Most result in fairly minor illness (fever, rash, headache, and "achiness"), although some cause severe infection of the nervous system and death.

Although extremely rare, eastern

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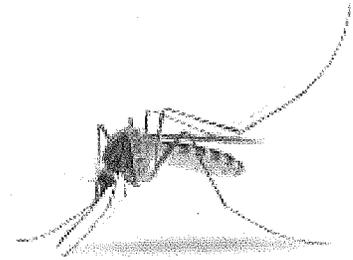
equine encephalitis (EEE) is the best example of the latter. There have been only a few known cases of EEE in New York State over the past forty-five years, and most have been fatal. West Nile virus infection is more common (hundreds of cases), and although potentially fatal it is much less likely to result in death than EEE.

Two arboviruses have recently begun to cause trouble in the U.S. Dengue fever had previously been thought to be limited to tropics. Although cases were increasingly common in Florida and Hawaii, there now are documented cases in New York. Chikungunya, an obscure tropical disease for years, recently made its way into the U.S. via travelers. It now appears to have spread within our country. There have been sixty-nine New York cases of this painful (rarely fatal) infection, all in travelers. (Lindsay Lohan is a "celebrity" chikungunya patient.)

Most recently, we have been hearing about a South American arbovirus infection, Zika. Although Zika has received a lot of hype, largely as a possible cause of birth defects, it is generally a mild illness.

None of these diseases has any specific therapy, so prevention of bites is the only real strategy. (I have discussed this subject in earlier columns.)

In the early days of the HIV/AIDS epidemic, there was consideration of a role for insect transmission. That notion has been discarded. The reasons are complicated, but boil down to the fact that HIV survives and replicates by infecting specific cells in hosts. Mosquitoes lack these cells.



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Any HIV that might get into a mosquito would likely be digested. Similarly, there is no evidence that hepatitis B or C has been transmitted by this route.

Recent media fixation on these rare and often minor illnesses is a sort of national narcissism. The real infection risk from mosquitoes is malaria, a disease that kills millions, including two children every minute. Since it is not transmitted in the U.S., we rarely give it a moment's thought. We are blessed to live in an area where the "misery" of mosquito bites is short-lived!



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