

**INDIAN COUNCIL OF MEDICAL RESEARCH
DIVISION OF EPIDEMIOLOGY & COMMUNICABLE DISEASES**

Background note on Zika Virus:

Introduction:

ZIKA, a mosquito –borne virus is a flavivirus first identified in monkeys in Zika forest in Uganda in the year 1947. Thereafter, sporadic human cases have been reported in parts of Africa, the Americas, South East Asia and Western Pacific. In 2007, first outbreak of Zika was documented from the Pacific region. Subsequently, outbreaks have been reported from Africa, America, Asia, French Polynesia, Western Pacific and Brazil. Since 2014, indigenous circulation of Zika virus (ZIKV) has been detected in the Americas. Alarm bells started ringing in October, 2015 in Brazil, when doctors saw a huge increase in babies born with microcephaly an abnormally small head often with consequent brain damage. Zika was found in the amniotic fluid of women carrying fetuses with microcephaly.

Mode of transmission & incubation period:

The Zika virus is transmitted by the bite of infected *Aedes aegypti* mosquitoes, which is also the vector of dengue and chikungunya. However, *Aedes albopictus* could also be responsible. Incubation period is unknown. There are few reports of spread of Zika virus through infected blood and semen. However, the claims still need to be validated. However, in endemic regions, the usual recommendations for safe transfusions should be followed (e.g., healthy volunteer donors).

Clinical picture & Complications:

Only one in four infected patients develop symptoms of Zika disease. Symptoms are mild in adults and resemble the clinical manifestations of Dengue & Chikungunya. Most often cases of Zika are missed or misdiagnosed. Mild fever, malaise, rashes, joint fever, conjunctivitis are the predominant symptoms which usually subside between 2-7 days of onset of illness. Though little is known about the complications of Zika virus disease, however, in subsequent outbreaks due to the virus in Brazil and French Polynesia, increased number in neurological and autoimmune problems including Gullain Barre syndrome among children and microcephaly in new borns has been reported coinciding with the time of the outbreak. Preliminary studies in Brazil suggest a correlation between the presence of virus in the blood and microcephaly in children. However, scientific studies are ongoing in Brazil to validate these claims.

Treatment:

There is no available drug or vaccine effective against Zika virus. Patients are generally advised to take rest and drink lot of water. Treatment, if required, is mainly supportive, including intravenous fluids and antipyretics. Anti-inflammatory drugs like Ibugesic need to be avoided till dengue positivity is completely ruled out.

Prevention and Control of Zika Virus disease:

The mainstay of prevention and control is avoiding mosquito bites by adopting the following measures:

- Personal protective measures including use of protective clothing, mosquito repellents, eliminating household *aedes* mosquito breeding sites
- Integrated Vector Management (IVM) including chemical, biological and environmental vector control.
- Improving community awareness by effective IEC.

Laboratory Diagnosis: Zika virus can be tested in a BSL-2 facility. Testing for Zika virus should be done in pregnant women who have travelled to Zika endemic regions, or are symptomatic patients. Tests for dengue and chikungunya should also be done in view of similar symptoms.

- **Acute phase (3 – 5 days):** Detection of viral genome by RT-PCR in maternal serum and amniotic fluid.
- **Convalescent phase (≥ 5 days):**
 - Serology by testing IgM antibodies in blood. This is not the mainstay of diagnosis as cross reactivity with other flaviviruses is very high.
 - Plaque Reduction Neutralization Test (PRNT): this is a confirmatory diagnosis.

Preparedness of ICMR's NIV, Pune, DHR/ICMR VRDLs and ICMR Institutes to handle Zika virus outbreak in India:

For testing acute phase samples:

- NIV, Pune has capacity to test the samples received during the acute phase of the disease by RT-PCR. The RT-PCR test available with NIV is standardized from published primers (Reference: Balm et al: J Med Virol 2012; 84: 1501-5). These primers are developed from NS-5 non-structural gene of Zika virus, which is relatively conserved across the different strains. Detailed SoP for the RT-PCR test is placed at [Annexure 1](#).

For testing convalescent phase samples:

- NIV & CDC are currently partnering on creating laboratory surveillance networks for enhancing diagnostic capabilities for high risk viral pathogens, under the Global Health Security (GHS) funds. As per this understanding, ICMR has requested CDC to provide Zika virus strains to NIV alongwith IgM ELISA diagnostic kits till in-house ELISA kits and PRNT tests are developed at NIV. WHO has also been requested separately.

Others:

- A training of DHR/ICMR VRDLs and concerned ICMR Institutes for Zika virus testing is shortly being organized by NIV, Pune. Tentative list of 20 labs have been identified for training.

- ICMR has also issued an alert to several paediatricians under various networks of ICMR as well as the Viral Research & Diagnostic Laboratories to refer suspected samples for Zika testing at NIV, Pune.

As of now, there are no diagnostic kits commercially available for testing of Zika virus in India.

Travel Advisory:

PAHO/WHO does not recommend any travel or international trade restrictions related to Zika virus outbreaks. Travellers are advised to take the suggested precautions to prevent mosquito bites. Pregnant women are being tracked in Brazil who are more likely to have babies with birth defects. CDC, Atlanta has released interim guidelines for physicians to advise pregnant women to avoid travel to ZIKA endemic regions region. Physicians are advised to enquire about recent travel in pregnant women.