COPHES (FP7) and DEMOCOPHES (LIFE+)

COPHES - European coordination action on human biomonitoring
DEMOCOPHES - Demonstration of a study to coordinate and perform human biomonitoring on a European scale

Through the COPHES project, CRP - Gabriel Lippmann has benefited from European research funding.

Comparing biomarkers across Europe

In our daily lives, we are constantly exposed to chemical substances. Thanks to human biomonitoring (HBM), we can assess whether and to what extent these substances enter our bodies. By measuring the concentration of chemicals in body fluids or tissues, biomonitoring can provide valuable information on environmental health effects and, in some cases, even help address potential health risks. The DEMOCOPHES project makes it possible to compare specific biomarkers in 17 European countries.

In the FP7-funded project COPHES, "Consortium to Perform Human Biomonitoring on a European Scale", a common European approach for human biomonitoring surveys was developed that was tested for its feasibility in the Life+ funded project DEMOCOPHES in 17 European countries. DEMOCOPHES looked at biomarkers for mercury, cadmium and phthalates as well as environmental tobacco smoke in human hair and urine. Luxembourg was one of six countries that also measured bisphenol A.

The chemicals were chosen because it is important to understand how much we are exposed to them in our daily lives. The information can help us understand patterns of exposure and reduce it where necessary. The participating institutions produced data on the distribution of specific biomarkers and related lifestyle data among defined study populations which, for the first time, are comparable on a European scale. These comparable data are an important step towards European reference values.

Unique Luxembourg participation

The Luxembourg participation in the two sister projects was unique among the participating countries since it comprised a public research centre (CRP – Gabriel Lippmann), a state laboratory (Laboratoire National de Santé, LNS) and an NGO (Initiativ Lievensufank – IL). The Environment and Agro-biotechnologies (EVA) department of CRP – Gabriel Lippmann participated in both projects and was responsible for coordination, method development, statistics and reporting. LNS analysed the hair and

Centre de Recherche Public Gabriel Lippmann

COPHES

Consortium to Perform Human Biomonitoring on a European scale

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urine samples from 60 mother-child pairs for mercury respectively for cadmium, creatinine and cotinine. The Analytical chemistry Platform of EVA performed the analysis of the urine samples for bisphenol A, parabens and triclosan. IL was responsible for the field work. An additional asset in Luxembourg was the interest in these studies expressed by the Minister of Health, Mars Di Bartolomeo: "I can ensure the political interest in performing HBM studies on a national scale in Luxembourg also in the future."

Cohort and quality control

The study covered children aged 6-11 years and their mothers aged 45 years and under. Fieldworkers collected hair and urine samples from a total of 120 volunteers. Mothers provided details on their living environment, nutrition, smoking behaviour, and other information that could help to explain the levels of the biomarkers measured in hair and urine.

"Organising the field work was demanding. Our field workers had to show a lot of flexibility to make appointments when the mother-child pairs were available at home for the extensive interviews and sample collection. The key to success was that we had no drop-outs or refusals to participate," says Maryse Arendt at IL who coordinated the field work in Luxembourg.

The laboratories analysing the samples were selected through a strict quality assurance process. Statistical analysis and interpretation of the results was performed in each country as well as at EU level.

Results

In Luxembourg, the results were presented to the participants in a workshop in the presence of the Minister of Health. During the project period, broad press attention raised the awareness of the general public for human biomonitoring. Overall, no biomarker values measured in samples from Luxembourg exceeded established health guidance values for any of the biomarkers.

On a larger scale, DEMOCOPHES mercury results from all of Europe were used in a publication issued in January 2013. The monetary benefits of controlling mercury pollution were estimated to be €8 to 9 billion per year for the entire EU.

"When we started we had no idea where this endeavour would lead us," says Arno Gutleb, project coordinator in Luxembourg, "but looking back we have achieved a lot in respect of human biomonitoring. We have also built up trust between the persons and institutions involved in Luxembourg."

Now that the feasibility of an EU-harmonised approach has been demonstrated, policy-makers can start to envisage a European survey programme using the lessons learned.

The Seventh European Framework Programme for Research and Technological Development (FP7) was the European Union's main financial instrument to support European research during the 2007-2013 period. The funding programme continues under Horizon 2020, the Framework Programme for Research and Innovation, supporting a wide range of research domains with a budget of € 79 billion (2014-2020).

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