Improving the REACH exposure scenario
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Introduction

The aim of REACH: Improving the protection of human health and the environment from the risks that can be posed by chemicals

The health of ecosystems and human beings are dependent on the quality of the environment

Need to consider the ecosystem services

Two objectives needed to accomplish the aims of REACH

Assessment of the aggregated exposure (including several routes, pathways and multiple substances with similar MOAs)

Contribution to the sustainability of industrial system (improve environmental quality by circular resource management systems)

Question: Can REACH be implemented with equal protection of the general population in- and outside EU for countries with different environmental qualities and national regulations?

Materials and methods

REACH exposure scenario and total human exposure

SOURCES TO TOTAL EXPOSURE: BACKGROUND ENVIRONMENT + PRODUCT USE + FOOD DIGESTION

Exposure from the environment (under REACH)

PEC(local) = C(local) + PEC(regional)

Figure 1, box 1.1.2 and 2.1.2

Cumulative exposure from background environmental quality (historical accumulation and existing emissions from other sources) are not included in current REACH assessment tools

Exposure from background environment

Air inhalation + Soil digestion (for historical accumulation and existing pollutants)

Figure 1., box 1.1.1 + 2.1.1

Results (Korea vs. Denmark)

As air and soil concentrations in Korea and Denmark differ (Fig. 2 and 3), the aggregate exposure to children via the environmental exposure in Korea and Denmark differ (Fig. 4).

Discussions

The REACH exposure scenarios may be supported by a system approach to address territorial differences in environmental qualities and their contribution to total exposure. REACH as regulatory framework may be supported by EIA and take into account environmental quality and emissions (PRTR) in a life cycle perspective.

Conclusions

1. Current REACH exposure scenario does not include the contribution from background environment quality, which reflects historical and existing emissions from other facilities

2. The results show that countries have different environmental quality which affects the environmental background exposure for humans and ecosystems

3. Based on this result, we can emphasize the importance of a system approach for linking the REACH exposure scenario with background environmental quality data

References


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