WNV Human Case Investigation and Reporting

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Michigan Department of Community Health
Types of West Nile Illness

- 80% asymptomatic
- 20% have flu-like symptoms
- <1% have meningo-encephalitis/flaccid paralysis/other serious sequelae
- ~10% of those with serious CNS signs die
Onset Date of Symptoms Among Human West Nile Virus Cases in Michigan for 2002

Data from 614 of the 644 Total Cases
West Nile Meningo-encephalitis

- Fever
- Headache
- Altered mental status AND/OR
- Stiff neck with CSF pleocytosis or elevated protein
West Nile Fever

- CDC-Recommended case definition
- Currently not nationally notifiable
- Purpose is to aid public health surveillance for certain diseases or conditions that have not been officially approved by the CSTE
- Event Code: 10049
West Nile Virus Case Summary

Total Laboratory Positive Cases: 644

West Nile Meningo-encephalitis cases: 559
  Age range: .75-95 yrs
  Average age: 57.8 yrs

West Nile Fever cases: 57
  Age range: 3-80 yrs
  Average Age: 47.7 yrs

Unknown cases: 28

Deaths: 51
  Age range: 24-95 yrs
  Average age: 74.5 yrs
Laboratory Diagnosis of Human Cases

- CSF is best specimen
- IgM Capture ELISA
- PRNT (measure of IgG)
- Serum-need paired sera to document a rise in titer
- SLE cross reaction-must run concurrently
Commercial Laboratory Issues

- Some will be offering ELISA tests
- Will **not** be running concurrent SLE testing
- May not be requiring **paired sera**
- **Flavivirus positive** is only possible interpretation
- Will still require confirmatory testing at MDCH Laboratory.
National Case Definitions:

CSTE Developed and Approved, CDC Adopted

- West Nile Meningitis/Encephalitis (WNME)
- West Nile Fever (WNF)
WNME (applies to all arboviruses):

Clinical Description:

Arboviral infections may be asymptomatic or may result in illnesses of variable severity sometimes associated with central nervous system (CNS) involvement. When the CNS is affected, clinical syndromes ranging from febrile headache to aseptic meningitis to encephalitis may occur, and these are usually indistinguishable from similar syndromes caused by other viruses. **Arboviral meningitis** is characterized by fever, headache, stiff neck, and pleocytosis. **Arboviral encephalitis** is characterized by fever, headache, and altered mental status ranging from confusion to coma with or without additional signs of brain dysfunction (e.g., paresis or paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, and abnormal movements).
Laboratory Criteria:

- Fourfold or greater change in virus-specific serum antibody titer, or
- Isolation of virus from or demonstration of specific viral antigen or genomic sequences in tissue, blood, cerebrospinal fluid (CSF), or other body fluid, or
- Virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF by antibody-capture enzyme immunoassay (EIA), or
- Virus-specific IgM antibodies demonstrated in serum by antibody-capture EIA and confirmed by demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in the same or a later specimen by another serologic assay (e.g., neutralization or hemagglutination inhibition).
Case Classification:

**Probable:** an encephalitis or meningitis case occurring during a period when arboviral transmission is likely, and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum IgG antibodies in the same or a later specimen.

**Confirmed:** an encephalitis or meningitis case that is laboratory confirmed
Caveats:

Because closely related arboviruses exhibit serologic cross-reactivity, positive results of serologic tests using antigens from a single arbovirus can be misleading. In some circumstances (e.g., in areas where two or more closely related arboviruses occur, or in imported arboviral disease cases), it may be epidemiologically important to attempt to pinpoint the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses. This is essential, for example, in determining that antibodies detected against St. Louis encephalitis virus are not the result of an infection with West Nile (or dengue) virus, or vice versa, in areas where both of these viruses occur.

The seasonality of arboviral transmission is variable and depends on the geographic location of exposure, the specific cycles of viral transmission, and local climatic conditions. Reporting should be etiology-specific.
Case Defintion/WNF

Case Description:

A non-specific, self-limited, febrile illness caused by infection with West Nile virus, a mosquito-borne flavivirus. Clinical disease generally occurs 2-6 days (range, 2-15 days) following the bite of an infected mosquito. Typical cases are characterized by the acute onset of fever, headache, arthralgias, myalgias, and fatigue. Maculopapular rash and lymphadenopathy generally are observed in less that 20% of cases. Illness typically lasts 2-7 days.
Case Classification:

*Probable*: a clinically compatible illness plus: case occurring during a period when arboviral transmission is likely, and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum IgG antibodies in the same or a later specimen.

*Confirmed*: a clinically compatible illness that is laboratory confirmed
Caveats:

Same as for WNME Plus:
Because dengue fever and West Nile fever can be clinically indistinguishable, the importance of a recent travel history and appropriate serologic testing cannot be overemphasized. In some persons, West Nile virus specific IgM antibody can wane slowly, and be detectable for more than one year following infection. Therefore, in areas where West Nile Virus has circulated in the recent past, the co-existence of West Nile virus-specific IgM antibody and illness in a given case may be coincidental and unrelated. In those areas, the testing of serially collected serum specimens assumes added importance.
CASE INVESTIGATION AND REPORTING
Public Health Code

- **R 325.173**
  Details the reporting requirements for health care providers, health care facilities, and clinical laboratories

- **R 325.174**
  Gives local and state public health officials the authority to investigate possible cases of illness reported to them
Encephalitis, viral

Meningitis, viral

Unusual occurrence, outbreak, or epidemic of any disease

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Michigan Department of Community Health

**PHYSICIAN - DISEASE REPORTING**

All Michigan physicians and health care providers are required to report patients with the following conditions to the local health department. To assist health care providers in meeting their obligations to report, the Michigan Department of Community of Health has prepared the list presented below. Lab-confirmed and clinical diagnosis are reportable in the time intervals listed. Reporting allows for appropriate public health follow-up for your patients and assists us in identifying outbreaks not always evident to a sole provider.

Local Health Dept. Phone: ( )  Contact Name: 

IMMEDIATELY

Any unusual occurrence, outbreak, or epidemic of any disease, condition, and/or nosocomial infection.

### WITHIN 24 HOURS

<table>
<thead>
<tr>
<th>Condition</th>
<th>Reporting pref.</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Granuloma inguinale</td>
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<tr>
<td>Anthrax</td>
<td><em>H. influenzae</em> (meningitis or epiglottitis)</td>
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<tr>
<td>Botulism</td>
<td>Hepatitis B in a pregnant woman</td>
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<tr>
<td>Chancroid</td>
<td>Lymphogranuloma venereum</td>
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<tr>
<td>Cholera</td>
<td>Measles</td>
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<tr>
<td>Diphtheria</td>
<td>Meningococcal disease (meningitis or meningococcemia)</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>Pertussis</td>
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<tr>
<td>Plague</td>
<td>Poliomyelitis</td>
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<tr>
<td>Rabies (human)</td>
<td>Syphilis</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Viral hemorrhagic fevers</td>
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<tr>
<td>Yellow fever</td>
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### WITHIN THREE WORKING DAYS

<table>
<thead>
<tr>
<th>Condition</th>
<th>Reporting pref.</th>
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<tbody>
<tr>
<td>Amebiasis</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Blastomycosis</td>
<td>Histoplasmosis</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Kawasaki disease</td>
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<tr>
<td>Campylobacter enteritis</td>
<td>Legionellosis</td>
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<tr>
<td>Chlamydia (genital)</td>
<td>Leprosy</td>
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<tr>
<td>Coccidioidomycosis</td>
<td>Leptospirosis</td>
</tr>
<tr>
<td>Cryptococcosis</td>
<td>Listeriosis</td>
</tr>
<tr>
<td>Cryptosporidosis</td>
<td>Lyme disease</td>
</tr>
<tr>
<td>Cyclosporiasis</td>
<td>Malaria</td>
</tr>
<tr>
<td>Dengue fever</td>
<td>Meningitis (bacterial &amp; viral)</td>
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<tr>
<td><em>E. coli</em> disease <em>(only shiga toxin producers)</em></td>
<td>Mumps</td>
</tr>
<tr>
<td>Ehrlichiosis</td>
<td>Psittacosis</td>
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<tr>
<td>Encephalitis, viral</td>
<td>Q fever</td>
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<tr>
<td>Giardiasis</td>
<td>Reye's syndrome</td>
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<tr>
<td>Guillain-Barré syndrome</td>
<td>Rheumatic fever</td>
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<tr>
<td>Hantavirus pulmonary syndrome</td>
<td>Rocky Mountain spotted fever</td>
</tr>
<tr>
<td>Hemolytic-uremic syndrome</td>
<td>Rubella (congenital syndrome)</td>
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<tr>
<td>Rubella</td>
<td>Salmonellosis</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>Staphylococcal disease, (first 28 days post-partum mother or child)</td>
</tr>
<tr>
<td>Streptococcal, invasive Group A (normal sterile sites)</td>
<td>Tetanus</td>
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<tr>
<td>Toxic shock syndrome</td>
<td>Trachoma</td>
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<tr>
<td>Trichinosis</td>
<td>Tularenia</td>
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<tr>
<td>Typhoid fever</td>
<td>Typhus</td>
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<tr>
<td><em>Yersinia</em> enteritis</td>
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### WITHIN ONE WEEK

<table>
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<tr>
<th>Condition</th>
<th>Reporting pref.</th>
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<tbody>
<tr>
<td>HIV Infection</td>
<td>Chicken pox (aggregate numbers)</td>
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<tr>
<td>HIV Infection</td>
<td>Influenza (aggregate numbers)</td>
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1 Communicable Disease Rules  
R 325.171 et al

**HOW TO REPORT**

Call, mail or fax your local health department  
Provide patient demographics, diagnosis and onset date
Arboviruses

Any unusual occurrence, outbreak, or epidemic of any disease
Steps in Case Investigation

- Determine meaning of test result using specimen type (CSF/serum), lab result (presumptive positive, equivocal, negative), and testing algorithm.
- If probable or confirmed case, investigate.
- First contact should be physician or hospital ICP, depending on circumstances.
WNV Case Report Form
Key information:

- Specify arbovirus type
- Demographics
- Physician info
- Onset date
- Clinical syndrome
- CSF results
- Lab testing
Key questions:

• Travel

• Exposure to biting insects

• Organ Donation/Blood Transfusion

• Pregnant/nursing

• Hx flavivirus vaccine

**EPIDEMIOLOGY**

*(Obtain from families)*

Within one month of the onset of symptoms in the patient: (please circle the appropriate response)

1) Does the patient know of anyone else with a similar illness?  
   Yes  No

2) Was the patient exposed to anyone with a respiratory, gastro-intestinal or rash illness?  
   Yes  No

3) Did the patient travel outside the country?  
   Yes  No

4) Was there heavy exposure(s) to biting insects?  
   Yes  No

5) Has the patient received an organ donation/blood transfusion?  
   Yes  No

6) Is the patient pregnant or nursing?  
   Yes  No

6) Has the patient ever received a vaccination for a flavivirus (Japanese encephalitis or Yellow Fever)?
   Yes  No

**For any yes answers to the questions above, provide all relevant details (including names, addresses, phone numbers, places, dates, etc.) in the space below or on a separate page to be attached.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone #</th>
<th>Date</th>
<th>Places</th>
<th>Other Comments</th>
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Home drinking water: well city Other _______________________

Home sewage system: septic tank city Other _______________________

DCH-0783 Rev. 3/03
HIPAA Rules

- The Health Insurance Portability and Accountability Act of 1996 (HIPAA)

  http://www.hhs.gov/ocr/hipaa

- Expressly permits PHI to be shared for specified public health purposes without individual authorization

  45CFR § 164.512(b)
Case Reporting Flow:

Laboratory or Health Care Provider

Local Health Department

State Health Department

CDC
Human WNV Cases, 2002
www.michigan.gov/westnilevirus

Information For Health Care Providers