USING CLIMATE INFORMATION FOR MALARIA RISK MANAGEMENT IN SRI LANKA

In collaboration with the Sri Lanka Ministry of Health and other government research partners, IRI and the International Water Management Institute have undertaken a project to characterize climate and malaria linkages in Sri Lanka, focusing initially on the Uva province in the southeastern part of the island. The goal is to use climate information for early warning of disease risk.

Climate is a major determinant in the distribution and occurrence of malaria epidemics in Sri Lanka. Temperature, rainfall, and humidity affect breeding and survival of vector mosquitoes and the development of malaria parasites within the mosquitoes. IRI, in collaboration with the Anti-Malaria Campaign of the Sri Lanka Ministry of Health, the International Water Management Institute (IWMI), Foundation for Environment, Climate and Technology and other partners, has studied climate-malaria linkages in order to develop an early warning system of climate induced disease risk. The project set goals of characterizing climate and malaria relationships in Uva Province at a fine scale, and to develop early warnings for malaria risk in all of Sri Lanka. The project was supported by NOAA's Climate Variability and Human Health program starting in December 2003.

Project Outputs

Project accomplishments to date include the development of:

- A database of fine scale climatic hydrological and malaria information
- Fine-scale climate analysis and high resolution prediction techniques
- A climate monitoring system
- A refined land surface model
- Geographic information systems for climatic, hydrological, malaria and societal data
- Methods of identifying linkages between climatic variables and malaria at seasonal, inter-annual, decadal and epochal time-scales
- Methods to identify factors that lead to vulnerability to malaria.

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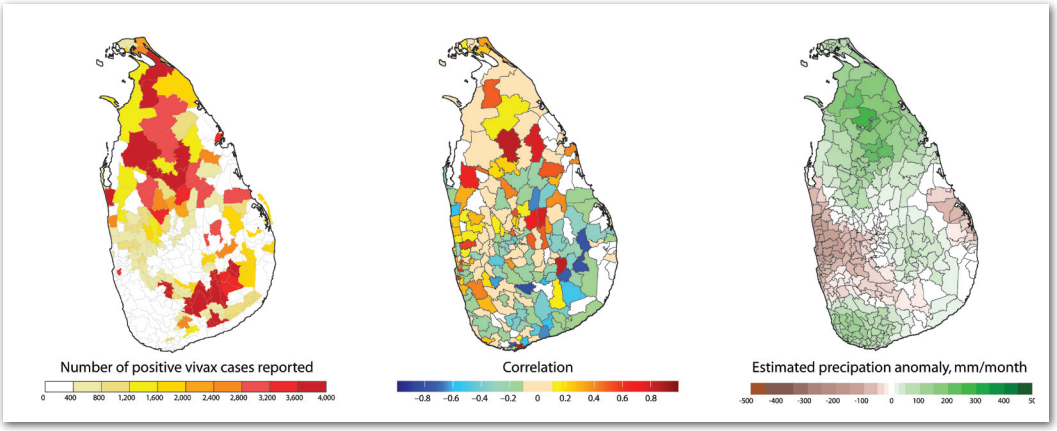
MALARIA RISK MANAGEMENT IN SRI LANKA

Ray Witlin/World Bank

Our analysis shows clear evidence of climatic influence on malaria, both spatially and temporally. Malaria is linked to both the El Niño phenomenon and climatic change. As there is considerable spatial and epochal heterogeneity in the climate and malaria linkage, carefully calibrated, fine-scale warning systems are needed.

The project has led to capacity building opportunities for researchers and government officials, as well as educational opportunities for students. For example, in November 2007, IRI hosted two malaria control officers from Sri Lanka, with support from the Global Fund for AIDS, TB and Malaria.

During stakeholder workshops in Sri Lanka in September 2007, Sri Lanka's Anti-Malaria Campaign and other local partners identified the need to continue this work especially in view of the recent decreases in malaria incidence. During periods of low malaria prevalence, as the immunity of the population is lowered, disease surveillance and control measures are relaxed, there is an enhanced risk of epidemics. Under these circumstances, early warning systems based on climate and environmental information can be a cost-effective means of identifying the risk of epidemics.



Left: Annual average malaria incidence (*Plasmodium Vivax*). Middle: The end of the year malaria incidence was correlated with anomalously high rainfall in the drier regions particularly in the North. This relationship of malaria with rainfall can be used in disease-risk prediction if the current climate is monitored. Right: A rainfall monitoring system has been put in place at fine-scales and an estimate of anomalous wetness and dryness for October 2007 as estimated in early November is shown. The lead time of predictions can be extended with seasonal climate forecasts which have also been developed at fine scales.

About the IRI

The IRI works on the development and implementation of strategies to manage climate related risks and opportunities. Building on a multidisciplinary core of expertise, IRI partners with research institutions and local stakeholders to best understand needs, risks and possibilities. The IRI supports sustainable development by bringing the best science to bear on managing climate risks in sectors such as agriculture, food security, water resources, and health. By providing practical advancements that enable better management of climate related risks and opportunities in the present, we are creating solutions that will increase adaptability to long term climate change. IRI is a member of the Earth Institute at Columbia University.