CLIMATE RISK MANAGEMENT AND HEALTH

This year, malnutrition and infectious diseases will kill more than 15 million people and sicken tens of millions more, mostly in developing regions. This will have devastating and lasting effects on societies and their economies because people become too sick to work, attend school or care for their children. Many of these diseases are climate-sensitive, occurring only in places or times of year when conditions are suitable for transmission. By having a scientific understanding of how climate information can be used to predict disease dynamics, health officials and decision makers can target interventions in a more appropriate and timely way and use scarce resources more intelligently and preemptively.

More than 124 million Africans live in areas prone to malaria epidemics. The epidemics occur when environmental conditions such as temperature, rainfall and humidity become favorable for transmission. Because this happens at irregular intervals, the people who live in these areas rarely budget adequate resources and training to diagnose, treat and control the disease outbreaks. Moreover, unlike their counterparts living in endemic regions, where malaria occurs each year, these populations have acquired little immunity to the disease. When the outbreaks do occur, they cause disproportionate loss of life and productivity.

But malaria, along with cholera, meningitis and dengue fever, are only a few of the 14 communicable diseases recently identified as being climate-sensitive by the World Health Organization. The IRI seeks not only to better understand the linkages between climate and these diseases, but also to demonstrate advantages in using climate information, whether to reduce exposures in vulnerable populations or to guide more effective interventions. To this end, the IRI is a PAHO/WHO Collaborating Centre for Climate Sensitive Diseases. We provide technical support to countries and regional health partners on the development and implementation of these systems.

Information needs for meningitis control

More than 222 epidemics of meningococcal meningitis were recorded in Africa's "Meningitis Belt" between 1950 and 1999. Around 350 million people live in this high-risk area. The belt is a region between latitudes 4° and 16° N which extends from Senegal to Ethiopia, including Mali, Niger, Burkina, Faso, as well as Sahelian zones of countries such as Ghana and Nigeria. Every year, the population is at risk of succumbing to the devastating effects of regional epidemics that cause hundreds of thousands of cases and tens of thousands of deaths as well as long-term disabilities. Meningitis shows a clear geographical pattern compatible with climate and the environment, and a seasonal pattern shown to be driven by the seasonality of the climate of the Sahel.

Isabelle Jeanne

Contact
Judy Omumbo
Postdoctoral Research Scientist

jomumbo@iri.columbia.edu

Ph: +1.845.680.4457
Fx: +1.845.680.4864

International Research
Institute for Climate and Society
Columbia University
Lamont Campus
61 Route 9W
Palisades, NY 10964-8000 USA

www.iri.columbia.edu

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World Health Organization

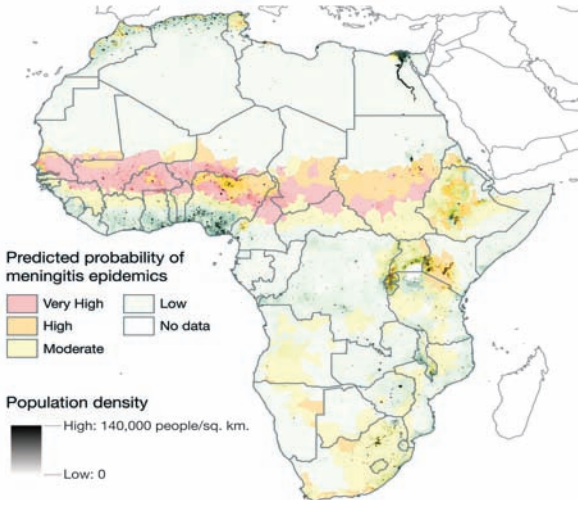
Improvements in protective vaccines have led to a renewed effort to control meningitis in the region. The Meningitis Vaccine Project (MVP) aims to eliminate epidemic meningitis as a public health problem in Sub-Saharan Africa. This may be possible due to the development of an effective long-lasting conjugate vaccine, which targets the dominant strain (Group A) of the bacteria that causes meningococcal meningitis and is associated with epidemics. Due to resource limitations, only 30-40 million doses of the new vaccine will be produced each year, meaning that many areas will continue to have inadequate control strategies over the next decade. The current vaccine offers only temporary protection and therefore the timing of its administration is crucial to ensure it is effective at the start and for the duration of an epidemic season. With limited doses available to control programs it is even more important to be able to identify those individuals most at risk.

Studies of the epidemiology of the disease, together with a greater understanding of its seasonality and relationship with climate, are helping planners to make timely predictions of the onset of the meningitis season. Risk maps, such as the one shown here, provide a description of the distribution of disease based on where cases are usually found. By combining case data with maps of age-stratified population distribution, the vaccination program can target vaccine interventions more accurately in time and space.

Malaria Early-Warning Systems

Economic development has played an enormous role in shaping the current global distribution of malaria. Where malaria isn't adequately controlled, however, its distribution and seasonality are closely related to seasonal characteristics of the climate. Our online mapping products, all freely accessible through the IRI's Data Library, aim to illustrate models of climate suitability for seasonal endemic malaria and recent climate conditions, such as rainfall anomalies, which may be associated with epidemic malaria in warm semi-arid regions of Africa.

Population Density in Meningitis Risk Areas in Africa



The Center for International Earth Science Information Network (www.ciesin.org)

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.