

Human Biomonitoring in Europe: Example from Germany

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Human Biomonitoring as a Public Health Instrument: from Science to Policy Decisions

About 50 years ago in Germany



- died more than 100 cows after exposure to heavy metals close to a lead works (Nordenham, 1972),
- were children living near a battery production plant highly exposed to lead (Berlin, 1979)
- lead in blood of children near a smelting works (Oker, 1980)....

Challenge:

- scientific basis for protection of the environment and health
- internal and external exposure- and exposure sources
- health impacts
- policy measures
- transparent information for citizens

The answer: Since the 1970s in Germany...

Human Bio Monitoring



Internal exposure



Identification of sources



Reduction measures

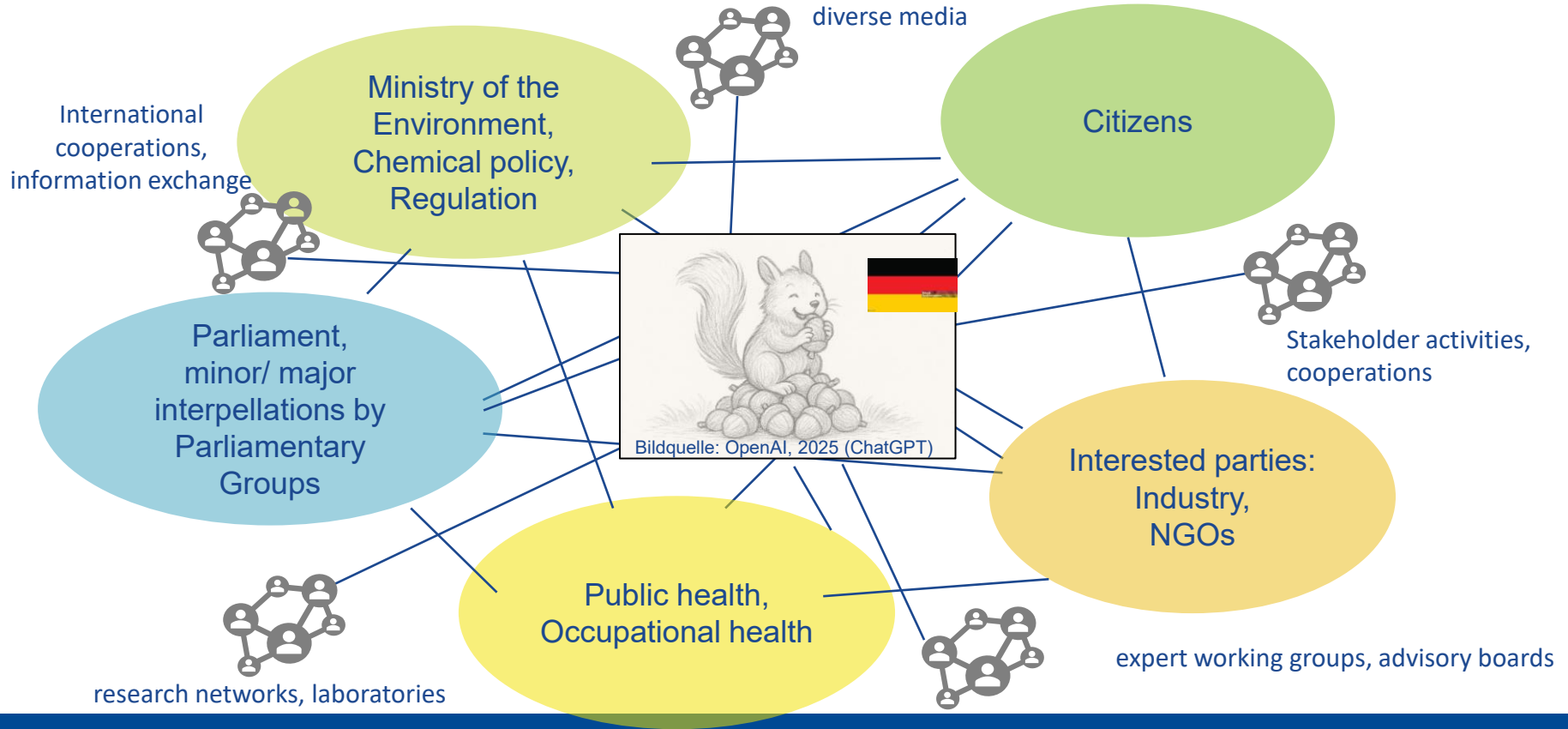


Policy recommendations



Control of success

Who are the recipients of Human Biomonitoring data?



The complementary German HBM system



Co-operation for the further development of HBM

- **new methods** for analysis for potentially exposure and health relevant substances



Human Biomonitoring Commission of the UBA

- **HBM-values** (toxicology)
- **reference values** (statistics)



German Environmental Survey (GerES)

- *population-representative Human Biomonitoring*
- *ambient monitoring*
- *interviews*



German Environmental Specimen Bank (UPB)

- *retrospective monitoring*
- *time trends (background exposure)*
- *archive*

German Environmental Survey – GerES V: 2014-2017



HBM
Ambient Monitoring
Drinking water Monitoring



Quelle: Robert Koch-Institut

5. Umweltstudie: 2014 -2017

2.294 Children and adolescents from 167 sampling locations in Germany

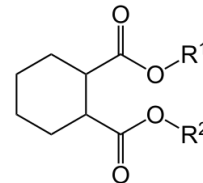
age: 3 bis 17 Jahre

Population representative for age, sex, community size

GerES	Field work	n	Age (years)
I	1985 - 1986	2.731	25 - 69
II	1990 - 1991	2.524	25 - 69
		453	6 - 14
	1991 - 1992	1.763	18 - 79
III		359	6 - 17
	1997 - 1999	4.822	18 - 69
IV	2003 - 2006	1.790	3 - 14
V	2014 - 2017	2.294	3 - 17
VI	2023 - 2024	1.622	18 - 79

Plasticiser DINCH- regrettable or successful substitution?

1,2-Cyclohexandicarbonsäurediisononyl ester



Substitute for reprotoxic, regulated hmw phthalates (i.a. DEHP)

Use: medical devices, toys, children's items, food contact materials



Bundesministerium
für Umwelt, Naturschutz
und nukleare Sicherheit

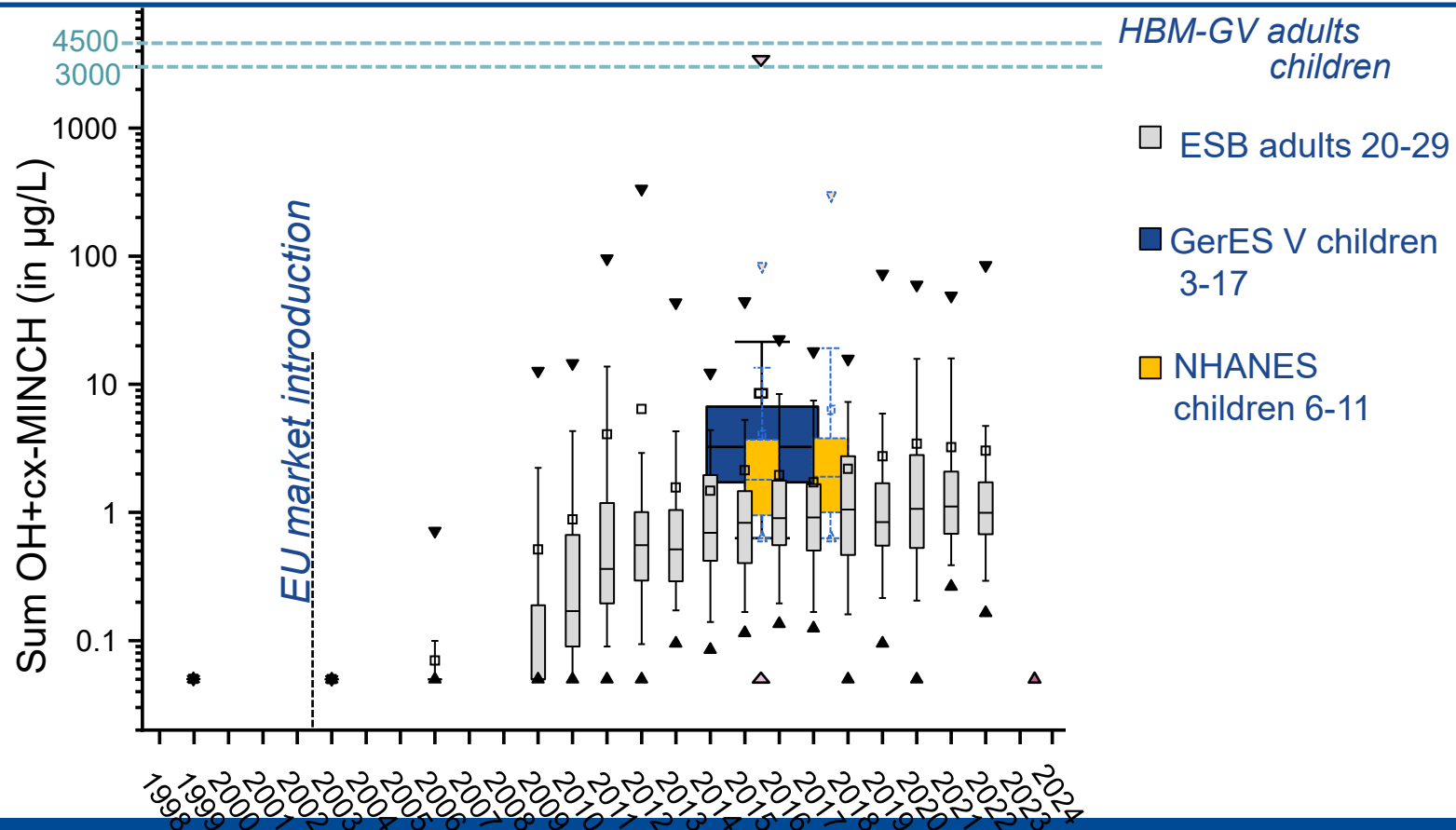


GerES



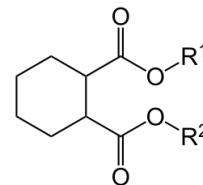
PARC

Success story DINCH



DINCH- successful substitution!

- ✓ New HBM method developed (cooperation between Ministry for the Environment and the German Chemical Industry Association, VCI)
- ✓ HBM value and HBM GV derived (HBM Commission, HBM4EU)
- ✓ Time trend analyses (ESB) following the entering of markets and bodies
- ✓ Population representative data (GerES V, VI)
- ✓ Transfer to EU level (HBM4EU, PARC)



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GerES



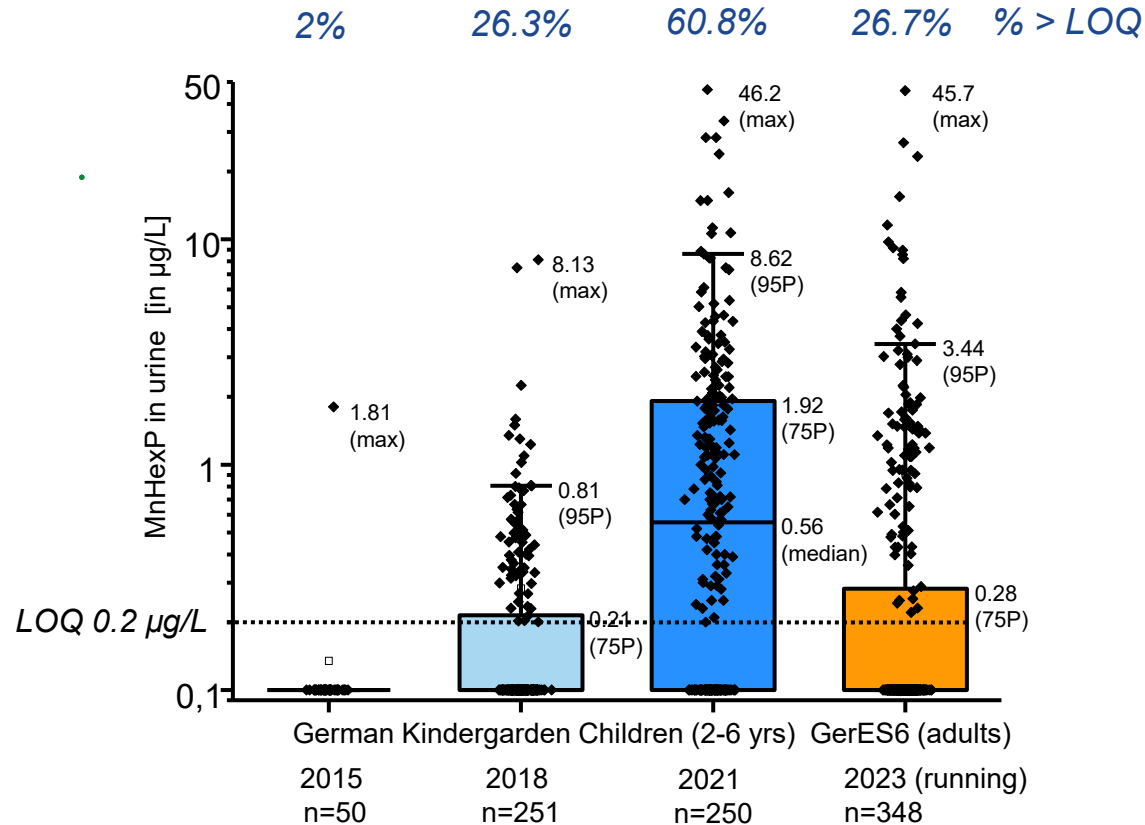
PARC

HBM to check compliance with EU regulation

Can banned phthalates which are not authorised in the EU and which are acting additively with other reprotoxic phthalates be detected in German citizens?



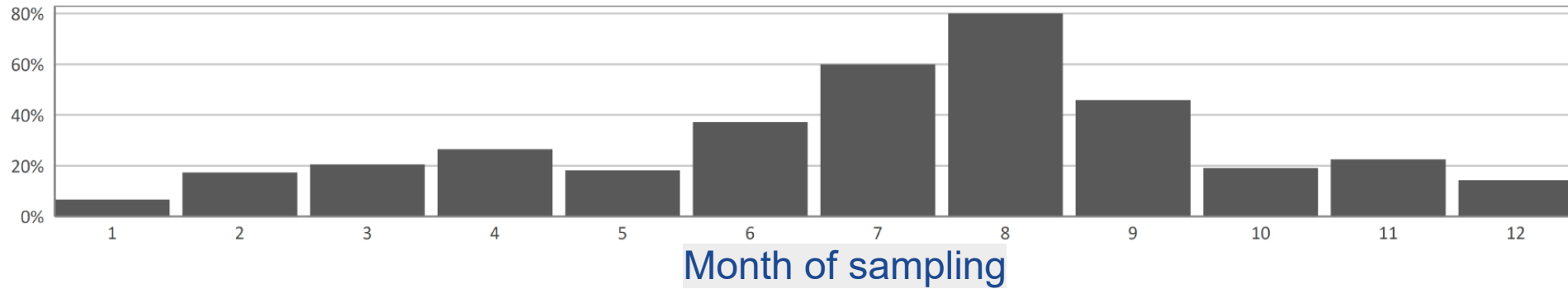
Surprise findings of MnHexP exposures (log)



Holger Koch et al.

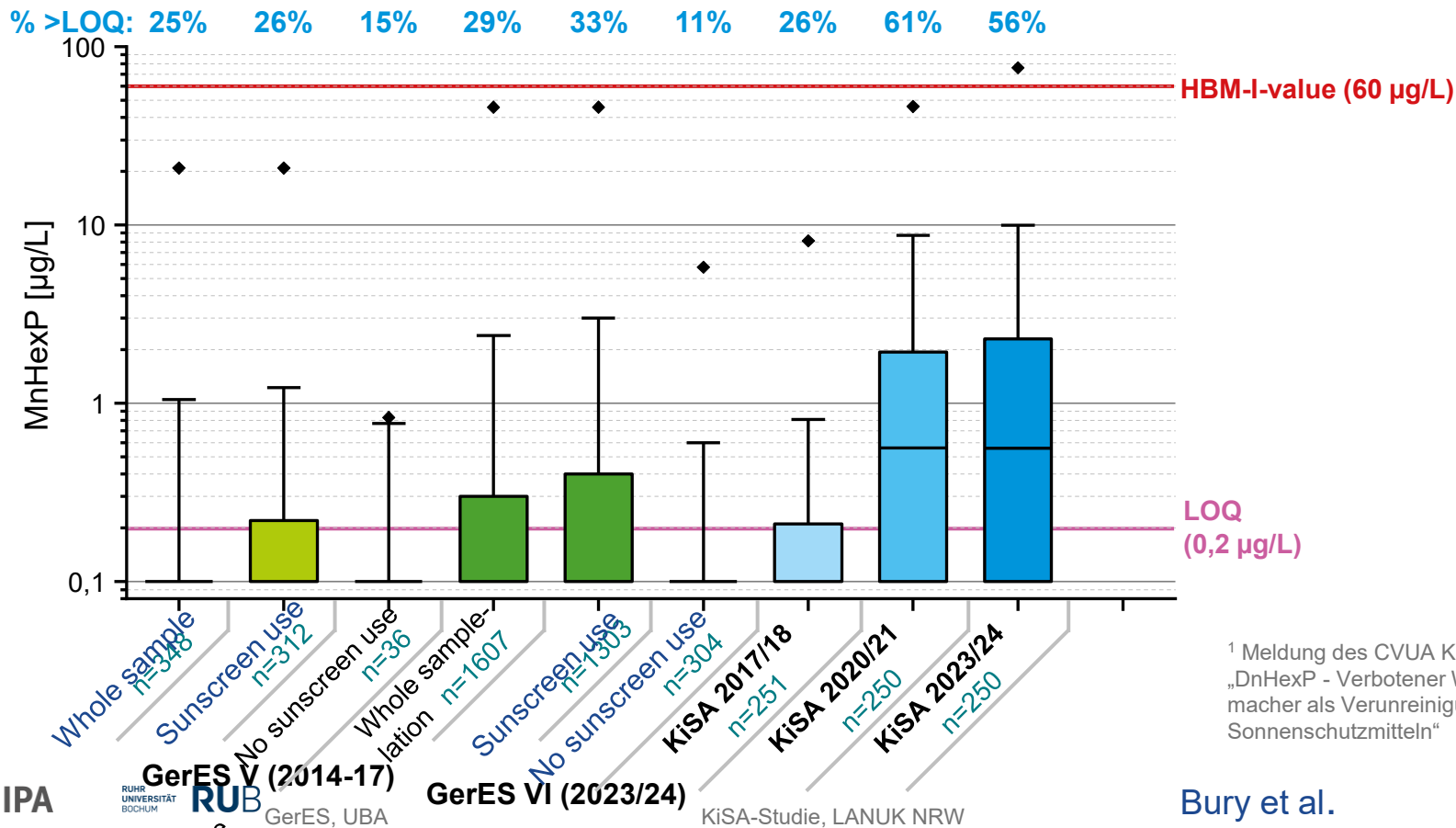
Saisonnality of the DnHexP exposure (GerES V-Data)

% MnHexP samples above LOD



Kindly supplied by Dr. Aline Murawski (UBA)

Use of sun screen



Rapid Response Mechanism in PARC

- **23.02.24 request:**

- Extent of MnHexP exposure in Europe?

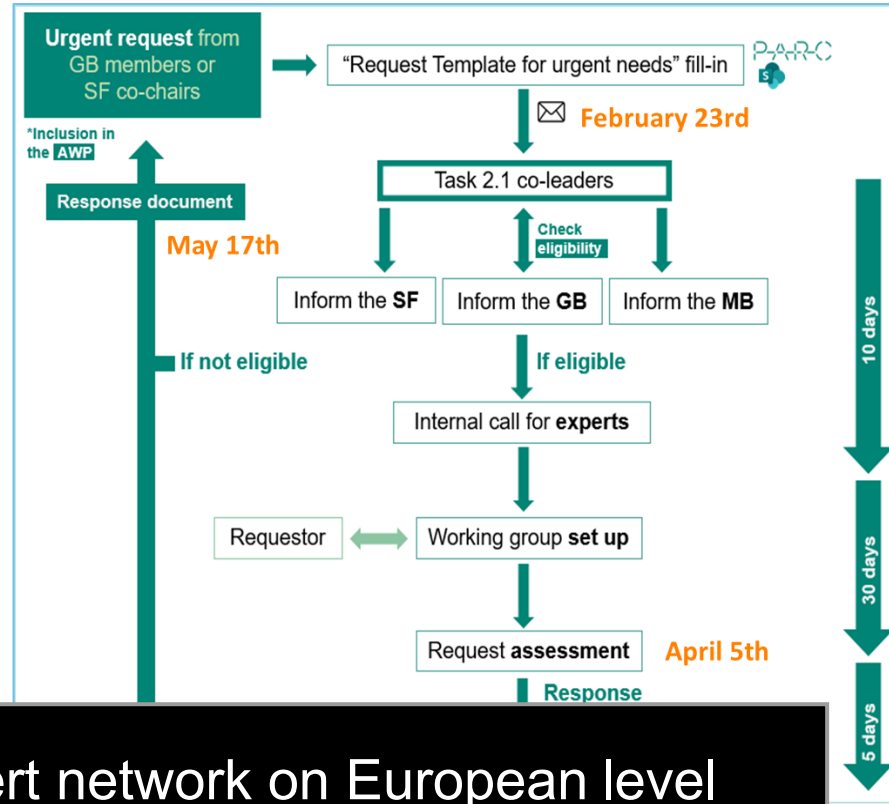
- Parent substance? Sources?

- **05.04.24** Assessment by PARC working group

- e.g. members of the tasks
- human/environmental monitoring,
- analytical methods,
- source to dose

- **17.05.24 Response document:**

discussion of current developments



→ Fast utilization of the PARC expert network on European level

Surprise findings of MnHexP exposures (log)

Current status:

Data available from Germany, Denmark, Spain & Italy

Reintegration of HBM4EU-datasets (2014-2020)

[France, the Netherlands, Poland]

09/24 (updated 05/25)

→ Rapid response with available national data

- Long term:

- addition of Dnt → Long term approach for integration in PARC research

- in the PARC Aligned Studies

data in 2027/2028

DINCH- regrettable or successful substitution?



Scientific Committee on Consumer Safety

SCIENTIFIC ADVICE

on the safety of Diethylamino Hydroxybenzoyl Hexyl Benzoate – DHHB – S83

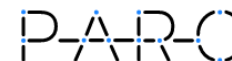
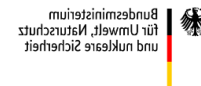
2. *Does the SCCS have any further scientific concerns regarding the presence of DnHexP in DHHB as a UV-filter in cosmetic products?*

The SCCS has noted from the available information that DnHexP was below the level of detection in several DHHB containing sunscreen products and other DHHB sources, provided that a specific manufacturing process is applied. The information also showed that it is technically possible to lower the levels of DnHexP in DHHB down to 1 ppm. Considering the existence of such alternative manufacturing process for DHHB, the SCCS is of the opinion that a trace level of 1 ppm should be the target for the maximal level of DnHexP as an impurity in DHHB.

New Cosmetic Products Regulation: 10 ppm (2026)

HBM: spot the problem, analyse it, and solve it

- ✓ New HBM **method developed** (IPA by order of UBA)
- ✓ **Source identification, monitoring of cosmetics & mitigation measures**
- ✓ **HBM value** derived (HBM Commission)
- ✓ **Population representative data** (GerES IV, V, VI) and **time trend** analyses (ESB)
- ✓ Transfer to **EU level** (PARC)- Rapid Response mechanism and new data
- ✓ Revision of SCCS (Scientific Committee on Consumer Safety) evaluation
- ✓ Extended regulation in the Cosmetics Products Regulation
- ✓ Contaminated products dropped from ~50 (2023) to ~20% (2026) in Germany



„What Europe is all about“:

Together for the protection of humans and the environment

