INTRODUCTION

Preventing Child Exposures to Environmental Hazards: Research and Policy Issues

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— Environ Health Perspect 103(Suppl 6):3–5 (1995)

This monograph contains 39 papers presented at the Symposium on Preventing Child Exposures to Environmental Hazards: Research and Policy Issues held March 1994. This national invitational meeting brought together 200 researchers, clinicians, policymakers, and community advocates to develop recommendations for action for the federal government and the research community. It was the first time that policy and research issues concerning child exposures were discussed by multidisciplinary experts at the national level.

The purpose of the symposium was to:

• Develop a set of recommendations for federal agencies, the research community, and community-based organizations that incorporate a multidisciplinary and multicultural perspective;

• Increase communication between the research, policy, clinical practice, and advocacy arenas by building a national network of organizations and individuals who are dedicated to issues of pediatric environmental health; and

• Define the field of pediatric environmental health through the commission and presentation of papers that identify and explore cutting-edge research and policy issues.

Four plenaries formed a framework for discussion. The plenary topics covered children’s unique vulnerabilities to environmental exposures, environmental justice for children, the federal government’s agenda for protecting children from exposures, and successful community models for participatory research. Thirteen workshops were held during the 2-day meeting and included topics such as Age-Specific Carcinogenesis: Radiation and Genetics; Asthma Among Children—Does Air Pollution Play a Role?; Neurotoxicology—The Role of the Environment in Injuries to the Developing Nervous System; and Pesticides—How Research Has Succeeded and Failed in Informing Policy. There are two workshops that are not included in this supplement, Building Healthy Environments for Children: Visions for the Future, and From Science to Soundbite: Understanding and Improving Communication Between Science and the Media. If you are interested in receiving copies of the manuscripts written for these workshops, please contact us.

The papers are grouped by their plenary sessions and workshops. These papers represent briefs and commentaries on specific aspects of pediatric environmental health rather than original research. This monograph is by far the largest collection on the subject of environmental exposures and children to be published to date. It will provide a different context within which to discuss environmental health and children. These papers represent a significant contribution to the literature because they address both research and policy issues.

The relationship between research and policy is a delicate one. Policy makers depend on good scientific data in order to develop sound public health policy, yet how can sound public health policy be developed in the face of limited or no data on a given population? The report on Pesticides and the Diet of Infants and Children (1) confronts that very issue as it cites limited databases on the exposure patterns and effects of pesticides on children and infants. With the exception of lead, adequate databases on the health effects of environmental exposures to children are lacking.

With 70,000 chemicals in common use today, it is imperative to understand the health effects resulting from exposures. For the majority of compounds, the health effects on children are unknown. Less than 10% of these chemicals have been tested for their effects on the central nervous system, with the exception of drugs controlled by the U.S. Food and Drug Administration (2).

Children are not routinely included in risk assessment processes, and most environmental regulations are based on exposure data of adult males. Because children have very different metabolic, physiologic and developmental processes, diets, and exposure patterns than adults, their health outcomes can differ drastically. There is a clear need for increased funding and increased research in this area.

Science, in order to remain objective, often does not want to be associated with policy, let alone with the political process. However, it is clear that funding for

Introduction to the Symposium on Preventing Child Exposures to Environmental Hazards: Research and Policy Issues held 18–19 March 1994 in Washington, DC.

We gratefully acknowledge the work of Rod Armstrong, who worked diligently with all of the authors in the preparation of these papers.

Additionally we thank all the moderators, the recorders, and the peer reviewers for their work in helping this project see the light: Jim Aidala, Barbara Boardman, Asa Bradman, Tere Brown, Theo Colborn, Gwen Collman, Nani Coloretti, Maureen Corry, Joan Cranmer, Susan Cummins, Brenda Eskinazi, Henry Falk, Richard Fenske, Deedra Ferris, Karen Fiorini, Gary Goldstein, Ned Groth, Jim Hanson, Birt Harvey, Harvey Karp, Rick Kreutzer, Kathryn Mahaffey, David Malkin, Robert Miller, Herbert Needleman, Martin Philbert, Routt Reigart, Walter Rogan, Katie Sokoloff, M.A. Stevenson, William Suk, and Margaret Tucker.

Above all, we thank all the authors and presenters at the conference for their contributions to this new field.

Finally, we gratefully acknowledge the generous support of the symposium sponsors: National Institute for Environmental Health Sciences; University of California, Berkeley, School of Public Health Superfund Basic Research Program; California Department of Health Services; W. Alton Jones Foundation; Medical University of South Carolina, Environmental Hazards Assessment Program; U.S. Environmental Protection Agency; Centers for Disease Control and Prevention; David and Lucile Packard Foundation; California Public Health Foundation; Impact Assessment, Inc.; March of Dimes Birth Defects Foundation; and theTeratology Society.

The symposium was sponsored by the Children’s Environmental Health Network. For more information about the Network or for a copy of the Symposium Summary, contact the Children’s Environmental Health Network, 5900 Hollis Street, Suite E, Emeryville, CA 94608. Telephone (510) 540-3857. Fax (510) 540-2673.
research is certainly within the political process, and environmental health policy is dependent on research and data to provide a framework. It is also clear that the solutions to the complex issues in environmental health require the creativity, brilliance, commitment, and cooperation of many disciplines and perspectives. It is in this spirit that the symposium recommendations to the research community are given.

Recommendations for Research Community

Symposium recommendations for the research community include the following:

- New research paradigms need to be developed to study long-term, delayed, and potential transgenerational health effects resulting from environmental exposures.
  - Coordinate research activities in laboratory science, human clinical, and population-based epidemiology.
- Research priorities must be expanded to include children.
  - Collect more data on children, especially on low-income children and children from racial/ethnic communities. Specifically, more data are needed on how children differ from adults; children's unique susceptibilities to environmental exposure; how health effects resulting from environmental exposures are influenced by the developing physiology of the adolescent; effects of cumulative, multiple, and synergistic exposures; and health effects in later life due to childhood exposures.
  - Collect more data on specific exposures, risks, and their potential effect on children.
  - Increase access to existing information on children's environmental exposures by creating data banks of available information on exposure; banking biological specimens (e.g., serum, fibroblasts and other tissues, including blood and other cells), both for children and members of high-risk groups; developing cost-effective technologies for specimen banks; and developing resource and referral systems (such as a national birth defects registry) for documenting information about clusters, prevention, and intervention for use by health professionals.
  - Conduct more epidemiological, clinical, applied, and basic research studies (both human and animal) on long-term outcomes of childhood exposure to toxic hazards.
- Better and more cost-effective research tools must be developed.
  - Develop systemic and new approaches for the screening of environmental exposures, including monitoring and evaluation methods for testing toxicants.
  - Develop appropriate population-based methods for assessing adverse developmental outcomes, ranging from spontaneous abortion to functional deficits (not limited to structural defects).
- Research must be conducted in ways that more effectively involve all affected communities.

Other Recommendations for Action

Policy Recommendations for Action: the Federal Government

- When drafting laws and policies, a public health approach, which considers long-term, prevention-oriented and socially equitable policies, should be taken particularly in the absence of information. This approach would establish health-based policies to protect vulnerable populations. Recommendations are as follows:
  - Set environmental standards to protect children, especially in the most vulnerable subpopulations such as low income and racial/ethnic communities.
  - In cases where the effects of an environmental hazard are uncertain, policies should be considered that prevent or eliminate exposure to that hazard.
  - Use a health-based rather than a cost–benefit standard in evaluating policies.
  - Require industry to estimate and label products regarding risks to children.
  - Encourage each Federal agency to consider policies that are especially protective of children. For example, the U.S. Department of Agriculture and U.S. Environmental Protection Agency should be encouraged to promote reduced pesticide use in agriculture, schools, and homes.
  - While public policies should be grounded in science rather than in the public's perception of risk, the availability of scientific data should not be a barrier to timely policy.
- Include multidisciplinary and multicultural perspectives in the policy-making process.
- Consider the numbers of people exposed when prioritizing environmental hazards. For example, the numbers of men and women of reproductive age, pregnant women, and children exposed to lead and environmental tobacco smoke make the eradication of these exposures of utmost importance. (It is important to consider that high-risk groups may be affected at a higher rate but may not be reflected in the actual numbers.)
- Children must be incorporated into the risk assessment process. The risk assessment process must be amended to include children's special sensitivities; cumulative, synergistic, and transgenerational effects of exposure; and cultural differences.
- Federal legislation, regulation, and agency mandate should undergo immediate review to identify where children are not taken into account. Recommendations for improvement are as follows:
  - Review existing laws and regulations, and amend any environmental laws undergoing reauthorization to specifically require that environmental standards incorporate consideration of children and other special subgroups.
  - Expand the Federal government's definition of diversity to include children under 18 years of age. This will increase opportunities for capitalizing on the diversity requirement for granting research funding and will allow for more youth participants at federally funded conferences.
- A Federal interagency workgroup should be convened to coordinate policies and activities regarding pediatric environmental health. Policy should be developed in partnership with members of affected communities to ensure that policy is culturally appropriate and reflects community needs.
- An international approach to pediatric environmental health should be adopted. Transborder regulation, liability, and health issues, such as those addressed in the debate over the North American Free Trade Agreement, should be addressed and the most stringent standard should be adopted.
Education Recommendations for Action: Health Administrators and Educators

Although the symposium emphasized policy and research, participants generated recommendations regarding improvements in the educational arena as well.

- Health care providers, including physicians and nurses, should be trained in the diagnosis, treatment, and prevention of pediatric environmental health hazards. Pediatric environmental health should be included as a topic in medical and nursing schools and in residency curricula. Continuing education should be provided on pediatric environmental health topics for physicians, nurses, and other health care providers.
- A broad spectrum of service providers such as physicians, social workers, teachers, school nurses, community members, and parents should be educated about pediatric environmental health issues. Prevention-oriented strategies, programs, and activities in pediatric environmental health should be developed and evaluated.
- Provide funding for patient education regarding pediatric environmental health.

Recommendations for Action: Forging Linkages

- Communication should be improved between researchers, public health officials, policy makers, and the public. This can be done through expanding cooperation between universities, local health departments, and affected communities to improve risk communication to populations at risk; empowering and involving children in environmental issues; and holding interdisciplinary conferences on pediatric environmental health.
- Comprehensive pediatric environmental health centers should be created and funded with a multidisciplinary framework, including clinical intervention and environmental toxicant identification. Elements would include basic and applied science, epidemiology, medicine, policy, community, law, urban planning, and education.

REFERENCES

1. National Research Council. Pesticides in the Diets of Infants and Children. Washington: National Academy of Sciences Press, 1993.
2. Landrigan PJ, Graham DG, Thomas RD. Strategies for the prevention of environmental neurotoxic illness. Environ Res 61:157-163 (1993).