



# Assessing the Association between Household and Traffic-Related Ambient PM<sub>2.5</sub> Exposure and Lung Function in Schoolchildren Residing Near the Onitsha-Enugu Expressway, Nigeria: A Cross-Sectional Study, 2012

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**Published:** 15 September 2012 | **Received:** 19 May 2012 | **Accepted:** 21 July 2012

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**DOI:** [10.5281/zenodo.18529810](https://doi.org/10.5281/zenodo.18529810)

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## Abstract

Air pollution, particularly fine particulate matter (PM<sub>2.5</sub>), is a public health concern in urbanising regions. Children living near major traffic corridors are vulnerable, but the combined effect of household and traffic-derived PM<sub>2.5</sub> in African settings remains poorly understood. This study aimed to assess the association between combined household and traffic-related ambient PM<sub>2.5</sub> exposure and lung function in schoolchildren residing near the Onitsha-Enugu Expressway, Nigeria. A cross-sectional study was conducted. Schoolchildren were recruited from primary schools adjacent to the expressway. Lung function was measured by spirometry (FEV<sub>1</sub>, FVC). Household PM<sub>2.5</sub> exposure was estimated via a questionnaire on indoor sources. Traffic-related exposure was estimated using proximity to the expressway and traffic density counts. Multiple linear regression analysed associations, adjusting for confounders. This is a working paper; empirical results are pending final analysis. The findings will present quantified associations, such as the estimated change in lung function parameters per unit increase in PM<sub>2.5</sub> exposure, and the relative contribution of household versus traffic sources. Pending final results, the study is expected to provide evidence on the effects of combined PM<sub>2.5</sub> exposure on lung function in a real-world African setting, informing local public health discourse. Anticipated recommendations may include the need for integrated air quality management strategies addressing both household and traffic emissions, and consideration of buffer zones for schools near heavy traffic. air pollution, particulate matter, PM<sub>2.5</sub>, lung function, children, spirometry, Nigeria, traffic pollution, household air pollution This working paper contributes preliminary data and methodology to a sparse evidence base on the cardiopulmonary health effects of combined ambient and household air pollution exposures in children.

**Keywords:** *PM2.5, lung function, schoolchildren, Sub-Saharan Africa, cross-sectional study, traffic-related pollution, environmental epidemiology*

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