

**Introduction to the Colloquium on Climate and Health:
A Challenge to Interdisciplinarity**

Abstract for NCAR Summer 2004 Colloquium on Climate and Health

Evolution of a Colloquium

The initial idea for this workshop developed within the context of the NCAR Weather and Climate Impacts Assessment Science Initiative (www.assessment.ucar.edu). This initiative embodies three important themes in impacts assessment science: 1) characterizing uncertainty throughout the impact assessment process; 2) analyzing and managing extreme weather and climate events of importance to society; and 3) building an educational program on climate and human health, to increase research capacity.

These three themes are of course related. For example, there are considerable uncertainties in the analysis of extreme events; and extreme weather and climate events and uncertainty are highly relevant to climate and health issues. (The topics of characterizing uncertainty and extreme weather and climate events are addressed extensively in this colloquium.) Of course that is also true for any number of impacts areas, such as water resources or agriculture. But climate and health possesses some unique characteristics that make it of particular importance.

First, *qua* impact area, human health is somewhat less developed, since it came to the attention of the climate impacts community later than other areas, such as agriculture. It is also an impact area to which the public is very sensitive. If you ask people if they would be more concerned about a 10% yield decrease in corn in the United States (if they are not farmers) or about increased spread of infectious diseases such as West Nile or Dengue fever, their reactions will be quite different. People respond to threats to their health more personally than to threats to the economy in general; the 'dread' factor (in risk analysis parlance) associated with disease is much higher.

While all impacts areas (agriculture, water resources, energy) are complex, the interactions between climate and health are among the most complex. In fact there is no simple interaction between climate alone and human health. For example, the factors that lead to emergence of infectious diseases include complex interactions of social, political, and economic factors, genetic and biological factors, ecological factors, as well as physical environmental factors that include climate and weather (fig 1).

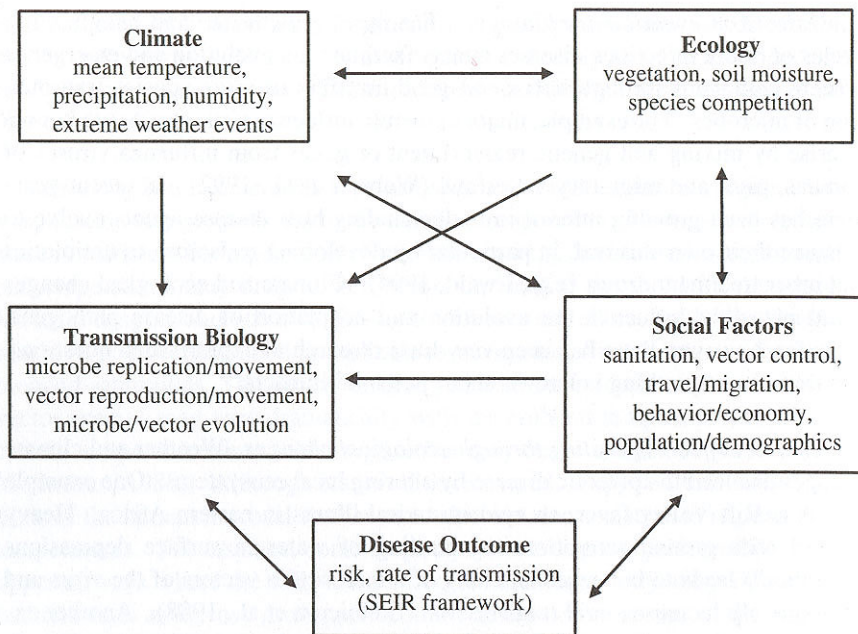


Fig 1: The Web of factors that influence transmission of infectious disease agents. (Source: Burke et al. 2001)

These are among the reasons why there have been specific recommendations for the development of programs to better train the next generation of researchers in climate-health interactions (Burke et al., 2001).

Growing Sophistication - A Longitudinal Assessment of the Treatment of Climate and Health in the IPCC.

One of the concerns about the study of climate and health, particularly in the context of climate change, is that analyses have been too simplistic, that they have failed to take into consideration all requisite complexities, and thus, have led to erroneous or incomplete conclusions. This may have been true in very early studies, but research demonstrates that there has been steadily increasing appreciation for complexity over time. If one reviews the treatment of health and climate in the context of the series of reports of the Intergovernmental Panel on Climate Change (IPCC), one sees a steady increase in recognition of and treatment of the complexity of the problem. In the first IPCC report (IPCC, 1990) no chapter on climate and health was included. In the Human Settlements chapter there is a rather cursory treatment of direct effects from heat stress and very little treatment of infectious disease. In the 1995 report (IPCC, 1995) the separate chapter on Climate and Health considers both direct and indirect effects of climate, and there is extensive treatment of vector-borne diseases. The importance of adaptation is emphasized. In the 2001 report (IPCC, 2001) one sees a new section on caveats and methodological problems associated with making causal links between climate, climate variability and change, and human health. Undoubtedly in the fourth assessment report of the IPCC now under way, even more nuanced and in-depth coverage of the topic will be seen.

The Challenge of Interdisciplinarity

The highly interdisciplinary nature of problems in climate and health necessitates sustained collaboration among practitioners of disciplines that share few underlying scientific principles and research methods.

This is one reason why, even though there have been steady improvements in the quality of studies of climate and health, more progress remains to be made. Recent National Academy studies related to health and the environment make very explicit recommendations for more rigorous interdisciplinarity. For example, Smolinski et al. (2003) make clear that addressing the highly complex nature of infectious disease emergence requires the involvement of experts from many disciplines and health sectors. It also notes that the current structure of academic and public health institutes precludes the necessary level of integrated collaboration. Earlier, the Report on Climate, Ecosystems, and Infectious Diseases encouraged all government agencies to support interdisciplinary programs on climate and infectious disease (Burke et al, 2001).

While in principle interdisciplinarity is currently a popular perspective to assume in many research settings, there remain non-trivial impediments. These include: belief that research that lacks disciplinary depth is inherently superficial, inhospitable institutional structures, difficulties in communicating across disciplines, inadequate or nonexistent reward systems, and research funding structures that are inimical to such research.

Hence, for many interdisciplinary research contexts there remains no scientific culture to sustain them including appropriate institutional structures, journals and professional societies. This is certainly the case for climate and health.

Of course contexts are changing. For example there now is the *Journal of Global Environmental Change and Health* (which recently evolved to the journal *Ecohealth*.) Moreover, they are now some well-developed programs in climate and health, such as at John Hopkins and at Columbia.

Goals of the Colloquium

We hope this is the first of what will become an annual event at NCAR: The Colloquia on Climate and Health. For this first event, our goals are somewhat wide-ranging and diffuse. We aim to present students from both arenas with a sampling of some critical issues in climate and health (including some of very immediate concerns such as West Nile virus and heat stress mortality), introductory material on the physics of the atmosphere, climate modeling, extreme weather and climate events, and an introduction to some statistical, technical and analytical techniques that are relevant to many sub-areas in this critical interdisciplinary field. We anticipate giving students from any one end of the problem appreciation for the other disciplines involved and plenty of time for interactions with the guest researchers in climatology, epidemiology, statistics, geography, remote sensing, and policy studies. We hope in the future to sharpen the focus of the colloquia, by exploring more narrowly defined topics in more depth that are of interest to students and researchers alike.

References

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