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# Assessing the Correlation between Airborne Particulate Matter and Asthma Exacerbations in Schoolchildren within an Industrial Zone of Nairobi: A 2002 Cohort Analysis

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## Abstract

Asthma is a major paediatric public health issue in urban Africa, with industrial emissions a suspected key factor. The quantitative relationship between airborne particulate matter (PM) and asthma exacerbations in schoolchildren living in African industrial zones remains poorly characterised. This study aimed to determine the correlation between concentrations of airborne particulate matter (PM2.5 and PM10) and rates of asthma exacerbation in schoolchildren residing in an industrial zone of Nairobi, Kenya. A cohort analysis was conducted. Daily ambient PM2.5 and PM10 levels were monitored at multiple sites within the industrial zone. Asthma exacerbation data, defined by symptom diaries and healthcare visits, were collected from a cohort of schoolchildren over an academic year. Statistical analysis used correlation and regression models. A significant positive correlation was found between elevated particulate matter levels and increased rates of asthma exacerbations. For every 10 µg/m³ increase in weekly average PM2.5 concentration, there was a 7% increase in the odds of a child experiencing an exacerbation. The findings confirm a clear association between higher concentrations of airborne particulate matter and increased asthma morbidity among schoolchildren in this industrial urban setting. Public health interventions should prioritise air quality improvement in industrial zones. Measures should include stricter emission controls, enhanced environmental monitoring, and the implementation of asthma action plans for at-risk school populations. air pollution, particulate matter, asthma, paediatric health, environmental health, industrial emissions, Kenya This study provides original, localised evidence quantifying the impact of industrial particulate pollution on child respiratory health in an African urban setting, informing targeted public health policy.

**Keywords:** *paediatric asthma, particulate matter, air pollution, industrial emissions, Nairobi, cohort study, exacerbations*

# ABSTRACT-ONLY PUBLICATION

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