

## Free Executive Summary

### **Toward Environmental Justice: Research, Education, and Health Policy Needs**

Committee on Environmental Justice, Institute of  
Medicine

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*Driven by community-based organizations and supported by a growing body of literature, the environmental justice movement contends that poor and minority populations are burdened with more than their share of toxic waste, pesticide runoff, and other hazardous byproducts of our modern economic life. Is environmental degradation worse in poor and minority communities? Do these communities suffer more adverse health effects as a result? The committee addresses these questions and explores how current fragmentation in health policy could be replaced with greater coordination among federal, state, and local parties. The book is highlighted with case studies from five locations where the committee traveled to hear citizen and researcher testimony. It offers detailed examinations in these areas: Identifying environmental hazards and assessing risk for populations of varying ethnic, social, and economic backgrounds, and the need for methodologies that uniquely suit the populations at risk. Identifying basic, clinical, and occupational research needs and meeting challenges to research on minorities. Expanding environmental education from an ecological focus to a public health focus for all levels of health professionals. Legal and ethical aspects of environmental health issues. The book makes recommendations to decisionmakers in the areas of public health, research, and education of health professionals and outlines health policy considerations.*

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## Introduction and Executive Summary

*Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.*

*President William Jefferson Clinton, 1994*

As an industrialized nation, the United States produces a broad range of goods and technologies that make modern life more convenient and more efficient. The same processes that generate the nation's power, manufacture its goods, and provide its transportation, however, also produce by-products that can pollute the environment and that can be hazardous to human health. The amelioration of environmental degradation in general, as well as environmental health hazards in particular, has been a prominent national concern for at least three decades. Within the last several years, an increasingly vocal concern has also been expressed: that the broad array of environmental burdens and hazards are being borne disproportionately by lower-income communities and by racial and ethnic minorities. Efforts to address this concern have been given the label *environmental justice*.

### CONCEPTS AND DEFINITIONS

As defined by the Environmental Protection Agency (EPA), *environmental justice* is

the fair treatment and meaningful involvement of all people regardless of race, ethnicity, income, national origin or educational level with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate burden of the negative human health or environmental impacts of pollution or other environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies. (Environmental Protection Agency, 1998, p. 2)

Environmental justice is a concept that addresses in a cross-cutting and integrative manner the physical and social health issues related to the distribution of environmental benefits and burdens among populations, particularly in degraded and hazardous physical environments occupied by minority or disadvantaged populations.

The definition of *health* adopted by the committee is that of the Constitution of the World Health Organization (1986), which defines health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Although the health of the individual is important, much of the attention in this report focuses on what is referred to as *communities of concern*. Communities in this sense consist of groups of individuals who live, and often work, in specific neighborhoods or regions. In this report, the phrase communities of concern refers to communities that have or that are suspected of having disproportionately high levels of exposure to environmental stressors. The committee uses the term *stressors* to describe a broad range of factors that can influence human health, such as chemicals, biologics, allergens, and traditional toxicants, but it also includes light, noise, odors, and particulate matter, among others. The populations of communities of concern may also be characterized as having limited access to health care and education, being politically disenfranchised, being of low socioeconomic status, and belonging to a racial or ethnic minority group. A focus on the health of communities involves a public health perspective, defined in a 1988 report by the Institute of Medicine's (IOM's) Committee on the Future of Public Health as "organized community efforts aimed at the prevention of disease and promotion of health" (Institute of Medicine, 1988a, p. 41).

The committee defined the *environment* to include all places where people live, work, and play. This definition highlights the often-overlooked relationship between environmental and occupational health. *Environmental health*, as defined by a previous IOM report (Institute of Medicine, 1995b), is "freedom from illness or injury related to exposure to toxic agents and other environmental conditions that are potentially detrimental to human health" (p. 15). Occupational health and safety focus on the environmental conditions in the workplace. Given that low-income and minority workers in the United States are disproportionately employed in occupations with higher levels of exposure to health hazards (Frumkin and Walker, 1997) and that work-related illnesses occur in these groups at disproportionately higher rates, the relationship between environmental or occupational health and environmental justice becomes highly pertinent. Finally, the committee adopts the definition of *environmental medicine* as "diagnosing and caring for people exposed to ... hazards in their homes, communities, and workplaces" (Institute of Medicine, 1995a, p. 8).

## THE COMMITTEE'S ORIGIN AND TASK

The origin of this report lies in a series of federal efforts and activities that were designed to identify and address various issues related to environmental justice.\* The first of these efforts was in 1990 at the National Minority Health Conference: Focus on Environmental Contamination. The conference, sponsored by the Agency for Toxic Substances and Disease Registry, was the first attempt by a federal agency to bring together a group of scientists who had evaluated various aspects of environmental justice from different perspectives. Since then, focused interest and coverage of environmental justice issues have accelerated with reports from EPA, congressional hearings, and reports by the U.S. General Accounting Office. In general, these activities highlight evidence that the effects of environmental health hazards are borne disproportionately by disadvantaged communities, including those who are poor, have limited education, and are either unemployed or work under hazardous conditions. Inadequate access to health care and a greater burden of disease compound whatever adverse health effects might be associated with such hazards.

The concept and goal of environmental justice gained wider recognition in February 1994, when President William Clinton signed Executive Order 12898 entitled Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (see Appendix D). This executive order called for each federal agency to develop programs and strategies to ensure that poor and minority communities no longer suffer from discriminatory environmental regulations or disparate environmental health effects. The signing of the executive order coincided with the Symposium on Health Research and Needs to Ensure Environmental Justice, sponsored by the National Institute of Environmental Health Sciences in conjunction with the Agency for Toxic Substances and Disease Registry and several other federal agencies. Ultimately, the proceedings of that symposium led to a request that IOM produce a report with recommendations on the research, clinical, and educational needs required to achieve environmental justice (National Institute of Environmental Health Sciences, 1994).

### The Committee's Task

In response to Executive Order 12898 and the proceedings of the 1994 symposium, the National Institute of Environmental Health Sciences—as the lead agency for a consortium of other institutes of the National Institutes of Health and agencies including the Centers for Disease Control and Prevention,

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\* It should be noted that federal efforts followed others such as those of the United Church of Christ, the National Academy of Sciences. All rights reserved.

the U.S. Department of Energy, and EPA—asked IOM to conduct a study that would provide an independent assessment of three general issues:

1. the specific medical and health issues that are raised by the concept of environmental justice and that require attention, for example, medical education, clinical practice and research, medical surveillance, and public health;
2. the suitable roles of basic research and medicine in addressing these issues; and
3. the appropriate priorities for medical research that would facilitate improvements in the current situation.

More specifically, IOM was asked to address the following:

- *Characterization of the medical issues related to environmental health and justice.* This would include a multiethnic focus with an emphasis on socioeconomic status, the diversity of potential environmental and occupational health hazards and conditions, and an assessment and evaluation of current health surveillance systems.
- *Cost-benefit and risk-benefit analyses of environmental health and justice issues.* For this aspect of the project, case studies or proposals for study methods could be reviewed to evaluate the different types of analyses with an accent on producing new research approaches and strategies.
- *Role of emerging scientific research.* An assessment of the status and development of biomarkers of susceptibility, exposure, and effect as they pertain to characterization of the health effects associated with environmental hazards. A target could be the development of new molecular biology-based technologies and tools. Ethical and legal issues related to clinical research would also be considered, as would epidemiologic research strategies.
- *Opportunities for collaborative approaches leading to disease prevention.* This would include some specific recommendations for implementation, including strategies for optimizing the conduct of basic and applied research. Collaborative interagency regulatory strategies would also be a focus of attention here.

Thus, in general, the committee's task was to assess the potential adverse human health effects caused by environmental hazards in communities of concern and to recommend how they should be addressed in terms of public health, biomedical research, education, and health policy perspectives. This report attempts to balance scientific opportunities with public needs and emphasizes the scientific approach in balance with the recognition that the community must play an increasingly active role in decisions about research and public health interventions. The committee felt that environmental justice issues do not lend themselves well to cost-benefit analyses and therefore approaching these issue from that perspective would not be helpful at this time. Environmental health sciences research can contribute to environmental justice most effectively by

identifying hazards to human health, evaluating the adverse health effects, and developing interventions to reduce or prevent risks for all members of society. Environmental justice research bears a special relationship to the communities being studied, requiring unusual degrees of collaboration if it is to be scientifically valid as well as policy relevant and if the findings are to be effectively implemented.

### **The Data and Site Visits**

The published literature on environmental justice and the related health effects is not abundant. Indeed, very little environmental and occupational medicine research specifically includes data for communities of concern and poor or minority workers. Adequate data are not available in most instances to examine the relationships among the environmental, racial, ethnic, and other socioeconomic determinants of adverse health outcomes. More research is needed to clarify these relationships. Still, there is a fair amount of published literature on the siting of toxic waste facilities, and workplace injuries, exposures, and fatalities are the best-documented environmental effects on health. Despite the inadequacy of the information to date, it seems clear that inequities related to environmental and occupational hazards do exist.

To explore these issues in greater depth beyond what could be learned from the literature, the committee visited a number of low-income and minority communities with known environmental problems and also heard presentations from stakeholders, citizens, and other concerned parties. During these visits, committee members participated in dialogues with the residents of communities in which known putative environmental hazards existed and environmental justice issues were at the forefront. When possible, the committee also heard from local, state, and federal officials, as well as industry representatives. In each instance, the committee met with local grassroots leaders, visited the neighborhoods of people affected by environmental concerns, and heard firsthand the myriad interrelated concerns.

Some of the communities visited were highly industrialized and located in close proximity to major urban centers (Chicago and New Orleans). Other communities were located near industrialized facilities without an urban infrastructure (Nogales, Arizona) but with similar concerns about exposure. Some were in agricultural communities in which the exposures of concern were agricultural chemicals (El Paso, Texas), and some were in regions with past major federal activities (Hanford, Washington). The committee recognizes that the issues and areas of concern of the communities visited are only samples but believes that these experiences provided insightful examples that helped to shape and frame the deliberations and, ultimately, the conclusions and recommendations.

## CONCLUSIONS AND RECOMMENDATIONS

On the basis of a review of the available scientific literature and the information obtained from the various site visits, the committee concludes that there are identifiable communities of concern that experience a certain type of double jeopardy in the sense that they (1) experience higher levels of exposure to environmental stressors in terms of both frequency and magnitude and (2) are less able to deal with these hazards as a result of limited knowledge of exposures and disenfranchisement from the political process. Moreover, factors directly related to their socioeconomic status, such as poor nutrition and stress, can make people in these communities more susceptible to the adverse health effects of these environmental hazards and less able to manage them by obtaining adequate health care.

The committee perceived that the minority and low-income communities that it chose to visit have had disproportionately higher levels of exposure to environmental stressors compared with those for the general population. Furthermore, the committee found that those with impoverished social, economic, and political support were also least able to effect change and create solutions for the broad range of problems that they experience. During the site visits, the committee members were told by those whom they met of the many social, economic, and geographic barriers that can separate vulnerable and minority or low-income citizens from healthy environments and adequate health care.

As a result of its deliberations, the committee formulated four overarching recommendations related to public health research, education, and health policy. Strategies for implementing the recommendations are contained in the body of the full report. Together, these constitute a framework for further action.

### Research

The committee believes that a public health approach should be the central means of dealing with the environmental health problems in disadvantaged communities. Conventional epidemiology will encounter difficulties, however, because of shortcomings in existing databases, the small populations typically involved, and cultural differences of researchers with residents of the communities of concern. Public health efforts should use new and appropriately creative methods for data collection and analysis and ensure community involvement throughout the process.

***Recommendation 1. A coordinated effort among federal, state, and local public health agencies is needed to improve the collection and coordination of environmental health information and to better link it to specific populations and communities of concern.***

Public health research related to environmental justice is a legitimate and valuable endeavor and is important to the communities of concern and to national

goals for improving the health of the U.S. population. To adequately address the concerns raised by environmental justice, several gaps in the current research base must be filled. These include a better understanding of the exposures to environmental hazards and susceptibilities to disease on the part of low-income and minority populations, as well as better documentation of the links between exposure and disease. Communities must participate in the identification of problems needing research and in the design and implementation of research. To address all of these needs, the committee identified three principles to help guide biomedical, environmental health sciences, and other research related to environmental justice, and makes the following overarching recommendation.

**Recommendation 2. Public health research related to environmental justice should engender three principles: improve the science base, involve the affected populations, and communicate the findings to all stakeholders (see Box 1-1).**

### Education

Among health care providers and other health care professionals, residents of communities of concern, and basic environmental health researchers, there is a lack of knowledge about the specific environmental hazards for particular populations. At present, enhanced efforts in the training of health professionals and education of the public are needed. A collaborative community response to environmental risks will help detect, limit, and prevent environmental insults and their harmful health effects. Such a community response requires that health care professionals be able to diagnose diseases with environmental etiologies and distinguish between environmental and other etiologies, that the public be able to understand these risks to the health of the community, and that governmental and industrial leaders use the strengths of the community while being

#### BOX 1-1 THREE PRINCIPLES FOR PUBLIC HEALTH RESEARCH TO ADDRESS ENVIRONMENTAL JUSTICE ISSUES

- 1. Improve the science base.** More research is needed to identify and verify environmental etiologies of disease and to develop and validate improved research methods.
- 2. Involve the affected populations.** Citizens from the affected population in communities of concern should be actively recruited to participate in the design and execution of research.
- 3. Communicate the findings to all stakeholders.** Researchers should have open, two-way communication with communities of concern regarding the conduct and results of their research activities.

responsive to their needs. Educational programs that will more effectively link all parts of the community and that will build a coherent network to meet the public's needs should be enhanced or created. Thus, the committee's overarching recommendation for education is as follows.

***Recommendation 3.* The committee recommends that environmental justice in general and specific environmental hazards in particular be the focus of educational efforts to improve the understanding of these issues among community residents and health professionals, including medical, nursing, and public health practitioners. This would include the following:**

- **enhancing health professionals' knowledge of environmental health and justice issues,**
- **increasing the number of health professionals specializing in environmental and occupational medicine, and**
- **improving the awareness and understanding of these issues by the general public.**

### Health Policy

Good risk management decisions are based on a careful analysis of the weight of scientific evidence that supports conclusions about a problem's potential risks to human health and the environment. However, decisionmakers must balance the value of obtaining additional information against the need for making a decision with imperfect or incomplete information. Acting prematurely may needlessly end an activity or close a facility that is doing no real harm (and may be improving the local economy through taxes and jobs); it may also needlessly stigmatize a community as contaminated, which may discourage alternative future development. On the other hand, acting too slowly may expose citizens to irreversible damage from actual risks whose existence might never be proven, given the limits of scientific methods. The relative importance of the risks of acting too soon or waiting too long is a political determination. The task of researchers is to provide the best possible estimates of the long-term effects of different policies. To that end, environmental justice needs better, more policy-relevant, and better-understood science.

The committee concludes that concerns about environmental health and justice are legitimate and should be taken seriously, even if the means of addressing these concerns are still lacking in some respects the rigorous science base to which policymakers might normally aspire. Policymakers cannot assume that these concerns are without merit. However, policymakers should also recognize that many other considerations also go into such decisions as choosing a site for a new manufacturing plant or solid-waste facility, removing an alleged hazard, or imposing expensive environmental controls. Choices and trade-offs

will almost always need to be made when making any decision of significant consequence. Given the current state of knowledge, the committee believes that policymakers should be attentive to potential environmental hazards and adverse health outcomes and should be meticulous about including the affected communities in the decisionmaking process.

***Recommendation 4. In instances in which the science is incomplete with respect to environmental health and justice issues, the committee urges policymakers to exercise caution on behalf of the affected communities, particularly those that have the least access to medical, political, and economic resources, taking reasonable precautions to safeguard against or minimize adverse health outcomes.***

Much remains to be learned about environmental health and justice. Great strides need to be made in terms of data collection, research, and education before society can ensure environmental justice in its broadest sense. Until then, environmental justice needs to become a higher priority in the fields of public health, research, education, and health policy. As increasing numbers of laypeople, health professionals, and policymakers become aware of the issues and become cognizant of the problems, communities will be assisted in striving toward environmental justice.

## ORGANIZATION OF THE REPORT

The remainder of this report describes what the committee discovered as a result of its site visits and other data collection activities. Chapter 2 describes the evidence for the contention that exposures to environmental hazards and subsequent adverse health outcomes are borne disproportionately by communities of concern. Chapter 3 (Research) describes the application of the public health perspective to environmental justice and defines the integral roles that public health efforts and the public health community play in addressing environmental hazards. The chapter also addresses research questions and their context in environmental justice, concluding with recommendations for research and research methods. Chapter 4 (Education) focuses on the need for education and strategies that can be used to educate various sectors of the population regarding environmental risks, the prevention of disease, and the care and treatment of those exposed. It concludes with recommendations directed to the public at large and the public education system as well as to physicians and other health professionals. Chapter 5 (Health Policy) addresses the limits of science and the effects of those limitations on policy decisions. It concludes with a discussion of the need to make policy decisions without conclusive data.

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# Toward Environmental Justice

**Research, Education, and Health Policy Needs**

Committee on Environmental Justice  
Health Sciences Policy Program  
Health Sciences Section  
INSTITUTE OF MEDICINE



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\* Served from May 1990 to August 1996.

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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the National Research Council's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the Institute of Medicine in making the published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. The committee wishes to thank the following individuals for their participation in the review of this report:

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While the individuals listed above have provided constructive comments and suggestions, it must be emphasized that responsibility for the final content of this report rests entirely with the authoring committee and the Institute of Medicine.

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## Preface

The subject of environmental justice elicits strong emotion from many parties. Neither the serious health concerns nor the charges of biased or unfair policies that are implicit in the subject can be taken lightly. More importantly, however, the communities of concern, such as those that the committee saw firsthand, carry burdens beyond poor health. They carry the burden of frustration and feelings of helplessness and betrayal. For these reasons, environmental justice differs from most other areas of research and study. The committee therefore felt that it was important to approach our task by different methods. The clearest example of this is that the committee visited a number of communities with a variety of types of exposures and potential health effects with various political, social, and regulatory histories. These interactions allowed committee members to hear firsthand the myriad interrelated concerns and to witness the residents' feelings toward systems that the residents felt did not recognize or respond to their environmental health needs.

This study by our committee was requested because of the evidence that some sectors of U.S. society bear a disproportionate share of environmental exposure and harm: more than is borne by other sectors of society and more than can be justified by any benefits that they receive from the sources of this harm. A reasonable corollary is that the concerns of these sectors are underrepresented in environmental science. Were their concerns more central to the scientific enterprise, it would have "discovered" environmental justice much earlier than has been the case.

The committee came to several important conclusions. First, it is the committee's heart-felt belief that all communities in the United States should live in environments supportive of health and that differential exposures to environmental stressors should be eradicated. Some communities exposed to higher levels of environmental stressors include minority and economically disadvantaged

populations. Because the populations of these communities are small and because they also have other complex disease risks, it is frequently difficult to separate exposures to environmental stressors from other disease or health risks. For these reasons, the committee calls upon federal, state, and local regulatory authorities to work with public health agencies to ensure that no communities within their jurisdictions suffer from disproportionate exposures to any environmental stressor.

The committee's second conclusion is that environmental justice research has constituent constraints and goals. First, environmental justice research is based on solving specific problems, and therefore, the results of the research are inherently tied to the community of concern. Second, the results may need to be translated into public policy even if they are incomplete or inconclusive. The communities of concern in the context of environmental justice typically have many social, behavioral, and economic risk factors for disease as well as complex environmental stressors. This makes the identification of the causation—or determination of the etiology—of the adverse health status typically experienced by these communities difficult. However, the committee believes that a concerted effort is needed to identify approaches that can improve the ability to define causation in this context, including the increased validation and use of biological markers, the development of enhanced biostatistical and epidemiological approaches, and the provision of appropriate funding for investigators and communities that participate in this research.

The third conclusion is that the public health, medical, and policy communities—as well as the citizens of the nation—need to be given an opportunity to understand what is and what is not known about the potential for adverse health effects resulting from exposures to environmental stressors. For this reason, the committee recommends a set of educational goals that are aimed at health professionals and policy communities and that can be extended to the general public.

Addressing the environmental justice-related issues discussed above could require a substantial reorganization and reorientation of the research enterprise. It means facing core issues in how research is funded and managed. In the short run, this could mean disrupting processes that are already quite arduous. Scientists and administrators work hard to develop and implement projects within the existing constraints of lobbying the U.S. Congress, submitting proposals, executing studies, mentoring students, weathering peer review, and so on. In the longer run, though, confronting the issues raised by environmental justice can strengthen the scientific enterprise. In an era of fiscal constraint, it can focus thinking about who are the ultimate "clients" for federal research and how their political support can be secured. It may even generate a new and vocal constituency. For projects that require observations within affected communities, a cooperative relationship might be needed for research to be conducted at all. Moreover, the science itself may benefit from consideration of the social context within which it is conducted. That exercise can provide insight into unwitting assumptions that scientists might not otherwise recognize. It can provide the

impetus for the interdisciplinary collaboration that must be a part of effective solutions to complex environmental problems.

Environmental justice issues and concerns typically involve several types of agencies with different research and regulatory mandates. The committee heard repeatedly from participants at the site visits about the difficulties associated with the fact that there is no well-identified point of contact in the various agencies responsible for responding to their concerns. A single federal agency or coordinating committee with better authority and responsibility across all administrative barriers should be assigned to those communities where environmental justice is a concern. An excellent example of how this could work is the consortia of agencies that have supported this study. The National Institute of Environmental Health Sciences, in taking the lead with other federal agencies (the Centers for Disease Control and Prevention, the Environmental Protection Agency, and the U.S. Department of Energy), has provided a useful approach toward a research policy request. Such an approach could provide a clearinghouse and communication channel between federal agencies and state and local entities.

Much remains to be learned about environmental health and environmental justice. Great strides need to be taken in terms of the interrelated topics of research and education before society can ensure environmental justice in its broadest sense. Until then, environmental justice needs to become a higher priority in the fields of public health, research, education, and health policy. More importantly, these areas need to be approached systematically so that research directly affects policy to improve public health and education and that policy, together with public health, identifies needs that can be addressed by research. As increasing numbers of laypeople, health care professionals, and policymakers become aware of the issues and become cognizant of the problems, communities can be assisted in striving toward environmental justice.

James R. Gavin III

Donald R. Mattison

*Cochairs*

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# **Toward Environmental Justice**

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