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The UCAR Africa Initiative - Overview and Update

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Motivated by the underrepresentation of Africa in international efforts to contribute to and benefit from improved meteorological and climatological research capabilities and facilities, The UCAR community, as represented by UCAR-Member and Affiliate universities, NCAR, and the UCAR Office of Programs, is actively assisting in building and leveraging atmospheric-sciences capacity in Africa. The UCAR Africa Initiative (AI) builds sustainable partnerships between UCAR and African institutions in order to pursue research and applications for the benefit of the African people. The initiative is envisioned as enabling **African Solutions for African Problems**.

A pilot effort in the UCAR Africa Initiative focuses on developing, with funding from Google.org and partners in the U.S. and Africa, a **prototype Earth-gauging system integrating weather and health data to help manage meningitis**.

The overarching goal of this project is to contribute to saving lives and enhancing livelihood in Ghana through integration of health and environmental data, and by using that integrated data in service of health-related decision-making. Specifically, the goal is to build and implement a prototype decision-support system that integrates two- to 14-day weather forecasts and epidemiological data to provide actionable information that can be used to help contain the spread of meningitis epidemics. By applying a preliminary economic evaluation of this decision support system, the potential benefit of using environmental data to improve public health outcomes will be assessed.

One part of the project focuses on investigating the links between weather and meningitis and the skill with which global weather forecast centers can predict the end of the regionally-prevalent meningitis season. Work to date models outbreak severity as a function of weather variables, and examines logistic and quantile regression approaches for prediction of meningitis. The current focus is on isolating the most important weather variables for prediction of outbreak duration. Then, the "global grand ensemble" of the WMO-initiative THORPEX TIGGE project will be used to forecast those important variables.

A second effort focuses on understanding the knowledge, attitudes and practices associated with meningitis in northern Ghana. Comprehensive interviews with over 100 individuals who have contracted meningitis (cases) and 200 age, gender, and location matched individuals without meningitis (controls) will allow us to investigate socio-economic factors that contribute to the spread of meningitis, and help assess the relative impact of environmental factors, including weather. This comparison will be facilitated by in situ hourly data obtained from 20 humidity and temperature sensors deployed in a transect through northern Ghana.

A third effort focuses on developing a technical and social infrastructure that can provide transparent, reliable, usable weather information to organizations who make decisions about meningitis vaccination campaigns. Our long-term goal is to support an African institution as the provider of this information; in the meantime we will pilot this in the U.S. using Unidata's TDS, RAMADDA and IDV software packages.

These three efforts are a small piece of an overall Google.org effort to develop an Earth-gauging System that will integrate environmental, health and development data into products that stakeholders and researchers can use to monitor variables, analyze trends and identify relationships among different variables. The Earth-gauging

System will support the prediction of emerging threats, and provide the basis for an robust early-warning system that will improve health, food security, and development and conservation outcomes.

This presentation provides an overview of the various efforts being conducted and planned as part of the UCAR African Initiative and gives a status update of efforts currently underway.