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Proximal Exposure of Utah Schoolchildren to Airborne Pollutants From Major Roadways

William M. McDonnell^{1,2}, Phoebe B. McNeally³, and Sean D. Firth¹

¹*Department of Pediatrics,* ²*Center for Children's Environmental Health Law and Policy,*

³*Department of Geography, University of Utah, Salt Lake City, UT*

Background and Objectives: Air pollutants from motor vehicle exhaust cause adverse health effects in children, increased by close proximity. Roads with higher speed limits generally have higher traffic volumes and more pollution. We examined the proximity of schoolchildren to these pollutants and assessed the effects of socioeconomic factors.

Methods: We obtained geographic location data for all schools in Salt Lake County, Utah. We reviewed Census Bureau data for each school's census tract. Using geographic information systems, we determined the distance from each school to the nearest "major roadway," defined as the road with the highest speed limit within 150 m. Roads were grouped as: ≤ 30 mph; 31-50 mph; and > 50 mph. We used non-parametric analyses for statistical comparisons.

Results: We identified 349 schools. Seven percent ($n = 24$) were within 150 m of > 50 mph roads, while 12 percent ($n = 41$) and 81 percent ($n = 284$) were within 150 m of 31-50 mph and ≤ 30 mph roads, respectively. Poverty was directly related to school proximity to higher mph roads. Poverty rates increased from 1.0 percent in communities with ≤ 30 mph schools, to 1.5 percent at 31-50 mph schools, and 2.8 percent at > 50 mph schools ($p < 0.05$). Lower educational achievement was associated with higher mph roads. In communities with ≤ 30 mph schools, 5.5 percent of the population had less than a high school education, with 6.4 percent at 31-50 mph schools, and 13.7 percent at > 50 mph schools ($p < 0.05$).

Conclusions: Many children attend schools close to medium- and high-traffic roads. Schoolchildren in lower socioeconomic communities may be at increased risk of close exposure to traffic pollutants.