# DOES COMMUNITY VULNERABILITY AMPLIFY THE RELATIONSHIP BETWEEN TRAFFIC EXPOSURE AND ADVERSE BIRTH OUTCOMES? A UNIVERSITY-REGULATORY RESEARCH COLLABORATIVE ON ENVIRONMENTAL HEALTH INEQUALITIES

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**Background**: Studies within the United States and elsewhere have identified a relationship between air pollution, preterm birth, and low birth weight Spatial variation in air pollutant concentrations in urban areas have been attributed to traffic emissions, and documented for several pollutants, including nitrogen dioxide, ultrafine particles, and particulates. Epidemiological studies have linked residential proximity to traffic, such as distance to major roadways or traffic density near specific locations with adverse perinatal outcomes, including increased risk of preterm birth, small size for gestational age, and low birth weight. However, there remains a paucity of research on traffic density and birth outcomes, and few studies have examined effect modification by area-level SES measures.
**Methods**: We build on existing work by examining links between traffic density and risk of preterm birth and effects on average birth weight in a large sample of singleton births (~1.5 million) in California between 2001-2005. We also assessed the potentially synergistic and confounding effects of area-level SES measures. Distance weighted traffic volume measures were geocoded to the mother's address at the time of birth.
**Results:** Results indicate a decrease in average birth weight with increasing traffic burden [-10.4 (95% CI: -7.1, -13.6)] in the highest versus lowest quintile of traffic density] and a higher risk of preterm birth with higher traffic density [1.04 (95% CI: 1.01, 1.07) highest versus lowest quintile of traffic density]. Effect estimates remained robust after controlling for maternal and neighborhood level SES variables. Although we did not observe effect modification by neighborhood-level SES, we did observe stronger effects for birth weight in areas characterized by higher levels of racial residential segregation.
**Conclusion:** Results suggest that studies applying source-specific measures of ambient pollution, such as traffic density, can elucidate policy-relevant opportunities for reducing community exposure to multiple pollutants.