science and policy
for a healthy future

HBM4EU

The European Human Biomonitoring Initiative

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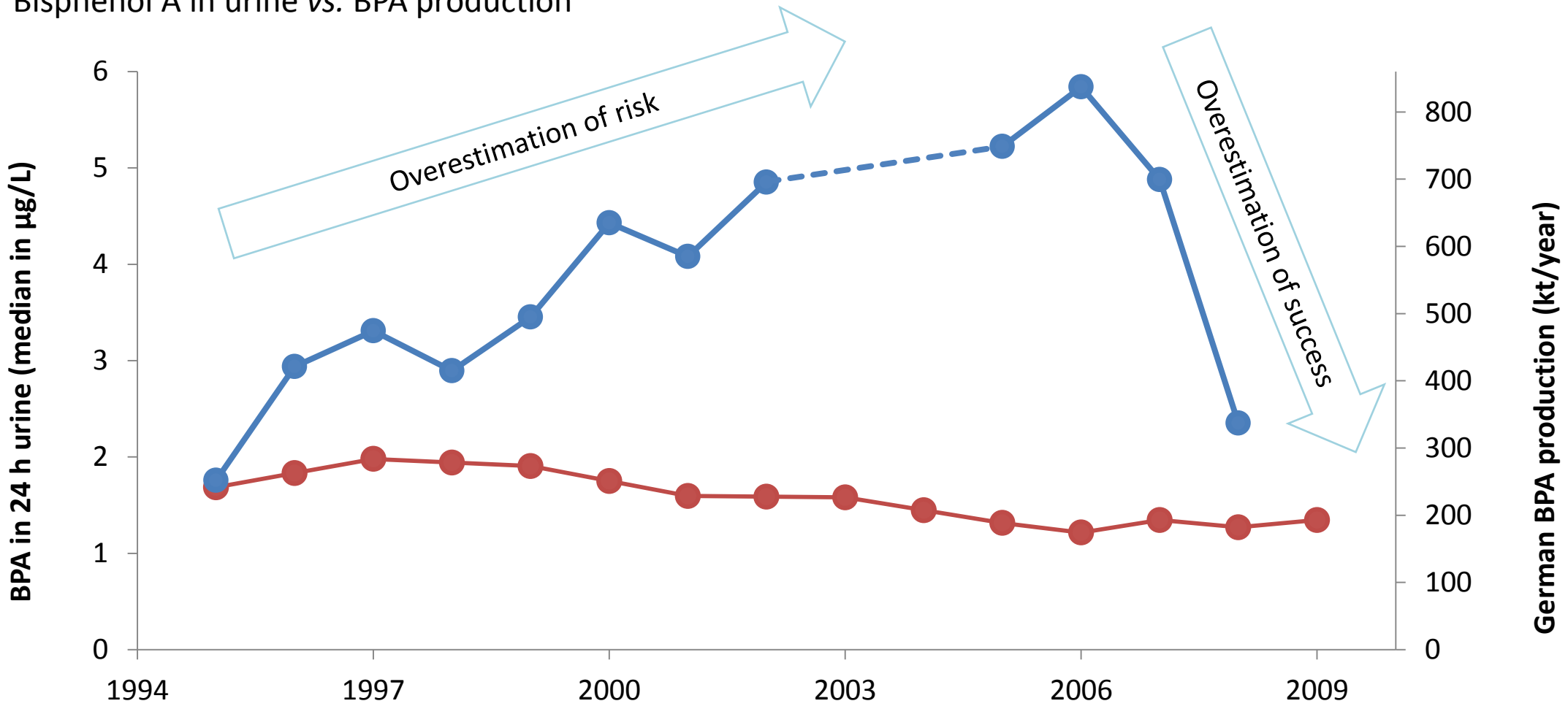
German Environment Agency

Umwelt Bundesamt

Why is Human Biomonitoring so important?

Bisphenol A in urine *vs.* BPA production



Data from the German Environmental Specimen Bank

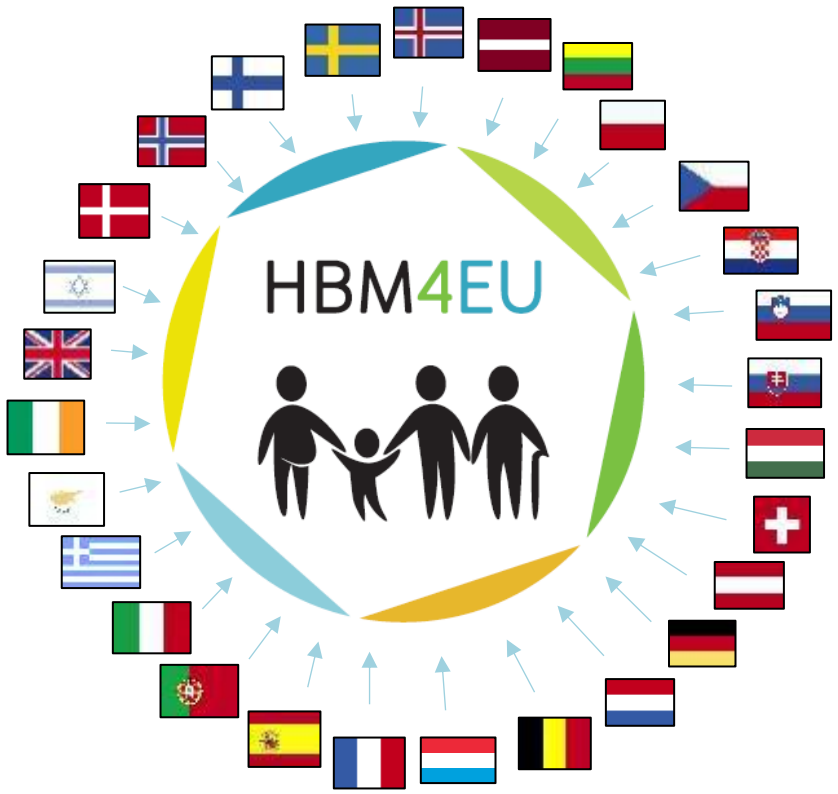
Building upon expertise from within the consortium…

Answer open policy-relevant questions as defined by EU Services and partner countries

Give policy makers a fast and easy access to results and data

Bridge the gap between science and policy

HBM4EU in short: Who we are



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- **5 years** (2017-2021)
- **European Joint Programme** under Horizon 2020

An ambitious EU research programme designed especially to answer policy-relevant questions

Agency (24 EU Member States, 3 associated countries, Switzerland)

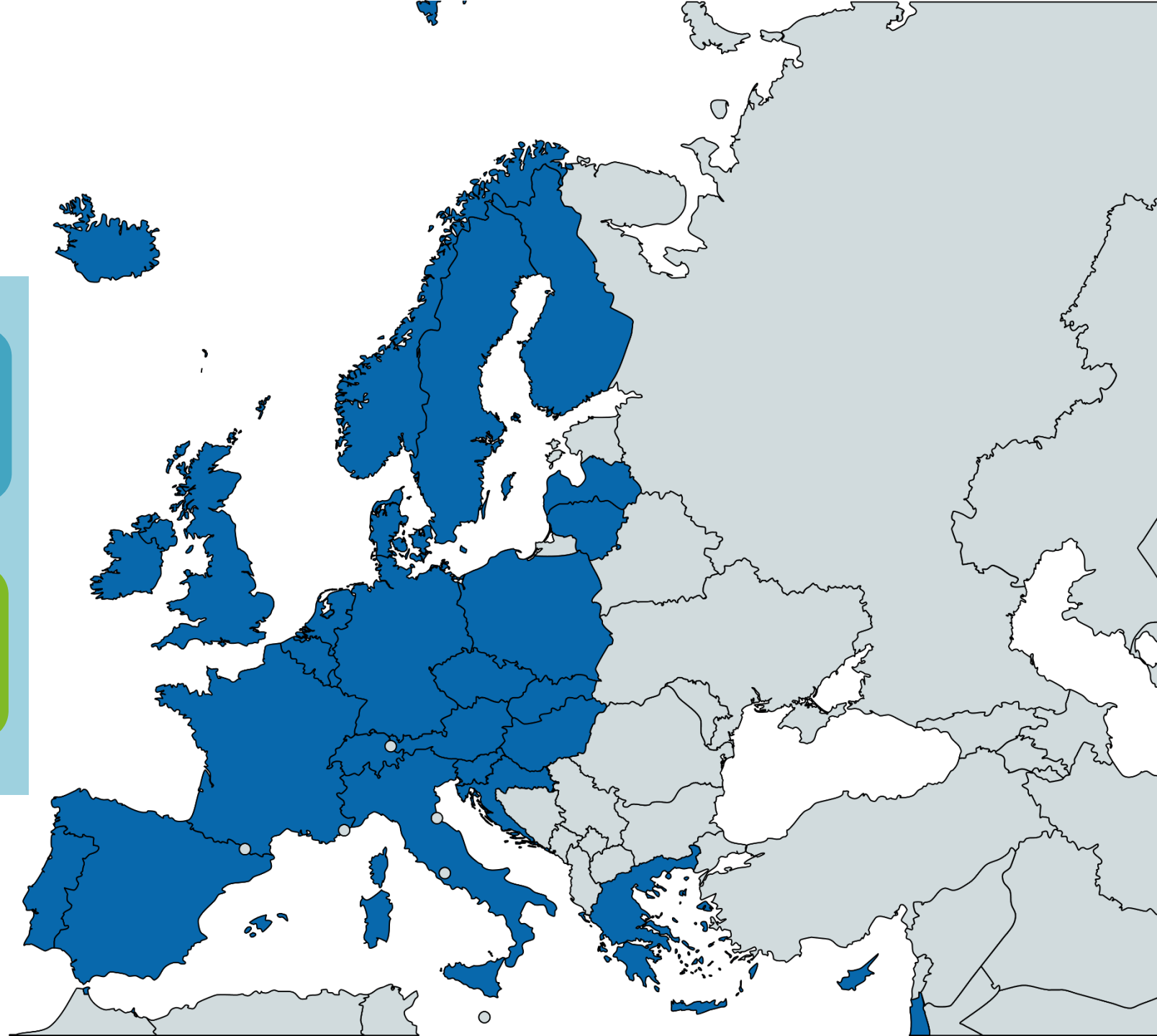
- **Coordinated by the German Environment Agency (UBA)**

Umwelt Bundesamt

European coverage

Capacity building at national level

Connected foundations for a sustainable pan-European HBM platform that builds on national hubs and existing expertise



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Gene

Pillar 1: Science to Policy

- WP4: Prioritisation and input to the annual work plan
- WP5: Translation of results into policy
- WP6: Sustainability and capacity building

Pillar 2: European HBM Platform

- WP7: Survey design and fieldwork preparation
- WP8: Targeted field work surveys and alignment at EU level
- WP9: Laboratory analysis and quality assurance
- WP10: Data management and analysis

Pillar 3: Exposure and Health

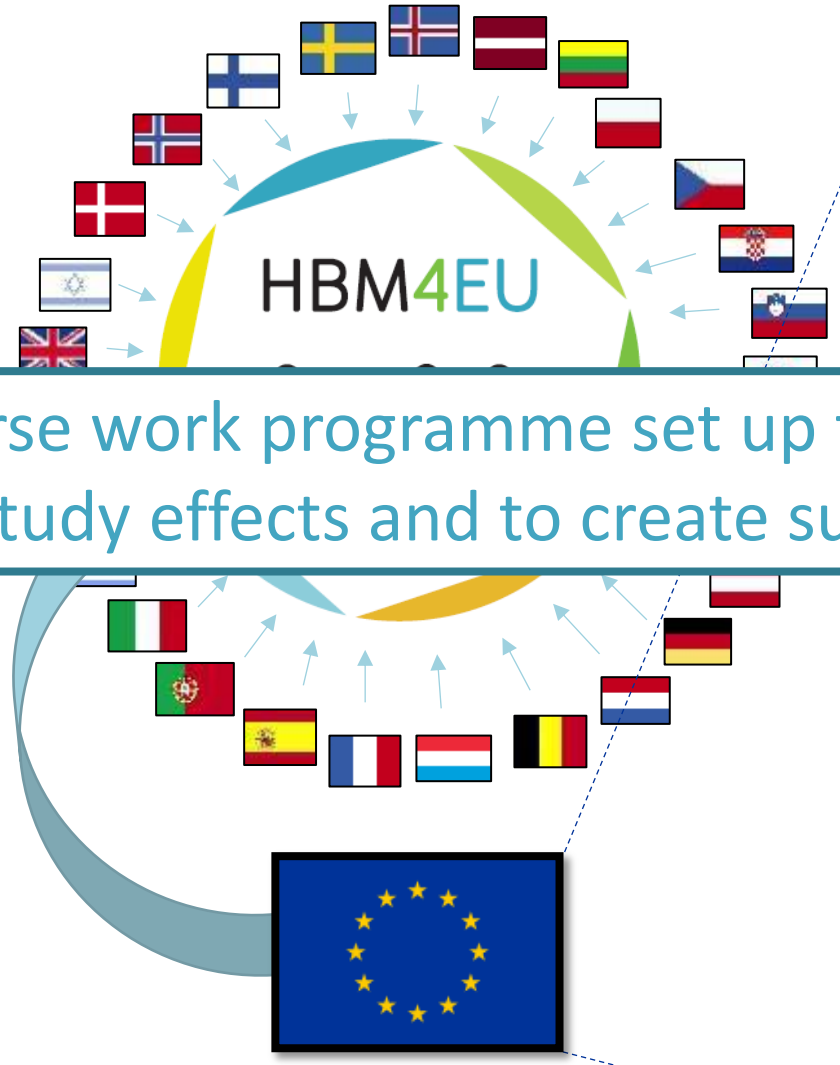
- WP11: Linking HBM, health studies, and registers
- WP12: From HBM to exposure
- WP13: Establishing exposure health relationships
- WP14: Effect Biomarkers
- WP15: Mixtures, HBM and human health risks
- WP16: Emerging Chemicals

- WP3: Internal Calls
- WP17: Ethics Requirements
- WP2: Knowledge Hub
- WP1: Programme management and coordination

Scientific and Administrative Management

National and EU Stakeholders; Advisory Board

Prioritisation on EU level



Second round

Prioritisation 2018

9 substance groups:

Diverse work programme set up to determine body burden, to study effects and to create sustainable risk assessment

4. Diisocyanates
5. Lead
6. Mercury
7. Mycotoxines
8. Pesticides
9. UV filters

Laboratory analysis and Quality Assurance: ICI/EQUAS 2018-2019

National laboratories

↓

Candidate list

↓

2 x Interlaboratory Comparison Investigations (ICI)
1 x External Quality Assurance Schemes (EQUAS)

↓

Database of qualified laboratories
1. Analysis
2. Development of new methods
3. Support in QA/QC

Group	Compounds	Matrix	No. Labs invited	Status
Phthalates	MEP, MBzP, MiBP, MnBP, MCHP, MnPeP, MEHP, 5OH-MEHP, 5oxo-MEHP, 5cx-MEPP, MnOP, OH-MiNP, cx-MiNP, OH-MiDP, cx-MiDP	Urine	26	ICI 1 finished
DINCH	OH-MINCH, cx-MINCH	Urine	10	ICI 1 finished
Bisphenols	BPA, BPF, BPS	Urine	33	ICI 1 finished
PFAS	PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFBS, PFHxS, PFHpS, PFOS (sum of all isomers)	Serum	21	ICI 1 finished
FR				finished
				finished
PA				finished
	hydroxyphenanthrene, 1-PYR, 3-hydroxybenzo(a)pyrene			
Anilines	MDA, MOCA, Aniline, p-aminophenol,MDA,N-acetyl-4-aminophenol, p-PDA, o-toluidine, 2,4-TDA, 2,6-TDA	Urine	14	ICI 1 in preparation
Cd		Urine and blood	38	ICI 1 finished
Cr		RBC, urine, plasma	16	ICI 1 ongoing

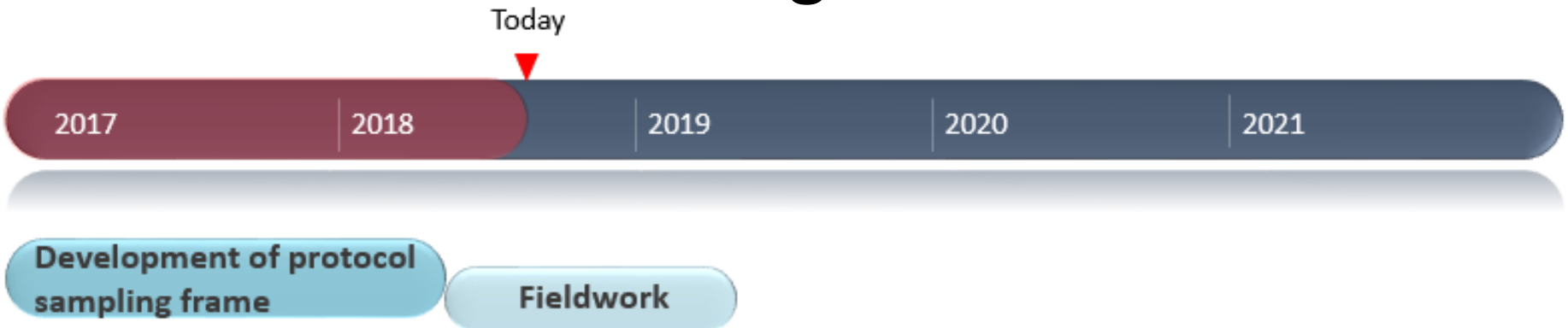
74 exposure biomarkers /round
5 matrices

3 rounds (2 ICIs+ 1 EQUAS)

7 organizing labs: preparing, testing, sending Control Material/analizing-comunicating results.

HBM data with EU wide coverage

Schedule:



Concept:

	North	West	South	East
Phthalates DINCH Flame retardants	~2950 Children 6-11 y			
	NO DK	**FR** **DE** NL	IT SL EL	HU SK PL
Phthalates DINCH PFASs	~2900 Teenagers 12-18 y			
	NO **SE**	**FR** **DE** BE	**ES** SL EL	CZ PL SK
Bisphenols Cadmium PAHs	~3165 Adults 19-39 y			
	DK FI **IS**	**FR** CH **DE** LU	**PT** HR	CZ PL

Data management under HBM4EU

- Collect individual and aggregate data from partner countries
  - Existing data: individual, aggregate, metadata
- **EU General Data Protection Regulation**
- Compliance with ethics and data protection requirements
- Make data available via IPCHEM

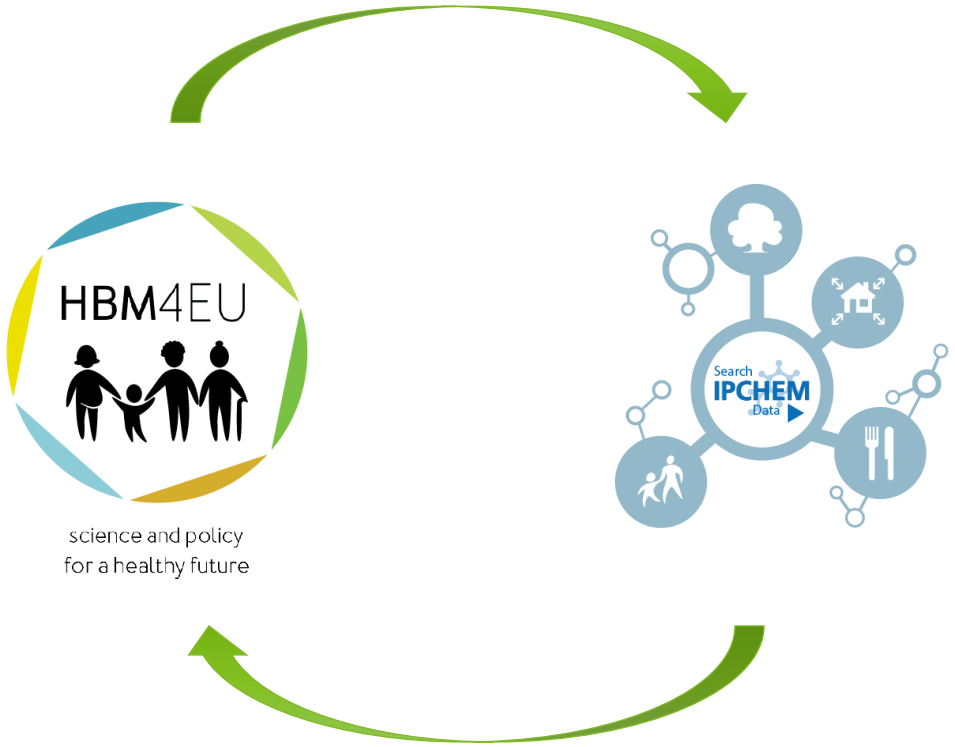
Synergies between HBM4EU and IPCHEM

Existing HBM data in Europe

Producing new HBM data

Network of scientists working on exposure and health effects

Expert input to improving IPCHEM architecture and functionalities



Free, accessible platform for providing access to HBM4EU results

Tool for data exchange

Credibility and profile of IPCHEM

Tailoring of architecture and function to suit HBM4EU needs

Human Biomonitoring in Risk Assessment

Examples for HBM data used in risk assessment schemes

- **WHO RA:** specific guidance on the use of HBM data in RA, e.g. CICADs on Chromium
- **Canadian CMP**: use of HBM in RA for phthaltes, PFOA/PFOS, lead
- **REACH:** HBM used in RA for restriction of 4 phthalate (DEHP, BBzP, DnBP, DiBP)
- **REACH**: HBM used in Authorisation Application for MOCA

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Recommendations for the better inclusion of HBM in risk assessment and health impact assessment

See Deliverable D5.1

- ✓ **Create awareness on capabilities of HBM at EU and national level**
- ✓ **Harmonised guidance for the use of HBM data**
- ✓ **HBM health-based guidance values needed**
- ✓ **HBM is key for addressing exposure to mixtures**

Communicat


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HORIZON 2020
KEEP YOURSELF SAFE FROM EXPOSURE TO PHTHALATES
WHAT ARE PHTHALATES?
Phthalates (also named phthalate esters or esters of phthalic acid) are industrial chemicals that may be used as plasticisers, to make plastics more flexible and harder to break. The group of phthalates comprises several single substances. Some phthalates are used as solvents, to dissolve other materials. Most of the phthalates are colourless, scentless, flavourless and vaporize easily.
WHERE ARE PHTHALATES FOUND?
Phthalates may be found in many products we use every day such as:
Consumer products with plastic components: plastic packaging film, inflatable toys, blood-storage containers, covering on wires and cables;
Other consumer products: modelling clay, adhesives, detergents, air fresheners and fragrance candles;
Cosmetics, food supplements and personal care products: soaps, shampoos, hair sprays, and nail polishes, perfumes.
In Europe, phthalates of concern are restricted in toys and childcare articles, in cosmetics and in articles intended to come into contact with food and may only be used with special authorisation. Currently, efforts are underway for further restrictions. Many phthalates and their substitutes are nevertheless still in use.
HOW CAN PHTHALATES ENTER YOUR BODY?
Eating and drinking food that have been in contact with containers and products containing phthalates;
Using phthalate-containing products (such as cosmetics, shoes, raincoats);
Breathing contaminated indoor-air (from phthalate-containing plastic products, such as vinyl flooring, at home or work);
Children can easily be exposed to phthalates by sucking on plastic toys.
HOW CAN PHTHALATES HARM YOU?
Some phthalates have hormone-like properties and have been found to affect the reproductive system of animals in some studies. The effects observed in animals are considered to be relevant in humans as well. Therefore, the EU classified some of these substances as reproductive toxicants and endocrine disrupting compounds[1] (compounds that affect the hormonal system) and thereby as substances of very high concern.
HUMAN BIOMONITORING OF PHTHALATES
Human biomonitoring investigates the concentration of substances in body fluids like blood and urine, or in body tissues like hair. This will allow the actual internal exposure to a substance to be determined, which can come from different sources and be absorbed in different ways.
The concentration of phthalates is generally measured in human blood and urine. As most of the phthalates are broken down into simple compounds, they are rapidly eliminated from the body and can easily be determined by measuring their excretion products (metabolites) in urine.
Finding a detectable amount of phthalates in a person does not mean it will harm your health. There are EU-wide human biomonitoring health-based guidance values where an individual's internal exposure level can be compared to. If the level is below this value, no adverse health effects are expected.
Biomonitoring data can also help scientists to plan and conduct research on exposure and health effects.
WHAT CAN YOU DO TO PREVENT EXPOSURE TO PHTHALATES?
Read product labels and choose to use phthalate-free products when possible. Vinyl plastics ("PVC" or labelled with "3") are more likely to contain phthalates;
Clean your home regularly, to remove dust. Use a damp cloth for dusting or a vacuum cleaner to prevent dust from circulating in the air;
Wash your hands often, especially before eating;
Choose fresh produce over processed and prepacked food.
[1] The following most common phthalates are among others classified as toxic for reproduction and having endocrine disrupting properties: Bis(2-ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBzP), Dibutyl phthalate (DnBP), Diisobutyl phthalate (DiBP).
The HBM4EU project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 733032.
HOW CAN YOU GET MORE INFORMATION? www.hbm4eu.eu

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Special Thanks to the HBM4EU Management Board:

Jean-Philippe Antignac (INRA)
Robert Barouki and Elena Tarroja (INSERM)
Argelia Castaño and Marta Esteban (ISCIII)
Ulrike Fiddicke (UBA)
Catherine Ganzleben and Joana Lobo Vicente (EEA)
Jana Klánová and Ludek Blaha (MU)
Erik Lebret and Mirjam Luijten (RIVM)
Nicolás Olea and Marieta Fernández (UGR)
Ovnair Sepai (DH)
Hanna Tolonen (THL)
Denis Sarigiannis and Spyros Karakitsios (AUTH)
Greet Schoeters (VITO)

… and to all our wonderful partners

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 733032.

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