Zika Virus: Protecting the Public
The Tennessee Surveillance Perspective

Mid-Atlantic Mosquito Control Association
Newport News, VA

Abelardo Moncayo, PhD | February 1, 2017
Zika Virus

- (+)ssRNA flavivirus
- Transmission routes:
  - Bite of infected *Ae.* mosquito
  - Pregnant woman to her fetus
  - Sex with an infected partner
  - Blood transfusion, fluids (?)
- Infection rate ~75%
- Incubation period 3-14 days
- Mild illness in ~ 20%
- Viremia
  - Serum up to 7 days
  - Urine longer
  - Semen even longer
Zika Disease & Testing

- Signs and symptoms;
  - Conjunctivitis, joint pain, fever, rash
  - Birth defects (microcephaly)
    - Eye defects, hearing deficits, impaired growth
  - Guillain-Barré Syndrome
- No specific treatment
- Diagnosis
  - Clinical signs, and
  - Laboratory evidence of recent infection
    - Antigen detection by PCR; or
    - IgM antibody detection by ELISA confirmed when NAb identified by PRNT
- No vaccine available
Zika Prevention

- Use insect repellent
- Reduce habitat (tip and toss after each rain)
- Keep mosquitoes out of your home

- Use male and female condoms
- Don’t share sex toys
- Consider abstinence
- 8 weeks to 6 months

- Check the latest travel notices
- Avoid travel when possible
- Talk to your doctor before conception or travel
Zika Emergence

How the Zika virus spread

- **Active transmission**
- **Known previous transmission**
- **Antibodies also detected**

1. **1947**
   - First documented in monkeys in Uganda

2. **1960**
   - First human cases in Nigeria

3. **1970s**
   - Cases in Pakistan, India, Malaysia, and Indonesia

4. **2007**
   - Epidemic on island of Yap, Micronesia

5. **2013**
   - Epidemic on French Polynesia

6. **2014-16**
   - Zika appears in northern Brazil and spreads through the Americas

SOURCE: WHO and Lancaster University, Feb.1
Zika Transmission Worldwide

- 198,607 Confirmed cases
- 540,176 Probable cases
- 76 Countries/territories
  - 29 with microcephaly
  - 21 with increased Guillain-Barré Syndrome
  - 13 with person-to-person transmission

Updated 01/26/2017
Zika Cases Diagnosed in the U.S.

Updated 01/26/2017
## Zika Cases Diagnosed in the U.S.

<table>
<thead>
<tr>
<th>Case Type</th>
<th>U.S. States</th>
<th>U.S. Territories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel-associated</td>
<td>4,930</td>
<td>140</td>
</tr>
<tr>
<td>Locally-acquired</td>
<td>219</td>
<td>35,644</td>
</tr>
<tr>
<td>Sexually-transmitted</td>
<td>40</td>
<td>Data Not Available</td>
</tr>
<tr>
<td>Guillain-Barré Syndrome</td>
<td>13</td>
<td>51</td>
</tr>
<tr>
<td>Pregnant Women</td>
<td>1,347</td>
<td>2,885</td>
</tr>
<tr>
<td>Liveborn w/ birth defects</td>
<td>37</td>
<td>Data Not Available</td>
</tr>
<tr>
<td>Pregnancy loss w/ birth defects</td>
<td>5</td>
<td>Data Not Available</td>
</tr>
</tbody>
</table>

CDC is not reporting numbers for adverse pregnancy outcomes in the territories at this time.

Updated 01/30/2017
Zika Surveillance in Tennessee

- Made reportable in TN and notifiable to CDC in Feb 2016
  - Only accommodated Zika disease (not asymptomatic infections)
  - Testing pregnant women
- At first, testing only at TDH lab and CDC
  - ALL tests require pre-authorization by public health (651 to date)
- Now, receive electronic lab results from TDH, LabCorp, and Quest (PCR and ELISA)
Zika Epidemiology in Tennessee

Number of Zika Tests Authorized by Month of Investigation Start Date
Jan 1, 2016 through Jan 26, 2017

[Bar chart showing the number of Zika tests authorized by month, with categories for Confirmed, Not a Case, Probable, and Suspect.]

Updated 01/26/2017
Unpublished data
Public Health vs Commercial Lab Testing

- Public Health & Commercial: 9 (2%)
- Commercial Only: 37 (9%)
- Public Health Only: 351 (88%)

Updated 09/26/2016
Unpublished data
Specimen collection type
Zika Cases Reported in Tennessee

Number of Zika Virus Infections by Public Health Jurisdiction
Tennessee
64 Cases

Updated 09/26/2016
Zika Cases Reported in Tennessee

- **64 travel-associated cases**
  - 51 laboratory-confirmed
  - 13 probable (pending or inconclusive PRNT)
  - 4 men in CDC virus persistence study (urine and semen)
  - 6 Congenital Investigations
  - 0 Zika-related microcephaly
## Characteristics of Zika Cases (TN & U.S.)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>TN N=64 (%)</th>
<th>U.S. N=2,382 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>36 (56)</td>
<td>1,495 (63)</td>
</tr>
<tr>
<td>Male</td>
<td>28 (44)</td>
<td>886 (37)</td>
</tr>
<tr>
<td>Age group (yrs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-19</td>
<td>8 (13)</td>
<td>208 (9)</td>
</tr>
<tr>
<td>20-39</td>
<td>31 (48)</td>
<td>1,012 (42)</td>
</tr>
<tr>
<td>40-59</td>
<td>19 (30)</td>
<td>889 (37)</td>
</tr>
<tr>
<td>≥ 60</td>
<td>6 (9)</td>
<td>273 (11)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caribbean</td>
<td>34 (53)</td>
<td>1,545 (65)</td>
</tr>
<tr>
<td>Central America</td>
<td>26 (41)</td>
<td>434 (18)</td>
</tr>
<tr>
<td>South America</td>
<td>4 (6)</td>
<td>224 (9)</td>
</tr>
<tr>
<td>Sign/Symptoms*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rash</td>
<td>50 (85)</td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>36 (61)</td>
<td></td>
</tr>
<tr>
<td>Arthralgia</td>
<td>34 (58)</td>
<td></td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>21 (36)</td>
<td></td>
</tr>
</tbody>
</table>

*Symptomatic Cases = 59

TN unpublished data updated 01/26/2017 (01/01/16 – 01/26/17)

U.S. data through 07/31/2016 at [http://dx.doi.org/10.15585/mmwr.mm6536e5](http://dx.doi.org/10.15585/mmwr.mm6536e5)
Local Response to Confirmed Zika Cases

If viremic traveler is identified (i.e., PCR +);

- Identify dwellings within a 200 yard radius (mosquito flight range)
- Provide prevention messages on mosquito reduction & avoiding bites
- Encourage healthcare consultation if symptomatic or pregnant within specified date range
Pictured above A. albopictus however A. japonicus and A. triseriatus also have similar dark clypeus.

**Clypeus**

- Black
- White

- Banded
- Dark Legs, Non-banded

**Legs**

- A. albopictus
- A. japonicus
- A. triseriatus

**Palps**

- White tipped
- No White Tips

- Aedes albopictus
- Aedes japonicus

Aedes aegypti
Blue Mosquitos: Traps that caught <100 *A. albopictus* specimens

Red Mosquitos: Traps that caught >100 *A. albopictus* specimens

**Aedes albopictus**

Females
Average: 31.55
Range: 3-137

Males
Average: 6.8
Range: 1-29