The role of exposure scenarios in human health risk assessment for microplastics

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Abstract

Evidence of microplastics being present in the human body has grown in recent years. Between 2022 and 2024, there have been over 55 peer-reviewed publications describing microplastic residues in the human body, compared to merely 4 publications reporting similar findings between 1998 and 2021. Yet, at this time, there is no accepted methodology for conducting a human health risk assessment of microplastics because of limitations in the exposure and hazard evaluations, respectively. To overcome these limitations, evidence-based microplastic exposure scenarios are needed to develop the risk assessment process by facilitating quantitative estimates of exposure through relevant inhalation, ingestion, and dermal exposure pathways. The ongoing work to be presented will describe a population-level exposure scenario for the European continent. Additionally, sub-population exposure scenarios, which incorporate important differences in human physiology and behaviour, will also be presented to highlight the variability in potential microplastic exposure for specific demographics. The strengths, weaknesses, and uncertainties of population and sub-population microplastic exposure scenarios will be discussed. The goal of this presentation is to showcase exposure scenarios and exposure factors therein which could lead to different levels of microplastic exposure for demographics within a population, thereby evolving the microplastic exposure scenario paradigm and advancing exposure science for microplastics.

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