

Identification of high-priority human biomonitoring substances in the Latvian context



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HBM4LV study team

**Human Biomonitoring as a Public Health
Instrument: from Science to Policy
Decisions, 29th of May, 2026**

Chemical substance prioritisation strategy

WP1 Creation of HBM4LV cohort;

WP2 Sampling and creation of the HBM4LV
biobank;

WP3 Identification of chemical substances to be
included in the HBM program:

WP3.1 Pesticides

WP3.2 Heavy metals

WP3.3 Persistent organic pollutants
+ others

WP4 Performance of measurements and creation
of dataset;

WP5 Integrated data analysis and drafting of the
HBM program;

WP6 Communication and dissemination.



IDENTIFICATION

1

Three pre-defined substance groups
(pesticides, heavy metals and persistent organic pollutants)

PESTICIDES



HEAVY METALS



PERSISTENT ORGANIC
POLLUTANTS



2

Based on:



Previous research
(national, HBM4EU)



Opinions expressed
at the Human
Biomonitoring Council
of Latvia



**Reports from other
monitoring systems**
(soil, drinking water)



Chemical property data
(EFSA, ECHA
databases)

IDENTIFICATION



To further explore the identification, governmental bodies (n=10) were asked to recommend substances that are priorities for the inclusion in the **HBM programme**.



16 pesticides
identified and evaluated



235 POPs
identified, **55** evaluated



12 metals
identified, **9** evaluated



55 substances categorized
as "other"
identified and **50** evaluated

SUMMARY



TOTAL

318

substances identified

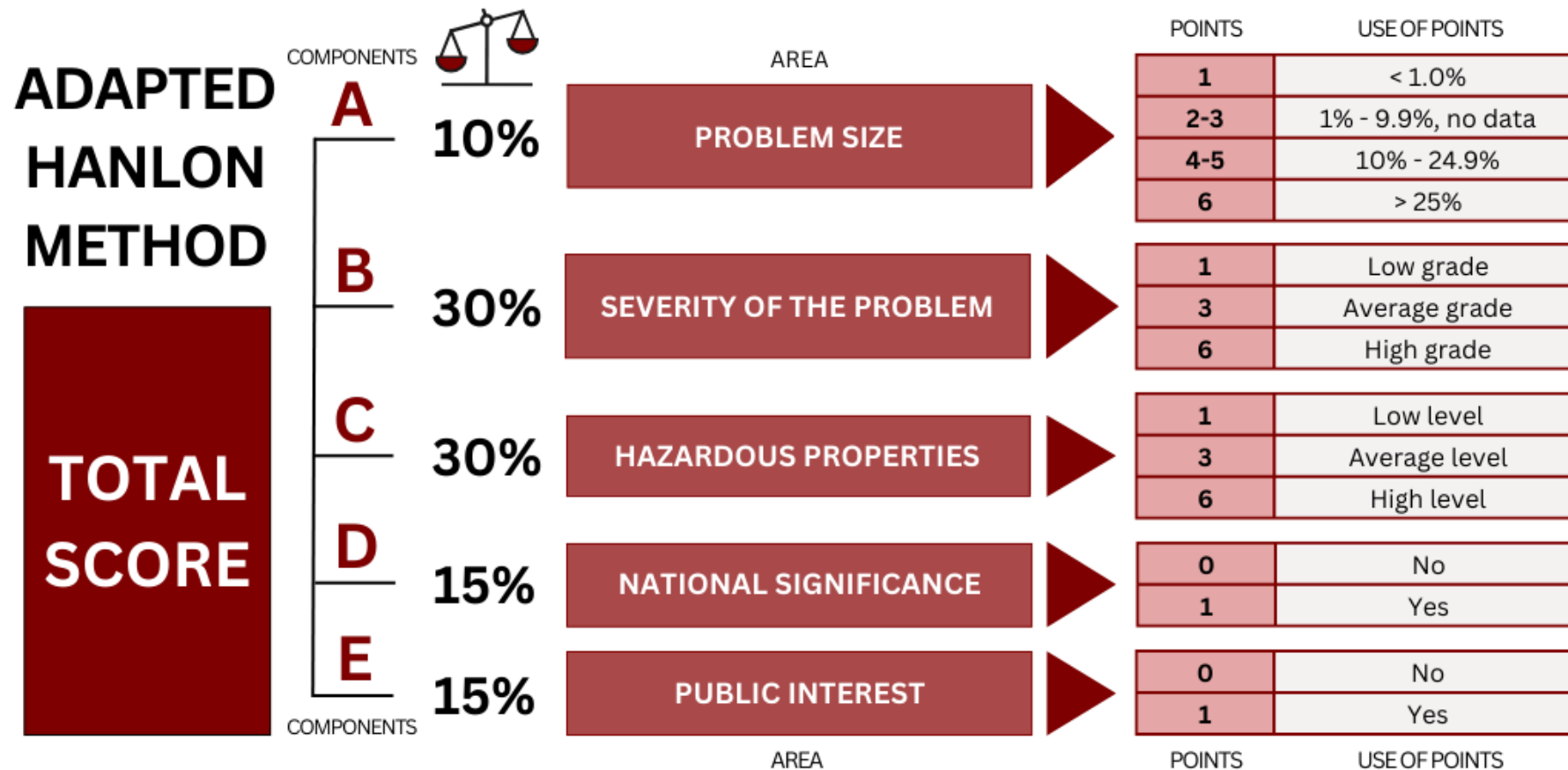
130

substances evaluated

**SHORT LIST OF CHEMICALS
(130 substances/groups)**

EVALUATION

The HBM4LV prioritization strategy used the **adapted Hanlon method**, assessing problem size, hazardous and exposure characteristics, national significance and societal concern.





METALS

Nine metals were assessed using the adapted Hanlon methodology.

PRIORITY CLASSIFICATION



HIGH PRIORITY
(≥ 90 pts)

- Mercury (Hg)
- Lead (Pb)



AVERAGE PRIORITY
(70 – 89.9 pts)

- Cadmium (Cd)



LOW PRIORITY
(33.5 – 69.9 pts)

- Arsenic (As)
- Nickel (Ni)
- Chromium (Cr)



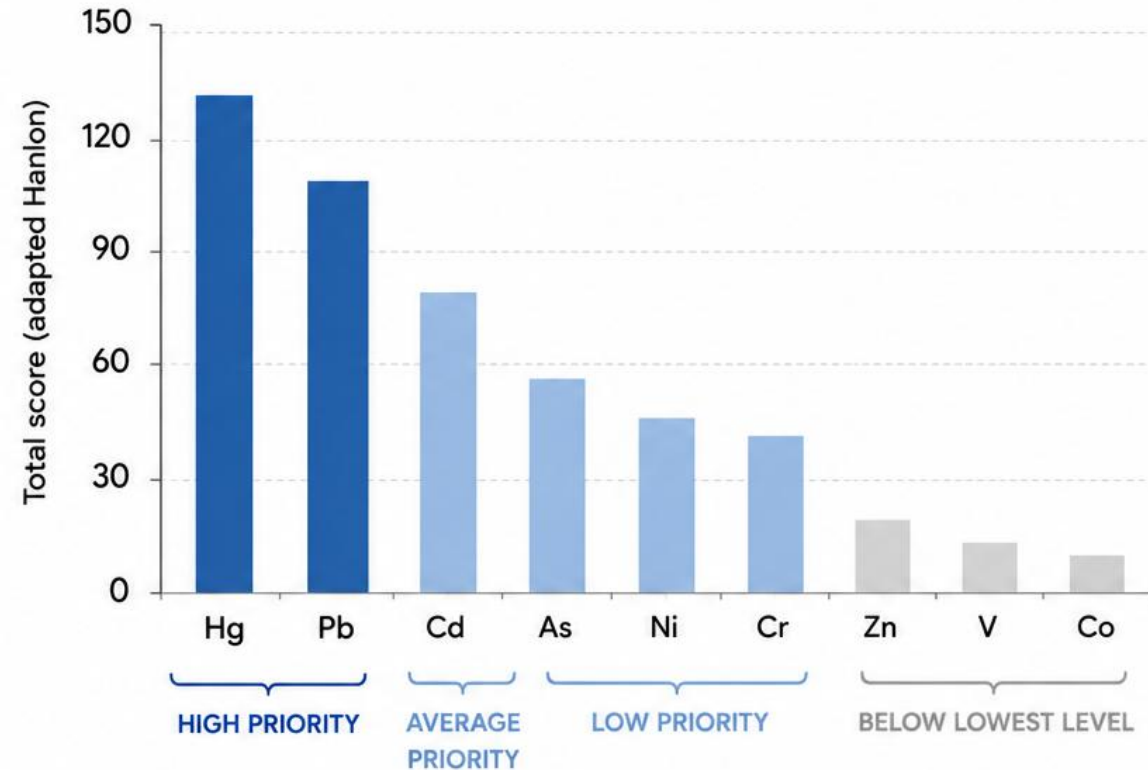
BELOW LOWEST LEVEL
(< 33.5 pts)

- Zinc (Zn)
- Vanadium (V)
- Cobalt (Co)



Only mercury and lead were classified as high priority. Zinc, vanadium, and cobalt scored below the lowest level of inclusion.

TOTAL SCORE RANGE (adapted Hanlon)



Scoring was performed using the adapted Hanlon methodology.

Priority classification thresholds: High ≥ 90.0 points; Average 70.0 – 89.9 points; Low 33.5 – 69.9 points; Below lowest level < 33.5 points.



PERSISTENT ORGANIC POLLUTANTS (POPs)

GROUP COMPOSITION (55 substances assessed)



11

Flame
retardants



17

Polycyclic
aromatic
hydrocarbons

PFAS

5

Per- and
polyfluoroalkyl
substances



5

Polychlorinated
biphenyls (PCBs),
dioxin-like
biphenyls,
biphenyls



7

Dioxins



9

Furans

SCORE RANGE (adapted Hanlon)

Total scores ranged from

133.8 – 33.5



Highest score:

Perfluorooctane sulfonate
(CAS 1763-23-1) –

133.8

Lowest score:

33.5



EXCLUDED DUE TO LACK OF CLP CLASSIFICATION

- Polychlorinated biphenyls (PCBs)
- Indeno(1,2,3-cd)pyrene
- Benzo(ghi)perylene
- Anthracene
- Pyrene

PRIORITY CLASSIFICATION SUMMARY



HIGH PRIORITY

(≥90.0 points)

17

substances



AVERAGE PRIORITY

(70.0 – 89.9 points)

5

substances



LOW PRIORITY

(33.5 – 69.9 points)

33

substances

55
substances
assessed



A wide range of total scores
reflects the diverse nature
of POPs.

The highest score was 133.8,
while the lowest included in the
assessment was 33.5. This group
includes substances with very
different uses, persistence, and
toxicity profiles.



OTHERS GROUP

Substances that did not fall into the categories of pesticides, persistent organic pollutants, or metals.

SUBGROUPS WITHIN "OTHERS"



PHthalATES

25

substances



PARABENS

14

substances



BISPHENOLS

9

substances



ACRYLAMIDE

1

substance



TRICLOSAN

1

substance



The largest subgroups are phthalates (25 substances) and parabens (14 substances). Acrylamide and triclosan were assessed as standalone substances.

OTHER INDIVIDUAL SUBSTANCES



ACRYLAMIDE

CAS 79-06-1

105.7
points

HIGH PRIORITY



TRICLOSAN

CAS 3380-34-5

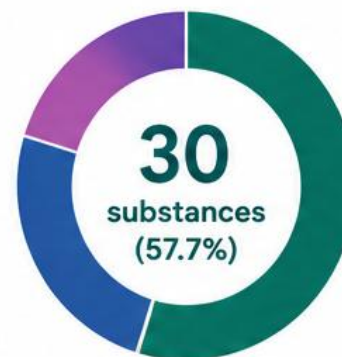
79.5
points

AVERAGE PRIORITY



Acrylamide was classified as **high** priority, while triclosan was classified as **average** priority.

HIGH PRIORITY OVERVIEW



30 substances were classified as **high priority**, which is **57.7%** of all high-priority substances.

HIGHEST TOTAL SCORES WITHIN SUBGROUPS

Subgroup	Substance	CAS Number	Total Score (adapted Hanlon)
PHTHALATES (selected)	• DEHP (Bis(2-ethylhexyl) phthalate)	117-81-7	129.9
	• DiBP (Diisobutyl phthalate)	84-69-5	124.3
	• DnBP (Di-n-butyl phthalate)	84-74-2	120.7
	• DiHP (Diisohexyl phthalate)	71850-09-4	118.6
	• DCHP (Dicyclohexyl phthalate)	84-61-7	115.4
PARABENS (14 parabens were excluded from the list of high-priority substances.)	—	—	EXCLUDED
BISPHENOLS (selected)	• Bisphenol A (BPA)	80-05-7	101.8
	• Bisphenol S (BPS)	80-09-1	78.8
	• Bisphenol F (BPF)	620-92-8	74.1
	• Other bisphenols	—	~40 points or fewer
ACRYLAMIDE (CAS 79-06-1)		105.7 points	HIGH PRIORITY
TRICLOSAN (CAS 3380-34-5)		79.5 points	AVERAGE PRIORITY



All assessed phthalates were classified as high priority by experts, but 13 substances from this group were excluded from the experts' suggested list due to missing CLP classification.



PESTICIDES

Pesticides were prioritized for inclusion in the HBM program based on the adapted Hanlon methodology.

PRIORITY CLASSIFICATION



Substance (CAS number)	Total score (adapted Hanlon)
• Glyphosate (1071-83-6)	145.5
• Acetamiprid (135410-20-7)	114.6



• Bentazone	90.9
• Prosulfocarb	86.4
• MCPA (94-74-6)	83.1
• Chlorpropham	77.8
• Dimethoate	75.7
• Pirimiphos-methyl	75.1



Most of the evaluated pesticides scored below 70.8 points.

EFFECT OF SCORING ADJUSTMENT

All recalculated scores resulted in the same changes, shifting from 3 points (average level) to 6 points (high level). This did not alter priority classification but slightly increased total scores.

Substance	Before (adapted)	After (recalculated)	Change
Glyphosate	140.7	145.5	+4.8
MCPA (94-74-6)	80.7	83.1	+2.4
Metazachlor	70.8	73.2	+2.4
Chlormequat chloride	69.6	72.0	+2.4



The revisions did not change the priority group classification of the pesticides but led to slight increases in total scores.



Scoring was performed using the adapted Hanlon methodology.

Priority classification thresholds: High ≥ 90.0 points; Average 75.1 – 90.9 points; Low < 70.8 points.



Thank you!



Faleminderit



Dank u



Hvala



Aitäh



Merci



Danke



Efharistó



Go raibh maith agat



Toda



Grazie



Rakhmet



PALDIES!



Ačiū



Villmools merci



Hvala



Dziękuję



Obrigado / Obrigada



Hvala



Gracias



Tack



Danke / Merci / Grazie

RSU