Georgia Department of Public Health

Zika Virus Update

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EIP

March 11, 2016

We Protect Lives.

The Zika response is constantly evolving and recommendations in this presentation may change over time

Please call your district epidemiologist or a GDPH epidemiologist for current guidance

404-657-2588

8-5 pm M-F

Overview

- Zika Virus: Current Epidemiology Globally
- DPH Roles: Surveillance (Lab), Inform Control Measures
- Current Epidemiology in Georgia
- Practical Advice for Healthcare Community
- Closing Comments

Zika Virus – Brief Background

- Mosquito-borne virus spread to humans primarily through the bite of an infected mosquito (*Aedes* spp.)
- First identified in Uganda in 1947 in rhesus monkeys through a monitoring program for sylvatic yellow fever
- After 1947, sporadic human cases occurred
- First outbreak occurred in 2007 in Yap Island in Micronesia
- Since that time, outbreaks have occurred in Africa, Southeast Asia, and the Pacific Islands – and now the Americas

Aedes aegypti

Aedes albopictus

CDC http://www.cdc.gov/chikungunya/pdfs/CHIKV_VectorControl.pdf

Zika Virus
why are we talking about it now?

Active transmission was identified in Brazil in May 2015
(potential link to microcephaly)

- Mexico in November 2015
- Puerto Rico in December 2015
- Since May 2015, vectorborne transmission has been confirmed in 28 new countries in the Americas
- As of March 9, 193 travel-associated cases reported in the US, including 5 from Georgia (as of March 11, we have 6)

CDC http://www.cdc.gov/zika/geo/

CDC http://www.cdc.gov/zika/geo/

Zika Virus in the US as of March 9, 2016

As of March 9, 2016 (5 am EST)

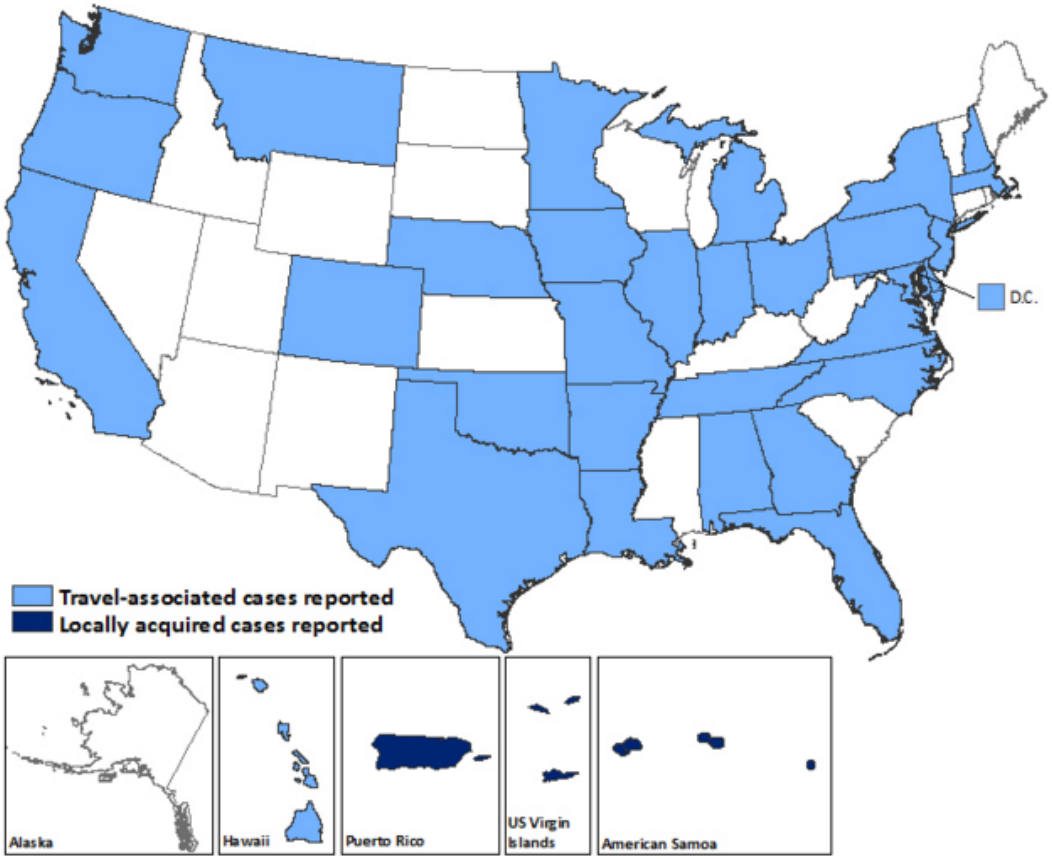
- As an arboviral disease, Zika virus is nationally notifiable.
- This update from the CDC Arboviral Disease Branch includes provisional data reported to ArboNET for January 1, 2015 – March 9, 2016.

US States

- Travel-associated Zika virus disease cases reported: 193
- Locally acquired vector-borne cases reported: 0

US Territories

- Travel-associated cases reported: 1
- Locally acquired cases reported:173



Zika Virus transmission via mosquito in the Americas as of Feb 29, 2016

Americas

- **Aruba**
- Barbados
- Bolivia
- **Bonaire**
- Brazil
- Colombia
- Commonwealth of Puerto Rico, US territory
- Costa Rica
- Curacao
- Dominican Republic
- Ecuador
- El Salvador
- French Guiana
- Guadaloupe
- Guatemala
- Guyana
- Haiti
- Honduras
- Jamaica
- Martinique
- Mexico
- Nicaragua
- Panama
- Paraguay
- Saint Martin
- **Saint Vincent and Grenadines**
- **Saint Maartin**
- **Trinidad and Tobago**
- Suriname
- U.S. Virgin Islands
- Venezuela

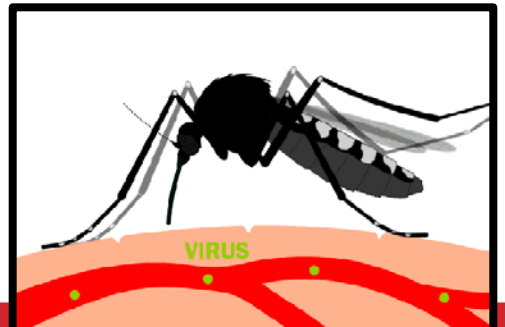
CDC http://www.cdc.gov/zika/geo/

Aedes aegypti

How is Zika Virus Transmitted?

Aedes albopictus

- Transmitted to humans primarily by bite of infected *Aedes* species mosquitoes
- *Aedes aegypti* primary (most efficient) vector; *Aedes albopictus* competent vector
- Both also transmit dengue and chikungunya viruses; both found in Georgia.
- Mosquitoes become infected when they feed on a person already infected with Zika virus (viremic), then can spread the virus to other people through bites.

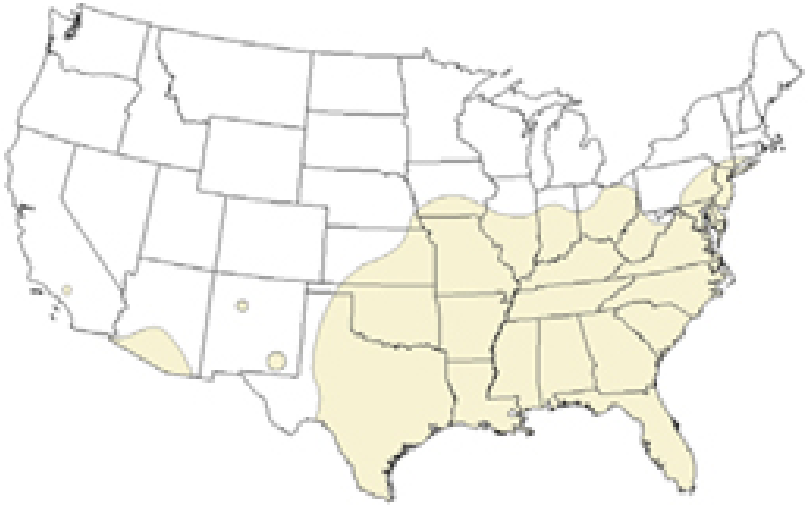


Mosquito vectors in the US

Two of the most prominent *Aedes* spp. mosquitos

Approximate distribution of *Aedes aegypti* in the United States*

Approximate distribution of *Aedes albopictus* in the United States*



http://www.cdc.gov/chikungunya/images/distribution-maps-us.jpg

Zika Virus: Other Routes of Transmission

- Intrauterine, resulting in congenital infection
- Sexual transmission
  - 3 documented instances, including recently in Texas
  - CDC has reported ongoing investigation of several additional suspect cases
- Blood transfusion
- 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.

Zika Virus Disease: Complications/Severe Outcomes

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

- CDC recently reported that two U.S. travelers with Zika infection developed 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.

  http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)00644-9/fulltext?rss=yes

Zika Virus Disease: Complications/Severe Outcomes

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 microcephaly is strongly suspected, though not yet fully scientifically proven.
- 3 recent scientific reports provide evidence toward that proof. Whether another co-factor is involved is unknown.

Zika In Pregnancy: More Data

- Since August 2015, CDC has documented 9 lab-confirmed cases of Zika infection in pregnant women in the U.S.; all traveled to Zika-affected areas.
- All nine women reported symptoms (fever, rash, conjunctivitis, or arthralgia);
- In this small case series, Zika virus infection during pregnancy was associated with a range of outcomes
- Newly-established CDC registry for U.S. pregnant women with Zika infection and their infants.

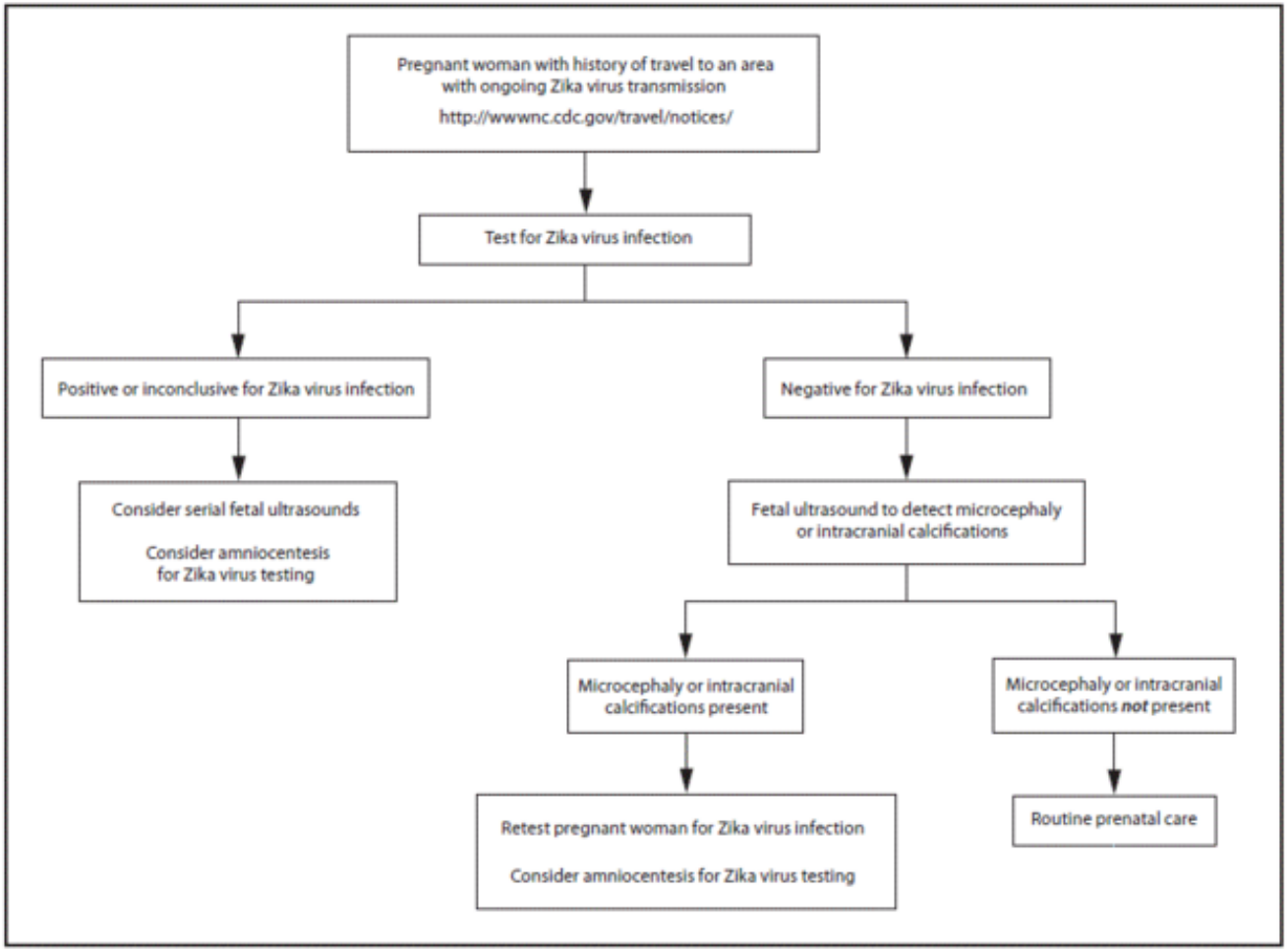
Pregnancy outcomes by when symptomatic (n=9)

Trimester	Number	Outcomes
1st	6	2 miscarriages 2 elective terminations 1 congenital microcephaly 1 still pregnant
2nd	2	1 still pregnant 1 healthy infant
3rd	1	1 still pregnant

Zika Virus and pregnant women

Updated interim guidance for pregnant women who have traveled to an area where zika transmission is occurring

FIGURE 1. Updated Interim guidance: testing algorithm*,†,§,¶,** for a pregnant woman with history of travel to an area with ongoing Zika virus transmission



http://www.cdc.gov/mmwr/volumes/65/wr/mm6505e2.htm

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Zika Virus Disease: Complications/Severe Outcomes

3. Other Severe Pregnancy Outcomes:

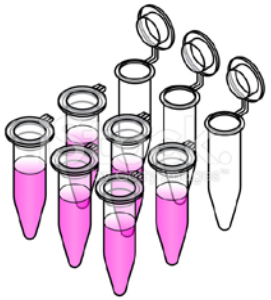
http://www.nejm.org/doi/full/10.1056/NEJMoa1602412

- 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

DPH Roles

- Facilitate Laboratory Testing
- Surveillance
- Inform Prevention and Control Strategies

Zika Virus: Laboratory Testing



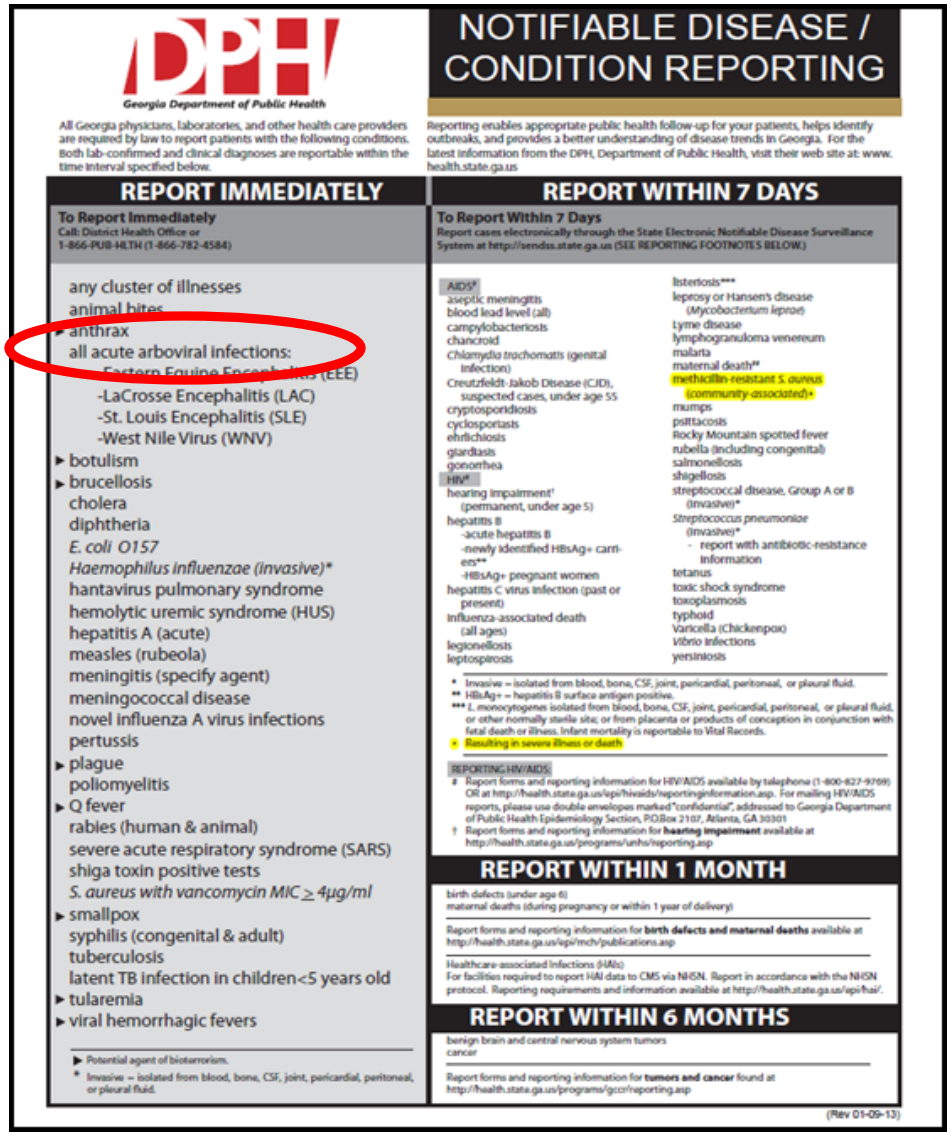
- No commercially-available diagnostic tests
- All testing performed at CDC and a few state public health labs (not yet at GPHL, but within a few weeks)
- Methods:
  - Reverse transcriptase-polymerase chain reaction (RT-PCR) in serum collected ≤7 days after illness onset
  - Serology for IgM and neutralizing antibodies in serum collected ≥4 days after illness onset
  - Plaque Reduction Neutralization Test (PRNT) done with IgM
- Healthcare providers must contact DPH to facilitate testing at CDC.
- Note: Surveillance testing versus patient diagnosis

Zika Emergence: Public Health Surveillance Goals

- Since up to 80% of Zika-infected persons are asymptomatic (or mildly ill) and lab testing is not widely available, not realistic to identify every case of infection.
- Priority Surveillance Goals
  - Document travel-associated spread to new areas/states (so local transmission to mosquitoes can be mitigated)
  - Better characterize clinical complications like GBS and sexual transmission
  - **Most important population at risk**: identify and evaluate pregnant women who traveled to areas with Zika virus transmission
  - Evaluate fetuses/infants of women infected during pregnancy for congenital infection and microcephaly

Zika Surveillance: How?

Zika made nationally notifiable in January 2016



DPH
Georgia Department of Public Health

NOTIFIABLE DISEASE / CONDITION REPORTING

All Georgia physicians, laboratories, and other health care providers are required by law to report patients with the following conditions. Both lab-confirmed and clinical diagnoses are reportable within the time interval specified below.

Reporting enables appropriate public health follow-up for your patients, helps identify outbreaks, and provides a better understanding of disease trends in Georgia. For the latest information from the DPH, Department of Public Health, visit their web site at: www.health.state.ga.us

REPORT IMMEDIATELY

To Report Immediately
Call: District Health Office or
1-866-PUB-HLTH (1-866-782-4584)

- any cluster of illnesses
- animal bites
- ▸ anthrax
- all acute arboviral infections:
  - -Eastern Equine Encephalitis (EEE)
  - -LaCrosse Encephalitis (LAC)
  - -St. Louis Encephalitis (SLE)
  - -West Nile Virus (WNV)
- ▸ botulism
- ▸ brucellosis
- cholera
- diphtheria
- *E. coli O157*
- *Haemophilus influenzae (invasive)**
- hantavirus pulmonary syndrome
- hemolytic uremic syndrome (HUS)
- hepatitis A (acute)
- measles (rubeola)
- meningitis (specify agent)
- meningococcal disease
- novel influenza A virus infections
- pertussis
- ▸ plague
- poliomyelitis
- ▸ Q fever
- rabies (human & animal)
- severe acute respiratory syndrome (SARS)
- shiga toxin positive tests
- *S. aureus with vancomycin MIC ≥ 4µg/ml*
- ▸ smallpox
- syphilis (congenital & adult)
- tuberculosis
- latent TB infection in children<5 years old
- ▸ tularemia
- ▸ viral hemorrhagic fevers

▸ Potential agent of bioterrorism.
* Invasive – isolated from blood, bone, CSF, joint, pericardial, peritoneal, or pleural fluid.

REPORT WITHIN 7 DAYS

To Report Within 7 Days
Report cases electronically through the State Electronic Notifiable Disease Surveillance System at http://sendss.state.ga.us (SEE REPORTING FOOTNOTES BELOW.)

- AIDS#
- aseptic meningitis
- blood lead level (all)
- campylobacteriosis
- chancroid
- *Chlamydia trachomatis* (genital infection)
- Creutzfeldt-Jakob Disease (CJD), suspected cases, under age 55
- cryptosporidiosis
- cyclosporiasis
- ehrlichiosis
- giardiasis
- gonorrhea
- HIV#
- hearing impairment† (permanent, under age 5)
- hepatitis B
  - -acute hepatitis B
  - -newly identified HBsAg+ carrier**
  - -HBsAg+ pregnant women
- hepatitis C virus infection (past or present)
- Influenza-associated death (all ages)
- legionellosis
- leptospirosis
- listeriosis***
- leprosy or Hansen's disease (*Mycobacterium leprae*)
- Lyme disease
- lymphogranuloma venereum
- malaria
- maternal death##
- methicillin-resistant *S. aureus* (community-associated)+
- mumps
- psittacosis
- Rocky Mountain spotted fever
- rubella (including congenital)
- salmonellosis
- shigellosis
- streptococcal disease, Group A or B (invasive)*
- *Streptococcus pneumoniae* (invasive)*
  - report with antibiotic-resistance information
- tetanus
- toxic shock syndrome
- toxoplasmosis
- typhoid
- Varicella (Chickenpox)
- *Vibrio* infections
- yersiniosis

* Invasive – isolated from blood, bone, CSF, joint, pericardial, peritoneal, or pleural fluid.
** HBsAg+ – hepatitis B surface antigen positive.
*** *L. monocytogenes* isolated from blood, bone, CSF, joint, pericardial, peritoneal, or pleural fluid, or other normally sterile site; or from placenta or products of conception in conjunction with fatal death or illness. Infant mortality is reportable to Vital Records.
+ Resulting in severe illness or death

REPORTING HIV/AIDS:
Report forms and reporting information for HIV/AIDS available by telephone (1-800-827-9769) OR at http://health.state.ga.us/epi/hivaids/reportinginformation.asp. For mailing HIV/AIDS reports, please use double envelopes marked "confidential", addressed to Georgia Department of Public Health Epidemiology Section, POBox 2107, Atlanta, GA 30301
† Report forms and reporting information for **hearing impairment** available at http://health.state.ga.us/programs/unhs/reporting.asp

REPORT WITHIN 1 MONTH

birth defects (under age 6)
maternal deaths (during pregnancy or within 1 year of delivery)

Report forms and reporting information for **birth defects and maternal deaths** available at http://health.state.ga.us/epi/mch/publications.asp

Healthcare-associated Infections (HAIs)
For facilities required to report HAI data to CMS via NHSN. Report in accordance with the NHSN protocol. Reporting requirements and information available at http://health.state.ga.us/epi/hai/.

REPORT WITHIN 6 MONTHS

benign brain and central nervous system tumors
cancer

Report forms and reporting information for **tumors and cancer** found at http://health.state.ga.us/programs/gccr/reporting.asp

(Rev 01-09-13)

Zika and Georgia

- As of March 11, 2016 GDPH has triaged over 230 clinical inquiries and 240 general inquiry calls, approving over 180 Georgia residents for testing (most are asymptomatic pregnant women with travel history).
- To date, 6 confirmed cases of travel-associated Zika virus infection have been identified in the state.
  - All had travel history to a country where Zika virus is circulating
  - None were pregnant

Zika Virus Prevention + Control

For Travelers to Affected Areas:

- No vaccine to prevent infection
- Travelers should check CDC travel advisories for their destinations
- Primary prevention measure is to reduce mosquito exposure

For Pregnant Women

- Pregnant women should postpone travel to areas with ongoing Zika virus outbreaks
- If must travel, practice strict mosquito bite prevention as above
  - When used according to the label, all EPA-registered insect repellents are safe in pregnant women
- Precautions to reduce chance of sexual transmission if partner has traveled
- If trying to conceive, consider delaying for at least one week after symptoms or 3 weeks after travel

Zika Virus Prevention + Control

For Infected (or Unknown) Travelers Returning Home

- Zika-infected (or suspect) persons should guard against additional mosquito bites during first week of illness to prevent further transmission.
- Practice mosquito reduction techniques (eliminate containers of standing water) around the home.
- Delay blood donation for one month; FDA guidelines for screening, deferral

Zika Virus Prevention + Control

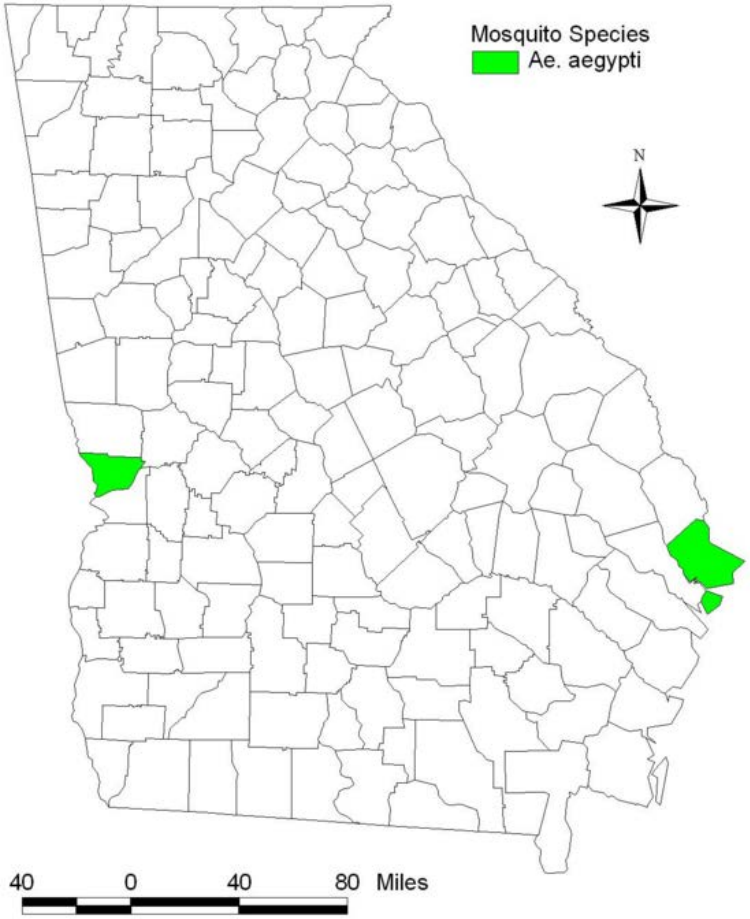
General (If Local Transmission)

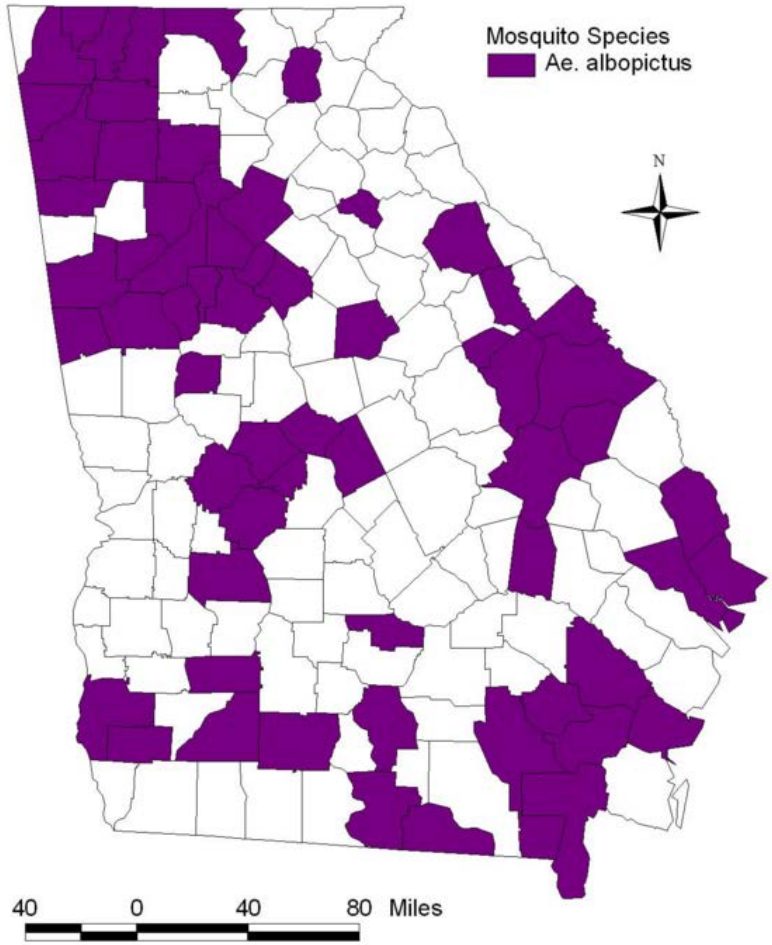
- *Aedes* vector control activities targeted to affected areas/near locally-acquired human cases (DPH Environmental Health, Local Mosquito Control Agencies)
- Regional planning/federal HHS

Controls Include:

- Public education; standing water reduction
- Door-to-Door inspections and education
- Mosquito population suppression (larviciding)

Mosquito vectors in Georgia





Approximate distribution of Aedes spp. based on available surveillance data
http://www.gamosquito.org/resources/mosspecies.htm

Zika: Practical Advice for the Healthcare Community

- **Priority: Pregnant women travelers and infants/fetuses of Zika-infected pregnant women**
- Symptomatic pregnant women with travel history to affected areas should be offered Zika testing.
- Asymptomatic pregnant women offered Zika serologic testing **2-12** weeks after return.
- Suspected Zika virus infections should also be evaluated for possible **dengue or chikungunya** virus infections (commercial tests available)
- CDC Guidance: http://www.cdc.gov/mmwr/volumes/65/wr/mm6505e2.htm

Zika: Practical Advice for the Healthcare Community II

Suspect Cases:

- DPH **must** triage and coordinate testing at CDC (via GPHL)
- Call District Epidemiologist, DPH Epidemiology (404-657-2588)
- Lab testing is not rapid and is not performed on an emergency basis; can collect clinical specimen (0.5 mL of serum) and refrigerate until DPH coordination.
- In the meantime, we have competent vectors for the virus in GA, so all suspect cases should be counseled to strictly avoid mosquito bites here (especially first week of illness).
- Lab testing results for pregnant women will guide evaluation of fetuses/infants for congenital infection and microcephaly.
- Evolving situation; CDC guidance: http://www.cdc.gov/mmwr/zika_reports.html

Key is Reducing Risk in Pregnant Women

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)

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 local transmission and outbreaks.
- We may gain answers to the unknown questions about congenital transmission, causal link between 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!

Closing Comments

1. Travel-associated emerging infectious diseases like Zika are the “new normal”.

2. Epidemiology points our way to mitigation and prevention (travel history critical, identification of populations at highest risk like pregnant women).

3. Whether public health emergency or not, our collective mission to protect lives requires collaboration.

4. **Routinely take travel histories and call DPH!**

What if your facility has a suspect case?

Call your district epidemiologist

or GDPH epidemiology

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

How to Contact DPH Epidemiology (24/7)

- Office/Epi On-Call (8-5): 404-657-2588 (ask for someone on zika team)
- Medical Epidemiologist (after hours): 1-866-PUB-HLTH