

**TITLE**

Adverse Birth Outcomes and Air Pollution in Michigan

**THEME**

Advance Environmental Public Health Science and Research

**KEYWORDS**

low birth weight, carbon monoxide, nitrogen dioxide, ozone, particulate matter less than 2.5  $\mu$ , sulfur dioxide

**BACKGROUND**

Exposure to ambient levels of carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter less than 2.5  $\mu$  (PM<sub>2.5</sub>) and sulfur dioxide (SO<sub>2</sub>) have been associated with adverse birth outcomes.

**OBJECTIVE(S)**

To assess potential effects of these criteria air pollutants on low birth weight (LBW).

**METHOD(S)**

A semi-individual study was designed to merge databases containing 1990–2001 CO, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub> and SO<sub>2</sub> measurements from air-monitoring sites in Allen Park, Lansing, and Detroit, Michigan, with a database containing corresponding individual-level birth certificate information. The study area involves 36 ZIP Codes that are within a 4-kilometer radius of an air-monitoring site. Among infants of 16–45 year old mothers, singletons weighing 750–4000g with a gestational age of 20–40 weeks were included. LBW risk factors in the study included maternal race, age, prenatal care level, site of residence, history of certain diseases, and smoking, as well as gender of the newborn and year and month of the delivery.

**RESULT(S)**

Analyses included 207,481 newborns. Mean gestational age was approximately 37 weeks at all sites. Risk factors for LBW were low gestational age (<38 weeks), maternal diseases (except for diabetes), maternal smoking, African-American ethnicity of the mother, female newborn, age of the mother (<20 years and > 30 years) and the site of residence.

**DISCUSSION/RECOMMENDATION(S)**

The analysis indicated that LBW is partially explained by maternal health conditions, habits, and ethnicity as well as newborn's gestational age and gender. Regression models for each pollutant controlling for LBW risk factors are being examined. In the final model, we will include all pollutants that show a significant effect in single-pollutant models.

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