

ZIKA Virus Factsheet for Health Professionals

Zika virus (ZIKV) is a member of the Flaviviridae virus family and the flavivirus genus. In humans, it causes a disease known as Zika fever. It is related to dengue, yellow fever, West Nile and Japanese encephalitis, viruses that are also members of the virus family Flaviviridae.

Outbreaks of Zika virus have previously been reported in tropical Africa, in some areas in Southeast Asia and more recently in the Pacific Islands and currently in Americas, especially Brazil.

Zika virus infection is symptomatic in only about one out of every five cases. When symptomatic, Zika infection usually presents as an influenza-like syndrome, often mistaken for other arboviral infections like dengue or chikungunya. It is believed that Zika causes brain damage and microcephaly in babies born with the virus after their mothers have been infected during the pregnancy.

Zika virus infection is notifiable in New Zealand as an arboviral disease.

It is transmitted by mosquitoes and has been isolated from a number of species in the genus *Aedes* - *Aedes aegypti*, *Aedes africanus*, *Aedes apicoargenteus*, *Aedes furcifer*, *Aedes luteocephalus* and *Aedes vitattus*.

The mosquitoes that are able to spread zika virus are not normally found in New Zealand.

AGENT

Zika virus is a mosquito-borne flavivirus closely related to dengue virus. The virus was first isolated in 1947 from a sentinel rhesus monkey stationed on a tree platform in the Zika forest, Uganda.

RESERVOIR

The virus reservoirs are presumably monkeys.

TRANSMISSION MODES

Zika virus is transmitted to humans mainly by certain species of *Aedes* mosquitoes. Some of these species bite during the day as well as in the late afternoon/evening.

SYMPTOMS

The main clinical symptoms in patients are fever, conjunctivitis, transient arthritis/arthralgia (mainly in the smaller joints of the hands and feet) and maculopapular rash (that often starts on the face and then spreads throughout the body). In general the disease symptoms are mild and short-lasting (2-7 days).

Studies show that the extrinsic incubation period in mosquitoes is about 10 days. The incubation period in human is typically 3–12 days. There is no specific therapy for Zika virus infection and acute symptoms typically resolve within 4-7 days

The first well documented case of Zika virus was in 1964, beginning with a mild headache and progressing to a maculopapular rash, fever, and back pain. Within 2 days, the rash was fading, and within 3 days, the fever was gone and only the rash remained. There is no vaccine or preventive drug for Zika virus, and only treatment of symptoms is possible. Usually non-steroid anti-inflammatories and/or non-salicylic

analgesics are used.

- low-grade fever (between 37.8°C and 38.5°C)
- arthralgia, notably of small joints of hands and feet, with possible swollen joints
- myalgia
- headache, retro-ocular headaches
- conjunctivitis
- cutaneous maculopapular rash
- post-infection asthenia which seems to be frequent.
- More rarely observed symptoms include digestive problems (abdominal pain, diarrhoea, constipation), mucous membrane ulcerations (aphthae), and pruritus.



Rash on arm due to Zika virus. Credit: FRED

Zika virus infection causes a mild disease and, other than notification, no particular action is required. However, as Zika infection may cause a rash that could be confused with more serious diseases such as measles or dengue, these more serious diseases do need to be ruled out. Diagnosis of Zika will first and foremost be by exclusion, based on symptoms, travel history and exclusion of more serious diseases including measles, rubella and dengue. The pathogenesis of the virus is hypothesized to first infect **dendritic cells** near the site of inoculation, and then spread to lymph nodes and the bloodstream. In terms of replication, flaviviruses generally replicate in the **cytoplasm**, but Zika virus antigens have been found in infected cell nuclei.

HUMAN TO HUMAN TRANSMISSION

In 2009, it was proved that Zika virus can be sexually transmitted between humans. Professor Brian Foy, a university biologist from the Colorado State University at the Arthropod Borne and Infectious Disease Laboratory, visited Senegal to study mosquitos and was bitten on a number of occasions during his research. A few days after returning to the USA he fell ill with Zika, but not before having vaginal intercourse with his wife. His wife subsequently showed symptoms of Zika infection, along with extreme sensitivity to light. Foy is the first person known to have passed on an insect-borne virus to another human by sexual contact.

DIAGNOSIS

Zika virus can be identified by RT-PCR in acutely ill patients and from day 5 post onset of fever by serology (detection of specific IgM antibodies). Serological cross-reactions with closely related flaviviruses are possible [4][5].

TREATMENT

Symptomatic only (non-steroid anti-inflammatories, non-salicylic analgesics); no vaccine or preventive drug is available.

PREVENTION

To reduce the risk of contracting Zika virus infection - as for the other mosquito-borne infections - travellers should minimise the exposure to mosquito bites by taking the following preventive measures:

1. Use of anti-mosquito devices (insecticide-treated bed nets, coils, smudge pots, spray, repellents) and wearing long sleeves and clothes with long legs, especially during the hours of highest mosquito activity (morning and late afternoon). Mosquito repellent based on a 30% DEET concentration is recommended;
2. Before using repellents, pregnant women and children under the age of 12 years should consult a physician or pharmacist;
3. For newborn children under three months, repellents are not recommended; instead, insecticide-treated bed nets should be used.

HISTORY

The first outbreak of the disease outside of Africa and Asia was in April 2007, on the island of Yap in the Federated States of Micronesia. This virus was characterized by rash, conjunctivitis, and arthralgia, and was initially thought to be dengue. The Chikungunya and Ross River viruses were also suspected. However, serum samples from patients in the acute phase of illness contained RNA of Zika virus. The Zika fever disease process was relatively mild: there were 49 confirmed cases, 59 unconfirmed cases, no deaths and no hospitalizations.

Zika virus could be considered an emerging pathogen, as it spread outside Africa and Asia for the first time in 2007. Thus far, it has been a relatively mild disease with limited scope, but its true potential as a virus and as an agent of disease is currently unknown.

OUTBREAKS OF ZIKA VIRUS

Serologic studies have shown that Zika infections are occurring from Africa to Southeast Asia; in 1978 a small outbreak of acute fever in Indonesia due to Zika virus infection was described.

An outbreak has been reported on Yap Island, Federated States of Micronesia (FSM) from April to July 2007. This was the first outbreak of Zika virus identified outside of Africa and Asia. A total of 108 cases were confirmed by PCR or serology and 72 additional cases were suspected. The most common symptoms were rash, fever, arthralgia and conjunctivitis, and no deaths were reported. The mosquito *Aedes hensilli*, which was the predominant species identified in Yap during the outbreak, was probably the main vector of transmission. While the way of introduction of the virus on Yap Island remains uncertain, it is likely to have happened through introduction of infected mosquitoes or a viraemic human.

Brazil: In May 2015, the public health authorities of Brazil confirmed autochthonous transmission of Zika virus in the northeastern part of the country. As of 8 October, autochthonous cases of Zika virus had been detected in 14 states: Alagoas, Bahia, Ceará, Maranhão, Mato Grosso, Pará, Paraná, Paraíba, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Roraima, and São Paulo. Public health measures implemented by national and state authorities include the development and dissemination of sentinel protocol for Zika virus surveillance, development and

validation of protocol for surveillance of neurological syndromes, and vector control activities.

Colombia: As of 16 October, 9 samples were laboratory-confirmed as Zika virus infections out of 98 samples from the Bolívar department (13 from Cartagena and 85 from Turbaco). These are the first cases of Zika virus infection detected in the country.

OUTBREAKS IN THE PAZIFIC ISLANDS

French Polynesia: Between early October 2013 and 21 March 2014, 8,700 suspected cases of Zika.

New Caledonia: Between 25 November 2013 and 25 March 2014 there have been 352 confirmed cases of Zika virus. Of these, 244 are locally transmitted cases while the other 32 cases were imported from French Polynesia.

Cook Islands: Between 13 February and 24 March 2014 there have been 648 dengue-like illness cases reported with 49 of these laboratory confirmed with Zika virus.

Easter Island: As of 07 March 2014 there have been 40 suspected cases and 1 confirmed case of Zika virus reported.

Cook Islands, Solomon Islands, Vanuatu, Fiji and Samoa in 2015.

Measures at the community level include;

1. Reduction of mosquito breeding sites (removal of all open containers with stagnant water in and round houses, or, if that is not possible, treatment with larvicides);
2. In affected areas, elimination of adult mosquitoes through aerial spraying with insecticides.
3. CDC recommends that travelers to the Cook Islands protect themselves from mosquito bites.

What travelers can do to prevent Zika fever:

There is currently no vaccine or medicine to prevent Zika fever. Travelers can protect themselves by preventing mosquito bites.

Prevent Mosquito Bites:

Cover exposed skin by wearing long-sleeved shirts, long pants, and hats.

Use an appropriate insect repellent as directed.

Higher percentages of active ingredient provide longer protection. Use products with the following active ingredients:

DEET  (Products containing DEET include Off!, Cutter, Sawyer, and Ultrathon)

Picaridin (also known as KBR 3023, Bayrepel, and icaridin. Products containing picaridin include Cutter Advanced, Skin So Soft Bug Guard Plus, and Autan [outside the US])

Oil of lemon eucalyptus (OLE) or PMD (Products containing OLE include Repel and Off! Botanicals)

IR3535 (Products containing IR3535 include Skin So Soft Bug Guard Plus Expedition and SkinSmart)

Always follow product directions and reapply as directed:

If you are also using sunscreen, apply sunscreen first and insect repellent second.

Follow package directions when applying repellent on children. Avoid applying repellent to their hands, eyes, and mouth.

Treated clothing remains protective after multiple washings. See the product information to find out how long the protection will last.

If treating items yourself, follow the product instructions carefully.

Do not use permethrin directly on skin.

Use permethrin-treated clothing and gear (such as boots, pants, socks, and tents). You can buy pre-treated clothing and gear or treat them yourself:

Stay and sleep in screened or air-conditioned rooms.

Use a bed net if the area where you are sleeping is exposed to the outdoors.

If you feel sick and think you may have Zika fever:

- Talk to your doctor or nurse if you feel seriously ill, especially if you have a fever.
- Tell them about your travel.
- For more information about medical care abroad, see Getting Health Care Abroad and a list of International Joint Commission-accredited facilities.
- Get lots of rest, and drink plenty of liquids.
- Avoid spreading the disease by preventing more mosquito bites.

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