Zika virus transmission in the US

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November 30, 2016
Zika virus vectors

- *Aedes aegypti* primary vector
- *Aedes albopictus* also competent vector
- Lay eggs in peridomestic water containers
- Live in and around households
- *Ae. aegypti* more efficient vector for humans
Estimated range of *Aedes aegypti* and *Aedes albopictus* in the United States, 2016*

*A Maps have been updated from a variety of sources. These maps represent CDC’s best estimate of the potential range of *Aedes aegypti* and *Aedes albopictus* in the United States. Maps are not meant to represent risk for spread of disease.*
Non mosquito-borne modes of transmission

- **Documented**
  - Intrauterine resulting in congenital infection
  - Intrapartum from viremic mother to newborn
  - Sexual
  - Laboratory exposure

- **Possible**
  - Blood transfusion
  - Organ or tissue transplantation
  - Breast milk
Laboratory-confirmed Zika virus disease cases reported to ArboNET by states or territories — United States, 2015–2016
(as of November 23, 2016)

<table>
<thead>
<tr>
<th></th>
<th>Travel-associated cases* (N=4,384)</th>
<th>Locally acquired cases† (N=32,784)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>States‡</strong></td>
<td>4,261 (96%)</td>
<td>182 (4%)</td>
</tr>
<tr>
<td><strong>Territories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>121 (&lt;1%)</td>
<td>31,944 (&gt;99%)</td>
</tr>
<tr>
<td>U.S. Virgin Islands</td>
<td>2 (&lt;1%)</td>
<td>603 (&gt;99%)</td>
</tr>
<tr>
<td>American Samoa</td>
<td>0 (0%)</td>
<td>54 (100%)</td>
</tr>
</tbody>
</table>

*Travelers returning from affected areas, their sexual contacts, or infants infected in utero
†Presumed local mosquito-borne transmission
‡One additional case acquired through laboratory transmission
Confirmed Zika, dengue, and chikungunya virus disease cases reported to PAHO from Puerto Rico, Jan–Oct 2016

Figure 1. Confirmed cases of chikungunya, dengue and Zika by epidemiological week. Puerto Rico. EW 1 to EW 40 of 2016

Source: Data published by the Puerto Rico Department of Health and reproduced by PAHO/WHO
High interest Zika virus disease cases reported to ArboNET by states or territories — United States, 2015–2016

(as of November 23, 2016)

<table>
<thead>
<tr>
<th></th>
<th>US States*</th>
<th>US Territories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guillain-Barré syndrome</td>
<td>13</td>
<td>46</td>
</tr>
<tr>
<td>Sexual transmission</td>
<td>36</td>
<td>--</td>
</tr>
</tbody>
</table>

*Includes Washington, DC
Sexual transmission of Zika in the US

- First report of probable sexual transmission from US
- Arbovirologist working in Senegal developed symptoms of Zika after returning to Colorado in 2008
- Ten days after his return, his wife developed symptoms and was serologically confirmed to have Zika infection
Sexual transmission in the US – informative cases

Limited vector-borne transmission in the US allows for identification of unusual cases of apparent sexual transmission. Reports to date include:

- From asymptomatic male partner
- Male-to-male sexual transmission
- Female-to-male sexual transmission
First potential locally transmitted case of Zika in US

- July 12, 2016 Utah Department of Health (DOH) notified of a patient with laboratory-confirmed Zika without travel to Zika transmission area
- Patient was family contact of travel-associated Zika case
  - No history of sexual contact with traveler, no blood transfusion, or organ transplantation
- Provided care to family contact with Zika with extremely high viremia
- Extensive investigation by Utah DOH and CDC for potential other cases and sources of infection

Brent et al, Preliminary Findings from Investigation of Zika Virus Infection in a Patient with No Known Risk Factors – Utah, 2016, MMWR, 2016 Sep 16;65(36):981-2
Utah investigation

- Four components
  - Epidemiologic-investigation of family contacts
  - Healthcare worker (HCW) serosurvey
  - Community serosurvey
  - Active vector surveillance near residence of patient and family

- No evidence of additional Zika infections identified among family contacts, HCWs, or community members
- No *Aedes aegypti* or *Aedes albopictus* mosquitoes identified
- No mosquito pools positive for Zika virus
Local Zika transmission in Florida, June-October 2016

- Early in July, four residents of Miami-Dade and Broward counties were confirmed to have Zika infection
  - None with history of travel or sexual contact with recent travelers
- Epidemiologic link between two of the index cases
- Investigation in area identified 25 more non-travel related cases

Likos et al, Local mosquito-borne transmission of Zika Virus – Miami-Dade and Broward Counties, Florida, June-August, MMWR, 2016 Sep 30;65(38):1032-38
Response to local transmission - Florida

- August 1, CDC issued health advisory notice for pregnant women for a 1-square mile area of apparent transmission
- Mosquito trapping in area showed large number of adult *Ae. aegypti* and breeding sites
- Pyrethroid spraying began July 23 via backpack and trucks
- Aerial ULV spraying with Naled and Bti added August 4
Effect of combined adulticide/larvicide approach
Further transmission in Florida

- Last confirmed case in Wynwood area with onset of symptoms August 8
- Other areas of local transmission identified, mostly in the Miami Beach area
Current status in Florida

- As of November 17, 2016 Florida DOH reporting 182 locally acquired cases of Zika to Arbonet
- Another area of active transmission in county identified in October
- Pregnant women should consider postponing travel to Miami-Dade county
Additional resources

- PAHO Zika virus pages:
For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.