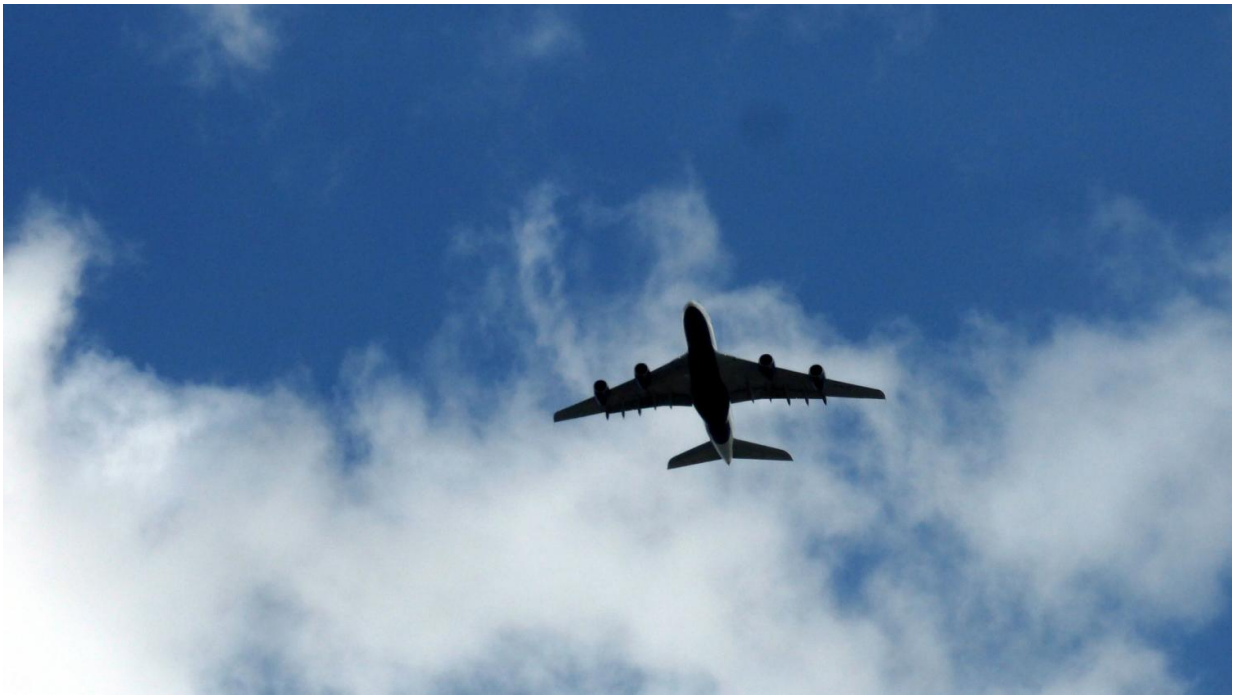
Air travel responsible for spread of dengue through Asia

August 3 2017



An airplane. Credit: Sean MacEntee, Flickr

While the incidences of many other infectious diseases have declined over the past decade, the number of cases and outbreaks of dengue virus have continued to increase. The spread of dengue to new areas is likely due in large part to trends in air travel, researchers now report in *PLOS Neglected Tropical Diseases*.

Dengue virus affects as estimated 390 million people around the globe each year, and can cause symptoms ranging from a mild fever and headache to severe low blood pressure. The virus has mostly caused disease in tropical and subtropical areas of the world, but a 2014 outbreak in Japan broke that pattern. Overall, the geographic area affected by dengue has been growing in recent years.

In the new work, Huaiyu Tian and Bing Xu, both of Beijing Normal University, China, together with colleagues from the University of Oxford and elsewhere analyzed the spread of dengue viruses in Asia from 1956 to 2015. They used 2,202 genetic sequences of dengue viruses, collected in 20 countries or regions of Asia over the 59 years, to determine how different strains were related. They also investigated trends in air travel, maritime mobility, migration, and socio-economics to determine what factors impact the spread of dengue.

The spread of three different dengue virus serotypes, DENV-1, -2, and -3, is associated with air traffic moreso than any other factors, the data revealed. Air traffic hubs such as Thailand and India, the researchers found, help seed dengue epidemics, while China, Cambodia, Indonesia, and Singapore help diffuse the virus to other Asian countries.

"Future trends in global mobility could potentially accelerate the appearance and diffusion of DENV worldwide," the researchers say. "Prevention and control of dengue epidemics requires a better understanding of its mode of geographic dissemination, especially for countries in the tropics."

More information: Tian H, Sun Z, Faria NR, Yang J, Cazelles B, Huang S, et al. (2017) Increasing airline travel may facilitate co-circulation of multiple dengue virus serotypes in Asia. *PLoS Negl Trop Dis* 11(8): e0005694. doi.org/10.1371/journal.pntd.0005694

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