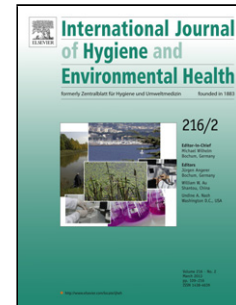


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Identification of exposure to environmental chemicals in children and older adults using human biomonitoring data sorted by age: results from a literature reviewJudy Choi^a, Lisbeth E. Knudsen^b, Seher Mizrak^b, Anke Joas^a^a BiPRO GmbH, Munich, Germany^b Department of Public Health, University of Copenhagen, Copenhagen, Denmark**Abstract**

Human biomonitoring (HBM) provides the tools for exposure assessment by direct measurements of biological specimens such as blood and urine. HBM can identify new chemical exposures, trends and changes in exposure, establish distribution of exposure among the general population, and identify vulnerable groups and populations with distinct exposures such as children and older adults. The objective of this review is to demonstrate the use of HBM to identify environmental chemicals that might be of concern for children or older adults due to higher body burden. To do so, an extensive literature search was performed, and using a set of defined criteria, ten large-scale, cross-sectional national HBM programs were selected for data review and evaluation. A comparative analysis of the age-stratified data from these programs and other relevant HBM studies indicated twelve chemicals/classes of chemicals with potentially higher body burden in children or older adults. Children appear to have higher body burden of bisphenol A (BPA), some phytoestrogens, perchlorate, and some metabolites of polycyclic aromatic hydrocarbons and benzene. On the other hand, older adults appear to have higher body burden of heavy metals and organochlorine pesticides. For perfluoroalkyl substances, polybrominated diphenyl ethers, parabens, and phthalates, both children and older adults have higher body burden depending on the specific biomarkers analyzed, and this might be due to the exposure period and/or sources from different countries. Published data from the DEMOCOPHES project (a pilot study to harmonize HBM efforts across Europe) also showed elevated exposures to BPA and some phthalate metabolites in children across several European countries. In summary, age-stratified HBM data can provide useful knowledge of identifying environmental chemicals that might be of concern for children and older adults, which, combined with additional efforts to identify potential sources of exposure, could assist policy makers in prioritizing their actions in order to reduce chemical exposure and potential risks of adverse health effects.

Keywords: Human biomonitoring; age; children; older adults; vulnerable groups**Abbreviations:** See footnote¹

¹ **Abbreviations****AM:** arithmetic mean**BE:** Biomonitoring equivalents

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