International advances in tiered assessment for combined exposures: Incorporating novel assessment methods

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A World Health Organization (WHO) International Programme on Chemical Safety (IPCS) Framework outlines a pragmatic approach to the identification and consideration of priorities in the grouping and assessment of combined exposures to multiple chemicals. The Framework includes formal problem formulation followed by step wise consideration of both exposure and hazard in several tiers of increasingly data-informed analyses. These analyses build on recent developments in assessment, incorporating predictive approaches in early tiers and increasingly refined, more data-informed mode of action and probabilistic analyses in later tiers.

Recently, the Framework has been additionally developed in a number of initiatives in both research and application, including guidance of the Organization for Economic Cooperation and Development and the European Food Safety Agency, the development of tools within the European Horizon 2020 Research Project, Euromix and a recent WHO Publication on Chemical Mixtures in Source and Drinking Water.

The Framework also serves as an organizing construct for a “Roadmap” for methodological guidance on chemical risk assessment of the WHO/IPCS Harmonization Initiative. This Roadmap provides the basis for practical advice for the implementation of these various methodologies in tiered assessment and management strategies.

Tiered assessment incorporating methodological advances internationally will be illustrated through presentation of examples and case studies. The implications of increasing international experience in tiered assessment incorporating new and evolving methods will also be addressed.
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