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Emerging contaminants in the Flemish Environment and Health biomonitoring Surveys (FLEHS)

Adrian Covaci, *University of Antwerp, Wilrijk-Antwerp, Belgium*
Nathalie Lambrechts, *VITO, Mol, Belgium*
Govindan Malarvannan, *University of Antwerp, Wilrijk-Antwerp, Belgium*
Gudrun Koppen, *VITO, Mol, Belgium*
Liesbeth Bruckers, *Hasselt University, Diepenbeek, Belgium*
Eva Govarts, *VITO, Mol, Belgium*
Vera Nelen, *Provincial Institute of Hygiene, Antwerp, Belgium*
Tim Nawrot, *Hasselt University, Diepenbeek, Belgium*
Ilse Loots, *University of Antwerp, Antwerp, Belgium*
Isabelle Sioen, *Ghent University, Ghent, Belgium*
Willy Bayens, *Free University Brussels, Brussels, Belgium*
Greet Schoeters*VITO, Mol, Belgium*

Besides classical pollutants measured in individual blood or urine samples, the Flemish and Environment Surveys (FLEHS) have also investigated human exposure to emerging contaminants. An emerging contaminant is defined as a chemical that is newly used in products, can distribute into the environment, and for which there are no or insufficient data available. Chemicals that have been used for a while, but for which we lack data regarding their occurrence, fate or toxicity are also considered emerging contaminants. These compounds have received increasing attention the last years. Exposure originates mostly from current usage of consumer products, such as plastics, food contact materials, personal care and household products, furniture, etc, and nowaday behaviour patterns. We will give an overview of past activities related to the analysis of emerging contaminants in the FLEHS campaigns and compare these with similar activities worldwide. We will then assess the (most) relevant emerging contaminants to be included in future biomonitoring studies.

For exploratory purposes, most of the work on emerging contaminants in the previous FLEHS campaigns has been done in a limited number of pooled urine or blood. While in FLEHS I, only classical pollutants were included, the following campaigns (FLEHS II and III) have included brominated flame retardants, such as polybrominated diphenyl ethers, hexabromocyclododecane and tetrabromobisphenol-A, personal care products (parabens, UV filters, triclosan) and bisphenol-A.

The newest campaign, FLEHS 4 (2016-2020) focuses on a number of new themes, such as use of open space and eco-behaviour, and some more defined investigation of emerging contaminants in adolescents. We will aim for the identification of emerging contaminants and their metabolites by using an array of analytical approaches, such as A) untargeted screening, B) suspect screening, and C) targeted measurements of emerging contaminants and/or their metabolites identified via screening. We will furthermore identify life style-specific exposure profiles: compounds that may differ in relation to specific behavioural patterns. This should give guidance towards more accurate prevention measures that protect against exposure to ubiquitous environmental toxicants and their substitutes in new materials. A number of emerging contaminants have been already identified, such as plasticizer substitutes, bisphenol-S and other bisphenols, organophosphate flame retardants, and new perfluorinated compounds. It is also expected that several new compounds will be identified through non-targeted screening. Lastly,further identification