

# A Preview of Environmental Health

## Learning Objectives

After studying this chapter, the reader will be able to:

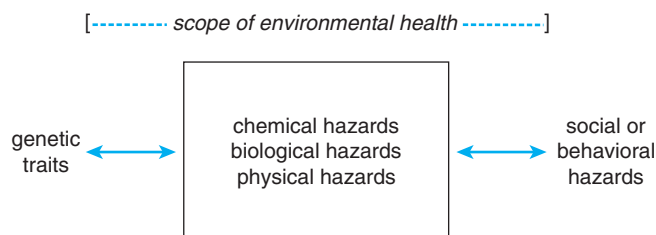
- Define or explain the key terms introduced throughout the chapter
- Describe the scope of environmental health as a field of research and practice
- Articulate key aspects of Western-style development and its impacts

The traditional concept of the “environment” is human-centered, with everything that surrounds us defined as the environment. Science, however, tells us that the **environment** is a complex system of living things and natural processes, and the human species just one player in this web—albeit a player with disproportionate impacts. The field of environmental health is firmly rooted in this scientific understanding of the world, recognizing that the human species creates hazards to the wellbeing of the natural environment. Still, as a branch of public health, the field’s core concern is the health of human populations, and its researchers and practitioners think mainly in terms of environmental hazards to human health.

As shown schematically in **Figure 1.1**, **hazards** that are chemical, biological, or physical in nature are at the core of environmental health as a field of study and practice. **Chemical hazards**—perhaps the most familiar environmental health threats—include industrial pollutants, pesticides, lead in paint, components of cigarette smoke, and a long list of other agents. **Biological hazards** (or **biohazards**) encompass the agents of infectious disease, but the category is much broader, ranging from molds that trigger allergic reactions all the way to genetically modified food plants. **Physical hazards** stem from contact with some form of energy. Radiation, noise, airborne dust particles, mechanical injury hazards, and extremes of heat and cold are all physical hazards. Thus, environmental health embraces much more than just industrial **pollution**.

However, as shown in Figure 1.1, the field does not extend to hazards associated with **genetic traits** per se. For example, health risks associated with the chromosomal defect that causes Down syndrome are not environmental health hazards. Still, interactions between genetic traits and environmental hazards, such as the effect of a woman’s genetic makeup on her breast cancer **risk** from exposure to man-made chemicals, fall firmly within the scope of environmental health. Further, many environmental hazards *cause* chromosomal damage, with a wide range of health effects.

At the other end of the continuum, the boundary is fuzzier, but purely **social or behavioral hazards** to health, such as poverty or drug use, are generally seen as outside the field of environmental health. Again, however, environmental health embraces the boundary zone. For example, an interaction between the physiological effects of a social stressor and the asthma risk from air pollution is within the scope of environmental health. And some hazards that are fundamentally social have environmental health impacts; for example, wars have exposed soldiers and civilians to pesticides and chemical weapons, to radiation from nuclear weapons, and to a host of infectious diseases.



**FIGURE 1.1** The scope of environmental health.

Finally, with the notable exceptions of infectious disease and naturally occurring radiation, the field of environmental health tends to focus more on man-made (**anthropogenic**) hazards than on natural hazards. For example, the science base for understanding natural disasters such as floods, windstorms, earthquakes, landslides, or tsunamis is generally seen as outside environmental health. On the other hand, such natural disasters often create environmental health hazards, such as the soup of industrial and sewage wastes that Hurricane Katrina left behind in low-lying New Orleans or, more recently, the radioactive pall over parts of Japan following the 2011 earthquake and tsunami there.

As an overview of environmental health hazards, this text is fundamentally about how we live in the world. After Chapter 2, “The Science and Methods of Environmental Health,” which ensures that readers from different backgrounds share some key concepts, this book is organized around the things we do, as individuals or societies, that create environmental health hazards or expose us to them. Chapter 3, “Living in the Natural World,” is about the hazards associated with being grounded in nature and surrounded by other species. Then, in the remaining chapters (4–7), the focus shifts from the natural setting to modern Western-style development.

By the standards of any earlier era, the residents of today’s more developed countries are simply awash in *stuff*—from appliances and electronic gadgets to household chemicals and plastic objects. The biologist and early environmentalist Barry Commoner once noted that in an **ecosystem**, nothing ever goes away,<sup>1</sup> and so society’s stuff, along with its byproducts, may move around or be transformed in the environment, but will not simply disappear. Thus, modern development, wherever it occurs around the world, brings burdens along with its benefits. Chapters 4 through 7 address these questions: Where does stuff come from? Where does stuff go? How do we make, use, and dispose of all our stuff? And how do all these activities affect human health? For example, when we use oil or uranium as fuel, it doesn’t disappear, but rather is transformed into energy and waste. Chapter 4, “Producing Energy,” describes the environmental health consequences of using fossil and nuclear fuels, as well as some alternatives to these energy sources. When we produce material goods and foods, we transform raw materials into products and more waste; Chapter 5, “Producing Manufactured Goods,” and Chapter 6, “Producing Food,” provide this environmental health context for our durable goods, consumer products, and food products. Finally, Chapter 7, “Living in the World We’ve Made,” considers the environmental health concerns of sharing the world we have created. This chapter ranges from local issues—in the communities where people consume food and water, use consumer goods, and produce waste in the form of sewage and trash—to global concerns about sharing the world’s resources, present and future.

In the 21st century, the underlying reality of environmental health—that our stuff and its byproducts may be transformed or moved around, but don’t disappear—is playing out in a changed context. We have begun to see clearly the effects of a general failure to exercise foresight at the societal level: that is, a tendency to make decisions about new products and technologies without much regard for the longer term or the bigger picture. At the same time, globalization is now a fact of life. The natural environment, of course, has always been globally connected, but our appreciation of the global scale of pollution and its impacts is more recent. Global trade and travel have become rapid and extensive, with profound implications for environmental health. With this global perspective, it has become clear that Western-style development is not sustainable; that is,

the earth simply cannot support the world's entire population in the lifestyle to which the more developed countries have become accustomed. This reality is reflected in the enormous disparities in environmental health burdens between more developed and less developed countries.

## Study Question

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As you begin your study of environmental health, note any environmental health problems that have been important in your own life or in areas where you have lived.

## Reference

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1. Commoner B. *Making Peace with the Planet*. New York, NY: Pantheon Press; 1990.