Zika Virus Disease

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The Emergence and Spread of Zika Virus

1947: isolated in nature, Uganda
1948: in Ae. africanus mosquitoes
1968: in human, Nigeria

1951-1981: Africa & SE Asia
  14 seropositives

1969-2001: Africa & Asia
  Ae. aegypti, Ae. vitatus, etc

2007-2009: Western Pacific outbreaks

2015: Brazil, Latin America and Caribbean, western Pacific
  microcephaly
  Guillain Barré Syndrome
  sexual transmission
Where has Zika virus been found?

Countries and Territories with Active Zika Virus Transmission, current outbreak

Last updated February 3, 2016
Zika Virus cases in the United States, 2015-16

- Travel-associated cases reported
- Locally acquired cases reported

Map showing states with reported cases of Zika Virus.
<table>
<thead>
<tr>
<th>Features</th>
<th>Zika</th>
<th>Dengue</th>
<th>Chikungunya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Rash</td>
<td>+++</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>++</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Myalgia</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Headache</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>-</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Shock</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>
Possible Future Course of Zika Virus in the Americas

- Continued spread in areas with competent vectors
- Transmission increasing in Central America, Mexico, and Caribbean
- Further spread in U.S.
  - Puerto Rico, U.S. Virgin Islands, American Samoa
  - Travel-associated cases in U.S. states
  - some local transmission and outbreaks
  - Limited by housing, vector distribution, weather
- Experience from dengue and chikungunya
  - From 2010–2014, 1.5 million dengue cases reported per year to PAHO
  - 558 travel-related and 25 locally transmitted cases in U.S. states
KNOWN TRANSMISSION OF DENGUE AND CHIKUNGUNYA VIRUSES

Dengue
Chikungunya

Approximate geographic distributions
CDC Response

Activated EOC - Jan 22           Elevated activation – Feb 8
Led by National Center for Emerging and Zoonotic Diseases
CDC Activities and Plans

- Part of a whole US Government response
- Coordinate response with PAHO and other regional partners
- Conduct surveillance and assist with laboratory confirmation
- Assist with investigations of microcephaly and Guillain-Barré syndrome
- Development of improved testing tools and capabilities
- Continue to evaluate and revise guidance as new data emerge
  - Distribute guidance through health notices, *MMWR*, other publications and the CDC website
  - Communicate regularly with clinicians (e.g., COCA calls), professional organizations and state and local partners
CDC Global Activities

- CDC is working in laboratories and on the ground in dozens of countries to learn more about Zika virus alongside:
  - Other USG agencies
  - Ministries of health and partners
  - Regional and global health authorities

- CDC is working with international public health partners to:
  - Detect and report cases.
  - Support diagnostic testing and develop new technologies.
  - Learn more about risk of severe outcomes.
  - Ensure technically sound efforts to prevent further spread.

- CDC resources in affected countries:
  - Global Disease Detection Centers
  - Field Epidemiology and Laboratory Training Programs
  - Emergency Operations Centers
Global Health Security
A safer US through a safer world

**Prevent** avoidable catastrophes
- Safer food and drug supply
- Reduced pace of drug resistance
- Safer, more secure labs working with dangerous pathogens

**Detect** threats early
- Surveillance systems
- Lab systems to characterize pathogens
- Trained disease detectives
- Facilities to investigate outbreaks

**Respond** rapidly and effectively
- Interconnected emergency operations centers and response capacity
- Improved border safety, quarantine measures, and rapid response
Additional resources

CDC works 24/7 to save lives & protect people from health threats

Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Phone: 1 800-CDC-INFO (232-4636) / TTY: 1 888-232-6348
Email: cdcinfo@cdc.gov  Web: www.cdc.gov

Department of Health and Human Services
Centers for Disease Control and Prevention
Rates of Microcephaly Over Time: the Americas and the Caribbean

Comparison of the rates of microcephaly in the Americas and Caribbean from 2010-2014 and 2015

Updated as of Epidemiological Week 52 (December 27, 2015 – January 2, 2016)

Microcephaly rates by state in Brazil (cases per 1,000 live births)

- 0.1-1.0
- 1.1-15.0
- 15.1-30.0
- 30.1-45.0
- 45.1-88.6

Countries with Zika confirmed cases

Data Source:
Reported from the IHR National Focal Points and through the Ministry of Health websites.

Map Production:
PAHO-WHO AD CHAIR ARO

CDC Guidance - published

- Update: Interim Guidelines for Health Care Providers Caring for Pregnant Women and Women of Reproductive Age with Possible Zika Virus Exposure – United States, 2016 (Feb. 5, 2016)
- Interim Guidelines for Prevention of Sexual Transmission of Zika Virus – United States, 2016 (Feb. 5, 2016)
- Interim Guidelines for the Evaluation and Testing of Infants with Possible Congenital Zika Virus Infection — United States, 2016 (Jan 29, 2016)
- Interim Guidelines for Pregnant Women During a Zika Virus Outbreak — United States, 2016 (Jan 22, 2016)
- HAN: Recognizing, Managing, and Reporting Zika Virus Infections in Travelers Returning from Central America, South America, the Caribbean, and Mexico (Jan 15, 2016)
Travel Notices

Mosquito Bite Prevention for Travelers

Mosquitoes spread many types of viruses and parasites that can cause diseases like chikungunya, dengue, Zika, and malaria. If you are traveling to an area where malaria is found, talk to your healthcare provider about malaria prevention medication that may be available.

Protect yourself and your family from mosquito bites. Here’s how:

Keep mosquitoes out of your hotel room or lodging

- Choose a hotel or lodging with air conditioning or screens on windows and doors.
- Sleep under a mosquito bed net if you are outside or in a room that is not well screened. Mosquitoes can live indoors and will bite at any time, day or night.
  » Buy a bed net at your local outdoor store or online before traveling overseas.
  » Choose a WHOPES-approved bed net (like Pramax®): compact, white, rectangular, with 156 holes per square inch, and long enough to tuck under the mattress.
  » Permethrin-treated bed nets provide more protection than untreated nets.
    - Permethrin is an insecticide that kills mosquitoes and other insects.
    - Do not wash bed nets or expose them to sunlight. This will break down the insecticide more quickly.
  » For more information on bed nets: [www.cdc.gov/malaria/malaria_worldwide/reduction/itn.html](http://www.cdc.gov/malaria/malaria_worldwide/reduction/itn.html)
Zika Virus Epidemiology

- First isolated from a monkey in Uganda in 1947
- Prior to 2007, only sporadic human disease cases reported from Africa and southeast Asia
- In 2007, first outbreak reported on Yap Island, Federated States of Micronesia
- In 2013–2014, >28,000 suspected cases reported from French Polynesia

Zika Virus Incidence and Attack Rates

- Infection rate: 73% (95% CI 68–77)
- Symptomatic attack rate among infected: 18% (95% CI 10–27)
- All age groups affected
- Adults more likely to present for medical care
- No severe disease, hospitalizations, or deaths

Note: Rates based on serosurvey on Yap Island, 2007 (population 7,391)

# Reported Clinical Symptoms
Among Confirmed Zika Virus Disease Cases

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>N (n=31)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macular or papular rash</td>
<td>28</td>
<td>90%</td>
</tr>
<tr>
<td>Subjective fever</td>
<td>20</td>
<td>65%</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>20</td>
<td>65%</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>17</td>
<td>55%</td>
</tr>
<tr>
<td>Myalgia</td>
<td>15</td>
<td>48%</td>
</tr>
<tr>
<td>Headache</td>
<td>14</td>
<td>45%</td>
</tr>
<tr>
<td>Retro-orbital pain</td>
<td>12</td>
<td>39%</td>
</tr>
<tr>
<td>Edema</td>
<td>6</td>
<td>19%</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3</td>
<td>10%</td>
</tr>
</tbody>
</table>

*Yap Island, 2007*

*Duffy M. N Engl J Med 2009*
Zika Virus Clinical Disease Course and Outcomes

- Clinical illness usually mild
- Symptoms last several days to a week
- Severe disease requiring hospitalization uncommon
- Fatalities are rare
- Guillain-Barré syndrome reported in patients following suspected Zika virus infection
- Relationship to Zika virus infection is not known
Zika Virus Preventive Measures

- No vaccine or medication to prevent infection or disease
- Primary prevention measure is to reduce mosquito exposure
- Pregnant women should consider postponing travel to areas with ongoing Zika virus outbreaks
- Protect infected people from mosquito exposure during first week of illness to prevent further transmission
Initial Assessment and Treatment

• No specific antiviral therapy
• Treatment is supportive (i.e., rest, fluids, analgesics, antipyretics)
• Suspected Zika virus infections should be evaluated and managed for possible dengue or chikungunya virus infections
• Aspirin and other NSAIDs should be avoided until dengue can be ruled out to reduce the risk of hemorrhage
Zika Virus Disease Surveillance

- Consider in travelers with acute onset of fever, maculopapular rash, arthralgia, or conjunctivitis within 2 weeks after return
- Inform and evaluate women who traveled to areas with Zika virus transmission while they were pregnant
- Evaluate fetuses/infants of women infected during pregnancy for possible congenital infection and microcephaly
- Be aware of possible local transmission in areas where Aedes species mosquitoes are active