




HBM4EU: THE EUROPEAN HUMAN BIOMONITORING INITIATIVE



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Ms. Monika Stankiewicz,
Executive Secretary of the
Minamata Convention on Mercury

December 13, 2020

Subject: Call for Information on Gender and Mercury

Dear Executive Secretary Stankiewicz,

With regards to your call for information on gender and mercury (your Ref.: MC/ES/2020/55, dated 30.11.2020), we are pleased to provide relevant information from HBM4EU, the European Human Biomonitoring Initiative.

HBM4EU (<https://www.hbm4eu.eu/>) is a European joint programme of 30 European countries and the European Environment, co-funded by the European Commission (Horizon 2020 Research and Innovation Programme) and national funds of the participating countries. It coordinates and advances human biomonitoring in Europe and generates evidence of the actual exposure of citizens to chemicals and the possible health effects, in order to support policy making for enhanced chemical safety. It kicked off in 2017 and will be completed at the end of 2021. HBM4EU builds bridges between the research and policy worlds by bringing together scientists, chemical risk assessors and risk managers, including several Commission services, EU agencies and national government representatives and other stakeholders (*Attachment 1, HBM4EU Information Leaflet*).

Mercury and methylmercury were selected for investigation by HBM4EU as a result of a transparent prioritization process, which involved national authorities of the participating countries, the Directorate-Generals of the European Commission (GROW, EMPL, ENV, SANTE, RTD, JRC) and relevant EU agencies (EEA, ECHA and EFSA) (*Attachment 2, 4th HBM4EU Newsletter, p. 5-9*). A dedicated webpage on mercury was created on the HBM4EU website, and it is updated as new information becomes available (<https://www.hbm4eu.eu/the-substances/mercury/>).

A Scoping Document on Mercury was prepared, which summarizes a lot of the current information on mercury in Europe, including e.g. a [summary of European HBM4EU studies on mercury exposure of vulnerable groups such as mothers of reproductive age, children and pregnant women](#), identifies knowledge gaps, defines open policy questions on mercury and proposes activities to be undertaken in the frame of HBM4EU in support of answers to these policy questions (*Attachment 3, HBM4EU Scoping Document on Mercury*). The scoping document is updated on a yearly basis.





The following policy questions are being investigated in the frame of HBM4EU:

1. How effective are policy actions to reduce human exposure to mercury in Europe?
2. How can harmonized, validated and comparable information be collected and transferred to support and evaluate current policies?
3. What biomonitoring and exposure data on mercury (and its species), relevant to the European population, are currently available and what new data are needed to address policy-related questions?
4. What is the geographic spread of the current exposure and how does it relate to different exposure sources Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?
5. How can the public be informed and how can public awareness and education be raised regarding the effects of mercury on health and the environment and about management options?
 - What advice should be given regarding dietary recommendations to vulnerable Europeans and other stakeholders (e.g., health practitioners, policy makers) to reduce exposure to mercury while in keeping with nutritional requirements and cultural dietary preferences?
6. How can HBM4EU results support policy decisions at EFSA and ECHA?
7. At what level of exposure to different mercury species and to total mercury are health effects likely to occur?
8. How does exposure relate to the manifestation of adverse health effects?
 - What are possible health effects resulting from chronic low exposure to mercury and its organic compounds (such as from food consumption and dental amalgams)?
 - What factors make people more susceptible to the development of health effects due to mercury exposure?

The results of HBM4EU activities relevant to these policy questions up to the end of 2019 are summarized in *Attachment 4, HBM4EU results on mercury 2018-19*.

The following activities relevant to the policy questions are being carried out in 2020-21, the final two years of HBM4EU's duration:

- An **aligned intervention study in five high fish-consuming European countries** – Spain, Portugal, Greece, Cyprus and Iceland, which aims to develop and test **dietary information for pregnant women for controlling mercury exposure while ensuring the health benefits of eating fish** (Relevant to Policy Questions 1,2,4,5)
- Collection and provision of information on mercury via the HBM4EU Knowledge Hub, <https://www.hbm4eu.eu/online-library/> (Relevant to Policy Questions 3,5)
- Assessment of the information needs of external bodies with relation to priority substances, which may include needs related to mercury (Relevant to Policy Question 5)



- Establishment of **HBM-based guidance values for mercury for the general population** (provided that sufficient epidemiological / toxicological / toxicokinetic data are available for this purpose) or development of recommendations for data needed to fill the information gap (if currently available data are not sufficient) (Relevant to Policy Questions 1, 4, 5)
- Development of a proposal on **how to integrate HBM in risk assessment procedures and use of available mercury HBM data for risk assessment** (Relevant to Policy Questions 1,4,5)
- Based on the availability of aggregated data, **HBM-based indicators for mercury** will be constructed and associated information will be developed to facilitate their interpretation by stakeholders, including policy makers (Relevant to Policy Questions 1,4,5)
- Update of the inventories and evaluations of the **best exposure biomarkers, matrices and analytical methods for mercury**, as new information becomes available (Relevant to Policy Questions 3,4,5,6)
- Update of the inventories of **candidate laboratories for the analysis of biological samples for exposure to mercury** (Relevant to Policy Questions 2,3)
- Completion of efforts to **collect, process and analyse epidemiological and toxicological data on mercury and its species from existing & available European human biomonitoring studies**, in order to answer policy questions (Relevant to Policy Question 3)
- Analysis to the extent possible of existing & available HBM data to assess (a) **baseline exposure of Europeans** to organic / total mercury and the associated risk and to facilitate the assessment of temporal trends with regards to the effectiveness of policies (b) **determinants of exposure**, including geographic variations and their causes (e.g. environmental exposures, diet), (c) generation of **European reference values** for mercury exposure, (d) **identification of groups at risk of exceeding health-based guidance values** (e.g. by age, gender, highly exposed, hot-spots in Europe). (Relevant to Policy Questions 1,2,3,4)
- Continuation of efforts to collect, integrate and **make available existing HBM data** on mercury into the European Commission's the Information Platform for Chemical Monitoring, IPChem, <https://ipchem.jrc.ec.europa.eu/> (Relevant to Policy Questions 2,3).
- Development of **guidelines to help standardization** of measurements and comparability of collected health data relevant to prioritized chemical groups – including mercury, in future studies (Relevant to Policy Questions 2,8).
- Optimize the **integrated exposure modelling platform**, which was developed already, by updating of the exposure model parameterisation for mercury using available data\

Characterization of the toxicokinetic behaviour / differences in internal dose of mercury species

Identification of internal exposure to different mercury species and to total mercury for various age groups; definition of optimized sampling schemes.

Depending on data availability on total mercury and/or mercury species, use of exposure modelling to explore the linking of internal exposure to external sources, risk characterization, support of the evaluation of the effectiveness of existing regulatory frames (Relevant to Policy Questions 1,2,4,5,6,7)



- 4 -

- Investigate allele frequencies of relevant **Single Nucleotide Polymorphisms (SNPs)** across **Europe** and how this might contradict exposure/health found so far, since inherited factors of individuals seem to play a role in determining toxic effects of mercury (Relevant to Policy Questions 6,7)
- Use the available Mediterranean cohort to (a) examine the **impact of mercury on neurobehavior** while taking into account co-exposure to other neurotoxic contaminants and to beneficial elements, and (b) explore relevant **genetic polymorphisms** (Relevant to Policy Questions 6,7)
- Investigation of the causal pathways from exposure to mercury to health outcomes and factors affecting susceptibility (**Adverse Outcome Pathways**) (Relevant to Policy Questions 6,7)
- Through a critical review of the literature published since EFSA's 2012 risk assessment, determine if recent findings on the health effects of mercury are consistent with the previously assessed evidence (Relevant to Policy Question 5)
- Identify the **most relevant biomarkers of effect for mercury**, through a focused literature search of mercury-related human studies and reported health endpoints (Relevant to Policy Questions 2,7)
- By integrating all information obtained on effect biomarkers related to HBM4EU priority chemicals, (a) create maps of the most commonly physiological pathways affected (e.g. neurodevelopment), (b) establish a holistic framework for connecting epidemiological and toxicological data (focused on effect biomarkers and AOPs) for utility in a future, sustainable European HBM agenda (Relevant to Policy Questions 2,7)
- Support the establishment of permanent European mercury biomonitoring as long-term support of global mercury policies. Emphasis on transfer of knowledge to enable new, quality-assured, comparable data and their interpretation in countries which ratified the Minamata Convention through the established procedures at EU level (Overarching activity Relevant to Policy Questions 1,2,3,4)

Finally, the following **additional information is provided from HBM4EU partners**:

- [*Attachment 5: Fish consumption patterns and hair mercury levels in children and their mothers in 17 EU countries*](#), by Castaño et al., *Environmental Research* 141 (2015) 58-68
- ["Healthy environment, healthy lives: how the environment influences health and well-being in Europe"](#) (2019) European Environment Agency
- ["Mercury in Europe's environment"](#) (2018) European Environment Agency

We remain at your disposition for any further information or clarifications you may require.

With kind regards,

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On behalf of HBM4EU,
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