

1 Prioritised substance group: Mercury and its organic compounds- UPDATED

Responsible author	Andromachi Katsonouri	E-mail	
Short name of institution	MOH-CY	Phone	
Co-authors	/		

1.1 Policy-related questions

Section §**Error! Reference source not found.** presents an overview of current EU policies related to mercury, including the Minamata Convention, a global treaty to address mercury pollution, which was ratified by the EU.

The following policy-related questions relate to commitments under this frame.

1. How effective are policy actions to reduce human exposure to mercury in Europe? (Including the EU's Strategy on Mercury and the Minamata Convention, which was ratified by the EU and Member States)?
2. How can harmonised, 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 (environmental; contaminated sites; dental amalgams; dietary, including different species of sea-food)? Ideally, this should capture the exposure of highly exposed populations (e.g. high seafood consumers with distinction of populations consuming predator fish from those with low/no consumption of such fish, such as Southern & Northern Europeans, European arctic populations), but also of low-exposure populations for comparison.
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 (e.g. pregnant women, infants, high sea-food consumers) and other stakeholders (e.g. health practitioners, policy makers) to reduce exposure to mercury while in keeping with nutritional requirements and cultural dietary preferences? Ideally, this should consider the different types of foodstuff (e.g. types of seafood) consumed in different parts of the EU, the toxicity and occurrence of the different mercury species in different foodstuff and the positive effects of n-3 long-chain polyunsaturated fatty acids in fish and of micro nutrients (e.g. selenium) in the diet. Related to this, how can HBM4EU results support policy decisions at EFSA and ECHA?
6. At what level of exposure to different mercury species and to total mercury are health effects likely to occur? Current guidance values were based studies of the Faroese people, who have a diet that is unique and does not relate to food consumption patterns in the EU. This important issue has not been given proper attention to date.

7. 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)? This type of exposure is the most relevant for Europeans and can be addressed by speciation analysis of biobanked samples from existing cohorts and associations with adverse health effects.
 - What factors make people more susceptible to the development of health effects due to mercury exposure?

1.2 Research Activities to be undertaken

Table 1 Research activities research activities to be carried out to answer the policy questions for mercury

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
<p>Evaluation of the effectiveness of policy actions to reduce human exposure to mercury in Europe.</p>	<p>Mercury and methylmercury</p>	<p>See § Error! Reference source not found.</p>	<p>Overarching activity (WP 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14). 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 in countries which ratified the Minamata Convention through the established procedures at EU level.</p>
<p>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?</p> <p>What advice should be given regarding dietary recommendations to vulnerable Europeans (e.g. pregnant women, infants, high sea-food consumers) and other stakeholders (e.g. health practitioners, policy makers) to reduce exposure to mercury while in keeping with nutritional requirements and cultural dietary preferences?</p> <p>How can HBM4EU results support policy decisions e.g. at EFSA and ECHA?</p>	<p>Mercury and methylmercury</p>	<p>See § Error! Reference source not found., Error! Reference source not found., Error! Reference source not found.</p>	<p>WP2 Collection, curation and provision of information relevant to the mercury chemical group (CG) as it becomes available (e.g. results, targeted communication products – including dietary advice to the extent feasible & relevant, common methods, protocols), to targeted audiences (e.g. public, health practitioners, scientists, policy makers) via the Knowledge Hub.</p>

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
<p>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?</p> <p>How can HBM4EU results support policy decisions at EFSA and ECHA?</p>	Mercury and methylmercury	See § Error! Reference source not found., Error! Reference source not found.	<p>WP4</p> <p>Mapping of the information needs of external bodies (e.g. understanding the perspectives of the public through focus groups).</p>
<p>What advice should be given regarding dietary recommendations to vulnerable Europeans?</p> <p>Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?</p> <p>How can HBM4EU results support policy decisions e.g. at EFSA and ECHA?</p>	Mercury and methylmercury	See § Error! Reference source not found., Error! Reference source not found.	<p>WP5</p> <p>Reporting on progress achieved by HBM4EU for the mercury CG.</p> <p>Establishment of HBM-based guidance values for mercury for the general population.</p> <p>Development of a proposal on how to integrate HBM in risk assessment procedures and use of available mercury HBM data for risk assessment.</p> <p>Based on the availability of aggregated data, construction of HBM-based indicators for mercury and development of associated information to facilitate their interpretation by stakeholders, including policy makers.</p>
<p>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?</p> <p>Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?</p>	Mercury and methylmercury	See § Error! Reference source not found.	<p>WP7 (and as relevant, WPs 8, 10)</p> <p>Identification and systematic collection of relevant recent or ongoing European studies, identification of knowledge gaps, prioritisation of research needs.</p> <p>As relevant, development of support materials for mercury biomonitoring surveys.</p>

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
How can harmonised, validated and comparable information be collected to support and evaluate current policies?	Mercury and methylmercury	See section §Error! Reference source not found.	<p>WP9</p> <p>Development and update (as information becomes available), of inventories and evaluations of the best exposure biomarkers, matrices and analytical methods relevant to mercury biomonitoring.</p> <p>Development and update (as information becomes available), of the inventories of candidate laboratories for the analysis of biological samples for mercury biomonitoring.</p>

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
<p>Evaluation of the effectiveness of policy actions to reduce human exposure to mercury in Europe.</p> <p>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?</p> <p>What is the geographic spread of the current exposure and how does it relate to different exposure sources (environmental; contaminated sites; dental amalgams; dietary, including different species of sea-food)?</p> <p>Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?</p> <p>What advice should be given regarding dietary recommendations to vulnerable Europeans?</p> <p>How can HBM4EU results support policy decisions e.g. at EFSA and ECHA?</p>	<p>Mercury and methylmercury</p>	<p>See sections § Error! Reference source not found., Error! Reference source not found., Error! Reference source not found., Error! Reference source not found.</p>	<p>WP10 (other WPs e.g. 5, 7, 8, 12 and possibly others, may also be involved as relevant).</p> <p>Collection, integration and making available existing HBM data on mercury into IPCChem.</p> <p>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). This is a core activity.</p>

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
<p>Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?</p> <p>At what level of exposure to different mercury species and to total mercury are health effects likely to occur?</p>	Mercury and methylmercury	See section § Error! Reference source not found.	<p>WP11</p> <p>Development of guidelines to help standardisation of measurements and comparability of collected health data relevant to mercury, in future studies.</p>

Policy question (see § Error! Reference source not found.)	Substance	Available knowledge	Knowledge gaps and activities needed
<p>Evaluation of the effectiveness of policy actions to reduce human exposure to mercury in Europe.</p> <p>What is the geographic spread of the current exposure and how does it relate to different exposure sources (environmental; contaminated sites; dental amalgams; dietary, including different species of sea-food)?</p> <p>Which populations remain vulnerable to health impacts from mercury exposure and how can they be protected?</p> <p>At what level of exposure to different mercury species and to total mercury are health effects likely to occur?</p> <p>What advice should be given regarding dietary recommendations to vulnerable Europeans?</p> <p>How can HBM4EU results support policy decisions e.g. at EFSA and ECHA?</p>	<p>Mercury and methylmercury</p>	<p>See sections § Error! Reference source not found. (Error! Reference source not found.), Error! Reference source not found. (Error! Reference source not found.)</p>	<p>WP12</p> <p>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 for vulnerable population groups, investigation of substance toxicological behaviour, risk characterisation, support of the evaluation of the effectiveness of existing regulatory frames.</p>