

Researchers examine possible implications of daily commute and mosquito-borne diseases

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University of Hawaii at Manoa assistant researcher Durrell Kapan recently published a paper, 'Man Bites Mosquito: Understanding the Contribution of Human Movement to Vector-Borne Disease Dynamics,' in *PLoS One*. Published August 26, the paper highlights how daily commuting patterns in mega-cities may be a critically overlooked factor in understanding the resurgence of mosquito-borne diseases such as dengue fever, infecting 50-100 million people annually.

"Even a small number of infected people who remain active can move a virus such as dengue between different parts of the community, where it will be picked up by mosquitos and, after an [incubation period](#), be passed on to another unsuspecting passerby," says Kapan. "Our research examined whether the standard practice of eliminating mosquito vectors at residences would be sufficient to control dengue if other areas in the community still had several large patches of mosquitos that could become infected by commuters."

To undertake this study, Kapan teamed up with mathematician Ben Adams from the University of Bath (UK), with support of UH Mānoa's Pacific Center for Emerging Infectious Diseases Research Center of Biomedical Research Excellence program, and as participating faculty in UH Mānoa's National Science Foundation Integrative Graduate Research Traineeship (IGERT) in Ecology, Conservation and Pathogen Biology.

"Our primary objective with this paper is to prompt researchers, public health practitioners and others concerned with vector control to look

beyond the traditional epidemiological definition of a transmission cluster based on home address, and consider novel ways to control community transmission of vector-borne diseases that account for great morbidity and mortality worldwide," says Kapan. "Even a short visit to an infected patch of mosquitos, say at a lunch venue or open market, may be enough to keep the virus circulating."

Adds Adams, "When someone gets infected we need to look at their recent travel patterns to figure out from which group of [mosquitoes](#) they got the disease, and to which groups they may have passed it on."

More information: www.plosone.org/article/info:doi/10.1371/journal.pone.0006763

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