

Explained: What is the West Nile Virus, how does it spread?

The West Nile Virus is a mosquito-borne, single-stranded RNA virus. According to the WHO, it is “a member of the flavivirus genus and belongs to the Japanese Encephalitis antigenic complex of the family Flaviviridae”.



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Updated: May 31, 2022 6:08:13 am



The virus was first reported in the state in Alappuzha in 2006 and then in Ernakulam in 2011. (Representational)

The Kerala health department is on alert after the **death of a 47-year-old from Thrissur due to the West Nile Virus**. Earlier in 2019, a six-year-old boy in Malappuram district had died of the same infection. The virus was first reported in the state in Alappuzha in 2006 and then in Ernakulam in 2011. What is the West Nile Virus and how does it spread?

The virus, its transmission

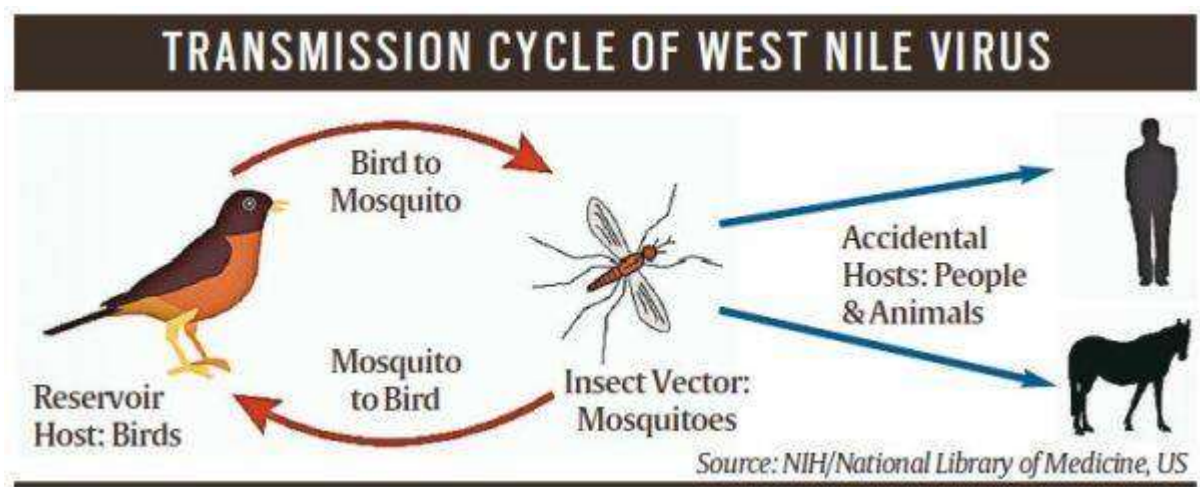
The West Nile Virus is a mosquito-borne, single-stranded RNA virus. It is a flavivirus related to the viruses that cause St. Louis encephalitis, Japanese encephalitis, and yellow fever.

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Culex species of mosquitoes act as the principal vectors for transmission. It is transmitted by infected mosquitoes between and among humans and animals, including birds, which are the reservoir host of the virus.

“Mosquitoes become infected when they feed on infected birds, which circulate the virus in their blood for a few days. The virus eventually gets into the mosquito’s salivary glands. During later blood meals (when mosquitoes bite), the virus may be injected into humans and animals, where it can multiply and possibly cause illness,” says the WHO.

WNV can also spread through blood transfusion, from an infected mother to her child, or through exposure to the virus in laboratories. It is not known to spread by contact with infected humans or animals.



According to the US Centre for Disease Control and Prevention (CDC), it does not spread “through eating infected animals, including birds. Always follow instructions for fully cooking meat”.

The CDC notes that the incubation period for WNV disease is typically 2 to 6 days, but can range from 2 to 14 days, and can be several weeks in immunocompromised people.

To date, no human-to-human transmission of WNV through casual contact has been documented, says the WHO.

Symptoms

The disease is asymptomatic in 80% of the infected people. The rest develop what is called the West Nile fever or severe West Nile disease.

In these 20% cases, the symptoms include fever, headache, fatigue, body aches, nausea, rash, and swollen glands.

Severe infection can lead to neuroinvasive disease such as West Nile encephalitis or meningitis or West Nile poliomyelitis or acute flaccid paralysis. WNV-associated Guillain-Barré syndrome and radiculopathy have also been reported.

“It is estimated that approximately 1 in 150 persons infected with the West Nile Virus will develop a more severe form of disease.... Recovery from severe illness might take several weeks or months. Some effects to the central nervous system might be permanent,” says the CDC.

It usually turns fatal in persons with co-morbidities and immuno-compromised persons (such as transplant patients).

Detection of WNV

The virus was first isolated in a woman in the West Nile district of Uganda in 1937. It was identified in birds (crows and columbiformes like doves and pigeons) in the Nile delta region in 1953. Before 1997, WNV was not considered pathogenic for birds, but then, a more virulent strain caused the death in Israel of different bird species, presenting signs of encephalitis and paralysis.

In 1999, a WNV strain, believed to be one circulating in Israel and Tunisia, reached New York producing a large outbreak that spread across the United States and eventually across the Americas, from Canada to Venezuela.

According to the WHO, human infections attributable to WNV have been reported in many countries in the world for over 50 years.

WNV outbreak sites are found along major bird migratory routes.

Today, the virus is found commonly in Africa, Europe, the Middle East, North America, and West Asia.

WNV in India

In India, antibodies against WNV were first detected in humans in Mumbai in 1952 and virus activity has since been reported in southern, central, and western India. WNV has been isolated in India from *Culex vishnui* mosquitoes in Andhra Pradesh and Tamil Nadu, from *Culex quinquefasciatus* mosquitoes in Maharashtra, and from humans in Karnataka.

Febrile illness and encephalitis cases in epidemic form were observed in Udaipur district of Rajasthan, Buldhana, Marathwada and Khandesh districts of Maharashtra.

Further, human sera collected from Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Madhya Pradesh, Odisha, Rajasthan and Assam has shown presence of WNV neutralising antibodies.

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Serologically confirmed cases of WNV infections were reported from Vellore and Kolar districts during 1977, 1978 and 1981, and in West Bengal in 2017.

In 2013, the complete genome sequence of WNV was isolated from human samples during an acute encephalitis outbreak in Kerala between May and June 2011.

A 2011 study in India had “clearly established” the association of WNV with ocular infection in Tamil Nadu during an epidemic of mysterious fever in the first half of 2010.

Preventive measures

In most countries, the peak for WNV infections generally coincides with the period when mosquito vectors are most active and the ambient temperature is sufficiently high for virus multiplication. Since WNV outbreaks in animals precede human cases, the establishment of an active animal health surveillance system to detect new cases in birds and horses is considered essential in providing early warning for veterinary and human public health authorities.

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The European Centre for Disease Control and Prevention (ECDC) has also often suggested in its annual epidemiological report that to prevent blood transfusion-transmitted WNV infections during the active virus transmission period. It is advised that “EU/EEA countries should implement 28-day blood donor deferral or nucleic acid testing of prospective donors who have visited or lived in an affected area” and similarly, donors of organs, tissues and cells living in or returning from an affected area should be tested for WNV infection.

Treatment

No WNV-specific prophylaxis, treatment or vaccine is available. So, only supportive treatments are given to neuroinvasive WNV patients. Health authorities globally advice for personal protective measures to reduce the risk of mosquito bites such as using mosquito repellents, and for public health departments to ensure larval source reduction especially at breeding and resting sites for the mosquito vectors.



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