

CLIMATE CHANGE ENABLES DENGUE TO SPREAD TO MORE COUNTRIES

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Huge spike: France reported 65 dengue cases of local origin as of October 21, 2022. | Photo Credit: AFP

Each year, nearly 100 million dengue cases and about 10,000 deaths are reported from over 125 countries, and about half the global population are in countries that provide suitable environmental conditions for dengue spread. With climate change, dengue-endemic countries will see increased dengue cases through “faster viral amplification, and increased vector survival, reproduction and biting rates”. This will lead to longer periods of spread and hence, more cases of dengue, as per a 2019 paper in *Nature Microbiology*. Increased temperature due to climate change will also allow the vector and virus to spread to countries that are currently free of dengue.

By October 21, France had already recorded 65 dengue cases of local origin from nine transmission events, the highest since 2006 when surveillance for dengue began. And for the first time in Europe, one event causing 34 cases on a single day was recorded in France on October 21, 2022. In comparison, in 2020, France witnessed 14 cases from six transmission events followed by nine cases from two events in 2019 and eight cases from three transmission events in 2018. Besides the locally transmitted cases, there have been 217 imported cases during the period between May 1 and October 21 this year.

The U.S. too reported one locally transmitted case of dengue this year in Arizona. Meanwhile, Vietnam and the Philippines reported over 3,00,000 cases (as on November 15) and over 1,70,000 cases (as on October 1), respectively.

Unlike in the case of the tropical countries where *Aedes aegypti* is the vector, *Aedes albopictus* is the vector responsible for virus spread in France. Unlike *Aedes albopictus*, the reason why *Aedes aegypti* mosquito is not the vector that spreads the virus in Europe is due to its eggs' inability to survive the cold winter of Europe.

Aedes-borne virus transmission locally is expected in southern France due to colonisation of *A. albopictus*. Yet, the epidemiological situation of dengue this year is considered “exceptional” as the number of events and the total number of locally transmitted cases far exceed those seen in the period 2010 to 2021, [as per a report](#) in *Eurosurveillance*. Especially since *Aedes albopictus* is considered to be a less efficient transmitter of dengue virus. The serotype 3

(DENV-3) has been identified for the first time this year in France.

“The drivers of arbovirus transmission are mainly influenced by the interactions between vector populations, virus strains and the global environment. Environmental conditions thus have a major impact on the efficiency of the vector system as well as on vector density and host-vector contacts,” notes the report in *Eurosurveillance*. France has witnessed especially warm spring and summer this year which might have contributed to increased “vector activity and transmission efficacy of dengue virus”.

“Southern France and Mediterranean have been at risk of dengue since the early 2000s when the Asian tiger mosquito (*Aedes albopictus*) arrived, then spread through Europe. Only certain times of the year are hot enough for the mosquito to transmit dengue efficiently enough to cause an outbreak, but dengue season in Europe is only increasing each year with climate change,” Dr. Oliver Brady, Associate Professor, London School of Hygiene and Tropical Medicine [writes in the institute’s report](#).

“Furthermore, with climate change and increasing global trade, we may see more parts of Europe with the right combination of factors for dengue outbreaks. The experience of Southern France shows that European countries are not immune from dengue and, like all other countries, may struggle to contain dengue.”

[In a tweet](#), virologist Dr. Angela Rasmussen from the University of Saskatchewan, Canada said: “We’ve been watching the slow creep northward of dengue around the world. Just another example of how the geography of infectious disease is not fixed. As climate change and land use disrupts ecology and viruses get more opportunity to spread... they will spread.”

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