

CONTAGIOUS COMMENTS

Department of Epidemiology

ZIKA VIRUS

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Updated 02-08-16: Please see updated recommendations regarding sexual transmission and testing of pregnant women.

1. What is Zika Virus (ZIKV)?

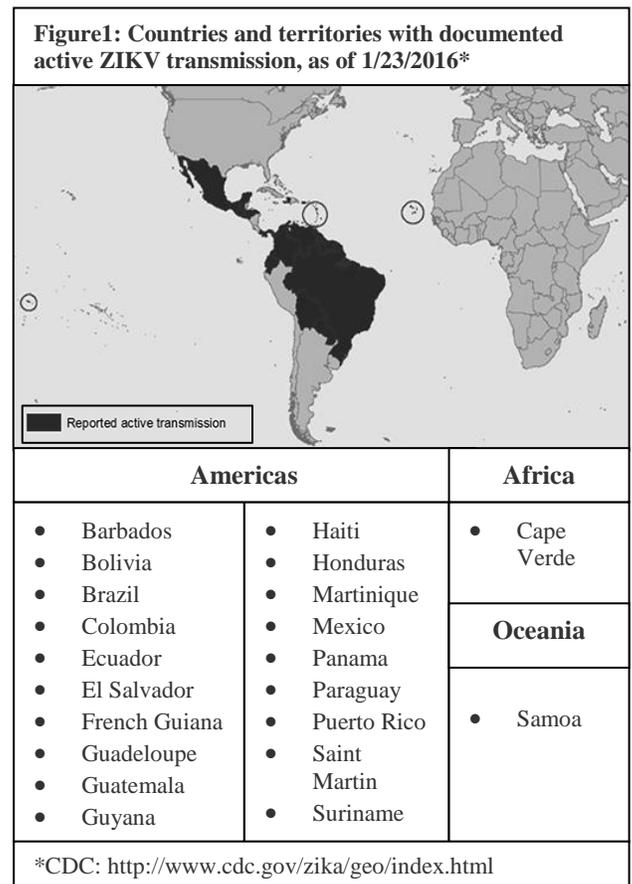
Zika Virus (ZIKV) is a single-strand RNA flavivirus, which is the same genus as West Nile Virus and dengue virus. It was first isolated from primates in the Zika forest of Uganda in 1947 and isolated in humans in 1968. ZIKV was most likely introduced into Brazil in 2014, and has led to a wide epidemic that is still ongoing.

2. How is ZIKV transmitted?

ZIKV is transmitted by the *Aedes aegypti* and possibly the *A. albopictus* mosquitos. These mosquitos typically lay eggs in and near standing water and are aggressive daytime biters. Maternal-fetal transmission of ZIKV has been documented throughout all stages of pregnancy. There have been reports of possible spread through blood transfusions and through sexual contact. Viable ZIKV has been isolated in semen weeks after illness onset and clearance from blood.

3. What is the epidemiology of ZIKV?

Since its discovery, ZIKV was confined to mostly primates and the mosquito vectors in a narrow equatorial belt in Africa and Asia with minimal human spillover (14 total cases before 2007), even in highly endemic areas. In 2007, the Pacific island nation of Yap had a large epidemic with approximately 75% of the islands residents infected. Subsequent outbreaks occurred in neighboring Pacific islands. In May 2015, the WHO confirmed the first local transmission of ZIKV in the Western hemisphere, with locally acquired cases in Brazil. Since that time, Brazil has experienced an explosive epidemic with > 1 million suspected cases. As of 1/23/2016, ZIKV has had documented *active* transmission in 20 countries (**Figure 1**). Numerous other countries, including the United States, have also had documented cases in returning travelers. Given the known distribution of these vectors, ZIKV is predicted to spread to all countries in the Americas except Canada and Chile. Furthermore, endemic ZIKV transmission is expected in the Southeastern US (**Figure 2**).

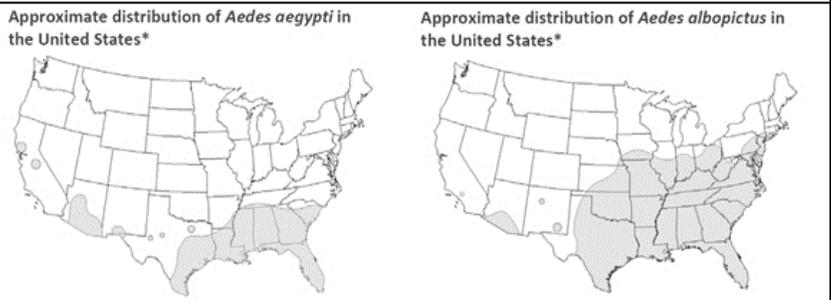


4. What are the clinical manifestations of ZIKV?

Only about 1 in 5 people (20%) who are infected with ZIKV develop symptoms. The most commonly reported acute symptoms are fever, rash (often pruritic), joint pain, conjunctivitis (usually non-purulent), myalgias, and headache, which last several days to a week. These acute symptoms are often indistinguishable from those of other viruses transmitted by the same vectors, which include chikungunya and dengue viruses. Death and severe disease requiring hospitalization are rare. Data from a recent ZIKV outbreak in French Polynesia documented 73 cases of Guillain–Barré syndrome and other neurologic syndromes among a population of only 270,000 people, which is substantially higher than normal.

Recent reports from the epidemic in Brazil have found an association between ZIKV infection in pregnant mothers and an increased risk of microcephaly. As of Feb 1, 2016, there has been over 4,000 reported cases of microcephaly in Brazil since October 2015, which is 20 times higher than the number of cases reported in 2014. In Brazil, ZIKV RNA has been found in the amniotic fluid of 2 pregnant women and in the placenta of a woman who had a miscarriage. Pregnant women can be infected with ZIKV during any trimester, though the overall incidence of ZIKV in pregnant women is unknown, and it is unknown if infection at any time point denotes greater risk. There is no evidence that pregnant women are more susceptible to ZIKV infection.

Figure 2: Approximate distribution of known (*A. aegypti*) and possible (*A. albopictus*) vectors for ZIKV in the United States*



*CDC: <http://www.cdc.gov/chikungunya/resources/vector-control.html>

5. How do you diagnosis ZIKV?

During the 1st week of infection, ZIKV can be diagnosed using reverse transcriptase-polymerase chain reaction (RT-PCR) on serum. Virus-specific IgM and neutralizing antibodies usually develop by day 7. IgM can have cross-reactivity with other flaviviruses such as yellow fever and dengue virus, so acute specimens for RT-PCR are preferable. Plaque reduction neutralization testing (PRNT) can be performed to discriminate between primary flavivirus infections. Convalescent serum samples should be obtained, if possible, 2-3 weeks after acute specimens. Given the clinical overlap, patients with acute ZIKV symptoms should also be tested for dengue and chikungunya virus.

The Colorado Department of Health and Environment (CDPHE) should be contacted for all suspected ZIKV cases (303-692-2700) and they can arrange for testing at the CDC-Division of Vector-Borne Diseases (DVBD) in Fort Collins, CO. Currently there are no commercially available tests for ZIKV.

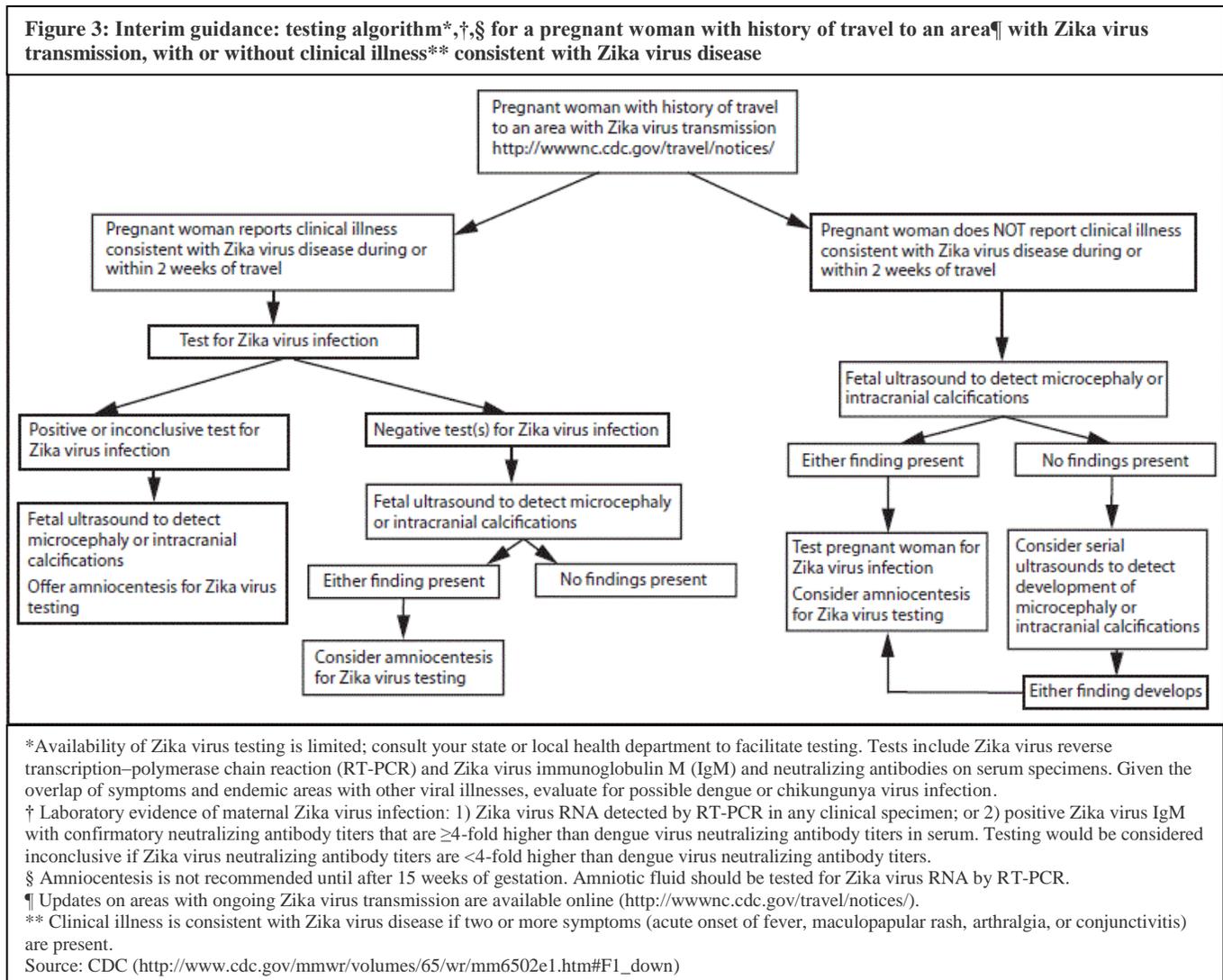
6. What are the treatment and prevention strategies for ZIKV?

Treatment of ZIKV is symptomatic care. There are no known specific antiviral treatments or vaccines for ZIKV. The only preventive strategy is to avoid contact with mosquitos if traveling in endemic areas, especially during the day when *A. aegypti* and *A. albopictus* are most active. These include wearing long sleeves and pants, covering exposed skin with EPA-approved insect repellent, wearing permethrin-treated clothing, and spending as much time as possible in screened-in and air-conditioned rooms. Insect repellent guidelines can be found at <http://wwwnc.cdc.gov/travel/page/avoid-bug-bites>.

Due to the potential for sexual transmission, couples in which a man has traveled to an area of active ZIKV transmission may consider using condoms during sex or abstaining from sexual activity for the duration of his partner's pregnancy.

The CDC has published interim guidelines for pregnant women during the current ZIKV outbreak: <http://www.cdc.gov/mmwr/volumes/65/wr/mm6502e1.htm>. **Currently, the CDC recommends that pregnant women postpone travel to all areas where ZIKV transmission is ongoing.** If travel is unavoidable, pregnant women should follow the steps outlined above to avoid exposure to mosquitos.

If a pregnant woman has traveled to a ZIKV endemic area, the CDC has published guidelines for management of pregnant women with potential exposure to ZIKV (**Figure 3**). Any pregnant woman who has traveled to an area where ZIKV is currently circulating should talk to her health care provider about being tested for the ZIKV. Testing should be offered from 2 to 12 weeks after return from travel. The recommended test is a blood test looking for an antibody (IgM) to the ZIKV. A negative test can rule out a recent infection with ZIKV. A positive test does not necessarily indicate a recent infection with ZIKV as the test can cross react with other flaviviruses. Further details on evaluation of suspected ZIKV infections among pregnant mothers can be found at the CDC website (listed above) and the ACOG website (<https://www.acog.org/About-ACOG/News-Room/Practice-Advisories/Practice-Advisory-Interim-Guidance-for-Care-of-Obstetric-Patients-During-a-Zika-Virus-Outbreak>).



7. Where can I find more information?

CDC Zika webpage (updated frequently) <http://www.cdc.gov/zika/index.html>
Guidelines

CDC Interim Guidelines for Pregnant Women During a Zika Virus Outbreak — United States, 2016. Weekly / January 22, 2016 / 65(2);30–33.

http://www.cdc.gov/mmwr/volumes/65/wr/mm6502e1.htm#F1_down.

ACOG 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>.

Other Articles⁽¹⁻⁵⁾

1. **Bogoch, II, O. J. Brady, M. U. Kraemer, M. German, M. I. Creatore, M. A. Kulkarni, J. S. Brownstein, S. R. Mekaru, S. I. Hay, E. Groot, A. Watts, and K. Khan.** 2016. Anticipating the international spread of Zika virus from Brazil. Lancet.
2. **Fauci, A. S., and D. M. Morens.** 2016. Zika Virus in the Americas - Yet Another Arbovirus Threat. N Engl J Med.
3. **McCarthy, M.** 2016. First US case of Zika virus infection is identified in Texas. Bmj **352**:i212.
4. **McCarthy, M.** 2016. Zika virus outbreak prompts US to issue travel alert to pregnant women. Bmj **352**:i306.
5. **Musso, D.** 2015. Zika Virus Transmission from French Polynesia to Brazil. Emerg Infect Dis **21**:1887.

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