

COMPARISON OF MODELLING APPROACHES FOR THE ASSESSMENT OF CHILDREN EXPOSURE TO LEAD IN A SMELTER AREA IN CHINA

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Lead contamination may represent a significant hazard for the health of children living in mining and smelter areas in China, as proved by cases of lead poisoning reported in the country in recent years. Considering that children constitute a vulnerable population group, more susceptible than adult to the long term cognitive and developmental effects of lead poisoning, the assessment of children health risks posed by lead exposure in China represents a priority research issue.

Although several studies were focused on the investigation of the most relevant lead pollution sources, the limited availability of human biomonitoring data and scarce detailed exposure assessment hamper the characterization of the most significant exposure pathways for children. Two modelling tools for human exposure assessment have been compared to investigate the relevance of different lead exposure pathways for children in rural and smelter areas in China, in order to support the definition of more effective risk management procedures. Specifically, a new software tool for the integrated assessment of human exposure (currently being refined and validated within the EU project "4FUN") has been applied to a case study concerning children exposure in a historical Pb-Zn smelter site in southwest of China. The tool provides a library of exposure models and allows to couple on the same platform multimedia and physiologically-based pharmacokinetic models for simulating human internal exposure. The results of this new tool are compared with the ones provided by the most common used Integrated Exposure Uptake Biokinetic (IEUBK) model. The application allows to identify the most relevant exposure routes and to explore their relative contribution to the overall children exposure. The results of the application and the comparison of the two exposure models are presented and discussed.