

DRAFT ONLY

CHILDREN'S ENVIRONMENTAL HEALTH INFRASTRUCTURE STUDY

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Executive Summary

In today's world, children live, attend school, and play in an environment that is dramatically different from previous generations. Many new risks have emerged as our nation's population has grown and advanced significantly in technology. The use of chemicals in manufacturing and the disposal of waste are two leading sources for environmental degradation in recent years. Colborn et al (1996) have shown us that chemicals are omnipresent, and we can detect man-made toxins in all humans and animals. The implications of this new environment are particularly important for children. Young people – from fetal development through adolescence – are negatively impacted by polluted environments. Exposure to such toxins like lead, air pollution, pesticides, and mercury are detrimental to developing children. Health impacts to these environments include cognitive function, respiratory, muscular, reproductive, and nervous systems. Because children physically develop through many years, they experience a unique threat to their future well-being. In short, the food we consume and the air we breathe are now more toxic to children than ever before. Children are especially at risk, and various organizations like government must protect this population.

This study seeks to put forth a better understanding of the organizations that deal with protecting children in this new environment. We provide a general overview of the children's environmental health infrastructure in the state of Maryland. Specifically, we aim to:

- Determine the primary state and non-governmental organizations that address children's environmental health issues
- Clarify what has and has not worked in addressing these issues

- Uncover the capacity of the organizations to deal with children's environmental health
- Demonstrate what can be learned from how these organizations effect children's health

To carry out these objectives, we conducted 24 interviews with key players in the children's environmental health arena in Maryland. We then focused on three contaminants and conditions that impact children: 1) lead; 2) asthma; and 3) mercury, and the key informants came from various state agencies and non-profits working to alleviate these environmental health risks. Based upon the interviews of these individuals, we conclude a number of key findings to help advance the children's environmental health infrastructure in Maryland:

- Legislation should be backed by adequate resources to ensure implementation
- Legislation should have a strong enforcement component
- Legislation should use the most up-to-date data and research
- There is a lack of resources to serve the number of children in need
- Adequate resources prevent unnecessary burden on agency with a new mandate
- Limited resources should be prioritized in relation to the extent of the problem
- Agencies should consider the problem of access for especially low-income children
- Costs associated with accessing public services should be reduced
- There is a need for further research into environmental health hazards affecting children.

- Tracking of data that links environment and health is necessary
- Data on children's environmental health must be collected adequately and efficiently
- Coordination among agencies is essential for implementing successful strategies to address children's environmental health issues.
- Strong leadership can help improve coordinating efforts
- Improved communication among state agencies, city agencies and non-profits is necessary
- Public outreach is seen as instrumental in reducing environmental risk among children
- More outreach in high-risk areas is needed
- Community outreach on environmental risk should be in lay terms so the public can understand often complex issues.
- Public education should not occur in a vacuum but must be accompanied by adequate programming

Introduction

This study provides an overview of the children's environmental health infrastructure in Maryland, looking in depth at three environmental hazards affecting children: lead, mercury and asthma. The focus of this study is the Maryland's governmental infrastructure, concentrating on how state agencies are addressing the problem of mercury, lead and asthma from a children's health perspective. The history of children's exposure to toxic chemicals in the environment is a long one, beginning notably with lead. Meanwhile, however, the existence of an infrastructure that deals specifically with children's environmental health is only beginning to grow, with as yet no one governmental agency or department solely responsible for such a broad and yet important issue.

In 2000, the Maryland General Assembly took action to address environmental health issues related to the well-being specifically of children by establishing the Children's Environmental Health and Protection Council (CEHPAC). CEHPAC reviews statutes and proposed legislation to determine if they are addressing the specific needs of children, making recommendations to state agencies and regulatory bodies that environmental laws and policy recognize children's vulnerabilities. CEHPAC commissioned the Center for Urban Environmental Research and Education to do an infrastructure study, recognizing that children are particularly vulnerable to environmental hazards and therefore require a unique response. In many ways, government needs to be proactive and effective in preventing and addressing environmental health exposure when dealing with children since the damage can be

irreversible. During the past 50 years, many thousands of chemicals have been developed with the production of synthetics and the advancement of industry. Similarly, new technologies are able to detect the existence of the numerous chemicals in the environment. According to the Children's Environmental Health Network (CEHN), use of more than 70,000 chemicals is currently allowed in the United States. Knowledge of the full impact of these chemicals on children's health is yet to be fully discovered. However, we are becoming increasingly aware of the environmental health problems associated with poor air quality, mercury, pesticides and other contaminants, and know that children are especially at-risk from exposure.

Maryland in many ways has taken the lead in addressing issues related to children's environmental health, although California and other states are following suit. California, in 1999, passed the Children's Environmental Health Act requiring the state to assess air quality and toxics to ensure that standards protect infants and children, not only adults. In 2001, California also created an Environmental Surveillance System to track environmental exposures and diseases affecting Californians, with the recognition that children are uniquely at risk. Other states such as Indiana, Nevada and Montana have introduced similar legislation to track the links between the environment and health, although not specifically for children. Meanwhile, many states regulate for specific chemicals or diseases that affect children's health and well-being.

Federal regulators are beginning to introduce protocols to address the unique susceptibilities of children. For instance, the Food Quality Protection Act (FQPA) fundamentally changed the way EPA regulates pesticides, requiring the agency to address risks to infants and children. Similarly, with the Safe Drinking Water Amendment Act

that requires special consideration of the needs of infants and children. In February, 1997 the Environmental Protection Agency was restructured to create the Office of Children's Health Protection with the goal of protecting children from the negative effects of environmental hazards. The idea in creating this new agency within EPA reflects the recognition that in today's society children are most at risk of exposure to toxic chemicals and their negative impact.

This infrastructure study focuses on Maryland, analyzing the response by different agencies, through both the legislative and programmatic process, to the problems of lead, asthma and mercury. We begin by discussing the history of legislation and governmental programs for contaminant and condition. Each is analyzed separately in Section 1 – the Case Studies. Our overall goal for this study is to reveal more about how agencies perceive these environmental risks to children's health, work together in their efforts, and understand or recognize what needs to be done to improve governmental responses.

To achieve this, we interviewed a total of 24 people in a number of different state agencies and non-profits. These interviews provide unique insight into the overall infrastructure in Maryland. The content of the interviews was analyzed to reveal themes and identify specific strategies being implemented to alleviate the problems associated with lead, mercury, and asthma, each in relation to the well-being of children. These themes, explored in Section Two of this study, include: the role of legislation; resources; access to services; coordination of efforts; and community outreach. Key informants, in telling us about their role, perception of the legislative process, available resources and

history of the problem of lead, asthma and/or mercury, provided important opinions about Maryland's efforts in addressing children's environmental health.

Methodology

This research study seeks to provide a general overview of the children's environmental health infrastructure in Maryland. The Center for Urban Environmental Research and Education (CUERE) conducted three case studies (lead, asthma, and mercury) to reveal environmental health contaminants that especially affect children. These cases illustrate how federal, state, and non-governmental agencies have addressed these contaminants and health conditions from a children's environmental health perspective. The case studies focus on the organizations, resources, and strategies developed to address children's environmental health.

Our research was divided into two parts: 1) data collection; and 2) data analysis.

We conducted a basic inventory of staff, resources, and written documents that relate to each particular contaminant or condition. In addition, we interviewed key players to provide a more in depth description of the infrastructure. We aimed to synthesize information about the infrastructure's key programmatic components, history, and key informants' assessment. To capture this information, we interviewed 24 individuals that work in the children's environmental health arena in Maryland. The interviewees came from a variety of backgrounds: government, nonprofit areas, and advocacy groups. We developed a questionnaire that guided us through our conversations. The interviews were semi-structured; the questions often times prompted us to obtain additional information. Moreover, we employed a snowball technique that allowed us build upon the data we collected from each successive interview. Our conversations with interviewees many times led us to contact other key players in the field.

After completing the interviews, we constructed a Microsoft Access database that contains the data collected during the interviews. We supplemented the interview material with pertinent information about legislation, government organization, and scientific research through technical literature, web searches and document gathering.

In the second stage of the project, we assembled, organized, and analyzed the material we collected. In each case study, we included information about the inventory of staff, resources, and written documents that address children's environmental health issues (CEHI). For example, we examined how children's environmental health fits into the mission of the agencies and what resources and procedures they have in place to carry out this aspect of their mission. This part of the study provided insight about the stated and intended objectives of the agencies in dealing with children's environmental health. With this, we identified key themes from the interviews and case studies to provide context for the current state of infrastructure in Maryland.

SECTION ONE: THE CASE STUDIES

Lead and the governmental infrastructure

Each year thousands of children in Maryland are exposed to lead from lead-based paint in their own homes. In 2002, the number of children statewide with blood lead levels above 10 $\mu\text{g}/\text{dL}$ was 2,297. The number of tested children who have elevated blood lead levels has declined over recent years. In fact, the proportion of tested children in Maryland with elevated blood lead levels ($\geq 10 \mu\text{g}/\text{dL}$) declined from 18.0% in 1995 to 2.9% in 2002. The number of children poisoned in 2002 was 260, compared to 446 in 1999, a decline of 58%. Although great strides have been made in recent years to deal with the lead problem, the Lead Poisoning Prevention Commission, in their 2001 report, suggested the need for further screening, particularly in “at-risk” areas, to ensure prevention. According to this report, fewer than 13% of children aged 0-6 years and 24% of children aged 2 have been tested for lead poisoning (Maryland Lead Poisoning Prevention Commission, 2001). Meanwhile, testing at age 1 and 2 for Baltimore City children became mandatory under Baltimore City ordinance in July 2000. Since the Commission’s report and the City ordinance, testing statewide, particularly for children ages one and two years old, has increased from 26,672 in 2001 to 27,480 in 2002 for one-year olds and from 16,646 to 17,793 for two-year olds (Maryland Department of Environment, 2003)

There are many governmental agencies and non-profit organizations in Maryland working hard to continue this downward trend and to increase the numbers of children tested. The governmental agencies span a number of different departments, with the two

major players being the Maryland Department of the Environment (MDE) and the Maryland Department of Health and Mental Hygiene (DHMH).

However, because of the nature of the problem of childhood lead poisoning, other governmental agencies are involved, each related to specific areas of concern. For instance, since lead-based paint in homes is the major source of lead-poisoning, the State Department of Housing is an important part of the overall infrastructure. Since children are of primary concern, the schools must be involved. The following is a list of the major governmental agencies involved in lead poisoning prevention:

- Maryland Department of Health and Mental Hygiene
- Maryland Department of the Environment
- Maryland Department of Education
- Maryland Department of Housing
- Baltimore City Health Department

This infrastructure is comprised of key participants across various departments and agencies, each working on different aspects of the problem depending on their mandate. Many were interviewed for this study. However, before giving details on the current programs and thoughts about the state infrastructure, it is important to give some historical perspective on the nature of childhood lead-poisoning and the legislation aimed at dealing with the problem.

Legislative and Policy History

To understand the current governmental infrastructure and involvement in addressing the environmental and health hazards of lead, it is necessary to recognize some key events in the history of the problem. To begin, the first documented case of childhood lead poisoning from paint in the United States was in 1914. Interestingly, this case was a boy from Baltimore who died from ingesting paint bitten from the railing of

his crib. At this time, there was considerable denial about the negative health effects of lead-poisoning, and many viewed childhood lead poisoning as a behavioral problem rather than a medical condition. However, beginning in the early 1930s, Baltimore City was at the forefront of public health knowledge related to lead poisoning in children, due mostly to the vision and sensitivity of Huntington Williams, Baltimore's Commissioner of Health in 1931. In 1935, the health department in Baltimore City began offering free laboratory testing for blood lead levels of anyone suspected of lead poisoning. Huntington Williams managed to persuade the Mayor of Baltimore, Howard Jackson, that the dilapidated slum housing in the city was the cause of the lead problem (Markowitz and Rosner, 2002). In 1941, the city issued an ordinance titled, 'The Hygiene of Housing Ordinance' that authorized the health commissioner to order the removal or abatement of anything in the home deemed 'dangerous or detrimental to life or health'. Lead abatement has been found to be necessary for the safety and health of children since the 1940s (Markowitz and Rosner, 2002).

Recognizing that lead-based paint was a major source of the problem, Baltimore City, in 1951, banned its use in residential construction - the first U.S. municipality to do so. Meanwhile, federal legislation aimed at dealing with the problems associated with lead-based paint was not fully initiated until 1971 with the passage of the Lead-based Paint Poisoning Prevention Act. This Act primarily established protocols for dealing with lead-based paint in public housing and required the Centers for Disease Control (CDC) to establish standards. The federal government, after finally banning lead in gasoline and paint in 1978, began a program to encourage states to begin screening children for lead poisoning, offering funding through the CDC. Such prompting led

Maryland, along with a number of other states, to pass screening and remediation legislation during the 1970s. Unfortunately, in 1981, the federal program was folded into the Maternal and Child Health Services Block Grant. Funding specific to lead was dropped, affecting the comprehensive approach to the lead poisoning problem initiated by Maryland. In fact, there was little federal funding for lead programs during the 1980s, although Maryland still managed to establish a Childhood Lead Registry in 1986, requiring medical laboratories to report all blood lead tests for lead screening of Maryland's children between one year and 18 years old. Although originally housed at the Maryland Department of Health and Mental Hygiene, the Childhood Lead Registry is now an important aspect of the Maryland Department of Environment's Lead Poisoning Prevention Program.

At the federal level, one of the most important pieces of legislation on childhood lead poisoning is the Residential Lead-Based Paint Hazard Reduction Act of 1992, otherwise known as Title X. Important federal agencies implementing various aspects of this legislation include Housing and Urban Development (HUD), the Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA). A precedent was set such that owners of residential housing built before 1978 must disclose the presence of known lead-based paint and/or lead-based paint hazards in the housing. Maryland is affected by this legislation in a number of ways. To begin, Maryland must have a lead-hazard reduction program as part of its housing strategies. The federal government provided grants and loans to the state to implement lead hazard reduction as well as provide training programs for the detection of lead in housing.

The implications of federal legislation as well as series of litigation proceedings against landlords in the early 1990s encouraged the State of Maryland to introduce legislation of its own to deal with the lead problem. The lead law in Maryland, referred to as Maryland Housing Bill 760, or “The Lead Poisoning Prevention Program” bill, was signed into law in May 1994, becoming effective at the beginning of 1996. This law called for the establishment of a state lead poisoning prevention program, requiring owners of properties built before 1950 that contain lead-based paint to make the housing safer for children. The law forces rental property owners to comply with specific lead hazard reduction measures or a dust testing procedure explained in the statute. Owners in compliance are protected against liability such that when the housing unit meets the standard, the owner is entitled to limited tort immunity. The Lead Poisoning Prevention Program established by the lead law is administered by the Maryland Department of the Environment (MDE), and all rental dwelling units built prior to 1950 are to be registered with MDE. The Maryland Department of Housing and Community Development (MDHCD) introduced its Lead Hazard Reduction Grant and Loan Program to provide funds to homeowners and landlords to meet the risk reduction standards identified in the House Bill 760.

Environmental Article Title 6 Subtitle 8 of the Maryland Code also established a Lead Poisoning Prevention Commission whose role is to advise the Maryland Department of the Environment on its efforts at implementing this program. The Commission essentially evaluates and monitors the effectiveness of MDE’s efforts and reports recommendations for improvement to the Governor. This Commission, by statute, is comprised of representatives from a number of state and local governmental

agencies, childcare and child advocacy groups, the private sector and other financial institutions. The Commission meets at least four times a year and provides an opportunity for coordinating lead poisoning prevention efforts amongst the various stakeholders.

In 1997, a year after the Lead Poisoning Prevention Bill went into effect, the Childhood Lead Screening Program was established with the passage of HB 1138. This legislation is designed to require blood lead prevention screening for all children in Maryland under six years old in high risk areas throughout the State. This bill requires that all children under six be screened for lead poisoning within 30 days after entering a day care center or child care center. The legislation establishes statewide case management for children with elevated blood lead levels, focusing on the importance of prevention in dealing with the problem of lead poisoning. The law requires that the Maryland Department of Health and Mental Hygiene establish and administer the Childhood Lead Screening Program.

Since the end of the 1990s, there have been a number of funding initiatives to improve the lead poisoning prevention activities at a statewide level. A series of investigative articles and editorials in *The Baltimore Sun* at the beginning of 2000 prompted some local and state level politicians to become proactive in the fight against childhood lead poisoning. On January 20, 2000, an investigative reporter for *The Sun* described in hard-hitting and poignant language the life of a young boy from Baltimore City suffering from lead poisoning. The reaction from children's advocates and the general public moved the Mayor of Baltimore and the Governor of Maryland to provide

additional funding for the enforcement of lead hazard reduction and expanding testing of children.

Governor Glendening pledged to commit \$3.5 million a year to remove lead-paint hazards by providing grants to landlords and homeowners in targeted neighborhoods primarily in Baltimore City. Baltimore City Department of Housing received most of this funding, acquiring almost \$15 million in state funding to remove lead-based paint from the City's homes. Other monies have been used to ensure enforcement of the lead law and Baltimore City earmarked federal funds for lead poisoning prevention. Publicity has been good for the programmatic efforts of state and local governmental agencies, instigating a renewed commitment by politicians and policymakers.

Since 2000, there have been a number of new legislative initiatives. One important piece of legislation relates to the administration and reporting of lead poisoning tests. HB 819 requires that, beginning in September 2003, specific agencies including the Maryland State Department of Education (MSDE) cooperate with the Maryland Department of Health and Mental Hygiene (DHMH) to adopt regulations regarding immunization and blood tests for lead poisoning. When a child enters a public pre-kindergarten program, kindergarten program or first grade, the parent or legal guardian of the child is required to provide documentation from a health care provider which certifies that the child has undergone blood testing for lead poisoning. Health care providers caring for children in areas designated as 'at risk' for lead poisoning are also required to test children at the time of a 12 month and 24 month visit. School Health Services are now an integral part of the state infrastructure to prevent childhood lead poisoning. Also, in 2000, HB 1052 was passed requiring property owners to include a copy of a current

verified inspection certificate. Included is the notice of tenant's rights provided by the Lead Poisoning Prevention Program at MDE. This aims to improve the level of enforcement necessary to ensure compliance of the lead law.

The historical examination of lead poisoning prevention in Maryland and the exploration of some of the more recent legislative and political initiatives to deal with this problem, help to put some of the programmatic aspects of state infrastructure in perspective.

Description of programs

There are a number of important governmental initiatives in place to help eliminate the problem of childhood lead poisoning in Maryland. This section aims to give an understanding of the programmatic aspects of the state infrastructure as well as a sense of the legislative mandates for the various governmental agencies with regard to lead poisoning prevention.

Lead Poisoning Prevention Program: The Maryland Department of the Environment is considered the lead agency in lead poisoning prevention. It identifies and monitors rental properties contaminated with lead-based paint. Based upon a legislative mandate (Maryland Code Environment 6-801), MDE inspects and registers pre-1950s rental properties and, through its enforcement program, ensures that rental property owners are compliant with lead paint laws, certifying and enforcing performance standards for inspectors and contractors working in lead hazard reduction. Also, MDE conducts initial inspections of properties and follow-up inspections of at-risk properties.

Similarly, MDE tracks laboratory reports on blood lead levels, overseeing a registry of results of all children tested in Maryland. This involves tracking reports by

the state laboratories at DHMH as well as private laboratories. MDE refers those children with elevated blood lead levels to the local health departments, providing case management protocols, coordination and consultation.

Childhood Lead Screening Program and other programmatic functions of DHMH: The Childhood Lead Screening Program is administered by the Center for Maternal and Child Health at the Maryland Department of Health and Mental Hygiene. Essentially, the goal of this program is to ensure the appropriate screening of children for lead poisoning as required by the HB 1138 and explained in Maryland Code Health-General Article Title 18 Section 106. This program also identifies areas most at risk of childhood lead poisoning so as to increase efforts in these neighborhoods. Technical assistance and consultation with local health departments in Maryland is part of DHMH's program. Similarly, the program oversees case management and implementation of the Medicaid EPSDT lead screening, diagnosis and treatment requirements.

Aside from the Childhood Lead Screening program, DHMH's laboratories test environmental samples collected by MDE during inspections of housing, an important function that has also been contracted out to private labs. DHMH provides blood tests for those individuals without insurance coverage for lead testing.

The Lead Hazard Reduction Grant and Loan Program and programmatic function of the Department of Housing and Community Development: The Maryland Department of Housing and Community Development (DHCD) provide funds to assist homeowners and landlords lessen the risk of lead poisoning by eliminating lead hazards in properties. Grants of up to \$8,500 are provided to property owners for total lead abatement.

Aside from the Lead Hazard Reduction Grant and Loan Program, DHCD also provides temporary housing for residents displaced because of lead contaminated housing.

School Health Services: With HB 819, local school health services must ensure they receive documentation certifying that children entering school have been tested for lead poisoning. Also, school nurses are often members of the governmental infrastructure who contact parents about health issues that arise and coordinate with the parents to seek help outside the school. This is the case with children with lead poisoning.

The Baltimore City Health Department and the Mayor's Initiative on Lead Poisoning Prevention: In 2000, the Mayor introduced his initiative on lead poisoning prevention. The LeadStat program works in conjunction with existing programs at the Baltimore City Department of Health (BCDH). These programs include the Childhood Lead Poisoning Prevention Program (CLPPP); the Lead Abatement Action Project (LAAP); and the Lead Awareness Project, each funded by state and federal governments. The Mayor's Initiative aims to improve coordination between city and state agencies and enforcement of legislation requiring property owners to comply with the lead law. Similarly, Baltimore's City's lead program focuses on housing abatement, disbursing grants for lead abatement using the \$3.5 million received from the Maryland Department of Housing and Community Development. In many cases, demolition of lead contaminated homes is occurring throughout the city with both city and state demolition funds being used for this purpose. Housing inspection is obviously a key component of Baltimore City's lead program and Baltimore City's Housing Department is an important partner in this process.

In terms of city legislation affecting the Health Department's initiatives, City Ordinance 20 calls for universal testing of Baltimore City's children (i.e.) blood lead testing at ages 1 and 2 years; and the establishment of a lead testing registry by the Health Commissioner to establish a lead testing registry, with mandatory reporting included.

| Summary of State and City Infrastructure to Combat Childhood Lead Poisoning | | | | | |
|---|---|---|--|--|----------------------------------|
| | Maryland Department of Environment (MDE) | Maryland Department of Health and Mental Hygiene (DHMH) | Maryland Department of Housing and Community Development | Maryland State Department of Education | Baltimore City Health Department |
| Primary role of the Department | <i>Lead agency for lead poisoning prevention</i> Implements Lead Poisoning Prevention Program as described in Section II | <i>Lead agency for childhood lead screening</i> Implements the Childhood Lead Screening Program as described in Section II | Reduction of lead in housing | School Health Services receive certification of test prior to enrollment | |
| Legislation/Regulation | Environment Art. 6 | HB:1138 | Housing Bill 760 | HB:819 | City Ordinances No. 19; 20 |

Since 2000 there have been a number of governmental initiatives to improve relations between the various governmental agencies involved in dealing with the problem of lead. The Maryland Department of Health and Mental Hygiene, the Maryland Department of Environment and the Maryland Department of Housing and Community Development held three regional meetings in June 2001. Over two hundred people from local health departments throughout the state participated.

Similarly, the three state agencies are now working more closely with Baltimore City, beginning the implementation phase of an Interdepartmental Strategic Plan. A Memorandum of Understanding between the MDE and the Baltimore City Health

Department (BCHD) reflects this goal of improved coordination, with funds from MDE to BCHD to hire more inspectors to improve enforcement. Indeed, program expansion in Baltimore City over recent years shows how the state infrastructure to improve lead poisoning prevention has become more involved in City efforts. A Memorandum of Understanding between the MDHCD and the Baltimore City Department of Housing and Community Development and BCHD for \$3.5 million is to be used for grants to reduce lead hazards in housing in targeted zip codes in the City. Also, the DHMH has provided additional funding to expand case management services in the City.

In our interview with key informants, coordination between programs was seen as instrumental in addressing the needs of children. These new efforts by state and city agencies help, although it is possible that the level of coordination may be more at the top than bottom of the governmental hierarchy.

Asthma and the governmental infrastructure

Asthma is a major health concern affecting millions of adults and children across the United States. The Department of Health and Human Services reported that in 1996 15 million Americans suffered from asthma, a figure more than twice as high as that reported in 1980. Children under five are disproportionately represented in that figure and are experiencing the highest increase in prevalence among all groups affected by asthma. The national percentage of children with asthma was reported as 3.6 percent in 1980, while the percentage reported in 1995 was 7.5 percent, an increase of over fifty percent (EPA, 2003). In 2001, the National Health Interview Survey reported that 6.3 million children were afflicted with asthma (EPA, 2003). In fact, asthma is the leading chronic disease for children today (EPA, 2003).

Maryland residents are sharing the burden with the rest of the country of this increasingly prevalent disease. In 2002, the Maryland Asthma Control Program reported that 1 in 10 Marylanders has a history of asthma. That figure equals 445,759 adults and 143,754 children whose health has been significantly affected by asthma (MACP, 2002). Nationally, the prevalence of asthma among school-aged children has increased by 80% since 1984. Maryland's children below school-age have experienced a rise of 160% (DHMH, 2003) Asthma not only affects a child's health but is a barrier to learning. It has been estimated that more than 10 million school days are missed due to asthma making it one of the most common causes of absenteeism for children (DHHS, 2000).

Women, African Americans, older adults, and low income individuals also share a higher proportion of those at risk for asthma than other groups (EPA, 2003). Children of minority groups and those in families with low income experience a higher rate of asthma

than children of other groups (EPA, 2003). Baltimore City residents are more likely to suffer from asthma than non-city residents. The 2000-2001 asthma lifetime prevalence rates among adults in Baltimore City was 15.3% compared to 10.8% in the rest of the state.

In addition to the health impact of asthma on the individual, there are also associated financial costs. The Asthma and Allergy Foundation of America estimates that in 1998 the direct medical costs of asthma were \$118 million and the indirect costs (time lost from either school or work) were \$89 million. The corresponding costs for children under 18 were \$37million and \$23 million. Each year, in Maryland, approximately 8,000 hospitalizations and 31,000 emergency room visits occur as the result of asthma. In 2000 the costs of hospital services to treat asthma in Maryland was \$47 million (MACP, 2002).

While there is some debate over the exact causes of asthma, clearly environmental as well as genetic factors play a role in triggering asthma attacks. The quality of indoor and outdoor air can greatly contribute to the exacerbation of asthma attacks and other respiratory illnesses. Indoor allergens that can trigger asthma include those produced by dust mites, cockroaches, mold, animal dander, tobacco smoke, and building products. Outdoor environmental factors include ozone, particulate matter, sulfur dioxide, nitrogen dioxide, diesel particulars, traffic related pollution, hazardous air pollutants, pollen and mold (ECOS-ASTHO, 2003).

Legislative and Policy History:

Federal law

In 2000, the United States Congress passed the Children's Health Act with the aim of identifying all federal programs that have asthma related activities. A federal plan

was developed to address the problem of asthma. An important recommendation of the Act was to gather, analyze, and disseminate asthma data at the national, state, and local levels.

In May 2000, the U.S. Department of Health and Human Services, published *Action for Asthma: A Strategic Plan for the Department of Health and Human Services*, describing the nation's current experience with asthma as "epidemic" (DHHS, 2000). The plan, part of the Healthy People 2010 initiative, lists four priorities for DHHS for addressing asthma in the United States. Those priorities include:

- discovering the causes of asthma so that accurate intervention can be put in place and used to facilitate primary prevention;
- minimizing the hardships for those living with asthma;
- eliminating the disparities among minorities and poor regarding asthma;
- collecting and keeping national data to determine the success of asthma programs while learning more about the disease.

About the same time, the Pew Environmental Health Commission, in conjunction with Johns Hopkins University of Public Health, produced a report evaluating the national effort to address environmental threats related to asthma (Pew Environmental Health Commission, 2000). The report called on the federal government to commit the resources to "necessary to slow or stop the rise in asthma prevalence rates." It also analyzed the HHS research budget and found that less than 1% was allocated for asthma tracking, less than 9% for prevention, and less than 17% for the direct causes of asthma. Meanwhile, more than 70% went to treatment and basic biomedical research. The report advocated rearranging spending priorities with a greater proportion of the budget going to tracking, prevention (including public education), and research into the direct causes of asthma as a way to address the growing prevalence of asthma.

Another important report, *Catching Your Breath* (2003) was developed by state health and environmental agency representatives and sponsored by the Environmental Council of the States (ECOS) and the Association of State and Territorial Health Officials (ASTHO). This outlined a vision and some strategies for addressing environmental contributors to children's asthma. It put forth goals that focus on the following areas:

- Enhancing coordination between health and environmental agencies and other partners;
- Identifying individuals, organizations, and agencies that can help reduce indoor and outdoor environmental factors that contribute to asthma, educate them on best practices;
- Educating the public about the significance of the problem;
- Reducing the indoor and outdoor environmental causes of asthma;
- Establishing systems to analyze and track the prevalence of asthma, as well as environmental causes that contribute to asthma;
- Supporting continued research into the causes and triggers and interventions for childhood asthma.

Especially relevant to this study of Maryland's infrastructure are the report's recommendations for coordination among various agencies in their efforts to battle asthma. They point to the need for the state to foster information exchange and engagement between environmental and health agencies, including both formal and informal structures. For example, the states should integrate the tracking of environmental and health data so that the relationship between the two sets of data can be more easily discerned. It also recommends that environmental and health agencies share asthma data. Furthermore, states should encourage collaboration among health, environmental and education agencies to coordinate efforts to promote healthy learning conditions in schools. They should also work with childcare agencies to address environmental health needs. Finally the report found that states "with strong indoor

environmental programs generally have a funding mechanism, upper management program support, and/or full time staff dedicated to indoor environmental efforts.” (p.12) In other words, the report, advised finding an “institutional home” for indoor air quality, something lacking in Maryland’s governmental infrastructure.

State law

Tracking legislation relevant to asthma is difficult since the issue of asthma crosses many boundaries including air quality, health care, and education. The primary statute in Maryland relating directly to asthma is 2002 House Bill 420 that established the Maryland Asthma Control Program described in detail in the next section. Maryland legislation specific to children and asthma also includes MD code 12-201. This code allows medical expenses for asthma treatment to be included as an extraordinary expense in child custody cases. Another code related to children is MD code 13-1504 requiring the Children’s Environmental Health Council to have an expert on childhood asthma at all times.

Description of programs

Maryland Department of Health and Mental Hygiene

The Maryland Childhood Asthma Program

The Maryland Childhood Asthma Program (MCAP), within the Center for Maternal and Child Health at the Department of Health and Mental Hygiene, was established in 1998 to respond to the increasing prevalence of childhood asthma in Maryland. The two main goals of the program were to decrease the morbidity and mortality of childhood asthma and to improve the quality of life of children with asthma. MCAP plans to reach its goals by implementing a public awareness campaign through

the media, educating school nurses, providing support for local asthma groups, and organizing activities within the governmental and non-governmental agencies.

A primary objective of MCAP is to promote the use of a written asthma action plan for school-age children. The action plan is information specific to each child regarding triggers and early signs of an asthma attack as well as medications. The action plan is written by one of the child's medical providers and is contained on an asthma action card. It is intended to be given to the schools, care providers, and relatives.

The Maryland Asthma Control Program

The Maryland Asthma Control Program is housed within the Family Health Administration at the Department of Health and Mental Hygiene. It was created in October 2001 with a three year grant from the Centers for Disease Control and Prevention. The grant called for the development of a state asthma surveillance system and a Ten-Year Asthma Control Plan. DHMH created the Maryland Asthma Planning Task force to accomplish these objectives.

The task force is comprised of various health care professionals, members of state, local, and public organizations, and members of families of children with asthma. The task force meets quarterly to write and revise the Ten-Year Asthma Plan in addition to publishing a newsletter. The newsletter contains information on the activities and accomplishments of the task force and other programs and agencies, national and local research findings, and a calendar of local events pertaining to asthma. MACP also publishes the Asthma Surveillance Reports, a source of data on the prevalence, costs, and causes of asthma in Maryland. MACP will expand the datasets used for the report to

improve the quality and specificity of information that can assist various localities in dealing with their specific problems of asthma.

Maryland State Department of Education

The Maryland State Department of Education (MSDE), Maryland State School Council, MDE, and DHMH collaborated to produce guidelines for addressing asthma in the schools called *Management of Students with Asthma in School*. Similarly, the Maryland School Asthma and Allergy Partnership is an effort by the Maryland Division of Health and Social Services, Wellness Centers, Medicaid, and the Maryland School Nurse Association to provide information on asthma in children. The primary source of information is found on the web site where there are materials and tools from national and local resources along with a list of online resources in Maryland

University of Maryland Hospital for Children and the Asthma and Allergy Foundation of America, Maryland-Greater Washington, D.C.

The Breathmobile is a mobile clinic that provides diagnosis and treatment to children with asthma directly in the community. The program, which began in March 2002, was modeled after a similar program in California that was very successful. The clinic is a customized motor home with medical equipment and staff to provide assessments, treatment, and medications to children who are referred to the clinic by a school nurse, parent, or medical provider. All services and medications are provided by the Breathmobile free of charge. Children assessed and identified as having asthma, receive follow up care every six weeks. Since its inception, the Breathmobile has visited twelve elementary and middle schools, mostly in West Baltimore. Various other site visits are planned for the future.

The Breathmobile was created with several goals in mind. One goal is to educate children and their caregivers about asthma as a disease, ways to identify early symptoms, and how to effectively manage asthma with proper treatment and medication. Accomplishing this goal will assist in keeping children in school by reducing absenteeism due to asthma. A second goal is to provide medical care to children who would not receive it otherwise due to constraints created by lack of income, health insurance and access to public transportation.

Open Airways

Open Airways for Schools is a program created by the Columbia University's College of Physicians and Surgeons and adopted by the Maryland American Lung Association. The program is designed for 8-11 year olds and consists of six forty minute lessons that are presented by school staff or trained volunteers. The lessons teach children how to manage asthma by being able to identify the early signs and symptoms of asthma attacks, how to use medications for asthma, and how to know when it is time to seek assistance from an adult. The lessons are taught using role playing, puppets, and posters in addition to handouts that students take home and share with their parents. To date, the program has been taught in over fifty percent of the counties in Maryland and has reached thousands of children.

Maryland's Air Quality Compliance Program

The role of MDE in addressing asthma is primarily its responsibility for monitoring and regulating air quality. The Air Quality Compliance Program is comprised of a set of regulatory activities to ensure compliance with national air quality standards for stationary sources of air pollution in Maryland. The program is responsible for giving

permits to and inspecting facilities, providing compliance assistance, and implementing enforcement actions for violations. Owners are required to submit a Compliance Certification Report annually to MDE to keep their permits of operation. MDE also responds to complaints from the public regarding facilities they monitor and provides a toll free number for citizens to call. The Air Quality Compliance Program is part of Maryland's State Implementation Plan mandated by the Clean Air Act of 1990. All activities are reported annually and must be approved by the Environmental Protection Agency according to the Act.

Air Watch

In addition, MDE educates the public on the importance of clean air and suggests ways residents can adjust their activities to promote better air quality. Marylanders can get data on the amount of ozone in their area each day. "Air Watch" is data is collected from thirty monitors around the Baltimore and Washington Metropolitan areas and provided on the web site.

Mercury and Government Infrastructure

Mercury is an emerging contaminant for all Marylanders, but it is especially toxic for young children. From fetal development through age 6, mercury exposure causes an array of serious problems. Various studies have shown that children who are exposed to mercury suffer from attention deficit, impaired visual-spatial skills, poor coordination, and overall slow cognitive development. As a neurotoxin that is carried through the blood system, pregnant women are most at risk. The Centers for Disease Control and Prevention estimate that approximately 8 percent of women of childbearing age contain high levels of mercury (CDC, 2003).

The sources of mercury are the result of both natural and human systems. Although mercury occurs naturally in the earth's soil, rocks, and fires, most of the health risks are associated with human-made systems that produce the toxin. These include coal burning power plants, trash burnings incinerators, and landfill disposal. As a result, bodies of water have become contaminated, and as a consequence, fish and other wildlife consume toxic mercury. Humans that consume fish that are contaminated with mercury also become exposed. Mercury has also been used in various household products like watches and thermometers. Such an array of mercury sources and related health risks has merited government invention.

Consequently, a variety of governmental agencies oversee the regulation of mercury and the negative impacts on both the environment and human health. In addition to federal standards, the Maryland Department of Environment, Department of Health and Mental Hygiene, and Department of Natural Resources provide a network of

collaborative efforts for managing mercury related issues. These executive agencies monitor mercury emission sources and provide educational outreach.

Legislative and policy history

A multitude of federal and state laws deal with the regulation of mercury. This section provides an overview of the laws that specifically regulate mercury emission into the environment.

Federal laws

The Mercury Reduction Act of 2002 stands out as the principal legislation that provides standards for mercury.¹ Senate Bill 351 bans the sale of mercury fever thermometers; it provides exceptions for prescription uses. It also mandates that manufacturers who sell thermometers include instructions on handling and proper clean up in case of breakage. The law makes funding available to a grant program for thermometer exchanges. Last, the Act called for the creation of an interagency task force to consider the long term management and retirement of collected mercury, reduction of threats to humans and the environment, and reduction of total quantity of mercury produced, used and released.

State laws

Maryland's state laws regulate the use of mercury.² First, MDE is required to submit a report on mercury to the governor, which details the implementation of outreach programs, public education, and environmental awareness about the hazards of mercury to schools, businesses, and individuals. Second, the sale and marketing of fever

¹ Passed by the U.S. Senate on September 5, 2002.

² See Annotated Code of Maryland, Section 2, Chapter 639, Subtitle 9 of the Environment Article. (HB 75, 2002).

thermometers containing mercury is prohibited, which became effective on October 1, 2002. Third, as of October 1, 2003, primary and secondary schools are prohibited from using elemental or chemical mercury in the classroom. Last, all State agencies are required to give preference to “mercury-free” products and equipment, or at the least, products that contain a minimal amount of mercury.

During the 2002 legislative session in Maryland’s General Assembly, there was a push to create the “Task Force on Mercury Discharge and Control.” Delegates D’Amato and Clagett presented HB 523 to empower the task force to evaluate the health hazards of mercury and report on remediation efforts. The task force would have been provided with specified membership, duties, and staffing. The bill failed to move out of the environmental matters committee, and therefore never was enacted. This bill was Maryland’s first attempt at creating a task force on mercury for better understanding the impacts and solution for mercury contamination.

Description of programs

Maryland Department of the Environment

The Maryland Department of the Environment (MDE) has taken a proactive approach to reducing the amount of mercury Maryland residents are exposed to in the environment. The department has an extensive public outreach and education programs. For example, the web site contains a general overview in lay terms of: 1) the origins of mercury; 2) how it enters the air and water; and 3) its effects on human health. Fact sheets design for both adults and children are on the web site. MDE provides a list of services available for mercury removal and recycling. Private companies provide recycling services; relevant contact information is provided by MDE.

The department also educates the public on reducing the chances of mercury exposure in the future. The web site stresses the importance of recycling products that contain mercury to prevent it from entering the environment in the first place. Energy conservation is also advised. It is another way to reduce mercury emission into the air by lessening the work load of power plants.

MDE successfully collaborated with other agencies in reducing mercury in Maryland's schools. MDE coordinated with the Maryland State Department of Education (MSDE), the Children's Environmental Health and Protection Advisory Council (CEHPAC) and the Maryland Environmental Services (MES), in surveying Maryland's schools to create an inventory of the amount of mercury and mercury products. The second phase of the project removed the mercury from the schools. Removal services were provided by MDE and MES or other companies hired by individual schools. At the end of the project, MES collected 6,603 mercury thermometers and 243 other devices in addition to 349 pounds of liquid mercury and 145 pounds of mercury compounds.

The MDE Hazardous Waste program offers collection of products containing hazardous materials like mercury for recycling and proper disposal. Items collected and days for pick up are listed on the web site. MDE has been operating a thermometer exchange program where residents receive a mercury-free thermometer at no charge in exchange for a mercury one. Fourteen counties in Maryland are permanent sites for the thermometer exchange program and a list of their locations and days to exchange thermometers is available. New thermometers are donated by CVS and EPIC

pharmacies, and the program has received positive responses from the public. MDE is using the data to evaluate the need for additional exchange sites in the State.

Since the largest source of mercury exposure for humans is fish consumption, MDE publishes advisories for Maryland residents with guidelines for consuming safe amounts of locally caught fish. MDE provides the advisories with fishing license rule books given to residents who catch and consume local fish, shellfish, and crabs. The contaminants measured and included in the advisories are PCBs, pesticides, and methyl mercury, the organic form of mercury that is eaten by fish when mercury from the air settles into water. The advisories consist of charts containing the type of fish, particular body of water, the contaminant found, and the amount of consumption of that fish per month that is considered safe. Different recommendations are given for adults, children, and women of child-bearing age since the health risks are different for each group.

In addition to providing the above services to the public, MDE collects data and assembles reports to assist policymakers in evaluating current legislation. MDE uses the data to make recommendations for adjusting rules and regulations to suit specific needs. MDE gathers data regarding the major sources of mercury emission into the environment and the amount of mercury dispensed. This information is used to make suggestions for reducing mercury emission from a specific site.

Maryland Department of Natural Resources

The Maryland Department of Natural Resources addresses environmental health by overseeing operations and generating reports on the practices of power plants in Maryland. The Power Plant Research Program (PPRP) was created under the Power

Plant Siting and Research Act of 1971 to ensure power plants meet the electrical needs of residents while maintaining reasonable costs and protecting natural resources.

The PPRP examines the potential for negative impact of a new or existing power plant on the air, water, and land. It publishes its findings annually. The findings include the mercury emission levels of power plants. The PPRP is funded by the Environmental Trust Fund (also established by the Power Plant Siting and Research Act), which draws its funds through a surcharge between 10 and 20 cents on the electric bills.

Children's Environmental Health and Protection Advisory Council

The Children's Environmental Health and Protection Advisory Council (CEHPAC), formed in 2000 by the Maryland General Assembly, identifies and addresses issues of environmental health for children in Maryland. The council advises the Governor and General Assembly on the environmental health risks for children in Maryland through an assessment of current rules and regulations and by offering recommendations or new regulations.

In 2000, legislation banned the use of chemical and elemental mercury in schools by October 2003 (HB75). At that time, the CEHPAC was charged with coordinating the efforts to survey the school systems on the amount of mercury present and to orchestrate the efforts to remove and safely dispose of mercury. The council collaborated with MSDE in surveying the schools.

SECTION TWO: COMMON THEMES

Legislation

According to the key informants interviewed in this study, legislation is a crucial step in protecting children from environmental causes of illness. One interviewee suggested that legislation is often passed in an atmosphere that can be very contentious, sometimes putting state agencies in the middle of disagreements about how to address an issue. The adequacy of staff and funding was mentioned as critical to effective legislation by many key informants. For instance, in the case of the lead law, some interviewees believed it would help if there were more staff available to carry out the necessary housing inspections in Baltimore City. Since areas of high-risk have been identified, a larger staff working in these areas could address more adequately the needs there.

Some key informants suggested that legislation should consider the child's age, especially when determining standards. Age-specific legislation can lead to more appropriate interventions. With knowledge from the academic community, legislators can know more specifically how to deal with this issue. Similarly, interviewees suggested that legislation should be linked to data sources. For example, legal mandates requiring doctors to report findings would improve data quality and increase our ability to track disease. California was cited by one key informant as more advanced than Maryland in tracking public health this way.

Interviewees felt that laws need strong enforcement components. The lead law was criticized for not encouraging compliance among landlords since there is little or no

incentive for them to eradicate the lead from their housing. Ways to ensure compliance might include some incentive component.

Key findings

- Legislation should be backed by adequate resources to ensure implementation
- Legislation should have a strong enforcement component
- Legislation should use the most up-to-date data and research

Resources

Every key informant felt there were inadequate resources available to adequately address children environmental health issues in Maryland. An important aspect of this complaint was the fact that some problems such as lead are overwhelming in often overburdened areas of Maryland. The largest complaint came from the Baltimore City Department of Housing where risk of exposure to lead-base paint is significant. Several informants stated the City housing department needs more manpower to inspect homes of children in at-risk areas.

Some informants suggested that new mandates be accompanied by additional funding. One example given was that since schools are now required to collect proof of lead testing, additional staff or funding ought to be assigned to handle this new task. In one case a new mandates lacked specificity in terms of where funds would come so that the agency responsible was required to shift monies around or look for outside resources. For instance, MDE was able to accept donations of mercury-free thermometers to give to the public in their drive to recycle mercury. The donations came from two local pharmacies and the exchange programs were very successful in engaging the public in the issue.

There is also concern among some informants that resources are being utilized in the most important or expansive issue in children's environmental health. Asthma was

mentioned to be the fastest growing health concern for children yet it is not as high priority as other children's health issues. Obviously, there is a need to prioritize for any issue but it appears that diseases or environmental conditions affecting the well-being of children end up competing for resources. The agencies or departments could work to prioritize resources under the umbrella of children's environmental health.

Key findings

- There is a lack of resources to serve the number of children in need
- Adequate resources prevent unnecessary burden on agency with a new mandate
- Limited resources should be prioritized in relation to the extent of the problem

Access to services

Many key informants within state agencies recognize the importance of access to services when addressing children's environmental health issues. The provision of Medicaid services is seen as a way to overcome barriers for low-income families. However, one key informant mentioned problems with lab testing for Medicaid patients. Doctors are not usually licensed to draw blood in their office so patients are referred to labs. There are a limited number of labs located near high-risk areas that are contracted with Medicaid. This limits the patient's ability to access them. This key informant suggested that an increase in the number of labs located in high-risk areas could significantly increase the number of children on Medicaid who are tested for lead poisoning.

Another aspect of access is the reduction of cost of services. For example, one interviewee suggested DHCD receives very few requests from landlords for lead-abatement grants because the cost for inspections of property is so high. Inspection is required prior to applying for grant funds. A reduction in costs might lead to more applications for grants.

Key findings

- Agencies should consider the problem of access for especially low-income children
- Costs associated with access to public services should be reduced

Research and Data

Key informants recognize the importance of research and data collection. Key informants suggested there is a need for research into understanding the effects of lead poisoning on older as well as younger children as well as infants. One key informant was particularly interested in the effects of lead poisoning on delinquency among young children.

Some key informants suggested there was a need for further research on the negative impact of fish consumption due to mercury emissions. Similarly, the public must be informed of these health risks since often the public feel the benefits of eating fish may outweigh the risks. Research like this could assist in providing the public with up-to-date advisories on fish consumption.

Research should be used to inform legislatures but similarly, legislation can help improve data collection methods by requiring health professionals to provide state agencies with information on the incidence, prevalence, and deaths related to environmental health issues. According to one key informant, Maryland has been very successful in understanding the nature of asthma as an environmental health problem but has incomplete data to fully explore the link between air quality and asthma.

Key findings

- There is a need for further research into environmental health hazards affecting children.
- Tracking of data that links environment and health is necessary
- Data on children's environmental health must be collected adequately and efficiently

Co-ordination of Efforts

Key informants from nine of the agencies/departments we interviewed talked about the importance of coordination among agencies to effectively address the childhood lead poisoning problem. Many did recognize the need for continued efforts to reach out to others in the field and one key informant suggested more regional meetings for state and city employees. According to some key informants, a lack of coordination can result if agencies have competing agendas and bring conflicting perspectives to the issue.

The case of testing for Blood Lead Levels illustrates some of the problems that arise from difficulties in coordinating efforts. In 1988 the responsibility for coordinating lead efforts in the state were transferred from the Department of Health and Mental Hygiene (DHMH) to the Lead Poisoning Prevention Program under the newly created Maryland Department of the Environment (MDE). The reasoning was that lead was perceived as more of an environmental issue than a health issue and therefore fell under the scope of MDE's work. Yet, the state Laboratory Administration remained under DHMH and was responsible for administering general health testing. This meant that the responsibilities for lead testing fell under both MDE and DHMH. MDE is responsible for referring cases to the DHMH lab and administering the grants related to lead testing. In practice, MDE has subcontracted much of the testing to private laboratories. According to key informants at DHMH, the Laboratories Administration has the expertise and capacity to do more testing than it is currently doing, but is limited in what it can do because of the current division of responsibilities between MDE and DHMH over lead testing. Several informants mentioned that the recording of demographic information on those tested is

often incomplete or incorrect (though it has improved in recent year), making follow up more difficult and costly.

Suggestions for improving coordination of lead efforts included creating strong leadership on the issue that is not tied to a particular agency and therefore can help bridge differences between agencies. Improving communication among agencies/groups and rethinking of assigning responsibilities among various agencies can also help with the coordination efforts.

Key findings

- Coordination among agencies is essential for implementing successful strategies to address children's environmental health issues.
- Strong leadership can help improve coordinating efforts
- Improved communication among state agencies, city agencies and non-profits is necessary.

Community Outreach

According to many key informants, community outreach and education has had a significant and lasting effect on reducing the prevalence of children's environmental health risks. Some of those successes include an increase in the number of children who are tested for lead poisoning, and an increase in understanding the causes and methods of treating childhood asthma.

Governmental agencies and non-profit groups have provided the public with extensive information about health risks in the environment and what people can do about them. This information has been made available on web sites, in pamphlets, and services in the community like drop-off sites for mercury thermometers. MDE received 600 calls in 2002 in response to its pamphlet on mercury and PCBs in recreational fish. School nurses monitor children with asthma and administer medicine throughout the day.

In the case of lead, community education has been important because so many

families with children still reside in dwellings containing lead hazards. A few key informants believe that if parents understand the seriousness of the problem and how to spot lead paint hazards, compliance with doctor's orders to get their children tested for lead poisoning would go even higher.

Although community education has made great improvements in reducing children's health risks, several informants reported obstacles to effectively educating the public. One obstacle is issues pertaining to the environment can be complex and difficult for the general public to understand. The second obstacle is the relevance of an issue. If an issue is not relevant to many people, it may not receive much attention from the public. Mercury is an example of an issue that has gotten a lot of attention from parents of young children but has received little attention from other groups.

Some key informants suggested there is a lack of outreach to the communities that are high risk, particularly in relation to lead. More lead awareness campaigns and community fairs were suggested as ways to reach the public. The press could cover the issues in the local paper or local news and posters could be displayed on buses in high risk areas where the target group for lead abatement would see them.

Key findings

- Public outreach is seen as instrumental in reducing environmental risk among children
- More outreach in high-risk areas is needed
- Community outreach on environmental risk should be in lay terms so the public can understand often complex issues.
- Public education should not occur in a vacuum but must be accompanied by adequate programming

Appendix

| | LEAD | MERCURY | ASTHMA | OTHER ISSUES |
|---|---|--|--|--|
| Maryland Department of the Environment | Lead Poisoning Prevention Program; Lead Poisoning Prevention Commission | Hazardous Waste Program | Air Monitoring and Air Quality compliance and permitting. No specific mention of asthma. | |
| Maryland Department of Natural Resources | | Fish advisory; survey of mercury concentrations in game fish from Maryland's fresh and estuarine water; Maryland's Power Plant Research Program; | | |
| Maryland Department of Housing and Community Development | Lead Hazard Reduction Grant and Loan Program | | | |
| Department of Health and Mental Hygiene Center for Maternal and Child Health: School Health | Center for Maternal and Child Health, Childhood Lead Screening Program | No specific mention of mercury but the Children's Environmental Health and Protection Advisory Council involved in report on mercury in 2002. | Center for Maternal and Child Health, Maryland Childhood Asthma Program | Works with MSDE and local health departments and school boards to implement standards and guidelines for school health programs. Every child entering the public school system must have proof of physical examination and up to date immunizations. |
| Maryland State Department of Education | Lead Screening program | No specific mention of mercury | MSDE donates money to Breathmobile | Infant and Toddler Program |
| Maryland Department of Agriculture | No specific mention of lead | No specific mention of mercury | No specific mention of asthma | |
| Maryland Department of Labor Licensing and Regulation, Occupational Safety and Health Administration (MOSH) | Lead exposure to workers. Nothing specific for children. | No specific mention of mercury | Task force on Indoor Air Quality (in the workplace) Nothing specific for children. | |
| Maryland Department of Human Resources | No specific mention of lead | No specific mention of mercury | No specific mention of asthma | |
| Governor's Office for Children, Youth and Families | No specific mention of lead. | No specific mention of mercury | No specific mention of asthma. | Maryland School-Based Health Center Initiative. Entering school ready to learn; child abuse and neglect |
| Baltimore City Health Department | LeadStat. The Mayor's Initiative on Lead Poisoning Prevention. | No specific mention of mercury | Health Department's Baltimore Asthma Surveillance System | Child safety, child food quality, tobacco prevention |

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