OUR NATION’S HEALTH
Celebrating 125 Years of the National Institutes of Health
Aedes aegypti, a mosquito that is a vector for several tropical fevers including dengue. Through RAPIDD, a program managed by FIC’s Division of International Epidemiology and Population Studies, Shweta Bansal, Ph.D., has worked with mathematical models to determine how dengue spreads within Iquitos, a large Peruvian city.

Bansal's research covers both direct and vector-borne disease transmission. Throughout 2011 she modeled data on dengue collected over a decade in Iquitos, the largest city in the Peruvian rainforest and home to swarms of Aedes aegypti, a mosquito that is a vector for several tropical fevers. Her goal is to extend the network models used to understand patterns of direct transmission to vector-borne diseases, so that the movement patterns of individuals can be overlaid with the vector to reveal how dengue is spread within the community. This involves using detailed location data including GPS coordinates.

The RAPIDD program also focuses on zoonosis, or the spread of disease from nonhuman animals to humans. Bansal has spent considerable time thinking about livestock diseases, specifically foot-and-mouth disease, which are of concern to Homeland Security officials, and how they might jump to other species.

Bansal's research exemplifies well the role of DIEPS at NIH – conducting research in epidemiology and mathematical modeling of infectious diseases. Primary concentrations include cross-national studies of mortality patterns with special emphasis on influenza-associated disease, malaria, and other vector-borne and vaccine-preventable diseases. Outcomes of DIEPS research and other activities are changes in public health policies and practices to decrease disease burdens.

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Quoted in the newsletter, Bansal explained, “This is to understand the data and think about where the greatest risk of transmission is and where we might focus our intervention.” With the data collected over 10 years, Peruvian health authorities can allocate limited spraying resources.

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Now a part of the faculty at Georgetown University's Biology Department, Bansal remains a RAPIDD faculty affiliate. She says RAPIDD was “very much a blessing” for her postdoctoral work. “It focuses on bringing the right expertise together on the mathematical side, the biological side, and the public health side and thinking at a fundamental level about infectious disease dynamics.”