

EXPOSURE TO ENVIRONMENTAL POLLUTION IN THE GENERAL FLEMISH POPULATION: RESULTS OF THE SECOND FLEMISH ENVIRONMENT AND HEALTH STUDY

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Background: The second Flemish human biomonitoring survey (2007-2011) generated information on the distribution of biomarkers for a large number of environmental pollutants in a representative sample of the Flemish population.

Methods: Between May 2008 and July 2009, 255 newborns and their mothers, 210 students (14-15 years old) and 204 adults (20-40 years old) were recruited as a representative sample of the Flemish population. Blood, urine and hair samples were collected; questionnaire data were obtained through self-assessment. For each biomarker, the detection frequency, geometric means and 90th percentiles were calculated as reference values for the Flemish population.

Results: Levels of historical compounds were compared with the first Flemish human biomonitoring campaign. Persistent chlorinated compounds, cadmium and lead levels decreased over time, while 1-hydroxypyrene (metabolite of PAHs) and t,t-muconic acid (benzene metabolite) remained at similar levels.

New emerging pollutants such as perfluorinated compounds, bisphenol A, phthalates, musks, triclosan, *para*-hydroxybenzoic acid (a metabolite of parabens) and 2,5-DCP (a metabolite of *para*-dichlorobenzene) were detected in 80% or more of the samples. For metabolites of organophosphate pesticides, the detection frequency ranged between 5 (DEDTP) and 95 % (DMTP) of the individual urine samples. Levels of brominated flame retardants were under the limit of quantification in most blood samples.

Margins of safety (MOS) were calculated by dividing the 90th percentile by the available health based biomonitoring equivalents (BEs). MOS below 10 were observed for toxicologically relevant arsenic, cadmium, lead, methyl mercury, hexachlorobenzene and phthalates.

Conclusions: Flemish reference values for exposure to environmental pollutants were obtained, both for historical and new emerging chemicals. These reference values may be used to follow up time trends and to compare exposure of the general Flemish population with health based guidance values.