

# Environmental Health in Early Childhood Systems Building

*Opportunities for States*

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The National Center for Children in Poverty (NCCP) is the nation's leading public policy center dedicated to promoting the economic security, health, and well-being of America's low-income families and children. Using research to inform policy and practice, NCCP seeks to advance family-oriented solutions and the strategic use of public resources at the state and national levels to ensure positive outcomes for the next generation. Founded in 1989 as a division of the Mailman School of Public Health at Columbia University, NCCP is a nonpartisan, public interest research organization.

## ENVIRONMENTAL HEALTH IN EARLY CHILDHOOD SYSTEMS BUILDING Opportunities for States

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## Introduction

Exposure to environmental hazards has negative outcomes for healthy child development. Household and community pollutants affect people of all ages, but for a number of important reasons young children face a significantly higher risk of developing disease and experiencing cognitive and psychomotor developmental delays. Fortunately, many common forms of exposure are preventable, and there are abundant opportunities for state-level stakeholders to initiate and support effective interventions.

This brief identifies some of the substances that threaten young children inside and nearby the home or early care and learning setting. It describes the importance of early intervention for disease prevention, and provides examples of strategic approaches to regional policy and program reform. Finally, it explores specific actions states can take to successfully address environmental health issues affecting children.

Statewide environmental health initiatives can play an important role in broader early childhood systems-building efforts. Coordinating cross-agency interventions requires some preparation to learn the basics of the issue, and there are many resources available to get started on a path to prevent and remediate environmental threats to the health of young children.

# Common Household and Community Environmental Health Hazards

Environmental health science is concerned with a broad range of substances, with common exposures related to residential, agricultural, industrial, medical, and military applications. All of these are important classes of pollutants to consider, but for children many of the most dangerous toxicants are those to which they are exposed on a daily basis in the home or child care setting.

The body of research on child environmental health is already abundant and continues to grow, covering a wide range of sources and types of toxicants. The following is a description of some of the most extensively researched harmful substances, all of which can place stress on child health either by operating as single agents in isolation or by acting in combinations of exposures.<sup>1</sup>

## *Harmful Substances of Particular Concern for Children*

### **Air Pollutants**

Some of the most common sources of toxic exposure are household smoking (or ETS, environmental tobacco smoke); vehicular exhaust produced by diesel buses and other buses, cars, and trucks; and stationary sources such as factories, incinerators, power plants, and dry cleaners, often located in immediate proximity to locations where young children reside or are educated. Many pollutants transmitted through the air disperse polycyclic aromatic hydrocarbons (PAH), carcinogenic chemicals produced by the incomplete combustion of carbon compounds. PAH can reach children in the home and community environment through smoke, soot, and exhaust.

### **Endocrine Disruptors**

An endocrine disruptor is a synthetic chemical that can mimic and block hormones and disrupt the body's normal functions. Toxic disruptors are found in many plastic consumer products used extensively by children, including baby bottles, cups and dishware, and toys. Chemical compounds that have been found to be of particular concern are Bisphenol A (BPA) and phthalates. Bisphenol A is

used to make many hard plastics, including most clear baby bottles and “sippy” cups. Phthalates are a class of chemicals used to soften flexible plastics in products such as toys and food packaging materials, and are also present in many cosmetics and other personal products. Phthalates are also widely used in building materials, most notably in polyvinyl chloride (PVC) products. Human exposure to both groups of hormone disruptors can occur through absorption, inhalation, and ingestion. Frequent product exposure to high temperatures by microwave or insertion of hot liquids elevates the dangers associated with use.<sup>2</sup>

### **Heavy Metals**

Household exposure to mercury and lead is derived from several sources. Mercury-added consumer products include thermostats, fluorescent light bulbs, some thermometers, and small batteries. Mercury is also present in thimerosal, a preservative used in some flu vaccines, and in amalgam dental fillings.<sup>3</sup> Lead is a neurotoxicant found in old paint (both on walls and in toys and other consumer products), dust, and soil.<sup>4</sup> Children can also be exposed by drinking water delivered through pipes containing lead. Harmful lead residue can accumulate in blood, bones, muscles, and fat. Policy efforts to limit exposure to lead and mercury have been in effect for decades, but limited energy has been focused on prevention at early childhood education venues and other strategic community locations.

### **Pesticides**

Dangerous chemicals in many residential and commercial pest control products are some of the most threatening substances for children. In 2001, the Environmental Protection Agency (EPA) took action to significantly limit exposure to the most dangerous pesticides by banning the residential use of chlorpyrifos and diazinon. The immediate positive health benefit from the ban was quickly detected, though subsequent research found that some banned products were still available years later in retail stores.<sup>5</sup> Many home pest control products that remain on the market contain pyrethroids, another harmful class of compounds. Agricultural

use of chlorpyrifos and diazinon is still permitted, and children in rural communities with parents employed in agricultural work face a particularly high risk of exposure.

Other common child environmental health threats include mold, radon, and hazardous ingredients contained in many household cleaning products. Some home-based hazards have particular relevance for individual communities, localities, states, or multi-state regions, and as indicated above, rural, suburban and urban environments are often confronted by different sets of health risks. As a result, individual strategies to prevent or address child environmental health threats may vary depending on a number of location-based factors. What all communities have in common, unfortunately, is the broad range of negative health outcomes associated with exposure for young children.

### *Major Health Risks Associated with Exposure*

Environmental health hazards pose a significant threat to children's health and learning. In addition to producing negative outcomes compromising physical, intellectual and behavioral health, exposure to environmental toxicants has also been specifically associated with higher incidences of asthma, obesity and metabolic disorders such as diabetes and cancer. The cumulative impact of these outcomes can translate into a significant economic burden for states.<sup>6</sup>

For a number of important reasons, exposures to harmful substances found in the home and community environment are particularly hazardous for developing fetuses, infants, and young children. Younger children often face higher levels of exposure because they spend more time on the floor or ground where many dangerous chemicals are applied. Infants and toddlers are also more likely to place objects containing high levels of toxicants in their mouth. Finally, health impacts are more pervasive and complex because smaller concentrations of substances have a bigger impact on children than adults as a result of their relative size, faster breathing rate, and stage of rapid physical growth and neurobehavioral development.

The following is a summary of the findings on the known detrimental effects of environmental health stressors on the physical, cognitive, and psychosocial health of small children.

### **Low Birthweight**

Maternal exposure to high levels of neurotoxic chemicals including PAH, phthalates, mercury, and chlorpyrifos has been linked to restricted fetal growth and preterm birth.<sup>7</sup> Children born small for gestational age and with a reduced head circumference can be at higher risk for impaired cognitive functioning and childhood school performance.<sup>8</sup>

### **Cognitive and Psychomotor Development**

Elevated levels of PAH from vehicular exhaust and combustion can be a factor in lowered IQ and attention and increased behavioral problems.<sup>9</sup> Learning disabilities have been associated with increased exposure to endocrine disruptors, which can upset normal hormone functioning critical to healthy development and growth.<sup>10</sup> Infants and small children that encounter higher levels of chlorpyrifos in pesticides are at heightened risk of developing behavioral disorders or developmental delays. Examples of these disorders are ADHD and cognitive and motor developmental impairments.<sup>11</sup> Finally, relatively low levels of lead pollution can interfere with mental development.

### **Asthma**

The development and exacerbation of asthma and other respiratory conditions such as bronchitis and emphysema have been linked to pollutants affecting indoor and outdoor air quality in residential communities. ETS exposure is a significant risk factor for the development and exacerbation of asthma. PAH compounds are another extensively studied environmental health trigger affecting the incidence of asthma.<sup>12</sup>

### **Cancer**

Pregnancy and early childhood are specific “windows of vulnerability” for developing cancer through environmental exposures.<sup>13</sup> Heightened cancer risk has been associated with exposure to endocrine disruptors, air pollutants, and pesticides.<sup>14</sup>

## Obesity and Metabolic Disorders

Chronic conditions such as obesity, diabetes and insulin resistance have been associated with exposure to air pollutants, BPA, and pesticides.<sup>15</sup> Exposure to toxic chemicals may prove to be an important factor in the epidemic increases in prevalence for these conditions and diseases in recent decades.

Scientific research on the varied health risks from exposure continues to advance, providing a deeper understanding of the mechanics of environmental stress and the development of disease. In addition to the long established research indicating that environmental health hazards are important contributors to negative health outcomes in childhood and later in life, increasing evidence of intergenerational impacts is now emerging. For the past 12 years Columbia University's Center on Child Environmental Health (CCCEH) has conducted innovative research on molecular and genetic damage from environmental exposure.<sup>16</sup> CCCEH researchers are working to unravel how prenatal and early childhood exposure may leave lifelong damage.

### *Vulnerable Children Face Higher Risk*

The impact of environmental toxicant exposure is exacerbated by other factors that contribute to susceptibility to disease such as race, ethnicity, and socioeconomic status. As a result, exposure risks and negative outcomes are particularly amplified for some children.

The disparate effects of these factors of susceptibility take several forms.<sup>17</sup> Socioeconomic disparities exacerbate the impact of environmental health exposure for the most vulnerable children who face higher levels of neighborhood environmental health hazards.<sup>18</sup> Proximity to transportation and waste transfer facilities is an important factor in racial and economic environmental health disparities.<sup>19</sup> This in part explains why minority and low-income children have disproportionately high asthma rates and asthma death rates.

Low-income households have greater exposure to both heavy metals and endocrine disruptors transmitted through cleaning supplies, toys, and plastic houseware products sold at low cost "99 cent" retail establishments. In addition, low-income children often face higher levels of household exposure related to the occupational exposure of their parents, who are more likely to be employed in jobs with greater environmental health risks.<sup>20</sup>

Research suggests it is often the interplay of multiple psychosocial stressors (ranging from social and economic hardship to nutrition, genes, and preexisting health conditions) that causes negative outcomes.<sup>21</sup> For example, a child with a nutritionally-challenged diet is likely to have more serious effects from lead exposure. Additional research on the cumulative impact of multiple risk factors that contribute to unequal negative health outcomes for vulnerable children is underway.

In sum, there is substantial evidence that "environmental exposure is a contributor to higher incidence of disease and mortality experienced by certain racial/ethnic groups."<sup>22</sup> Thus, program and policy work to make early childhood environments as healthy as possible is an important component of broader efforts to reduce disparities and help all children thrive.

# The Role of States in Reducing Exposure

The area of child environmental health presents a rich opportunity for state action to promote prevention. A broad range of early intervention strategies can be implemented to advance environmental health prevention. While the federal role in the areas of policy, regulation, and research is critically important, there are key initiatives that can be coordinated at the state level.

## *Potential Strategies for Cross-systems Work*

Multiple opportunities exist to incorporate environmental health prevention into existing early childhood systems-building efforts. Potential strategic collaborations at the state level might include agencies responsible for health, child care and child welfare, education, housing, consumer protection, and the environment.

## **Policy Changes to Limit Residential and Community Exposure**

A number of states have taken significant action to implement legal, regulatory, and administrative restrictions on access to harmful substances. California set an early precedent with Proposition 65 that mandated extensive labeling of toys containing toxicants. The measure also requires grocery stores to label fish with an indication of potential mercury content. California's toy labeling legislation drove many manufacturers to institute changes nationwide. Other states have considered approving laws banning BPA and mercury in toys and other products for children. Regulations around the recycling of fluorescent lights to limit mercury exposure through waste removal processes are also in various phases of implementation across the country.

A few states have taken on a cross-systems assessment of opportunities to improve protection of children's environmental health. Maryland's Children's Environmental Health and Protection Advisory Council reviews all relevant state regulations to see how well they serve to protect children's environmental health. The Council provides a permanent forum for state policymakers and maternal and child health experts to collaborate on additional

activities such as grant applications, planning processes, and community education.<sup>23</sup>

Some states and localities have instituted policy changes to limit pesticide use in buildings where children live or are cared for. Integrated pest management, an approach to pest control that involves proactive prevention and limited strategic use of pesticides, has been implemented in schools and public housing. States can also provide resources to schools and day care centers that help assess indoor air quality, and develop policies and regulations to limit outdoor air quality hazards such as exhaust from vehicular idling.

## **Training and Certification for Early Childhood Educators**

A few states have developed efforts focused on preventing environmental health exposure risks at child care centers. Specific approaches include incorporating environmental health into training programs for child care workers and mandating testing for exposure risks as part of the licensing and certification process. Targeting early childhood education can offer an opportunity to reach large numbers of children and families, helping to promote healthy development and support the foundation for school success.

A limited number of states currently require child care centers to conduct testing for harmful environmental exposures. Some states have developed voluntary programs that identify and reward child care centers taking active steps to reduce or prevent risk exposure. Indiana's Five Star Environmental Recognition Program is a leader in this area. Another free, voluntary recognition program is operated by Oregon's Environmental Council's Eco-healthy Child Care (EHCC) initiative, which has developed extensive program resources that are available for use by other states interested in educating and empowering child care providers to reduce exposure to environmental toxicants.

Resource guides and detailed training materials have also been developed by the national Children's Environmental Health Network (CEHN). CEHN's

Healthy Environment for Child Care Facilities and Preschool Program (HECCP) conducts intensive 15-module trainings for childhood education trainers who then impart knowledge about potential risks and prevention to individual child care workers in subsequent trainings conducted in their respective states. CEHN works individually with a limited number of target states and encourages all states to access resource materials online.

### Engaging Health Care Providers

Initiatives involving providers seek to promote education and resource access through targeting maternal and child health practitioners, educators and administrators. Important strategies include integrating content on environmental health risks into physician licensing and continuing education, and instituting environmental health patient checklists.

The Environmental Health Faculty Champions Initiative, an effort of the National Environmental Education Foundation, provides tools and resources for use by healthcare professionals to train other providers and students on child environmental health.<sup>24</sup> State-level professional associations representing pediatricians and maternal health providers are an important partner in this work. In some cases ethnic-based professional associations have taken on initiatives as a means of reducing racial and ethnic health disparities. In addition to training, states can include some measure of competency in child environmental health as a requirement for board certification of physicians.

In recent years there have been strong recommendations that routine environmental health risk assessment be included as part of standard medical care.<sup>25</sup> Many providers today lack basic information on topics such as exposure risk, windows of vulnerability, and critical questions to ask patients when reviewing medical histories. Each state can take important action to incorporate environmental health as a more integral part of standard training at medical schools and ongoing education in hospitals. States can also play a role in the development and distribution of educational materials available to families in waiting rooms at hospitals and medical offices. Finally, physician checklists, such as one developed by CEHN, can be adopted for universal use among providers in a given state as a means of standardizing exposure prevention.

### Prevention Education Targeting Families and Communities Directly

A critical component to any broader environmental health action plan is a collaborative strategy to raise awareness of specific risks among families and the organizations that serve them. This can include public forums such as community conferences, health fairs, town hall meetings, and public hearings. It can also involve the development of print and web-based materials, or even engagement with new social networking tools. The important goal is to connect information dissemination efforts to new audiences in order to reach families and children who may be at risk.

When considering a cross-systems public awareness campaign, states should choose target audiences and develop tools in a format appropriate to the audience and the time-sensitive nature of the message. For example, public advisories on health risks that are variable over time (such as air quality or dangerous and defective products) may need a more immediate dissemination method. Other risks, such as mercury fishing and radon advisories, are more constant and need more prolonged public education campaigns. States have many resources to draw from in shaping the actual message, including federal agencies, research, and advocacy groups and local environmental protection groups. Perhaps most importantly, a state's own environmental protection agency or individual units within a department of health may already have developed messages and materials for public education that are being underutilized and would benefit from a creative new dissemination strategy driven by cross-agency collaboration.

### Research and Advocacy

States interested in intensifying engagement in child environmental health issues should consider research partnerships that might advance regional understanding of current health risks and potential benefits of various interventions while contributing to the nation's knowledge base. Research partnerships can involve academic institutions and even more community-based participatory research.<sup>26</sup> State or locally-based research may be useful in efforts to motivate other policymakers in the region, and might also be used to leverage additional interest among medical or child care providers.<sup>27</sup>



## Examples of States that Have Made Significant Strides

### INDIANA

Indiana's Five Star Environmental Recognition Program for Child Care Facilities incentivizes providers to take action steps to reduce childhood exposure to environmental hazards. A multi-tier rating system enables providers to continually advance in hopes of reaching the highest, "Five Star" level. Parents are indirectly educated as they learn to seek out facilities that have received higher ratings. The program was developed in 1999, and is operated by the Indiana Department of Environmental Management.

Last year Indiana took additional action against child environmental health threats by enacting legislation that established air quality standards in the construction and repair of school buildings. Separate legislation requires the state Department of Health to report on conditions related to air quality such as carbon dioxide, humidity, mold, and excess dust in schools and state agencies. The State Department of Health is also working with a statewide Joint Asthma Coalition (InJAC) to develop a new five-year plan for combating asthma. The state's environmental health prevention efforts have benefited from an active non-profit organization, Improving Kids' Environment.

### MARYLAND

Established in 2000, the Maryland Children's Environmental Health and Protection Advisory Council (CEHPAC) has worked across systems and agency divides to continuously review existing and proposed regulations and to serve as a source of information and education for a diverse set of stakeholders in the state. CEHPAC identifies environmental hazards affecting children's health and recommends policies to limit childhood exposure in schools, homes, and communities. The

group is legislatively mandated to include legislators; leadership from the Departments of Health and Mental Hygiene, Environment, Agriculture, Education, Human Resources, and Housing; health providers; and environmental scientists.

CEHPAC is structured to promote the flow of information and analysis regarding child environmental health. Local and national organizations and academic researchers regularly make presentations to the group on current topics, and the group's review of proposed regulations offers an opportunity to place new learning about environmental hazards into immediate practice. The group also holds joint meetings and symposiums with other commissions and committees, such as a major event last year with the Maryland Commission on Environmental Justice and Sustainable Communities.

### OREGON

The Oregon Environmental Council (OEC), a non-profit group that develops legislative and programmatic solutions to environmental issues, has established award-winning prevention programs for homes and child care facilities. OEC's Eco-healthy Child Care program offers child care professionals a checklist that highlights 30 specific action steps facilities can take to prevent exposure to environmental health hazards. Checklist materials are available in four languages, and OEC has also developed a full complement of user-friendly fact sheets on specific threats. The program received the *Children's Environmental Health Excellence Award* in 2006 from the Environmental Protection Agency for its innovative and effective approach, and has recently received financial support to take its program to the national level. The program is currently working with 27 state and national organizations to expand the initiative, and all resources are available for use on its website.

Whether or not states are directly involved in the design or execution of research, coordinators can help present information on existing research to local and state policymakers through policy forums and professional conferences. States may consider coordinating with neighboring states to study common environmental health issues, which could lead to more effective advocacy collaborations. Multi-state coalitions can be useful in communicating legislative and policy priorities to the federal

government, and can also help advance local regulatory proposals that may be perceived as placing an individual state in an anti-competitive economic position. Cross-state collaboration can be mobilized to reduce a particular source of environmental pollution, such as mercury and carbon dioxide emissions from power plants, or be focused around a particular disease area, as is the case with the Asthma Regional Council of New England.

## Getting Started

Below is a checklist of suggested action steps to explore and initiate strategies that promote systems integration in child environmental health prevention. There are multiple approaches to consider, but the following steps will help guide engagement of local, state, and federal partners. An important starting point is developing a basic understanding of the various environmental threats to the healthy development of children. Many valuable resources are available to support states in this work.

### Find out what is already happening in the state and multi-state region

Investigate existing efforts to limit childhood exposure to environmental health risks and consider opportunities to advance strategic partnerships. State and local agencies that focus on the health and education of children, as well as those responsible for environmental protection and housing, may have initiatives under way that can be strengthened through expanded collaboration. Additional ways to learn more about efforts under way in the broader region are to:

- ◆ find out how the state or localities communicate environmental public health warnings and see if there are partnership opportunities to amplify or expand messages to reach families and communities more effectively;
- ◆ talk to the agency responsible for licensing child care centers to learn about existing environmental health standards;
- ◆ contact the regional EPA office and ask the person working on children's environmental health about current activities and partnership opportunities; and
- ◆ search the National Conference of State Legislatures' Environmental Health Legislation Database to find out what laws have been proposed and adopted in neighboring states.

### Consider establishing relationships with new stakeholder partners at the regional level

New partners may be able to offer advice on how to start a campaign to raise public awareness about environmental health issues or help design policy initiatives to limit exposure. In addition to state and local government agencies, the following stakeholders may be strategic collaborators.

- ◆ **Community organizations.** Plugging into community-based efforts, including environmental justice initiatives, can help target initiatives to children facing the highest risk. Community-based organizations may be effective partners in shaping outreach and prevention policies, and in research efforts to better understand local child environmental health risks.
- ◆ **Medical professionals.** Find out what professional associations in the state are doing or planning to bolster the role of health care providers in environmental health prevention. Contact the state's public health association and local chapters of national disease-based organizations such as the American Cancer Society, American Lung Association, and March of Dimes to see what resources are available. Finally, the regional Pediatric Environmental Health Specialty Units can help bridge resource gaps and design interventions.
- ◆ **Researchers.** Academic institutions with expertise in child environmental health offer a wealth of knowledge and are typically motivated to conduct additional community-based research. Contact the closest center of excellence in children's environmental health and disease prevention research.

### Access and utilize resources available through national organizations and federal agencies

Many national organizations offer an abundance of resources, and the opportunity to sign up to receive ongoing communications with additional information and tools. Federal agencies also have extensive information on regulation, research, and policy related to child environmental health issues.

- ◆ Children's Environmental Health Network offers resource guides, training manuals, and operates separate listservs for science and the community.

- ◆ Eco-Healthy Child Care offers checklists and fact sheets to help reduce exposure to environmental health hazards at early childhood education centers.
- ◆ Collaborative on Health and the Environment provides written resources and offers the opportunity to participate in regional working groups and monthly phone calls on environmental health science, policy, and advocacy.
- ◆ The National Association of County and City Health Officials offers a monthly environmental health e-newsletter called *The Greener Side of Local Public Health* which features resources, tools, and events.

The websites of federal environmental health agencies are listed at the end of this report. One important national initiative is the National Children’s Study, which will “examine the effects of environmental influences on the health and development of 100,000 children across the United States.”<sup>28</sup> There are 40 study centers operating in 105 study locations throughout the country, and states can help target communities to encourage families to enroll. Contact the staff at the closest study center to find out how to support this longitudinal research, which will advance knowledge about what children are exposed to and the health effects of exposure over time.

### Establish a formal or informal pediatric environmental health interagency group

Take steps to establish a statewide policy group to advance strategies to promote further systems integration. Seek out participation from all relevant state agencies, as well as key local government officials, physicians and representatives from state chapters of pediatric medical associations, child care training and referral agencies, community groups, and researchers. The group should be mobilized to leverage all available resources. Such a group may also position the state to attract federal funding, as federal agencies are increasingly funding initiatives of stakeholder coalitions.

## Resources for Further Information

Valuable opportunities exist in every state to incorporate environmental health into comprehensive early childhood systems of care. Regardless of the current level of engagement on children’s environmental health, states can take additional steps to leverage new and emerging resources to bridge gaps between science, advocacy and policy. States can

strengthen efforts to implement effective prevention initiatives by establishing relationships with new partners within and outside of the state. A wealth of national and local resources in the field means comprehensive preventive action can be initiated at little or no cost.

## Websites for Further Information

### Federal Agencies

A complex system of federal agencies governs the area of Child Environmental Health, with a number of different divisions sharing responsibility for policy, regulation, and research.

Environmental Protection Agency

- ◆ NCER, National Center for Environmental Research
  - *List of Children’s Environmental Health Centers* [www.epa.gov/ncer/childrenscenters/centercontacts.html](http://www.epa.gov/ncer/childrenscenters/centercontacts.html)
  - *Additional Resource page* [www.epa.gov/ncer/childrenscenters/additional\\_resources.html](http://www.epa.gov/ncer/childrenscenters/additional_resources.html)
- ◆ OCHP, Office of Children’s Health Protection <http://yosemite.epa.gov/ochp/ochpweb.nsf/content/homepage.htm>

Department of Health and Human Services

- ◆ ATSDR, Agency for Toxic Substances and Disease Registry [www.atsdr.cdc.gov/](http://www.atsdr.cdc.gov/)
- ◆ NCEH, National Center for Environmental Health
  - Home Page [www.cdc.gov/nceh/](http://www.cdc.gov/nceh/)
  - Children’s Health and the Built Environment [www.cdc.gov/healthyplaces/healthtopics/children.htm](http://www.cdc.gov/healthyplaces/healthtopics/children.htm)
- ◆ NCTR, National Center for Toxicological Research [www.fda.gov/AboutFDA/CentersOffices/NCTR/default.htm](http://www.fda.gov/AboutFDA/CentersOffices/NCTR/default.htm)
- ◆ NIEHS, National Institute of Environmental Health Sciences [www.niehs.nih.gov/health/topics/population/children/index.cfm](http://www.niehs.nih.gov/health/topics/population/children/index.cfm)

National Children’s Study (led by a consortium of federal agencies) [www.nationalchildrensstudy.gov](http://www.nationalchildrensstudy.gov)

President’s Cancer Panel, National Cancer Institute <http://deainfo.nci.nih.gov/advisory/pcp/pcp.htm>.

OSHA, Occupational Safety and Health Administration (Department of Labor) [www.osha.gov](http://www.osha.gov)

### Research and Advocacy Groups

Association of Occupational and Environmental Clinics, information on federally-funded Pediatric Environmental Health Specialty Units) <http://aoec.org/PEHSU.htm>

Children’s Environmental Health Network [www.cehn.org](http://www.cehn.org)

Collaborative on Health and the Environment [www.healthandenvironment.org](http://www.healthandenvironment.org)

Columbia Center for Children’s Environmental Health [www.ccceh.org](http://www.ccceh.org)

Environmental Health Perspectives (journal published by the National Institute of Environmental Health Sciences) [www.ehponline.com](http://www.ehponline.com)

National Association of County and City Health Officials [www.naccho.org/topics/environmental](http://www.naccho.org/topics/environmental)

National Conference of State Legislatures (Energy and Environment Legislation Tracking Database) [www.ncsl.org/?tabid=13011](http://www.ncsl.org/?tabid=13011)

National Environmental Education Foundation (Children’s Environmental Health Faculty Champions Initiative) [www.neefusa.org/health/index.htm](http://www.neefusa.org/health/index.htm)

Oregon Environmental Council (Eco-healthy Child Care) [www.oeconline.org/our-work/kidshealth/ehcc](http://www.oeconline.org/our-work/kidshealth/ehcc)

WE ACT for Environmental Justice [www.weact.org](http://www.weact.org).

# Endnotes

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Special thanks to our colleagues at the following organizations:



Since 1998, the researchers at the **Columbia Center for Children's Environmental Health (CCCEH)** have carried out community-based research to examine the health effects of prenatal and early postnatal exposures to common urban pollutants, with the aim of preventing environmentally related disease in children. In turn, the Center's research results are used to educate parents, community members, health professionals, advocacy organizations, and policymakers to inform prevention and policy reform strategies to reduce levels of harmful environmental toxicants. For more information about the Center, please visit: [www.ccceh.org](http://www.ccceh.org).



**West Harlem Environmental Action, Inc. (WE ACT)** is a non-profit, community-based organization working to improve environmental quality and to secure environmental justice in predominately African-American and Latino communities. Since 1988, WE ACT has worked with citizen groups, youth, community residents, environmentalists, local/state/federal governments, and educational & medical institutions. Based in northern Manhattan, WE ACT advances its mission through research, public education, advocacy, mobilization, litigation, legislative affairs & sustainable economic development. WE ACT works to inform, educate, train and mobilize the predominately African-American and Latino residents of northern Manhattan on issues that impact their quality of life – air, water and indoor pollution, toxins, land use and open space, waterfront development and usage, sanitation, transportation, historic preservation, regulatory enforcement, and citizen participation in public policy-making.



The **Children's Environmental Health Network** is a national multi-disciplinary organization whose mission is to protect the fetus and the child from environmental health hazards and promote a healthy environment. To achieve this mission, the Network has had several goals: to promote the development of sound public health and child-focused national policy; to stimulate prevention-oriented research; to educate health professionals, policymakers and community members in preventive strategies; and to elevate public awareness of environmental hazards to children. Today, CEHN is the voice of children's environmental health in the nation's capitol, one that is uniquely informed by a strong basis in pediatric and environmental health science.

