Impacts of air pollution on health in southern Africa

**Status of human exposure to air pollutant in southern Africa**

Tens of thousands, if not hundreds of thousands of people in the SADC region, are likely to be exposed to concentrations of various pollutants in the ambient air in excess of the World Health Organisation (WHO) guidelines. However, due to the lack of monitoring information it is difficult to be specific about numbers and impacts. It is also likely that a large proportion of the population using biomass fuels indoors will be exposed to health damaging concentrations of pollutants.

Traffic, waste burning, industry, veld fires, burning of wood, coal, dung and kerosene for domestic energy needs are the main sources of air pollution.

Smoke from winter fires in the township of Alexandra, Johannesburg.

Exceedances of WHO and national guidelines occur in hotspots areas such as in:

Vaal Triangle – total suspended particulate matter (TSP) concentrations exceeded the US National Ambient Air Quality Standard (NAAQS) of 260 \( \mu g/m^3 \) for 24-hour period, five times in 1992.

Botswana (Palapye) – 1-hour \( SO_2 \) concentrations of 4,457 \( \mu g/m^3 \) were reported in 1997.

**Impacts of ambient air pollution in Southern Africa**

**Sulphur Dioxide (SO\(_2\))** short term exposures have been associated with increases in the occurrence of lower respiratory symptoms indicative of asthma such as cough, wheezing, chest tightness, and shortness of breath in school children in the South Durban Industrial Basin. Asthma prevalence rate was reported to be approximately 52%.

**Nitrogen Dioxide (NO\(_2\))** acute exposures induce decreased lung function particularly in sensitive sub-population groups such as asthmatics. \( NO_2 \) exposure is linked with increased susceptibility to bacterial and viral infections.

**Particulate Matter (PM\(_{10}\))** acute exposures have been associated with changes in lung function and exacerbation of asthma symptoms in school children in the South Durban Basin.

Chronic exposure of TSP (184 \( \mu g/m^3 \)) in the Vaal Triangle was associated with high prevalence (65%) of upper respiratory diseases (running nose, earache, hay fever, sinusitis and/or rhinitis), and lower respiratory illnesses (chronic bronchitis, chronic cough, chest illness) of 28.9% in children aged 8-12 years.

**Indoor Air Pollution**

**Sources:** dung, coal, wood, crop waste, kerosene etc.

**Concentrations:**

- **Zimbabwe (1990)** – Levels for inhalable TSP were reported to be 1,300 over a 2-hour averaging period.

- **South Africa (1993)** – Levels of TSP were 1,720 and 1,020 \( \mu g/m^3 \) in the kitchen and bedroom respectively over a 12-hour period.

**Health Impacts:**

Acute and chronic respiratory illnesses particularly in children and the elderly. Examples are chronic obstructive pulmonary disease, cancer and tuberculosis.

Common pollutants: particulate matter, carbon monoxide, polycyclic organic matter and formaldehyde.

**Examples:**
Regional responses to health impacts


This initiative is based on plans to phase out leaded gasoline by 2005 in Sub Saharan Africa.

Achievements to date include:
- Awareness raising regarding urban air pollution impacts.
- Leaded gasoline phase out action plans.
- Promotion of use of solar energy.
- AFRICACLEAN network of air quality practitioners.
- Low smoke coal program in South Africa.
- Electrification program in South Africa.
- Rural electrification in Zimbabwe.

b) Air pollution legislation aimed at protecting public health.

In most cases legislation is outdated and difficult to enforce due to a lack of manpower, financial and institutional resources.

c) Revision of air quality legislation in South Africa.

Ambient air quality standards are being revised to follow internationally recommended guidelines.

Air Pollution Information Network – Africa (APINA)

APINA is part of the Regional Air Pollution in Developing Countries (RAPIDC) Programme which is funded by the Department of Infrastructure and Economic Cooperation (INEC) of Sida, the Swedish International Development Cooperation Agency. RAPIDC Programme activities are coordinated by the Stockholm Environment Institute (SEI) and are carried out in Asia and Africa (mainly south Asia and southern Africa). The APINA Secretariat is at the Institute of Environmental Studies, University of Zimbabwe and project activities are carried out by researchers from several African universities, research institutes together with industries and non governmental organisations. The aim of APINA is to fill gaps in knowledge on air pollution in Africa and ensure that currently available information and concerns are articulated to policy makers in the region. APINA acknowledges the financial support from Sida.

Further Information at:

McGranahan G and Murray F. (eds) (2003). Air Pollution and Health in Rapidly Developing Countries


and the APINA website http://www.york.ac.uk/inst/sei/rapidc2/apina/apina.html

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