Human Health
Scientists at the National Center for Atmospheric Research are investigating the complex interactions among meteorological, ecological, and social processes in order to reduce the impacts of weather variability and climate change on human health. This research is performed with collaborators from U.S. and international universities and agencies, and has the following objectives:

- To determine vulnerabilities and appropriate adaptations to weather-and-climate-related threats to human health.

- To understand the complex relationships between climate variability and the health of ecosystems.

- To help educate the next generation of researchers in these interdisciplinary areas.

Components
The NCAR Weather, Climate and Health Program has several components:

- Addressing health risks from extreme heat in major cities including Phoenix, Arizona, Houston, Texas and Toronto, Canada. This research is aimed at identifying the areas of cities where health risks are highest due to a combination of high heat and social vulnerability, and at developing solutions for reducing the impacts of extreme heat on urban populations.

The range of Ae. aegypti, the primary vector of dengue virus, has greatly expanded in the Americas in recent decades. The mosquito needs the right combination of temperature, humidity, and rainfall to survive. NCAR researchers are working with a multi-institutional, multi-disciplinary team to develop a model of Ae. aegypti abundance in Mexico, to determine whether and where the mosquito’s range may shift or expand.

- Assessing the potential for the dengue virus vector mosquito Ae. aegypti to expand in the Americas under a variety of climate-and-societal change scenarios. As warming continues, this human-dependent mosquito may move into cities that are currently too cool and dry for it to exist.

- Working in northern Ghana and across the African Sahel to reduce the burden of upper respiratory disease and meningitis. This research includes investigating the use of clean cooking technologies to improve regional air quality, and developing a weather forecasting capability that specifically informs meningitis vaccination campaigns.
Cooking over open fires throughout the developing world contributes to human health problems, local and regional air pollution, and global climate change. Researchers from NCAR, the University of Colorado, and Ghana Health Services are measuring the potential impacts of scaling up use of cleaner cook stoves in Northern Ghana. Photo courtesy: Global Alliance for Clean Cookstoves.

- Modeling fluctuations of human plague cases in Uganda, which are linked to weather variations. This work, aimed at improving plague surveillance and prevention, includes a component in which traditional healers in the West Nile region of Uganda are trained to recognize plague symptoms.

- Establishment of a joint postdoctoral program between NCAR and the U.S. Centers for Disease Control and Prevention. Fellows spend a year at each institution doing collaborative research on climate-sensitive vector-borne diseases, or environmental health. The program provides interdisciplinary training to address climate-related health issues.

NCAR researchers are collaborating with scientists at the Centers for Disease Control and Prevention to develop models to simulate human plague risks that are caused by climatic factors.

Researching the complex interactions among climate processes, ecosystems, and health in order to reduce impacts of climate change on human health and the health of the planet.

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