



NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
Ashwin Vasani, MD, PhD
Commissioner

2024 Health Advisory #19: Early and Increasing West Nile Virus in Mosquitoes in New York City

- **West Nile virus (WNV) has been detected in 325 pools of mosquitoes collected from the Bronx, Brooklyn, Manhattan, Queens, and Staten Island.**
- **The first positive pools were identified on June 5, the earliest detection ever reported in New York City (NYC).**
- **No human cases have been reported in NYC so far this year.**
- **Peak WNV activity is usually during August and September. Consider WNV disease in patients presenting with viral meningitis or encephalitis, acute flaccid paralysis, or symptoms compatible with West Nile fever, now through October 31.**
- **Testing is available at commercial laboratories. The IgM enzyme immunoassay (EIA) on cerebrospinal fluid (CSF) and serum is the most sensitive diagnostic test for WNV. RT-PCR testing may be the best option for severely immunosuppressed patients. If ordering RT-PCR, always order IgM EIA testing on serum (and CSF if collected) concurrently.**
- **Advise people, especially adults 60 years and older and people with weakened immune systems (particularly those on rituximab and other B-cell depleting therapies), to protect themselves from mosquito bites.**
- **Report patients with laboratory evidence of current or recent WNV infection or other arboviral infection to the NYC Department of Health and Mental Hygiene (NYC Health Department).**

July 17, 2024

Dear Colleagues,

West Nile virus (WNV) has been detected in 325 positive mosquito pools (a pool is a group of up to 50 mosquitoes combined for WNV testing) from the Bronx (54), Brooklyn (44), Manhattan (12), Queens (130), and Staten Island (85); no human cases have been reported in NYC to date. The first detection on June 5, is the earliest WNV has been found in mosquitoes in NYC. Real time WNV surveillance data is available [here](#). The NYC Health Department has a robust mosquito surveillance, prevention and control program; details are available [here](#).

West Nile Virus Disease

Be alert for possible cases of WNV disease now through October 31. An estimated 70-80% of human WNV infections are subclinical or asymptomatic. Most symptomatic persons experience an acute systemic febrile illness referred to as West Nile fever (WNF) that often includes headache, weakness, myalgia, or arthralgia; gastrointestinal symptoms and a transient maculopapular rash also are common. Less than 1% of infected persons develop West Nile Neuroinvasive Disease (WNND), which typically manifests as meningitis, encephalitis, or acute flaccid paralysis. People over 60 years of age or with certain medical conditions or treatments that cause immunosuppression such as diabetes, hypertension, cancer, and organ

transplantation, are at greater risk of WNND. This is especially true for patients on rituximab and other B-cell depleting therapies (e.g., patients with certain autoimmune, onco-hematologic, and/or neurologic disorders).¹

Consider WNV disease in people with compatible symptoms, especially unexplained encephalitis, viral meningitis, acute flaccid paralysis, or other neurologic manifestations (e.g., Guillain-Barré syndrome). Most people with WNV fever or WNV meningitis recover completely but fatigue, malaise, and weakness can linger for weeks or months. People with WNV encephalitis or poliomyelitis often have residual neurologic deficits.

West Nile Surveillance

Since WNV surveillance began in 1999, the annual number of WNV-competent mosquitoes trapped and WNV positive mosquito pools has consistently increased, likely driven by climate change. Shifting precipitation and temperature patterns contribute to increased mosquito reproduction rates and amplification of WNV in mosquitoes. Human infections are being detected earlier and later into the season and with more frequency. Between 2014 and 2023, an average of 20 people per year were diagnosed with WNND (range 6-36). The median age was 63 years (range 22-95 years) and the case fatality rate 9%. Patients lived in Queens (75), followed by Brooklyn (65), Manhattan (30), Staten Island (26), and the Bronx (11).

Laboratory Testing

The most sensitive test for WNV in humans is the IgM EIA on CSF and serum. WNV-specific IgM antibodies are usually detectable within 8 days of symptom onset. A positive IgG EIA result with a negative IgM likely indicates past infection or possibly cross reactivity with another flavivirus (e.g., dengue or Zika virus). Ideally, both CSF and acute/convalescent (collected at least 3 weeks after acute) serum specimens should be submitted for testing if neuroinvasive diseases is suspected. RT-PCR on CSF and serum is less sensitive than the IgM EIA but can aid in the diagnosis of people who are severely immunocompromised and unable to mount a detectable humoral immune response. A positive RT-PCR result confirms infection, but a negative result does not rule it out. When pursuing RT-PCR, always request IgM EIA testing on serum (and CSF if collected) concurrently.

Guidelines for testing for WNV and other arboviral Infections are available [here](#), including information about options at commercial laboratories. New York State Wadsworth Center has [guidance](#) for [submitting both CSF and serum](#) for the RT-PCR Viral Encephalitis Panel² and Arboviral Immunology Screen.³ Providers submitting to Wadsworth Center are encouraged, but

¹ Kapadia RK, Staples JE, Gill CA, et al. Severe arboviral neuroinvasive Disease in Patients on rituximab therapy: a review. *Clin Infect Disease*. 2022; 76(6), 1142-1148. doi.org/10.1093/cid/ciac766

² The PCR Summer Viral Encephalitis Panel includes arboviruses (West Nile, Powassan, St. Louis encephalitis, Eastern equine encephalitis, California serogroup [including La Crosse and Jamestown Canyon], Cache Valley, and Heartland viruses), adenovirus, cytomegalovirus, Epstein-Barr virus, enterovirus (all serotypes including echovirus, Coxsackie virus, poliovirus, and others), herpes simplex viruses 1 and 2, human herpes virus 6, and varicella zoster virus.

³ The Arboviral Serology Screen includes West Nile, Powassan, Eastern equine encephalitis, Western equine encephalitis, St. Louis encephalitis, and California serogroup encephalitis. Testing for chikungunya and Zika viruses is only available upon request and in consultation with the NYC Health Department.

not required, to submit urine and whole blood samples to help improve the opportunity for detection and identification of suspected arboviral infections.

In special cases (e.g., cases potentially due to an unusual source of transmission, such as transfusion, transplant, or laboratory exposure), contact the NYC Health Department to assist with testing or transporting specimens to Wadsworth or the Centers for Disease Control and Prevention for confirmation.

Prevention

Mosquitoes that carry WNV usually bite around dusk and dawn. Advise patients to take [precautions to avoid being bitten](#), including using an [EPA- approved insect repellent](#) and taking steps to reduce mosquitoes in and around their residence.

Other Mosquito-borne Diseases

Testing for Eastern equine encephalitis (EEE), St. Louis encephalitis, La Crosse encephalitis, and Jamestown Canyon virus (JCV) are included in the Wadsworth encephalitis panel and conducted in mosquitoes. These viruses have not been identified in mosquitoes or people in NYC. However, EEE and JCV were detected in mosquitoes and animals in other northeast states in 2023.

Dengue, chikungunya, and malaria are associated with travel to endemic areas in the Americas, Asia, and Africa. There are ongoing outbreaks of dengue in the Americas – see this [June 28, 2024 Health Advisory](#) for more information. Malaria cases have also been increasing, primarily acquired in West Africa and Central and South America. In May 2024, [Oropouche virus \(OROV\) fever](#) cases were reported outside the typical Amazonian region in parts of South America and Cuba. The NYC Health Department can assist with testing specimens for new and emerging diseases for which testing is not commercially available.

Reporting to the NYC Health Department

WNV (and most other arboviral infections) with laboratory evidence of recent or current infection should be reported immediately, as required by the NYC Health Code. For consultation or to report a case of WNV or other arboviral infection, call the NYC Health Department Provider Access Line at 866-692-3641. Additional reporting instructions are available [here](#).

The successful detection of WNV in NYC has been due in large part to the ongoing partnership with the city's medical and laboratory communities. Thank you for your continuing efforts.

Sincerely,



Celia Quinn MD, MPH
Deputy Commissioner
Division of Disease Control