

# Virus-carrying mosquitoes are more widespread than ever, and spreading

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Dengue fever is a mosquito-borne illness that infects at least 50 million people worldwide each year.

Scientists behind the first global distribution maps of two species of dengue and chikungunya-carrying mosquitoes warn they are spreading to new areas where they could cause disease.

The population of the tiger mosquito, which is known to carry dengue and chikungunya, has rapidly expanded in parts of the US, Southern Europe and China over the past 10-15 years. A new study by scientists at Oxford University reports the growth and identifies areas not yet populated by the insects that are suitable for their survival, for example in Europe. The findings are published in the journal *eLife*.

"Given the lack of a vaccine or any [antiviral treatment](#) for either virus and the debilitating pain they both cause, knowing where the mosquitoes are spreading to and where they might turn up next is crucial for helping to protect communities," says first author Moritz Kraemer. This is especially true in Africa, where records are sparse.

Urban areas worldwide are particularly susceptible to the spread of the yellow fever mosquito, *Aedes aegypti*, which also carries the viruses and lays its eggs in artificial containers such as buckets and

discarded tyres. Concentrations of both mosquitoes are particularly high in Brazil, China, Taiwan and the US, though infection via *Ae. Aegypti* is not so widespread in the US.

Dengue fever is the world's most common insect-borne virus, causing 100 million annual infections and leaving almost half of the world's population at risk. The invasion of chikungunya into the Americas has already caused over one million cases of disease. The maps are also relevant to yellow fever, though infections from this virus are already on the decline.

Temperature is key to the survival of both species and they are mainly found in the tropics and subtropics. However, the [tiger mosquito](#) *Aedes albopictus* can overwinter in colder locations by becoming dormant. This allows it to extend the margins of its range. Once introduced via major shipping or travel routes, the [mosquitoes](#) spread quickly over land.

The scientists created the maps from records that include collections of the insects from national entomological surveys and published resources in many languages.

According to lead author Professor Simon Hay, "We have made our data openly available so they can be used straight away to help protect people against these viruses about which we still know so little and have so few defences."

**More information:** The paper 'The global distribution of the arbovirus vectors *Aedes aegypti* and *Ae. albopictus*' can be freely accessed online at [dx.doi.org/10.7554/eLife.08347](http://dx.doi.org/10.7554/eLife.08347)

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