

# How the Dengue virus circulates in the wild

February 20 2014, by John German

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Science has come a long way in containing infectious diseases over the past five decades. Despite this progress, the incidence of dengue fever has increased thirty-fold, with 390 million people infected annually worldwide.

Now, with several dengue virus vaccine candidates at various stages of clinical development, SFI Omidyar Fellow Benjamin Althouse and his collaborators are examining how the virus circulates in the wild—beyond the reach of vaccines—and the relationships among the virus, the mosquitoes that carry it, and the primate hosts (including humans) it infects.

In much of the developing world, climate change and the urban slum phenomenon continue to increase the risk of infection by dengue and other mosquito-borne pathogens. A successful dengue vaccine would reduce the incidence of the painful and sometimes fatal disease in humans. But wild primates can't be vaccinated, so the virus will continue to infect both wild and human primate hosts as the same mosquitoes feed on both populations.

Althouse explains that it is crucial to understand dengue in wild populations, "so we can effectively mitigate the morbidity and mortality that result from a virus whose transmission we have little control over."

Their paper, published this week in the journal *Virology*, examines results from some 54 different [dengue virus](#)-related studies of non-human primates and provides estimates of how long after inoculation

there is detectable virus in the blood and how different viral strains behave.

"The longer there's virus in a primate's blood, the greater the chance a mosquito will ingest the [virus](#) and then transmit to another host—human or monkey," Althouse explains.

Their analysis finds that the differences among the 11 species of apes and old world and new world monkeys tested are minimal.

Althouse says the new estimates might improve prediction of [dengue](#) epidemics in wild populations—which in turn might help protect endangered primates and lessen the degree of spillover to people living near their wild primate kin.

**More information:** Benjamin M. Althouse, Anna P. Durbin, Kathryn A. Hanley, Scott B. Halstead, Scott C. Weaver, Derek A.T. Cummings, "Viral kinetics of primary dengue virus infection in non-human primates: A systematic review and individual pooled analysis *Virology*, Volumes 452–453, March 2014, Pages 237-246, ISSN 0042-6822, [dx.doi.org/10.1016/j.virol.2014.01.015](https://doi.org/10.1016/j.virol.2014.01.015).

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