

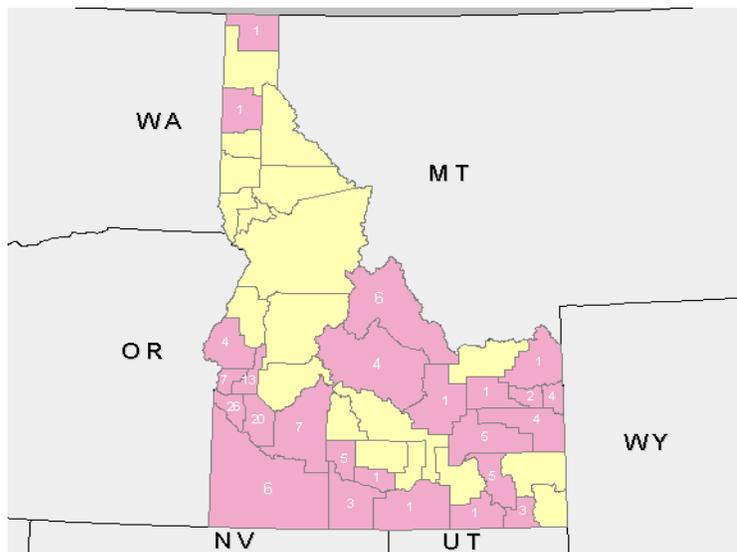
## West Nile Virus

West Nile Virus is a flavivirus commonly found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus found in the United States. The virus can infect humans, birds, mosquitoes, horses and some other mammals.

West Nile Virus was first discovered in the United States in 1999.

West Nile fever is a case of mild disease in people, characterized by flu-like symptoms. West Nile fever typically lasts only a few days and does not appear to cause any long-term health effects. West Nile Virus is transmitted through the bite of an infected mosquito.

More severe disease due to a person being infected with this virus can be “West Nile encephalitis, West Nile meningitis or West Nile meningoencephalitis.” Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.



2007 Positive human cases by county

### Geographic Distribution and Distribution History

- First isolated in the West Nile District of Uganda in 1937
- Emerged in Egypt and Israel in the 1950s
- Before 1999, was endemic in Africa, the Middle East, Europe, and India
- Recent expansion in the Western Hemisphere in 1999
- Since 1999, has now moved into the Caribbean Islands and Central America

### Host Range

#### Natural Vertebrate Hosts

1. Humans
  - a. develop infection
  - b. dead-end host only
2. Domestic Animals
  - a. Horses develop infection but are dead-end hosts only
  - b. Evidence suggests that domestic animals do not serve as amplifying hosts
  - c. Canines and felines do not become infected (there are very rare occurrences)

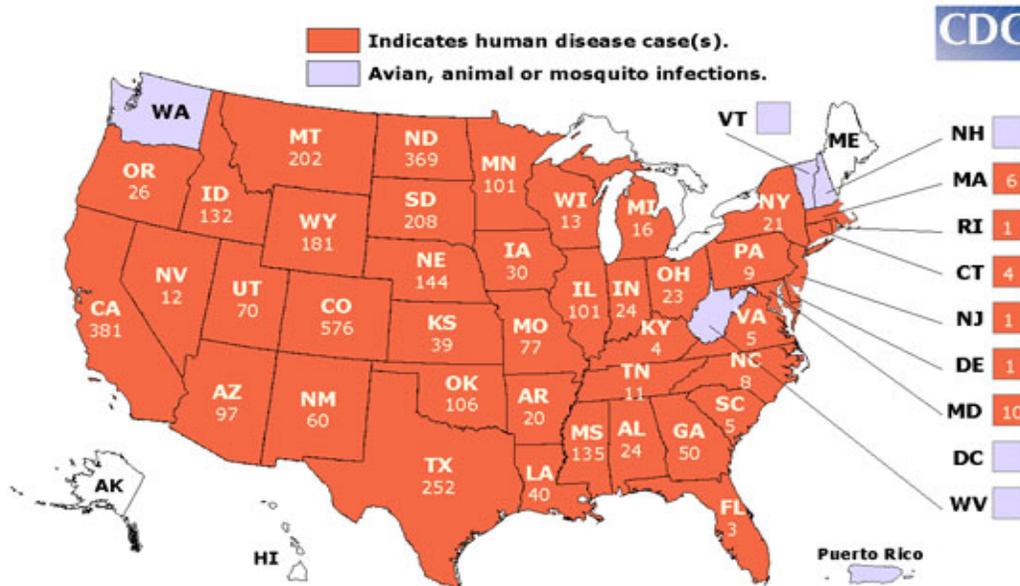
3. wild animals
  - a. birds and mammals
    - i. wild birds and waterfowl serve as the primary amplifying hosts and are very important in the transmission of WNV
      1. migrating fowl are suspected in causing rapid spread of virus from endemic areas
    - ii. it is unknown if cotton tail rabbits and other small mammals serve as amplifying hosts

### **Disease manifestation**

1. Humans
  - a. Mild febrile illness, aseptic meningitis, or visceral inflammation, or, most importantly, acute meningoencephalitis
  - b. Case fatality rate: < 1%
  - c. Approx. 80% of people do not show symptoms
  - d. Severe meningitis or encephalitis in elderly patients
  - e. Very few cases show neuropsychiatric sequelae
  - f. Incubation period of 1 – 6 days
2. Domestic Animals
  - a. Approx. 40% of infected horses result in death from fatal encephalitis
  - b. Domestic pets such as dogs and cats do not develop extensive illness
    - i. Evidence shows that dogs and cats do become infected, the disease does not develop encephalitis
3. Wildlife
  - a. At least 138 species of birds can show infection
    - i. Birds in the family Corvidae (crows and jays) show severe disease or death when infected
  - b. Bats, chipmunks, skunks, squirrels, and rabbits become infected but it is unknown whether the infection has an impact on the animals

### **Ecology**

1. Natural vectors
  - a. WNV has been isolated from 43 mosquito species in the U.S.
  - b. WNV has been isolated from many *Culex* species
    - i. Of the *Culex* species and all possible mosquito vectors, the most important vectors are *Cx. Pipiens* (Eastern U.S.) and *Cx. Tarsalis* (Western U.S.)
  - c. WNV has been isolated from many *Aedes* and *Ochlerotatus* species
    - i. *Ae. albopictus*, *Ae. vexans*, *Oc. trivittatus*, *Oc. triseriatus* and many others
  - d. WNV has been isolated from some *Anopheles* species
    - i. *An. punctipennis*, *An. walkeri*, and *An. quadrimaculatus*
2. Reservoir Hosts
  - a. Wild birds and waterfowl serve as the primary amplifying hosts and are very important in the transmission of WNV
3. Basic Transmission Cycle
  - a. WNV is amplified in the blood systems of wild bird species
  - b. Mosquito vector becomes infected by feeding on birds that have viremia
  - c. *Culex* species are amplifying vectors as they transmit virus from one bird to another
  - d. *Aedes* and *Ochlerotatus* serve as bridge vectors since they will feed on both avian and mammalian hosts



2007 Cases by state

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