The impact of out-door air polution on respiratory health and stunting in school children in Nairobi, Kenya.

By Nyalobeka Gladys Motende

Introduction: Globally urban air pollution is estimated to be responsible for 800,000 premature deaths each year. Acute respiratory infections are ranked fourth in the share of disease burden in Sub-Saharan Africa accounting for 7% of total deaths. Air pollution is a nuisance to industry mostly concentrated in urban centers where majority of the people live. Nairobi was reported to be having high levels of particulate matter $\text{SPM}_{10}$ (239-126m3) higher than WHO acceptable level of 150ug/m3.

Objective: The main objective of the study was to assess the impact of air pollution on the respiratory symptoms among school going children in Nairobi. A questionnaire was sent out to parents using the children. Children in kindergarten were examined for signs of respiratory infection while those attending primary schools were examined for height, weight and peak flow measurements. Only children whose parents gave a written consent were allowed to participate.

Study Design: This was a comparative ecological study intended to find out whether a difference existed in episodes of respiratory symptoms, peak flow reading, BEAT and stunting among children in two residential areas. One of the study areas was proximal to industrial area (South C) while the other was 10 kms away that is (Ngummo) estate in Nairobi.

Setting and Time Frame: Seven schools were randornty selected. Data collection took place from January 2004 through to October 2004.

Methods: Data was obtained by making observation and self administered questionnaires. The respondents of the questionnaires were c'ildren's parents while the principal investigator carried out the clinical observation and other measurements.

Results: A total of 602 cases were selected, 303 were from Ngumrno residential estate while 299 were from South C estate. Out of these, 306 were from primary schools while 296 were from pre-primary schools. The mean age was 7.6 years.
The children came from similar socio economic class, allergic reaction, cooking fuel and smoking patterns were also similar. Response rate was 85%. Reported cough was the highest reported with an overall morbidity at 39.5% and the least reported was high temperature. The most observed symptom was inflamed throat at 52.7% and the least observed was sneezing 0.7%. The results showed more cases of respiratory infection signs in South C compared to Ngummo. For example, observed inflammed throat and blocked nose in kindergarten child were statistically significant respectively ($x^2=9.32, df=1, p=0.002$ and $x^2=10.41, df=1, p=0.001$) using chi test of significance. The reported symptoms were not statistically significant probably due to inaccurate reported information. Majority of cases recorded abnormal peak flow measurements may be due to poor technique in handling the gadget or the table used to compare was not applicable to Kenyan and African children in general. Abnormal peak flow comparison was statistically significant ($x^2=43.506, df=28, p=0.031$). Body Mass Index showed statistically significant with low BMI recorded in a more polluted area. Multiple regression analysis confirmed the exposed zone, assessed as residence, as a risk factor for observed blocked nose (Wald's stat=4.147, p=0.053), inflammed throat (Wald's stat=9.270, p=0.005), and reported sore throat (Wald's stat=4.205, p=0.040).

**Conclusion:** Proximal human habitation to industrial setup was found to be a risk factor in exacerbation of respiratory infections

**Recommendation:** The result suggests the need for action in regulating air pollution in the city of Nairobi or else there will be continued increase in disease burden due to air pollution related illnesses (respiratory symptoms) as it is the case in cities of developed countries.