Diabetes and the Environment

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

Stakeholder Advisory Board members include:

- Community Health and Social Services Center, Inc.
- Detroit Department of Health and Wellness Promotion
- Detroit Hispanic Development Corporation
- Detroiter Working for Environmental Justice
- Green Door Initiative
- Henry Ford Health System
- Imagine Creative Opportunities Now
- Michigan Department of Community Health
- Michigan Department of Environmental Quality
- University of Michigan School of Public Health
- Warren-Conner Development Coalition

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Why is Diabetes an Important Issue?
糖尿病是一种严重的疾病，可能导致许多健康问题，包括心脏病、失明和肾脏衰竭。美国的糖尿病人数在1980年至2008年期间超过翻了三倍。密歇根州有报告的成人糖尿病率为9.5%，而底特律的发病率甚至更高，达到14.4%。这是该州的最高比率，也是一个重大的健康问题。

How is Diabetes Linked to the Environment?
糖尿病与环境有联系。有一部分研究认为，化学品在环境中的存在可能与2型糖尿病有关。以前被称为成人糖尿病的这种最常见形式的糖尿病可以在任何年龄发展。化学品可能与糖尿病相关联，包括双酚A、杀虫剂和持久性有机污染物。

Diabetes and Bisphenol A (BPA)
数据来自动物实验和细胞培养实验，表明双酚A（BPA）可能与糖尿病有关。BPA在许多常用产品中被发现，包括塑料食品和饮料容器、某些食品罐的衬里、某些婴儿奶瓶和牙科密封剂。事实上，一项研究发现BPA在95%的人体样本中被检测到，以及在胎儿和胎盘的液体中，甚至在母乳中。

科学家认为BPA可能影响身体中与糖尿病相关的几个过程：
- 稳定血糖水平
- 细胞在胰腺中产生胰岛素的信号
- 胰岛素在体内的释放
- 身体脂肪的生产

Studies in animals also suggest a possible link between pesticides and diabetes. Pesticides, and particularly insecticides, may affect parts of the nervous system that help to regulate the pancreas. The pancreas produces insulin, which in turn regulates glucose levels. Therefore, pesticides that interfere with the pancreas can make glucose levels unstable, thus increasing the risk of developing diabetes.

Diabetes and Pesticides
- 稳定血糖水平
- 细胞在胰腺中产生胰岛素的信号
- 胰岛素在体内的释放
- 胰岛素的生产和身体脂肪
Diabetes and Persistent Organic Pollutants (POPs)
Scientists think that certain persistent organic pollutants (POPs) may be associated with diabetes. “Persistent” refers to the fact that these pollutants, used in agriculture, disease control, manufacturing and industry, stay in the environment for a long time instead of breaking down and becoming inactive.

There is some research to suggest that POPs may be linked to diabetes by increasing insulin resistance, and that those who are more obese and are exposed to certain POPs may be more likely to develop insulin resistance and diabetes. While the U.S. and many other countries have stopped using some POPs, we can still be exposed to those persisting in the environment or transported to the U.S., for example, by wind or water. POPs that are strongly associated with diabetes include:

- DDT - an insecticide previously used to control malaria and protect crops from insects. DDT was banned for agricultural use worldwide, but not disease vector control (e.g., killing insects that carry disease in order to prevent them from spreading it).
- Dioxins - chemicals produced by burning, such as waste and trash incineration. The Detroit incinerator is one of the world’s largest, burning about 800,000 tons of trash every year.

What Does this Mean for Me and My Community?

Caution! It is important to note that:
- Studies carried out in animals do not tell us if the effect will be the same in humans. Therefore, we cannot say for certain that BPA and pesticides cause diabetes in humans. More research is needed to make this conclusion. The fact that 95% of people have BPA in their bodies makes this an important area for further investigation.
- Association does not prove causation. Therefore, the link between POPs and diabetes does not tell us that POPs cause diabetes. Here too, more research is needed.

What action steps can we take?
While we do not know for certain if BPA, pesticides, and POPs cause diabetes, until we know more it may be safest to err on the side of caution. We can work with others to advocate for regulations that decrease exposure to chemicals that may be associated with diabetes, and in the meantime, avoid food and other products with BPA or pesticides. For additional information on actions you can take, please visit www.sph.umich.edu/niehs.