

"Diversity matters: leading work on inequalities and health"

Submitted by: Davyda Hammond, PhD – W.K. Kellogg Community Health Scholar  
Postdoctoral Research Fellow

Mentorship Team: Edith Parker, DrPH – Associate Dean and Associate Professor  
Tim Dvorch, PhD – Research Assistant Professor  
Wilma Brakefield-Caldwell, RN – CAAA Steering Committee

The deterioration of the air has become a global public health problem of crisis proportion. When an area experiences high concentrations of particulate matter (PM), particularly when the concentrations are in violation of the National Ambient Air Quality Standard (NAAQS), identification of the contributing emission sources aids researchers in accessing health impacts and assists policymakers in developing effective control strategies. Detroit, Michigan is a non-attainment zone of the PM<sub>2.5</sub> (particles  $\leq 2.5$   $\mu\text{m}$  in diameter) NAAQS that contains a host of local air pollution contributors.

I work with the Community Action Against Asthma (CAAA) project which uses a community-based participatory research (CBPR) approach to identify and address the environmental triggers for asthma among children in Detroit, MI. East Detroit is predominantly African American (97%) and contains a major interstate highway and some manufacturing plants. Southwest Detroit is the part of the city where the largest percentage of Latinos reside [approximately 60% Latino, 16% African American, and 20% White] and has historically contained most of the industrial facilities of Detroit along with high diesel traffic from a nearby international border crossing. Previous findings from the CAAA project show that children with asthma in east and southwest Detroit disproportionately experience decreased lung function and adverse respiratory symptoms as a result of exposure to PM<sub>2.5</sub>.

My research involves the identification and characterization of the contributing PM<sub>2.5</sub> sources in east and southwest Detroit using source apportionment modeling techniques. The findings indicate that regional coal combustion and local motor vehicle emissions alone are enough for Detroit to be in non-attainment for the annual PM<sub>2.5</sub> NAAQS. Moreover, in east and southwest Detroit, the exposure risk to community members is compounded by the presence of several local industrial facilities which emit multiple heavy metals associated with adverse health outcomes to the respiratory, cardiovascular and neurological systems. Results of the source apportionment will be used to determine the source-specific health effects of asthmatic children in Detroit and advocate for environmental policy change.

Related websites:

**Community Action Against Asthma**

<http://www.sph.umich.edu/mcech/research/caaa.html>

**Michigan Center for the Environment and Children's Health**

<http://www.sph.umich.edu/mcech/>

**Detroit Community-Academic Urban Research Center**

<http://www.sph.umich.edu/urc/>

**W.K. Kellogg Health Scholars Program**

<http://www.cfah.org/programs/healthscholars/>