



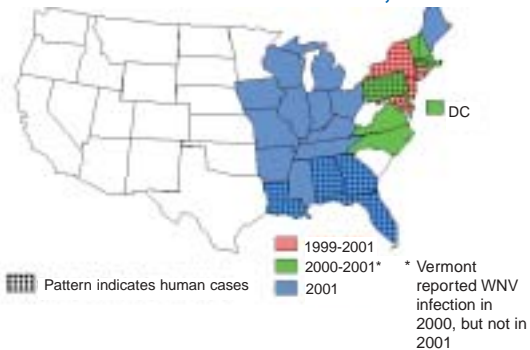
# WEST NILE VIRUS

DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention

# West Nile Virus

West Nile virus was first recognized in the United States in 1999 as the cause of severe and fatal human illness in metropolitan New York City. West Nile virus is commonly found in Africa, West and Central Asia, and the Middle East. It is not known how the virus was first introduced into the United States, but since the initial appearance it has spread rapidly, and by 2001 was found throughout the eastern half of the country.

## West Nile Virus in the United States, 1999-2001



## How is West Nile virus transmitted?

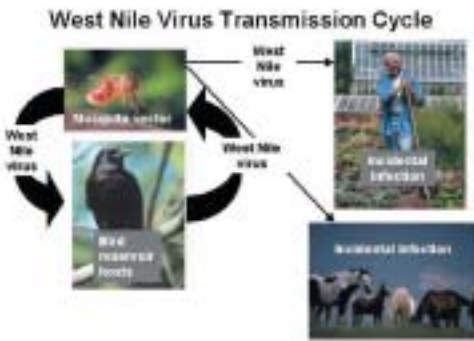
The principal transmission cycle of West Nile virus involves several species of mosquitoes and various species of birds. Mosquitoes become infected with West Nile virus when they feed on a bird carrying the virus in its blood. After 10 to 14 days, the virus can be transmitted to another bird, person, or other animal that the mosquito bites. During blood feeding the mosquito injects the virus, contained in its saliva, into the bird, animal, or person – where the virus replicates and may cause illness.

**See the CDC West Nile virus Web site for updated informaton:**

<http://www.cdc.gov/ncidod/dvbid/westnile/>

Although humans and some other animals may get sick when infected with West Nile virus, it is thought that they usually do not develop enough virus in the bloodstream to infect mosquitoes. For this reason, humans and animals such as horses are referred to as incidental hosts. **West Nile virus is not spread from person to person.**

The main role that people play in contributing to the continuing cycle of West Nile virus is by maintaining environments (especially standing water) in which mosquitoes can lay eggs.



## What are the symptoms of West Nile virus infection?

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Most people who are infected with West Nile virus will not develop symptoms. Some people may become ill 3 to 15 days after the bite of an infected mosquito. Evidence suggests that a minority of infected persons will develop a mild illness with fever, headache, body aches, and sometimes skin rash and swollen glands. There are no known long-term effects due to mild illness.

West Nile virus infection infrequently results in a severe illness, however, known as West Nile encephalitis. Encephalitis is an inflammation of the brain that may be marked by headache, high fever, stiff neck, stupor, disorientation, coma, tremors, convulsions, muscle weakness, and paralysis. A small number of cases have been fatal.

## Who is at risk for West Nile virus infection?

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People are only at risk for becoming infected with West Nile virus when in areas where the virus is circulating in nature. In northern states, this is during the summer months, but in southern states transmission may occur year-round. The risk of West Nile encephalitis (the severe form of disease) is higher for persons 50 years of age and older.

Even in areas where West Nile virus transmission is occurring, infection of humans is still relatively rare. A study carried out in 1999 among residents in the most affected areas of New York City showed that 2.6% had been infected with West Nile virus. Studies elsewhere have shown a lower infection rate. As noted earlier, most infected persons have no or only mild symptoms.

There is no documented evidence that a pregnancy is at risk due to a mother's infection with West Nile virus.

## How is West Nile virus infection treated?

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No specific therapy is available for infection with West Nile virus. In the case of West Nile encephalitis, intensive supportive therapy may be required—such as hospitalization, intravenous fluids, respiratory support (ventilator), prevention of secondary infections (such as pneumonia, urinary tract infections, etc.) and good nursing care.

**Persons with severe or unusual headaches should seek medical attention as soon as possible.**

## Prevention & Control

### What can we do to prevent West Nile infection?

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#### Personal and Household Prevention

##### *Avoid mosquito bites*

- Apply insect repellent to exposed skin when you go outdoors. The most effective repellents contain DEET (N,N-diethyl-m-toluamide). The more DEET a repellent contains, the longer time it gives protection from mosquito bites. DEET concentrations higher than 50% do not increase the length of protection.
- Use care in applying repellent to children: don't put repellent on their hands, and be careful to avoid their mouths and eyes. Products containing 10% or less DEET are the most appropriate for children aged 2 – 12 years.
- Whenever possible, wear protective clothing such as long sleeves, long pants, and socks while outdoors.
- Spray clothing with repellents containing DEET or permethrin, because mosquitoes may bite through thin clothing.
- Consider staying indoors between dusk and dawn, which is peak mosquito biting time. Avoid activities in areas where mosquitoes are plentiful.
- Fix or install window and door screens to keep mosquitoes out of buildings.

**Always read and follow the product directions when using any insect repellent or insecticide!**

For more information on safe repellent use, visit the CDC West Nile virus Web site.

<http://www.cdc.gov/westnile>

For more information on DEET and other pesticides, see the Web site of the **Environmental Protection Agency** (<http://www.epa.gov/pesticides/>) or the **National Pesticide Information Center** (NPIC) (<http://npic.orst.edu/>), phone: 1-800-858-7378, 6:30 a.m. to 4:30 p.m. Pacific time, 7 days/week, except holidays.

### ***Avoid breeding mosquitoes***

Mosquitoes lay their eggs in standing water. To avoid helping mosquitoes breed in your environment, drain standing water.

Routinely empty water from flower

pots, pet bowls, clogged rain gutters, swimming pool covers, discarded tires, buckets, barrels, cans, and other items that collect water in which mosquitoes can lay eggs.



### **Community Prevention**

#### ***Watch for mosquito-breeding areas***

Alert local health authorities to potential mosquito breeding sites in your area, such as storm sewers, ditches, and abandoned properties with standing water.

#### ***Support disease-tracking activities***

Since 1999, federal, state and local governments have been tracking the occurrence of West Nile virus infections in birds, mosquitoes, horses, and people. This tracking relies in part on people reporting dead and dying birds and horses that are suspected of being infected with West Nile virus. Each state or territory collects and reports this information to CDC. CDC, in collaboration with the U.S. Geological Survey, maintains

up-to-date maps detailing the distribution and spread of West Nile virus. These can be seen at: [http://cindi.usgs.gov/hazard/event/west\\_nile/west\\_nile.html](http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html)

**Report dead or dying birds** to your state health department. Avoid touching dead birds, or any dead animal, with your bare hands. Use gloves or an inverted plastic bag to place the carcass in a plastic bag. As policies may vary, ask your state or local health department about their requirements for submitting specimens for testing.



Local governments may make use of other resources, such as “larvicides” (chemicals that kill immature mosquitoes) applied to standing water where mosquitoes breed, or “adulticides” (chemicals that kill adult mosquitoes) to control mosquito populations in an area, especially if people have been infected. Check with your local health department or local government for more information about programs to control disease-carrying mosquitoes in your area.

### **For more information:**

Centers for Disease Control and Prevention (CDC)  
National Center for Infectious Diseases  
Division of Vector-Borne Infectious Diseases  
PO Box 2087  
Fort Collins, CO 80522  
Fax: 970-221-6476  
Email: [dvbid@cdc.gov](mailto:dvbid@cdc.gov)  
Web site: <http://www.cdc.gov/ncidod/dvbid/>  
CDC Voice and Fax Information Service:  
1-888-232-3228