

EUROPEAN HUMAN BIOMONITORING INITIATIVE (HBM4EU) INDICATOR LEAFLETS

ALIGNED HUMAN BIOMONITORING STUDIES

Indicator 1.2 Number of aligned human biomonitoring (HBM) studies within HBM4EU

SPECIFIC GOAL 1: Laying the foundations for a pan-European HBM platform that includes National Hubs and builds on existing expertise

RESPONSIBLE: Department of Health (DH), UK

WORK PACKAGE: 7, 8, 9, 10

KEYMESSAGES

- 21 out of 30 of HBM4EU participating countries collaborate on aligning HBM studies in the general population with combined financing from countries and HBM4EU, leading to a total number of 34 aligned HBM studies
- The first 2 joint occupational exposure studies target occupational exposure to chromium VI and diisocyanates. A second part of the occupational studies is exposure to e-waste
- The above mentioned approach stimulates capacity building and lays the foundation of a European HBM platform ensuring harmonised data
- Harmonised European HBM data can feed directly into risk assessment, policy development and evaluation
- 83% of participating countries is involved in one of the aligned human biomonitoring studies

WHY

- 1 Identify policy need for harmonised and comparable data on internal chemical exposure of citizens at EU level
- 2 Develop common guidelines and SOPs building on existing capacities
- 3 Align (ongoing) studies and design new targeted studies
- 4 Build a European HBM platform
- 5 Provide harmonised and reliable European HBM data as basis for risk assessment and management

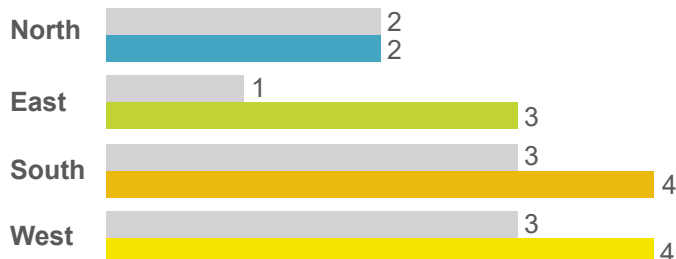
1) EUROPEAN HBM EXPOSURE STUDIES IN GENERAL POPULATION TARGETING SPECIFIC AGE GROUPS AND CHEMICALS

Results

Children
6-11 years

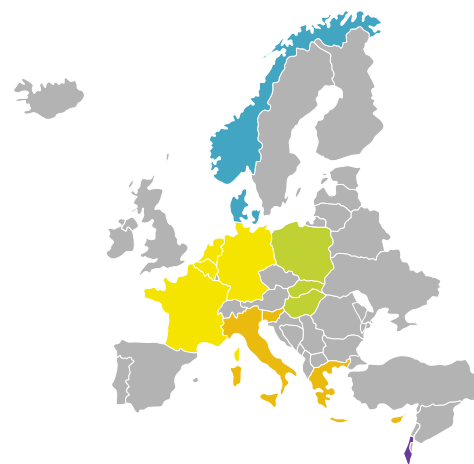


Number of participating studies



■ Geographical Target in relation to the number of inhabitants

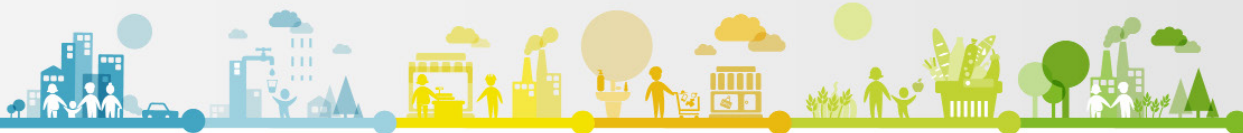
*14 countries participated, Israel is a non-European country



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

For more information please contact:

HBM4EU@uba.de
gezondheid.omgeving@vlaanderen.be



New analyses planned in aligned studies

1st priority substances and effect biomarkers

Phthalates & DINCH	Flame retardants (urine)	Flame retardants (serum)	Effect biomarkers	Countries
✓	✓	✓		NO, FR, SL
✓	✓			DK, SK, BE, DE
✓		✓		GR
✓				HU, PL, IT, NL
			✓	NO, SK, HU, SL, IT

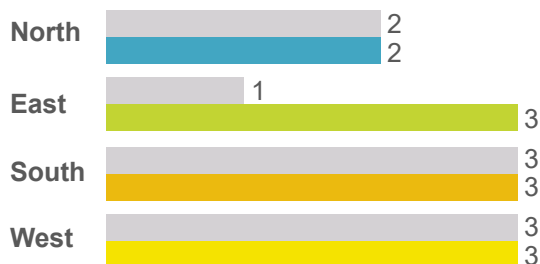
2nd priority substances

Pesticides (glyphosate/AMPA)	Pesticides (TCPy/pyrethroids)	Acrylamide	Countries
✓	✓	✓	FR
✓	✓		SL, BE, CY
	✓		NL, IL
		✓	NO, IT
✓		✓	DE

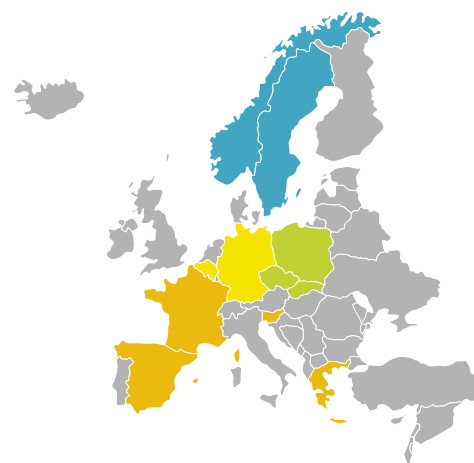
Teenagers 12-19 years



Number of participating studies



■ Geographical Target in relation to the number of inhabitants



New analyses planned in aligned studies

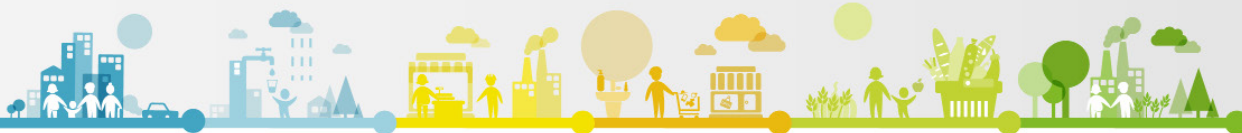
1st priority substances and effect biomarkers

Phthalates	DINCH	Perfluorinated compounds	Effect biomarkers	Countries
✓	✓	✓		NO, SE, SK, SL, GR, ES, FR, BE, DE
✓	✓			PL, CZ
			✓	NO, SK, SL, ES, BE

2nd priority substances

Arsenic species	UV-filters	Countries
✓	✓	SE, ES, FR, DE
✓		SL, BE
	✓	NO, PL

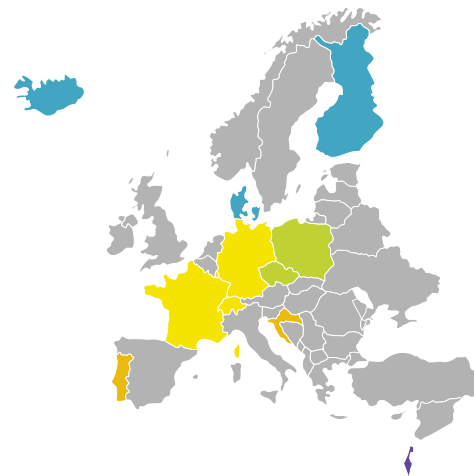
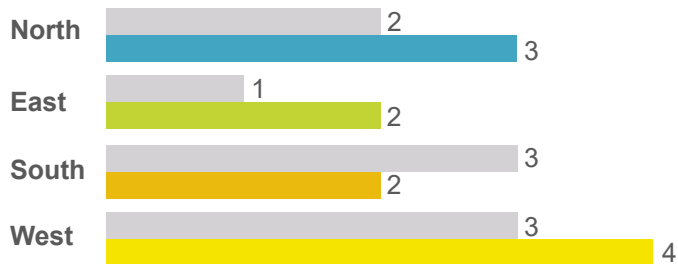




Adults 20-39 years



Number of participating studies



■ Geographical Target in relation to the number of inhabitants
*14 countries participated, Israel is a non-European country

New analyses planned in aligned studies

1st priority substances

Bisphenols	Cadmium	Polycyclic aromatic hydrocarbons	Countries
✓	✓	✓	DK, IS, CZ, PL, HR, FR, PT, LU, DE
✓		✓	FI
			CH

2nd priority substances

UV-filters	Acrylamide	Mycotoxins	Pesticides (Glyphosate/AMPA)	Pesticides (TCPy/Pyrethroïds)	Countries
✓	✓	✓			LU,
✓	✓	✓	✓	✓	FR, DE
			✓	✓	CH
✓				✓	DK
		✓		✓	IL
	✓	✓	✓	✓	PL
	✓	✓		✓	IS
		✓		✓	PT

ON TRACK

- High participation rate (21 out of 30 HBM4EU participating countries)
- Good geographical spread: geographical target reached in children and teenagers
- Overall sample size target of 2700-3000 subjects will be met

FUTURE PERSPECTIVES

- Due to restricted budget & practical considerations some groups (sensitive & non-sensitive) are unaddressed

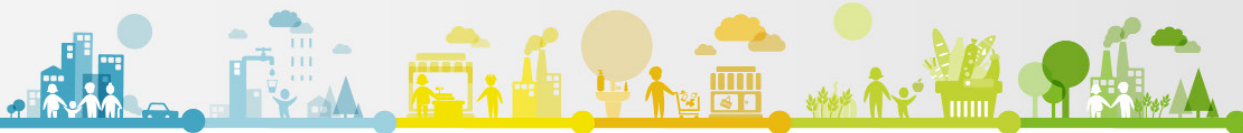
BE: Belgium, CH: Switzerland, CZ: Czech Republic, DE: Germany, DK: Denmark, FI: Finland, FR: France, GR: Greece, HR: Croatia, HU: Hungary, IL: Israel, IS: Iceland, IT: Italy, LU: Luxembourg, NL: The Netherlands, NO: Norway, PL: Poland, PT: Portugal, SE: Sweden, SL: Slovenia, SK: Slovakia



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

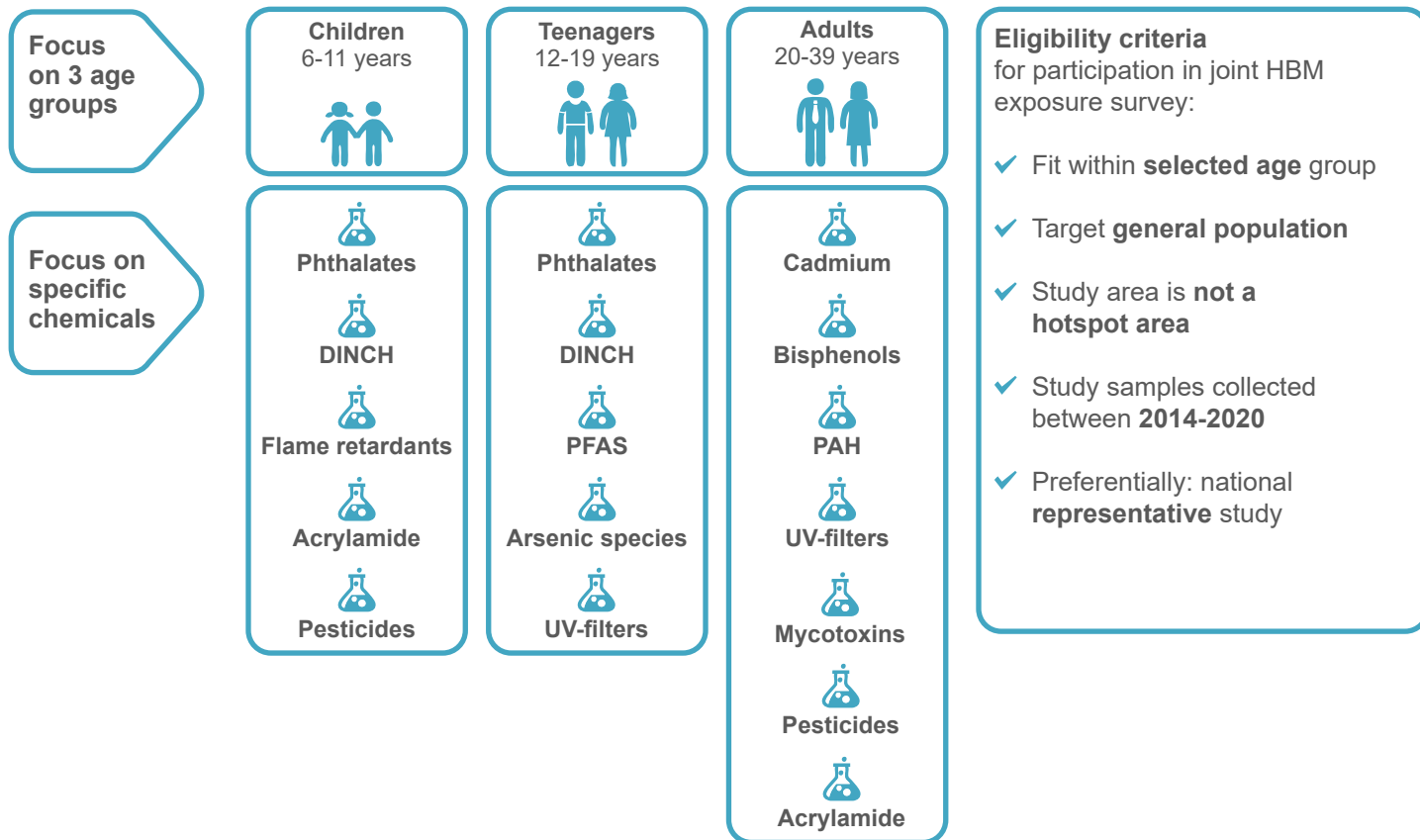
For more information please contact:

HBM4EU@uba.de
gezondheid.omgeving@vlaanderen.be



Methodology

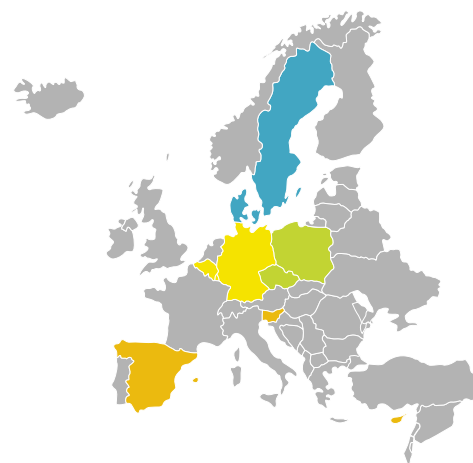
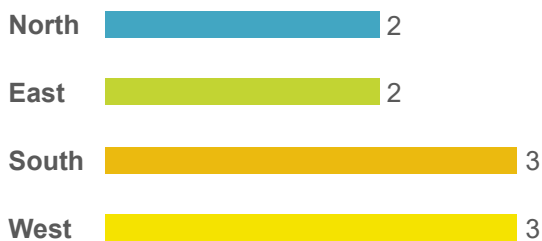
1) EU wide exposure studies in general population



2) TIME TREND STUDIES

Results

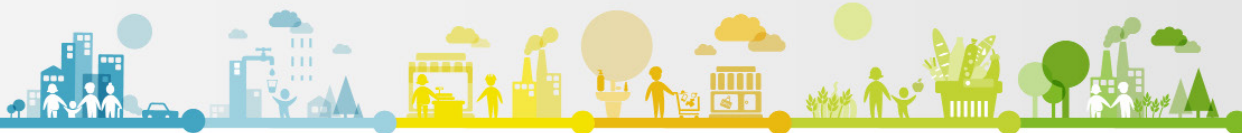
Number of DEMOCOPHES countries performing new analysis in biobanked samples



New analysis in children samples:

DINCH	Phthalates	Flame retardants (urine)	Bisphenols	PAH	Cadmium	Countries
✓		✓	✓		✓	SE
	✓	✓	✓		✓	SL
✓	✓	✓				CZ, BE
✓	✓		✓			ES
✓		✓				DK, CY, DE
✓	✓					LU
✓						PL





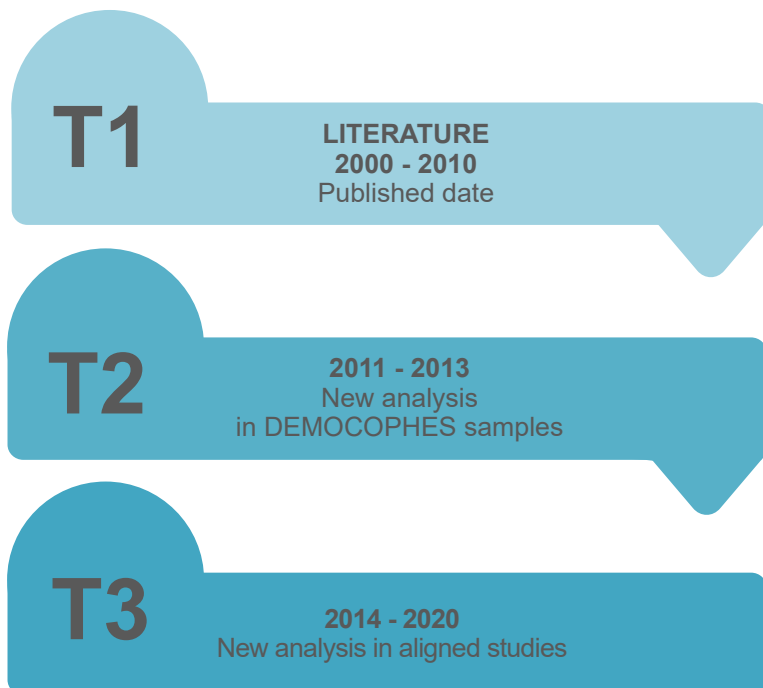
New analysis in adult women samples:

DINCH	Phthalates	Flame retardants (urine)	Bisphenols	PAH	Cadmium	Countries
			✓	✓		DK, CZ, CY, DE, LU, PL
			✓			BE
	✓		✓			ES
	✓		✓		✓	SL
✓	✓	✓	✓	✓	✓	SE



- 10 countries have responded positive to perform new analysis in biobank urine samples
- Data on cadmium, seven phthalate metabolites and BPA exposure levels in children (6-11 yrs) and their mothers has previously been analysed and published
- New analyses in DEMOCOPHES biobank samples (collected in 2011-2012) in 2020
- Target groups: children 6-11 yrs and women 20-40 yrs
- Substances to be analysed were determined in alignment with the EU wide aligned general population study
- Literature review of published data for 1st set priority chemicals

Methodology



Due to covid-19 delay, some aligned studies also collected samples from 2020 and 2021

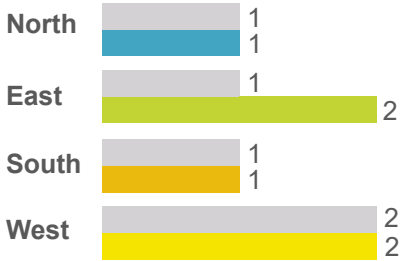




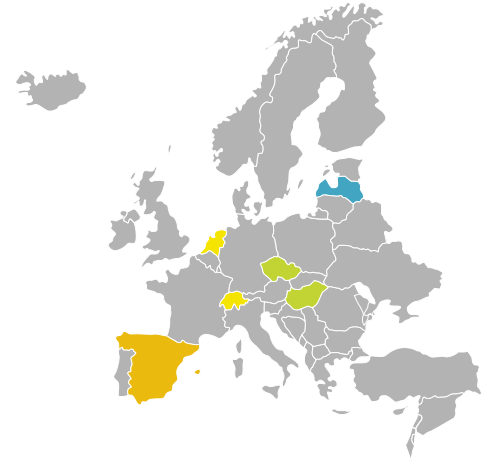
3) Survey on PEstiCide Mixtures in Europe (SPECIMEn)

Results

Number of participating studies



■ Geographical Target in relation to the number of inhabitants



The joint hotspot-survey is targeted on exposure to **pesticide mixtures**. It collects samples from **parents and children** living in **hotspot areas vs. control areas**. These hotspot areas are residential areas in close proximity (<250m) to agricultural areas with active pesticide applications. Samples are collected in **Spraying season** (May - August 2020) and **Non-spraying season** (Dec 2019-Feb 2020) for comparison. Together with WP16 pesticide suspect screening will be applied.

✓

ON TRACK

- Collection of 50 parent-child pairs of urine samples commenced in October 2019 to cover the non-spraying season
- Field work executed
- The participating countries selected the laboratories to undertake sample analyses

Methodology

ALIGNED EUROPEAN HBM EXPOSURE STUDIES IN THE GENERAL POPULATION

n=2950

n=3165

SUBGROUP OF ALIGNED STUDIES

n=50 | **5 COUNTRIES** | **ADD-ON:**

n=50 | **2 SEASONS** | **PESTICIDE SUSPECT SCREENING**

ADD-ON: HOTSPOT AREAS
(residents in close proximity to agricultural fields)

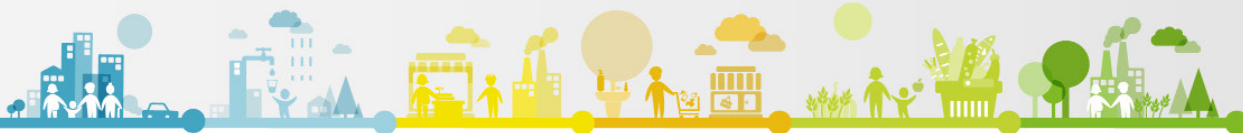
5 COUNTRIES
2 SEASONS

ADD-ON:
PESTICIDE SUSPECT SCREENING

n=50

n=50

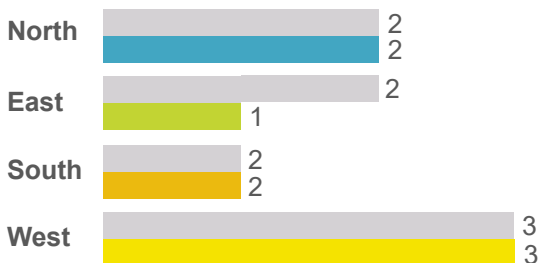




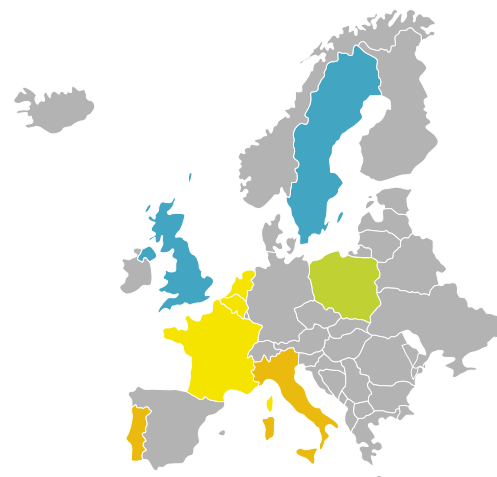
4) EUROPEAN OCCUPATIONAL EXPOSURE STUDIES

Results - Occupational survey on Chromium VI

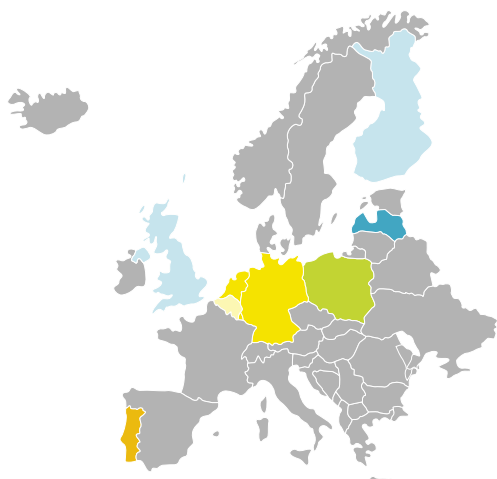
Number of participating countries



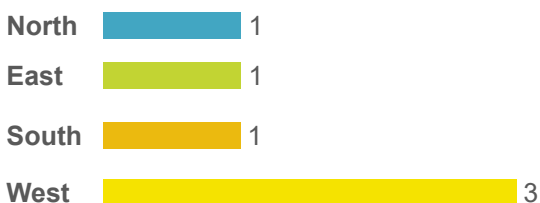
■ Geographical Target in relation to the number of inhabitants



Occupational survey on chemical exposure in E-waste industry

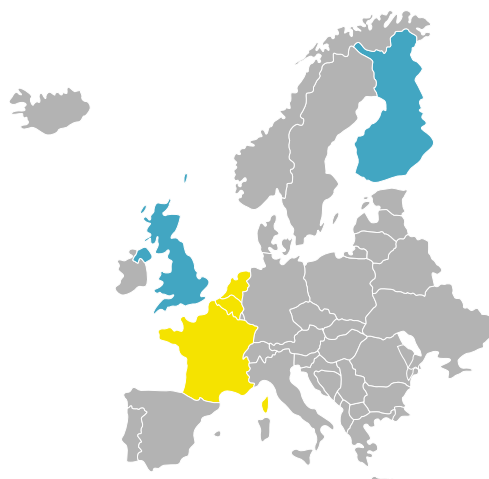


Number of participating countries



Shaded countries are still unsure for participation

Occupational survey on Diisocyanates

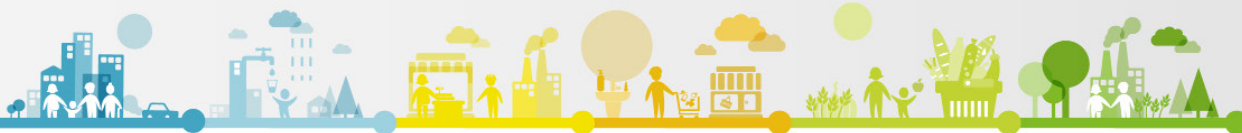


Number of participating countries



- All 4 geographical regions included; micro-enterprise, SME and large international companies included for the survey on Chromium VI
- 2nd (part 1 and 2) occupational study has started
- Occupational survey on hexavalent chromium completed

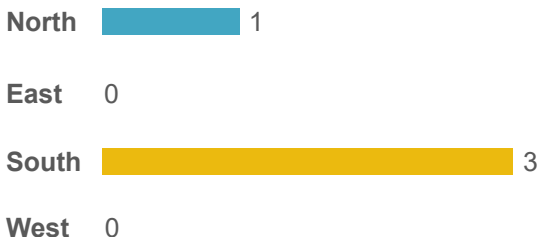




5) SURVEY ON METHYLMERCURY-CONTROL IN EXPECTANT MOTHERS THROUGH SUITABLE DIETARY ADVICE FOR PREGNANCY (HBM4EU-MOM)

Results

Number of participating studies

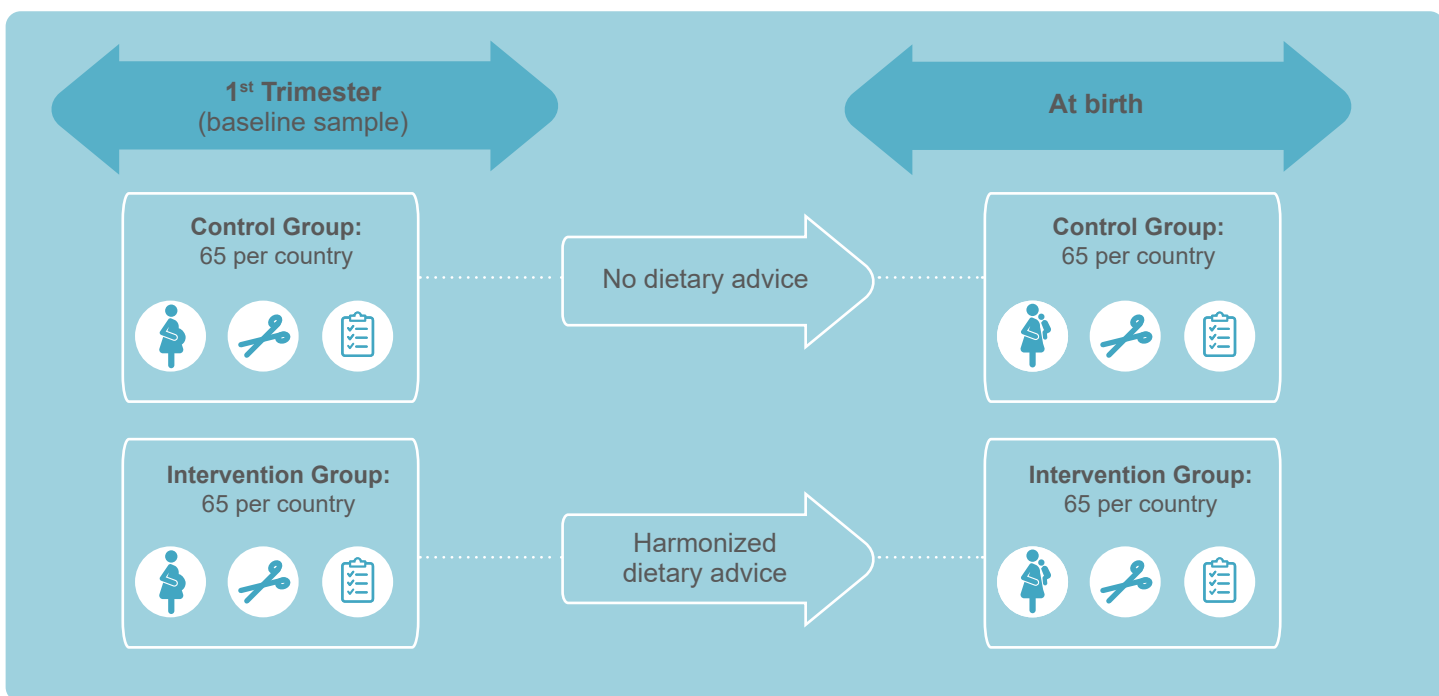


✓
ON TRACK

- A total of 644 pregnant women have been recruited, and samples have been collected in all 5 countries

Methodology

HBM4EU-mom survey is an intervention study evaluating the effect of dietary advice in lowering mercury exposure through diet (fish consumption).



Deliverable 8.1, 8.3, 8.4, Additional Deliverable 8.2 (report chromat study), D8.8, D8.6
 Aligned studies paper: <https://doi.org/10.1016/j.ijheh.2021.113809> a second paper is submitted but not published yet.
 Occupational study paper: <https://dx.doi.org/10.1016/j.envres.2019.108583>, D8.11, D8.12
<https://doi.org/10.1016/j.ijheh.2021.113725> [10.1016/j.envres.2021.111984](https://doi.org/10.1016/j.envres.2021.111984)
 Second paper on aligned studies: <https://doi.org/10.3390/ijerph19116787>

Last version 23/06/2022



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

For more information please contact:
HBM4EU@uba.de
gezondheid.omgeving@vlaanderen.be