

Farmers, Chickens, and West Nile Virus



West Nile Virus (WNV) is a mosquito-borne viral illness that can manifest with varying degrees of seriousness, ranging from no symptoms or mild flu-like symptoms to brain damage and death. Infections generally occur in late summer and early fall in temperate areas such as the United States.

The WNV has become a serious public, veterinary, and wildlife health threat since it first appeared in the United States in 1999. Initially discovered in Uganda in 1937 and previously known only to exist in Africa, Asia, and the Middle East, WNV first occurred on the East Coast in New York in late summer 1999 and has since spread west to include all of the 48 contiguous states. Alaska and Hawaii are the only states that have not reported cases of WNV.

Cases of WNV have been reported in wild and exotic birds, horses, bats, small mammals, and humans. Most healthy animals appear to be able to overcome the infection with little or no apparent illness. However, there are exceptions. **Blue jays and crows** are extremely susceptible to the effects of WNV and often die. The virus can result in encephalitis, which is inflammation of the brain. **Horses** are also prone to death from the disease, but a vaccine is available for horses. Check with your vet about whether and when to vaccinate, and remember that the first vaccination must be followed by a booster about a month after the initial dose. In some areas, additional boosters may be necessary every 6–12 months; check with your vet about local recommendations.

The WNV is most commonly **transmitted by the bite of an infected mosquito**. Only female mosquitoes bite, and they do so to obtain necessary blood proteins that allow them to produce eggs. There are many types of mosquitoes that carry WNV, but the virus is often transmitted through the bites of northern (*Culex pipiens*) and southern (*Culex quinquefasciatus*) house mosquitoes that are most active at dusk and dawn. **Not every mosquito is infected**

with WNV during an outbreak. In fact, only a small percentage of the total mosquito population actually carries WNV. However, when conditions such as temperature and rainfall favor mosquito breeding, and the total population is large, there will likely be an increased number of infected mosquitoes.

Mosquitoes become exposed to the virus when they feed on birds that are infected with WNV. **Wild birds act as hosts** to WNV. Infected birds carry a large amount of the virus in their bloodstream, large enough for the virus to be passed on to mosquitoes that feed on infected birds. Once the mosquito is infected, it can pass the virus to other birds, animals, or humans when it bites them. Many animals may become infected with WNV, but most will produce too little virus to pass it on to feeding mosquitoes or to other animals. Humans and domestic chickens fall into this group and are considered “dead-end” hosts. This means humans and domestic chickens are not part of the WNV transmission cycle.

However, **anyone can become infected** and some people die each year from the disease. Approximately 80 percent of people infected will show no symptoms, while the rest will display flu-like symptoms. About 1 in 150 people infected with WNV will develop severe illness. **Table 1** lists the confirmed WNV cases and deaths in the United States and Mississippi since 1999 when WNV was first detected in the country.

Many mild cases of WNV may go undetected because symptoms are similar to the flu and those affected may not seek medical treatment. People with mild infections may experience headache, fever, body aches, swollen lymph glands, and a skin rash. Those with a more severe infection may experience neck stiffness, high fever, severe headache, stupor, disorientation, coma, tremors, convulsions, paralysis, and possibly death. Seek medical attention if any of these symptoms develop. Individuals over 50 years of age

are the most likely to develop severe illness because it is more difficult to fight off infection as our bodies age.

Chickens may also become infected with the virus; however, they have little or no symptoms. This makes the chicken a good “sentinel” animal to track WNV activity. In addition to sentinel chickens, surveillance systems for tracking WNV include tracking human and equine infections, isolation of virus from captured mosquitoes, and isolation of virus from dead or live birds in the wild (Gerry and Hom, 2004). With respect to location and time of virus transmission, **sentinel chickens provide the most accurate information** and are generally the most cost-effective method to monitor WNV activity. Studies conducted by the Centers for Disease Control have validated the use of sentinel chickens to detect WNV (Langevin, 2001), and many communities now use sentinel flocks to monitor WNV activity.

It is possible to isolate the virus for 8 days from infected chickens. Chickens develop antibodies to the virus in 5–7 days, which has been an asset to researchers in helping track the virus. However, this fact may have also caused some confusion among the general public. Researchers searching for a way to track the spread of the virus when it was first detected in the United States chose chickens because they developed antibodies, would not become ill from the infection, would not become a source of future infection, and were easy to handle. However, because several types of chickens were used as sentinels, many people began to associate the virus with chickens and believe that chickens were the source of WNV (Beyer, 2003).

The truth is that infected mosquitoes are the source of WNV, and **you cannot catch West Nile Virus from chickens**. Infected mosquitoes transmit the virus to birds, but there is no evidence that direct transmission from birds to humans can occur. In addition, infected chickens housed with uninfected chickens have not transmitted the virus.

Most small backyard flocks are allowed access to the outdoors, making it practically impossible to eliminate their exposure to mosquitoes. Therefore, you should attempt to control mosquito populations near the area where chickens are housed by eliminating unnecessary standing

water. Eggs and meat from backyard flocks are safe to eat as long as birds are healthy and proper cooking procedures are followed. Commercial chickens are produced indoors, which limits the risk of WNV in commercial flocks.

There is **no treatment for WNV in chickens**. Viruses are often left to run their course because of their difficulty to treat. However, some hobby and small backyard flock owners may temporarily give a broad spectrum antibiotic if they suspect a problem. This may prevent opportunistic bacteria from taking advantage of the birds’ compromised health state. If you choose to take this route, follow label directions carefully, and consult your agricultural supply dealer or county agent for guidelines on the proper use of antibiotics in your flocks. Turkeys show a response similar to chickens—they can become infected but show little or no effect of the virus and are not considered a significant source of virus.

Farmers may be at greater risk to WNV than the general population because they often start early and work late and are outside when mosquitoes are most active. However, there are **steps you can take to protect yourself and your chickens** from WNV. The easiest and best way to avoid WNV is to prevent mosquito bites.

- If you must be outside when mosquitoes are active, wear protective clothing and use insect repellents that contain an EPA-registered insect repellent. Follow label directions.
- Make sure doors and windows have screens adequate to keep mosquitoes out.
- If possible, avoid being outside when mosquitoes are seeking blood; for many species, this is during the dusk and dawn hours.
- Good drainage is important; get rid of standing water in buckets, barrels, and flower pots. Frequently change the water in pet dishes. Cut out the bottom or drill holes in tire swings to prevent standing water. Make sure ditches or low areas on your property do not hold standing water.
- Stock small ponds with fish to consume mosquito larvae.

Table 1. West Nile Virus cases and deaths in the U.S. and Mississippi since 1999.

Year	United States		Mississippi	
	Cases	Deaths	Cases	Deaths
1999	62	7	0	0
2000	21	2	0	0
2001	66	9	0	0
2002	4,156	284	192	12
2003	9,862	264	83	2
2004	2,539	100	28	4
2005	3,000	119	70	6
2006	4,269	177	184	14
2007	3,630	124	136	4
2008	1,356	44	65	3
2009	720	32	53	5
2010	1,021	57	8	0
2011	712	43	52	5
2012*	5,245	236	245	5
TOTAL	36659	1498	1116	60

*Data is through November 27, 2012.

In conclusion, people cannot catch West Nile Virus from chickens. In addition, chickens that become infected recover with little or no symptoms. They pose no risk of infection to humans or other poultry. The virus is most commonly spread through the bite of an infected mosquito; however, the Centers for Disease Control and Prevention have reported that, in a very small number of cases, WNV has also been spread through blood transfusions, organ transplants, breastfeeding, and during pregnancy from mother to baby. However, you cannot contract WNV by donating blood or through direct contact with an animal or person that has the virus. There is no specific treatment for WNV infection in humans or chickens. Therefore, focus on prevention by taking steps that will limit the risk of mosquito bites.

References

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