

Zika, dengue, and chikungunya: get the facts

Vector-borne viral diseases transmitted to humans by hematophagous insects—such as mosquitoes—are caused by arthropod-borne viruses, also known as arboviruses. Out of the approximately 150 arboviruses that are known to cause human diseases,¹ three mosquito-borne arboviruses have led to large-scale outbreaks in recent years.² These three viruses—Zika virus (ZIKV), dengue virus (DENV), and chikungunya virus (CHIKV)—share similar epidemiology, are transmitted by the same mosquito species, and can result in overlapping clinical symptoms.³ There is no specific treatment, but early and accurate diagnosis is crucial to support proper patient management and adequate public health measures.



Zika

Zika virus is an RNA virus in the family Flaviviridae. Zika virus infections have been reported in over 85 countries and territories worldwide.⁴



Dengue

Dengue virus is mostly found in tropical and subtropical areas worldwide, affecting about half of the global population.⁵ The virus has an RNA genome and belongs to the family Flaviviridae.



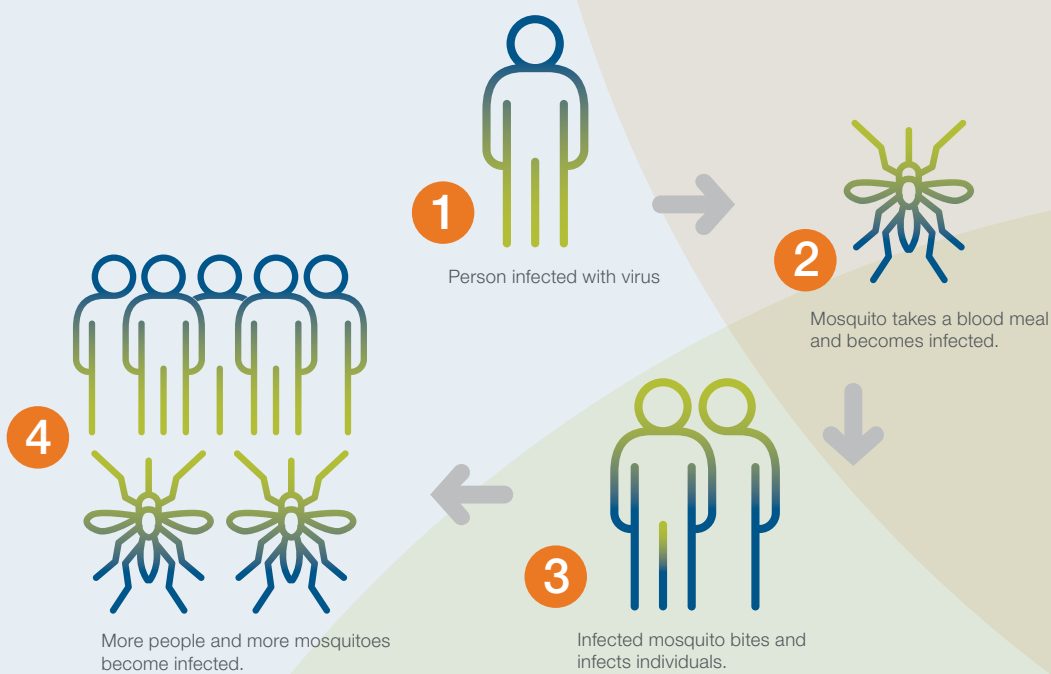
Chikungunya

Chikungunya virus belongs to the family Togaviridae and possesses an RNA genome. The virus has been identified in over 60 countries.⁶

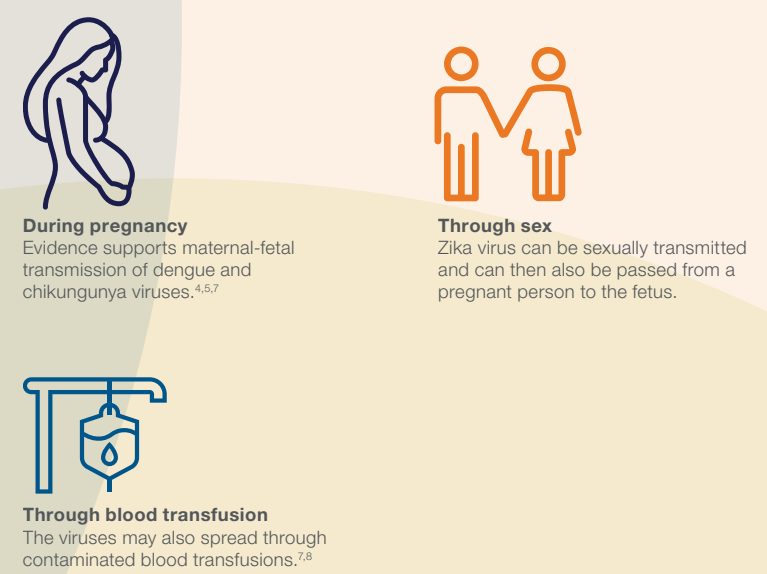
Vector

The main vectors for the Zika, dengue, and chikungunya viruses are the mosquito species *Aedes aegypti* and *A. albopictus*.

How people get infected



Other ways people get infected



Clinical symptoms

Patients infected with any of the three viruses are often asymptomatic or present with mild and nonspecific symptoms. Early symptoms can include fever, headache, muscle pain, and joint stiffness.

Zika

Symptoms associated with Zika virus infection include fever, rash, headache, conjunctivitis, and muscle and joint pain. Zika virus infection can lead to severe neurological complications such as Guillain-Barre syndrome (GBS) in adults and congenital Zika syndrome (CZS) in fetuses.⁴

Dengue

Dengue virus infection can manifest as a high-grade fever and other flu-like signs and symptoms. Severe dengue can be life-threatening as it can lead to respiratory distress, severe bleeding, plasma leakage, shock, and organ failure.⁵

Chikungunya

The most common symptoms are fever and joint pain. Severe joint pain can continue for months. Some patients develop chronic chikungunya arthritis.⁶



Diagnosis

Symptomatic diagnosis can be challenging, as early symptoms, if present, can be nonspecific. The World Health Organization (WHO) recommends molecular assays as the preferred detection method for dengue and Zika virus infections.⁹

Nucleic acid amplification tests have high specificity and sensitivity and can be designed to detect and differentiate among the three viruses: Zika, dengue, and chikungunya. Testing is best performed within the first days after symptom onset.

Antigen tests targeting the dengue virus's nonstructural protein 1 (NS1) have accuracy similar to the molecular tests.

Indirect detection methods include detecting immunoglobulin M (IgM) antibodies.

Management

Although there is no specific treatment, timely and accurate diagnosis is crucial in order to provide proper patient education and to monitor for signs of complications. Zika and chikungunya diseases are rarely life-threatening,^{5,6} but monitoring for signs of severe dengue, such as bleeding, can be life-saving.⁴ As Zika virus can be sexually transmitted even months after the symptoms have cleared, proper patient education can protect partners.¹⁰

Given the inherent risk of arbovirus outbreaks, the WHO has launched a global initiative focused on detection, prevention, and control of arboviruses.¹¹ Testing and differentiating Zika, dengue, and chikungunya viruses can help identify outbreaks or increased incidence of infections and enable rapid public health responses.

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