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Determinants of exposure to POPs and pesticides in the Flemish population

Kim Croes, *Vrije Universiteit Brussel, Brussels, Belgium*
Nathalie Lambrechts, *VITO, Mol, Belgium*
Ann Colles, *VITO, Mol, Belgium*
Liesbeth Bruckers, *Hasselt University, Hasselt, Belgium*
Ilse Loots, *University of Antwerp, Antwerp, Belgium*
Vera Nelen, *PIH, Antwerp, Belgium*
Greet Schoeters, *vito, Mol, Belgium*
Stefaan Dehenauw, *University of Ghent, Ghent, Belgium*
Adrian Covaci, *University of Antwerp, Antwerp, Belgium*
Tim Nawrot, *Hasselt University, Hasselt, Belgium*
Willy Baeyens, *Vrije Universiteit Brussel, Brussels, Belgium*

BACKGROUND: In 2001, the first cycle of the Flemish Environment and Health Study (FLEHS) started. During the past 15 years, multiple pollutants were measured in the blood and urine of newborns, adolescents and adults, residing in whole Flanders. Furthermore, information on lifestyle, food consumption, socio-economic status, occupation, living conditions, tobacco smoke, diseases, and medication intake was obtained through self-administered questionnaires.
OBJECTIVES: The objective of this study is to give an overview of the determinants that significantly influence the body burden of classical pollutants, like PCDD/Fs and dl-PCBs, HCB and p,p'-DDE and more recent pesticides, like metabolites from organophosphate pesticides and glyphosate.
METHODS: The dioxin-like activity of PCDD/Fs and dl-PCBs in the serum was obtained with the CALUX bioassay, while the marker PCBs and pesticides were measured with GC-MS. Confounders and possible covariates were selected and tested with univariate regression analysis. In the adult and newborn campaigns, selected determinants with a p-value below 0.20 in univariate analysis were used in the multiple regression model, but only stayed in the model when significant ($p<0.05$).
RESULTS: Throughout the three biomonitoring campaigns, blood fat content, BMI and intake of fat-rich food were important predictors for the lipid-dependent pollutants, like dioxins, HCB, PCBs, and p,p'-DDE, as was the case for local egg consumption and being breastfed as a newborn. For the currently used pesticides, the most important determinants were season of sampling and residing close to professional vegetable cultivation.
CONCLUSIONS: This study showed that several lifestyle factors significantly influence the body burden of both persistent, accumulative and less persistent pollutants, measured in the Flemish population.