

Population movement can be critical factor in dengue's spread

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Human movement is a key factor of dengue virus inflow in Rio de Janeiro, according to results from researchers based at the Oswaldo Cruz Foundation (Fiocruz) in Brazil. The results, based on data from a severe epidemic in 2007-2008, contribute to new understanding on the dynamics of dengue fever in the second largest city in Brazil. Details are published November 10 in the open-access journal *PLoS Neglected Tropical Diseases*.

Dengue fever is a major public health problem in many tropical regions of the world. It is a vector-borne disease, transmitted most often by the mosquito [Aedes aegypti](#). According to the WHO, the prevalence of dengue is highest in tropical areas of Asia and the Americas, with 50-100 million estimated cases of dengue fever and 250,000-500,000 cases of dengue [hemorrhagic fever](#) occurring annually worldwide as explosive outbreaks in urban areas. In Brazil, three dengue virus serotypes (DENV) have been introduced in the past three decades.

In 2007-2008, a dengue fever epidemic in Rio de Janeiro led to 240 deaths registered (100 deaths due to dengue hemorrhagic fever and 140 due to other dengue-related complications). This populous city presents highly favorable conditions for transmission of dengue. Dengue surveillance and control in large urban areas with high levels of dengue transmission pose important challenges. Therefore, consistent knowledge of the dynamics of this disease that integrates epidemiological and entomological data is essential.

The present research combines data on [dengue fever](#) seroprevalence, recent dengue infection, and vector density in three neighborhoods of Rio de Janeiro: an urban, a suburban, and a slum area. Serological surveys were conducted before and during the epidemic period. Entomological surveys consisted of weekly collections of *A. aegypti* eggs and adults from traps.

This integrated entomological-serological survey showed evidence of silent transmission even during a severe epidemic. No association was observed between household infestation index and risk of dengue infection in these areas, raising new questions about where transmission occurs - in the household, at work or elsewhere. When combined, the neighborhood-specific seroprevalence maps correlated significantly higher risk with areas of intense people traffic.

These results add to previous epidemiological studies of [dengue virus](#) infections and contribute to the understanding of *A. aegypti* habits. The conclusions may provide a basis for new studies that could further identify the higher seroprevalence risk areas and help to develop and implement dengue-control programs.

More information: Honório NA, Nogueira RMR, Codeço CT, Carvalho MS, Cruz OG, et al. (2009) Spatial Evaluation and Modeling of Dengue Seroprevalence and Vector Density in Rio de Janeiro, Brazil. *PLoS Negl Trop Dis* 3(11): e545. [doi:10.1371/journal.pntd.0000545](https://doi.org/10.1371/journal.pntd.0000545)

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