



INVESTIGATION OF CONTRIBUTION OF AMBIENT OZONE LEVEL TO
THE ASTHMA PREVALENCE AMONG THE SCHOOL CHILDREN

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ABSTRACT

The present work describes an investigation of the contribution of ground level ozone to the asthma prevalence among the school children in between urban-industrial zone and in suburban zone, in Gampaha district.

A questionnaire survey was administered to pupils (11 years of age) in two schools in urban (school A) and suburban (school B) areas to collect data on respiratory health and selected home environmental factors. Two schools were selected with similar social background but having different environmental conditions that may deteriorate the health of the children. Outdoor school ambient ozone level were tested using a passive sampling method for the concentration of airborne ozone using indigo blue (10^{-3} M: 0.0062 g) spiked filter.

A total of 600 pupils participated from both schools. Out of the asthmatic subjects who were getting continuous medication, 87% in 'school A' had started their asthmatic symptoms after age six compared to 43% in 'school B'. Thirty four percent children had at least one positive respiratory symptom in 'school A' compared to 'school B' (6%) and wheezing and phlegm production when subjects don't have cold also appeared to be more common among children in 'school A' (23% and 32% respectively) compared to 'school B' (3% and 5% respectively). The house characteristics that contribute to cause the asthmatic respiratory symptoms such as renovations, parental smoking, presence of pets, living in an old house (more than 20 years old) and parental asthma are not significant among 'school A' and 'school B' subjects. A significantly ($p < 0.01$) higher proportion of case subjects in 'school A' had a higher ozone exposure (0.08 ± 0.01 ppm) compared to 'school B' (0.03 ± 0.01 ppm) and 'school A' classrooms had significantly ($p < 0.01$) greater ozone exposure during the sunny days. The study also established a significant positive relationship between ozone levels and room temperature ($p < 0.01$). According to the present analysis children exposed to levels of ozone of ≥ 0.08 ppm (one hour analysis) are 34% in 'school A' more likely to have at least one respiratory symptom related to asthma compared to those who are not exposed to such levels in 'school B' (≥ 0.03 ppm, 6%). The present results confirm that airborne ozone level in industrial zone contribute as risk factors for asthma in children in urban school in Gampaha district. Since the quality of the school environment in 'school A' is potentially modifiable there might be opportunities for intervention to reduce asthma symptoms.