

MEASUREMENT OF EMERGING ENVIRONMENTAL CONTAMINANTS IN EUROPEAN BIRTH COHORTS: AN INVENTORY AND RECOMMENDATIONS

Maribel Casas, Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain- Hospital del Mar Research Institute (IMIM), Barcelona, Spain. Spanish Consortium for Research on Epidemiology and Public Health (CIBERESP), Spain
Elly Den Hond, Flemish Institute for Technology Research (Vito), Environmental Health and Risk, Mol, Belgium
Ilias Kavouras, National Institute of Public Health Surveillance (InVS), Saint Maurice, France
Frank Pierik, Department Environmental and Health, Netherlands Organisation for Applied Scientific Research (TNO). Utrecht, The Netherlands - The Generation R Study Group, Erasmus Medical Centre Rotterdam, The Netherlands
Rémy Slama, INSERM and Grenoble University, team of Environmental Epidemiology applied to Reproduction and Respiratory Health, Institut Albert Bonniot (U823), Grenoble, France
Gunnar Toft, Department of Occupational Medicine. Aarhus University Hospital, Aarhus, Denmark
Stéphanie Vandentorren, National Institute of Public Health Surveillance (InVS), Saint Maurice, France
Michael Wilhelm, Hygiene, Social and Environmental Medicine, Ruhr-University, Bochum, Germany
Martine Vrijheid Centre for Research in Environmental Epidemiology (CREAL), Barcelona, Spain - Hospital del Mar Research Institute (IMIM), Barcelona, Spain. Spanish Consortium for Research on Epidemiology and Public Health (CIBERESP), Spain

Background and Aims: There are emerging concerns about potential effects on child health and development of early-life environmental exposure to substances such as brominated flame retardants (BFRs), perfluorinated compounds (PFCs), phthalates and phenols (including bisphenol A – BPA). A number of pregnancy and birth cohort studies are now measuring such exposures. Early collaboration between these ongoing studies will improve potential for future comparison and combined studies. Our aim is therefore to provide an overview of planned, ongoing and published biomarker measurements of emerging contaminants in European birth cohorts.

Methods: The ENRIECO inventory of birth cohorts in Europe (www.birthcohortsenrieco.net) was used to identify measurements of BFRs, PFCs, phthalates, phenols, and other compounds of emerging concern. Furthermore, publications were searched to obtain information on measured concentrations of these chemicals.

Results: Very few European cohorts have already carried out measurements of emerging contaminants; only 7 have published exposure levels. Measurements of BFRs are ongoing or planned in 11 European birth cohorts; measurements of PFCs in 10, of phthalates in 13 and of BPA in 7. Only 2 cohorts are also measuring other exposures such as parabens, triclosan and benzophenone. Biological matrices and timing of the measurements vary considerably between cohorts. BFRs have been determined mostly in blood, breast milk, and placenta, whereas PFCs have been measured mostly in blood (plasma and serum). Urine has been the most used biological matrix to measure phthalates and phenols. Most measurements are conducted prenatally or at birth and generally the measurements involve few subjects in each cohort (a few hundred maximum).

Conclusions: Although there is currently not enough data in the cohorts to combine data, many measurements are ongoing and within a few years there will be possibilities for comparison studies. Cohorts should work together to develop conversion models and inter-laboratory comparisons that will allow future combined studies.