Health

Weather, Climate, and Health:
Projecting risks, targeting interventions

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I. Description

Human health is strongly connected to climate and weather. Temperature, precipitation, humidity, and other weather characteristics can all negatively affect human health. Examples range from extreme heat exposure to a shift in the geographic range of insects and other disease carriers (called vectors). Current and future changes in extreme events and other impacts of a changing climate will affect health among populations in both the developed and developing world.

To better understand the complex linkages, NCAR researchers have established an internationally recognized, interdisciplinary weather, climate, and health program focused on integrating physical and social sciences and policy. The program addresses a basic need to understand these linkages, leveraging both internal expertise and multi-disciplinary, multi-institutional collaborations. NCAR has physical and social scientists and a strong geographic information system program to conduct spatial analyses, with the long-term goal of generating quantitative models of weather- and climate-related health risks.

II. Stage of Research

NCAR plans to generate quantitative models of weather- and climate-related health risks to
- better understand the non-linear linkages among people, weather, climate, and health
- project climate-related health risks in advance
- help policy makers and communities to implement effective interventions, including preventive mitigation and adaptation to changed conditions.

Next steps: Researchers will focus on refining spatial risk analysis through longitudinal studies that more precisely identify areas at risk for health hazards and intervenable factors.
III. Applications

- Provide decision makers with information targeted toward communities at highest risk for health-related hazards
- Identify regional and local areas with different adaptive capacities to better understand resilient communities
- Establish co-benefits, constraints, and approaches toward preparing for extreme weather events and multiple health-related hazards

IV. Advantages

- Practitioner, decision maker, and community involvement assures that basic and applied research addresses real-world needs.
- Engages community leaders to assist with targeting research toward community needs.
- Trains the next generation of researchers in both climate and health applications, as well as interdisciplinary methods.

V. Funding

National Science Foundation
NASA
National Institutes of Health
Centers for Disease Control
NOAA
U.S. Department of Defense, Defense Threat Reduction Agency
USAID

VI. Research Partners

Universities:
University of Arizona, Arizona State University, Colorado State University, University of Colorado, University of Georgia, Columbia University, University of Kansas, North Carolina State University, Ryerson (Canada), Universidad de Veracruz (Mexico), University of Ghana (Ghana)

Local agencies and private partners:
Google, Houston Advanced Research Center, Toronto Department of Public Health, Toronto Environment, Houston Department of Health and Human Services, Veracruz Health Ministry, Veracruz Environment Ministry, Veracruz Civil Protection Ministry, Navrongo Health Research Centre

International agencies:
World Health Organization, World Meteorological Organization, Health Canada, Ghana Health Services, Uganda Virus Research Institute

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