New US tool to assess cumulative health risk of multiple chemicals

Assessing the cumulative human health risk caused by multiple toxic substances is a major challenge. New research has reported on developments in the US, where the Environmental Protection Agency (EPA) is creating a tool that will provide maps and other information to depict exposure data and risks at both a national and a local level.

Identifying and prioritising environmental issues within a community requires clear assessment tools that are based on scientific evidence. These tools include exposure models, sampling methods, databases and geographical information systems (GIS). The US EPA is developing models and tools to conduct exposure assessments of multiple stresses to the environment, with the aim of reducing risks and improving health.

The study outlined the research programme behind this initiative. So far the programme has reviewed and evaluated existing assessment tools by applying them to case studies. Alongside discussions with stakeholder groups, which include scientists and regional EPA officers, the review indicated that existing tools are difficult to use and do not answer all community questions. More specifically it suggested that:

- Tools need to be developed collaboratively with end-users to become more user-friendly
- Tools need to quantify cumulative risks and the impact of reduction activities
- More data are needed on both community-level and individual-level exposure and their links to health effects
- Additional research is needed to consider the effects of non-chemical factors that affect risk, such as noise and individual stress

The programme has started to develop the Community-Focussed Exposure and Risk Screening Tool (C-FERST). This will assess exposure at several levels, for example, sources (e.g. airports, traffic), individual toxic substances (e.g. radon, benzene) and health effects (e.g. childhood asthma, lung cancer). It will contain general information about the selected environmental stressor or toxic mixture, such as factsheets and weblinks, more specific information about the population affected, through maps, for example, as well as more details on sources, concentrations, exposures, risks, health effects and actions that can be taken to reduce risk.

Research to underpin the development of C-FERST has started. This includes evaluating existing risk assessment approaches for environmental issues, such as benzene, radon, tobacco smoke and ultraviolet radiation. The aim is to collaborate with community assessments and the National Children’s Study to evaluate the tools, and initial efforts have been made to develop models to assess individual exposure to multiple pollutants focussing on asthma and diet.

Eventually C-FERST will identify communities at risk to multiple toxic chemicals, assess the health impacts of these chemical mixtures and evaluate reduction strategies.


Contact: schultz.brad@epa.gov

Theme(s): Chemicals, Environment and health, Risk assessment