The advent of global environmental change, with all its uncertainties and requirement for long-term prediction, brings new challenges and tasks for scientists, the public and policy makers.

A major environmental upheaval such as climate change is likely to have significant health effects. Current mainstream epidemiological research methods, in general, do not adequately address the health impacts that arise within a context in which ecological and other biophysical processes display nonlinear and feedback-dependent relationships. The agenda of research and policy advice must be extended to include the larger-framed and longer-term environmental change issues. This book identifies the nature and scope of the problem, and explores the conceptual and methodological approaches to studying these relationships, modelling their future realization, providing estimates of health impacts and communicating the attendant uncertainties.

This timely volume will be of great interest to health scientists and graduate students concerned with the health effects of global environmental change.
Pim Martens holds degrees in Biological and Environmental Health Sciences from Maastricht University, The Netherlands. He worked within the project Global Dynamics and Sustainable Development, launched in 1992 by the Dutch National Institute of Public Health and the Environment (RIVM). After obtaining his PhD from the Department of Mathematics, Maastricht University, he worked as assistant professor at the same Department. Since 1998, Pim Martens has been a senior researcher at the University’s International Centre for Integrative Studies, where he directs the Global Assessment Centre. He is editor-in-chief of the international journal *Global Change and Human Health*. Furthermore, he was a member of the Assessment Study ‘Climate, Ecosystems, Infectious Disease, and Human Health’ (US National Research Council/National Academy of Sciences), and lead-author of several climate change and human health assessment reports of the Intergovernmental Panel on Climate Change (IPCC) and the World Health Organization (WHO). Pim Martens is a Fulbright New Century Scholar within the program ‘Challenges of Health in a Borderless World.’

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## Contents

**List of contributors**  
page vii

**Foreword**  
xi

**Robert T. Watson**

1 Global environmental changes: anticipating and assessing risks to health  
*Anthony J. McMichael & Pim Martens*  
1

2 Historical connections between climate, medical thought and human health  
*Ann G. Carmichael & Millicent Fleming Moran*  
18

3 The contribution of global environmental factors to ill-health  
*Kirk R. Smith & Manish A. Desai*  
52

4 Surprise, nonlinearity and complex behaviour  
*Tamara Awerbuch, Anthony E. Kiszewski & Richard Levins*  
96

5 Epidemiological and impacts assessment methods  
*Kristie L. Ebi & Jonathan A. Patz*  
120

6 Retrospective studies: analogue approaches to describing climate variability and health  
*R. Sari Kovats & Menno Bouma*  
144

7 Detecting the infectious disease consequences of climate change and extreme weather events  
*Paul R. Epstein*  
172

8 Integrated Assessment modelling of human health impacts  
*Pim Martens, Jan Rotmans & Dale S. Rothman*  
197
### Contents

9 Remote sensing, GIS and spatial statistics: powerful tools for landscape epidemiology  
*Louisa R. Beck, Uriel Kitron & Matthew R. Bobo*  
226

10 Monitoring the health impacts of global climate change  
*Diarmid H. Campbell-Lendrum, Paul Wilkinson, Katrin Kuhn, R. Sari Kovats, Andy Haines, Bettina Menne & Terry W. Parr*  
253

11 Epidemiology, environmental health and global change  
*Alistair Woodward*  
290

12 Dealing with scientific uncertainties  
*Tim O’Riordan & Anthony J. McMichael*  
311

Index  
334

*Colour plate section between pages 146 and 147*
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Over the past two decades there has been a rapid evolution of research concepts and methods in relation to global environmental changes – their processes, impacts and the response options. The scale and complexity of these environmental problems are, in general, greater than those that individual scientists or their disciplines usually address. This is particularly so for those components of the topic that are furthest “downstream” from the pressures, or their drivers, that initiate the processes of global environmental change.

Indeed, in seeking to detect or forecast the population health impacts of global environmental change there is an additional difficulty. Not only is the impact of research contingent on various assumptions, simplifications and projections made by scientists working “upstream” on the environmental change process per se, but the category of outcome – a change in the rate of disease or death – is one that usually has multiple contending explanations. If a glacier melts, then temperature increase is a very plausible explanation. Likewise, if birds, bees and buds exhibit their springtime behaviours a little earlier as background temperatures rise, that too is reasonably attributable to climatic change. However, if malaria ascends in the highlands of eastern Africa, regional climate change is just one contending explanation – along with changes in patterns of land use, population movement, increased urban poverty, a decline in the use of pesticides for mosquito control, or the rise of resistance to antimalarial drugs by the parasite.

There is also the problem of the time-frame. Much of the postulated health impact of global environmental change is likely to unfold over coming decades, as environmental stresses increase and life-support systems weaken. Yet, scientists generally prefer to work with empirical observations. Given that preference, and a well-honed body of scientific methods appropriate to empirical research, why try to use mathematical models to estimate how a change in global climatic conditions...
would affect patterns of infectious diseases, when the simple alternative is to sit back and wait for empirical evidence?

Well, that question is very much the nub of the issue. The world cannot afford to sit back and await the empirical evidence. The luxury of unhurried scientific curiosity must, here, be replaced by a more urgent attempt to estimate the dimensions of this problem – the health consequences of global environmental change – and then feed this information, with all its imperfections and assumptions, into the policy arena. Consideration of human health impacts is a crucial, even central, issue in the emerging international discourse on “sustainable development”.

This, then, is a timely volume. There is an indisputable need to clarify the concepts and research procedures, and to illustrate recent and current research activities in this domain. The ongoing spectrum of health impact research entails learning from the recent past, detecting emergent health impacts and modelling future impacts. It also requires the assessment of how changes in world futures (social, economic, technological, political) will modulate these impacts, and how populations can or are likely to adapt to the change in environmental conditions.

If anything, this volume is overdue. The recognition of global environmental changes has already been a major spur to scientific development and methodological advances in many other disciplines, especially those elucidating and modelling the processes of change themselves. Accordingly, for example, our ability to model the world’s climate system has increased many-fold over the past decade. In contrast, because of the abovementioned complexities that beset research into human health impacts, compounded by an apparent diffidence on the part of most epidemiologists and other population health scientists to engage in this unfamiliar domain, advances have been relatively slow to emerge in this disciplinary area. This volume will help to change that.

It is a well-rounded volume. The range of chapters includes attention to historical and social context, to differing conceptual domains of research, to questions about the assessment of population vulnerability, and to exploring and evaluating societal adaptation options. The challenge of scientific uncertainties is addressed – a challenge that looms large in research that deals with complex biophysical, ecological and social processes and which seeks to estimate future trajectories of population health risks.

Finally, this is an important volume because population health is so central to the formulation of humankind’s “sustainable development” trajectory. If the life-support systems are weakened, and health is jeopardized, then we are all on the wrong track. Health scientists therefore have a major role and responsibility
in informing this international discourse. The team of authors assembled in this
book has had impressive and wide-ranging experience in the pioneering stages of
this great scientific undertaking. Their shoulders should now be stood upon by
others.

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