

# Zika Virus

## Critical Information for Emergency Providers



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### KEYWORDS

• Zika • Microcephaly • Arbovirus • Flavivirus • Mosquitos • *Aedes spp*

### KEY POINTS

- Zika virus is a mosquito borne arbovirus.
- Most individuals infected with Zika virus have minimal or no symptoms.
- If present, typical symptoms include rash, conjunctivitis, and fever.
- Pregnant women infected with Zika, particularly during the first trimester, appear to be at increased risk of having infants with congenital abnormalities such as microcephaly.
- There is currently no vaccine or treatment for Zika virus. Prevention through minimizing mosquito bites is the best means of decreasing risk of infection.

### INTRODUCTION

Zika virus' recent introduction into the Western Hemisphere and its dramatic and rapid spread during 2015 to 2016 represent a global public health challenge. Associations between Zika virus with congenital anomalies and Guillain Barre Syndrome (GBS) underscore the importance of understanding strategies for management and control of the virus. There is significant concern for risk to pregnant women/women of reproductive age and the risks associated with the spreading disease and with travel to endemic areas. Preparations for the 2016 Olympic Games in Brazil cast an increased sense of urgency on the need for improved assessment/identification, management,

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and containment of Zika virus. Given the potential for increased numbers of infected individuals, it is essential that emergency providers equip themselves with the knowledge and background necessary to effectively assess, manage, and counsel patients. This article provides background and epidemiologic information on Zika virus followed by a discussion of diagnostic, treatment, and management strategies.

## HISTORY

### *Origins*

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The Zika Virus was first identified in 1947 at the Yellow Fever Research Laboratory in the Zika Forest area of Uganda.<sup>1,2</sup> During this time period, British scientists placed Asian rhesus monkeys in Africa. Blood samples from 1 sentinel rhesus monkey were injected into mice. These mice subsequently became ill. Several viruses were identified in the brain tissue of the ill mice; 1 of the isolated viruses was the Zika virus. Zika virus was also isolated from mosquitos in the region.<sup>2</sup>

### *Epidemiology*

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From 1947 to 2007, there were limited and infrequent documented human cases of Zika virus infection.<sup>3,4</sup> In 2007, scientists reported the first outbreak of Zika virus on the island of Yap within the Federated States of Micronesia. There were 49 confirmed and 59 probable cases documented over a 4-month period.<sup>5,6</sup> Public health officials recorded a subsequent outbreak in 2013 in French Polynesia. There were 294 cases, confirmed by RNA assay, recorded over a 10-week period.<sup>7,8</sup>

The first documented case of the Zika virus in the Americas was in 2014 with locally acquired cases in Easter Island.<sup>9</sup> Subsequently, in May 2015, initial cases were confirmed in Northeast Brazil.<sup>10–12</sup> From May 2015 until early 2016, Brazilian officials estimated that there were 1.5 million cases of Zika virus infections throughout the country.<sup>11</sup> Colombia also reported more than 25,000 cases from October 2015 through the middle of February 2016.<sup>13</sup> Given that infection is often subclinical, with many affected patients not seeking medical care, officials advise that cases are likely underreported.

As of March 2016, there have been no documented cases of locally acquired Zika virus infection in the continental United States. However, there have been 153 travel-associated cases within 28 states and the District of Columbia. Within the US territories, to that date, there was 1 documented travel-associated case and 107 locally acquired cases.<sup>14</sup>

## VIROLOGY

### *Classification and Structure*

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Zika virus is an arbovirus within the genus *Flaviviridae* and family *Flavivirus*.<sup>1</sup> It is a single-stranded RNA virus with Asian and African lineage.<sup>6,15,16</sup> Other flaviviruses include yellow fever, dengue fever, and West Nile virus.<sup>1</sup> Within the African lineage, the life cycle of the virus is between nonhuman primates and mosquitoes. Humans are occasional, unintentional hosts within the African life cycle.<sup>17,18</sup> Outside of Africa, humans are the primary host for infection.<sup>5</sup>

### *Transmission*

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The primary transmission vector is the *Aedes aegypti* mosquito. Laboratory testing has shown the possibility of transmission via the *Aedes albopictus* mosquito.<sup>19–23</sup>

Sexual transmission of the Zika virus has been reported.<sup>24–27</sup> There has been at least 1 documented case of male-to-female sexual transmission of the virus as well

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