

# Childhood exposure to contaminants varies by country and compound

October 30 2018

---



Credit: CC0 Public Domain

The levels of 45 environmental contaminants were measured in samples from 1 300 mother-child pairs in Greece, Spain, France, Lithuania, UK and Norway, as part of the HELIX Study.

The results from the study show that:

- Most of the [contaminants](#) were found in almost all the participants, but less than one per cent of the samples had [levels](#) that exceeded current thresholds for increased risk of adverse health effects.
- For mercury and two perfluoroalkyl substances (PFOS and PFOA), many of the participants had concentrations that exceeded the threshold for which a reduction in exposure is recommended.

The level of contaminants in both mothers and [children](#) were in the same range as previously reported in studies from Europe and the USA for single compound groups.

## Regulations

"The best way to reduce exposure to PFOS and PFOA is to prohibit their use. The amount of these contaminants in [consumer products](#), diet and surroundings will eventually diminish," explains Line Småstuen Haug, senior researcher at the Norwegian Institute of Public Health and main author of the paper.

"There is already a global ban against PFOS, and a ban for PFOA is in progress. There is also an international treaty to protect people and the environment from the harmful effects of mercury," she continues.

## Need for surveillance

The results highlight the need for frequent and harmonised surveillance to monitor levels of known contaminants and to detect any new ones as early as possible. The Human Biomonitoring Initiative for Europe (HBM4EU) is being established, involving Norway and 27 other countries.

## **Breastfeeding and fish consumption may explain differences**

The levels of PCBs and perfluoroalkyl substances in the Norwegian children were among the highest in the study. This may partly be due to the transfer of these substances to breastmilk, and that the Norwegian children in this study were breastfed on average for longer than the other European children. Furthermore, these contaminants are present in fish, and Norwegian children were among those with higher fish consumption. However, Norwegian children had lower levels of other contaminants such as phthalates (in plastic) and parabens (in cosmetics) compared to the other children in this study.

The Norwegian mothers had the highest median levels of some of the phthalates and two of the parabens. In contrast to the children, the levels of PCBs and perfluoroalkyl substances in the Norwegian mothers were not among the highest in this study.

## **Many contaminants**

The study considered many families of chemicals, including some where health effects are suspected or plausible. These are:

- metals (including lead and mercury)
- phenols (including bisphenols A, triclosan, parabens)
- phthalates (such as DEHP)
- persistent organic pollutants (such as PCBs and DDT)
- organophosphate pesticides (for example chlorpyrifos)
- perfluoroalkyl substances (including PFOS and PFOA)
- flame retardants (PBDEs).

We are exposed to these contaminants through ingestion of food and

beverages, inhalation of air, ingestion of house dust or dermal contact with cosmetics and other consumer products.

## Differences between countries

The levels varied a lot between the six countries, which shows that country of residence is a strong determinant of your personal exposure. However, the authors note that the studied groups are not necessarily representative of their populations.

"Differences between countries can be explained by differences in diet and food contamination, use of consumer products and toiletries, indoor contamination as well as duration of breastfeeding," she explains.

## Mothers had higher levels of contaminants than their children

Concentrations in samples from mothers were usually higher than in samples from children, except for one relative new phthalate and bisphenol A.

"The blood and urine samples from mothers were donated during pregnancy, while child samples were collected between 6 and 12 years later. The use of man-made chemicals that contaminate the environment may have changed during this period, such as the new phthalate and bisphenol A. However, we should keep in mind that these chemicals may metabolise differently in children and adults, which may also affect their urine levels.

"For compounds that remain in the body for a long time, for example PCBs and perfluoroalkyl substances, it is expected that mothers have [higher levels](#) than their children. High correlations between levels in

mothers and their children were observed for these compounds, showing that maternal exposure is important for the child's levels many years after birth," she concludes.

## About the study

This is the first study to investigate the levels of a wide range of [environmental contaminants](#) in [mothers](#) and their children by comparing results from harmonised sample collection in six European countries.

The study is part of the Human Early Life Exposome (HELIX) project where Norway is one of six participating countries. It is financed by the EU and is led by Professor Martine Vrijheid from the Barcelona Institute for Global Health in Spain.

The Norwegian participants in the study are participants in the Norwegian Mother and Child Cohort Study (MoBa).

The aim of HELIX is to describe environmental exposure in the first years of life (early-life exposome) and study the association with different biomarkers and adverse health effects that affect children. The exposome includes all environmental factors from conception throughout life and can be compared to the role of the genome for our DNA.

**More information:** Line Småstuen Haug et al. In-utero and childhood chemical exposome in six European mother-child cohorts, *Environment International* (2018). [DOI: 10.1016/j.envint.2018.09.056](https://doi.org/10.1016/j.envint.2018.09.056)

Provided by Norwegian Institute of Public Health

Citation: Childhood exposure to contaminants varies by country and compound (2018, October 30) retrieved 25 April 2024 from <https://phys.org/news/2018-10-childhood-exposure-contaminants-varies-country.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.