



## West Nile Virus

**For Prelims:** West Nile Virus, Flavivirus, Transmission cycle of West Nile Virus, WHO

**For Mains:** Prevention and Control of virus-associated diseases

### Why in News?

Recently, a 47-year-old man in Thrissur, Kerala died due to [West Nile Virus \(WNV\)](#). This has caused the Kerala health department to be on alert.

- Malappuram's 6-year-old boy also died of the same infection, earlier in 2019.
- WNV was **first reported in the state of Alappuzha in 2006**. Later in 2011, it was also reported in Ernakulam, Kerala.

### What is WNV?

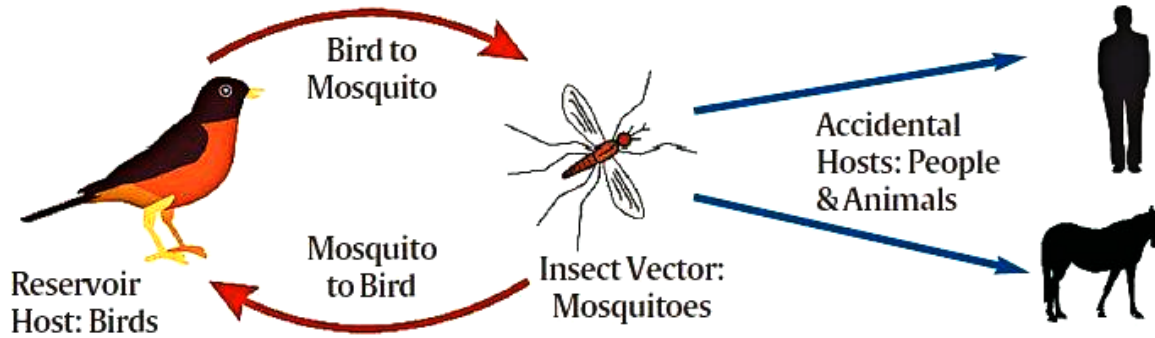
- **About:**
  - The West Nile Virus is a **flavivirus related to the viruses** that are also **responsible for causing St. Louis encephalitis, Japanese encephalitis, and yellow fever**.
  - It is a **mosquito-borne, single-stranded RNA virus**.
- **Global Prevalence:**
  - **Along all major bird migratory routes**, WNV outbreak sites are found.
  - **Africa, Europe, the Middle East, North America, and West Asia** are the regions where the virus is commonly found.
  - Usually, WNV **infections peak during the period when mosquito vectors are most active and the ambient temperature is high** enough for virus multiplication for most of the countries.
- **Prevalence in India:**
  - In Mumbai in the year 1952, the **antibodies against WNV were first detected in humans**.
  - Since then, the virus activity has been reported in **southern, central, and western India**.
  - In **Andhra Pradesh and Tamil Nadu**, WNV was isolated from **Culex vishnui mosquitoes**.
  - **In Maharashtra**, it was isolated from **Culex quinquefasciatus mosquitoes**.
  - **In Karnataka**, it has been isolated from **humans**.
  - Further, WNV neutralizing antibodies were found to be present in human serum collected from **Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Madhya Pradesh, Odisha, Rajasthan and Assam**.
  - In **1977, 1978 and 1981**, serologically confirmed cases of WNV infections were reported in **Vellore and Kolar districts**, and in **West Bengal in 2017**.
  - During an **acute encephalitis outbreak in Kerala**, the complete [genome sequence of WNV](#) was isolated in 2013.
  - The **association of WNV with eye infection in Tamil Nadu** had been clearly established

during an **epidemic of mysterious fever in the first half of 2010.**

▪ **Origin:**

- WNV was first isolated in a woman in the **West Nile district of Uganda in 1937.**
- It was **identified in birds** in the Nile delta region **in 1953.** Before 1997, WNV was not considered pathogenic for birds.
- **Human infections** attributable to WNV have been **reported in many countries for over 50 years.**

## TRANSMISSION CYCLE OF WEST NILE VIRUS



▪ **Transmission Cycle:**

- **Principal vector** for transmission is the **culex species of mosquitoes.**
- **Birds** act as the **reservoir host** of the virus.
- Infected mosquitoes **transmit WNV between and among humans and animals, including birds.**
- When a **mosquito feeds on infected birds**, they become **infected.**
- The **virus circulates in the blood** of those infected mosquitoes for a **few days, eventually getting into the mosquito's salivary glands.**
- The virus **may get injected into humans and animals during later blood meals (when mosquito bites).** Therein, WNV can **multiply and possibly cause illness.**
- WNV can also get transmitted from an **infected mother to her child through blood transfusion** or via exposure to the virus in laboratories.
- **No instance of transmission by contact with infected humans or animals** has been reported.
- It **does not spread "through eating infected animals, including birds.**
- Generally, **the incubation period for WNV disease is 2-6 days.** However, this **may range from 2-14 days**, and can also be **several weeks in people whose immunity is compromised.**
- According to the [World Health Organization \(WHO\)](#), **no human-to-human transmission of WNV through casual contact has been reported till date.**

▪ **Symptoms:**

- **In 80%** of the infected people, the disease is **asymptomatic.**
- In the rest of the **20% cases, West Nile fever or severe WNV is observed with symptoms such as fever, headache, fatigue, body aches, nausea, rash, and swollen glands.**
- Severe infection may even cause **neurological diseases** like West Nile encephalitis or meningitis or West Nile poliomyelitis or acute flaccid paralysis.
- Also, there are reports of **WNV-associated Guillain-Barré syndrome** and radiculopathy.
- Around **1 in 150 individuals** with WNS is likely to develop a more **severe form of disease.**
- It may take **several weeks or months to recover from severe illness.**
- **Nervous system damage can last forever.**
- In persons with **co-morbidities and immuno-compromised persons** (such as transplant patients), the disease may turn out to be **fatal.**

▪ **Measures of Prevention:**

- The establishment of **an active animal health surveillance system** to detect new cases in birds and horses should be essentially established.
- As WNV outbreaks in animals precede human cases, it is necessary to **provide early warning for veterinary and human public health authorities.**
- The **European Centre for Disease Control and Prevention (ECDC)** has suggested that **28-day blood donor deferral or nucleic acid testing of prospective donors** who have visited or lived in an affected area should be implemented by the [European Union \(EU\)](#).
- Besides, **testing for WNV infection must be done for the donors of organs, tissues and cells, who are living in or returning from an affected area.**
- **Treatment:**
  - As of now, **no treatment/vaccine for WNV is available.**
  - Only supportive treatments can be provided to neuroinvasive WNV patients.

## UPSC Civil Services Examination, Previous Year Question

### Q. Consider the following statements: (2017)

1. In tropical regions, Zika virus disease is transmitted by the same mosquito that transmits dengue.
2. Sexual transmission of Zika virus disease is possible.

### Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Ans: (c)**

**Exp:**

- **Zika virus is a flavivirus** which was first discovered in 1947 in monkeys and then in humans in Uganda in 1952.
- Both Zika and Dengue have similarities in terms of symptoms of fever, skin rashes, conjunctivitis, muscle and joint pain, malaise, and headache. In addition to this, **the mode of transmission is also same for both the diseases, i.e., both are spread by Aedes aegypti and Aedes albopictus species of mosquitoes. Hence, statement 1 is correct.**
- **Modes of Zika Transmission:**
  - **Mosquito bites**
  - **From mother to child during pregnancy**, which can cause microcephaly and other severe fetal brain defects. Zika virus has also been found in breast milk.
  - **Sexual transmission** from infected partner. Hence, statement 2 is correct.
  - **Through blood transfusion.**
- **Therefore, option (c) is the correct answer.**

**Source: IE**