

Zika virus

North Carolina Department of Health and Human Services,
Division of Public Health



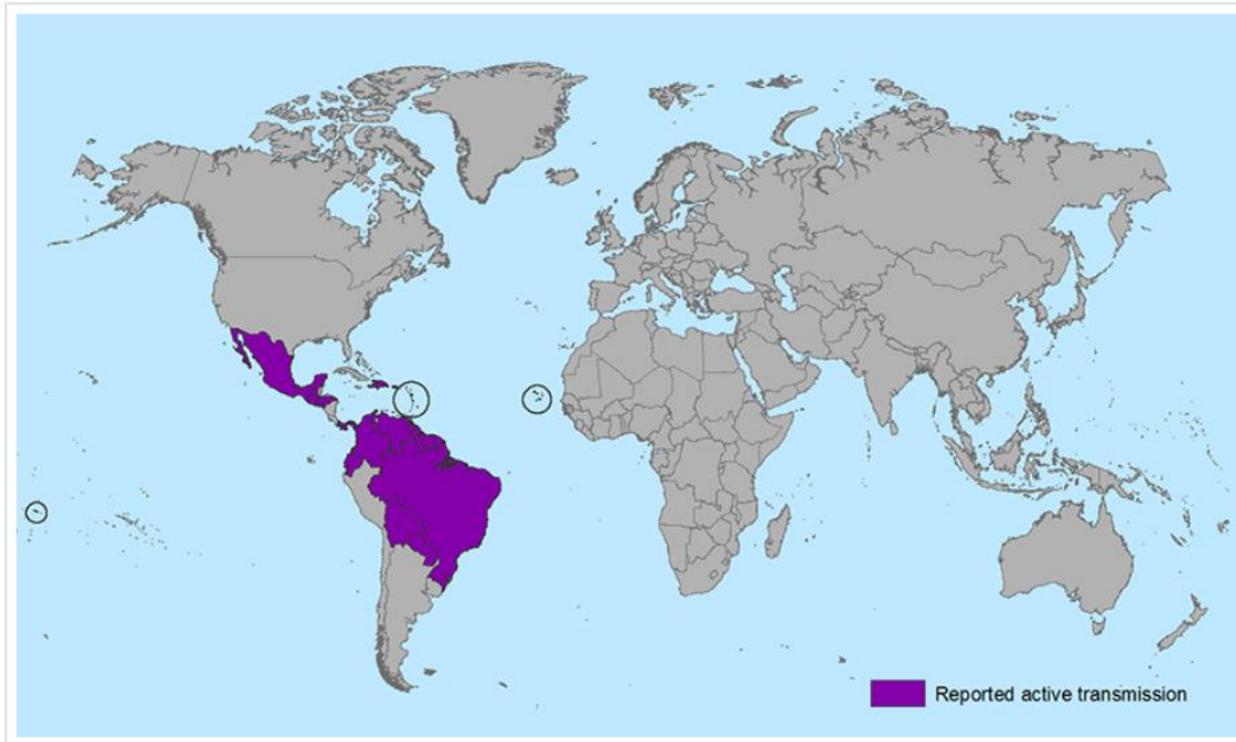
Goals

- Describe Zika virus and possible association with birth defects
- Review management and reporting of Zika virus disease in North Carolina
- Answer questions about guidance

Background

- Mosquito-borne emerging arbovirus
- Closely related to dengue, yellow fever, Japanese encephalitis and West Nile viruses
- First identified in Uganda in 1947
- Since 2007: Outbreaks in Gabon, Micronesia, French Polynesia
- Since 2015: Endemic transmission in Central & South America

Figure: Countries and territories with active Zika Virus Transmission (as of January 27, 2016)



- Only travel-associated cases have been identified in the United States

AMERICAS

- Bolivia
- Brazil
- Colombia
- Dominican Republic
- Ecuador
- El Salvador
- French Guiana
- Guadeloupe
- Guatemala
- Guyana
- Haiti
- Honduras
- Martinique
- Mexico
- Panama
- Paraguay
- Puerto Rico
- Saint Martin
- Suriname
- US Virgin Islands
- Venezuela

OCEANIA/PACIFIC ISLANDS

- Samoa

AFRICA

- Cape Verde

Vectors: *Aedes* mosquitos

- *Aedes* species mosquitos
 - Primary: *Ae aegypti*
 - Secondary: *Ae albopictus*
- Aggressive day-time biters
- Also transmit dengue and chikungunya viruses

Clinical Presentation

- ~1 in 5 people infected with Zika virus become ill
 - Symptom onset: 3–12 days after exposure
 - Symptoms resolution: 2–7 days after onset
- Symptoms include:
 - Mild fever
 - Rash (mostly maculopapular)
 - Headaches
 - Arthralgia
 - Myalgia
 - Non-purulent conjunctivitis
- Presentation is similar to dengue and chikungunya infection
- Severe disease requiring hospitalization and fatalities is rare

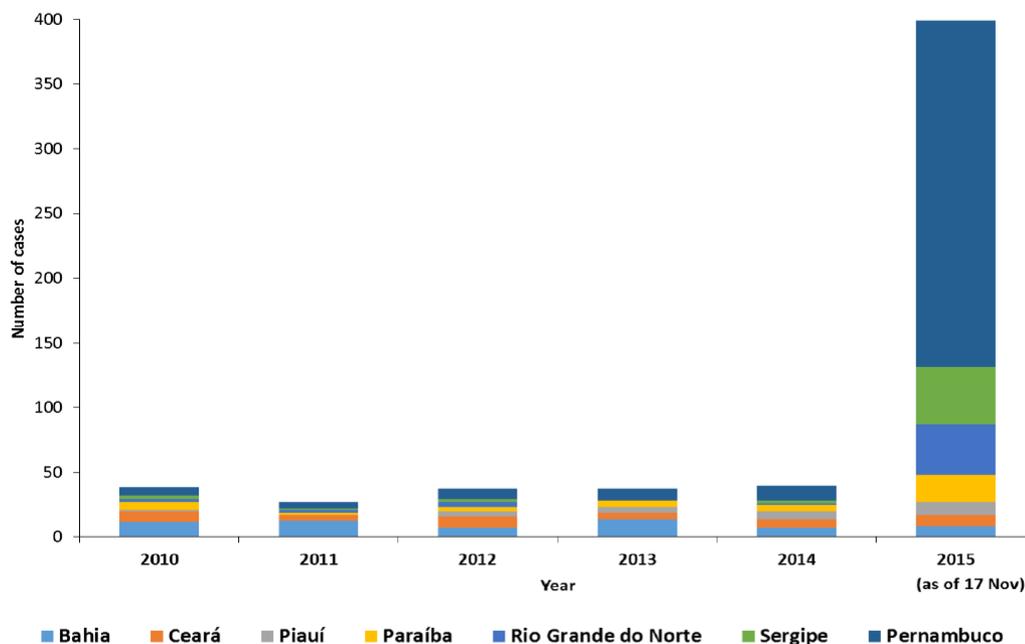
Case Management

- Symptomatic patients should be evaluated and managed for possible Zika, dengue, and chikungunya infection
- No specific antiviral treatment is available
- Treatment is symptomatic (e.g. rest, fluids, acetaminophen)
- Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided until dengue can be ruled out

Zika Virus Infection and Pregnancy

Brazil 2015: Reports of microcephaly and other poor outcomes in babies of mothers who were infected with Zika virus while pregnant

Figure 2. Number of cases of microcephaly reported annually in the seven Brazilian states reporting an unusual increase of microcephaly, 2010–2015



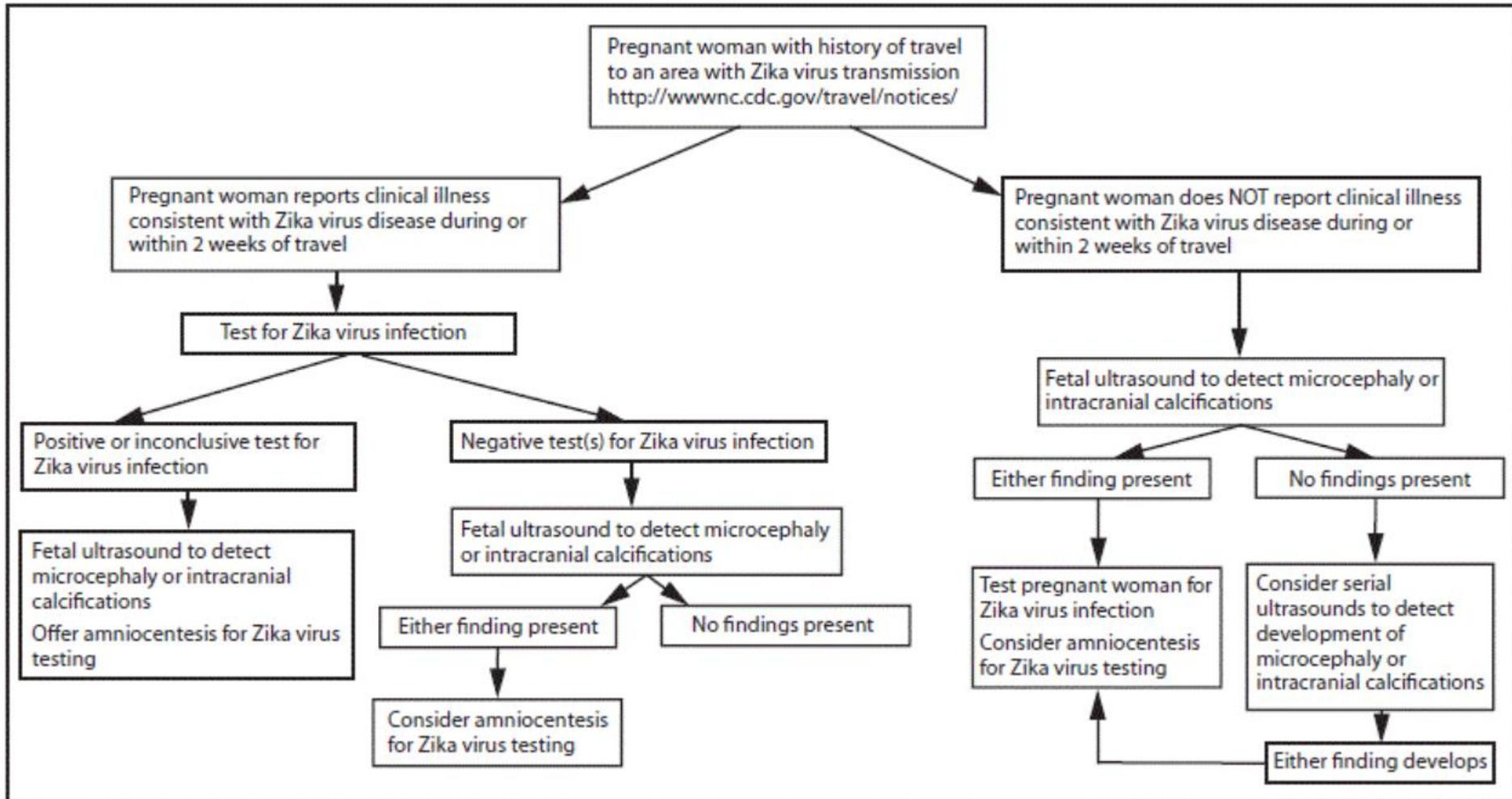
Jose Wesley, a Brazilian baby shown here on Dec. 23, 2015, was born with microcephaly. His mother was diagnosed with the Zika virus that researchers think may cause the birth defect.

(AP Photo/Felipe Dana)

CDC Travel Notice for Pregnant Women

- Pregnant women in any trimester should consider postponing travel to areas where Zika is present
- Pregnant women who do travel to one of these areas should talk to their healthcare provider and strictly follow steps to avoid mosquito bites during the trip

Figure: Interim guidance testing algorithm, for a pregnant woman with history of travel to an area with Zika virus transmission, with or without clinical illness consistent with Zika virus disease.



Evaluation of Persons with suspected Zika virus disease

- Testing should be conducted in consultation with state and local public health for:
- Pregnant Women
 - Pregnant women presenting with symptoms consistent with Zika virus disease within two weeks of travel to an area with ongoing transmission
 - Asymptomatic pregnant women who have ultrasound findings of fetal microcephaly or intracranial calcifications and who report travel to an area with ongoing transmission during pregnancy
- Non-pregnant persons
 - Patients presenting with signs and symptoms consistent with Zika virus disease within two weeks of travel to an area with ongoing transmission

Zika Virus Testing

Testing Strategies for Zika, Chikungunya and Dengue

Technology used to conduct testing is based on when the specimen is collected after symptom onset

| Specimen Type | Days Post-onset | Testing Technology |
|----------------|-----------------|------------------------------|
| Serum | ≤ 4 | RT-PCR |
| | 4 -7* | RT-PCR, IgM, Flavivirus PRNT |
| | > 7 | IgM, Flavivirus PRNT |
| Urine & Saliva | TBD | RT-PCR Zika only |

* IgM negative specimens collected ≤ 7 days should be repeated ≥ 21 days post-onset

Specimen Submission Forms for Zika, Chikungunya and Dengue Testing

- NC State Laboratory of Public Health (NCSLPH) will coordinate concurrent testing for zika, dengue, and chikungunya viruses
- Providers submitting samples should complete the following forms
 1. [NCSLPH submission form DHHS 3445](#)
Check "Forward to CDC"
Write in specific tests requested
 2. [CDC 50.34 DASH form](#)
Complete online and print
"Test Order Name" is "Arbovirus Serology"

Specimen Submission Supplemental Information

- Travel history
- Onset date
- Specimen collection date
- Specimen type
- Description of clinical illness
- Vaccination history (IgM Flavivirus cross-reactivity)
 - Yellow fever
 - Japanese encephalitis
- Submitter contact information

Specimen Collection, Testing, and Shipping Conditions

| Specimen | Test Performed | Specimen Volume | Shipment |
|--|---|--|---|
| Serum | Chikungunya RT-PCR & IgM (NCSLPH); Zika and Dengue RT-PCR and virus-specific IgM; Flavivirus PRNT | 2 – 5 mL | Refrigerated (4°C), placed on cold packs if shipment is to be received within 72 hrs of collection. For delays exceeding 72 hrs, freeze at -70°C & ship on dry ice. |
| Urine and Saliva | Zika RT-PCR | 1 – 3 ml | |
| Amniotic Fluid* | Zika RT-PCR | 0.5 – 3 ml | Refrigerated (4°C), placed on cold packs if shipment is to be received within 72 hrs of collection. For delays exceeding 72 hrs, freeze at -70°C & ship on dry ice. |
| Cord Blood | Zika RT-PCR & IgM Flavivirus PRNT | 0.5 – 3 ml | Refrigerated (4°C), placed on cold packs |
| Placental Tissue | Zika RT-PCR Viral Culture | 2 – 5 grams | Freeze at -70°C & ship on dry ice. |
| Placental Tissue and Umbilical Cord | Immunohistochemical Staining and Zika virus RT-PCR | 2 – 5 grams of tissue and/or paraffin blocks | Tissue should be formalin-fixed or paraffin-embedded. Ship specimens at room temperature. Note: Request consultation with NCSLPH for specific instructions. |

*Patient and healthcare provider must weigh risks and benefits of testing prior to collection of amniotic fluid

Shipping Specimens to NCSLPH

- Contact the NCSLPH (919-807-8600) prior to shipment or if you have questions
- All specimens should be shipped as a Category B Biological Substance
- Address all specimen shipments as follows:

**Attention: Virology/Serology Unit
North Carolina State Laboratory of Public Health
4312 District Drive
Raleigh, NC 27607-5490**

Question?

Provider Memo



North Carolina Department of Health and Human Services
Division of Public Health

Pat McCrory
Governor

Richard O. Brajer
Secretary

Daniel Staley
Division Director

January 28, 2016

To: North Carolina Health Care Providers and Laboratories
From: Megan Davies, MD, State Epidemiologist
Scott Zimmerman, DrPH, MPH, HCLD (ABB), State Laboratory of Public Health
Belinda Pettiford, MPH, Women's Health Branch

Subject: **Zika Virus Diagnosis, Management and Reporting (3 pages)**

This memo is intended to provide information to NC clinicians and laboratories regarding diagnosis, management and reporting of Zika virus infection.

Surveillance and Reporting

Surveillance and Reporting in NC

- Dengue and chikungunya infections are specifically reportable per 10A NCAC 41A .0101
- NC DPH is working on a temporary rule to make Zika virus disease reportable in North Carolina
- Imported cases of Zika virus disease are expected
 - Local transmission, while possible, is unlikely to occur based on experience with dengue and chikungunya
- Please contact the Communicable Disease Branch at 919-733-3419 or your local health department if Zika virus infection is suspected

Case Report Form



Zika Case Report Form

North Carolina Department of Health and Human Services
Division of Public Health, 1902 Mail Service Center • Raleigh, NC 27699-1902

Please complete form and fax to the local health department in your county.

State Case No.:

Date of Report:

Demographics

Patient name (Last, First): Patient DOB:

Sex: Male Female

Race: American Indian/Alaska Native Unknown

Ethnicity: Hispanic or Latino
 Not Hispanic or Latino

Asian

Native Hawaiian/Other Pacific Islander

Black or African American

White

Other:

Resident of North Carolina? Yes No

Pregnancy status: Yes No

Current gestational age (weeks):

Patient Address:

City: County: State:

Phone number:

Clinical: Onset of illness:/...../..... Date of first consultation:/...../.....

Fever°F Rash (Please describe) maculopapular puritic Other.....

North Carolina Surveillance

- Zika is not in NC EDSS yet (under development)
- Cases will be reported in Arbonet
 - Fax all case report forms to Jodi Reber (919-733-9555)
- Case definition is still under development
- Stay tuned for updates

Resources

NC DPH

- Diseases & Topics: Zika virus <http://epi.ncpublichealth.info/cd/diseases/zika.html>

Lab Submission Forms

- NCSLPH submission form DHHS 3445 <http://slph.ncpublichealth.com/Forms/DHHS-3445-SpecialSerology.pdf>
- CDC DASH form <http://slph.ncpublichealth.com/Forms/CDC-5034-DashForm-120515.pdf>

CDC Resources

- Zika Virus <http://www.cdc.gov/zika>
- Interim Guidelines for Pregnant Women <http://www.cdc.gov/mmwr/volumes/65/wr/mm6502e1.htm>
- Interim Guidelines for the Evaluation and Testing of Infants with Possible Congenital Zika Virus Infection http://www.cdc.gov/mmwr/volumes/65/wr/mm6503e3er.htm?s_cid=mm6503e3er.htm_w
- Q & A for Obstetrical Healthcare Providers <http://www.cdc.gov/zika/pdfs/questions-answers-clinicians.pdf>
- Q & A for Pediatric Healthcare Providers <http://www.cdc.gov/zika/hc-providers/qa-pediatrician.html>

American Congress of Obstetricians and Gynecologists

- Practice Advisory: Interim Guidance for Care of Obstetric Patients During a Zika Virus Outbreak <https://www.acog.org/About-ACOG/News-Room/Practice-Advisories/Practice-Advisory-Interim-Guidance-for-Care-of-Obstetric-Patients-During-a-Zika-Virus-Outbreak>

Extra slides

Aedes aegypti and *Aedes albopictus* Mosquitoes: Geographic Distribution in the United States



Aedes aegypti



Aedes albopictus

Zika, Dengue, Chikungunya virus

| Features | Zika | Dengue | Chikungunya |
|----------------|------|--------|-------------|
| Fever | ++ | +++ | +++ |
| Rash | +++ | + | ++ |
| Conjunctivitis | ++ | - | - |
| Arthralgia | ++ | + | +++ |
| Myalgia | + | ++ | + |
| Headache | + | ++ | ++ |
| Hemorrhage | - | ++ | - |

Figure: Interim guidelines for the evaluation and testing of infants WITH microcephaly or intracranial calcifications whose mothers traveled to or resided in an area with Zika virus transmission during pregnancy.

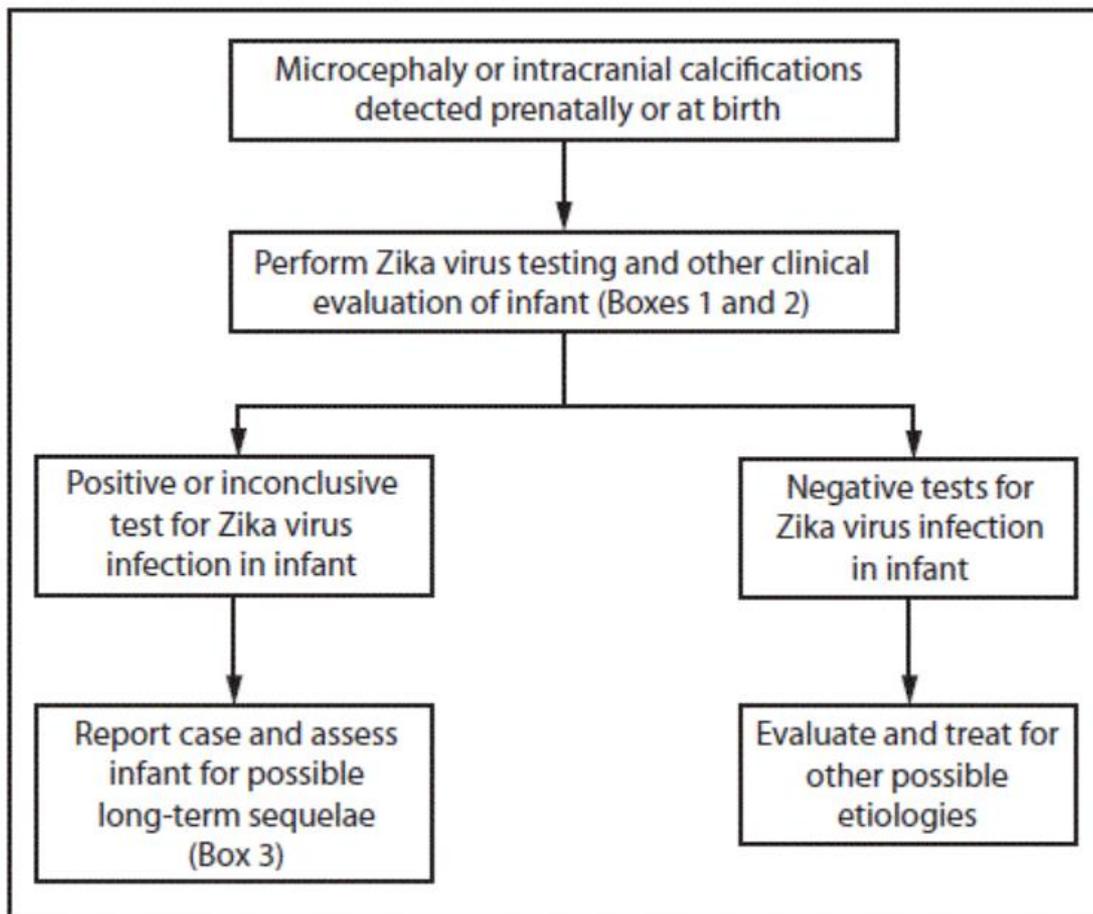


Figure: Interim guidelines for the evaluation and testing of infants WITHOUT microcephaly or intracranial calcifications whose mothers traveled to or resided in an area with Zika virus transmission during pregnancy.

