MONTHLY SCIENTIFIC REVIEW
ON WEST NILE VIRUS

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Situation at a glance

- West Nile fever (or West Nile disease) is an infectious disease caused by an arbovirus, the West Nile virus (WNV).
- From the beginning of the year to September 10, 2025, 10 European countries reported human cases of WNV infection: Albania, Bulgaria, France, Greece, Hungary, Italy, Romania, Serbia, Spain, and Türkiye.
- As of September 15, 2025, 36 locally acquired cases of WNV infection had been recorded in mainland France (Provence-Alpes-Côte d'Azur, Île-de-France, Occitanie, and Auvergne-Rhône-Alpes).
- The number of reported cases in France in previous years was 38 in 2024, 39 in 2023, 6 in 2022, and none in 2021.

Scientific articles

This section presents relevant articles published on peer-reviewed scientific journals or pre-print platforms.

2025-08-02

The impact of climate change on transmission season length: West Nile virus as a case study.

Journal: bioRxiv

Authors: R L Fay, C K Glidden, A T Ciota, E A Mordecai

The study found that in New York State, the West Nile virus (WNV) transmission season has extended by an average of 24.8 days over the past 25 years, with earlier starts and later ends, due to rising temperatures. Longer seasons correlate with increased WNV prevalence in both mosquitoes and humans, indicating that climate change is altering the epidemiology of this vector-borne disease.

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2025-07-01

Healthcare Provider Knowledge of West Nile Virus Diagnostic Testing-United States, 2022.

Journal: Open Forum Infect Dis

Authors: Shelby L Lyons, Stacey W Martin, Carolyn V Gould, J Erin Staples

Our survey of 1502 U.S. healthcare providers found that about one-quarter (395 [26%]) ordered the correct laboratory tests to diagnose 2 patients with West Nile virus disease. Outreach is needed to educate healthcare providers on West Nile virus disease and diagnostic testing to better inform clinical management and patient prognosis.

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2025-06-23

Long-Term Follow-Up of Patients with West Nile Neuroinvasive Disease.

Journal: Viruses

Authors: Nataša Nikolić, Branko Milošević, Stojanović Miloš, Ljubisavljević Mila, Ivana Milošević, Nikola Mitrović, Jovan Malinić, Ana Filipović, Nevena Todorović, Uroš Karić, Boris Jegorović, Miloš Šabanović, Ivana Gmizić, Branko Beronja, Jasmina Poluga

The study found that most patients with West Nile neuroinvasive disease (WNND) achieved functional independence within a year, with 60% having unimpaired cognitive status. However, 11.3% of patients died during follow-up, and some persistent symptoms, such as muscle weakness and cognitive issues, were reported.

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2025-07-01

Extreme flood and WNV transmission in Thessaly, Greece, 2023.

Journal: Sci Rep

Authors: Spiros Mourelatos, Elissavet Charizani, Stella Kalaitzopoulou, Xanthi Tseni, Nikolaos Lazos, Katerina Tsioka, Anna Papa, Stella Dafka, Joacim Rocklöv, Sandra Gewehr

Storm Daniel, the deadliest Mediterranean tropical-like cyclone, caused significant flooding in Thessaly Region, Greece, from September 4 to 7, 2023. This study examines the potential impact of such extreme weather events on vector-borne disease transmission by assessing changes in mosquito populations and West Nile virus (WNV) circulation before and after the flood in two regional units of Thessa

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2025-09-08

Effect of increased CpG and UpA dinucleotides in the West Nile virus genome on virus transmission by Culex mosquitoes and pathogenesis in a vertebrate host.

Journal: J Virol

Authors: Joyce W M van Bree, Imke Visser, Eleanor M Marshall, Wessel W Willemsen, Carmen van de Waterbeemd, Dennis Kenbeek, Marleen H C Abma-Henkens, Gorben P Pijlman, Monique M van Oers, Barry Rockx, Jelke J Fros

Vertebrate animals and many small DNA and single-stranded RNA viruses that infect vertebrates have evolved to suppress genomic CpG dinucleotides. All organisms and most viruses additionally suppress UpA dinucleotides in protein-coding RNA. Synonymously recoding viral genomes to introduce CpG or UpA dinucleotides has emerged as an approach for viral attenuation and vaccine development. However, stu

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2025-08-06

Serological differentiation of West Nile, Usutu, and tick-borne encephalitis virus antibodies in birds and horses using mutant E protein ELISAs.

Journal: Sci Rep

Authors: Anne Schwarzer, Ute Ziegler, Jasmin Fertey, Markus Kreuz, Thomas W Vahlenkamp, Martin H Groschup, Sebastian Ulbert

The study introduces mutant E protein ELISAs (Equad ELISAs) to differentiate antibodies against West Nile virus (WNV), Usutu virus (USUV), and tick-borne encephalitis virus (TBEV) in birds and horses. These assays showed high sensitivity and specificity, even without virus neutralization tests (VNTs), and can be used for seroprevalence studies and veterinary diagnosis.

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2025-06-12

A Scoping Review of Preclinical Research on Monoclonal Antibody Development for Prophylaxis and Treatment of West Nile Virus Infections.

Journal: Viruses

Authors: Amanda E Calvert, Kerri L Miazgowicz, Bailey Atkinson, Audrey H Long, Elisa Thrasher, Aaron C Brault, Randall J Nett

The review identifies 25 preclinical studies on monoclonal antibodies (MAbs) for West Nile virus (WNV) prophylaxis and treatment, with most targeting the envelope protein. E16, targeting E-Domain III, showed promise in animal models. However, no studies addressed delivery across the blood-brain barrier, highlighting a key gap in current research.

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2025-07-11

Rising temperatures contribute to West Nile virus diversification and increased transmission potential.

Journal: Sci Rep

Authors: Rachel L Fay, Mauricio Cruz-Loya, Joseph G Maffei, Erin A Mordecai, Alexander T Ciota

Rising temperatures in New York State have correlated with increased West Nile virus (WNV) genetic diversity and prevalence. Contemporary WNV strains, isolated during warmer summers, show higher transmission potential at elevated temperatures compared to historic strains, suggesting that climate warming may facilitate the emergence of more transmissible WNV strains.

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2025-08-23

One Health approach uncovers emergence and dynamics of Usutu and West Nile viruses in the Netherlands.

Journal: Nat Commun

Authors: Emmanuelle Münger, Nnomzie C Atama, Jurrian van Irsel, Rody Blom, Louie Krol, Tjomme van Mastrigt, Tijs J van den Berg, Marieta Braks, Ankje de Vries, Anne van der Linden, Irina Chestakova, Marjan Boter, Felicity D Chandler, Robert Kohl, David F Nieuwenhuijse, Mathilde Uiterwijk, Ron A M Fouchier, Hein Sprong, Andrea Gröne, Constantianus J M Koenraadt, Maarten Schrama, Chantal B E M Reusken, Arjan Stroo, Judith M A van den Brand, Henk P van der Jeugd, Bas B Oude Munnink, Reina S Sikkema, Marion P G Koopmans

Mosquito-borne arboviruses, including Usutu virus (USUV) and West Nile virus (WNV), are emerging threats in Europe, with changes in climate, land use shifts, and increasing global connectivity influencing their dynamics. Understanding how these viruses emerge and establish in new regions is critical for mitigating risks and improving public and wildlife health preparedness. Here, we present a seve

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Relevant news

This section presents official reports from health agencies, manufacturers and press releases with reliable sources.

2025-09-10

Chikungunya, dengue, Zika and West Nile in mainland France. Enhanced surveillance bulletin of September 10, 2025.

Source: PRS

The report documents 49 episodes of local vector-borne transmission in mainland France, including 38 chikungunya episodes (382 cases) and 11 dengue episodes (21 cases), with new regions affected. Additionally, there are 966 imported chikungunya, 894 dengue, and 7 Zika cases, along with 23 locally acquired West Nile virus infections.

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2025-06-26

The 2024 reappearance of the coxsackievirus A24 variant, which is responsible for an outbreak of acute hemorrhagic conjunctivitis in the South West Indian Ocean.

Source: PRS

The 2024 outbreak of acute hemorrhagic conjunctivitis in Mayotte and Madagascar was caused by a distinct lineage of coxsackievirus A24 variant (CVA24v), differing from the current Asian outbreak. Full-length genome sequencing revealed a putative recombinant strain, unlike previous outbreaks.

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Clinical Studies

This section presents relevant clinical trials.

2024-07-31

Convalescent Plasma for the Treatment of Patients With WNV - a Double- Blind Randomized Controlled Study

Status: Completed

Sponsor(s): Sheba Medical Center

Name of the study: Administering neutralizing convalescent plasma to hospitalized patients with West Nile fever - a double-blind randomized controlled study. The purpose of this study is to test the safety and effectiveness of giving blood plasma from convalescents rich in neutralizers as treatment against West Nile fever.

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2024-07-14

Early Interferon-beta Treatment for West-Nile Virus Infection

Status: Recruiting

Sponsor(s): Tel Aviv Sourasky Medical Center

The study highlights that while West Nile virus (WNV) typically causes mild disease, a small percentage develop severe neuroinvasive disease, often due to neutralizing antibodies against interferons. Early treatment with interferon-beta, to which most patients do not have neutralizing antibodies, may prevent severe neuroinvasive WNV disease.

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2024-12-12

Safety and Immunogenicity of an Inactivated West Nile Virus Vaccine in Healthy Adults

Status: Active not recruiting

Sponsor(s): National Institute of Allergy and Infectious Diseases

A randomized, placebo controlled, double-blind (within dosing group), sequential dose escalation study. This phase 1 trial addresses the urgent need for a vaccine to prevent disease resulting from infection with West Nile virus (WNV), a virus that is primarily spread to people by the bite of an infected mosquito. The purpose of this Phase 1 trial is to evaluate the safety and immunogenicity of the

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2025-02-27

Serological Measurement of Montpellier Professionals' Contacts with Infectious Agents Responsible for Animal-borne Diseases

Status: Not yet recruiting

Sponsor(s): University Hospital of Montpellier, TransVIHMI UM, IRD UMI233, Inserm U1175, UMR 1058 Pathogenesis & Control of Chronic & Emerging Infections PCCEI

Zoonoses and arboviroses refer to a group of diseases transmitted from animals to humans, either directly or indirectly (via mosquitoes, ticks or contact with contaminated environments). Most of these diseases are found in certain tropical zones, but global warming and increased international trade are modifying their geographical distribution, with a gradual trend towards temperate regions. A num

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2024-07-11

Rapid Molecular Diagnosis and Detection of Emerging Infectious Diseases in Patients With Tropical Fever (Tropifever)

Status: Recruiting

Sponsor(s): Assistance Publique - Hôpitaux de Paris

Travellers returning from tropical countries often present to emergency departments with acute fever. While systematic screening for malaria is well established in clinical practice in France, further diagnostic testing for infectious diseases is less codified. In addition, the clinical presentation of many tropical and emerging infectious diseases is often similar, making a positive diagnosis in

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2025-04-30

Determination of Etiology of Febrile Illness in Nepal (DEFINe Study)

Status: Not yet recruiting

Sponsor(s): Patan Academy of Health Sciences, Patan Academy of Health Sciences, Nepal

In the absence of a microbiological lab testing, majority of the cases of febrile illnesses in Nepal are diagnosed on a clinical basis alone. These cases of "undifferentiated febrile illness" are treated empirically with multiple antibiotics without an etiological diagnosis. Unnecessary use of antibiotics can increase the risk of antibiotic resistance and adds unnecessary burden of cost to the pat

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Guidelines and practical information

This section lists official manuals of recommendations for clinical practice or public health policy published by leading health organizations.

HAS	**HAS Guidelines for West Nile Virus Surveillance and Control**
ECDC	**Surveillance, prevention and control of West Nile virus and Usutu virus infections in the EU/EEA**
ECDC	**Vector control practices and strategies against West Nile virus**
ECDC	**West Nile virus risk assessment tool**
CDC	**West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control**

Fact sheets

Phylogeny

West Nile virus (WNV) is a positive-sense RNA arbovirus belonging to the family Flaviviridae and the genus Orthoflavivirus, like Zika virus and dengue virus. It was first identified in 1937 in Uganda. Among the nine lineages described, only lineages 1 and 2 are responsible for the majority of human infections in Europe, while lineage 3 is potentially pathogenic.

Transmission

Birds are the main reservoir, with transmission ensured by Culex mosquitoes (particularly C. pipiens and C. modestus) in mainland France. Other mosquitoes, such as Aedes albopictus, can replicate or transmit WNV, although their epidemiological significance in France has not been demonstrated. WNV circulation follows a seasonal pattern, linked to the mosquito breeding period that begins in spring and ends in autumn. Humans and horses are incidental hosts and epidemiological dead ends. Human-to-human transmission is possible through blood transfusion, grafts, or transplantation.

Diagnosis and Symptoms

The incubation period ranges from 2 to 6 days, and up to 21 days in immunocompromised individuals. The diagnosis of WNV infection relies on indirect detection based on serology (serum and CSF; cross-reactivity with viruses of the Orthoflavivirus genus), but also on direct detection (PCR on whole blood, plasma from day 2 onwards, serum, CSF in cases of neurological involvement, and urine). Approximately 80% of human infections are asymptomatic; 20% present as symptomatic cases with fever, myalgia, malaise, nausea, vomiting, or skin rashes, which usually subside within a week. In rare cases (less than 1%), neurological complications may occur (meningitis, encephalitis, and flaccid paralysis), as well as Guillain-Barré syndromes that can lead to death. Among severe cases, lethality may reach up to 17%, particularly in at-risk populations (immunocompromised individuals and the elderly). Risk factors include advanced age, malignancies affecting the blood-brain barrier, hypertension, hematologic disorders, diabetes mellitus, kidney disease, alcohol abuse, and genetic predispositions.
In animals, more than 250 avian species are affected, with particular susceptibility in corvids and raptors; 10% of horses develop neurological signs.

Treatment and vaccines

In humans, there is no vaccine or curative treatment, and in particular no approved specific therapeutic immunoglobulins.
Vaccination of horses, with products such as West Nile-Innovator® (Zoetis) and Recombitek® Equine West Nile Virus (Merial), has proven effective and represents a promising model for the development of human vaccines.