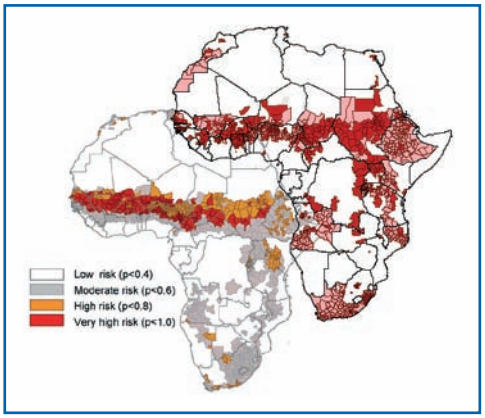
Improving intervention strategies for meningitis epidemics in Africa through enhanced application of environmental information

Description

GEO is actively involved in facilitating efforts to combine Earth observations with public health data and information systems to improve strategies for the prevention and control of meningitis epidemics in Africa.

Meningococcal meningitis is one of the most feared diseases in Africa because of its rapid onset, high fatality rates and long-term disabilities such as brain-damage and deafness. Epidemic outbreaks pose a serious threat to susceptible populations, with each outbreak placing severe burden on the public health system and socio-economic development of affected areas. In 1996-97 alone, epidemics infected 250,000 people and led to 25,000 fatalities in Africa.



Epidemic outbreaks tend to occur roughly on a four- to seven- year cycle throughout a region of Africa known as the 'Meningitis Belt', stretching from Senegal in the west to Ethiopia in the east. While meningococcal meningitis is an endemic disease across this region, with carriage of the bacteria common and often benign, epidemic outbreaks are typically triggered during hot, dry and dusty conditions and in regions of high population density.

While there are still many uncertainties about the transmission of the disease and the development of an epidemic event, an increasing amount of scientific research conducted by numerous research institutes throughout the world is shedding light on the environmental factors which may influence the start, duration and nature of a meningitis epidemic. The environmental risk indicators, including changes in temperature, humidity levels and concentrations of sand and dust aerosols, appear to influence the spatial and seasonal distribution of epidemic outbreaks. Climate variability on a year-to-year basis as well as longer term climate change may also impact the timing, occurrence and extent of epidemic events.

Significant improvements are also being made in the quality, effectiveness and availability of meningitis vaccines used in response and control programs. Unlike past and current control strategies which have been based on reactive, short-term mass vaccination campaigns, the public health community is optimistic about the opportunities provided by the recent development of an affordable and effective conjugate vaccine, through efforts of the Meningitis Vaccine Project. This new vaccine offers the potential to provide life-long protection against the dominant strain of the bacteria (Serogroup A) to 300 million-plus people in Africa's Meningitis Belt over the next 10 years.

While advances are being made within both the scientific research community and the public health community, of critical importance to the success of future prevention strategies is the identification and bridging of the gap between the providers and users of relevant and up to date information. While it is clear that a number of often complex environmental, social, demographic and economic factors need to be taken into consideration in the design of strategies to reduce the burden of meningitis in Africa, a more comprehensive and in-depth understanding of these specific risk indicators will assist decision-makers in determining populations at highest risk of an outbreak and help inform strategies for the distribution of preventative vaccines.

Relevance to GEO

Recognizing the emerging opportunities for collaborative efforts between the environmental, epidemiological and public health communities to improve these strategies, GEO has been actively involved in the development of the Meningitis Environmental Risk Information Technologies (MERIT) Project. In collaboration with the World Health Organization (WHO) and other partners, GEO hosted a consultative meeting from 26-27 September 2007 which brought together experts to investigate opportunities to improve the understanding of the relationship between meningitis epidemics and environmental parameters, to increase the understanding of the information requirements of the public health community, and to identify critical research gaps.

As part of ongoing collaborative efforts, participants at the meeting agreed to work together on the development of the MERIT Project initiative under the initial coordination of GEO, with identified aims to: improve the application of climate and environmental information to meet the needs of public health policy-makers in Africa; enhance regional and national surveillance capabilities; and strengthen decision-making and public health policy development through institutional capacity building efforts.

Added Value

GEO adds value to this activity by providing an opportunity for effective engagement between the environmental and public health communities and by promoting areas for effective integration of environmental information with public health information systems to support the development of meningitis early warning and alert systems.

Relevance to GEO

The MERIT Project is contributing to the objectives of the GEO Health Task HE-06-03, 'Forecasting and Monitoring Environmental Health Hazards'. This project which is driven by the public health community, contributes to the Health Societal Benefit Area of GEO by emphasizing a systematic approach to increasing the application of environmental information based on the proven benefit to public health strategies. The MERIT Project brings together non-GEO organizations with GEO Members and Participating Organizations to address climate- and weather-sensitive diseases and provides a forum for non-GEO participants, especially public health workers, to benefit from interactions with the GEO community.

Participants

The participants involved in the initial development of the MERIT Project include:
- World Health Organization
- World Meteorological Organization
- International Federation of the Red Cross and Red Crescent Societies
- Health and Climate Foundation
- International Research Institute for Climate and Society
- Meningitis Vaccine Project PATH

Current Status and Next Steps

1. Development of a MERIT framework to enable effective integration of environmental information into public health strategies for meningitis epidemics;
2. Improvements in the uptake and use of health decision support tools to provide timelier warnings of potential epidemics;
3. Identify funding opportunities to meet resource requirements and sustain future operations of the MERIT Project.