and selection of emerging contaminants could be based on the analyses of environmental samples (indoor air, dust and products).
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Early-life exposure to multiple environmental contaminants and birth outcomes: pooled analysis in four Flemish birth cohorts

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Background:
Prenatal chemical exposure has frequently been associated with reduced fetal growth although results have been inconsistent. Most studies associate single pollutant exposure to these health outcomes, even though this does not reflect real life situations as humans are exposed to thousands pollutants during their life time. Human biomonitoring shows that complex mixtures of xenobiotic chemicals are present in the prenatal environment.
Aim:
The objective of this study is to investigate the association between prenatal exposure to a mixture of environmental chemicals and birth weight.
Methods:
We used exposure biomarker data obtained from cord blood samples of 2033 women from three Flemish birth cohorts (FLEHS I, II & III) and a regional birth cohort in the Flemish regions Dessel, Mol and Retie (3xG). The common set of available and detectable exposure measures in these cohorts are the organochlorine compounds (three PCB congeners (138, 153 and 180), HCB, p,p'-DDE) and the heavy metals Cd and Pb. Birth weight was assessed as a proxy for reduced fetal growth. In a first step, the exposure-response associations were investigated by single pollutant linear regression models adjusted for gestational age, newborn's sex, smoking of the mother during pregnancy, parity, maternal age and prepregnancy BMI. Next, elastic net regression was used to assess the effect of multipollutant exposure on birth weight.
Results:
In the pooled database, birth weight ranged from 1245 to 5575 grams with a median of 3430 grams. The median contaminant levels in cord blood were: 26 ng/g lipid for PCB 153, 15 ng/g lipid for PCB 138, 18 ng/g lipid for PCB 180, 90 ng/g lipid for p,p'-DDE, 17 ng/g lipid for HCB, 0.045 µg/L for Cd and 9 µg/L for Pb. In single pollutant models, the three PCB congeners were significantly associated with reduced birth weight. The correlations between the different pollutants are low to moderate (r = 0.11 – 0.59), except for the three PCB congeners being highly correlated with Pearson correlation coefficients ranging