EcoSurv

West Nile Fever (WNF)

Category: MIGRATORY BIRDS

What It Is:

West Nile Fever (WNF) is a **viral zoonosis transmitted by mosquitoes**, caused by the West Nile virus (WNV), a member of the Flaviviridae family. This RNA virus, part of the Japanese encephalitis serogroup, has a marked tropism for the nervous system and **can infect both humans and various animal species**.

WNF is **a disease of significant importance** both for public health and the veterinary sector, due to its impact on ecosystems, its potential effects on human and animal health, and its **global distribution**.

Categories

MIGRATORY BIRDS

RESIDENT BIRDS

MOSQUITOES CULEX

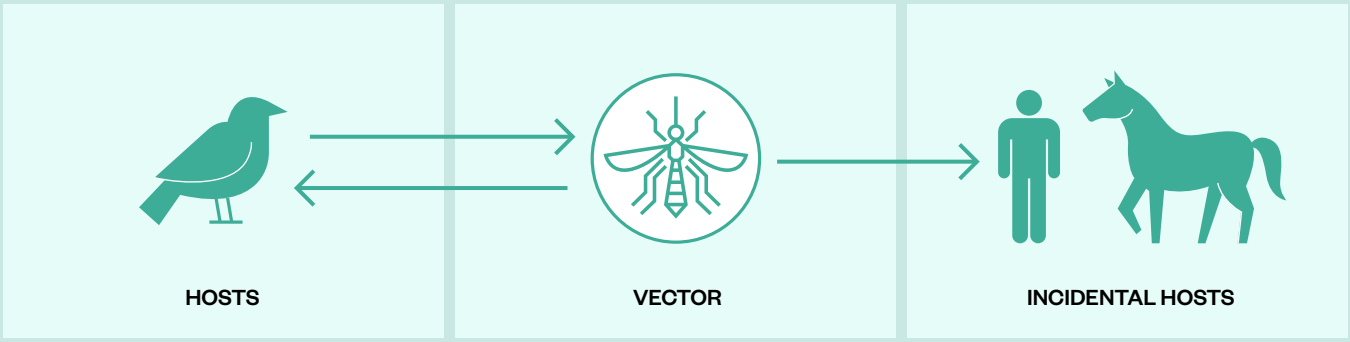
The host range of West Nile virus (WNV) is broad and includes various vertebrate species, such as **mammals, birds, and reptiles**.
Birds and mosquitoes of the genus *Culex* are the primary reservoirs of the virus. Some bird species, including those from the orders Passeriformes (sparrows, starlings, magpies, and crows), Charadriiformes (gulls, terns, snipe, and lapwings), and Strigiformes, develop **high and persistent viraemia,** acting as amplifying hosts that contribute to the persistence of the virus in endemic areas and its geographical expansion.

Origin and Transmission

The West Nile virus (WNV) is maintained in nature through an endemic **cycle between ornithophilic mosquitoes and birds**, which serve as **reservoir hosts**. Mosquitoes become infected by feeding on viremic birds and, after viral replication in their salivary glands, they can transmit the virus to other hosts. The mosquito species most involved in vector transmission belong to the ***Culex* genus**: *Culex modestus* and *Culex pipiens*.

The epidemic cycle occurs when **mosquitoes infect incidental** (or "dead-end") hosts, such as **humans and equids**, which do not develop sufficient viraemia to transmit the virus to other mosquitoes.

Rarely, WNV **can be transmitted between humans** through infected blood transfusions, organ transplants, and, in isolated cases, during pregnancy, breastfeeding, or as a result of laboratory exposure.



Symptoms and Impacts

ANIMALS	HUMANS
BIRDS: The infection is often **asymptomatic** or subclinical. In rare cases, it can cause fatal neurological symptoms within 24 hours of onset. Affected birds exhibit neurological deficits, with signs such as limb paralysis, incoordination, and reluctance to move. High mortality in crows and other birds has been observed in the United States of America after the introduction of the infection in 1999. **EQUIDS:** The disease may present as **asymptomatic, benign** (flu-like), **or neuroinvasive** forms. Approximately 10% of equids develop clinical symptoms after an incubation period of 3-15 days, including fever and/or neurological symptoms such as ataxia, paralysis, tremors, muscle rigidity, and weakness. In **mild forms, recovery** occurs within 5-15 days, while in neurological cases, 22-45% of animals die or are euthanised. Among survivors, 10-20% may develop permanent neurological deficits.	In humans, West Nile disease has an incubation period of approximately 2-14 days, and **symptoms can range from mild to severe**. It is **usually asymptomatic or presents with flu-like symptoms** (such as fever, headache, muscle aches, nausea, diarrhoea, skin rashes). In 1% of cases, especially in elderly or immunocompromised individuals, the infection can progress to the neuroinvasive form, causing severe neurological complications such as meningitis, encephalitis, or poliomyelitis, which can sometimes be fatal or result in permanent sequelae.

Geographical Distribution

The West Nile virus is one of the **most widespread** zoonotic flaviviruses transmitted by mosquitoes worldwide. Initially identified in Uganda in 1937, it later caused **outbreaks in Asia, Europe,** and **Australia**. In 1999, it appeared in the United States, initially causing deaths among birds, horses, and humans in the New York area, and later spreading across the entire North American continent.
In Europe and the Mediterranean area, the virus was originally reported in France, Portugal, Spain, Cyprus, and Russia from the 1960s, and gradually spread to central and southeastern regions. In the last 15 years, it has been reported in Bulgaria, Greece, Albania, Macedonia, Croatia, Serbia, and Kosovo, with cases observed in Germany in 2019 and in the Netherlands in 2020.

In Italy, the virus was first detected in horses in 1998 and in humans in 2008. Since then, it has been **reported annually during the mosquito season.** Until 2004, only WNV Lineage 1 circulated in Europe, associated with sporadic outbreaks. Subsequently, Lineage 2 emerged, and is now predominant on the continent. In recent decades, cases have increased, with **documented viral circulation in about 20 European countries.**

Preventive Measures

In endemic countries, the primary objective for protecting public health is to **detect viral circulation early** in order to apply the necessary mitigation measures. For humans, preventive measures include **diagnostic screening** of blood and blood products in transfusion centres and of organs and tissues in transplant centres located in provinces with documented viral circulation.
Regarding the disease in equids in Europe, **two vaccines for horses** have been authorised: an inactivated vaccine and a chimeric vaccine, both of which can be administered from 6 months of age.

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Project coordinated by: Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise "G. Caporale"
Project Partners: Ministero della Salute, Istituto Zooprofilattico Sperimentale delle Venezie, Istituto Superiore di Sanità

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) onlyand do not necessarily reflect those of the European Union, the European Commission or European Health and Digital Executive Agency (HADEA). Neither the European Union nor the granting authority can be held responsible for them.

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