

# **Hazardous Chemicals Impacts Assessment for Risk Management and Reduction**

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Assessment of risks posed by chemicals and especially hazardous chemicals to human health is one of the main parts in the holistic methodology of Risk Analysis, including risk assessment, risk management, and risk notification.

The great danger for human health and the environment is posed by highly-stable chemical compounds with ability to intra-media transfer and spatial distribution. This group includes persistent organic pollutants (POPs): polychlorinated biphenyls (PCBs), polychlorinated dibenzodioxines and dibenzofurans (PCDDs/PCDFs), aldrin, dieldrin, DDT, chlordane, hexachlorbenzol, mirex, toxafen, heptachlor, as well as mercury and heavy metals. These substances being accumulated in environmental matrices (water, air, soil) penetrate through the trophic chain and enter the human organism.

Upon availability of data on concentrations of mentioned substances in environmental objects, the estimation of their comparative danger was achieved using individual and population-based carcinogenic risk values.

For substances with homogeneous action or those affecting identical bodies/systems, it is reasonable to estimate total risk.

Chemicals present in the environment and potentially influencing the population should be revealed at the stage of hazard identification.

This stage of risk assessment presupposes:

- Identification of environmental pollution sources;
- Identification of pollutants;
- Characterization of probably harmful effect of chemicals;
- Identification of priority chemicals for their further study: exposure routes and pathways for penetration into human organism;
- Revealing harmful effects probably caused by priority substances.

The procedure of risk analysis consists of such elements as risk assessment, risk management, and risk communication. Implementation of risk assessment methodology for environmental and human health quality management allows:

- Developing management mechanisms and strategy of various regulatory measures on risk reduction;
- Obtaining quantitative characteristics of health damage from exposure to harmful environmental factors;
- Comparing and ranking different effects by severity of impact factors;
- Reducing the uncertainty of analysis in decision-making;
- Establishing more reliable and safe exposure levels and hygienic standards;
- Identifying environmental policy priorities and human health protection policy.