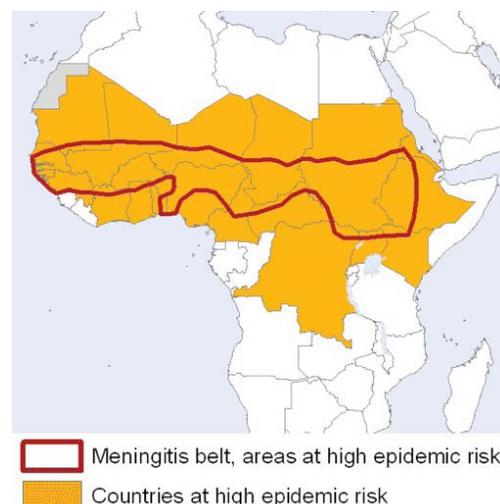




# UNDERSTANDING THE DRIVERS OF MENINGITIS OUTBREAKS IN THE SAHEL TO TARGET IMMUNIZATION

Meningococcal meningitis is one of the most feared epidemic diseases in Africa because of its rapid onset and severe consequences. In addition to being responsible for significant deaths across the Meningitis Belt, which spans from Senegal to Ethiopia, recurring outbreaks impair economic development, burden health systems, families and individuals by causing chronic and debilitating conditions such as brain damage and deafness. The worst outbreak in recent history occurred in 1996-1997, affecting 250,000 people and causing 25,000 deaths in the region. In 2009, there were over 50,000 cases in northern Nigeria alone.

Sadly, the current immunization strategy for meningitis control is not sufficient to reduce the burden of this disease. This control strategy relies on the early detection of outbreaks followed by mass immunization, which is effective only if implemented immediately after the onset of the epidemic. The development of a more protective conjugate vaccine against the predominant meningococcal strain in Africa, serogroup A, offers promising opportunities for the prevention of the disease. However, this vaccine is not yet routinely available and it will take time and considerable resources before sufficient vaccine coverage is achieved. Its implementation must therefore be targeted first to the populations most at risk.



## CONTACT

Barbara Platzer,  
Africa Regional  
Program Coordinator

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

Ph: +1.845.680.4426  
Fx: +1.845.680.4866  
www.iri.columbia.edu

A more complete understanding and monitoring of the epidemic drivers of meningitis would enable public health practitioners to predict the occurrence of meningitis outbreaks and to target immunization. Unfortunately, at this point in time, neither the drivers of meningitis outbreaks nor their relative influence are yet fully understood. However, increasing evidence suggests that environmental factors impact the spatial and seasonal distribution of epidemic outbreaks. It is also clear that the climate plays a critical role, notably the hot, dry and dusty conditions that lead to irritated throats are seen to be key culprits in the increase of meningococcal transmission.

## The MERIT Project

The Meningitis Environmental Risk Information Technologies (MERIT) project was initiated in 2007 to reduce the burden of meningitis epidemics in Africa by facilitating collaboration between the public health, epidemiological and environmental communities, in particular through the development of effective decision-making tools. Led by the World Health Organization (WHO), MERIT specifically aims to support enhanced outbreak response using the current polysaccharide vaccine and the introduction of the new preventive conjugate vaccine. Since its implementation, the MERIT initiative has grown to

 COLUMBIA UNIVERSITY  
IN THE CITY OF NEW YORK



IRI is a WHO/PAHO  
Collaborating Center for  
Climate-Sensitive Diseases



Harmattan dust envelopes a Nigerian village.

include a wide group of researchers and practitioners from national, regional and international institutions.

MERIT has initiated disease modeling activities in Niger, Ethiopia and Ghana and is extending its efforts across the entire Meningitis Belt. It has identified opportunities to integrate valuable climate, environmental and other information into meningitis prevention and control through the specific development of i) Current and future risk maps; ii) Early warning systems; iii) Improved impact assessment methodologies for prevention efforts.

## IRI support to MERIT

A founding partner of MERIT, the IRI has been involved in the earliest studies and mobilization efforts of this initiative. In particular, the IRI supports MERIT's problem-focused, demand-led, multi-stakeholder project through: i) Climate expertise on monitoring and predicting the dry season and on characterizing dust, specific humidity, temperature and the onset of the rainy season in the Meningitis Belt; ii) Testing the means and implications of integrating climate information into the decision-making tools of the WHO and relevant Ministries of Health starting in January 2010; iii) Education, training and outreach, specifically through the implementation of interdisciplinary workshops such as the Summer Institute on "Climate Information for Public Health" organized each year in New York by the IRI and partner institutions, as well as in-country training workshops run by Summer Institute alumni. Distance learning tools are also being developed.



IRI's Google Earth tour discusses the link between climate and meningitis.

To learn more about MERIT and its steering committee, please visit the webpage of the Health and Climate Foundation:

<http://merit.hc-foundation.org/index.html>.

More about IRI's Google Earth tour on Climate and Meningitis can be found on:

<http://www.google.com/landing/cop15/>

## 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.