

US EPA ARCHIVE DOCUMENT

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BEFORE THE  
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Chairman Boxer, Ranking Member Inhofe, and Members of the Committee, thank you for the opportunity to appear before this committee to discuss EPA's efforts to improve children's health.

Children's health is a driving force behind Administrator Jackson's priorities. In a February 2010 memo to EPA senior managers, she reaffirmed EPA's commitment to considering the health of pregnant women, infants and children in all human health related activities and to the use of EPA's 1995 Policy on Evaluating Health Risks to Children and the best available research and data to guide our children's health protection efforts. In the memo, Administrator Jackson describes EPA's Children's Health Agenda and identifies the Office of Children's Health Protection as having the lead in ensuring that the Agency is successful in its efforts to protect children's health.

**Why Focus on Children?**

EPA's mission is to protect human health and the environment. Ensuring that our children are protected from exposure to environmental threats is central to EPA's work. Children face greater

threats from environmental pollutants than adults due to differences in their physiology, activity patterns and development. And not all children are the same: we continue to see disparities in exposures and health outcomes among the poor, African American, Latino, Native American and other ethnic minorities.<sup>1</sup>

Children eat, drink and breathe more per pound than adults. When food, water, or air is polluted, children are exposed to more of the pollution than adults. For example, an average infant less than 6 months old consumes 2.5 times more water than an adult on a per pound basis.<sup>2</sup>

Children can have greater exposure to chemicals through behaviors that are unique to childhood, such as crawling, putting objects in their mouths, and eating nonfood items. Children also have unique exposures, for example, through the umbilical cord and through breast milk. Their bodies are rapidly developing. Exposure to toxic chemicals during critical windows of development can lead to disease or other serious effects on organ systems.<sup>3</sup>

Children's rapid development during pregnancy and childhood may also increase their vulnerabilities to toxicants. For example, the nervous system begins to rapidly develop in the embryo only days after conception and continues to develop through puberty. Depending upon the toxicant, early exposures may have serious consequences throughout a child's life.

Administrator Jackson recently began a new era of focus on communities historically underrepresented in EPA decision making. EPA will build strong working relationships with

tribes, communities of color, and economically distressed cities and towns, and we will include children's environmental health and environmental justice principles in all of our decisions.

### **Report from General Accounting Office**

GAO was asked by this committee to determine the extent to which EPA has institutionalized and prioritized the protection of children's health from environmental risks.

EPA agrees that the GAO report reflects well the early history and progress of the Agency's children's health protection efforts. The report accurately portrays the Agency's challenges in addressing children's environmental health, and sets forth sound recommendations on steps that could be taken to better incorporate protection of children's health as an integral part of EPA's everyday business.

Administrator Jackson noted in a September 2009 memo that "...several goals central to the environmental mission of this Administration need to be brought into the regulatory process as early as possible in order to give them the attention they are due; these are environmental justice, children's health, and climate change....With respect to children's health, early attention to this issue is critical to grasping the full implications of a regulatory or policy decision for children and to addressing those implications in the decision making process."

Offices throughout the Agency continue to work to protect children's health by implementing mandates, developing regulations, supporting programs, reaching out to communities, and

funding and conducting research. GAO's recommendations will help EPA to strengthen these efforts to bring about even more tangible results.

EPA and the Department of Health and Human Services (HHS) are joining with other federal departments and agencies to work towards reestablishing the President's Task Force on Environmental Health Risks and Safety Risks to Children, and with this group we will collaborate to address the most critical children's environmental health issues facing the Nation. Through our participation in the President's Task Force on Childhood Obesity, EPA is also working with other federal agencies to address environmental factors that contribute to the pervasive problem of obesity in children.

Administrator Jackson has made clear that children's environmental health will be a top priority for EPA under her leadership and we are in the process of implementing a comprehensive strategy to ensure protection of children's environmental health at EPA.

#### **EPA's strategy on children's health**

- 1. EPA will use the best science to ensure that regulations provide for protection of children's environmental health by actively addressing the potential for unique childhood vulnerability and exposure.** Our goal is to reduce negative environmental health impacts on children through rulemaking, policy, enforcement and research that focus on prenatal and childhood vulnerabilities.

**National Ambient Air Quality Standards (NAAQS):** EPA is confronting the harmful effects of criteria pollutants on the health of children. For example, we have decided to reconsider the 2008 national smog standards to ensure they are scientifically sound and protective of human health. Smog, which is also known as ground level ozone, has been linked to asthma and other respiratory illnesses in children. “This is one of the most important protection measures we can take to safeguard our health and our environment. Smog in the air can cause difficulty breathing and aggravate asthma, especially in children,” said EPA Administrator Lisa P. Jackson. “Reconsidering these standards and ensuring acceptable levels of ground level ozone could cut health care costs and make our cities healthier, safer places to live, work and play.”

EPA has enhanced its **Rule and Policy Information Development System (RAPIDS)** to collect more targeted information regarding effects on children’s health. Specifically, programs are now asked to provide information on whether a rule is likely to address an adverse impact on childhood life stages and the nature of that impact.

**America's Children and the Environment:** EPA is developing appropriate indicators of its efforts in protecting children’s health. *America's Children and the Environment* brings together quantitative information from a variety of sources to show trends in levels of environmental contaminants in air, water, food, and soil; concentrations of contaminants measured in the bodies of mothers and children; and childhood diseases that may be influenced by environmental factors.

The report presents indicators of key factors relevant to the environment and children in the United States; informs discussions among policymakers and the public about how to improve federal data on children and the environment; and helps policymakers and the public track and understand the potential impacts of environmental contaminants on children's health and, ultimately, to identify and evaluate ways to minimize environmental impacts on children.

EPA's America's Children and the Environment website is updated annually with the most current data available for our indicators of contaminants, body burdens and illnesses related to environmental exposures in children. The website presents data for 21 different indicators of children's environmental health, including measures for drinking water contaminants, blood mercury levels, and neurodevelopmental disorders. The next update to the website will take place this summer. We have also started working on developing several new indicators to represent additional children's environmental health topics. We obtained input from the Children's Health Protection Advisory Committee on our selection of new topics and data sets, and plan to publish an updated edition of America's Children and the Environment in 2011.

In addition, EPA is a partner in the development of the federal government wide *America's Children Report*.

**Children's Environmental Health Centers:** The Children's Environmental Health Centers, established in 1998 by HHS's National Institute of Environmental Health Sciences (NIEHS) and EPA, examine the interactions between key environmental exposures and a range of child health outcomes, including overall growth and development, asthma and respiratory health and

neurodevelopmental disorders such as autism. Collectively, these centers comprise a national network of scientific and community leaders, health care providers, and government officials with the common goals of preventing and reducing childhood diseases in the research areas under study and translating the findings to the affected communities and the broader public.

The Children's Environmental Health Centers have evolved over the past ten years to emphasize a multidisciplinary approach that includes basic, applied, and community based participatory research. EPA will use research results from the children's centers to develop more robust protections for children's environmental health.

**National Children's Study:** The National Children's Study is the largest ever study of children's health in the US and is expected to examine the development of 100,000 children from before birth to age 21. Of high relevance to EPA, the study will eventually provide data for investigating the effects of environmental exposures (chemical, biological, physical, and psychosocial) as well as gene-environment interactions on pregnancy outcomes, child health and development, and precursors of adult disease.

By studying the same children over time through their different phases of growth and development, including early life exposures, we hope to be able to better understand the role of environmental factors in health and disease. The study is expected to provide data that will play an important role in helping EPA establish policies that are based on science and protective of children's health. Household and community level environmental measures analyzed together with biological indicators will help us identify health risk factors across multiple life stages.

The data generated from these activities are expected to directly inform interventions for EPA, public health stakeholders, manufacturers, designers and builders. Data from the National Children's Study are also expected to help EPA evaluate the consequences and the effectiveness of our regulatory decisions.

## **2. Protecting children through safe chemicals management.**

The **Toxic Substances Control Act (TSCA)** Inventory currently contains over 80,000 existing chemicals, few of which have been studied for their risks to children. Assuring the safety of chemicals in our products, our environment and our bodies is critical to ensure the health of children. EPA will consider establishing standards, policies, and guidance at home and abroad to help eliminate harmful prenatal and childhood exposures to pesticides and other toxic chemicals.

Unlike the laws applicable to drugs and pesticides, TSCA does not have a mandatory review program for EPA to determine the safety of existing chemicals. In addition, TSCA places legal and procedural requirements on EPA before the Agency can request the generation and submission of health and environmental effects data on existing chemicals. It has also proven difficult in some cases to take action to limit or ban chemicals found to cause unreasonable risks to human health or the environment.

There is growing interest in the United States to modernize TSCA. Last year Administrator Jackson announced principles for modernizing the Toxic Substances Control Act. We are hopeful that TSCA will be updated by Congress so that we are better able to take action on

chemicals that pose a concern, particularly those that adversely affect children. Separately, EPA is shifting its focus to address chemicals that pose a concern to the public. At the end of 2009, EPA's Office of Prevention, Pesticides and Toxic Substances released an initial set of chemical action plans for four groups of substances, and more plans are in the pipeline for 2010.

**Pesticides:** EPA also recognizes that children may be more vulnerable to pesticide exposure and, under the Food Quality Protection Act of 1996 (FQPA), EPA is required to consider an extra margin of safety to protect children when regulating pesticides. Over a 10 year period, EPA reevaluated all food use pesticides to ensure that they were protective and eliminated uses where risks exceeded our level of concern. For example, indoor uses of chlorpyrifos and diazinon were largely eliminated, as well as use of those pesticides on residential lawns based in part on potential risks to children. Many food uses of methyl parathion were eliminated for that reason.

EPA has taken steps to protect children from pesticide risks in addition to increasing safety factors in risk assessments and improving risk management decisions. We are working closely with partners such as the Department of Housing and Urban Development (HUD) and, in HHS, the Centers for Disease Control and Prevention and the Administration for Children and Families, to protect children from pesticides in residences and in schools. EPA developed a Pest Management Strategic Plan for School Integrated Pest Management (IPM) and as part of our Healthy Homes Initiative, developed a comprehensive IPM in Housing Strategy designed to make IPM standard practice in affordable housing nationwide. We are conducting public education campaigns on the safe storage of pesticides, use of pesticides in child care centers, and the importance of following pesticide labels.

We are also planning to further strengthen assessment of pesticide health risks. EPA has taken public comment on a proposed approach that would include a more thorough assessment of risks to workers, including farmworkers and farm children, as well as risks posed by pesticides that are not used on food. Under the proposal, EPA risk assessments for children and farmworkers, would consider aggregate pesticide exposures from all sources in addition to cumulative effects from multiple pesticides that have similar toxicity. EPA also would apply an additional safety factor to protect infants and children from the risks of pesticides where the available data are incomplete. By modifying our risk assessment approach, we hope to continue to minimize the adverse health consequences of pesticide exposure.

**3. Coordinate national and international community based programs to eliminate threats to children's health while measuring and communicating our progress.**

**Healthy School Environments:** The Energy Independence and Security Act directed EPA to develop guidelines for healthy, high performing schools. Healthy schools provide a clean, safe, and energy efficient learning environment, encourage physical exercise through multiple transportation choices such as biking and walking, and reduce the need for additional buildings and facilities by sharing recreational and other facilities with the broader community.

EPA is collaborating with HHS, the Department of Education and a diverse group of stakeholders, through our Children's Health Protection Advisory Committee, to develop guidelines to help states and communities make better decisions with respect to where new

schools are located. We will receive a report from the Advisory Committee in April, and we expect to release a draft for public review in the Fall. Guidelines will provide tools to communities to build a new generation of healthy green schools, and will ensure that existing schools are in good condition and properly maintained.

**Healthy Homes:** Children spend more time in their homes than in any other environment, and are at greater risk from environmental hazards in the home than adults. Exposure to lead-based paints and other environmental hazards in the home disproportionately impact children, the poor, and minorities.

According to HUD's 2007 American Housing Survey, nearly 6 million households live with moderate or severe physical housing problems. About 24 million homes face significant lead-based paint hazards.

As stated in the Surgeon General's Call to Action to Promote Healthy Homes, "Residents of homes with significant upkeep problems and structural and safety defects, such as lack of specific safety devices, deferred maintenance, moisture, and pest infestation, are also at increased risk for housing related illness, injury, and disability".<sup>4</sup> Housing related health costs total in the billions annually. Examples of housing related health hazards include lead based paint, radon, and other toxins in the environment.<sup>5</sup> Depending upon exposure levels, housing related hazards may cause lead poisoning, cancer, and neurobehavioral disorders.

EPA, HHS and HUD are collaborating to respond to the Surgeon General's Call to Action on healthy homes<sup>6</sup> by taking advantage of opportunities to leverage federal resources to provide states, Tribes and local communities with the necessary tools to help improve home environments, particularly in underserved communities.

**Pediatric Environmental Health Specialty Units:** With HHS's Agency for Toxic Substances and Disease Registry, EPA supports the Pediatric Environmental Health Specialty Units, a program that provides advice to communities, healthcare providers, and parents on children's environmental health issues. The Units bring together many disciplines, such as occupational and environmental health physicians, pediatric practitioners, medical toxicologists, nurses and other specialists. These experts in environmental exposures work to prevent, diagnose, manage and treat environmentally driven health issues in children. They are located in hospitals in each of the ten EPA regional offices, and this model is being utilized in other countries as well. The Units assist primary health care professionals in a wide range of exposures such as lead, arsenic, carbon monoxide, pesticides, air pollutants, mold, waterborne contaminants, toxic waste, agricultural pollution and household chemicals. They also assist in site specific cases, such as school and day care environments; deal with diagnostic dilemmas, where the etiology of problems are possibly environmental in nature; and educate health care providers and the general public about children's health issues related to exposure to environmental contaminants. Parents and other public health professionals often enlist the aid of the Units directly.

**Environmental Health Disparities:** Two critically important environmental health issues -- childhood asthma and lead exposure -- demonstrate an inequality in exposures and health effects

for some of America's children. For example, one study indicates that children who belong to racial or ethnic minorities often have greater harmful exposures and poorer health outcomes than white children.<sup>7</sup> Improving the environment and public health for all necessitates a special focus on health disparities and their causes.

**Asthma:** Asthma is a chronic disease affecting about 6.8 million children in the United States.<sup>8</sup> It is a major reason for emergency room and hospital visits and missed school days. The burdens of asthma fall more heavily on African American and Puerto Rican children.<sup>9</sup> In 2004 to 2007, 13% of African American children, regardless of family income, had asthma.<sup>10</sup> This compares to 8% of White, 7% of Mexican-Americans, 20% of Puerto Rican children, and 10% of American Indian and Alaskan Native children.<sup>11</sup>

Children may inherit a tendency to develop asthma, and racial and ethnic differences in the burden of asthma may be related to social and economic status, access to health care, and exposure to environmental triggers.<sup>12</sup> Asthma rates have increased worldwide.<sup>13</sup> The US rate increased 75% from 1980 to 1994. In 2005, 12.7% of children had been diagnosed with asthma at some point in their lifetime.<sup>14</sup> The largest increase was among children up to 4 years old (160%). Rates among children 5 to 14 years old increased by 74%.<sup>15</sup> Although asthma rates have stabilized, a 2005 study showed that childhood asthma rates remain at an all time high.<sup>16</sup>

For the period 1980-2005, increases in asthma rates among poor minorities have been even larger than the averages.<sup>17</sup> EPA's policies to address asthma take minority children into special consideration. The EPA Asthma Initiative,<sup>18</sup> which was originally set forth in the 1999 Asthma

Strategy developed by the President's Task Force on Environmental Health Risks and Safety Risks to Children, includes research, education and outreach to identify the environmental factors that cause asthma and asthma symptoms, and to replicate effective interventions to mitigate these factors in homes and schools.

EPA sponsored the Asthma Health Outcomes Project—a 2006 study showing that asthma programs that address environmental triggers work best to improve health outcomes, such as reduced emergency room visits, improved quality of life, and fewer missed days of school or work, when they build strong connections with front-line health care providers and local communities.<sup>19</sup>

In response, we launched the Communities in Action for Asthma Friendly Environments initiative in 2005-2006. This initiative creates a network of community programs, nearly 500, pursuing strategies to achieve positive health outcomes, including cultivating program leaders, establishing sound community relationships, maximizing cooperative opportunities, providing integrated health care services and implementing tailored environmental interventions.

Leading programs in the Network are realizing 50-80% reductions in emergency department visits and hospitalizations, based on each program's tracking studies. These programs track outcomes for their enrolled patients -- in general, they compare outcome endpoints at 12 months to baseline at time of enrollment.<sup>20</sup>

**Lead:** It is often recognized that the removal of lead from gasoline and resulting lowered blood lead levels in children is a public health success story. The average concentration of lead in the blood of children 5 years old and under dropped from 15 micrograms per deciliter ( $\mu\text{g}/\text{dL}$ ) in 1976-1980 to 1.4  $\mu\text{g}/\text{dL}$  in 1999-2004, a decline of 91%.<sup>21</sup> Lead also has been eliminated or reduced in paint, drinking water, food and beverage containers and ceramic ware, and in products such as toys, mini blinds, and playground equipment. The lead strategy developed in 2000 by the President's Task Force on Environmental Health Risks and Safety Risks to Children was instrumental in furthering reductions of blood lead in America's children.

Although this decline in elevated blood lead levels is heartening and has been seen among all ethnic groups, lead levels continue to be highest among African American children, whose median blood lead level remains significantly above that of other children.<sup>22</sup> From 1999-2004, some 285,000 children aged 1–5 were estimated to have elevated blood lead levels each year; 33% of these were Black children.<sup>23</sup> Residence in older housing, poverty, age, and being non-Hispanic black are still major risk factors for higher lead levels.<sup>24</sup> This is also seen on a community wide level; one inner city prevalence study published in 2004 found that 27% of children in two inner city Chicago communities had elevated blood lead levels.<sup>25</sup>

As part of an effort to address new cases of elevated blood lead levels arising as a result of renovation and repair work, in 2008, EPA issued an additional rule aimed at protecting children from lead paint hazards. The Lead Renovation, Repair and Painting Rule (40 CFR Part 745) provides broad protections against inadvertent lead poisoning by requiring contractors and construction professionals to be trained, certified and to use lead safe work practices during

renovation, repair and painting in pre-1978 housing and childcare centers. The rule also requires contractors to provide an important lead hazard information brochure to property owners, tenants, and owners and operators of buildings that have child occupied facilities as well as to the parents and guardians of children under age six using the facilities.

The rule will be fully effective in April 2010. In addition, last August EPA announced plans to propose further strengthening and expanding the scope of these regulations.

**Sustainable Communities:** Our work at EPA extends beyond protecting the natural environment. These days, more and more we're talking about the built environment. And our focus is not just on how human activities affect the environment. It's about how the environment we have created in our towns and cities and communities where we live can affect our health and well being. Chronic diseases such as diabetes and asthma are influenced by environmental conditions. In low income communities children are often at greatest risk from exposure to contaminants. Housing and community based interventions in low income communities are likely to contribute to reducing health disparities in the US.

We will also work with Tribes, states and local communities to design and implement policies that improve the environment and protect children. We will work to ensure safe and healthy places for children to live, learn, work and play by providing leadership and focus to America's community infrastructure, its homes, schools, child care centers, farmlands and workplaces.

As part of our efforts in all these areas, we will utilize our Children's Health Protection Advisory Committee to help ensure that we are developing effective strategies to address the most significant threats to children's environmental health.

## Conclusion

Thank you, Chairman Boxer, and members of the Committee for the opportunity to talk to you today. As evident by our strategy and actions, Administrator Jackson and I share your commitment to children's environmental health and we appreciate your ongoing interest in our efforts. Thank you again for inviting me to give testimony and I look forward to answering any questions you might have.

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<sup>1</sup> America's Children and the Environment. U.S. Environmental Protection Agency. <http://www.epa.gov/envirohealth/children/index.htm>

<sup>2</sup> U.S. EPA. Child-Specific Exposure Factors Handbook (Final Report) 2008. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-06/096F, 2008, <http://cfpub.epa.gov/ncea/CFM/recorderdisplay.cfm?deid=199243>

<sup>3</sup> Barr DB, Bishop A, Needham LL. 2007. Concentrations of xenobiotic chemicals in the maternal-fetal unit. *Reproductive Toxicology* 23(3): 260-6.

<sup>4</sup> U.S. DHHS. Surgeon General's Call to Action to Promote Healthy Homes. U.S. Surgeon General, Washington, DC, 2009, <http://www.surgeongeneral.gov/topics/healthyhomes/index.html>

<sup>5</sup> Leading our Nation to Healthier Homes: The Healthy Homes Strategic Plan. U.S. Department of Housing and Urban Development. 2009. [http://www.hud.gov/offices/lead/library/hhi/hh\\_strategic\\_plan.pdf](http://www.hud.gov/offices/lead/library/hhi/hh_strategic_plan.pdf)

<sup>6</sup> U.S. DHHS. Surgeon General's Call to Action to Promote Healthy Homes. U.S. Surgeon General, Washington, DC, 2009, <http://www.surgeongeneral.gov/topics/healthyhomes/index.html>

<sup>7</sup> Dilworth-Bart JE and Moore CF, Mercy Mercy Me: Social Injustice and the Prevention of Environmental Pollutant Exposures Among Ethnic Minority and Poor Children. *Child Development*. 2006;77:247-65.

<sup>8</sup> Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey. <http://www.cdc.gov/nchs/nhis.htm>

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Reviewed in: Asthma and Allergy Foundation of America and The National Pharmaceutical Council. Ethnic Disparities in the Burden and Treatment of Asthma. Washington, DC. January 2005. [www.aafa.org](http://www.aafa.org)

<sup>13</sup> National Institutes of Health. Global Strategy for Asthma Management and Prevention: NHLBI/WHO Workshop Report. National Heart, Lung, and Blood Institute, National Institutes of Health; 1995. NIH Publ. No. 95-3659

<sup>14</sup> Akinbami LJ. The State of childhood asthma, United States, from 1980 to 2005. Advance data from vital and health statistics; no 381, Hyattsville, MD: National Center for Health Statistics.

<sup>15</sup> Mannino DM, Homa DM, Pertowski CA, et al. Surveillance for Asthma—United States, 1960–1995. *MMWR Morb Mortal Wkly Rep.* 1998;47(SS-1):1–28

<sup>16</sup> Akinbami LJ. The State of childhood asthma, United States, from 1980 to 2005. Advance data from vital and health statistics; no 381, Hyattsville, MD: National Center for Health Statistics.

<sup>17</sup> Ibid.

<sup>18</sup> <http://www.epa.gov/asthma>

<sup>19</sup> <http://www.epa.gov/asthma/ahop.html>

<sup>20</sup> <http://www.asthmacommunitynetwork.org>

<sup>21</sup> SOURCE: America's Children and the Environment. U.S. Environmental Protection Agency.

<http://www.epa.gov/envirohealth/children/index.htm>. DATA: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey,

<http://www.cdc.gov/nchs/nhanes.htm>

<sup>22</sup> “Elevated Blood Lead Levels” is defined as a blood lead level great than 10  $\mu\text{g}/\text{dL}$ . In 2003-2006, Black children had the highest median blood lead level of 2.3  $\mu\text{g}/\text{dL}$ , compared with 1.4  $\mu\text{g}/\text{dL}$  for White children and 1.5 for Mexican-American children. SOURCE: America's Children and the Environment. U.S. Environmental Protection Agency. <http://www.epa.gov/envirohealth/children/index.htm>. DATA: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey,

<http://www.cdc.gov/nchs/nhanes.htm>. The disparity is important to note as research continues to show adverse effects at lower and lower blood lead levels. For more information about health effects at lower blood lead levels, see the National Ambient Air Quality Standards for Lead Final Rule, 73 FR 66964.

<sup>23</sup> Centers for Disease Control, National Center for Health Statistics. National Health and Nutrition Examination Survey: 1999-2004: November 2006.

<sup>24</sup> Pirkle JL, Kaufmann RB, Brody DJ, Hickman T, Gunter EW, Paschal DC. Exposure of the U.S. population to lead, 1991 - 1994. *Environ Health Perspect.* 1998;106:745-50.

<sup>25</sup> Dignam TA, Evens A, Eduardo E, Ramirez SM, Caldwell KL, Kilpatrick N, Noonan GP, Flanders WD, Meyers PA, McGeehin MA. High-Intensity Targeted Screening for Elevated Blood Lead Levels Among Children in 2 Inner-City Chicago Communities. *American Journal of Public Health* 2004;94:1945-1951.