Everything you ever wanted to know about **Zika Virus Disease**

(in 14 slides)

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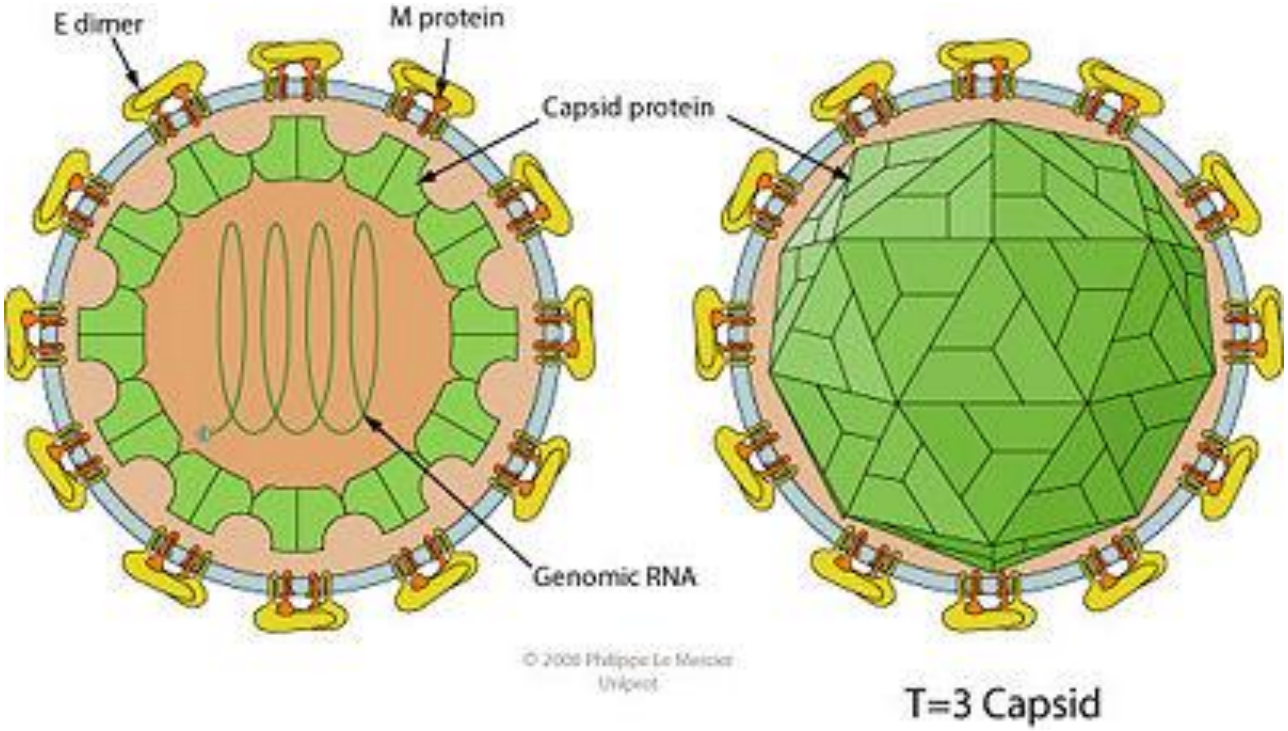
Zika Virus

- mosquito-borne flavivirus
- closely related to dengue virus



Historical Notes

- first isolated from a rhesus monkey (*Macaca mulatta*), in Zika forest, Uganda in 1947
- isolated from mosquitoes (*Aedes africanus*) in the same forest in 1948
- isolated in humans in Nigeria in 1954
- Zika virus is endemic in parts of Africa/Asia
- identified in the South Pacific after a 2007 outbreak in Micronesia

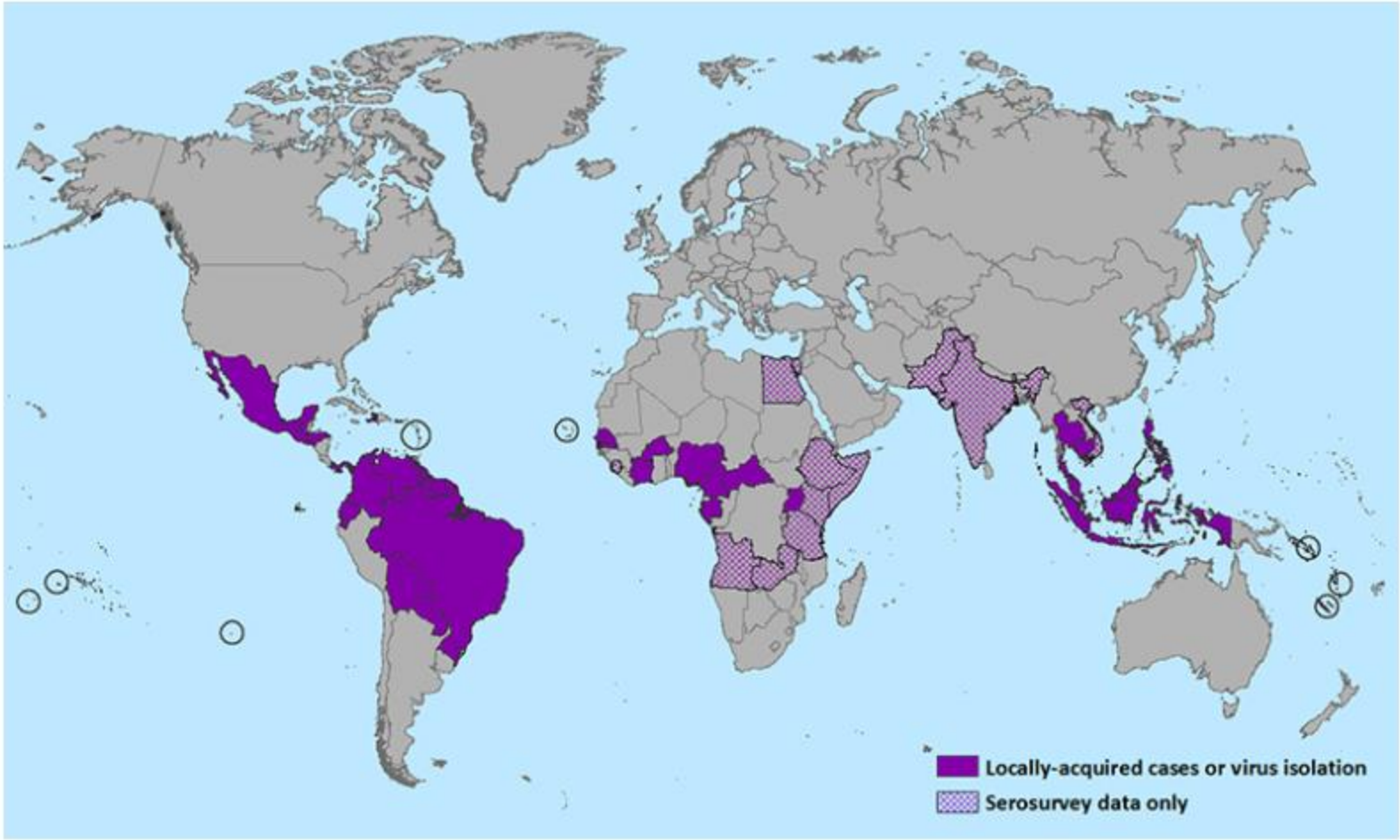
Arrival in the Western Hemisphere

- In October 2013, French Polynesia reported its first outbreak, which was estimated to affect around 11% of the population
- This particular outbreak spread to other Pacific Islands including New Caledonia, Cook Islands, and Easter Island (Peru)
- First identified in the Western Hemisphere in February, 2014 (Easter Island, Chile). Since that time, it has literally exploded across South and Central America

Current Distribution

http://www.cdc.gov/zika/geo/index.html

Countries that have past or current evidence of Zika virus transmission (as of January 2016)



Zika Virus Disease in the Americas

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

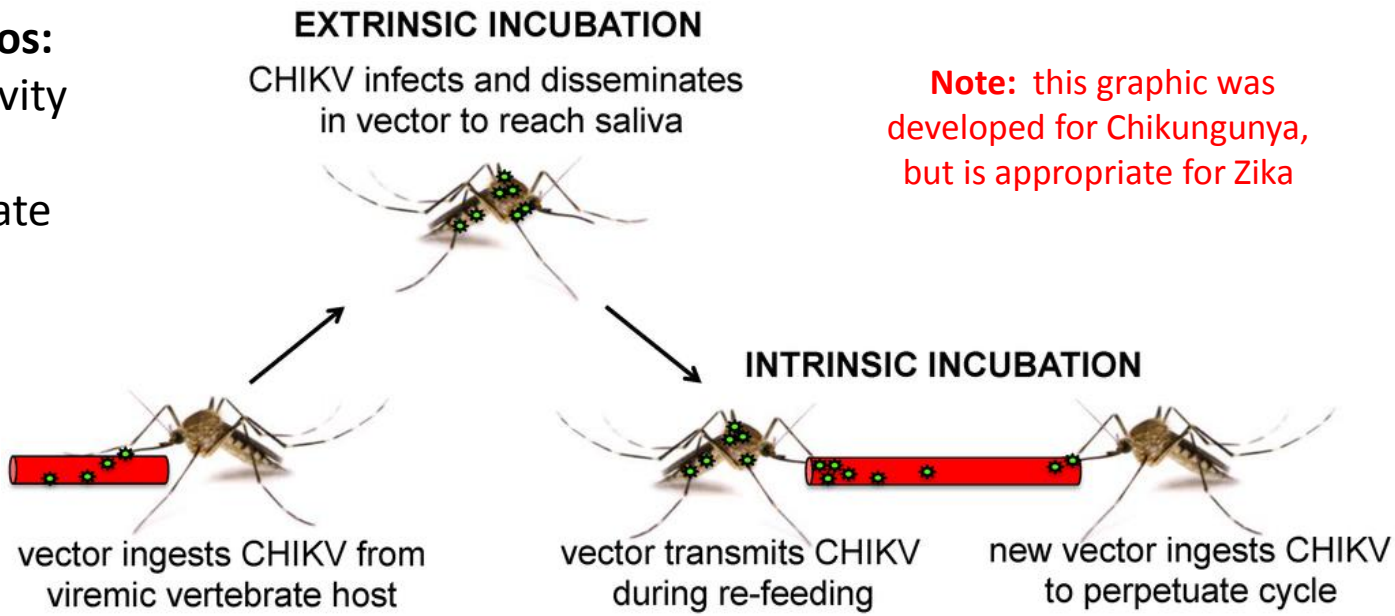
- Zika is transmitted in the Americas by the mosquito *Aedes aegypti*
- A second species, *Aedes albopictus,* has been shown capable to carry Zika in laboratory conditions

Transmission

- Transmitted by mosquito
- Also case reports for:
  - blood transfusion
  - perinatal transmission
  - sexual transmission

- Incubation 2-7 days
- Virus present in blood for about 7 days
- vertebrate hosts are primarily monkeys and humans

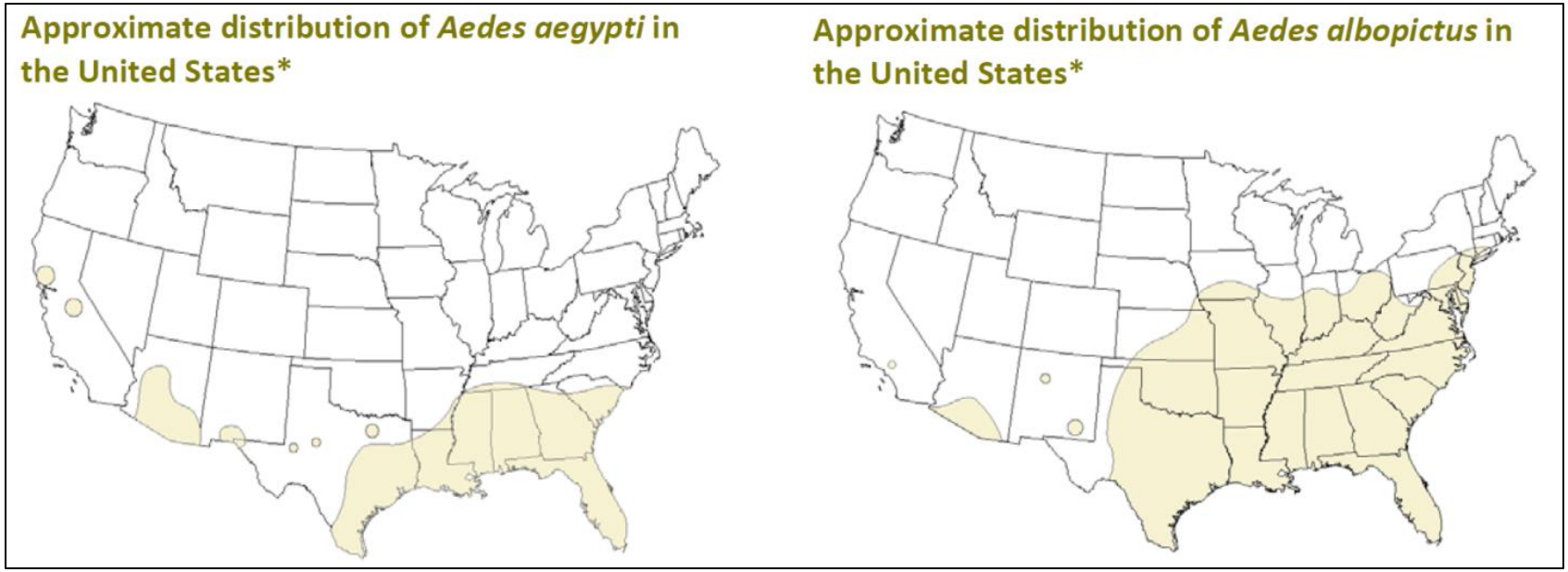
***Aedes* mosquitos:** peak biting activity occurs in early mornings and late afternoons



Note: this graphic was developed for Chikungunya, but is appropriate for Zika

Closer to Home

- Wisconsin is home to 56 mosquito species
  - 2 species of *Aedes* mosquitos
    - but not *A. aegypti* or *A. albopictus*



With climate change, and the resultant shift in insect distributions, the U.S. is at high risk.

Clinical Spectrum

- 80% of cases are asymptomatic
- Clinical spectrum of symptomatic cases
  - low grade fever (less than 38.5°C)
  - maculopapular rash (frequent)
  - muscle pain
  - joint pain with possible swelling
    - notably of the small joints of the hands and feet
  - headache (pain behind the eyes)
  - conjunctivitis
- Symptoms usually last from several days to 1 week
  - Severe disease requiring hospitalization is uncommon
  - fatalities are rare
- Often misdiagnosed as dengue
- Infection and recovery likely results in lifelong immunity

Concerning Correlates

- Guillain-Barré syndrome has been noted following suspected Zika infection
- Microcephaly in infants born to mothers infected with Zika virus
  - With the arrival of Zika in Brazil, the rate of microcephalus has exploded
    - Increasing from 5.7 per 100,000 births in 2014 to 99.7 per 100,000 in 2015
      - (a 17-fold increase)

Diagnosis

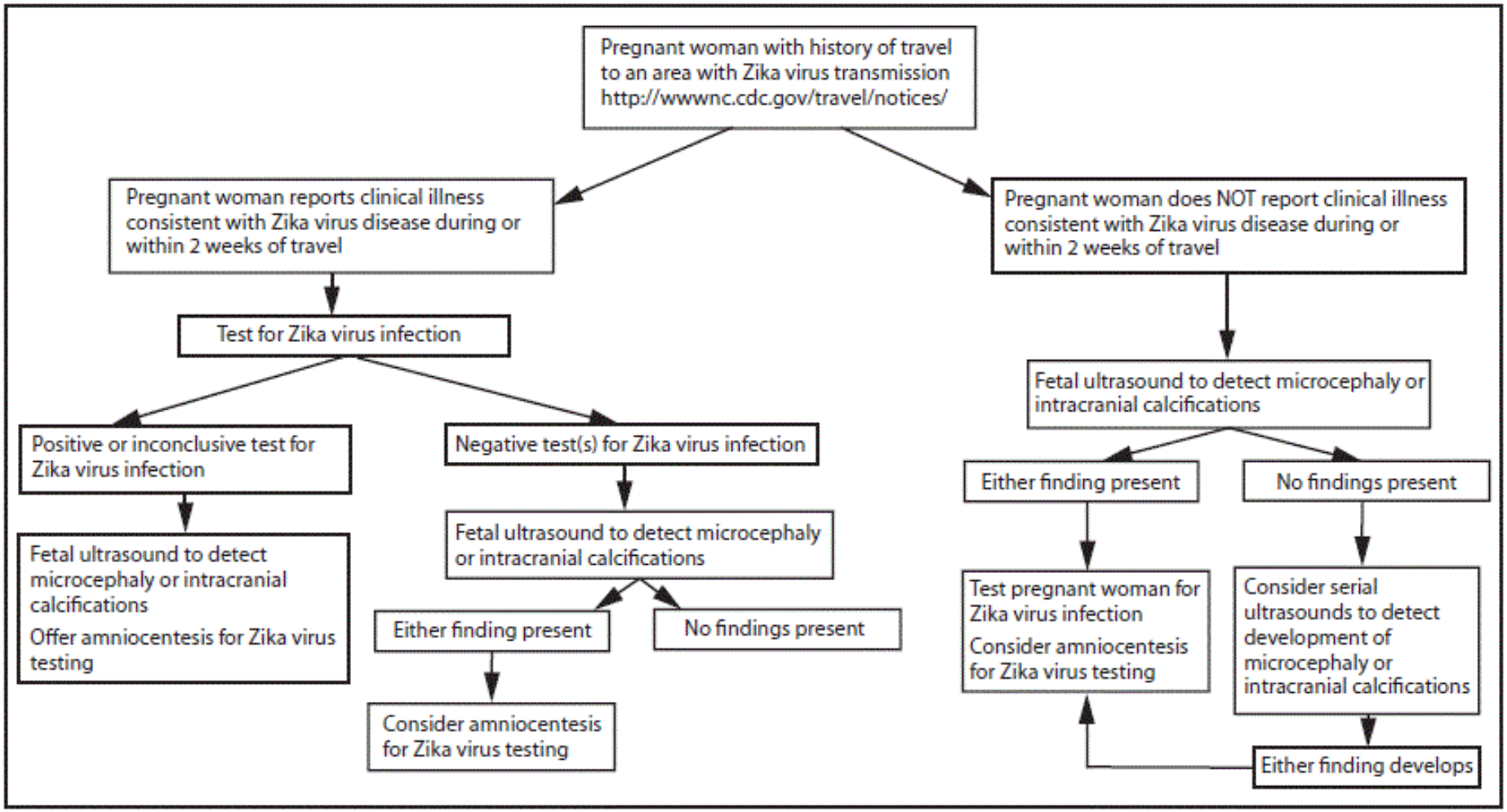
- Several methods can be used for diagnosis,
  - viral nucleic acid detection: <u>primary mode</u>
    - RT-PCR targeting the non-structural protein 5 genomic virus
    - Saliva or urine samples collected during the first 3 to 5 days after onset
    - serum collected in the first 1 to 3 days
  - No commercial assays – coordinate with Public Health
    - Wisconsin State Laboratory of Hygiene
  - virus isolation: research method, not commonly used
  - serological testing for anti-Zika virus IgM and IgG
    - immunofluorescence assays
    - enzyme-linked immunosorbent assays
    - IgM cross reactivity with other flaviviruses

Treatment

- no commercial vaccine
- no specific antiviral drug treatment
- Treatment is directed primarily at relieving symptoms using antipyretics and analgesics
  - preference for acetaminophen unless Dengue can be ruled out
  - avoid aspirin and ibuprofen unless Dengue can be ruled out

CDC guidance in Pregnancy

http://www.cdc.gov/mmwr/volumes/65/wr/mm6502e1er.htm



Prevention and Control

- Reduce the breeding of mosquitoes through source reduction
  - removal and modification of breeding sites
- Reduce contact between mosquitoes and people
  - Repellants
  - insect screens
  - closed doors and windows
  - long clothing
  - mosquito coils or other insecticide vaporizers
- Basic precautions for protection from mosquito bites should be taken by people traveling to high risk areas. These include use of repellents, wearing light colored, long sleeved shirts and pants and ensuring rooms are fitted with screens to prevent mosquitoes from entering.

Summary Recommendations

- Consider Zika virus infection in patients with acute fever, rash, arthralgia, or conjunctivitis, who traveled to areas with ongoing transmission in the two weeks prior to onset of illness.
- Travelers should take steps to avoid mosquito bites to prevent Zika virus infection and other mosquito-borne diseases.
- Pregnant women should consider postponing travel to areas known to have Zika virus transmission. Pregnant women and women trying to become pregnant who do travel should strictly follow steps to avoid mosquito bites.
- Evaluate fetuses and infants of women infected with Zika virus during pregnancy for possible congenital infection and neurologic abnormalities.
- Report any suspected Zika virus disease cases to your state or local health department.

CONTACT INFORMATION

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