

# Health and the Environment

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## I. INTRODUCTION

Humans interact with the environment constantly. These interactions affect quality of life, years of healthy life lived, and health disparities. The World Health Organization (WHO) defines environment, as it relates to health, as “all the physical, chemical, and biological factors external to a person, and all the related behaviors.”<sup>1</sup> Environmental health consists of preventing or controlling disease, injury, and disability related to the interactions between people and their environment. The Healthy People 2020 Environmental Health objectives focus on 6 themes, each of which highlights an element of environmental health:

1. Outdoor air quality
2. Surface and ground water quality
3. Toxic substances and hazardous wastes
4. Homes and communities
5. Infrastructure and surveillance
6. Global environmental health

Creating health-promoting environments is complex and relies on continuing research to understand more fully the effects of exposure to environmental hazards on people's health.

## II. WHY IS ENVIRONMENTAL HEALTH IMPORTANT

Maintaining a healthy environment is central to increasing quality of life and years of healthy life. Globally, nearly 25 percent of all deaths and the total disease burden can be attributed to environmental factors.<sup>1</sup> Environmental factors are diverse and far reaching. They include:

- Exposure to hazardous substances in the air, water, soil, and food
- Natural and technological disasters
- Physical hazards
- Nutritional deficiencies
- The built environment

Poor environmental quality has its greatest impact on people whose health status is already at risk. Therefore, environmental health must address the societal and environmental factors that increase the likelihood of exposure and disease.

## III. UNDERSTANDING ENVIRONMENTAL HEALTH

The 6 themes of the Environmental Health topic area draw attention to elements of the environment and their linkages to health.

### A. *Outdoor Air Quality*

Poor air quality is linked to premature death, cancer, and long-term damage to respiratory and cardiovascular

systems. Progress has been made to reduce unhealthy air emissions, but, in 2008, approximately 127 million people lived in U.S. counties that exceeded national air quality standards.<sup>2</sup> Decreasing air pollution is an important step in creating a healthy environment.

### B. *Surface and Ground Water*

Surface and ground water quality applies to both drinking water and recreational waters. Contamination by infectious agents or chemicals can cause mild to severe illness. Protecting water sources and minimizing exposure to contaminated water sources are important parts of environmental health.

### C. *Toxic Substances and Hazardous Wastes*

The health effects of toxic substances and hazardous wastes are not yet fully understood. Research to better understand how these exposures may impact health is ongoing. Meanwhile, efforts to reduce exposures continue. Reducing exposure to toxic substances and hazardous wastes is fundamental to environmental health.

### D. *Homes and Communities*

People spend most of their time at home, work, or school. Some of these environments may expose people to:

- Indoor air pollution
- Inadequate heating and sanitation
- Structural problems
- Electrical and fire hazards
- Lead-based paint hazards

These hazards can impact health and safety. Maintaining healthy homes and communities is essential to environmental health.

### E. *Infrastructure and Surveillance*

Prevention of exposure to environmental hazards relies on many partners, including State and local health departments. Personnel, surveillance systems, and education are important resources for investigating and responding to disease, monitoring for hazards, and educating the public. Additional methods and greater capacity to measure and respond to environmental hazards are needed.

### F. *Global Environmental Health*

Water quality is an important global challenge. Diseases can be reduced by improving water quality and sanitation and increasing access to adequate water and sanitation facilities.

#### IV. EMERGING ISSUES IN ENVIRONMENTAL HEALTH

Environmental health is a dynamic and evolving field. While not all complex environmental issues can be predicted, some known emerging issues in the field include:

##### A. *Climate Change*

Climate change is projected to impact sea level, patterns of infectious disease, air quality, and the severity of natural disasters such as floods, droughts, and storms.<sup>3, 4</sup>

##### B. *Disaster Preparedness*

Preparedness for the environmental impact of natural disasters as well as disasters of human origin includes planning for human health needs and the impact on public infrastructure, such as water and roadways.<sup>5</sup>

##### C. *Nanotechnology*

The potential impact of nanotechnology is significant and offers possible improvements to:

- Disease prevention, detection, and treatment
- Electronics
- Clean energy
- Manufacturing
- Environmental risk assessment

However, nanotechnology may also present unintended health risks or changes to the environment.

##### D. *The Built Environment*

Features of the built environment appear to impact human health-influencing behaviors, physical activity patterns, social networks, and access to resources.<sup>6</sup>

##### E. *Exposure to Unknown Hazards*

Finally, every year, hundreds of new chemicals are introduced to the U.S. market. It is presumed that some of these chemicals may present new, unexpected challenges to human health, and, therefore, their safety should be evaluated prior to release.

These cross-cutting issues are not yet understood well enough to inform the development of systems for measuring and tracking their impact. Further exploration is warranted. The environmental health landscape will continue to evolve and may present opportunities for additional research, analysis, and monitoring.

##### F. *Blood Lead Levels*

The number of children with elevated blood lead levels in the U.S. is steadily decreasing. As a result, determining stable national prevalence estimates and changes in estimated prevalence over time using NHANES is increasingly difficult. Eliminating elevated blood lead levels in children remains a goal of utmost importance to public health. The sample sizes available with the currently structured NHANES are too small to produce statistically reliable estimates and preclude the ability to have a viable

target for HP2020 (see Objective 8.1). Efforts must and will continue to reduce blood lead levels and to monitor the prevalence of children with elevated blood lead levels.

Environmental health risks are factors outside of the body that can affect a person's wellbeing and influence their behaviour. Examples include the quality of a person's air, food and water supply or their exposure to hazardous materials. Preventing or reducing the risk of illness, injury or disease in the community is essential to good environmental health.

#### V. EXAMPLES OF ENVIRONMENTAL HEALTH RISKS

Environmental health covers many different factors in a person's surroundings. These can include:

**Air pollution** – for example, smog, wood smoke and mould.

**Water quality** – for example, grey water, tank water, fluoridation and drought.

**Food quality** – for example, contamination and nutrition.

**Chemicals** – for example, pesticides, farm chemicals, arsenic and CCA treated timber.

**Metals** – for example, exposure to lead, mercury and cadmium.

**Diseases from animals and insects (vector borne)** – for example, dengue fever, hendra virus, lyssavirus, Ross River fever and malaria.

**Infectious diseases** – for example, viral infections like swine flu.

**Natural hazards** – for example, solar radiation and extreme weather events.

**Man-made structures** – for example, exposure to asbestos or electromagnetic radiation sources like mobile phones.

**Occupational health** – for example, safety issues relating to the workplace such as noise pollution and hazardous waste.

**Climate change** – for example, higher sea levels, increased soil salinity and increased temperatures.

#### VI. REFERENCES

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