Zika Virus:
Epidemiology Update

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October 14, 2016
The Zika response is constantly evolving and recommendations in this presentation may change over time.

Please call your district epidemiologist or a state epidemiologist on the Zika ream for current guidance.

404-657-2588
8-5 pm M-F
Overview

• Zika Global Epidemiology
• Zika National Epidemiology
• Georgia Epidemiology + Surveillance
Zika Virus
why are we talking about it now?

Large outbreak with active transmission was identified in Brazil in May 2015 (potential link to microcephaly – since confirmed)

- Mexico in November 2015
- Puerto Rico in December 2015
- Since May 2015, vectorborne transmission has been confirmed in over 50 new countries/territories in the Americas
- New outbreaks including a large outbreak in Singapore (~400 infections since August 2016)

Travel-linked and locally acquired Zika Virus in the US as of October 5, 2016

US States
Locally acquired mosquito-borne cases reported: 105
Travel-associated cases reported: 3,712
Laboratory acquired cases reported: 1
Total: 3,818
Sexually transmitted: 30
Guillain-Barré syndrome: 13

Zika Transmission in Florida

- It is estimated that local transmission began in mid-June 2016 in the Wynwood area of Miami.
- Local transmission was later identified in Miami Beach.
- Wynwood was moved from “red” to “yellow” in September.
- Miami Beach “red” zone has been expanded to 4.5 square miles from 1.5 square miles.
- Florida has reported 153 locally acquired Zika infections related to outbreak (including 19 people from other states who were infected during travel to FL).
- Note difference in national numbers – lag in reporting.

U.S. Zika Pregnancy Registry

- 837 pregnant women in the continental U.S. have lab evidence of Zika infection and are being followed in the CDC U.S. Zika Pregnancy Registry, which tracks any adverse pregnancy outcomes and the infants up to 12 months after delivery.

- So far in continental U.S., CDC has documented 22 live-born infants with Zika-related birth defects and 5 pregnancy losses involving Zika-related birth defects.
How is Zika Virus Transmitted?

• Transmitted to humans primarily by bite of infected *Aedes* species mosquitoes

• *Aedes aegypti* primary (most efficient) vector; *Aedes albopictus* competent vector, both found in Georgia – Dr. Kelly is the expert here!

• Mosquitoes become infected when they feed on a person already infected with Zika virus, then can spread the virus to other people through bites. Bite must occur during viremic period, within 7-10 days of illness onset.
Zika Virus: Other Routes of Transmission

- Intrauterine, resulting in congenital infection
- Sexual transmission
  - 30 documented cases in the US tied to the current outbreak (one in Georgia).
  - Most are male-to-female, there has been male-to-male and female-to-male documented. Condoms should be used during vaginal, oral, and anal sex as well as with sex toys.
- Laboratory exposure (documented)
- Blood transfusion (suspected, but not confirmed)
- Possibly via breast milk or organ donation, but never documented
What Happens After Transmission?
Zika Virus Disease: Clinical Picture

- The incubation period likely ranges from 3 days to 2 weeks
- About 1 in 5 people infected with Zika virus become ill
- Clinical illness usually mild; symptoms last several days to a week.
- The most common symptoms are fever, maculopapular rash, joint pain, and conjunctivitis.
- Treatment supportive (rest, fluids, analgesics, antipyretics); no specific antiviral therapy.
- Hospitalizations uncommon; fatalities rare.
- Zika virus remains in blood for a week; unknown how long in other body fluids – has been documented to persist in semen for months.
- Greatest concern is pregnant women and their unborn child
Zika Virus Disease: Complications/Severe Outcomes

1. Guillain-Barré Syndrome (GBS)/Other Neuropathies

   • 13 cases of GBS in the US associated with Zika (out of 3,818 cases – only .34% of cases have GBS)

   • In the 2013 French Polynesia outbreak, about 40 cases of GBS were reported among Zika case-patients.

   • Link looks strong but not definitive.

     – Virus may be neurotropic– case report in March 3 Lancet of a 15 yo with acute myelitis due to Zika infection.

2. **Microcephaly**: The Brazil Ministry of Health reported a substantial increase in number of babies born with microcephaly in 2015; true baseline unknown.

- A link between Zika virus infection during pregnancy and adverse outcomes, including microcephaly, was confirmed by CDC and researchers. Findings were reported through a NEJM article released on April 13, 2016.
  

- Questions remain about the spectrum of defects caused by Zika as well as definitive risk associated with trimester of infection
3. Other Severe Pregnancy Outcomes:


- Fetal death, placental insufficiency, intrauterine growth restriction, CNS injury, eye problems
- Similar to rubella
- Severe outcomes noted among women infected in all trimesters, not just the first
- Recommend that pregnant women with Zika infection be handled as high-risk pregnancy
Zika: DPH Surveillance Goals

• Priority Surveillance Goals
  
  – Document travel-associated spread to new areas (so local transmission to mosquitoes can be mitigated).

  – Most important population at risk: identify, test, and evaluate pregnant women who traveled to areas with Zika virus transmission (or whose sexual partners traveled).

  – Rapid ascertainment of cases of microcephaly and other birth defects potentially associated with Zika virus infection in pregnancy and referral to services.
DPH Epidemiology Roles

- All human disease related activity including
  - Facilitate Laboratory Testing, interpretation of results
  - Surveillance of cases and suspect cases
  - Case follow up and investigation
  - Inform Environmental Health of cases and investigations of interest
  - Inform Prevention and Control Strategies
Zika Virus: Laboratory Testing

• Testing may be performed at GPHL or commercial labs
• Most complete testing options are only available through GPHL and DPH Epidemiology triage

• Methods:
  • Reverse transcriptase-polymerase chain reaction (RT-PCR) in serum and urine collected ≤14 days after illness onset
  • Serology for IgM and neutralizing antibodies in serum collected ≥4 days after illness onset
  • Plaque Reduction Neutralization Test (PRNT) done when IgM is positive, equivocal, or inconclusive
• Healthcare providers must contact DPH to facilitate testing at GPHL/CDC.
• Note: Surveillance testing versus patient diagnosis
Zika: Georgia Epi Definition

“Symptomatic” is defined by having at least 1 of the 3 major symptoms: joint pain, conjunctivitis, or maculopapular rash
Zika: Testing Snapshot

- **Priority:** Pregnant women with potential Zika exposure and infants/fetuses of Zika-infected pregnant women

- Symptomatic and asymptomatic pregnant women with travel history or a sex partner who has traveled to affected areas should be offered Zika testing.

- Pregnant women should use condoms consistently and correctly with partners that may have been exposed to Zika for the duration of pregnancy.

- Symptomatic suspected Zika virus infections in anyone (pregnant or not) should also be evaluated for possible **dengue or chikungunya** virus infections (commercial tests available)
Zika: Testing Snapshot

- **Symptomatic travelers (not pregnant)**
- Symptomatic, non-pregnant travelers should be offered testing (“symptomatic” is defined as having at least 1 of the three major, Zika-specific symptoms)
- Symptomatic suspected Zika virus infections in anyone (pregnant or not) should also be evaluated for possible **dengue or chikungunya** virus infections (commercial tests available)
Zika: Testing Snapshot

- **Sexual transmission suspects**
  - Symptomatic, non-traveler sexual partners (male, female, or female/pregnant) of persons who traveled and were symptomatic should be offered testing. The traveler should also be tested.
  - Asymptomatic, non-traveler pregnant sexual partners of males who traveled should be offered testing.
  - These non-travelers being considered for sexual transmission should also be given mosquito avoidance education.
Zika: Testing Snapshot

- **Local vectorborne transmission suspects**
- We consider these on a case-by-case basis for testing
- DPH Epi contacts Dr. Chris Kumnick/Dr. Ros Kelly immediately so they can assess the need for vector surveillance and response
- Person would need to fit normal case definitions (at least one of maculopapular rash, conjunctivitis, and joint pain) and have absence of a more likely diagnosis.
- Travel and residence information as well as sexual history and vaccination history is important
Zika Epidemiology/Response in Georgia

- In Georgia, since January, DPH Epidemiology has triaged about 1,700 Zika clinical inquiries and almost 4,000 general inquiries (averaging about 40-70 calls per day currently).
- Facilitated Zika testing at our Georgia Public Health Laboratory for over 1100 persons (~65% among pregnant women), including those with travel to affected areas of Miami, Florida.
- No local Zika transmission in Georgia. To date, we have documented 90 travel-related Zika infections; about 65% in metro Atlanta.
- We counsel suspect and confirmed cases to strictly avoid mosquito bites here in Georgia (for 3 weeks after travel), to prevent sexual transmission of Zika, and to practice Tip-N-Toss around their properties.
Patient Tracking

- All suspect patients must be triaged through epidemiology (either district or state office)
- State epidemiology is tracking all patients through the State Electronic Notifiable Disease Surveillance System (SendSS) Zika Active Monitoring System (ZAMS)
Zika Community Campaign

WHAT ARE THE FACTS?
Zika Virus Infection

- Zika virus is spread by mosquitoes.
- Symptoms include fever, headache, rash, and joint pain.
- Pregnant women should avoid travel to areas with Zika outbreaks.
- No vaccine is available to prevent Zika.

HOW IS ZIKA TRANSMITTED?
- Mosquitoes bite infected individuals and then spread the virus to others.

WHAT ARE THE SYMPTOMS?
- Fever
- Headache
- Rash
- Joint pain

HOW DO YOU PROTECT AND PREVENT?
- Use DEET-based insect repellent.
- Stay indoors with air conditioning or use window and door screens.
- Wear protective clothing.
- Sleep under a mosquito net.

CONTROL MOSQUITOES TIP ’N TOSS
- Eliminate standing water to reduce mosquito breeding.
- Drain any water containers, even small.
- Keep gutters, downspouts, and window boxes clean.
- Use mosquito nets at night.

KEEP MOSQUITOES AWAY!
- Wear long sleeves and pants.
- Use mosquito repellent.
- Keep your home and property clean.
- Use mosquito nets at night.

Find out what it takes to stop Zika
Please visit dph.georgia.gov/zika
Zika Travel Campaign

- 14 domestic and international concourses
- Countries with ongoing Zika transmission
- EPA registered insect repellents with DEET sold on the concourse
- Wear long sleeves, pants
- Air conditioning or screened in locations
- Use a mosquito net
Key is Reducing Risk in Pregnant Women and the Risk of Local Transmission

1. By reducing travel to affected areas

2. By reducing chance of sexual transmission from male partners who traveled

3. By reducing mosquito populations in areas where zika is spreading (hard to do)

4. Through education and rapid reporting of suspect local transmission cases
What Does the Future Hold for Zika Virus?

- Virus will continue to spread in areas with competent vectors
- Many travel-associated cases will occur; may result in some additional local transmission and outbreaks (likely next mosquito season if it will happen).
- We may gain answers to the unknown questions about congenital transmission, more about infection and microcephaly, the role of sexual transmission, how long virus persists in other body fluids (semen, saliva, urine) and the role of other mosquito vectors in temperate areas.
- Stay tuned!
State Epidemiology Resources and Contacts

- GDPH Zika website - https://dph.georgia.gov/zika (physician and lab letters, FAQs, etc)
- MMWRs for Zika - http://www.cdc.gov/mmwr/zika_reports.html
- DPH Epidemiology – 404-657-2588 (M-F, 8-5)

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