

**Analyzing Societal Responses to Climate Change
With Particular Reference to Health**

Social responses to climate change can occur at the individual, group, governmental, and transgovernmental levels. Recent theoretical developments in the understanding of globalization suggest that transnationalism, NGO's, and fluid geographical boundaries and understandings are necessary in comprehending societal responses to anything, and the same is true for responses to climate change. This is particularly the case since health effects of climate change may begin at the local level through altering local disease ecologies and infectious diseases transmission patterns, and extend to the global, as in one scenario, which may or may not come true, or redistribution of disease vectors and resulting vectorborne diseases.

Many of the scenarios that attempt to analyze the effects of climate change on health do not explicitly incorporate human and social activity and action into the analysis. In our NRC/Institute of Medicine report, Under the Weather, we came to realize that this was a major shortcoming of these scenarios. Yet the theoretical tools exist to be able to incorporate both social causes and social responses into our understanding. Classical disease ecology, for example, as articulated by Jacques May, considers the simultaneous effects of environment, culture, behavior, biology, and population in understanding disease patterns. The understanding that derives from this model thus incorporates the human element more explicitly than the classical epidemiologic triad of agent, host, and environment. What is lacking in May's work, however, is an explicit understanding of the political causes and consequences of disease. I have suggested in several articles that political ecology, which unites political economy with cultural ecology, is easily applicable to understanding infectious disease patterns. Thus, the unintended consequences of development projects such as the construction of large dams in West Africa have included increases in schistosomiasis and malaria transmission. The motivation for the construction of these projects have been both economic and political—economic in the sense that hydroelectric power was seen as being needed to drive specific industries, such as the aluminum industry in Ghana, and political in the sense that state and governmental power needed to be solidified. Thus, the indirect causes of increased disease prevalence have been just as much political, social, and economic as they have been biological.

This same model can be applied to understanding both the health consequences of, and causes of, global climate change. Insofar as there is a reasonable consensus that a major component of climate change has been driven by human activities, any health consequences are themselves, in part, the result of human activities. Some of these activities have been conducted to benefit specific "parties" at specific times and specific places, whereas other activities are the unconscious results of social evolution and individual decisions. In the short run and in the long run, some groups have indirectly benefited and others have indirectly "lost" in the complex chain that has led to global climate change. As such, redistribution of diseases, and increases in prevalence in some locations and decreases in other locations is not the result of seemingly impersonal biological forces alone, but are also the result of a complex set of human decisions and actions operating at numerous spatial and temporal scales.

Public health, in the broadest sense, serves as a buffer between people and the environment—it serves to decrease vulnerability, when it is working well, as a result of activities ranging from the modification of habitats and environments to the construction of dams for flood control (not traditionally seen as a public health activity) or the implementation of vaccine programs. This set of buffers is unequally distributed in the world. The buffer is broad and strong in developed countries and weak to nonexistent in developing countries. This is one way of interpreting vulnerability in the context of climate change-social response-health. The health consequences, at least in terms of infection, may be less significant in developed countries, as is implied in Under the Weather, than in developing countries, where the buffer is weak and the adaptive abilities of these societies to adverse circumstances are limited. This can be seen in the case of HIV/AIDS in Africa and increasingly in Asia.

Societies do not react passively to epidemics and to environmental change, but adapt in a number of ways. These may range from social reorganization to far simpler engineering measures such as construction of dykes and levies and environmentally appropriate housing. This has been well addressed in the natural hazards literature, which can easily be extended to the framework of climate change and health. Indeed, in the case of sea level rise, the effects of sea level rise on populated islands and on low-lying nations such as Bangladesh constitute classical cases of natural hazards. By considering the extensive natural hazards literature, a broad series of social responses to stress, such as that posed by climate change, can be understood.

References:

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Jonathan Mayer's Background:

Jonathan Mayer is Professor at the University of Washington in Geography, Medicine (Allergy and Infectious Diseases), Epidemiology, Family Medicine, and Health Services. He is also with the Center for Studies in Demography and Ecology at the University. He was a member of the joint NRC/IOM Committee on Climate, Ecosystems, Infectious Diseases, and Human Health, and is a member of the National Academy of Science's Committee on the Earth Sciences and Public Health and the NAS' Standing Committee on Geography, as well as the NIH panel on the Epidemiology of Clinical Disorders and Aging. His current research involves social and epidemiologic dimensions of HIV/AIDS in Ghana and Cameroon as well as environmental change and health. He is co-director of the University of Washington's undergraduate program in public health, and Director of the Department of Geography's Honors Program. Dr. Mayer is a medical geographer by background, and is also an elected member of the American College of Epidemiology.