



AN OVERVIEW OF CHILDREN'S HEALTH ISSUES IN MICHIGAN - 2006: ENVIRONMENTAL HEALTH

- [1] **Childhood Asthma and Particulate Matter**
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- [3] **Childhood Obesity**
- [4] **Childhood Lead Poisoning**
- [5] **Childhood Exposure to Methylmercury**

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CHILDREN'S HEALTH ISSUES

CHILDREN'S ENVIRONMENTAL HEALTH

As the Great Lakes State, Michigan's environment is at the heart of our state's identity and has substantial, direct impact not only on our economy but on our children's health. Toxins in our air, water, food, and housing have fundamental life-long consequences for our children's health and development, especially on the developing brain. The environments we create for our children through our commerce, schools, and communities also affect children's health behavior and risk of chronic disease.

Specific environmental threats to children in Michigan include: on-going exposure to lead, mercury, and other potentially toxic chemicals; increasing rates of childhood asthma linked to air pollution; and increasing rates of childhood obesity associated with the physical environments and the food we offer children.

[1] CHILDHOOD ASTHMA AND PARTICULATE MATTER

Overview

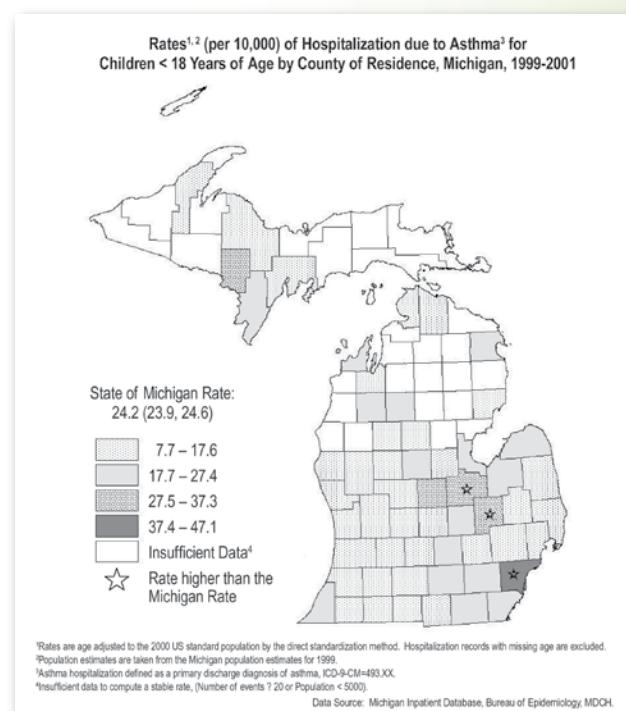
Children are at heightened risk of asthma from exposure to fine particles called Particulate Matter (PM), a form of air pollution. Children breathe 50 percent more air per pound of body weight than adults, and their developing respiratory systems are more susceptible to environmental threats. Exposure to fine particles is associated with:

- Increased frequency of childhood illnesses, which are of concern both in the short run and for the future development of healthy lungs in the affected children.
- Increased respiratory symptoms and reduced lung function in children, including symptoms such as aggravated coughing and difficulty or pain in breathing. These can result in school absences and limitations in normal childhood activities.

Michigan

The most common sources of PM are power plants, waste incinerators, and emissions from cars and trucks. Children who live near these sources are more likely to be exposed to PM resulting in a higher rate of asthma among this population. Some studies in urban areas have found large increases in PM and components of PM specific to diesel truck exhaust measured in schools located along and near highways. Many studies, including those conducted in Detroit, have linked outdoor levels of air pollution (including PM) to adverse health effects, including:

- Premature death
- Increased hospitalization for cardiovascular and respiratory disease

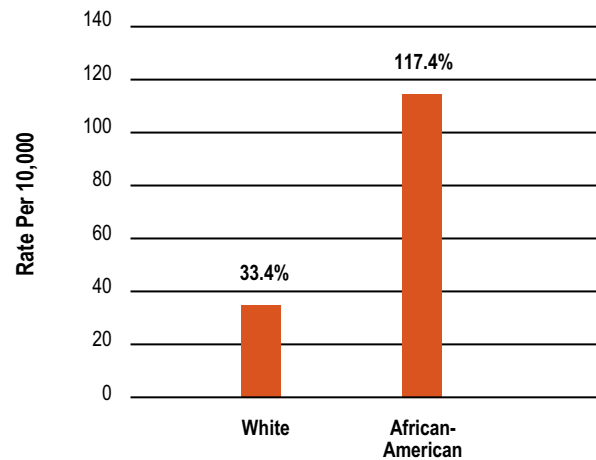


- Decreased lung function and increased asthma symptoms (cough, chest tightness, wheeze) for Detroit children with asthma
- Increased school absenteeism

Prevalence of Asthma in Children in Michigan

- 213,600 children currently have asthma in Michigan
- 17% of public middle and high school students in Michigan say that they have asthma now
- Asthma rates are higher for African American children, and they are less likely to receive effective treatment, resulting in more costly hospitalizations
- Children 0 to 4 years have the highest asthma hospitalization rates, 1999 to 2001, regardless of the median income in their zip code
- For children less than 18 years of age, Genesee, Saginaw, and Wayne counties have asthma hospitalization rates that are significantly higher than that for children in the entire State of Michigan

Asthma Hospitalizations for Michigan Preschoolers (Ages 0-4) by Race



Source: Michigan's Children

Resources

- Epidemiology of Asthma in Michigan, 2004 Surveillance Report, Michigan Dept of Community Health and Asthma Initiative of Michigan http://www.getastmahelp.com/MIasthmaSurveillance_2004.pdf
- Environmental Protection Agency Health and Environmental Effects of Particulate Matter <http://www.epa.gov/ttn/oarpg/naaqsfm/pmhealth.html>
- American Lung Association Childhood Asthma Overview <http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=22782>
- Asthma Initiative of Michigan www.getastmahelp.org
- Closing the Gap: Addressing Racial and Ethnic Health Disparities Among Michigan's Children, Michigan's Children, October 2004.

Principal Author: Edith A. Parker, DrPH, Associate Dean for Academic Affairs, Associate Professor of Health Behavior and Health Education, University of Michigan School of Public Health

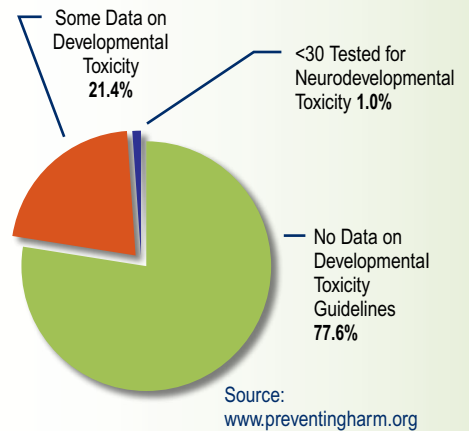
[2] CHEMICAL REGULATION AND CHILD HEALTH

Overview

Every day, the U.S. produces or imports 42 billion pounds of chemicals. Approximately 80,000 chemicals are now registered for use in the US by the Environmental Protection Agency. Some of these chemicals persist and accumulate in the environment and in our bodies and may have properties that cause them to be toxic to

children's development. Children may be exposed during pregnancy, via breast milk, through consumer products, and through food, air, and water. Among children, chemical exposures in one study have been conservatively estimated to contribute to 5% to 20% of neurobehavioral disorders and 2% to 10% of certain cancers.

In 1993 the National Academy of Sciences reported that children may be uniquely vulnerable to the effects of chemical exposures during all periods of fetal, infant, and child development. Yet, among the 2863 most highly produced chemicals by volume only 21% have ever been tested for developmental toxicity and less than 30 chemicals have been tested for neurodevelopmental toxicity (impact on brain and nervous system development) according to EPA guidelines.



In the US, multiple government bodies have concluded that the federal law that regulates industrial chemicals – the Toxic Substances Control Act of 1976 – has not been an effective vehicle for the public, industry, or government to adequately assess the hazards of chemicals or control those of greatest concern. Facing this gap, state governments, including Michigan's, have sought to regulate individual chemicals and compounds after health risks are recognized. Some states have begun to explore broader chemical policy changes to protect children and high risk groups as well as Green Chemistry initiatives to promote innovative technologies that reduce or eliminate pollution at the earliest stages of the chemical design process.

In 2007, the European Union will implement a new regulatory system which will require companies to justify the continued use of chemicals of very high concern. This system will put more responsibility on companies to collect data on most chemicals on the market, assess the risk of these chemicals, and define safe use down the supply chain. Any company that exports to or competes with the EU, including Michigan-based businesses, will be affected.

Michigan

- In 2002, Michigan released more than 18 million lbs of suspected or known developmental toxicants; 25 million lbs of suspected neurotoxicants, and 54 million pounds of suspected respiratory toxicants into the air along with additional releases directly into our waters.
- Brominated flame retardants (BFRs) and perflourinated chemicals (PFCs) are just two examples of chemical groups that now threaten health, wildlife and the resources of the state.
- PBDEs (one type of BFR) have been found in fish and sediment in Michigan and levels in human blood, breast milk, and tissues have increased by a factor of 100 in the last 30 years.
- In 2005, the state acted to regulate two forms of PBDEs, but a third form of PBDEs, along with many PFCs, remain unregulated.

Resources

- Michigan Network for Children's Environmental Health – www.mnceh.org
- Children's Environmental Health Network – www.cehn.org
- Scorecard: The Pollution Information Site – www.scorecard.org
- US EPA Green Chemistry Site – <http://www.epa.gov/greenchemistry/>

- Green Chemistry in California <http://coeh.berkeley.edu/FINALgreenchemistryrpt.pdf>
- Lowell Center for Sustainable Production – University of Massachusetts Lowell – <http://www.chemicalspolicy.org/>
- Health Care Without Harm - <http://www.noharm.org/us/bfr/issue>
- In Harm's Way: Toxic Threats to Child Development. A report by Greater Boston Physicians for Social Responsibility, May 2000. www.preventingharm.org

Principal Author: Dan Kusch, EdM, Michigan Chapter of American Academy of Pediatrics, University of Michigan C.S. Mott Children's Hospital

[3] CHILDHOOD OBESITY

Overview

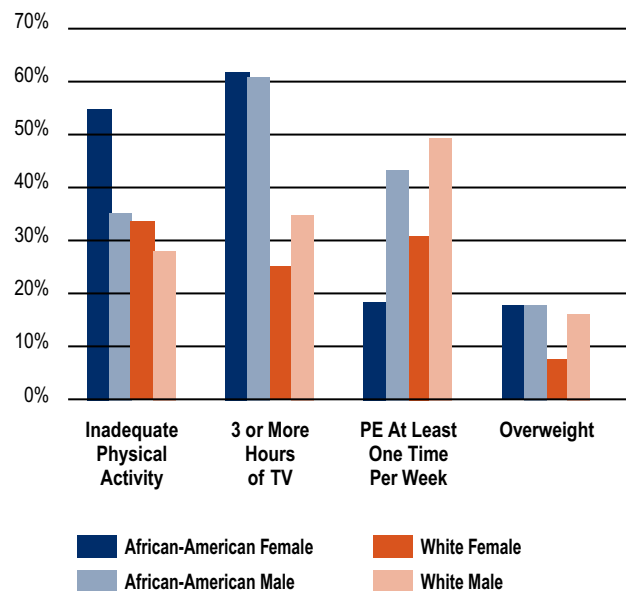
Childhood overweight and obesity is a growing concern in the United States. The weight gain and increasing size of many children is accelerating at an alarming pace, and as a consequence, the incidence of elevated cholesterol, hypertension and diabetes is increasing in younger populations. It is estimated that one in three children is overweight. Some of the contributing factors associated with increased risks of obesity in children and youth include:

- Excessive television watching and time spent on computers
- Fewer meals eaten at home with the family
- Less access to or consumption of fresh fruits and vegetables
- Less opportunity for physical activity in schools
- Community environments that do not encourage a physically active lifestyle

Research has shown that

- Improved nutrition and physical fitness leads to better academic performance
- Obesity in childhood has long term and often irreversible consequences for health in adulthood
- 50% of all health care related problems can be linked to the behavioral choices individuals make

Physical Activity and Obesity Among Michigan Youth by Race (2003)



Source: Michigan's Children

Michigan

- Michigan has ranked in the top 10 states for obesity for over 10 years
- Approximately 11 % of Michigan kids are considered overweight, a threefold increase in 30 years
- Michigan ranks 3rd in the nation in the percentage of medical expenses related to obesity
- African American and Hispanic youths are at higher risk for weight-related health problems and are less likely to be physically active
- 19% of male adolescents and 18% of female adolescents meet the minimum daily goal of at least five servings of fruits and vegetables
- 38% of Michigan high school students attend physical education classes

Resources

- United States Health And Human Services: Childhood Obesity - http://aspe.hhs.gov/health/reports/child_obesity/
- Action for Healthy Kids <http://www.actionforhealthykids.org>
- Michigan Health Tools www.mihealthtools.org
- CDC – The Obesity Epidemic and Michigan Students, <http://www.cdc.gov/HealthyYouth/overweight/pdf/Michigan.pdf>
- Michigan Model Curriculum for Comprehensive Health Education - <http://www.emc.cmich.edu/mm/default.htm>
- Children’s Health and Obesity Project, a series from Michigan Radio - NPR on childhood obesity: <http://www.michiganradio.org/kidsobesityproject.html>
- Closing the Gap: Addressing Racial and Ethnic Health Disparities Among Michigan’s Children, Michigan’s Children, October 2004
- Michigan’s Children

Principal Author: Stephanie Kai Halfmann, MS, RD, Community Health Consultant, Michigan Public Health Institute

[4] CHILDHOOD LEAD POISONING

Overview

Lead is an environmental toxin that has particularly harmful effects on the developing brains of infants and young children. Children in Michigan are most commonly exposed to environmental lead through household paint in many homes built before 1978, but lead can also be found in some drinking water systems, soil (deposited from the days of leaded gasoline), dust, ceramic glazes, folk remedies, make-up, and imported toys.

Ingestion of high doses of lead, though rare, can lead to seizures, coma, kidney failure, and even death. More commonly, young children exposed to even low levels of lead are more likely to develop learning and behavior

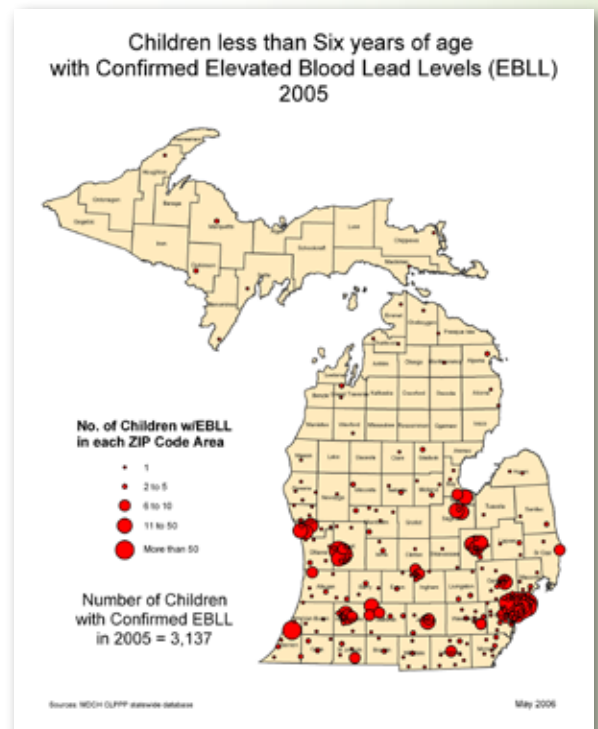
problems, and experience negative effects on hearing, balance, and hand-eye coordination. These problems result in costly special education programs, higher delinquent behavior, higher school drop-out rates, and lower adult productivity. Treatment can halt progression of damage when detected early, but damage is permanent.

Michigan

- Michigan ranks as one of the top 10 states for estimated number of children with lead poisoning. The number of children identified with elevated lead levels is higher than the national average.
- The primary source of lead exposure for young children in Michigan is lead-based household paint in housing built before 1978, the year in which sale of lead-based paints was banned by the federal government. The use of lead in household paints was more prevalent prior to 1950. In Michigan, more than 70% of housing was built before 1978 and 27% of housing was built before 1950. The percentage of pre-1950 housing is higher than the state average in more than half of Michigan's counties. In Detroit, 56% of the housing is pre-1950. The average cost of remediation of the lead hazard in a single family dwelling is \$10,000.
- Lead poisoning is known to peak in children who are just shy of 2 years of age. Yet only 27.7% of Michigan's 1 and 2 year-olds were tested in 2005. Only 16.7% of the 795,000 children under age 6 in Michigan were tested for lead poisoning in 2005.
- Among those tested, more than 3,100 children in Michigan had elevated blood lead levels above the recommended level set by the Center for Disease Control (CDC). Another 18,000 children were found to have high-risk levels of poisoning, levels that have been shown to have an adverse effect upon children's IQ and performance on standardized cognitive tests.

Resources

- Michigan Department of Community Health Childhood Lead Poisoning Prevention and Control Commission: http://www.michigan.gov/mdch/0,1607,7-132-2942_4911_4913---,00.html
- Michigan Department of Community Health Lead Poisoning Prevention Program 2005 Data Report: <http://www.michigan.gov/documents/2005>
- Center for Disease Control. Preventing Lead Poisoning in Young Children: A Statement by the Centers for Disease Control and Prevention. Washington DC: US Department of Health and Human Services; August 2005:1-8. <http://www.cdc.gov/nceh/lead/Publications/PrevLeadPoisoning.pdf>
- American Academy of Pediatrics Policy Statement: "Lead Exposure in Children: Prevention, Detection, and Management Committee on Environmental Health," Pediatrics 2005; 116; 1036-1046, <http://www.pediatrics.org/cgi/content/full/116/4/1036>
- Michigan's Children - <http://www.michiganschildren.org>

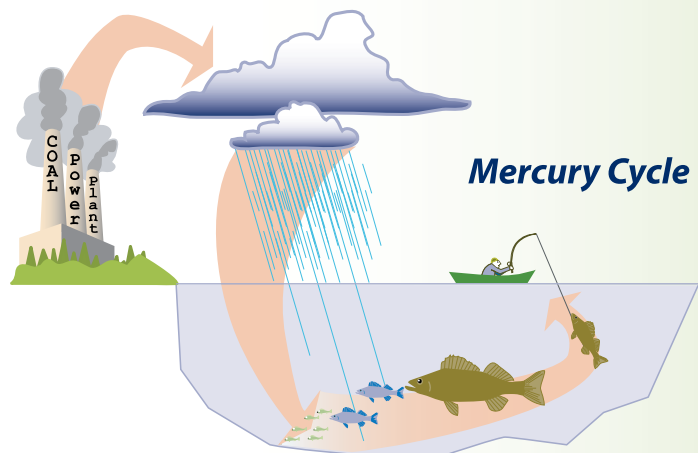


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[5] EXPOSURE TO METHYLMERCURY

Overview

Methylmercury is an environmental pollutant that poses significant risks for children's developing brains and nervous systems. Infants and developing fetuses are primarily exposed when their mothers consume contaminated fish. Even low levels of methylmercury exposure can damage the developing brain, resulting in learning disabilities, IQ deficits, and impaired memory, attention, and language skills. Women exposed to extremely high levels of methylmercury during pregnancy have given birth to children with mental retardation, cerebral palsy, seizures, and other neurological disorders.



Source: Adrian Cotter/Sierra Club Collection

The Environmental Protection Agency (EPA) estimates that over 600,000 babies are born each year in the US to mothers who have methylmercury levels that exceed the safe amount and that 1 out every 6 women of childbearing age already has enough methylmercury in her blood to put a child at risk for permanent health effects.

According to the EPA, coal-fired power plants are the largest source of mercury emissions to the environment, accounting for 41% of annual emissions in the US. Other sources include waste incineration and releases from products that still contain mercury such as thermostats and blood pressure devices. Once released, it can settle in our waterways and is transformed into methylmercury by bacteria – persisting and building up in the food chain, particularly in fish.

Michigan

- Michigan's 21 coal-burning power plants emit 2,464 lbs of mercury each year.
- As a result of historic and ongoing releases, mercury pollution is so pervasive in Michigan that the state has posted mercury-related fish consumption advisories for all of our 11,000 inland lakes and all 2,199 miles of Great Lakes coastline. These advisories warn people to avoid or limit their consumption of certain types of fish.
- In 2004, 56% of fish tested in Michigan's lakes by the EPA contained methylmercury levels that exceeded EPA's "safe" limit for women of childbearing age.
- Michigan faces significant methyl-mercury related costs due to lost potential and resource requirements to meet special needs in school and other activities. Researchers at the Mt Sinai School of Medicine in New York estimate that lost productivity from mercury-related IQ deficits in the US amounts to \$8.7 billion annually.

Resources

- United States Environmental Protection Agency – <http://www.epa.gov/mercury/index.htm>
- Michigan Department of Environmental Quality – <http://www.michigan.gov/deqmecury2>
- Michigan Mercury Electric Utility Workgroup Report, June 2005 - <http://www.deq.state.mi.us/documents/deq-aqd-air-aqe-mercury-report.pdf>
- Michigan Fish Consumption Advisory –
http://www.michigan.gov/mdch/0,1607,7-132-2944_5327-13110--,00.html
- Public Interest Research Group in Michigan <http://pirgim.org/MI.asp?id2=14009&id3=MI&>
- Adrian Cotter/Sierra Club collection

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