Zika Virus Background and Tracking in Washington, DC, and Surrounding States

Andrew Hennenfent, DVM, MPH

DC Department of Health
Center for Policy, Planning and Evaluation
Senior Zoonotic Disease Epidemiologist
Aedes Mosquitoes

Aedes aegypti

Aedes albopictus
CDC's estimate of the potential range of Aedes aegypti in the United States.
Keeping Track of Zika in DC

Who are we targeting through our surveillance?

• Persons who recently traveled to or live in a Zika-affected area (including Miami, Florida)
  • In some cases, the sexual partner (male or female) of someone who has traveled to a Zika-affected area
• Fetuses exposed during pregnancy or around the time of birth
Keeping Track of Zika in DC

How do we share the results?

• DC DOH reports the results to the patient’s provider (not directly to the patient)

• Positive cases are reported to CDC to be included in national surveillance data

• Data for some cases are included in the US Zika Pregnancy Registry
Keeping Track of Zika in DC

How do we share the results?

• DC DOH reports the results to the patient’s provider (not directly to the patient)

• Positive cases are reported to CDC to be included in national surveillance data

• Counts of travel-associated and local cases are posted on the DC DOH website (updated daily – as of 8/18/16)

Zika Virus Update:
• Last Update: Daily (5 pm EST)
• Total Human Cases Related to International Travel: 16
• Locally Acquired Mosquito Borne Cases: 0

Getting Tested for Zika

Who can be tested?

- People that travelled to affected areas and who experience one of the following symptoms within 2 weeks of travel: fever, rash, red eyes, or joint pain
- All pregnant women who were exposed: by having travelled to affected areas (0-12 weeks after their travel) or by having had unprotected sexual contact with a partner who has travelled
- Pregnant women who were exposed eight weeks before conception (6 weeks before the last menstrual period)
Getting Tested for Zika

DCDOH Notified of Case

Pregnant?

NO

Positive Travel AND One Symptom

NO

Zika testing not indicated

YES

Zika testing performed

YES

Zika testing performed

NO

Zika testing not indicated
District of Columbia Department of Health (DC DOH)
Zika Virus Laboratory Testing Recommendations

Testing for Zika virus depends on the time between potential exposure and the patient's symptom status:

- **Viral RNA RT-PCR**: performed on both serum and urine samples for symptomatic patients within 14 days of onset and asymptomatic pregnant women within 14 days of the last day of travel OR any pregnant women with an IgM positive test.
- **Seroology (IgM ELISA)**: performed on serum samples 2 to 12 weeks after symptom onset for symptomatic patients or the last day of travel for asymptomatic pregnant women.
- **Plaque reduction neutralization test (PRNT)**: confirmatory test performed on all IgM positive serum samples at CDC laboratories.

**Who qualifies for testing?**

- **Symptomatic** (fever, conjunctivitis, rash, or arthralgia) men and women with appropriate travel history or sexual exposure.
- All pregnant women, regardless of symptoms, with appropriate travel history or sexual exposure.

**Interpreting test results**

Detailed guidance on interpreting test results can be found in the CDC MMWR titled: *Interim Guidance for Interpretation of Zika Virus Antibody Test Results*.

**Testing Symptomatic Non-Pregnant Patients**

<table>
<thead>
<tr>
<th>Symptom Onset</th>
<th>RNA RT-PCR</th>
<th>IgM ELISA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>Day 1</td>
<td>Day 7</td>
</tr>
<tr>
<td></td>
<td>Beyond Day 14</td>
<td>Week 12</td>
</tr>
</tbody>
</table>

**Viremia**

**Testing Pregnant Women**

<table>
<thead>
<tr>
<th>Last day of</th>
<th>RNA RT-PCR</th>
<th>IgM ELISA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>Day 1</td>
<td>Day 7</td>
</tr>
<tr>
<td>Day 14</td>
<td>Beyond Day 14</td>
<td>Week 12</td>
</tr>
</tbody>
</table>

**Collect 6 mL of venous blood in a tiger/speckled top tube or red top tube.**

**Collect 5 - 15 mL of urine in a sterile screw-top container and seal with parafilm.**

Always submit serum and urine samples when testing pregnant women.

To test other sample types (CSF, amniotic fluid, placenta, cord blood) contact DOH at (202) 442-8141 or DOH.EPI@dc.gov.

Last Updated 8/10/2016
Zika Risk

What are the long-term side effects?

• For most people, nothing
• Sexual transmission
• Microcephaly
• Guillain-Barré syndrome
Zika Risk

What is the risk?

• Pregnant women
• Women trying to become pregnant
• Men whose partner is pregnant
• Infants
Recommendations for Pregnant Women

• **Avoid travel** to Zika-affected areas

• **Avoid sexual contact** with anyone who may have been infected with the Zika virus, or use condoms consistently and correctly for the duration of the pregnancy
Laboratory Testing

Horng-Yuan Kan, Ph.D, TS (ABB)

DC Department of Forensic Sciences
Public Health Laboratory
Interim Assistant Laboratory Director
To date, a total 426 specimens have been tested at DC PHL by PCR with 16 positive of Zika virus.
**DFS-PHL Zika virus Testing**

**Guidance for U.S. Laboratories Testing for Zika Virus Infection**

<table>
<thead>
<tr>
<th>Specimen Types</th>
<th>Test</th>
<th>Virus detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum, CSF</td>
<td>PCR</td>
<td>Zika IgM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zika, Dengue, and Chikungunya</td>
</tr>
<tr>
<td>Urine, Amniotic fluid</td>
<td>PCR</td>
<td>Zika</td>
</tr>
<tr>
<td>Tissue Specimens</td>
<td>PCR</td>
<td>Zika, Dengue, and Chikungunya</td>
</tr>
</tbody>
</table>
# DFS-PHL Enhanced Mosquito Surveillance

## Proper Clinical Specimen for Laboratory Testing

<table>
<thead>
<tr>
<th>Case</th>
<th>Specimen type</th>
<th>Diagnostic methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic</td>
<td>Serum</td>
<td>RT-PCR: Yes, Serology Testing: IgM and PRNT: Yes</td>
</tr>
<tr>
<td>Suspect Cases</td>
<td>CSF</td>
<td>RT-PCR: Yes, Serology Testing: IgM and PRNT: Yes</td>
</tr>
<tr>
<td></td>
<td>Urine</td>
<td>RT-PCR: Yes, Serology Testing: IgM and PRNT: No</td>
</tr>
<tr>
<td></td>
<td>Other*</td>
<td>RT-PCR: Yes, Serology Testing: IgM and PRNT: No</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td>Serum</td>
<td>RT-PCR: Yes, Serology Testing: IgM and PRNT: Yes</td>
</tr>
<tr>
<td>Pregnant Women</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: amniotic fluid, placental tissue, cord blood

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>RT-PCR</th>
<th>Serology Testing : IgM and PRNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic</td>
<td>Serum</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Suspect Cases</td>
<td>CSF</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Urine</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Other*</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
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<td>Yes</td>
<td>Yes</td>
</tr>
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<td>Pregnant Women</td>
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<td></td>
</tr>
</tbody>
</table>
**Guidance for U.S. Laboratories Testing for Zika Virus Infection**

<table>
<thead>
<tr>
<th>Type of specimen</th>
<th>Sample volume (ml)</th>
<th>Storage condition</th>
<th>Shipping condition</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>6 ml</td>
<td>2-8°C</td>
<td>4°C Ice pack</td>
<td></td>
</tr>
<tr>
<td>Urine</td>
<td>5 to 15 ml</td>
<td>2-8°C</td>
<td>4°C Ice pack</td>
<td></td>
</tr>
<tr>
<td>CSF</td>
<td>3 ml</td>
<td>2-8°C</td>
<td>4°C Ice pack</td>
<td></td>
</tr>
<tr>
<td>Amniotic fluid</td>
<td>3 to 5 ml</td>
<td>2-8°C</td>
<td>4°C Ice pack</td>
<td></td>
</tr>
<tr>
<td>Cord Blood</td>
<td>3 ml</td>
<td>2-8°C</td>
<td>4°C Ice pack</td>
<td></td>
</tr>
<tr>
<td>Tissue</td>
<td>See CDC guideline*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Collecting & Submitting Fetal Tissue Specimens for Zika Virus Testing
Specimen storage and shipping:

- Store all specimens at 4°C and ship in a cooler with ice packs within 24 to 72 hours after collection. For delays exceeding 72 hours, freeze at -20°C and ship with ice packs.
  - **Note:** It is important that frozen samples not thaw during shipping. To prevent this be sure to pack with extra ice packs during the summer months.
- **Required** Documentation:
  - CDC 50.34 form
  - Case report
  - DC Public Health Laboratory Chain of Custody form
  - DC Public Health Laboratory Test requisition form
Total number of positive of Flavivirus from mosquito pool samples

<table>
<thead>
<tr>
<th>Month</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
</tr>
</thead>
<tbody>
<tr>
<td>WNV</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>CHIKV</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dengue</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Zika</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

DFS-PHL Enhanced Mosquito Surveillance

Total and positive mosquito pool samples

- Total Mosquito tested
- Positive WNV Mosquito pool

<table>
<thead>
<tr>
<th>Month</th>
<th>Total Mosquito pool samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr</td>
<td>66</td>
</tr>
<tr>
<td>May</td>
<td>117</td>
</tr>
<tr>
<td>Jun</td>
<td>341</td>
</tr>
<tr>
<td>Jul</td>
<td>217</td>
</tr>
<tr>
<td>Aug</td>
<td>31</td>
</tr>
<tr>
<td>Sep</td>
<td>16</td>
</tr>
<tr>
<td>Oct</td>
<td>3</td>
</tr>
</tbody>
</table>

Total: 739
Arbovirus Surveillance and Mosquito Control in Washington, DC

Vito DelVento, DVM, MS

DC Department of Health
Health Regulation and Licensing Administration
Animal Services Program Manager
Executive Director Board of Veterinary Medicine
National Capital Region Response
Arbovirus Surveillance of Zika in DC

How is the surveillance being conducted?

• Weekly surveillance throughout all 8 District Wards

• Sites selected on population and environment

• Traps utilized:
  • Gravid Traps
  • Carbon Dioxide Traps

Samples tested weekly by the Public Health Laboratory
Mosquito Traps

Gravid Style Trap

Carbon Dioxide Style Trap
Mosquito Control in DC

What methods of control are being utilized?

• Reduce or eliminate mosquito breeding habitats

• Larvicide application
Mosquito Control in DC

- Reduce or eliminate mosquito breeding habitats
Mosquito Control in DC

Enforcement:

• Investigations
• Abatement notice
• Citation issuance
Mosquito Control in DC

• Larvicide application

Dunks  Vectolex
Mosquito Control in DC

Larvicide application

- District-wide: storm drains, standing water
- Sister government agencies
- Residential application
Mosquito Prevention in DC

• When outdoors, wear long sleeves, pants, socks and shoes

• Apply Environmental Protection Agency (EPA)- approved insect repellent to exposed skin and/or clothing as directed by the product label

• When indoors, use air-conditioning and ensure that windows have intact screens and doors are secured
Zika Outreach in DC

- Website
- Neighborhood community meetings
- Community events
- OB-GYN providers
- Department of Health – walk in appointment
DCDOH Zika Contact Information

DC DOH Website:

Testing or Travel Questions:
DOH.EPI@dc.gov

Mosquito Related Issues:
Mosquito.Info@dc.gov
or (202) 442-5833
Questions?

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