

# TRAFFIC RELATED AIR POLLUTION AND REGIONAL AIR QUALITY ARE ASSOCIATED WITH AUTISM

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**Background and Aims:** Autism is a developmental disorder with rising prevalence. Examination of regional pollutants has suggested the importance of air toxics in autism etiology, yet little research has examined local level air pollution exposure beyond measures of roadway proximity. In this study we investigate the relationship between traffic related air pollution (TRP), regional air quality, and autism.

**Methods:** This study analyzed data on 303 autism cases and 259 typically developing controls enrolled in the Childhood Autism Risks from Genetics and the Environment (CHARGE) Study. Autism diagnosis was confirmed from evaluations conducted at the M.I.N.D. Institute. The mother's address from the birth certificate and addresses from a residential history questionnaire were geo-coded and used to determine residential location for the first year of life and each trimester of pregnancy. TRP estimates were assigned to each location using the CALINE4 line-source air-quality dispersion model. Regional air pollutant measures were assigned using the EPA's Air Quality System data. Logistic regression models were fit comparing estimated first year pollutant levels for autism cases vs. typically developing controls.

**Results:** Cases were more likely to live at residences with the highest quartile of TRP exposure as compared to controls (OR 2.02, 95%CI 1.25-3.28). Measures of regional PM<sub>2.5</sub> and PM<sub>10</sub> also increased autism risk (2.10, 1.18-3.76 per 8.8 µg/m<sup>3</sup> PM<sub>2.5</sub> and 2.15, 1.22-3.84 per 12.4 µg/m<sup>3</sup> PM<sub>10</sub>). Results were relatively unchanged after including covariates.

**Conclusions:** Exposure to both regional and local air pollutants was associated with autism risk. Further examination of specific air pollution measures is needed to better understand this association.