

Zika Virus Outbreak and Its Relation with Climate Change

(Down to Earth, 16 Nov)

Why in news:

In less than a month, Kanpur in Uttar Pradesh recorded 123 cases of Zika infection. The recent surge in cases, the biggest since the outbreak in 2016, brings back focus on the role of climate change in the spread of the infection.

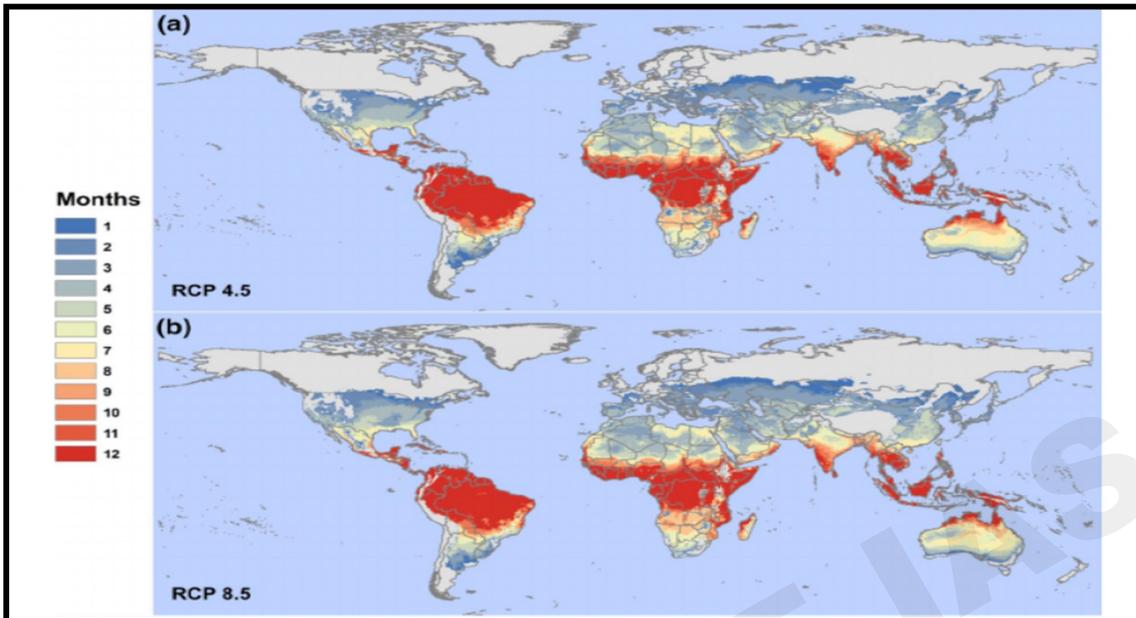
More about the issue:

- ❖ **Changing Frontiers:** In the initial years, the **disease was endemic to tropical and subtropical regions**.
 - The global rise in surface temperature due to **climate change pushed the virus into colder reaches** of the country.
- ❖ The vectors of the virus — **Aedes aegypti** and **Aedes albopictus** mosquitoes — are **ectotherms**.

Ectotherm: any so-called **cold-blooded animal** — that is, any animal whose regulation of body temperature depends on external sources, such as sunlight or a heated rock surface. The ectotherms include the fishes, amphibians, reptiles, and invertebrates.

- ❖ This means **the body temperature is regulated by their habitat** — the warmer the surroundings, the warmer it is within the host body.
- ❖ Aedes mosquitoes **breed in small pools of water**. Thus, heavy and frequent rainfall due to climate change can result in higher transmission rates.
- ❖ But the relationship between rainfall and Zika infection isn't that simple. The virus can also flourish during droughts in water storage containers — a correlation seen during the outbreak in Latin America.
 - Precipitation patterns upset by climate change thus fuels the spread of the Zika virus previously untouched by the infection.
- ❖ The suitable **range for the transmission of the Zika virus is 23.9 to 34 degrees Celsius**, according to a study that tried to map the imminent threat from the infection due to thermal variations.
- ❖ In a worst-case global warming scenario, where greenhouse gas (GHG) emissions are not reduced, **over 1.3 billion new people will be exposed to Zika by 2050**, the study showed. Of this, 1.17 billion will be outside Latin America and Caribbean, which saw the worst outbreak in 2015-16.

Moderate-case and worst-case scenario for 2050



The number of months suitable for Zika transmission in 2050 if – (a) climate change is moderate and if (b) it is extreme

The world is not on track to keep warming within 1.5°C over pre-industrial levels, and global **temperature rise can cross 2.4°C by the end of this century** despite pledges made at the 26th Conference of Parties (CoP 26) to the United Nations Framework Convention on Climate Change.

- The higher global temperatures can accelerate evolution of the pathogen and vector, apart from widening the range of transmission. Such evolution can play a significant role in vector-borne disease emergence, re-emergence and spread (for example, through pathogens evolving resistance to treatment or vectors evolving resistance to pesticides)

Zika Virus:

- First detected in **rhesus monkeys** in the **Zika forest** in Uganda in 1947.
- First major outbreak seen in Brazil in March 2015.
- In 2016, Zika virus outbreak was designated a **Public Health Emergency of International Concern** by **WHO**.
- The first two outbreaks of Zika virus infections in India were reported in 2017.

About Zika Virus:

- Zika virus is primarily a **mosquito-borne illness**, transmitted by the **Aedes mosquitoes** (which also transmits *chikungunya* and *dengue*).

ALL ABOUT ZIKA VIRUS DISEASE

Zika virus disease is an emerging viral disease transmitted through the bite of an infected **Aedes mosquito**

Symptoms

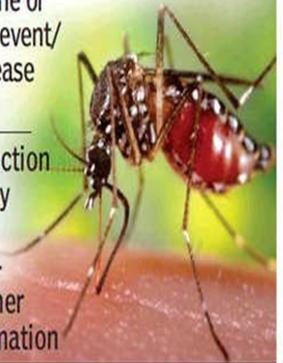
➤ Most of those infected with Zika virus disease either remain asymptomatic or show mild symptoms of fever, rash, conjunctivitis, body ache, joint pain

pitalization is uncommon and fatalities are rare

➤ There is no vaccine or drug available to prevent/treat Zika virus disease at present



➤ Zika virus infection during pregnancy can cause infants to be born with microcephaly and other congenital malformation





Transmission: from infected mother to fetus during pregnancy,

- Through blood and other body fluids and
- Organ transplantation
- As well as sexual contact.

Symptoms:

- Most people do not develop any symptoms; however, a few may develop fever, rashes, redness in eye, muscle and joint pain, headache, and generalised fatigue.
- It is a mild illness for all age groups except for the pregnant women, whose fetus may develop congenital malformation, especially abnormal brain development, microcephaly and other related neurological outcomes.

Microcephaly is a condition where a baby's head is much smaller than expected. During pregnancy, a baby's head grows because the baby's brain grows. Microcephaly can occur because a baby's brain has not developed properly during pregnancy or has stopped growing after birth, which results in a smaller head size.

- The symptoms are **very similar to other common viral illnesses**. Infection is suspected if there is ongoing Zika virus transmission in the area, travel history or contact history with a confirmed case. **The laboratory confirmation is done from blood or urine samples.**

Treatment:

- There is **no licensed vaccine to prevent disease** and **no specific treatment available**.
- People are advised to **take rest, eat well and drink plenty of fluids**.