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Retrieval and scientific interpretation of ecotoxicological information

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Air Pollution and Human Health Risks

Air pollution and associated potential human health risks are of concern to regulating authorities, the concerned public and industrial managers seeking to balance profitable business ventures with responsible environmental stewardship.

INFOTOX conducts assessment of human health risks associated with exposure to carcinogens and systemic toxicants in air according to the paradigm that was published in 1983 by the National Research Council in the USA. This paradigm has been refined since that time and is applied worldwide by regulatory agencies and health risk assessment specialists. Noncancer risk assessment is based on reference doses or tolerable daily intakes, whereas cancer risk assessment applies cancer slope factors in the quantification of risk. Mutagenic carcinogens are dealt with as special cases. INFOTOX keeps up to date with the latest international scientific publications in toxicology and epidemiology to produce risk assessment reports that are of world class standard.

Criteria pollutant health risk assessments require a different approach. International regulating authorities focus regulation of ambient air quality on a set of common air pollutants known as "criteria pollutants". These are, inter alia, particulate matter, sulphur dioxide, nitrogen dioxide and carbon monoxide. Cardiovascular and respiratory health effects are of primary concern in exposed communities.

INFOTOX performs criteria pollutant health risk assessments based on air concentrations of these pollutants and not on adherence to ambient air quality standards or guidelines. Criteria air pollutants are managed through ambient air quality standards or guidelines, which aim to minimise adverse health effects associated with pollutant exposure. However, it is common to find associations between health effects and increased concentrations of criteria pollutants even when the 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.

Criteria pollutant health risks are quantified in terms of premature mortality or the potential increase in hospital admissions due to cardiovascular or respiratory health effects. The assessment methodology is factually based on results of epidemiology studies from the international scientific literature, in which statistical methods are used to associate changes in hospitalisation or mortality rates with changes in air quality. INFOTOX quantifies human health risks associated with criteria pollutants 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.