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Am J Epidemiol. 2012 Aug 15;176(4):327-37. doi: 10.1093/aje/kws012. Epub 2012 Jul 25.

Does traffic-related air pollution explain associations of aircraft and road traffic noise exposure on children's health and cognition? A secondary analysis of the United Kingdom sample from the RANCH project

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PMID: 22842719 PMCID: PMC3415279 DOI: 10.1093/aje/kws012

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Abstract

The authors examined whether air pollution at school (nitrogen dioxide) is associated with poorer child cognition and health and whether adjustment for air pollution explains or moderates previously observed associations between aircraft and road traffic noise at school and children's cognition in the 2001-2003 Road Traffic and Aircraft Noise Exposure and Children's Cognition and Health (RANCH) project. This secondary analysis of a subsample of the United Kingdom RANCH sample examined 719 children who were 9-10 years of age from 22 schools around London's Heathrow airport for whom air pollution data were available. Data were analyzed using multilevel modeling. Air pollution exposure levels at school were moderate, were not associated with a range of cognitive and health outcomes, and did not account for or moderate associations between noise exposure and cognition. Aircraft noise exposure at school was significantly associated with poorer recognition memory and conceptual recall memory after adjustment for nitrogen dioxide levels. Aircraft noise exposure was also associated with poorer reading comprehension and information recall memory after adjustment for nitrogen dioxide levels. Road traffic noise was not associated with cognition or health before or after adjustment for air pollution. Moderate levels of air pollution do not appear to confound associations of noise on cognition and health, but further studies of higher air pollution levels are needed.

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