

Book Review. Integration of Public Health with Adaptation to Climate Change – Lessons Learned and New Directions (edited by Kristie L. Ebi, Joel B. Smith and Ian Burton), 2005, 300pp, \$124.00, hardbound, Taylor & Francis, ISBN 90-5809-686-6.

Hurricane Katrina struck New Orleans and the rest of the U.S. Gulf Coast in 2005, killing over a thousand people and generating over a million evacuees. An intense heat wave in Europe in 2003 caused thousands of deaths as well as widespread forest fires. These and other climatic events have raised awareness of adverse impacts of climate on public health and heightened appreciation of the potential of a changing climate system to threaten public health.

Collaboration between the public health community and the climate change community has developed greatly over the past decade. Yet this collaboration is still rather new as a scientific endeavor and the concept of adapting to climate change has many dimensions. *Integration of Public Health with Adaptation to Climate Change – Lessons Learned and New Directions* brings together an excellent selection of contributors to share ideas on public health and climate change adaptation with a focus on two principal questions:

- How can public health practitioners and policy-makers take climate variability and change into account in strategies, policies and measures to reduce the potential added burden of disease?
- What lessons can be drawn from the long history of public health managing external environmental and other threats that can be applied to adaptation to climate variability and change?

A basic unifying concept is that the prerequisites for public health action are analogous to the determinants of adaptive capacity. The authors of each case study assign a value ranging from a low of 1 to a high of 5 for the factors that influence the problem discussed. The prerequisites for public health action are:

- Awareness that problem exists
- Sense that the problem matters
- Understanding of the causes
- Capability to deal with problem
- Political will to influence

The determinants of adaptive capacity are:

- Range of available technological options
- Availability and distribution of resources
- Structure of critical institutions
- Human capital
- Social capital
- Access to risk spreading
- Ability to manage information
- Public's perceived attribution

For example, two case studies on early warning systems provide a view of practical approaches for preventing exposure to climate-related hazards. An early warning system

comprises a method of prediction and a mode of response. The early warning system for mosquito-borne Ross River virus disease in Australia (ch. 6) aims to identify where and when transmission occurs in order to provide targeted information to populations at risk. The lead time for warning is on the scale of seasons. The context for the need is a growing opposition to the use of insecticides for mosquito control while current prevention education is too general to be very effective. The chapter on Ross River virus rates the range of available technological options at 3 and the awareness that the problem exists at 5. In contrast, a review of heat waves and urban warning systems (ch. 8) rates adaptive capacity for addressing heat-related deaths in the United States as 5 for the range of available technology options and only 4 for awareness that the problem exists. Interventions include opening of cooling (air-conditioned) centers and increased staffing in hospital emergency rooms. In this instance, the lead time for warning is on the scale of days. Although these scores are subjective, they provide an illustrative point of comparison.

Yet a call for action must be tempered by the difficulties in achieving effective interventions. One of the strengths of the book is using the lessons learned in the public health case studies to show how apparently simple solutions may fail for lack of adequate understanding and monitoring of the intervention. The case study on arsenic in drinking water in Bangladesh (ch. 5) is a good one to demonstrate the pitfalls that can arise in technological solutions to public health problems. The installation of tubewells in Bangladesh was motivated by the desire to reduce the burden of diarrheal disease with an alternative source of water that was cleaner than the surface water. The installation program started in the British colonial era and expanded over the years so that about 97% of the rural population relies on tubewells for drinking water. It is now common knowledge that arsenic, a carcinogen, contaminates the water in many of these tubewells and that millions of Bangladeshis have been exposed. What is less well recognized is that the tubewells were not as effective as planned in reducing diarrheal disease, the intended target. Water quantity can be more important than water quality in poor communities with high levels of fecal contamination in the water. Joint programs involving multiple factors and multiple sectors -- health, agriculture, water supply and sanitation -- should be part of interventions to prevent diarrheal disease.

Another strength of the book is explaining important uncertainties in the current understanding of the epidemiology of specific diseases. Two case studies -- one on campylobacteriosis and one on vector-borne disease -- provide good examples. Campylobacteriosis (ch. 4) is a gastrointestinal illness affecting humans that has spread rapidly in New Zealand over the past two decades. This illness is transmitted in food and water by the *Campylobacter jejuni* bacterium, which has a reservoir in domesticated animals, including poultry, sheep and cattle. It is not clear why New Zealand has much higher rates of this illness than do Australia, Canada, and England and Wales, which have similar sociocultural backgrounds. It is also not clear why the seasonal peak in incidence in New Zealand occurs in the summertime in contrast to the wintertime peak in the United States and Europe. The case study on the resurgence of vector-borne diseases (ch. 3) focuses on dengue and yellow fever, which are diseases caused by viruses transmitted by the same mosquito species. Nevertheless, the two diseases have different geographic distributions. The yellow fever virus has never been documented in Asia although dengue virus transmission is rampant in Asia. It is not well understood why yellow fever is absent from Asia but modern air travel certainly increases the opportunities for viruses to spread.

A perspective on the adoption of adaptation measures (ch. 12) draws lessons from approaches to lifestyle changes that did not succeed in the 1980s. It points out the

limitations of an emphasis on professional expertise that requires only passive cooperation from citizens. Even if the technical intervention is effective, public support fades when the danger justifying the intervention is no longer obvious. The problem becomes a political one that requires greater public involvement. A general conclusion is that multiple channels should be engaged in behavioral change. Patience and persistence are required. The four approaches to adoption are:

- Preventive medicine (patient follows physician's directives)
- Psychosocial (individual within web of relationships)
- Community health and participation (focus groups and stakeholders)
- Upstream determinants of health (societal inequalities)

A perspective on international public health policy (ch. 13) introduces explicitly the work of U.N. agencies in climate and health. The World Health Organization, the World Meteorological Organization and the United Nations Environment Program have formed the Inter-Agency Network on Climate and Human Health. This chapter underscores the importance of cross-sectoral collaborations and the need to engage the Global Environment Facility, established in 1991, which helps to support projects in developing countries related to climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants.

Despite (perhaps because of) its ambitious undertaking, the book leaves some loose ends with respect to decision-making. Weather extremes (such as heat waves), climate variability (such as seasonal variability), and climate change (change over longer time scales) are all lumped under the umbrella of climate change. It is stated that "increased understanding of the health impacts of current climate variability is likely to facilitate adaptation to future climatic conditions [p. 286]," but there are important differences in making decisions for different time scales. The phrase "win-win" describes interventions that can address current climate conditions as well as provide adaptation for climate change. However, the phrase "win-win" also draws attention away from the economic, social and political costs of interventions that are an important part of the decision-making context.

Most importantly, multisectoral interventions for sustainable development deserve a distinct focus. How do multiple sectors work together? Even simply sharing information has presented problems. How can interventions be effective and sustainable? How should education in these sectors be structured for collaboration? Echoing a question from the discussion on international public health policy, what needs to be changed incrementally and what needs to be done differently?

In sum, I recommend this book highly for learning about interventions to protect public health from the adverse effects of weather extremes, climate variability and climate change. It provides an informative summary of lessons learned as well as a conceptual base for future activities. It is a worthy addition to a climate and health library.

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