

Nebraska's Bad Buzz: What You Need to Know About Mosquitoes and West Nile Virus

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Mosquitoes: The Deadliest Animals on Earth

Mosquitoes are both a nuisance pest and a health pest. Mosquitoes are known as the deadliest animal on earth due to the ability of some mosquitoes to transmit diseases like malaria, dengue fever, yellow fever, encephalitis and West

Fast Facts

- West Nile virus is spread from mosquito bites that feed on infected birds.
- It is NOT spread through touching infected people or birds, but can be spread through blood transfusion, organ donation or mother to baby.
- Symptoms can vary from having no symptoms at all, to flu-like symptoms and fever, to severe neurological damage to serious fatal illness.
- There are no vaccines or medication to treat people infected with West Nile virus, so education and prevention is important.



Female *Culex* mosquito taking a blood meal.

Jim Kalisch, UNL Department of Entomology



Culex mosquitoes lay eggs in rafts on the surface of standing water.

Nile virus (WNV). Mosquitoes feed on a variety of hosts and the diseases they are able to transmit is specific to the type/species of mosquito.

Mosquitoes in Nebraska

There are 50 species of mosquitoes in Nebraska, but only half of them feed on human blood, the rest feed on other mammals, bird and reptiles. Males and females obtain nutrients from plant nectar, but female mosquitoes require blood to produce eggs.

In 2016, Zika virus was highly publicized due to the risk of birth defects and microcephaly in children born to mothers infected with Zika virus during pregnancy. All of the cases of Zika virus reported in Nebraska were attributed to travelers returning from affected areas because the particular *Aedes* mosquitoes that transmit Zika are rare.

In 2018, Nebraska had the highest number of human cases of WNV in the United States and the second most

number of deaths. The majority of cases occurring in Eastern Nebraska. WNV is spread by the *Culex* species, which are common blood feeders in the Midwest. *Culex* mosquitoes rest on structures and in vegetation during the day and come out biting at dusk and continue after dark into the morning.

WNV Mosquitoes

Culex mosquitoes lay their eggs on standing, stagnant water in irrigated fields and containers (i.e. tires, flower pots, toys, clogged gutters), and their populations and incidence of WNV are at peak levels during the fall months. Two things that lead to high incidents of WNV include:

1. **Higher-than-normal temperatures**, which speed up the mosquito life cycle, leading to a greater abundance of mosquitoes in a specific area.
2. **High rainfall**, which provides more breeding and larval habitats.

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How Do You Get WNV?

WNV is spread from infected birds to people by mosquito bites. It cannot be transmitted from person to person touching, coughing or sneezing, but it can spread through blood transfusions, organ donation and from a mother to baby. The incubation period — the time between exposure by mosquito bite and appearance of symptoms — can range from 2–14 days.

What Are the Symptoms?

The symptoms of WNV can vary:

- 80% of infected people do not develop any symptoms at all. This means numerous people have it or have had it, but did not even know.
- 20% of infected people develop mild symptoms such as fever, headache, joint pain, fatigue, swollen lymph glands, eye pain, vomiting, diarrhea, loss of appetite or rash. This is self-limiting and will resolve itself without treatment and without long-term effects.
- 1 in 150 of infected people develop a severe illness that affects the central nervous system, which includes high fever, paralysis, tremors, muscle weakness, seizures, meningitis and encephalitis. In severe cases, damage can be permanent and sometimes lethal.

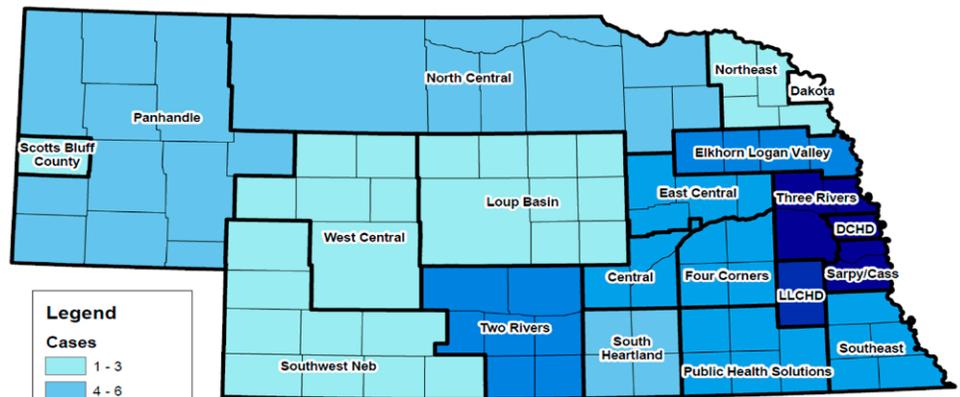
If you are experiencing any of these symptoms, see your health-care provider.

Who Is at Greatest Risk?

People who spend a great deal of time outside, especially after dusk, may be exposed to more mosquito bites, especially in August and September when mosquitoes are most active. Persons over the age of 50 and those with medical conditions (such as cancer, diabetes, hypertension, kidney disease, received an organ transplant or take medications to suppress immune system) are at greater risk of developing a severe case of WNV. There is no greater risk to children.

What Other Animals Can Be Affected?

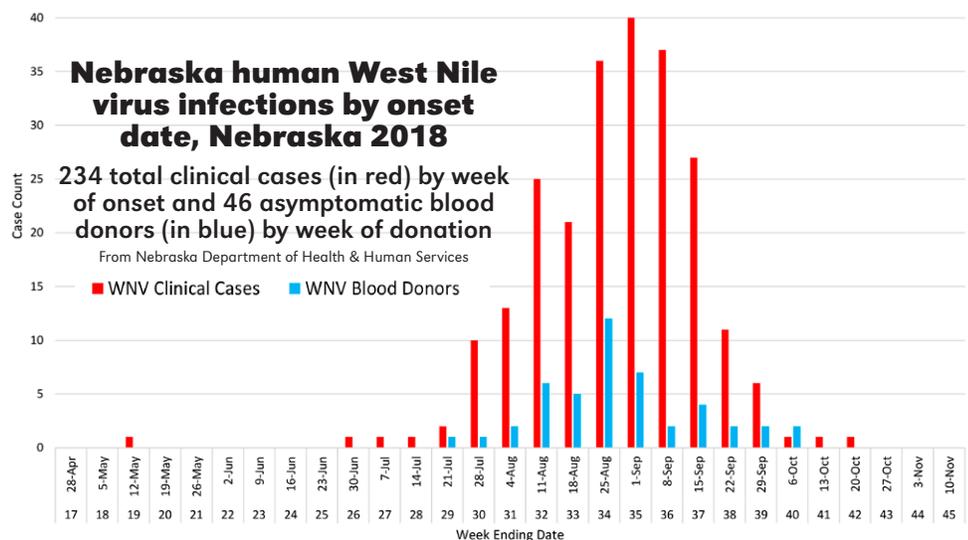
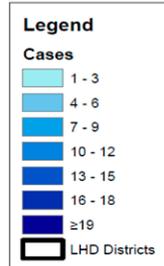
WNV primarily affects birds of over 250 species. Crows and jays are known to get sick and die from infection.



Nebraska human clinical West Nile virus cases by local health jurisdiction, 2018

235 total clinical cases in Nebraska

From Nebraska Department of Health & Human Services



Horses are another animal that can suffer a variety of symptoms, including encephalitis and death from mosquito bites.

How Long Has WNV Been Here?

Prior to 1999, WNV was not reported in the United States. Since then, it has been reported in all 48 continental states. In 2003, Nebraska recorded 1,994 cases and 27 deaths, which is the most throughout the years. In 2018, Nebraska had the highest number of cases in the United States with 245 cases and 11 deaths, which was second only to Illinois, with 16 deaths.

What Is the Treatment for WNV?

Unfortunately, there are no specific treatments like antiviral medication or licensed vaccines for WNV labeled to be used by humans. Treatment is supportive

and based on symptoms. In severe cases, hospitalization, pain reduction and nursing care is necessary.

There is an equine vaccination available, which is very effective at protecting horses from WNV. Vaccinations are typically administered to horses each spring. Contact your veterinarian for more information.

If I Have or Had WNV, Will I Be Immune?

Once a person recovers, immunity to WNV is thought to be lifelong.

How Can I Protect Myself From Mosquito Bites and WNV?

- Use effective insect repellents that have been evaluated and approved by the U.S. Environmental Protection Agency. These active ingredients include:

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Dump standing water at least once every five days so mosquito eggs do not have time to hatch into larvae. Standing water includes natural and human-made water collection sources such as livestock tanks (pictured above), toys (pictured below), tires, flower pots, etc.



Jody Green, Nebraska Extension in Lancaster County

If standing water cannot be dumped and replaced regularly, Mosquito Dunks are an organic option which use bacteria toxic only to fly larvae (which includes mosquitoes). Read label instructions. Pictured is a water pan for beneficial insects in a pollinator habitat.

DEET, Picaridin, Oil of lemon eucalyptus, IR3535. Higher percentages indicate longer-lasting protection. See related article, “Choosing the Best Bug Spray to Protect Your Family From Mosquitoes and Ticks” by Jody Green in Nebline May 2019 or online at <https://lancaster.unl.edu/pest/resources/repellents.shtml>.

- Wear long sleeves and pants outside, loose fitting is best because mosquitoes can bite through some fabric.
- Fix and repair window and door screens to keep mosquitoes out of the house.
- Avoid the outdoors during peak mosquito times such as dawn and dusk.
- Dump standing water around your home at least once every 5 days so mosquito eggs do not have time to hatch into larvae.
- If water cannot be dumped and replaced regularly (i.e. bird path, pools, small ponds), consider treating with *Bacillus thuringiensis israelensis*

(Brand name: Mosquito Dunks) which is an organic treatment that target mosquito larvae when they feed on the product.

What Are Community Agencies Doing?

Nebraska’s WNV surveillance program tests dead birds, collects mosquitoes from routine surveillance sites around the state of Nebraska, collects data from clinical positive individuals, as well as blood donors that test positive. There are maps on their website that get updated regularly.

FOR MORE INFORMATION

- Nebraska Department of Health & Human Services Public Health, <http://dhhs.ne.gov/Pages/West-Nile-Virus.aspx> (includes testing criteria for dead birds).
- Centers for Disease Control and Prevention, www.cdc.gov/westnile.