

# West Nile Virus in Newton

Last year, ten blue jays died in just my Newton Centre yard during the months of July and August. The birds had no signs of trauma, and one dropped out of a tree and died at my feet. It seemed likely that they were suffering from some disease.

The first bird died two weeks after the Massachusetts Health Department found mosquitos carrying West Nile Virus in Newton Centre. The year before, four blue jays died in my yard during those same weeks.

Although West Nile Virus has been found in hundreds of bird species, the corvid bird family, which includes blue jays and crows, and also robins are particularly susceptible to West Nile Virus.

I called Mass Audubon after I found the third blue jay. By the time the seventh bird died, Andrew Vitz, the state ornithologist, expressed concern. I asked him to test the dead birds in my yard to see what was causing the deaths. The state health department no longer tests dead birds (having found that testing just mosquitos is sufficient for tracking the locations in which the disease is present), and he could not get the test done in Massachusetts. Fortunately, the National Wildlife Services came to the rescue. By the time the ninth bird died, Randall Mickley in that office found a lab in Madison, Wisconsin, that would autopsy a bird.

I kept the ninth bird in my freezer for three weeks until all arrangements could be made and then gave it and the tenth dead (non-frozen) bird to Randall, who drove from western Massachusetts to pick them up.

The results were that both birds were infected with West Nile Virus, and wildlife folks assumed that all ten birds were killed by the disease.

What does that mean, and how does it affect those of us who live in Newton?



*Culex pipiens*

Knowing that there is a sufficient population of disease-carrying mosquitos to kill ten birds in my small yard, I decided to learn more about the disease and to make sure that my family and guests protect themselves from

mosquito bites, especially at dusk and dawn, when the West-Nile-carrying mosquitos are active.

WNV first was detected in the Western Hemisphere in New York in 1999, and it arrived in New England about a decade ago. The state has found it in Newton mosquitos all three years since the summer of 2012. In 2015, WNV-infected mosquitos were detected in the following local cities and towns: *Arlington, Bedford, Belmont, Boston, Brookline, Burlington, Cambridge, Chelsea, Everett, Lexington, Lowell, Malden, Medford, Melrose, Natick, Newton, Quincy, Reading, Revere, Somerville, Wakefield, Waltham, Watertown, Wellesley, Wilmington, and Winthrop.*

The primary residence of the virus is in birds. Mosquitos get the disease when they bite an infected bird and then can pass it on to the humans (and other birds) that they bite subsequently. If an infected bird flies to an area that does not have the disease, the whole cycle can begin anew in that area when that bird is bitten by the local unaffected mosquitos.

The mosquitos suffer no ill effects from the virus. They are the “vector” that spreads the virus, which is a threat

## Discourage Mosquitos from Breeding and Biting

- ☐ Patch any torn screens, making sure they are tightly attached to all your doors and windows.
- ☐ Wear lightweight, long sleeved shirts and pants when outdoors
- ☐ Look around outside your house for containers and other things that might collect water. Turn them over, regularly empty them, or dispose of them. Make a regular inspection of your yard after every rainfall, or if you use sprinklers, and look for any pooled water. Even a half-cup in a can be a mosquito breeding ground.
- ☐ Drill holes in the bottom of recycling bins and trash cans that are left outdoors so that water can drain out.
- ☐ Clean clogged roof gutters; remove leaves and debris that may prevent drainage of rainwater.
- ☐ Turn over plastic wading pools, play toys and wheelbarrows when not in use.
- ☐ Think about taking down birdbaths. If not, change the water in birdbaths every few days; aerate ornamental ponds or stock them with hungry fish.
- ☐ Keep swimming pools clean and properly chlorinated; remove standing water from pool covers. Ditto for outdoor grill and furniture covers.
- ☐ Use landscaping to eliminate standing water that collects on your property.
- ☐ Don't use electric bug zappers, as they kill helpful insects too. Use citronella candles instead.

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to humans as well as birds. According the Connecticut Department of Health, "The virus is maintained in the mosquito's salivary glands. During blood feeding, the virus is injected into the animal. The virus then multiplies and may cause clinical signs in a susceptible animal." The incubation period for people usually is two to six days but can be as long as 14 days.

According to Massachusetts Department of Health statistics, there were six severe cases of the disease detected in humans in Massachusetts in 2014; there were eight severe cases of the disease in 2015, and two of them died. People over sixty years old are at greatest risk of the more severe form of the disease.



*Eliminate Stagnant Water*

found in bats, cats, dogs, horses, chipmunks, squirrels, skunks, and domestic rabbits. Unlike birds, however, affected humans and other animals do not develop enough of the virus in their bloodstreams to pass it on if they are bitten by another mosquito.

70% to 80% of people who are infected with the virus feel no ill effects. Approximately 20% develop flu-like symptoms. At the other end of the spectrum, less than 1% of those infected develop debilitating paralysis and fatigue or contract life-threatening brain inflammation. Recent research revealed that the virus may also move to the kidneys over time, causing possibly fatal disease.

Although the disease has been found in humans in every month of the year, 94% of the cases occur in the span from mid-July through the end of August (according to the Centers for Disease Control).

No drugs have been shown to be effective to treat either the immediate or the long-term symptoms of West Nile Virus, so prevention is imperative. That is especially important because scientists assume that the prevalence of the disease will increase as the effects of climate begin to be felt. That's

true because higher temperatures seem to be strongly correlated with the spread of the disease.

In our region, the disease is carried by *Culex pipiens* mosquitos, which are the most common in our area, but it also occasionally occurs in other species such as *Culex restuans*, which also is found in Newton.

How does Newton try to prevent the presence of mosquitos carrying West Nile Virus? The city, working with the East Middlesex Mosquito Control Project, puts *Bacillus sphaericus*, a bacterium that is toxic to mosquito larvae but not other creatures or people, in catch basins to prevent the larvae from growing to be adults. Our lakes and ponds usually aren't treated because they're thought to have predators that will help to control the population and because they are not stagnant. (However, some small ponds and a larger kettle pond such as Crystal Lake that doesn't have the inflows and outflows that often keep lakes fresh, have areas that are very shallow and still. It might be worth investigating whether mosquitos breed at the edges of those bodies of water.)

After hearing about the great loss of bird life in my yard within a block of Crystal Lake, the officials involved with mosquito treatment in the city discussed the issue and decided that there is at least one non-functioning catch basin that has not been treated and should be treated this year. That was great news.

What more can Newton residents do to protect themselves from mosquitos? Check the box on pg. 5 for some suggestions for steps to protect yourself from mosquito bites.



*Water in Old Tire Becomes Mosquito Breeding Area*

The most important point to remember was summarized by the Cambridge Board of Public Health, "In New England, the mosquitoes that carry West Nile virus are 'container breeding' species. These mosquitos lay their eggs in still or stagnant water found in catch basins, roof gutters clogged with leaves, old tires, flower pots, bird baths, swimming pool covers, buckets, cans, barrels, and other places where water can be trapped." ■

— Beth Wilkinson

# All About Zika

The last time an infectious virus caused an epidemic of congenital defects in the United States was more than 50 years ago, when a German Measles (rubella) epidemic caused an estimated 30,000 still births and 20,000 children to be born with congenital rubella syndrome (CRS), a condition characterized by blindness, deafness and/or intellectual disabilities.

The development of a vaccine against the rubella virus the late 1960s has proved remarkably successful; in 2004 the World Health Organization verified that in the United States, rubella and CRS were eliminated. However, this past winter word came that another virus is implicated in a new outbreak of congenital birth defects. An alarming number of babies with microcephaly (abnormally small head) and other brain defects are being born in Brazil. The culprit? A bite from a common mosquito.

“It looks like Zika is inhibiting development of the brain, not just small head size, and it’s associated with stillbirths,” Peter Jay Hotez, MD, PhD, dean of the National School of Tropical Medicine at Baylor College of Medicine in Houston, told Everyday Health. “That’s why I called it the virus from hell, because it really is something terribly evil happening that’s blocking the brain of the unborn baby.”

The rubella virus is spread by casual human contact, like a sneeze. In Massachusetts, we have two mosquito-borne viruses: West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE or “Triple E”). They can cause serious illness, even death, especially in the elderly or those who are already compromised by other diseases, but fortunately such occurrences are rare. Unfortunately, it is becoming increasingly apparent that Massachusetts must brace for the arrival of a third mosquito-borne virus: Zika.

The Zika virus — named after the Zika Forest in Uganda — was first identified in Ugandan monkeys in 1947 and in people in Nigeria in 1948. For decades Zika posed little problem, occasionally causing disease in a few people in African and Asian countries. In 2007, however, a major outbreak on Yap Island in Micronesia occurred during

which approximately 75% of residents were infected. Six years later another large outbreak occurred in French Polynesia, and in April 2015, a massive outbreak was recognized in Brazil. Since then the Zika virus has been spreading quickly throughout South and Central America and the Caribbean. Optimistic at first, most researchers now concede it is only a matter of time before Zika establishes a beachhead in North America.

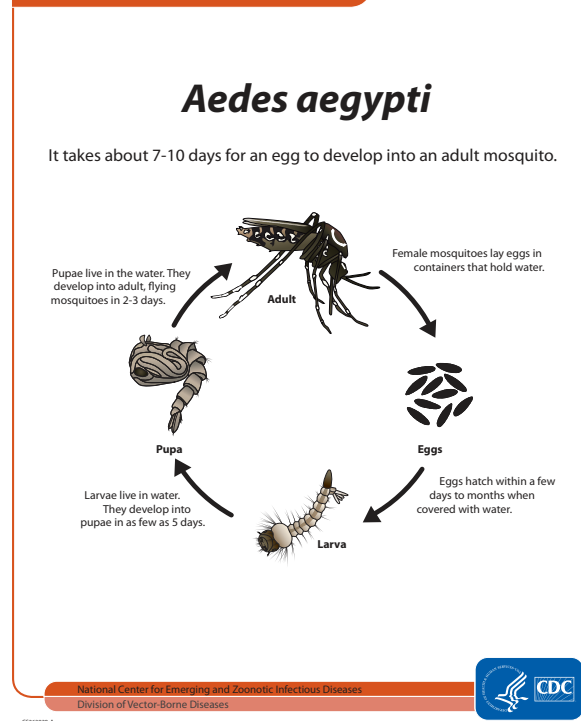
Earlier this year, researchers were minimizing the likelihood of Zika coming to the United States. The only mosquito known to transmit Zika, *Aedes aegypti*, or the yellow fever mosquito, is found in significant numbers only in the southern US (the only New England state with a recorded *Aedes aegypti* population of any

note is New Hampshire). However, they were soon forced to acknowledge that another mosquito, *Aedes albopictus*, or the Asian tiger mosquito, can also harbor the virus. *Aedes albopictus* first made its first US appearance in Houston, TX, in 1985 in a load of used tires from Asia, and by 2000 it had made its way to Massachusetts, where it’s been implicated in the spread of EEE and continues to display an affinity for used tires. *Aedes* mosquitos usually bite during the day, peaking during early morning and late afternoon/evening, so usual dawn-to-dusk protection routines are not helpful.

West Nile, which is predominantly spread by culex-species mosquitoes, made its first American appearance in the summer of 1999, when the New York City health department realized that an outbreak of a new kind of encephalitis was moving through the area. Within a month, 37 people had been identified with the same perplexing neurological syndrome, which seemed to be caused by a virus, and four had died. At the same time, veterinarians at the Bronx Zoo were encountering unusual numbers of dead birds: exotics, like flamingos, and city birds, primarily crows. The zoo vets’ concern allowed the CDC to connect the dots: West Nile virus, which was well known in Europe, but had never been seen in this country before, had arrived.

Birds, with their long flight range, bring both West Nile and EEE to mosquitos with far more limited travel range. That may be the only silver lining in the Zika pandemic.

## Mosquito life cycle



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Unlike West Nile and EEE, Zika has no known avian hosts. Instead it favors non-human primates, something we have a notable dearth of in North America. However, also unlike WNV and EEE, Zika can be transmitted by a man, even if asymptomatic, to his sexual partners. Such a case has already been documented in New Hampshire, when an out of the country traveller unwittingly brought the infection home to his female partner. It's not unreasonable to expect that other travellers will gift New England mosquitos with the virus, which some may then pass it on to other humans. There is also growing concern that Zika is implicated in the development of Guillain-Barré syndrome, an often-devastating neurological condition in children and adults.

As we go to press, the CDC is preparing to release a "blueprint for action", guidance for when the first cases of locally transmitted Zika occur in the continental United States. "We know that Zika is a completely unprecedented problem and the front-line response is going to be crucial,"

Dr. Anne Schuchat, the CDC's deputy director, told the New York Times. "The summer is starting, and the mosquitoes are coming." The CDC is not expecting an epidemic of Brazilian proportions — mostly because most homes have window screens and many have air conditioning — but officials worry that a Zika outbreak could be difficult to identify and fight because 80 percent of the people infected with the virus experience no symptoms.

In the meantime you can keep up to date by regularly checking in with the CDC <http://www.cdc.gov/zika/> and the Massachusetts Department of Health and Human Services <http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/providers/mosquito/zika-virus.html> and keep safe by implementing good mosquito control practices at home. ■

✍ Margaret Doris

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**Yellow Warbler**

*Photo by Suzette Barbier*