



Texas West Nile (WN) Virus Public Health Response Guide - 2004

Since its initial appearance in the Western Hemisphere in New York in 1999, West Nile virus has spread across the eastern United States. The virus was first identified in Texas in June 2002 and has since been found in all parts of the state. West Nile is now a part of the state's ecology, like eastern equine encephalitis, St. Louis encephalitis, and western equine encephalitis.

The public health response to WN virus is important in order to:

- minimize human illness through public education, early diagnosis of the disease, and vector control;
- track viral activity through seasonal variations;
- identify locations where the disease poses the greatest threat; and
- identify key mosquito vector species that contribute to the transmission of the disease.

Now that the disease has become endemic in Texas, surveillance and control efforts will be targeted toward the areas at most risk and to the species of mosquitoes and other animals most involved in the disease cycle.

As with other diseases, one of the keys to a proper response lies in ensuring that prompt, accurate information reaches the public so they may institute personal protective measures without panic and confusion. It is also important that the public be fully informed of the reasons and methods for detecting and controlling vector species.

During 2004, Texas Department of Health (TDH) will immediately inform the appropriate Public Health Region and local health departments or county officials at the first discovery of WN virus activity in their area.

Local health departments should be prepared to reinforce any statewide information campaign with additional public information targeted to specific communities.

Statutory authority to conduct mosquito control (including the use of adulticides and larvicides as well as source reduction) is contained in [Chapter 81](#) of the Texas Health and Safety Code.

As of February 2004, funds provided by the Centers for Disease Control and Prevention for WN surveillance activities may not be used for equipment or chemicals for mosquito control activities. State funding is not available to supplement local control efforts.

This response guide is designed for WN virus but can be used as a guide for other diseases carried by mosquitoes. The guide is divided into four levels based on the risk of human disease, with recommended responses based on that risk. This guide is not intended to be a “how to” manual since methods and scope of surveillance and control may vary from community to community based on actual vector species present, community resources, and the preferences of local citizens.

Risk Level 1 Normal Response

Conditions: Probability of human outbreak is low.

Trigger: Normal mosquito activity with little or no evidence of WN viral activity.

Recommended Response*:

Surveillance:

Mosquitoes – Conduct routine surveillance, including identifying species collected and conducting viral isolation activities when vector species are active.

Wild Birds – Conduct testing of selected dead birds, mainly crows, jays, and hawks in areas where vector species may be active.

Equine – Attempt virus isolation from the brain of equine that are negative for rabies at the TDH laboratory.

Information/Education: Prior to the main season for vectors and outdoor activities, publicize methods for mosquito reduction and personal protection.

Control Measures:

Survey for mosquito vector species, both adults and larvae.

Conduct larviciding of breeding sites of mosquito vector species.

Promote source reduction.

Apply adulticides, either by ground or aerially, in area(s) where mosquito samples are found to be positive for WNV.

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Risk Level 2 Enhanced Response

Conditions: Probability of human outbreak is moderate.

Trigger:

WN virus isolated from samples of mosquitoes or wild birds.

Recommended Response*:

Surveillance:

Mosquitoes – Increase surveillance in area of positive samples.

Wild Birds – Conduct testing of selected dead birds, mainly crows, jays, and hawks.

Equine – Attempt virus isolation from the brain of equine that are negative for rabies at the TDH laboratory.

Information/Education:

Alert Public Health Regions, local health departments, and other agencies.

Inform local medical professionals, including veterinarians, of clinical signs and symptoms, ecology, and disease control measures.

Inform the public, emphasizing source reduction, personal protection, and disease symptoms.

Control Measures:

Intensify larviciding of breeding sites of mosquito vector species.

Intensify source reduction.

Apply adulticides, either by ground or aerially, in area(s) where birds and/or mosquito samples are found to be positive for WNV.

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Risk Level 3 Public Health Warning

Conditions: Probability of human outbreak is high.

Trigger:

Multiple WN virus isolations from mosquitoes or wild birds collected at different times and locations; **or**

Confirmed or probable human or equine cases supported by laboratory testing (see case definition at the end of this document).

Recommended Response*:

Surveillance:

Mosquitoes – Increase surveillance activities in adjacent areas where spread of WN virus is likely.

Wild Birds – Conduct testing of selected dead birds, mainly crows, jays, and hawks.

Equine – Attempt virus isolation from the brain of equine that are negative for rabies at the TDH laboratory.

Information/Education:

Alert Public Health Regions, local health departments, and other agencies.

Alert local medical professionals of probability of disease and provide instructions for submitting specimens from suspect human cases (Patients with signs of encephalitis or viral [aseptic] meningitis.).

Warn the general public with emphasis on source reduction, personal protection, and disease symptoms.

Publicize vector control measures within the target communities.

Control Measures:

Continue intensified larviciding of breeding sites of mosquito vector species.

Continue intensified source reduction.

Apply adulticides, either by ground or aerially, in area(s) of confirmed or probable human cases, if the cases were acquired locally, or in area(s) where birds and/or mosquito samples are found to be positive WNV.

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Risk Level 4 Public Health Alert

Conditions: Human outbreak is confirmed.

Trigger: Multiple human cases confirmed by laboratory testing.

Recommended Response*:

Surveillance:

Mosquitoes – Increase surveillance activities in adjacent areas where spread of WN virus is likely.

Wild Birds – Conduct testing of selected dead birds, mainly crows, jays, and hawks.

Equine – Attempt virus isolation from the brain of equine that are negative for rabies at the TDH laboratory.

Information/Education:

Inform the public through the news media with emphasis on source reduction, personal protection, and disease symptoms.

Publicize vector control measures within the targeted communities.

Alert health professional organizations and area hospitals, clinics, and individual health care providers and provide instructions for submitting specimens from suspect human cases (patients of any age with signs of encephalitis and patients over age 65 with viral [aseptic] meningitis).

Control Measures:

Continue intensified larviciding of breeding sites of mosquito vector species.

Continue intensified source reduction.

Apply adulticides, either by ground or aerially, in area(s) of confirmed human cases, if the cases were acquired locally.

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State Arboviral Contacts

Texas Department of Health – Regional Zoonosis Control Offices (dead bird surveillance, other surveillance activities, suspect human cases).

Region 1 – Canyon (806) 655-7151
Region 2/3 – Arlington (817) 264-4920
Region 4/5N – Tyler (903) 533-5212
Region 6/5S – Houston (713) 767-3300
Region 7 – Temple (254) 778-6744
Region 8 – Uvalde (830) 278-7173, ext 212, 209, or 210
Region 9/10 – El Paso (915) 834-7781
Region 11 – Harlingen (956) 444-3224

Texas Department of Health - Regional Environmental Health Offices (mosquito control).

Region 1 – Lubbock (806) 744-3577
Region 2/3 – Arlington (817) 264-4707
Region 4/5N – Tyler (903) 595-3585
Region 6/5S – Houston (713) 767-3254
Region 7 – Temple (254) 778-6744
Region 8 – Uvalde (830) 278-7173. ext 217 or 221
Region 9/10 – El Paso (915) 594-1568
Region 11 – Harlingen (956) 423-0130

Texas Department of Health – Laboratory (human diagnostic samples), (512) 458-7592 or (512) 458-7515.

Texas Animal Health Commission, (800) 550-8242;

Texas Veterinary Services, United States Department of Agriculture, (512) 916-5552.

Texas Veterinary Medical Diagnostic Laboratory (equine diagnostic samples)
Amarillo – (888) 646-5624
College Station - (888) 646-5623

Texas Department of Health - Website for current maps and other information such as symptoms, sample submission, and protective measures,
<http://www.tdh.state.tx.us/zoonosis/arbo>

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West Nile (WN) Human Case Definitions

West Nile Fever: A non-specific, self-limited, febrile illness without aseptic meningitis or encephalitis that meets the laboratory criteria for probable or confirmed.

West Nile Encephalitis or Meningitis: A febrile illness associated with aseptic meningitis or encephalitis that meets the laboratory criteria for probable or confirmed.

Laboratory criteria for diagnosis:

Confirmed:

Isolation of WN virus from or demonstration of WN antigen or genomic sequences in tissue, blood, CSF, or other body fluid.

Demonstration of IgM antibody to WN virus in CSF by IgM-capture EIA.

A ≥ 4 -fold serial change in plaque-reduction neutralizing test (PRNT) antibody titer to WN virus in paired, appropriately timed serum or CSF samples.

Demonstration of both WN virus-specific IgM (by EIA) and IgG (screened by EIA or HI and confirmed by PRNT) antibody in a single serum specimen.

Probable:

Demonstration of serum IgM antibody against WN virus (by EIA).

Demonstration of an elevated titer of WN virus-specific IgG antibody in convalescent-phase serum (screened by EIA or HI and confirmed by PRNT).

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West Nile Virus (WNV) Equine Case Definitions:

West Nile Virus Infection: West Nile virus (WNV) causes encephalitis in horses. The horse cannot transmit the virus to other animals or mosquitoes.

Laboratory criteria for diagnosis:

Confirmed Case: Compatible clinical signs plus one or more of the following:

- A titer equal to or greater than 1:400 or in serum, or a titer equal to or greater than 1:2 in the CSF, on the IgM-capture ELISA test;
- Isolation of West Nile virus from tissues;
- An associated fourfold increase in antibody titer to WNV in paired serum samples (14 or more days apart), on the plaque-reduction neutralization test (PRNT);
- If non-vaccinated, but negative at 1:400 at IgM-capture ELISA positive at 1:100 on PRNT^{1,2,3,4}.
- Positive immunohistochemistry (IHC) for WNV antigen in tissue and a positive polymerase chain reaction (PCR) for WNV genomic sequences in tissues.

Probable Case:** Compatible clinical signs, plus one of the following:

- If non-vaccinated with clinical signs but negative at 1:400 on IgM-capture ELISA, and positive at 1:10, but negative at 1:100, on PRNT;
- Positive PCR for WNV genomic sequences in tissues
- Positive IHC for WNV antigen in tissue.

*Clinical signs include ataxia (including stumbling, staggering, wobbly gait, or incoordination) or at least two of the following: circling, hind limb weakness, inability to stand, multiple limb paralysis, muscle fasciculation, proprioceptive deficits, blindness, lip droop/paralysis, teeth grinding, acute death.

**An equine classified as a probable case should, if possible, undergo further diagnostic testing to confirm or rule out WNV as a cause of clinical illness.

¹Neutralizing antibody, as detected by PRNT, may not be present in equine serum until two weeks after exposure to WNV;

²Clinical signs may be present in an equine before a serum PRNT is positive;

³Neutralizing antibody in serum by PRNT indicates past exposure to WNV;

⁴A negative PRNT on serum collected 22 days or more after onset of clinical signs will reclassify this equine as a non-case.

Note: Vaccines for horses are available through licensed veterinarians.

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