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Levels of exposure to nitrogen dioxide of individuals traveling from suburban areas to a selected site in the city of Colombo

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The city of Colombo like many other urbanized cities in developing countries faces a situation where the concentrations of gaseous air pollutant levels are on the increase. Individuals traveling from suburban areas to the city of Colombo along busy roads are exposed to these pollutants which increases the risk of respiratory health effects. Of these pollutants, Nitrogen dioxide is a gaseous pollutant which is associated with a range of respiratory health effects.

This study was done to determine and compare the levels of exposure to Nitrogen dioxide of individuals traveling from selected suburban areas to the City of Colombo.

Four students traveling from four suburban areas; Dehiwala, Moratuwa, Maharagama and Kadawatha, to a common site in the city of Colombo (Department of Zoology, University of Colombo) were selected for the study. The total exposure of each student for a period of four working days (Monday morning to Friday morning) was measured using a passive sampling unit. Minimum measurable concentration of the unit is 1.2 $\mu g/m^3$. Simultaneously their home levels were also measured throughout the same period. The final NO_2 concentrations were obtained using a standard colorimetric method. Sampling was carried out for a period of six consecutive weeks.

Individual exposure levels to Nitrogen dioxide during normal day to day activities ranged from 48.0 $\mu g/m^3$ to 126.3 $\mu g/m^3$. The home levels ranged between 23.8 $\mu g/m^3$ and 57.7 $\mu g/m^3$. Considering the mean exposure levels, statistical analysis showed that the exposure during normal day to day activities was significantly higher than their respective home levels in all subjects ($P<0.05$). All recorded values were below the WHO one-hour standard value of 200 $\mu g/m^3$.

The study concludes that individuals traveling from suburban areas to the City of Colombo for normal day to day activities are exposed to significantly higher concentrations than their home levels. Although these values do not exceed the WHO standard level, previous studies have shown that long term exposure to these levels can cause significant respiratory health problems.

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