Predicting the spread and the risk of Dengue

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Imagine living in a country where a single mosquito bite can be deadly or cause a fever resulting in hospitalization for weeks. In fact, according to the WHO more than 2.5 billion people are at risk from Dengue – a mosquito-borne infection, whose risk varies due to seasonal, climatic and environmental changes. Being the world's fastest growing disease with no available vaccine, Dengue overwhelms countries' health systems and severely impacts economic development and tourism.

The prevention and control of Dengue outbreaks depend on effective mosquito control strategies and being able to predict who is likely to become infected next. Hence, it is crucial to capture information about the mosquito population, and how this changes across locations and seasons. While high-quality data about infected humans are often available from government databases, precise data collection about mosquitoes is difficult and expensive to obtain.

Our research aims to address this problem by creating a new disease prediction tool using information from past infections combined with factors such as rainfall, temperature, and human population density. By deploying statistical methods we create info-graphic maps to identify previously unknown locations with high mosquito population and the likelihood of infection on a national scale. Policy makers can use this information for location targeted counter-measures such as quarantines and further, for more accurate real time prediction of the spread of the disease. Altogether these new methods will not only save millions spent on disease control every year, but they will also enhance everyday health and save lives.