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Press Relations Officer: Martin Ittershagen
Deputy Press Relations Officer: Stephan Gabriel Haufe
PR-staff: Fotini Mavromati, Martin Stallmann,
Marc Rathmann, Uwe Weber (office)
Telephone: +49 340/2103 -2122, -6625, -2318, -2250, -2507, -2637
Address: Umweltbundesamt, Postfach 1406, 06813 Dessau-Roßlau
Email: pressestelle@uba.de
Internet: www.umweltbundesamt.de
Internet: www.fuer-mensch-und-umwelt.de



Testing for human pollutant exposure in Europe

Federal Environment Agency in charge of German contribution to DEMOCOPHES pilot study

A study known as DEMOCOPHES on human exposure levels to pollutants will involve some 4,000 mothers and children from various countries in the European Union (EU). It is scheduled to start in 17 European countries in August. This harmonised approach to testing for exposure to pollutants in humans (biomonitoring) used to be funded by the EU Action Programme Environment and Health. The Federal Environment Agency is the German project partner on whose behalf samples from randomly selected mother-child pairs from Bochum and the Hochsauerland region (North-Rhine Westphalia) will be collected and tested for traces of the pollutants mercury, cadmium, cotinine and phthalates (plasticisers).

Traces of environmental pollutants can be found to varying degrees in humans. The process of detecting them in body fluids and tissues, known as human biomonitoring (HBM), helps to determine whether and to what extent substances are absorbed and what average exposure levels are. Comprehensive and regular human biomonitoring is thus able to identify which segments of the population are heavily exposed. The results of human biomonitoring can be applied to put new regulations that prevent pollutant exposure into place.

Since pollutants are widespread throughout Europe and because human biomonitoring is able to provide feedback on Europe's REACH chemicals law, a consortium of experts from 27 European countries, commissioned by the EU, launched a joint programme. These principles and guidelines are now being tested and applied for the first time in a pilot study- DEMOCOPHES- will involve the participation of 17 European countries, including Germany.

UBA has determined that the German part of the study will take place in North Rhine-Westphalia, and therefore the Department of Hygiene, Social and Environmental Medicine at the University of Bochum will ask mothers of 6-to-11-year olds to be part of the study. A total of 120 mother-child pairs are needed, each of whom will provide a urine and hair sample in addition to filling in a questionnaire. The samples will be tested for traces of the environmental pollutants mercury, cadmium, cotinine, and phthalates. The results will not only be used in the study, they will also be disclosed to the participating families as it is a most relevant health matter.

The tested pollutants were selected on account of their hazardous properties and because health-based evaluation criteria for them exist. The presence of mercury in hair reflects consumption of fish that has been exposed to mercury. Humans absorb cadmium through food and smoking. Cotinine content in urine is a measure of exposure to passive smoking. Phthalates

are plasticisers that are present in a large number of plastic products, including children's toys. Previous studies in Germany have revealed that children in particular have high levels of exposure to phthalates.

Although 120 participants per country may not be very many, a total of 4,000 urine and hair samples will be taken in the course of this EU pilot study. The study results are not the only important outcome, for the experience gained by the individual countries will determine the future feasibility of establishing harmonised human biomonitoring in Europe. A harmonised approach to human biomonitoring would allow for better comparability of human exposure levels in the Member States, for tracing the causes of exposure, and for deriving political action that can be taken to reduce it.

More information and links:

European consortium website:

<http://www.eu-hbm.info>

Consortium newsletter:

<http://www.eu-hbm.info/cophes/communication/july-newsletter>

UBA website for the German part of DEMOCOPHES:

<http://www.umweltbundesamt.de/gesundheit/gbub/hbme.htm>

Dessau-Roßlau, 28 July 2011