



# INFOTOX (Pty) Ltd

Established 1991

Retrieval and scientific interpretation of ecotoxicological information

P O Box 98092

Waterkloof Heights

0065

SOUTH AFRICA

Tel: +27(12) 346 4668

Fax: 086 513 5478

Cell: 0824165864

E-mail: [info@infotox.co.za](mailto:info@infotox.co.za)

Website: [www.infotox.co.za](http://www.infotox.co.za)

## Technical Note 001 Rev 1.0

### Air Pollution and Human Health Risks

Assessment of the risk of non-cancer health effects associated with exposure to environmental toxicants is based on the comparison of the concentration or dose of exposure with risk-based reference concentrations or doses. The fundamental theory is that the likelihood of adverse health effects at exposures below these references is remote. This approach is the basis for the management of criteria air pollutants, *inter alia* particulate matter, sulphur dioxide and nitrogen dioxide, through ambient air quality standards or guidelines.

Ambient concentrations higher than air quality guidelines or standards may be associated with adverse health outcomes, but simple comparisons between exposure concentrations and guidelines are inadequate to quantify potential health risks. This is because background concentrations, without considering the contribution of sources under investigation, may already be associated with potential adverse impacts on health. It is, indeed, common to observe associations between increased hospitalisation and mortality rates and increased concentrations of particulates, sulphur dioxide and nitrogen dioxide even when the increased concentrations are within air quality guidelines. Estimation of impacts on health may therefore not be restricted to areas in which the guideline concentrations are exceeded, but must include areas in which concentrations are within limits.

Effects on the cardiovascular and respiratory systems are of primary concern for particulate matter, sulphur dioxide and nitrogen dioxide. Health risks are quantified in terms of the potential increase in hospital admissions or in mortality due to particular health effects, based on modelled increases in air concentrations of these pollutants. The assessment methodology is factually based on results of epidemiology studies from the international scientific literature, in which statistical methods are used to compare changes in hospitalisation or mortality rates with changes in air quality.

INFOTOX conducts human health risk assessments for pollutants in this category according to updated and internationally accepted assessment methodologies and epidemiological information. The pivotal importance of a knowledgeable approach is reflected in the magnitude of ongoing research and the increasing frequency of re-assessment of epidemiological evidence by international regulating authorities.



Artist: Frans Claerhout