HBM4EU reflections on the European Commission's roadmap for a Zero-Pollution Action Plan

This document channels input from the HBM4EU Management Board to the European Commission on the **roadmap on the EU Action Plan Towards a Zero Pollution Ambition for air, water and soil**.

Human biomonitoring is a key tool in supporting the design, delivery and evaluation of chemical regulation in Europe and in communicating on chemical risks to the general public.

HBM4EU - the European Human Biomonitoring Initiative - is co-funded under the European Commission's Horizon 2020 programme and is investigating knowledge gaps regarding the exposure of the European population to priority chemical substance groups and resulting impacts on health, with the aim of answering policy questions. As a leader in research on exposure to chemicals and impacts on health in Europe, HBM4EU is well-positioned to provide scientific insights on what the Zero Pollution Ambition might mean for the human body.

Zero pollution applies as much to people as to the environment. Human biomonitoring studies have found hundreds of exogenous chemicals in the bodies of European citizens, reflecting the aggregate of all contaminants taken up by the body from environmental compartments, including water, air and soil, as well as from products and in the occupation setting.

To measure progress towards **zero pollution of the human body**, Europe needs coordinated efforts:

- to measure chemicals in the bodies of European citizens;
- to determine the impact of these chemicals on health; and
- to assess progress in reducing the levels of hazardous chemicals in the population over time.

Europe needs a human biomonitoring surveillance system anchored in European Union legislation under the Zero Pollution Action Plan.

Baseline of human exposure to chemicals against which to measure progress

The zero-pollution agenda should depart from an **understanding of how European citizens are polluted with synthetic chemicals**. Reducing the chemical body burden and associated adverse health impacts, both across the European population and for vulnerable groups, should be a key priority.

- Human biomonitoring conducted through harmonised approaches and quality assured analytical methods at European scale is generating coherent data on the internal exposure of the European population to HBM4EU Priority Substances in different European regions. This provides **a baseline against which to track the efficacy of the Zero Pollution Action Plan in reducing human exposure to pollution.**

- Future biomonitoring activities that focus on the same substances will allow us to establish time trends in exposure and produce **indicators to track the success of risk management measures**.

- Data on total human exposure to mixtures of chemicals will allow us the define effective **risk assessment for mixtures**.

- Comparing population exposure and the exposure of vulnerable groups against **health-based human biomonitoring guidance values** allows us to understand health impacts as a basis for effective cross-silo risk management.

- Comparing human biomonitoring data from across Europe can **highlight regional differences linked to variations in pollution levels, consumer behaviour and lifestyle.**

- Identifying exposure to chemicals of emerging concern, including substitutes for banned substances, in the population can serve as a **warning of undetected risk.**

Identifying routes of exposure to chemical pollutants

The capacity to identify the main pathways and routes of exposure for chemicals is a *sine qua non* for effective risk management of environmental sources of pollution, including industrial production, consumer products, releases of urban waste water, and the agriculture and transport and energy sectors.

- HBM4EU is identifying **routes and pathways of exposure to chemical pollutants**, taking into account differences in exposure modifiers, such as age and gender, as well as occupation, across Europe.

- Using modelling tools, environmental monitoring data and personal information from questionnaires, we relate internal exposure to external sources of environmental pollution. We then reconstructed external exposure levels and derived **exposure estimates over the life-course for the general population across the EU for key pollutants**.

Human exposure to chemicals in products in a circular economy

Protecting citizens from hazardous chemicals in products, including products imported into the EU, is identified as a priority in the roadmap. The transition to a circular economy is creating new pathways for human exposure to chemicals in recycled material flows.

- HBM4EU is identifying **upstream exposure routes in various material flows**, including in consumer products, via diet and in the occupational setting. This can inform targeted efforts to minimize exposure by eliminating chemicals from material flows and tackling pollution upstream.

- HBM4EU is assessing the **links between exposures to chemicals and impacts on health**, contributing to novel approaches to risk assessment, including for mixtures. Effective **risk assessment** is a key step in understanding the risk posed by chemical pollution.

- Further **research on chemical exposure and toxicity** should be a priority under the Zero Pollution Action Plan, in a context where knowledge on chemicals is limited to a fraction of the chemicals circulating on the market in Europe.

- Over the long term, the availability of information on exposure to chemicals in specific material flows, including products, will **stimulate the production of safer chemicals, products and materials**.

- HBM4EU is producing data on the **exposure of workers to chemicals in waste management** installations, including recycling facilities, thanks to harmonized schemes and quality assured

analytical methods. This evidence will help support the design of circular material flows that minimise human exposure at all stages of the product life cycle.

- Human biomonitoring data can be used to **track the efficacy of efforts to transition to production approaches that are safe and sustainable by design**.

- HBM4EU is **communicating with citizens on chemicals in products** and producing easily accessible factsheets that support the shift towards sustainable consumption.

- HBM4EU is contributing to the **discoverability, accessibility and availability of high quality, reliable and coherent datasets on human exposure to chemicals at European level**, in particular by making metadata available via the Information Platform for Chemical Monitoring (IPCHEM). This supports the sharing and reusing of data across legislative silos as required for the "one substance – one assessment" approach to chemical risk management.