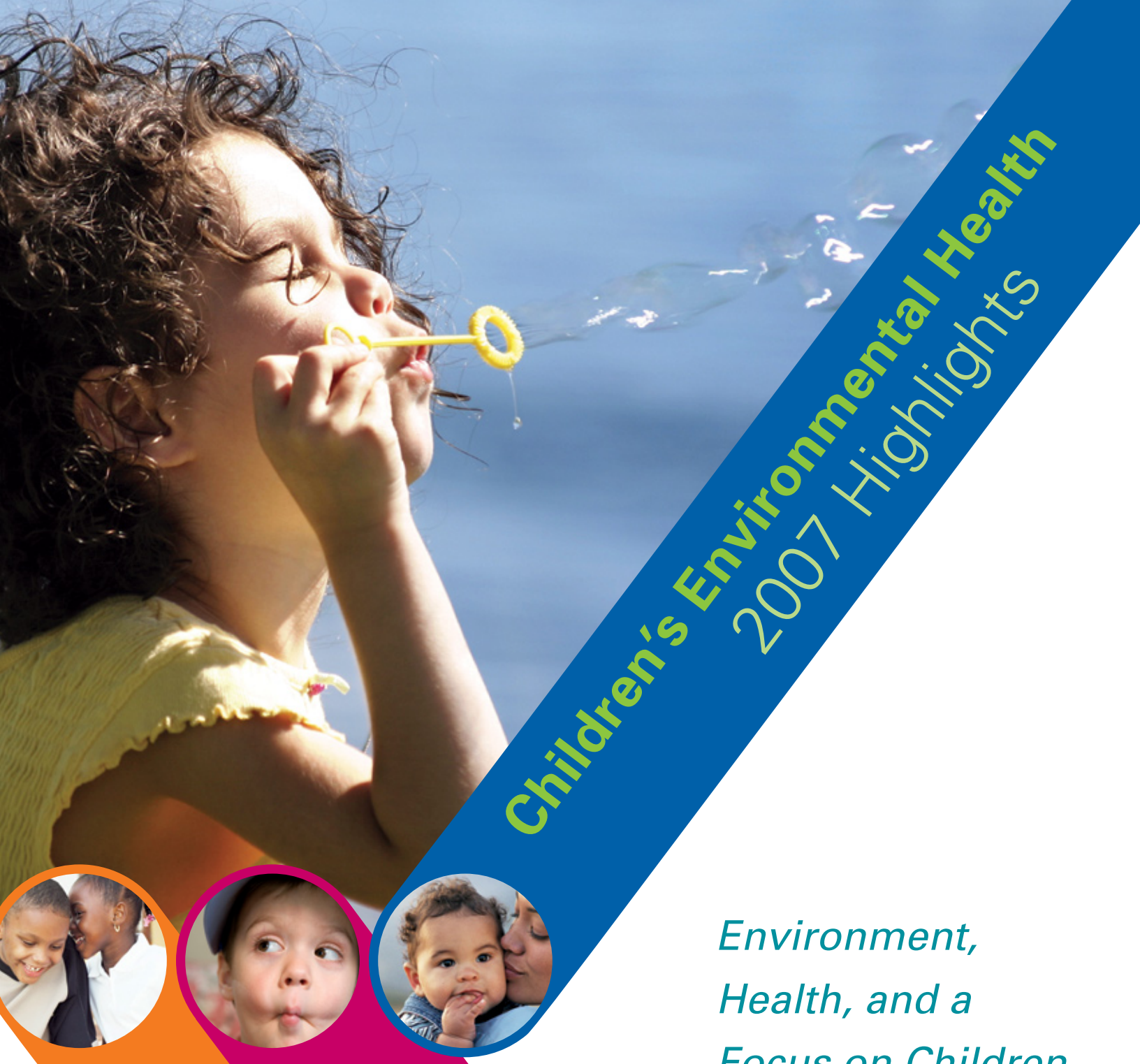

Children's Environmental Health 2007 Highlights

Environment, Health, and a Focus on Children

07

EPA
United States Environmental Protection Agency

Children's Environmental Health Excellence Award

Many organizations featured in this report are Children's Environmental Health Excellence award winners. These awards recognize ongoing and sustainable dedication to protecting children from environmental risks. To learn more, go to www.epa.gov/children.

The U.S. Environmental Protection Agency (EPA) was created in 1970 to protect human health and the environment. The year 2007 marks 10 years of concerted Federal effort to address children's environmental health risks as mandated by Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. We have tagged asthma and lead poisoning as priorities in our work - they pose particular dangers to children, and EPA can be especially effective in fighting them. Strategies designed to address asthma and lead poisoning can be instructive as we tackle emerging issues of concern to child health and development. Much of our work is done in partnership with others and falls generally into three categories: outreach and education, science and research, and regulatory action. Through outreach and education, we work to train health care providers on the environmental causes or contributors to ill health in children, and we educate parents on how to protect their children from harmful exposures. Research in the last decade has documented many nuances about the effects of physical, chemical, and biological exposures on children's health. We strive to write policies and regulations that protect all children from exposure to harmful substances. This report captures much of our work.

Why Children?

Children are different from adults, and there is clear evidence that they may face health and development risks:

- Children's neurological, immunological, respiratory, digestive, and other physical systems are still developing and may be more easily harmed by exposure to any number of factors in the environment.
- Children eat more, drink more, and breathe more than adults in proportion to their body weight—their food, water, and air therefore must be especially safe.
- Children play and learn by crawling and placing hands and objects in their mouths, increasing their chances of exposure to environmental contaminants.
- Children have unique exposure pathways, such as through the placenta and breast milk.
- Children have limited ability to communicate and urge action about their environment and their health; others must act on their behalf.

Protecting Children in The Great Outdoors

The Air They Breathe: In March 2007, EPA issued a final rule to help State and tribal environmental agencies develop and implement plans that will improve air quality for the millions of Americans living in areas where fine particle pollution levels do not meet the national standards EPA established in 1997 (15.0 micrograms per cubic meter (ug/m3) annually and 65 ug/m3 daily). Fine particle pollution, or PM2.5, can aggravate heart and lung disease and is associated with premature death and a variety of serious health problems (i.e., asthma attacks, heart attacks, chronic bronchitis, stroke, and more). Those particularly sensitive to PM2.5 exposure include people with heart and lung disease, older adults, and children. All areas must meet the 1997 fine particle standards no later than 2015. Benefits to children with asthma include at least 3,700 fewer emergency room visits per year, 140,000 fewer days with exacerbated symptoms, and 110,000 fewer cases of upper respiratory symptoms. Other benefits to children include annual reductions of more than 15,000 cases of acute bronchitis and 150,000 cases of lower respiratory symptoms. By 2020, States also must meet the more health-protective daily PM2.5 standard (35 ug/m3) that EPA issued in 2006, which will result in additional public health benefits to both children and adults. By 2020, additional benefits to children with asthma are expected to include, annually, at least 50,000 fewer days with exacerbated symptoms, 50,000 fewer cases of lower respiratory symptoms, 40,000 fewer cases of upper respiratory symptoms, 7,000 fewer cases of acute bronchitis, and 1,200 fewer emergency room visits. www.epa.gov/ttn/ecas/ria.html

Under the Sun: About half of all cancers diagnosed each year in the United States are skin cancers. Overexposure to the sun can cause skin cancer, as well as eye damage, cataracts, and immune system suppression. EPA's SunWise Program works to improve knowledge, attitudes, and behavior about sun science and protection, as sun damage is cumulative and protection is best if started early. To date, more than 16,000 schools in all 50 States are participating in this program, making it the most widely used public health education program in the country. SunWise has cultivated many partnerships over the last 8 years; this year, a public service announcement with Radio Disney will air on more than 40 radio stations. www.epa.gov/sunwise

Environmental Renewal for Communities: Since 2005, EPA has provided $4.5 million in grants through the Community Action for a Renewed Environment program to help 29 communities adopt programs to reduce releases of toxic pollutants. Many of these communities are focusing on children's health among their expressed priorities, making strides to reduce exposure to lead, mercury, and other chemicals. EPA expects to award up to 20 more grants under this program in 2007. www.epa.gov/care

Children First: EPA New England (Region 1) has made children's health a priority since 2000 with the Children First campaign. The Region's Healthy Communities Grant Program funds up to $35,000 per community to benefit children in low-income areas. One specific effort is to end childhood lead poisoning in Boston, where the number of lead-poisoned children has dropped from 1,123 cases in 2001 to 460 cases in 2006. By working with many partners, including Tufts University and other public, private, nonprofit, and housing organizations under the Lead Action Collaborative, the program increases visibility of the issue and creates strong lead policies and regulations.

Reclaiming Space for Children: The Small Business Liability Relief and Brownfield Revitalization Act describes a brownfield as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." But to communities nationwide, brownfields are vacant lots, abandoned gas stations, industrial or mine sites, methamphetamine labs, or blighted lands and buildings where contamination may linger, posing unknown risks to children, neighbors and the environment. EPA is working with the Agency for Toxic Substances and Disease Registry (ATSDR), Environmental Law Institute, National Association of City and County Health Officials, and American Planning Association to pursue redevelopment design that improves children's health. Walking and biking trails; parks; access to schools, health care, community gardens, and healthy food; and improving safety and security—all focus on reducing or eliminating children's exposures to hazardous and toxic materials while increasing child-friendly community design. www.epa.gov/brownfields

Children's Environmental Health Excellence award winner.

Protecting Children Indoors

At Home: Getting the Lead Out—Among Other Things

Lead Safe Babies: EPA and the National Nursing Centers Consortium started the first Lead Safe Babies grant in Philadelphia in 1999. Lead Safe Babies is a primary prevention program to educate families about effective techniques for reducing lead exposure. Trained outreach workers from nurse-managed health centers provide home visits to low-income caregivers in at-risk areas. Families who have participated in the program experience a statistically significant increase in their level of knowledge about lead poisoning and prevention techniques, and report lower blood lead levels than those in the same geographic areas who have not participated in the program. In Philadelphia, this program has reached over 8,000 mothers and babies. Lead Safe Babies has been implemented in Pennsylvania, Maryland, Connecticut, and the District of Columbia. www.nncc.us/programs/programs_Lead_Safe_Babies.htm

Reducing Lead Poisoning: Research suggests that the primary sources of lead exposure for most U.S. children are deteriorating lead-based paint and lead-contaminated dust and soil. Under the 1992 Residential Lead-Based Paint Hazard Reduction Act, EPA has established training and certification rules and standards for lead in paint, dust, and soil. Recent efforts to eliminate childhood lead poisoning by 2010 include proposing a regulation to ensure lead-safe work practices during renovation, repair, and painting in homes; targeting assistance to low-income families whose children are known to be at highest risk; working with the Consumer Product Safety Commission to address lead in child-oriented products; and continued education and outreach. EPA's new community-based grants fund local efforts, such as outreach, training, and local ordinance development projects, to reduce childhood lead poisoning. In 2007, EPA is awarding $8.3 million to 70 grantees across the country to fund efforts in areas with high incidence of elevated blood lead levels in children. www.epa.gov/lead

Secondhand Smoke: The 2005 National Health Interview Survey found that approximately 8 percent of children age 6 and under were regularly exposed to environmental tobacco smoke (secondhand smoke), compared to 20 percent in 1998. Secondhand smoke is harmful to everyone, especially infants and young children. This exposure can cause middle ear infections, bronchitis, pneumonia, and Sudden Infant Death Syndrome, and it can help cause or worsen asthma, particularly for children under 6. A Surgeon General's report in July 2006 found there is no safe level of exposure, yet millions of young children are exposed in their homes. EPA's Smoke-Free Homes and Cars program continues its effort to reduce such exposures. The program has received more than 127,000 pledges since its launch in 2001, with more than 10,000 submitted in 2007. This year EPA and the U.S. Department of Health and Human Services are working with nearly 1 million children in Head Start to reduce their health risks related to secondhand smoke and other environmental triggers of asthma. www.epa.gov/smokefree

Pesticides in Low-Income Housing: EPA continues to support the National Center for Healthy Housing in promoting integrated pest management (IPM) in low-income housing to protect children from overexposure to pesticides. IPM can reduce exposure to both pests and pesticides. Cockroaches are one of the most frequent and potent allergens provoking asthma in children. The center has provided IPM training to more than 75 small and medium-size public housing authorities, more than 600 health and housing professionals, and developed the *IPM in Multi-Family Housing* course. www.healthyhomestraining.org

Children's Environmental Health Excellence award winner.

At School: A Whole New Class of Tools

HealthySEAT: EPA's approach to environmental quality at the 120,000 public and private K-12 schools in the United States continues to evolve. Previously EPA offered a disparate collection of unrelated environmental programs that challenged resource-strapped school districts. EPA now has www.epa.gov/schools, which provides one-stop shopping for the most current information on all school environmental health issues. In 2006, EPA launched the Healthy School Environments Assessment Tool (HealthySEAT), a first-of-its-kind, free, and fully customizable software to help school districts set up assessment programs covering every facet of school health and safety. HealthySEAT is a much-needed tool to track school conditions and improvements across a wide range of issues, from cleanliness to emergency preparedness, from playground safety to asbestos management. The State of New Hampshire has customized HealthySEAT and is training its school districts to use the program. Ohio and California are working on versions that will allow school districts to meet new requirements for facility assessments, and many districts are already using HealthySEAT as part of their school facility management systems. EPA will release an enhanced version of the program in fall 2007.

Breathing Lessons: Better indoor air quality management in schools has reduced exposure to pollutants and improved the health of approximately 18 million students, faculty, and staff. The Indoor Air Quality Tools for Schools (IAQ TfS) program began in the mid 1990's to help schools address indoor air issues. By 2002, 22 percent of schools had indoor air quality management programs consistent with IAQ TfS, and EPA is recruiting 1,100 schools in 2007. The goal is to have 35 percent of America's schools adopt such practices by 2012. Key elements of the program include outreach and education, training, tool development, and awards. www.epa.gov/iaq/schools

Less Lead, More Water: Exposure to lead is a significant health concern, especially for young children and infants, and drinking water is one possible source. EPA's objective is to raise awareness about the implications of lead in drinking water. In January 2006, EPA released the *3Ts for Reducing Lead in Drinking Water at Schools and Child Care Facilities Toolkit*, which contains materials to adopt a 3Ts—*t*raining, *t*esting, and *t*elling—strategy. In 2007, EPA released a DVD on lead testing and a document that identifies funding sources for water quality improvements. www.epa.gov/safewater/schools

Working Together in Michigan: In EPA Region 5, the Greater Grand Rapids Children's Environmental Health Initiative is a collaboration of community groups and government agencies to promote healthier homes, child care facilities, school environments, and communities. Local program champions include the Asthma Network of West Michigan, Healthy Homes Coalition of West Michigan, and West Michigan Environmental Action Council. The initiative came together in June 2006 and so far includes participation and support from community and advocacy groups, public health and environmental agencies, and local business and industry. Working with the coalition, Region 5 has trained more than 800 school and child care facility managers, science teachers, school nurses and other health care providers, transportation managers, and property owners and managers on children's environmental health topics. Region 5 also helped remove 5,500 pounds of outdated chemicals from 41 schools.

Chemical Safety in Tennessee: The School Chemical Cleanout Program was formally announced in 2004 by EPA Region 4 at Red Bank Middle School in Chattanooga. A $51,000 grant was awarded to the Tennessee Department of Environment and Conservation to properly identify and dispose of potentially dangerous chemicals from secondary schools. Since then, 33,000 pounds of hazardous waste, including flammable solids, liquids, oxidizing liquids, corrosive acids, alkalis, mercury compounds, and degraded containers, have been removed from more than 140 schools in Tennessee. Preventive programs such as chemical management training for lab instructors and "green chemistry" were also provided. www.epa.gov/sc3/

Safe Food for Children

Mercury, Fish, and Children's Diets: Mercury occurs naturally in the environment and is released into the air through industrial pollution. When airborne mercury falls into water, bacteria there transform it into methylmercury, which fish absorb as they feed. Eating fish with high levels of methylmercury can be harmful to developing nervous systems. The brochure *What You Need to Know About Mercury in Fish and Shellfish* (available in eight languages) provides comprehensive advice to women of childbearing age and children about how to reduce mercury exposure while still getting nutritional benefits from eating fish. Recently, EPA released quick-reference versions of this advice as an eye-catching poster (*One Fish, Two Fish, Don't Fish, Do Fish*) and a handy key chain tag (*Choose Fish Wisely*). www.epa.gov/fishadvisories

The 1996 **Food Quality Protection Act** (FQPA) remains the most comprehensive overhaul of the Nation's pesticide and food safety laws in decades. EPA has completed over 99 percent of the required tolerance reassessments for all pesticides used on food, as required by FQPA. This Act changed the safety standards that EPA uses in evaluating potential pesticide risks, taking into consideration that children may be more sensitive to pesticides than adults. Under FQPA, the Agency may require up to an extra 10-fold children's safety factor in dietary risk assessments. EPA has banned use of organophosphate pesticides that pose unacceptable risks to children, including indoor and outdoor residential uses of chlorpyrifos and diazinon and many food uses of methyl parathion and azinphos methyl.

Developing and Using Data to Protect Children

Environmental Health Indicators: Since 2000, EPA's groundbreaking *America's Children and the Environment* reports and Web site have led the way in systematically presenting data on environmental contaminants that can affect children's health, on body burden, and on childhood illnesses that can be influenced by exposure. Parents, teachers, doctors, nurses, researchers, government officials, and the public can visit the site to get current information and trend data on important topics in children's environmental health, such as:

- Percentage of U.S. children living in counties where air pollution exceeds national standards
- Blood lead levels in children under 6 years of age
- Percentage of U.S. children with asthma

Most measures presented in *America's Children and the Environment* are based on databases maintained by EPA, the Centers for Disease Control and Prevention, and other Federal agencies. Along with graphical presentations of the data, the report provides concise summaries of the scientific information on how environmental contaminants can affect children's health. The Web site and reports have been an important influence on other efforts to provide data concerning the health and welfare of children, both nationally and internationally. The Interagency Forum on Child and Family Statistics was established though Executive Order 13045 and publishes an annual report on conditions and trends for children and families. The 10th anniversary edition of the Forum's *America's Children: Key National Indicators of Well-Being, 2007* now includes more data on physical environment and safety. EPA spearheaded the international Children's Environmental Health Indicators initiative launched at the World Summit on Sustainable Development in 2002. Now under the leadership of the World Health Organization, this effort will enable many countries to develop their own national indicators of children's environmental health. Regular reporting of critical data is crucial to understanding the potential impacts of environmental contaminants on children's health, and ultimately helps to identify and evaluate ways to improve their environments and health. www.epa.gov/envirohealth/children www.who.int/ceh

Better Testing: *Toxicity Testing in the Twenty-First Century: A Vision and a Strategy*, released with EPA support by the National Academy of Sciences in June 2007, presents a plan to improve testing and human health assessments for environmental contaminants. There are still many knowledge gaps surrounding toxicity testing, including a lack of comprehensive understanding about early life-stage susceptibility, the impact of genetic diversity, mechanisms of toxic action, cumulative risk, health effects, and more. The Academy's report describes the field of toxicity testing as approaching a "scientific pivot point…poised to take advantage of revolutions in biology and biotechnology." http://books.nap.edu/openbook.php?record_id=11970&page=R1

Assessing Exposures: EPA has released the draft *Child-Specific Exposure Factors Handbook* for peer review and public comment. The handbook provides a summary of statistical data on various factors used in assessing exposures to children, including drinking water consumption; soil ingestion and mouthing behavior; inhalation rates; dermal factors, such as skin surface area and soil adherence factors; consumption of retail and homegrown foods; breast milk intake; body weight; and activity pattern data. http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=56747

Pesticides Exposure: EPA conducted observational studies over the past 10 years to improve understanding of children's exposures to chemicals. Results are described in a 2007 report, *Important Exposure Factors for Children: An Analysis of Laboratory and Observational Field Data Characterizing Cumulative Exposure to Pesticides*, which summarizes real-world measurement data, critical for improving exposure assessments. Data are presented for a number of different pesticides in air, dust, soil, and food. The findings ensure that scientists, modelers, and risk assessors have the most up-to-date information available to develop more accurate risk assessments and risk reduction measures. www.epa.gov/nerl/research/data/

Helping Rule Writers: *The Guide to Considering Children's Health When Developing EPA Actions: Implementing Executive Order 13045 and EPA's Policy on Evaluating Health Risks to Children* helps EPA staff determine whether the Executive order or policy apply to an EPA action. Since the 1998 issuance of the *Rule Writer's Guide to Executive Order 13045*, EPA has published several guidance documents related to risk assessment, regulatory policy, and action development. This revision of the guide reflects these new developments and more clearly integrates EPA's child health policy with the action development process. www.epa.gov/children

Discovering, Understanding, and Documenting Effects of Environmental Exposures

The **National Children's Study** is the largest and longest study of children's health and development ever planned in the United States. It will look at how the environment influences the health and development of 100,000 children in 105 locations from before birth—and in some cases before conception—to age 21. Participating children will represent the ethnic and economic diversity of the Nation. Authorized by Congress in 2000, the study is one of the most ambitious child health research efforts to date and the first of its kind to explore important health issues—from birth defects to a number of major diseases, such as asthma and diabetes. The study is led by the National Institutes of Health in collaboration with EPA and the Centers for Disease Control and Prevention. In February 2007, the study received an appropriation from Congress for expansion into additional communities across the country. With this step, the Nation's leaders made a commitment to promote optimum health and save lives and dollars for generations to come.

The research plan is being reviewed by the National Research Council and the Institute of Medicine of the National Academies, the lead Federal agencies, and the public in 2007. The plan includes discussion of the study hypotheses, sample design, rationale for outcome and exposure measures, statistical analysis plan, data use and confidentiality protections, human subject protections, the information management system, and adverse event reporting.

Since 2005, the first seven study centers ("vanguard centers") have been preparing to implement the study in their respective locations. Fifteen to 20 new contracts for additional centers around the country will be awarded in fall 2007 as a result of the new funding. The vanguard centers will begin enrolling at least 250 newborns each year for 5 years beginning in 2008. The new study centers will begin recruitment in 2009. Initial results are expected in 2010. www.nationalchildrensstudy.gov

Translating 10 Years of Research Results Into Public Health Actions: Executive Order 13045 stimulated a wide array of EPA-supported children's environmental health research, particularly through the Science to Achieve Results (STAR) grants program. In 1998, the STAR program, which supports human health, ecology, economics, and engineering sciences through grants and fellowships, initiated a diverse portfolio focused specifically on children's health research. The goals are to better understand children's genetic, life stage, or behavioral susceptibilities; better characterize child-specific harmful chemical exposures; and demonstrate cost-effective, protective interventions, particularly at the household and community levels. Since 1998, EPA, in partnership with the National Institute of Environmental Health Sciences, has funded 21 Centers for Children's Environmental Health and Disease Prevention Research (11 are currently active; the Columbia Center for Children's Environmental Health is a Children's Environmental Health award winner), 19 grants on vulnerability to toxic substances in the environment, 8 grants to study biomarkers for children's risks, 7 studies of economic valuation of children's health outcomes, 5 grants on early indicators of environmentally-related disease, and 3 grants for aggregate assessments of pesticide exposure. Ten years ago, society didn't know:

- How environmental exposures change across life stages, from newborn to school-age children through adulthood
- Which genetic factors contribute to children's vulnerability
- How to assess aggregate and cumulative exposures
- What biological markers in children's urine or blood tell us about exposure or effects
- Where to intervene to prevent harmful exposures
- Which interventions are effective and sustainable in clinical settings

Through the work of the Centers for Children's Environmental Health and Disease Prevention Research, much has been learned, including:

- People metabolize pesticides differently based on their genotype; some metabolize faster, others slower. This is a particular concern during pregnancy, as many babies do not develop the ability to metabolize some pesticides during the first 2 years of life.
- Children living close to major roadways in southern California have a higher risk of asthma.
- EPA's ban on two household pesticides, diazinon and chlorpyrifos, resulted in a rapid decrease in exposures in New York City. Children born after the ban were also healthier in general.
- IPM can be effectively implemented in urban areas to reduce both pesticide and allergen triggers.
- There are novel, non-invasive ways of measuring children's exposure to environmental chemicals.
- Community partners play critical roles in informing, implementing, and translating children's environmental health research.

STAR funded human health research has added substantially to knowledge about children's environmental health. STAR work has been cited in numerous policy and decision-making documents, including those issued by the U.S. Environmental Protection Agency, the World Health Organization, the Agency for Toxic Substances and Disease Registry, Health Canada, and others.

The STAR program is working closely with Federal, State, and community partners to disseminate these and many other findings to create healthier environments and nurture healthier kids. STAR managers also anticipate continuing, even broadening, Federal partnerships for future research efforts. www.epa.gov/ncer and www.epa.gov/cehc

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Environmental Expertise and Health Care Providers

Pediatric Environmental Health Specialty Units: EPA and ATSDR fund 10 Pediatric Environmental Health Specialty Units (PEHSUs)—one in each EPA Federal region. Other units in Mexico and Canada joined to create a North American network of more than 100 physicians and other health professionals with expertise in pediatrics, toxicology, occupational health, epidemiology, and other disciplines. Each PEHSU provides education and consultation to health care providers, parents, and public health officials about suspected exposures and the possible health effects. In the 10-year life of the program, 100,000 health professionals have been trained on children's environmental health issues. The PEHSU network is managed by the Association of Occupational and Environmental Clinics. Two examples of PEHSU work are:

In Region 3, the **Mid-Atlantic Center for Children's Health and the Environment** has been conducting annual children's environmental health conferences since 2002 in partnership with EPA, ATSDR, and State environmental and health departments. These conferences address clinically important issues in children's environmental health, such as lead, indoor and outdoor air pollution, emerging chemicals, and pesticide exposure in homes and schools. The PEHSU teaches participants to recognize the clinical impact of environmental toxicants on the health of children, describes a variety of approaches to management and interventions for environmental health problems in children, and identifies resources to investigate and manage environmental health problems. The unit has also been instrumental in addressing children's health issues across the region. Staff testified before the Washington, DC City Council on lead in drinking water; worked with the Center for Risk Science at George Washington University to organize a summit and develop a strategic plan on asthma in the District; provided training to migrant clinicians on Virginia's Eastern Shore as part of EPA Region 3's outreach effort; and are active members on the District's lead screening advisory committee and lead task force, and the Maryland children's environmental health advisory committee. The PEHSU recently gave a lecture at the U.S. Senate child care center on mold in response to exposure concerns. It provides education and consultation through grand rounds, workshops, and health fairs all over the Mid-Atlantic region. www.health-e-kids.org

In Region 6, the **Southwest Center for Pediatric Environmental Health** at the University of Texas Health Science Center in Tyler has been active in the professional community, sponsoring or presenting environmental health education to health care providers since 2000. From October 2005 to March 2007, the PEHSU reached 1,800 health care professionals, offering 51 continuing education credits in children's environmental health to physicians, nurses, and respiratory therapists in Louisiana, New Mexico, and Texas. Outreach activities include presentations at health fairs, including the unique Poison Jungle Safari held at the El Paso Zoo in Texas. The PEHSU has been working closely with the North East Texas Public Health District, using health educators to reach the community on issues such as lead poisoning, sun exposure, smoking risks, and hand washing. Health educators targeted disadvantaged groups such as residents of low-income ZIP codes and patients in public health clinics. Related activities include asthma summits for health care professionals and camps for asthmatic children in the Rio Grande Valley, intergenerational training using seniors to train students in after school programs, and a study of the efficacy of the smoke-free home pledge. The PEHSU assisted EPA and others in preparing health advisory documents after Hurricane Katrina and presented displays on children's environmental health at State medical society meetings in Arkansas, Louisiana, and New Mexico in 2005. It has also presented to pediatric residents in Oklahoma and worked with the Oklahoma Poison Center. www.swcpeh.org

The **University of Massachusetts Lowell** has an EPA grant to work with health professionals who serve low-income, immigrant, refugee, and minority children in small urban and rural areas in New England. This population is generally underserved by children's

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environmental health capacity-building efforts even though it suffers disproportionately from exposure to environmental contaminants. In collaboration with State health departments, professional development workshops for nurses and other public health professionals have been conducted in all six New England States using a curriculum based on the professional competencies identified in the Institute of Medicine's 1995 report *Nursing, Health, and the Environment: Strengthening the Relationship to Improve the Public's Health*. As of June 2007, 378 nurses and public health professionals representing more than 150 organizations have completed the capacity-building development programs, which offer a range of new clinical skills for prevention. Educational sessions were also provided for more than 450 student nurses and 30 faculty members. Participants were encouraged to address environmental health issues in their practices and engage patients and their families in prevention efforts. More than 90 percent of participants said they were currently incorporating principles of children's environmental health into their care, benefiting the health of more than 20,000 children. www.uml.edu/childrenshealth

The **National Environmental Education Foundation** (formerly the National Environmental Education and Training Foundation), with funding from EPA, has developed 28 children's environmental health faculty champions in medical and nursing schools throughout the Nation. These champions are integrating children's environmental health into their institutions by teaching, revising curricula, and serving as models for integrating environmental health into health professional education. Within 8 months of the faculty champion workshop, the 28 champions trained more than 1,500 additional health professionals, including physicians, nurses, nurse practitioners, physician assistants, medical residents, and students. The training resources are available online and are being widely disseminated through publications and professional conferences, reaching tens of thousands of pediatric health professionals. www.neefusa.org

Pediatric Training: Greater Boston Physicians for Social Responsibility (GBPSR) coordinated the Pediatric Environmental Health Toolkit Training Program with local partners, including Physicians for Social Responsibility (PSR) chapters, in five States over 2 years. EPA supported this training program. The toolkit, endorsed by the American Academy of Pediatrics, was developed by GBPSR; the San Francisco Bay Area chapter of PSR; the **Region 9 PEHSU at the University of California**, San Francisco; and a team of pediatricians from around the country. It identifies critical developmental stages and opportunities for age-appropriate interventions to promote health and wellness. The training sessions were well received at all 5 sites and included more than 180 health care professionals, including physicians and nurses, health educators, and public health specialists, with expected secondary trainings to reach 1,000 more. The programs provided overviews of toolkit concepts in a series of case studies and background information on environmental health, as well as introductions to local pollution issues and local resources on environmental health, including the 10 PEHSUs. http://psr.igc.org/ped-toolkit-project.htm

The **National Center for Healthy Housing**, with funding from EPA, is delivering training to public health nurses on residential environmental health hazards. Substandard housing is a key determinant of health and has been linked to childhood lead poisoning, asthma and respiratory disease, and unintentional injuries. The center reached 400 nurses through its modified flagship course, *Essentials for Healthy Homes Practitioners*, which explains the relationships between housing and health and identifies ways to improve housing-related health outcomes. As part of this effort, the center launched a new online *Pediatric Environmental Home Assessment* course specifically targeting nurses. www.healthyhomestraining.org/Nurse/index.htm

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Protecting Children Worldwide

Educating Professionals in Central and Eastern Europe: Medical and public health schools in Iowa, Kansas, and Ohio are providing, with EPA support, a 2-year pediatric environmental health education program to child health professionals in Bosnia-Herzegovina, Croatia, Hungary, Poland, Romania, and Slovakia. Last year more than 40 participants completed the series of interactive lectures and attended a 3-day workshop in Slovakia. This year more than 60 participants registered for the program. First-year participants are enthusiastic about their experiences:

- One has joined an environmental research project jointly sponsored by her country and the European Union.
- Another has begun a series of lectures on children's environmental health for senior medical students.
- A third participant reports: "I can recognize environment-related risk factors and contributors more often, and discuss it with parents and children more convincingly. I am often able to convince parents and children of the importance of these factors, and help them to avoid hazardous environmental risk."
- A fourth graduate has initiated a 40-hour course to train Hungarian nurses about children's environmental health.
- A Romanian colleague reports that "I try to identify environmental factors early in the disease evolution as a risk factor, especially in respiratory tract diseases." Involvement with the collaboration "is a big opportunity for us to build relationships with other colleagues…In my country a very useful collaboration between the participants is growing up," she says.

After the project wraps up this year, organizers hope to provide opportunities for graduates to meet regularly and remain connected through the Fogarty Network–sponsored Summer Institute for Rural and Environmental Health held annually in Eastern Europe.

Teaching the Hemisphere's Health Pros: The Canadian Institute of Child Health is working with the Asociación Argentina de Médicos por el Medio Ambiante; Canadian Association of Paediatric Health Centres; International Society of Doctors for the Environment; Societies of Paediatrics in Argentina, Chile, Paraguay, and Uruguay; and the World Health Organization (WHO) to educate and train health care professionals about children's environmental health issues. With funding from EPA, eight workshops were held with the *WHO Training Modules on Children's Environmental Health*, translated and adapted to reflect local issues, reaching 2,000 professionals.

The **International Pediatric Association** (IPA), with support from EPA, launched a virtual International Pediatric Environmental Health Leadership Institute, which could eventually reach up to 500,000 pediatricians about children's environmental health. IPA, WHO, and the United Nations Environment Program held workshops in Nairobi, New Delhi, and Port-au-Prince that attracted 67 medical professionals from 21 African countries, 44 professionals from India, and 70 professionals from Haiti. The workshops used the *WHO Training Modules on Children's Environmental Health*, which were developed with EPA support. The leadership institute will evaluate its training by administering a pediatric environmental health examination to those who attended the workshops. Pediatricians will become diplomats of the institute and will help teach workshops, serve as resources for information requests, provide clinical consultation upon request, and advise policymakers. Ultimately, the institute will improve participants' expertise and leadership in recognizing, diagnosing, preventing, and managing pediatric diseases linked to environmental factors, and will enable them to be champions of healthy environments for children.

Quicksilver Response: In February 2006, St. Andrew's School in Paranaque, Philippines, had a mercury spill in a classroom during a chemistry experiment. Few measures were taken to clean up the mercury, which appeared to be tracked throughout the school, and some of the children reportedly played with the mercury beads. Clinical evaluation determined that 18 children had high mercury levels and 3 later underwent chelation therapy. A multi-agency task force of national and local government agencies was formed to assess and direct cleanup of the school; however, they soon realized they had neither the equipment nor expertise to adequately assess conditions. The Philippine government made a formal request of the U.S. Embassy for technical assistance from EPA. The EPA Region 9 Environmental Response Team traveled to Manila to assess the severity of the spill and help craft a response plan. The Philippines/EPA team supervised the complete remediation of the mercury hazard, using local contractors, and certified that mercury vapor levels were recognized as safe before reopening the school.

Curbing Cooking Smoke: More than half the world's population and about three-quarters of households in developing countries rely on solid fuels (e.g., wood, dung, crop residues, and coal) for everyday cooking and heating needs, filling homes with harmful smoke and particulate matter. Among children younger than 5, breathing dangerous levels of this smoke increases susceptibility to acute lower respiratory infections. Worldwide, such infections continue to be the biggest killer of young children, causing more than 2 million deaths annually—19 percent of deaths in children younger than 5. The Partnership for Clean Indoor Air, launched by EPA in 2002, is tackling this issue by introducing safer and cleaner burning fuels and cooking technology that result in healthier homes. More than 130 public and private organizations in 67 countries are working together on the initiative. Since 2003, they have convinced 1.3 million households to adopt clean and efficient cooking. In March 2007, at the Third Biennial Partnership Forum, 35 organizations made commitments to get clean, efficient cook stoves to 1.4 million households in the next year and more than 6.6 million households within 3 years. www.pciaonline.org

Mining Gold: EPA continues to achieve reductions in mercury use and emissions through global partnerships. In Senegal, for example, EPA is working with local organizations and mining communities to reduce exposure to mercury used in artisanal gold mining. In many artisanal mining communities, there is little public awareness of mercury's dangers or how to minimize risk. Nursing mothers and children are often involved directly in the amalgamation and refining processes that release significant amounts of mercury vapor. By introducing best practices and appropriate technologies, the project will improve the health and developmental outcomes of children in these communities. In the Brazilian Amazon, EPA has developed a mercury vapor control system for small-scale shops that refine the amalgamated gold. Presently mercury is emitted directly into streets in Amazonian towns. The low-cost, locally manufactured system will reduce mercury emissions by more than 80 percent. www.chem.unep.ch/mercury/partnerships/

Asthma and the Environment

Asthma continues to be a major environmental public health challenge worldwide. Its prevalence has continued to increase over the last 10 years. In the United States, more than 20 million people, including 6.5 million children in 2005, have asthma, which accounts for more than 14 million outpatient clinic visits and nearly 2 million emergency room visits every year. Asthma is the most common serious chronic disease of childhood, and reducing exposures to environmental asthma triggers is an essential component of national asthma care guidelines.

Addressing Disparities: African Americans continue to have higher rates of asthma-related emergency room visits (350 percent higher), hospitalizations (240 percent higher), and deaths (200 percent higher) than Caucasians. Approximately 2 million Hispanic Americans have asthma; Puerto Ricans are disproportionately affected. Further, costs to society in annual expenditures for health and lost productivity continue to increase and are currently estimated at $16 billion. To address disparities, EPA funded the Asthma Health Outcomes Project to understand what is working at the community level. The results of this landmark study indicate that successful asthma programs have common characteristics: strong community ties, connections to health care systems, partnerships with a variety of other organizations, and ability to provide asthma interventions tailored to individual needs.
www.asthma.umich.edu

EPA launched the **Communities in Action for Asthma-Friendly Environments** network in 2006. This initiative is aimed at accelerating adoption of best practices at the community level, linking community resources to a sustainable infrastructure, and accelerating national progress toward reducing asthma and asthma disparities. Nearly 200 community programs are pursuing strategies to improve health outcomes. The network is supported through an interactive Web site that allows education, communication, resource sharing, and recognition. With a goal of 1,000 communities participating by 2010, EPA expects national indicators of asthma morbidity and mortality to decline.
www.asthmacommunitynetwork.org

Research: EPA scientists developed the Asthma Research Strategy in 2002 to advance scientific understanding of exposure, health effects, risk assessment, and risk management of indoor and outdoor environmental pollutants linked to asthma. EPA supports research studies to address three high-priority areas:

- Role of air pollutants in onset and exacerbation of asthma
- Susceptibility, or factors that increase risk for subgroups, such as socioeconomic status, residence history, genetics, lifestyle, and health
- Interventions for reducing risks from environmental factors

Education and Outreach Activities: With the Ad Council, EPA launched the National Childhood Asthma Public Service Campaign in 2000 to educate parents about preventing serious asthma attacks. Public awareness efforts over the last 10 years have resulted in much greater awareness among caregivers of the environmental triggers of asthma. Educating families is essential to improving asthma outcomes. Working with national nonprofit organizations, EPA has supported educational efforts to help families reduce exposures to the things in their homes that make asthma worse. Nationally, awareness and response have improved; now, 30 percent of caregivers of children with asthma take actions to reduce exposure. EPA has also worked to educate more than 2,000 health care providers about environmental triggers. With encouragement from EPA, health plans in the United States have also made measurable progress in integrating environmental concerns into asthma management. Medicaid plans increased coverage for environmental asthma management from 5 percent in 2004 to 27 percent in 2006. Private plans increased coverage from 19 percent to 27 percent.

Awards and Recognition: EPA's National Environmental Leadership Award in Asthma Management recognizes health plans and health care providers who best manage the environmental triggers of asthma. Recognized in 2007:

Maine Health: Serving more than 90,000 patients with asthma, including 27,000 children, the AH! [Asthma Health] Program run by MaineHealth combines standards-based clinical care with strong environmental asthma management. The program has a strong presence outside its clinical settings, having built relationships with community organizations, schools and child care centers, public health departments, and others. It has reduced emergency room use, hospitalizations, and missed school days, and improved physician compliance with national guidelines for asthma care.

Priority Health: The private, nonprofit health plan serves 8,000 patients with asthma, including 5,600 children, in 43 Michigan counties. In the late 1990s, Priority Health recognized the need for home-based asthma care that includes environmental trigger management. To deliver effective care, Priority Health formed a first-of-its-kind partnership with the Asthma Network of West Michigan. The partnership uses the network's case managers and social workers to provide home-based education, home environmental assessments, and resources to reduce exposure to asthma triggers. The results of this effort include improved medication use and significant reduction in emergency room visits and hospitalizations.

Read more about asthma and the environment at www.epa.gov/asthma

The **Asthma Regional Council**, created in 2001 with help from EPA New England (Region 1), is a coalition of public agencies, private organizations, and researchers working to address the environmental contributors to asthma. The council has documented and tracked asthma rates in children and adults, trained hundreds of professionals on healthy housing, adopted IPM, and instituted healthy building and maintenance standards at 67,450 existing and new housing units to benefit children and families across New England. www.asthmaregionalcouncil.org/

Increasing Environmental Health Literacy

Born to Be Healthy: The Prenatal Partnership on Environmental Health works to ensure that children in the United States are born in the best health possible by eliminating or cutting environmental health risks to pregnant women. The coalition of health professional organizations, academia, Federal agencies, PEHSUs, and other service providers has these goals:

- Promote community behaviors and social changes that reduce exposure of pregnant women and children to environmental health risks.
- Promote clinician behaviors that (1) reduce exposure of pregnant women and children to environmental health risks, (2) educate families about risks, and (3) support community and social changes that reduce risks to pregnant women and children.
- Promote individual behaviors that reduce risks to pregnant women and children.
- Promote understanding of environmental health risks before, during, and after pregnancy,

PEHSU Tribal Summit: The 2007 Tribal Nations Children's Environmental Health Summit was organized by EPA and the PEHSUs from Region 6, Region 8, and Region 10 in partnership with ATSDR and the Indian Health Service. Tribal children can have different exposures to environmental contaminants than the general population because of their unique cultures, lifestyles, and religions. As a result, they can face a disproportionate burden of environmental health hazards.

Toxicity and Exposure Assessment for Children's Health (TEACH): Begun in 1998 to improve access to children's environmental health risk information, this Region 5 project consolidates scientific literature for a subset of chemicals and provides access through a Web site. The site has two major components: a searchable database and chemical summaries. It includes all peer-reviewed scientific literature on children's environmental exposure and toxicity related to the subset of chemicals.published since 1972. The chemical summaries highlight information from TEACH and other government resources such as the Integrated Risk Information System. TEACH currently provides information for 18 chemicals or chemical groups, including arsenic, benzene, formaldehyde, three forms of mercury, and polychlorinated biphenyls (PCBs). www.epa.gov/teach

Outreach to Prevent Pesticide Poisonings: Spanish-speaking households are often not reached by traditional English-language media, but rates of asthma and the potential for pesticide exposure in this population are among the highest in the Nation. Therefore, EPA started an education campaign in Spanish about the dangers of pesticide exposure, especially among children. During this year's National Poison Prevention Week, EPA reached over 28 million Hispanics through national and local TV, radio, and print media outlets, centered on the theme "Children Act Fast and So Do Poisons." Nearly half of all U.S. households with children under age 5 had at least one pesticide stored in an unlocked cabinet and within reach of children. Other outreach messages address IPM techniques for pest control and pesticide risk reduction, migrant family worker safety, children's health and pesticides, green landscaping practices, and pregnancy and pesticides.

Scouting and Environmental Health: EPA began work with the Girl Scouts of America on environmental health issues in 2001. An Environmental Health Badge was created and an Environmental Awareness Badge Day was started in collaboration with the Northwest Georgia Girl Scout Council in EPA Region 4. For each of the last 5 years, more than 50 volunteers from EPA, Hughes Spalding Children's Hospital, Keep Georgia Beautiful, Lowe's home improvement stores, and other organizations have shared their environmental health expertise with scouts. Scouts progress through a series of creative stations that educate them on a range of environmental topics, such as water and air pollution testing, pollution prevention, recycling, asthma screening, lead awareness, and sun safety. The council presented Region 4 with the local Girl Scout Daisy Award and National Trefoil Award, the highest award an outside organization can receive from the Girl Scouts.

EPA recognizes that environmental challenges to children's health remain. Some are daunting in their scope, such as the effects of global climate change on the health of the world's children. Some problems seem to mock us with their persistent recurrence, such as the disproportionate effects of exposure on minority and poor children. Some challenges are inevitable—such as natural disasters and their environmental health consequences—and must be addressed with the best judgment, resources, and professionalism we can muster. All these concerns, together with the longstanding challenges to clear our air, filter our water, restore the land, safely grow food, remove waste, and treat sewage, require our continued leadership and collaboration with many diverse partners.

While we have made significant progress since Executive Order 13045 was issued 10 years ago, much more can be accomplished. EPA is committed to protecting children and is steadfast in its efforts to develop sound science, issue protective regulations, and raise awareness to create a healthy environment so that current and future generations of children continue to thrive.

For more information, visit EPA's Child and Aging Health Protection Division at:
www.epa.gov/children

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