

# Partnership for the Assessment of Risks from Chemicals

Deliverable D9.1

Initial laboratory catalogue and design of the network platform (dashboard)

WP 9





**Co-funded by  
the European Union**

This partnership has received funding from the European Union's Horizon Europe research and innovation program under Grant Agreement No 101057014.

## Technical reference

Work package	WP 9
Task	Task 9.1 – Laboratory networking
Dissemination level 1	PU
Lead Beneficiary/ Responsible AE	ISCIII
Contributing Participants	FMUL, NPHSL
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Due date of deliverable	M12 – 30 April 2023
Actual submission date	23 May 2023

1 PU = Public

PP = Restricted to other program participants (including the Commission Services)

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## Document history

Version	Date	Reviewer name/Institutions	Short description of changes
1	11/05/2023	ISCIII	First version
1.1	03/05/2023	Magnus Løfstedt	Revision of document
1.2	11/05/2023	ISCIII	Reviewer's comments addressed
1.3	19/05/2023	Ovnair Sepai	Revision of document
1.4	22/05/2023	ISCIII	Reviewer's comments addressed
1.5	02/10/2023	European Commission	Revision of document
1.6	10/10/2023	ISCIII	European Commission's comments addressed

## Abstract

This deliverable “Initial laboratory catalogue and design of the network platform (dashboard)” (D9.1) focuses on the cross-cutting activities that have been implemented during the first year of PARC related to the mapping and building of laboratory catalogues for human biomonitoring (HBM), environmental exposure and monitoring under Task 9.1 Laboratory networking.

During the first year of PARC, the first mapping of laboratories with HBM and outdoor and indoor environment capabilities was done using simple and short online surveys including contact details of each laboratory with experience in chemical analysis of human and air/indoor samples. After these actions, a total of 240 HBM laboratories and 70 air/indoor laboratories were identified to be part of the first laboratory networks in the framework of the PARC project.

In parallel with the identification of HBM laboratories, the first draft of a detailed questionnaire to collect specific information was elaborated, and we are currently working on the online questionnaire version with *LimeSurvey*, a free and open-source survey tool, that will be launched to the initially identified HBM laboratories in April 2023. The same strategy will be followed for the air/indoor laboratories and other environment domains to obtain detailed information about the sample analysis.

The laboratory networks on HBM and environment domains, created during the duration of the PARC project, will be maintained, and updated through a section hosted on the PARC website with a link “Join the PARC networks”. Furthermore, all information from the laboratories of HBM and the environment will be integrated into a dashboard that will be accessible through the PARC website.

In the next years, efforts will be put into the air/indoor laboratory network expansion, consolidation of the HBM laboratory network, and the development of the first inventories of environmental laboratories including water, sediment, soil, biota, food and feed, and articles/consumer products.

## Keywords

Human biomonitoring; Environmental monitoring; air/indoor; analytical laboratories; catalogues; networks; questionnaires; dashboard

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## Table of contents

Technical reference _____	3
Document history _____	4
Abstract _____	5
Keywords _____	5
List of Tables _____	7
List of Figures _____	7
Annexes _____	7
Abbreviations _____	7
1. Authors and Acknowledgments _____	7
2. Background _____	8
3. Results _____	9
3.1. HBM laboratory network _____	9
3.1.1. Initial HBM laboratory network _____	9
3.1.2. Development of the detailed questionnaire for HBM laboratories _____	17
3.2. First inventory on air/indoor laboratories _____	17
3.3. First inventories of other environmental matrices _____	20
3.4. Maintenance and updating of laboratory networks _____	20
3.5. Dashboard _____	21
4. Conclusions _____	22
5. Next steps _____	22
Annex 1. Requests sent to NHCPs regarding HBM laboratories _____	24
Annex 2. Requests sent to NHCPs regarding air/indoor laboratories _____	25

## List of Tables

Table 1.	Initial HBM laboratory network of the PARC project _____	10
Table 2.	First inventory of air/indoor laboratories _____	18

## List of Figures

Figure 1.	Initial HBM laboratory network of the PARC project _____	16
Figure 2.	First inventory of air/indoor laboratories of the PARC project _____	20
Figure 3.	Preliminary search filters of the dashboard _____	21

## Annexes

Annex 1.	Requests sent to NHCPs regarding HBM laboratories _____	24
Annex 2.	Requests sent to NHCPs regarding air/indoor laboratories _____	25

## Abbreviations

HBM: Human Biomonitoring

HBM4EU: Human Biomonitoring for Europe

LOQ: Limit of Quantification

NHCP: National Hub Contact Point

PARC: Partnership for the Assessment of Risks from Chemicals

PT: Proficiency Test

QA/QC: Quality Assurance and Quality Control

## 1. Authors and Acknowledgments

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We would like to thank all Task 9.1 partners for their contributions to reviewing the draft questionnaire for HBM laboratories, and specifically, to the Faculdade de Medicina da Universidade de Lisboa (FMUL) and the Nacionalinės visuomenės sveikatos priežiūros laboratorija (NPHSL) who have contributed to the development of the detailed online questionnaire for HBM laboratories, and the short online survey elaborated for the first inventory on air/indoor laboratories, respectively. Especially to Ana Patricia Virgolino (FMUL), Mantas Norkus (NPHSL) and Toma Petrulionienė (NPHSL) for their contributions.

Furthermore, we would like to thank the National Hub Coordinators who have distributed the surveys and all the NHCPs who have filled out the respective surveys.

## 2. Background

This deliverable “Initial laboratory catalogue and design of the network platform (dashboard)” (D9.1) focuses on the cross-cutting activities that have been implemented during the first year of the Partnership for the Assessment of Risks from Chemicals (PARC) related to the mapping and building of laboratory catalogues on human biomonitoring (HBM), environmental exposure and monitoring (including air, water, sediment, soil, biota, food and feed, indoor environments, and articles) and (eco)toxicology under Task 9.1 Laboratory networking.

PARC aims to create research and innovation infrastructures and networks in the framework of chemical risk assessment. Under this specific objective, the overall goal of WP9 is to promote the further development of existing and new infrastructural and human capacities, focusing on laboratory networks including reference laboratories in Task 9.1.

During the first year of PARC, Task 9.1 activities have focused on the mapping, cataloguing, and expanding of the European network of HBM laboratories, and on the mapping and cataloguing of the first inventory of air and indoor (including dust) laboratories. In the second year, efforts will be spent in water (including surface and groundwater) and soil/sediment laboratories of analysis. From year 3 to year 4 of PARC, (eco)toxicology laboratories will be addressed and other remaining monitoring laboratories in the fields of food and feed, articles, and biota. The initial catalogues will be updated periodically and activities to promote, link and/or coordinate the created or emerging networks will be implemented. . The final objective in the mentioned domains is the development of consolidated and real networks, promoting activities to coordinate and maintain them active (by sharing information and documents, organising meetings, etc.).

Laboratory networks developed in the domains mentioned above will include public and private laboratories with expertise in the analysis in the different fields, participating in PARC and also others outside of PARC interested in being part of the networks. In addition, in Task 9.1, activities to strengthen these networks will be identified and promoted. Regarding human biomonitoring and environmental monitoring, the focus will be the integration of laboratories with experience in sample preparation and analysis in the different matrices including target and non-target analysis.

Detailed questionnaires for each domain will be developed to obtain all relevant information from laboratories in each specific case, and in general, information about the laboratory accreditation and their participation in proficiency and intercomparison tests will be collected.



## DELIVERABLE

This work will support the research and innovation activities and integrated risk assessment, data (re)use (WP7 task 7.1-FAIR data), sustainability of capacities (WP2 task 2.3-sustainability) and establishment of synergies (WP3 task 3.3-networking and synergies). It will enhance the EU experimental capacities, promote putting in place effective networks of laboratories, increase the reliability/quality of newly generated information and increase access to available resources beyond the PARC initiative.

### 3. Results

During these first months of PARC, the activities of WP9 have been focused on promoting the development of existing and new infrastructural capacities and mainly in laboratory networks including reference laboratories in Task 9.1. The first activity was an initial mapping of existing laboratory networks and reference laboratories, and the result has been the initial HBM laboratory network, with the cooperation of subtask 4.1.2, and the first inventory of air/indoor laboratories, as well as the architecture of the laboratory network dashboard, in collaboration with WP2 and 3, to be implemented over the next years of PARC project.

#### 3.1. HBM laboratory network

##### 3.1.1. Initial HBM laboratory network

The development of the initial laboratory network on HBM laboratories in the framework of PARC capitalizes on the work done in the HBM4EU project (Human Biomonitoring for Europe), in which the first European network of HBM laboratories was built. The necessary steps to develop this initial HBM laboratory network in PARC include mapping, cataloguing, and expanding the original list of laboratories included in the network.

The first mapping was done in November 2022, by sending a request through National Hub Co-ordinators (NHCC) to all National Hub Contact Points (NHCPs) to complete a **simple and short online survey**, including the **contact details of national laboratories with experience in chemical analysis of human samples** ([Annex 1](#)). This action was carried out in collaboration with Task 4.1.2, which is responsible for the HBM Quality Assurance and Quality Control (QA/QC) program and chemical analysis in PARC. The deadline for completing the survey was established on December 19. A reminder was sent on December 2022 by the NHCC to all NHCPs pointing to the relevance of the construction of a laboratory network as a key objective of the PARC project.

Twenty seven from a total of 28 NHCPs provided contact details for 153 laboratories. One HBM laboratory from Canada (Centre de toxicologie du Québec) was interested in being part of the network. However, as the laboratory network is European, this laboratory was not included. The NHCP for Poland did not report any information about HBM laboratories in their country. As 80 of these 153 laboratories were already part of the European network of HBM laboratories of HBM4EU, the expansion of the network corresponds to a total of **73 new laboratories** with experience in HBM.

Until now, 167 HBM laboratories from 28 European countries were integrated into the European network of HBM laboratories of HBM4EU. Therefore, after this first call, a total of **240 HBM laboratories** encompass the initial laboratory network of HBM laboratories in the framework of the PARC project.

**Table 1** summarises the initial laboratory network of HBM laboratories of the PARC project. New HBM laboratories reported by NHCPs have been marked in green.

**Table 1. Initial HBM laboratory network of the PARC project**

	Country	Laboratory name
1	Austria	UmweltB2:B146bundesamt Laboratories, Environment Agency Austria
2	Austria	Medical University Innsbruck
3	Austria	University of Vienna, Global Exposomics and Biomonitoring Laboratory, Department of Food Chemistry and Toxicology
4	Austria	Abteilung Umweltanalytik (Testing Laboratory for environmental analysis, GMO and fuel analysis) (Environment Agency Austria)
5	Austria	Global Exposomics & Biomonitoring Group, University of Vienna
6	Austria	Environmental Metabolomics - Analytical Chemistry, University of Graz
7	Austria	Institute of Legal Medicine and Core Facility Metabolomics, Medical University of Innsbruck
8	Austria	Institute of Medical Genetics/Gundacker Lab, Medical University of Vienna (MUW)
9	Austria	Austrian Agency for Health and Food Safety
10	Austria	Department IFA-Tulln, University of Natural Resources and Life Sciences, Vienna (BOKU)
11	Austria	Institute of Bioanalytics and Agro-Metabolomics, University of Natural Resources and Life Sciences, Vienna
12	Belgium	Laboratory of Toxicology
13	Belgium	Laboratory for Occupational and Environmental Hygiene (KU Leuven)
14	Belgium	Sciensano_Trace elements
15	Belgium	Centre for Environmental Sciences
16	Belgium	Platform Mass Spectrometry - Sciensano
17	Belgium	Toxicological Center, University of Antwerp
18	Belgium	Center for Analytical Research and Technology (CART)
19	Belgium	VITO - goal (Flemish Institute for Technological Research)
20	Belgium	Organic Contaminants and Additives, Sciensano [former: WIV-ISP]
21	Belgium	Laboratory of Industrial and Environmental Toxicology, Cliniques Universitaires Saint-Luc, Université catholique de Louvain
22	Belgium	AMGC, Vrije Universiteit Brussel
23	Belgium	In Vitro Toxicology and Dermato-Cosmetology, Vrije Universiteit Brussel
24	Belgium	IBEVE vzw
25	Belgium	APB PIH
26	Belgium	Chemical and Physical Health Risks, Sciensano
27	Belgium	Analytical Environmental and Geochemistry, Vrije Universiteit Brussel
28	Belgium	Centre of Excellence in Mycotoxicology & Public Health, Ghent University
29	Belgium	OBIACHEM, ULLege
30	Belgium	Centre of Excellence in Mycotoxicology and Public Health, Ghent University
31	Croatia	Analytical Toxicology and Mineral Metabolism Unit, Institute for Medical Research and Occupational Health
32	Croatia	Biochemistry and Organic Analytical Chemistry Unit, Institute for Medical Research and Occupational Health
33	Cyprus	State General Laboratory, Ministry of Health
34	Cyprus	Water and Health Laboratory
35	Czech Republic	RECETOX Central Laboratories (The Trace Analytical Laboratories, Microbiome and Biomarker laboratories)

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36	Czech Republic	VSCHT Prague
37	Czech Republic	The Laboratory of Molecular Epidemiology of the Faculty of Medicine and Laboratory of Chemical Analyzes of the Faculty of Science
38	Czech Republic	National Institute of Public Health, NIPH Prague - SZU-CZ Czech Republic
39	Czech Republic	Department of Element Analysis, NIPH Prague laboratory
40	Denmark	Analytical chemistry laboratory at Dept. of Growth and Reproduction, Rigshospitalet, RegionH
41	Denmark	Analytical Chemistry laboratory at Dept. of Public Health, University of Southern Denmark
42	Denmark	National Food Institute, Research group for analytical food chemistry
43	Denmark	Department of Environmental Science, Aarhus University
44	Denmark	Department of Bioscience, Aarhus University
45	Denmark	Department of Plant and Environmental Sciences, University of Copenhagen, Research Center for Advanced Analytical Chemistry (RAACE)
46	Denmark	NFA, National Research Centre for the Working Environment
47	Denmark	Clinical Biochemistry and Pharmacology, Odense University Hospital
48	Denmark	Centre for Arctic Health & Molecular Molecular Epidemiology, Aarhus University
49	Denmark	Institute of Public Health, University of Copenhagen
50	Estonia	Laboratory of Communicable Diseases
51	Estonia	SA TÜ Kliinikum Ühendlabor
52	Estonia	TalTech university laboratory
53	Estonia	Terviseamet
54	Finland	Work Environment Laboratories; Finnish Institute of Occupational Health
55	Finland	THL, Chemical Risks team laboratory; Finnish institute for health and welfare
56	Finland	FFA, Chemistry laboratory; Finnish Food Authority
57	Finland	Biomonitoring Laboratory of FIOH
58	France	Labéo
59	France	Labocéa
60	France	Chemtox
61	France	Laberca, ONIRIS
62	France	UT2A
63	France	CHU Grenoble
64	France	Institut de recherche et d'expertise
65	France	INRS - Laboratoire de Biométrie
66	France	Laboratoire LERES de l'EHESP
67	France	Laboratoire Innovations en Spectrométrie de Masse pour la Santé (LI-MS) du CEA de Saclay
68	France	Laboratoire Pollem CSTB
69	France	Laboratoire National de Métrologie et d'Essais, French National Metrology Institute
70	France	Department Toxicology and Biomonitoring, INRS
71	France	INRA Toxalim
72	France	TOXILABO
73	France	Pharmacology and Toxicology laboratory, University Hospital Limoges
74	France	Department of Pharmacology, Toxicology and Pharmacovigilance, University Hospital of Limoges
75	France	Hedex laboratory, Chu Poitiers
76	France	Laboratoire de l'Environnement et de l'Alimentation de la Vendée, Conseil Départemental 85
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86	Germany	Institute for Occupational, Social and Environmental Medicine
87	Germany	Institute for Occupational and Maritime Medicine (ZfAM) University Medical Centre Hamburg-Eppendorf (UKE)
88	Germany	Institute and Clinic for Occupational, Social and Environmental Medicine; University Hospital LMU Munich
89	Germany	Indoor hygiene and health-related environmental impacts; German Environment Agency (Umweltbundesamt)
90	Germany	German Federal Institute for Risk Assessment; Department of Food Safety
91	Germany	Fraunhofer-Institute for Biomedical Engineering IBMT; Department Bioprocessing & Bioanalytics
92	Germany	Fraunhofer-Institut für Toxikologie und Experimentelle Medizin (ITEM)
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94	Germany	Eurofins GfA Lab Service GmbH
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111	Ireland	Dublin Public Analysis Laboratory, HSE
112	Israel	Public Health Laboratory MOH-IL
113	Israel	Clinical Pharmacology and Toxicology Unit, Assaf Harofeh Medical Centre
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120	Italy	Laboratorio di Igiene e Tossicologia (LITO), Brescia University
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123	Latvia	RSU Laboratory of Biochemistry
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128	Lithuania	Laboratory of Toxicology Neuroscience institute Lithuanian University of Health Sciences
129	Luxembourg	Laboratoire national de santé (LNS); Unit Environmental Hygiene and Human Biological Monitoring
130	Luxembourg	Laboratoire de biosurveillance humaine analytique (LAHB)
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132	Netherlands	Vrije Universiteit Amsterdam
133	Netherlands	Department for Health Evidence, Radboud University Medical Center
134	Netherlands	Food Safety & Nutrition Consultancy
135	Netherlands	Analysis Techniques in the Life Sciences, Avans University of Applied Sciences
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140	Norway	Environmental Exposure and Epidemiology, Norwegian Institute of Public Health
141	Norway	Environmental Pollutant Laboratory, University Hospital of North Norway
142	Norway	NILU-MILK, NILU - Norwegian Institue for Air Research
143	Norway	National Institute of Occupational Health, STAMI
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171	Slovenia	University Clinical Centre Ljubljana
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187	Spain	Laboratorio de Salud Pública de León
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215	Spain	FISABIO - Public Health Laboratory of Valencia
216	Spain	Environmental Chemistry, CSIC
217	Spain	Human exposomics to organic chemicals, IDAEA-CSIC
218	Spain	Técnicas Instrumentales, Universidad de Navarra
219	Spain	ENFOCHEM, IDEA-CSIC
220	Spain	Dpt. Chemical Engineering and Analytical Chemistry, University of Barcelona
221	Spain	Enriched Stable Isotopes, University of Oviedo
222	Spain	Medicina Ambiental-CIBM, University of Granada
223	Sweden	Occupational and environmental medicine - Lund University - ULUND
224	Sweden	Metals and Health, Karolinska Institutet
225	Sweden	Swedish Environmental Research Institute
226	Sweden	Division of Occupational and Environmental Medicine, Lund University
227	Sweden	School of Science and Technology, Örebro University
228	Sweden	Institute of Environmental Medicine, Karolinska Institutet
229	Sweden	Dept of Environmental Science, Stockholm University
230	Sweden	Occupational and Environmental Medicine, Gothenburg University, School of Public Health and Community Medicine
231	Switzerland	METAS- Federal Institute of Metrology (Lindenweg 50 CH-3003 Berne-Wabern)
232	Switzerland	Lausanne Forensic Toxicology and Chemistry Unit, University Center of Legal Medicine
233	Switzerland	Scitec Research SA
234	Switzerland	Biomedical and Metabolomics analysis, University of Geneva
235	Switzerland	Laboratory for Advanced Analytical Technologies, Swiss Federal Laboratories for Materials Science and Technology

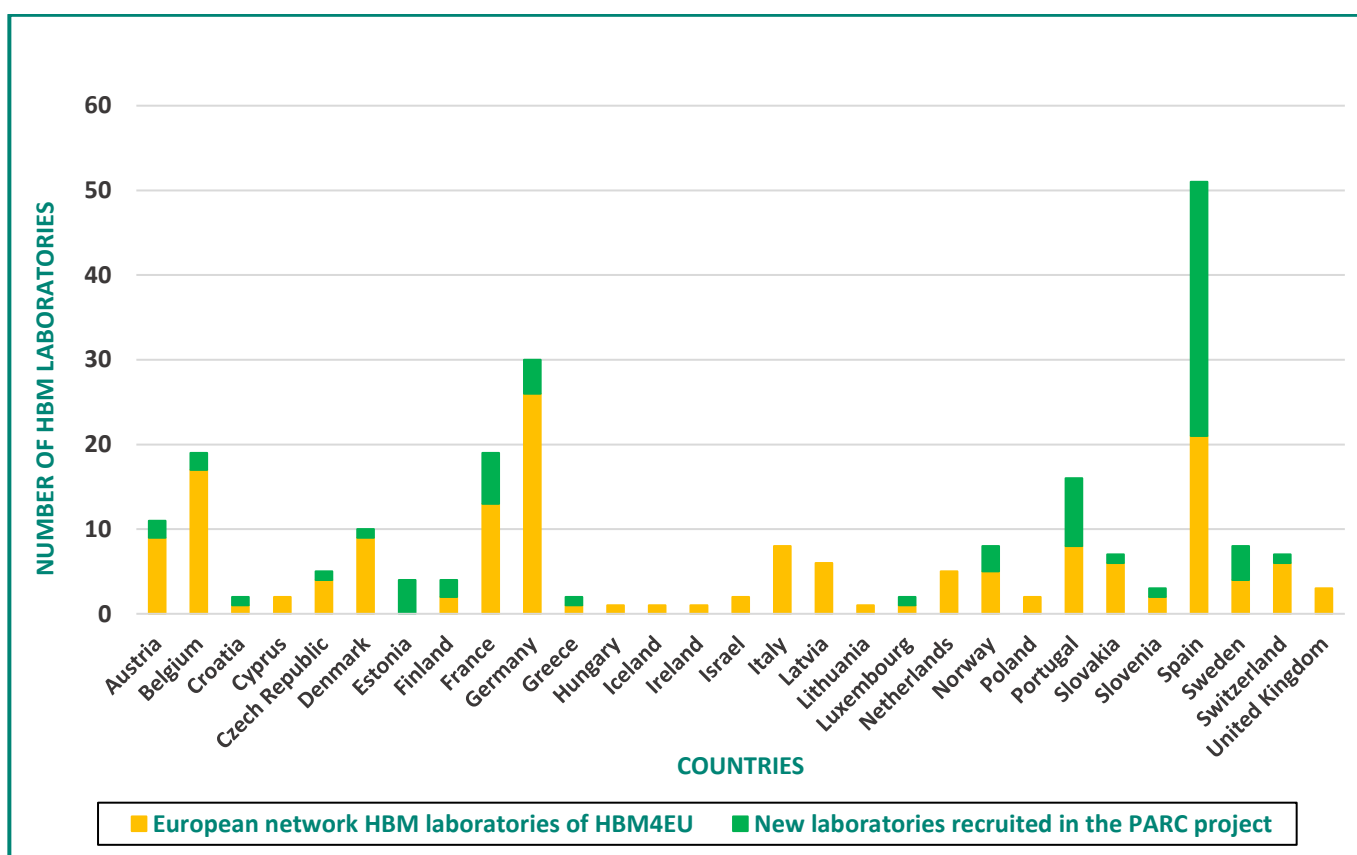
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236	Switzerland	Risk Assessment Division, Laboratories Sector, Federal Food Safety and Veterinary Office FSVO
237	Switzerland	Biomonitoring, Università della Svizzera Italiana (USI)
238	United Kingdom	Inorganic Geochemistry, British Geological Survey
239	United Kingdom	Toxicology, UK Health Security Agency (Formerly Public Health England)
240	United Kingdom	Health and Safety Executive

**Figure 1** shows the number of laboratories that reported experience in the analysis of human samples per country of the PARC project, distinguishing between the laboratories already integrated into the European network HBM laboratories of HBM4EU and the new laboratories incorporated.

Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Luxembourg, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, and Switzerland provided new HBM laboratories to expand the European network HBM laboratories of HBM4EU. Others like Cyprus, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Netherlands, Poland, and the United Kingdom hold the same HBM laboratories as in the European network HBM laboratories of HBM4EU. Among all, Portugal, with 8, and Spain with 30 reported the highest number of laboratories. Furthermore, 4 HBM laboratories from Estonia are represented at the first time in the European network.

**Figure 1. Initial HBM laboratory network of the PARC project**



The coming years will be crucial to consolidate the HBM laboratory network and to make it sustainable, developing interesting activities and studies for its members, and promoting interactions and collaborations between them.



### 3.1.2. Development of the detailed questionnaire for HBM laboratories

In parallel with the identification of HBM laboratories, the elaboration of a detailed questionnaire to collect more information from laboratories in the network was started in December 2022. This questionnaire will update and complete the information on the experience and capacities of the European network of HBM laboratories and will support the activities in Task 4.1.2., responsible for the HBM QA/QC program and chemical analysis. All the information collected will be organised within the WP9 dashboard with the objective of having all the useful information available and easily accessible for consultation.

The **draft questionnaire** was shared with all Task 9.1 partners in January 2023 for their review to obtain suggestions and comments to get a final version of the questionnaire. The deadline for reviewing the draft questionnaire was fixed on the 25<sup>th</sup> of January 2023. Volunteers between partners with experience in using RedCap, LimeSurvey or any other tool for developing online surveys were also requested.

The Faculty of Medicine of the University of Lisbon (FMUL) offered as a volunteer to perform the online questionnaire version by the LimeSurvey tool. The final questionnaire version was sent to FMUL in February 2023, and we are currently working together on the online version.

The questionnaire encompasses the following five sections: **contact details, experience in HBM analysis, experience in matrix-related adjustments, participation in proficiency tests schemes (PTs) and experience in organization of PTs**. The section related to the experience in the chemical analysis includes separate sections for each group of chemicals and specific biomarkers analysed, matrices, instrumental techniques, sample amount required, and limit of quantification (LOQ).

### 3.2. First inventory on air/indoor laboratories

Activities including mapping, building, consolidating, and expanding the existing laboratory networks and identifying gaps, are necessary for the development of national and Europe-wide infrastructures in the environmental domains.

The domain prioritized for the first year of PARC was air/indoor, and the first steps have been conducted to elaborate the first catalogue of laboratories in the field of chemical analysis in air samples, including both outdoor and indoor environments, in collaboration with the key partner National Public Health Surveillance Laboratory (NPHSL) of Lithuania.

An **online survey** was sent by NPHSL in February 2023 to all NHCPs to get **contact detail information** about **national laboratories with experience in chemical analysis of air/indoor samples**. The deadline to submit the online survey was established on the 1<sup>st</sup> of March 2023 ([Annex 2](#)). This deadline was later extended to the 10<sup>th</sup> of March.

21 NHCPs from a total of 28 NHCPs provided contact details of **70 laboratories** with experience in chemical analysis of air/indoor samples. No air/indoor laboratory capacities were reported from Greece, Israel, Italy, Iceland, Luxembourg, Slovenia, and Sweden.

**Table 2** summarises laboratories with experience in air/indoor that filled out the initial survey for each country.

**Table 2. First inventory of air/indoor laboratories**

	Country	Laboratory name
1	Austria	Umweltbundesamt Laboratories (Environment Agency Austria)
2	Austria	IBO Innenraumanalytik OG
3	Belgium	BlueApp envirolab
4	Belgium	Laboratory for Occupational and Environment Hygiene
5	Belgium	Sciensano
6	Belgium	Toxicological Center, University of Antwerp
7	Belgium	VITO - Air quality measurements (Team Indoor Air Quality)
8	Croatia	Reference laboratory for the determination of floating particles and chemical analyzes of their composition, Environmental Hygiene Unit, Institute for Medical Research and Occupational Health
9	Croatia	Reference laboratory for measuring gaseous pollutants in the air (NO <sub>x</sub> , O <sub>3</sub> , SO <sub>2</sub> , CO, benzene), Air Quality Sector, Croatian Meteorological and Hydrological Service (DHMZ)
10	Croatia	Reference laboratory for measuring gaseous pollutants in the air (NO <sub>x</sub> , O <sub>3</sub> , SO <sub>2</sub> , CO, benzene MEASUREMENT AND ANALYTICS DEPARTMENT), Ekoneg
11	Cyprus	Environmental Chemistry II & Control of Effluents Laboratory, State General Laboratory, Ministry of Health (SGL/MOH-CY)
12	Cyprus	Air Quality National Reference Laboratory, Air Quality Section, Department of Labour Inspection, Ministry of Labour, Welfare and Social Insurance
13	Cyprus	Volatomics Research Lab, Department of Chemistry, University of Cyprus
14	Cyprus	Experimental Atmospheric Sciences
15	Czech Republic	National Institute of Public Health, Laboratory of Air Quality
16	Czech Republic	Trace analytical laboratories, RECETOX, Masaryk University
17	Denmark	Technical University of Denmark (DTU) Section for Indoor Environment, Department of Environmental and Resource Engineering
18	Denmark	AU - Aarhus University
19	Denmark	The National Research Centre for the Working Environment
20	Estonia	Public Health Laboratory (Laboratory of Estonian Health Board)
21	Finland	Work Environment Laboratories
22	France	CSTB / Pollem
23	France	TERA ENVIRONNEMENT
24	France	CNRS-SyMMES
25	France	LERES (Laboratoire d'étude et de recherche en environnement et santé)
26	Germany	Landeslabor Berlin Brandenburg
27	Germany	Thüringer Landesamt für Verbraucherschutz
28	Germany	Laboratory German Environment Agency; Department II 1.3
29	Germany	Fraunhofer WKI, Department of Material Analysis and Indoor Chemistry
30	Germany	LASD Innenraumlabor
31	Hungary	National Public Health Center
32	Latvia	RSU Laboratory of Hygiene and Occupational Diseases
33	Latvia	Department of Analytical Chemistry, Faculty of Chemistry, Latvian University
34	Latvia	The Laboratory of the Center for Environment, Geology and Meteorology of Latvia
35	Lithuania	National Public Health Surveillance Laboratory
36	Netherlands	Vrije Universiteit - Environment and Health
37	Norway	National Institute of Occupational Health, Group for Chemical Work Environment
38	Norway	The Climate and Environmental Research Institute NILU, Department of Environmental Chemistry
39	Poland	Centrum Badań Jakości (CBJ)

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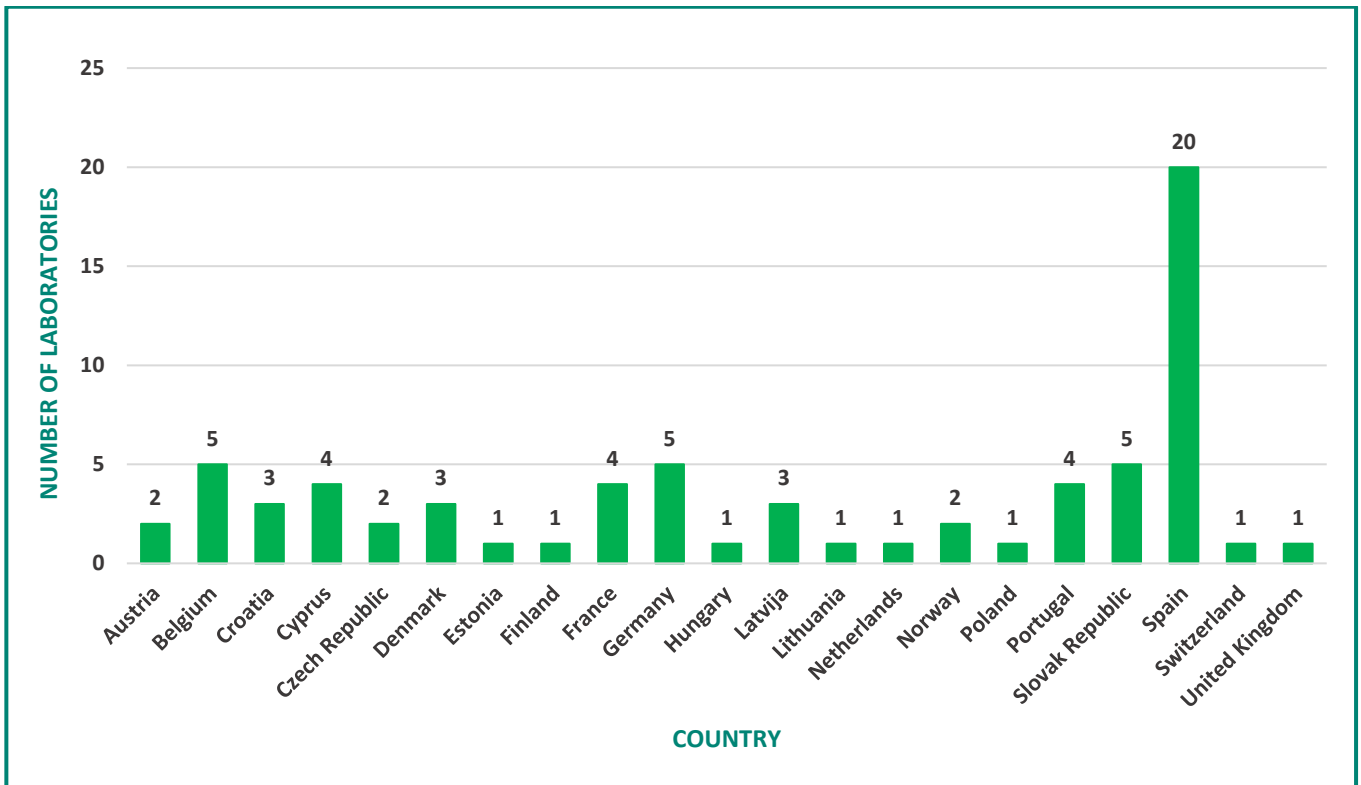
40	Portugal	Centre of Environmental and Marine Studies, Department of Environment
41	Portugal	Universidade de Évora
42	Portugal	Laboratório de Qualidade do Ar - Instituto Nacional de Saúde Doutor Ricardo Jorge
43	Portugal	Micoteca da Universidade do Minho - Centro de Engenharia Biológica
44	Slovakia	Testing Laboratory, Slovak Hydrometeorological Institute
45	Slovakia	Department of materialization of living conditions factors, Regional Public Health Authority with the seat in Banská Bystrica
46	Slovakia	Department of Chemical Analysis, Regional Public Health Authority with the seat in Kosice
47	Slovakia	National reference centre for sampling of chemical factors and their assessment in working environment, Regional Public Health Authority with the seat in Trencin
48	Slovakia	National reference centre for dioxins and related compounds
49	Spain	Laboratorio Nacional de Referencia de Calidad del Aire
50	Spain	Laboratorio de Salud Pública de Madrid
51	Spain	Grupo de Análisis Químico del Medio Ambiente (AQUIMA)-Departamento de Química Analítica de la Universidad de Extremadura
52	Spain	Laboratorio Andaluz de Referencia de la Calidad del Aire (LARCA)
53	Spain	Red de Control y Vigilancia de la Calidad del Aire de Cantabria-Centro de Investigación del Medio Ambiente (CIMA)
54	Spain	Laboratorio de Medio Ambiente de Galicia-Subdirección General de Meteorología y Cambio Climático
55	Spain	Red de Calidad del Aire de Galicia (CAIRE)
56	Spain	Atmospheric Pollution Unit. CIQSO. University of Huelva
57	Spain	AGQ LABS
58	Spain	AGQ ALKEMI
59	Spain	Laboratorio de Sabiñanigo
60	Spain	Laboratorio de medio ambiente de la Diputación Provincial de Teruel (LABMA)
61	Spain	EUROFINS IPROMA
62	Spain	Dnota medioambiente s.l.
63	Spain	EUROFINS ENVIRA Ingenieros Asesores, S.L.
64	Spain	Eurofins Iproma, S.L.U.
65	Spain	ALS LIFE SCIENCES
66	Spain	ALS AQUIMISA
67	Spain	Instituto Municipal de Salud Pública del Ayuntamiento de Zaragoza
68	Spain	Instituto de Investigación en Combustión y Contaminación Atmosférica-UCLM
69	Switzerland	Empa, Swiss Federal Laboratories for Materials Science and Technology
70	United Kingdom	Health and Safety Executive Science and Research Centre

**Figure 2** shows the number of laboratories with experience in air/indoor per country.

The number of laboratories nominated per country range from 1 to 20, with Spain and Belgium showing the highest number of air/indoor laboratories.

This first inventory of laboratories with experience in the analysis of air/indoor samples is a first picture, which may not represent the actual current real situation in each country, due to maybe the insufficient or inadequate knowledge about the project and its objectives, deficiencies in the communication or a short deadline for the identification and the recruitment of air/indoor laboratories by the NHCPs.

**Figure 2. First inventory of air/indoor laboratories of the PARC project**



The next step under the air/indoor laboratory network will be the development of a detailed questionnaire to collect specific information from the first inventory of laboratories regarding the analysis of air/indoor samples. The strategy will be the same as mentioned for HBM laboratories in 3.1.2. All the information collected will be served for the future implementation of a dashboard. Furthermore, new efforts will be put together to expand this first inventory of air/indoor laboratories and to create and consolidate a European air/indoor laboratory network for the duration of the PARC project.

### 3.3. First inventories of other environmental matrices

Preliminary actions were carried out with the NORMAN network as a permanent self-sustaining network of reference laboratories, research centres, and related organisations, for the monitoring and biomonitoring of emerging environmental substances, to obtain the first contacts from laboratories with experience in the analysis of other environmental matrices (including water, sediment, soil, biota, food and feed, and articles). The work is ongoing and further actions will be implemented to develop the first inventories of environmental analysis laboratories.

### 3.4. Maintenance and updating of laboratory networks

The laboratory networks on HBM and environment domains, created during the duration of the PARC project, will be maintained, and updated through a section hosted on the PARC website with a link “**Join the PARC networks**”. This section will include a questionnaire about contact details and a field asking in which domain or laboratory network they are interested.

### 3.5. Dashboard

As mentioned before, the information about the experience and capacities of the laboratories in the different networks will be integrated into a dashboard that will be accessible from the PARC website. The process has started with the design and implementation of the questionnaires and in parallel, the first discussions on the structure and layout of the dashboard have been initiated.

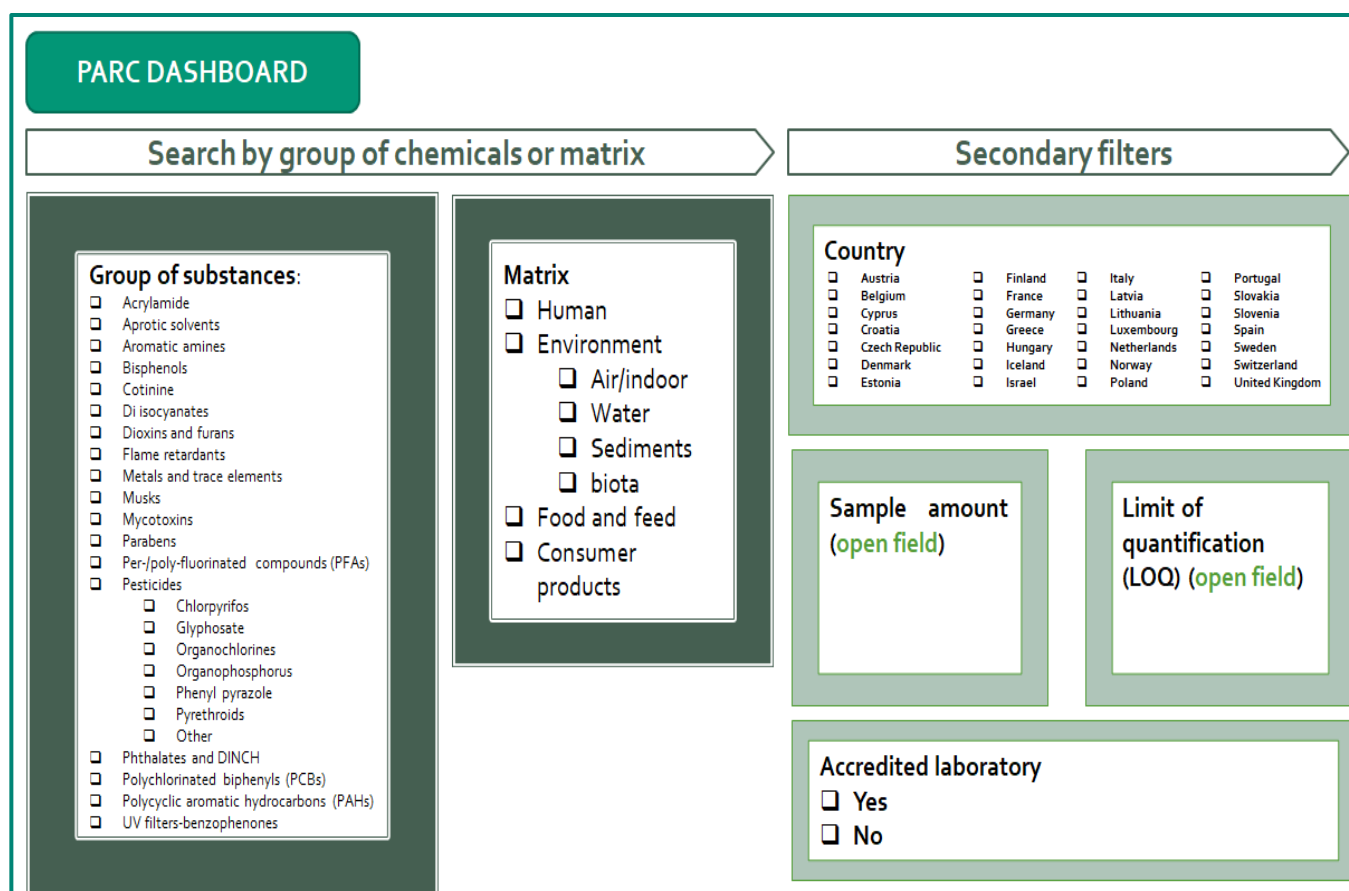
Currently, the Task 9.1 leaders are working in collaboration with WP2 and 3, on the architecture of the laboratory network dashboard considering previous designs from other projects like the HBM4EU (<https://www.hbm4eu.eu/what-we-do/european-hbm-platform/eu-hbm-dashboard/>) or i-HBM (<https://www.intlexposurescience.org/i-hbm/>) dashboards.

The dashboard will be dynamic and designed to integrate and support new records to enable the expansion of the laboratory networks.

Two initial filters are planned to guide the search by group of substances or matrix. Filters related to the accreditation of laboratories in PARC, the sample amount required for the analysis, or the LOQ will be included as secondary filters. The sample amount and LOQ filters will not apply for non-target screenings and suspected screenings. The type and level of the accreditation of laboratories will be defined for each domain (HBM and environment domains) in the next years.

**Figure 3** shows the preliminary search filters to be included in the dashboard.

**Figure 3. Preliminary search filters of the dashboard**



The task 9.1 leaders are considering different possibilities to make the dashboard as much functional and useful as possible, but the final structure and layout of the dashboard will depend on the technical capabilities of the PARC website, in which the dashboard will be hosted.

## 4. Conclusions

After the first year of the PARC project and the activities developed under task 9.1, the balance is positive regarding the HBM laboratory network as an increase of 73 laboratories has been shown compared with the European network of HBM laboratories of HBM4EU. Laboratories integrated into the network belong to 29 countries, with Estonia represented in the network for the first time. The objective for the next years of the PARC project will be to consolidate the HBM laboratory network through the development of activities and studies, and the promotion of interactions and collaborations between all laboratories.

Regarding the first inventory of air/indoor laboratories, 8 countries nominated only one air/indoor laboratory, and the rest of countries between 2-5, with the exception of Spain, that nominated 20 laboratories. Therefore, new efforts will have to be put into the following calls to expand the first inventory of laboratories with experience in the analysis of air/indoor samples.

## 5. Next steps

After these preliminary actions, the next steps under Task 9.1 will be:

1. Continue working on consolidating and expanding HBM and air/indoor laboratory networks. Specifically:
  - a. The expansion of the HBM and air and indoor laboratory networks, looking for new strategies to reach all European capacities in the HBM and air/indoor domains, and consolidating strong networks in the frame of the PARC Project.
  - b. The development of a detailed questionnaire to be distributed to the first inventory of air/indoor laboratories to collect valuable information related to the analysis of air/indoor samples.
  - c. The analysis of all the information collected from questionnaires related to HBM and air/indoor and the definition of the best strategies to identify data gaps in the information reported and laboratory infrastructures identified per country, as well as its final integration in a PARC dashboard. After that, the analysis of data gaps will be conducted once a year after reviewing the last update of the laboratories' information.
2. Start mapping and building catalogues of environmental monitoring laboratories including water, sediment, soil, biota, food and feed, and articles, as well as (eco)toxicology laboratories in later steps, following the same strategy as for HBM and air/indoor domains: an initial short and simple survey to be distributed through NHCPs, and detailed questionnaires to collect relevant data related to the chemical analysis of environmental samples as well as the analysis of data gaps.
3. Maintenance and update of the laboratory networks created through a section hosted on the PARC website with a link "Join the PARC networks" with the aim to keep networks alive and in expansion.
4. Go forward on the refinement of the initial design of the biomonitoring and environmental monitoring laboratory network dashboard and start working together with the dashboard

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developers on its implementation looking for the best technical way to host it on the PARC website.

5. Develop the design of (eco)toxicology laboratory network dashboards and analyse the best way for its implementation on the PARC website.

## ANNEX 1. Requests sent to NHCPs regarding HBM laboratories

### **Request 1: 28<sup>th</sup> of November 2022**

Dear National Hub Contact Points,  
On behalf of the ASCII Team, we forward you the following message:

Dear colleague,

We contact you as National Hub Contact Point to kindly ask for your collaboration providing information for Task 4.1.2, which is responsible of the HBM Quality Assurance and Quality Control (QA/QC) programme and chemical analysis in PARC, and Task 9.1, Laboratory networking.

The chemical analysis of human biomonitoring samples in PARC will be done only by laboratories that participate successfully in the QA/QC programme. Currently, we are identifying the laboratories that should be invited to participate in the programme.

Your collaboration is needed for this identification and therefore, we ask you to complete a [simple and short survey](#) in which you have to fill in the **contact details of national laboratories** that you know **with experience in chemical analysis of human samples**. As this should be an open, public and transparent process you can nominate laboratories out of the PARC consortium and disseminate the survey in those networks, fora, etc. you consider relevant.

We remind you of **the importance of your laboratory nominations since this is the way to analyse human samples in the PARC HBM studies**. Furthermore, **these laboratories will be included in the European network of HBM laboratories** (work done in collaboration with Task 9.1, Laboratory networking).

Please complete the survey by **19<sup>th</sup> December at 12:00 am**. Do not hesitate to contact us at [PARC@isciii.es](mailto:PARC@isciii.es) if you have any questions.

ISCIII Team



*Instituto de Salud Carlos III / National Health Institute Carlos III*

*Centro Nacional de Sanidad Ambiental / National Center for Environmental Health  
Área de Toxicología Ambiental / Environmental Toxicology Unit  
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E – 28220. Majadahonda (MADRID)  
Tfno.: +34 918 223 585  
[www.isciii.es](http://www.isciii.es)*

Best regards,  
Lubica and Ovnair

### **Request 2: 13<sup>th</sup> of December 2022**

Dear NHCP,  
We ask you to nudge your partners so far only **Iceland, Switzerland, Luxembourg, Estonia, UK, Belgium, Lithuania, Finland, Czech republic, Italy, Croatia, Slovakia and Hungary** have responded.

This is a really important aspect of PARC – the laboratory network will be central to the objectives of the partnership.

Please send your completed survey by the 19<sup>th</sup> of December – see email below.

I take this opportunity to wish you all a wonderful Christmas Break and Happy New year.

Best wishes  
*Ovnair*



## ANNEX 2. Requests sent to NHCPs regarding air/indoor laboratories

### Request 1: 9<sup>th</sup> of February 2023

Dear colleague,

We contact you as National Hub Contact Point to kindly ask for your collaboration providing information for Quality Control (QA/QC) programme and chemical analysis in PARC, and Task 9.1, Laboratory networking.

Your collaboration is needed for identification of environmental laboratories (air/indoor) and therefore, we ask you to inform us of the **contact details of national laboratories (survey is available [here](#))** that you know **with experience in chemical analysis of air/indoor**. As this should be an open, public and transparent process you can nominate laboratories out of the PARC consortium and disseminate the survey in those networks, fora, etc. you consider relevant.

Please complete the survey by **1<sup>st</sup> March at 12:00 am**. Do not hesitate to contact us at [toma.petrulioniene@nvspl.lt](mailto:toma.petrulioniene@nvspl.lt) if you have any questions.

NPHSL Team

Sincerely,

Toma Petrulionienė

Deputy Head of Chemical testing department

**National Public Health Surveillance Laboratory**

Zolyno str 36, LT-10210 Vilnius

email: [toma.petrulioniene@nvspl.lt](mailto:toma.petrulioniene@nvspl.lt)

### Request 2: 1<sup>st</sup> of March 2023

Dear Colleagues,

We would like to inform you that the deadline for survey was extended. New deadline is **10th of March, 12 a.m.**

Thank you for those who have already participated in the survey.

Have a nice day!

Sincerely

Mantas Norkus

The Head of Instrumental Testing Subdepartment

**NVSPL**

Nacionalinės visuomenės sveikatos

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