

Children's Environmental Health Research— An Introduction

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Research is one of the cornerstones of environmental health, providing the foundation for sound public policy and for appropriate education of communities and professionals in a myriad of disciplines. Until very recently, little research in environmental health focused on exposure patterns and health outcomes for children. Pediatric medicine shows that children are not just little adults; they are uniquely vulnerable.

This monograph contains 12 papers originally presented at the national research conference entitled Children's Environmental Health: Research, Practice, Prevention, and Policy, developed by the Children's Environmental Health Network and held in Washington, DC, on 21–23 February 1997. At the meeting, more than 200 of the nation's experts on pediatric environmental health outlined an ambitious research agenda aimed at protecting the nation's children from environmental health risks.

Thirty-nine papers on children's environmental health issues from a 1994 conference also sponsored by the Children's Environmental Health Network were published in *Environmental Health Perspectives* (1). This current monograph represents progression in children's environmental health research.

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The Children's Environmental Health Network is a national multidisciplinary project whose mission is to promote a healthy environment and protect the fetus and the child from environmental hazards. The Network concentrates its efforts in the areas of education, research, and policy, and can be reached at: 5900 Hollis Street, Suite E, Emeryville, CA 94608, and at <http://www.cehn.org>

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In addition to the research issues posed in this volume, the outstanding overarching questions before the research, environment, and health communities include: How do we infuse pediatric research with an environmental perspective? How do we infuse environmental research with a pediatric perspective? As both pediatric and environmental research becomes more interdisciplinary, how do we develop the next generation of scientists who can move between these worlds?

As a result of conferences and research that grapples with these issues, an increasing focus on children's environmental health research has brought increased federal resources. This is a step in the right direction, but the resources must be accompanied by a commitment to introducing a child health perspective across disciplines, providing training opportunities, fellowships, and multidisciplinary forums, and ongoing support.

Synopsis of Children's Environmental Health: Research, Practice, Prevention, and Policy Conference

The 3-day agenda for the Children's Environmental Health: Research, Practice, Prevention, and Policy conference included current research in four priority areas: asthma and respiratory diseases, endocrine disruption, childhood cancers, and nervous system and developmental effects.

A fifth plenary session, entitled Cross-Cutting Issues, incorporated new approaches to research, including developmentally based exposures, genetic susceptibility, and childhood-based biomarkers.

Each plenary session featured prominent scientists from basic, clinical, epidemiologic, and community research who collectively provided a thorough and interdisciplinary picture of each topic area. Current research and emerging research questions formed the basis of discussion. Reflecting the understanding

that science and research exist in a larger societal context, policy and environmental justice leaders contributed crucial considerations to the pediatric environmental health research picture.

The goals of this conference were to:

- Provide a national forum for the presentation and discussion of current research on children's health and the environment
- Stimulate new research in the field of pediatric environmental health
- Stimulate the funding of new research
- Provide opportunities for policymakers to become better informed about pediatric environmental health issues
- Further elevate the issue of children's health and the environment on the federal and national agenda

Research Needs and Recommendations: Charting a Course toward Prevention

Research that identifies patterns of environmental diseases in children, assesses children's exposures to environmental toxicants, determines developmental periods of vulnerability, and quantifies dose-response relationships will bring us closer to prevention-oriented interventions. The conference outlined some of the larger research issues that must be addressed to improve our understanding of the relationship between environmental exposures and health outcomes in children. These issues include:

- Studying developmental processes and identifying critical periods of vulnerability
- Studying environmental exposures in early life and their relationship to the risk of adult disease and to transgenerational effects
- Debating vigorously the ethical and social issues associated with the use of genetic and biomarker information
- Including communities in research agreements that incorporate respect, equity, and empowerment

Key Points

Environmental degradation leads to disease. Children are uniquely vulnerable to environmental toxicants because of their greater relative exposure, less developed metabolism, and higher rates of cell production, growth, and change. The

environmental insults of childhood may manifest themselves over a lifetime of growth to adulthood and senescence. In addition to physiologic vulnerabilities, children may have great social vulnerabilities as well. Poverty, malnutrition, and environmental injustice are our collective responsibility. We must develop policies to create safety, opportunity, and sustainability, and we must carry into the next century a child-focused vision and value system.

Trends

There is currently, and shall be in the future, more research that involves communities in a relationship of respect, equity, and empowerment. Researchers will also design relevant studies by looking through a child-development lens. There must be more research that looks for surprises: research that diverges from the current model of risk assessment, which looks for potential effects from dosing animals at the equivalent human age of 15 years and

sacrificing them at the human age equivalent of 50 years. Instead, there must be dosing at all stages of development, combined with efforts to consider outcomes over a full life and multiple generations.

The conference also produced specific research recommendations for each topic addressed in the plenary sessions. These recommendations are outlined in more detail in Landrigan et al. (2). A complete conference report is available on the Internet (3).

REFERENCES AND NOTES

1. Preventing Child Exposures to Environmental Hazards: Research and Policy Issues. *Environ Health Perspect* 103 (Suppl 6):3-205 (1995).
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3. Children's Environmental Health Network. Conference Report: Children's Environmental Health: Research, Practice, Prevention, and Policy, 21-23 February 1997, Washington, DC. Emeryville, CA:Children's Environmental Health Network, 1997. [Online] <http://www.cehn.org/Resconfreport.html>