



Environmental Health Fact Sheet

Air Pollution and Early Development

November 2012

The Community Outreach and Engagement Core (COEC) increases awareness and understanding of environmental health research.

Stakeholder Advisory Board members include:

- Community Health and Social Services Center, Inc.
- Detroit Hispanic Development Corporation
- Detroiters Working for Environmental Justice
- Institute for Population Health
- Green Door Initiative
- Henry Ford Health System
- Eastside Community Network
- Michigan Department of Community Health
- University of Michigan School of Public Health

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Why is Air Pollution an Important Issue?

Air pollution is a significant problem in Detroit and southeast Michigan. This pollution comes from numerous sources, such as cars, trucks, industrial factories and power plants.¹ Often poorer neighborhoods have higher levels of air pollution due to more traffic congestion² and nearby pollution sources.

There is evidence to suggest that if pregnant women are exposed to air pollution, their children can experience a number of health issues before they are born, at birth, during infancy, and in early childhood. This is because pregnancy and early childhood are particularly vulnerable times. A growing fetus is very sensitive to its mother's environment, and children are particularly vulnerable to environmental exposures.

It is possible that air pollution plays a role in Detroit's high infant mortality rate. With almost 15 deaths per 1,000 live births, the city has one of the highest infant mortality rates in the country.³

How is Air Pollution Linked to Early Life Outcomes?

Before Birth

Researchers have found evidence to suggest that exposure to air pollution during pregnancy may:

- Make the fetus small for its gestational age, which refers to the length of time it has been in the womb.⁴
- Increase the risk of birth defects, such as heart deformities.⁵
- Increase the mother's risk of high blood pressure during pregnancy (pre-eclampsia), which can make the pregnancy more dangerous for both mother and child.²



At Birth

Air pollution may cause problems at the time of birth, as it can:

- Contribute to preterm birth, where the infant is born at least three weeks early (at less than 37 weeks). This is an important health concern, as some babies who are born early will not survive, and others may experience health problems during childhood or later in life.⁶
- Increase the chance that the child will have low birth weight and smaller head size² (which has been linked with developmental problems).⁷

Infancy and Early Childhood

There is evidence that exposure to air pollution in the womb may be linked with numerous problems for the child after birth. These include:



- Developmental problems, such as a lower intelligence quotient (IQ)⁸, anxiety, depression and attention problems.⁹
 - Infant death from respiratory problems and Sudden Infant Death Syndrome (SIDS).¹⁰
 - Increased risk of childhood asthma.²
- Greater risk of high blood pressure and heart disease in adulthood, a possible outcome of being small for gestational age (which is associated with exposure to air pollution) is linked with these poor health outcomes.⁴

Why is this Happening?



Scientists are still researching how air pollution leads to problems during and after pregnancy. Some think that air pollution prevents oxygen and nutrients from getting to the fetus. Others think that air pollution may change the activity of cells in the fetus as it develops.²

There are many types of air pollutants and most of us are exposed to a mixture of them that includes metals (such as chromium, lead and arsenic), organic compounds (such as benzene and formaldehyde) and gases (such as ozone and sulfur dioxide). While many of these chemicals are known to be toxic and cause cancer, their exact role in early development and childhood is complex.

What Does this Mean for Me and My Community?

Caution! It is important to note that association does not prove causation. Therefore, the link between air pollution and early life outcomes does not tell us that air pollution causes these health problems. It just tells us that there is some association. Researchers continue to study this link in order to better understand what causes the association.

What action steps can we take?

We can work together to reduce air pollution in our communities so that pregnant women – and all of us - can breathe cleaner air. For example, we can:

- Advocate that new sources of pollution, such as bridges and highways, are located further away from people's homes and schools.
- Work with community groups to promote alternatives to sources of air pollution (such as solar or wind energy instead of coal burning power plants).
- Advocate for stricter air pollution standards, such as regulations to limit levels of harmful particulate matter and ozone.
- Require technologies that reduce air pollution, such as diesel engine retrofits and electric energy for rail and industry.
- Educate and advocate eliminating and reducing indoor pollution, including tobacco smoke.
- Demand more research to study ways to reduce the negative effects of air pollution on health in Detroit, southeast Michigan, and other communities.¹¹

For additional information on actions you can take, please visit ehscc.umich.edu.

The University of Michigan Environmental Health Science Core Center promotes collaboration among UM environmental health researchers and communities. Researchers work together to advance knowledge of environmental health issues that affect community members in Detroit and Southeast Michigan.

Support provided by grant P30ES017885 from the National Institute of Environmental Health Sciences-National Institutes of Health