Understanding Environmental Health
How We Live in the World

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In memory of

Benjamin L. Maxwell, Scott R. Maxwell, and Edward J. Murphy, whose experiences brought home the human cost of environmental illness.
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Preface

An introductory text like this one, which frames environmental health for a broad group of public health students, should leave its readers with a permanent awareness of environmental influences on health, as well as an appreciation of the societal roots of those influences. Further, it should prepare students who are not focusing in environmental health to engage the environmental health issues that will cross into their professional lives in other domains of public health.

Like many other schools of public health, the Boston University School of Public Health offers two introductory courses in environmental health. One is required of Master of Public Health (MPH) students who are concentrating in environmental health, and also of doctoral students in environmental health. A different course, which I have taught many times, introduces environmental health to MPH students concentrating in other areas—from social and behavioral sciences to biostatistics to health policy and management. These students are a mix of recent college graduates and experienced professionals. And, although the course is designed for MPH students, some undergraduates also seek it out. Thus students bring a wide range of professional and educational experiences to this beginning environmental health course. In particular—and this creates a challenge for both student and teacher—some students have done graduate work in science or medicine, while others have only modest backgrounds in college-level science.

Here are the distinctive features of this textbook. First, it is briefer than most introductory environmental health texts. It provides all essential information about environmental health for the MPH student and is designed to stand alone in an introductory course for students in concentrations other than environmental health. At the same time, the brevity of the book gives instructors flexibility to customize their course content by assigning additional readings if they wish to do so. Thus, with supplemental readings this book is appropriate for a unified introductory course in environmental health for MPH students in all concentrations, as offered in some schools and programs in public health. This brief book is also suitable as the environmental health text in a survey course in public health—and in a variety of interdisciplinary courses spanning other fields.
In light of the varied science backgrounds of public health students, this text’s treatment of science content is designed for readers who have different starting points yet need to end up with the same understanding of the subject matter. An early chapter presents the fundamental science and methods of environmental health, much of which may be unfamiliar even to students with strong science backgrounds. In the rest of the text, sidebars present small bites of general science information at the point where it is first needed to understand an environmental health issue. This format directly addresses the challenge of the varied science preparation of the students, allowing each reader to fill in along the way whatever gaps in background knowledge he or she may have.

The book’s organization also reflects its intended readership. Environmental health is a sprawling and diverse field, embracing many topics. Traditional topics in the field reflect professional specializations or regulatory domains; as a result, these topics are a mix of hazards (such as toxic chemicals or ionizing radiation), settings (such as occupational health), and environmental media (such as air or water pollution). For those outside the field—a core audience for this textbook—these categories do not easily add up to a coherent whole.

To provide that coherence, this text, more than most, tells a connected narrative, with chapters on the various things people do, as individuals or societies, that create environmental health hazards. After a brief introductory chapter and a substantial chapter on the science and methods of environmental health, there are chapters on the hazards of living with other species, including infectious disease; producing energy from fossil fuels, nuclear fuels, and alternative sources; producing manufactured goods, with the associated pollution; producing food through an industrialized agricultural system; and living in communities, from local to global. Traditional environmental health topics fit easily in this larger framework; as an aid to instructors, a table in the Appendix locates traditional topics within this book’s chapter structure. The book’s organization gives instructors considerable flexibility in allocating class time to chapters or chapter sections over the course of a semester.

Finally, this text offers a number of pedagogical features that serve both instructor and student. The writing style is direct and free of jargon, weaving together narration, explanation, and science. With the nontechnical reader in mind, the text makes explicit many assumptions and connections that are often left implicit, thus guiding the student through unfamiliar territory. Key terms serve as stepping-stones for the reader and appear in an extensive glossary of more than 500 items. Learning objectives and study questions are provided for each chapter, and supplemental materials for both instructor and student are available online. The text is enriched by photographs and supported by diagrams, graphs, and tables that summarize or explain important concepts and processes. One series of tables, building chapter by chapter, sets out the complex U.S. regulatory framework for environmental health.

I hope this book will leave students not only with a basic understanding of environmental influences on health, but also with an appreciation of the ways in which we all make the environment we live in.

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In writing this text, I have benefited greatly from the wisdom and generosity of my colleagues at the Boston University School of Public Health who reviewed draft chapters: Richard Clapp, ever my first reader and formerly a teacher of the introductory environmental health course; Wendy Heiger-Bernays, teacher of the more intensive survey course for students focusing in environmental health; Michael McClean, a committed teacher and insightful critic; and Roberta White, my department chair, who supported this endeavor in ways large and small. As graduate teaching assistants in the introductory environmental health course, Gregory Howard, Patricia Janulewicz, Jessica Nelson, and Megan Romano gave helpful feedback as we used this text in manuscript form. More recently, my colleague Madeleine Scammell has generously used the full manuscript in teaching the same course. Needless to say, any errors that remain are my own.

I thank the many students to whom I have taught environmental health, because they in turn taught me what this textbook should be like. And thanks are also due to Mike Brown, publisher for Jones & Bartlett, who had a long wait for my manuscript but didn’t give up; to the anonymous reviewers who provided feedback on the manuscript; and to the editorial staff who turned the manuscript into a book.

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