



## Report 2 Handover document to next coordinating team – ATHLETE/EQUAL-LIFE (M30)

June 2022



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## Contents

Introduction: Network description	3
Network Activities M16-M30	4
Network Working Groups	5
Metadata WG	5
Communication and Dissemination WG	6
Ethics and Law WG	8
Additional WG's	9
EHEN Board Meetings	10
Event Activities	10
EHEN Network Day	10
EHEN Online Conference <sup>1</sup>	10
ISEE <sup>1</sup>	11
Green week <sup>1</sup>	11
Webinars and courses	11
EHEN Internal Scientific Meeting	11
EHEN Deliverables in period 16-30 months	12
Network Advisory Board	12
Publications	13
Handover meeting and recommendations	14
Annex 1: Minutes of EHEN Board meetings	15
Minutes EHEN board meeting 4 – 29 June 2021	15
Minutes EHEN board meeting 5 -16 September 2021	19
Minutes EHEN board meeting 6 – 9 December 2021	23
Minutes EHEN board meeting 7 – 5 April 2022	28
Annex 2: Program Conference 2022	33



## Introduction: Network description

The European Human Exposome Network (EHEN) is the world's largest network of projects studying the impact of environmental exposure on human health.

It brings together nine research projects, outlined below, and addressing issues such as exposures to air quality, noise, chemicals, urbanization and health impacts. The network results will advance the European Green Deal's ambition to protect citizens' health and well-being from pollution and environmental deterioration by providing new evidence for better preventive policies. The nine research projects are described below:

### **HEDIMED**

In HEDIMED 22 partners from 12 different countries will identify exposomic determinants, which are driving the rapid increase of immune-mediated diseases (IMDs) such as type 1 diabetes, celiac disease, allergies and asthma. The project is based on data and samples from large clinical cohorts and trials from countries with either high or low IMD incidence. Exposomic disease determinants and the underlying biological pathways will be identified using advanced omics, multiplex and data-mining technologies.

### **LongITools**

Lifestyle and living environments have changed. Exposures to the environment such as air and noise pollution and the built environment, and an individual's lifestyle, psychological and social situation, react with genetic factors leading to increased risk of developing diseases such as obesity, type 2 diabetes, heart disease and atherosclerosis. The LongITools project will study and measure how exposure to these environmental factors contribute to the risk of developing such diseases through a person's life. The project will take an 'exposome' or holistic- based approach to determine the best points in life to intervene to reduce these risks.

### **REMEDIA**

The objective of REMEDIA project is to better understand the contribution of the exposome to 2 untreatable respiratory diseases: chronic obstructive pulmonary disease (COPD) and cystic fibrosis (CF). Starting from the study of patient cohorts throughout life, REMEDIA will develop a toolbox, which will allow delivering new guidelines to predict disease risk better and should lead to the identification of modifiable risk factors on which preventive action could be implemented.

### **ATHLETE**

ATHLETE will measure many environmental exposures (urban, chemical, lifestyle and social risk factors) during pregnancy, childhood, and adolescence. This "early- life exposome" will then be linked to children's biological responses and cardiometabolic, respiratory, and mental health. The results will help us to better understand and prevent health damage from environmental agents and their mixtures, from the earliest parts of the life course onward.

### **EPHOR**

Within EPHOR we will develop methods and tools to characterise the working-life exposome. By applying these to both existing data and for collection of new data, we will obtain better and more complete knowledge on the working-life exposome. The developed tools, methods and knowledge will be made available in a toolbox to scientists, policy makers and occupational health practitioners. This will enable scientists to use and enhance the data, methods and models in exposome research, rapidly increasing the knowledge base on the working-life exposome. Policymakers and occupational health practitioners can use the toolbox for the development of evidence-based and cost-effective preventive policies and actions. Ultimately, EPHOR will contribute to reducing the burden of NCDs on EU healthcare systems, improving the health and wellbeing of EU citizens, improving the productivity of the EU workforce and increasing the competitiveness of EU industry.



## EXIMIOUS

In several cohorts—covering the entire lifespan, including prenatal life—Eximious will map exposome, immune system (immunome), other omics and clinical and socio-economic data, using two main methodologies—one starting from the exposome, the other starting from health effects—that ‘meet in the middle’. Novel bioinformatics tools, based on systems immunology and machine learning, will be used to integrate and analyse these huge datasets and to construct ‘immune fingerprints’ that reflect a person’s lifetime exposome and identify ‘immune fingerprints’ that are early signs of poor health and predictors of disease at the individual level.

The project’s legacy will be a multifaceted toolbox for researchers, policy makers, clinicians and the general public containing the exposome/immunome tools developed during the project to help assess the impact of the exposome on the immune system at the level of individuals and populations.

## Equal-Life

Equal-Life will develop and test combined exposure data using a novel approach to multi-modal exposures and their impact on children’s mental health and cognitive development. A combination of birth cohort data and school studies with new sources of data will provide insight into aspects of physical and social exposures hitherto untapped. It will do this at different scale levels and timeframes while accounting for the distribution of exposures in social groups based on gender, ethnicity and social vulnerability.

## EXPANSE

The EXPANSE project addresses one of the most pertinent questions for urban planners, policy makers, and inhabitants in Europe: “How to maximize one’s health in a modern urban environment?”

The project aims to decrease the proportion of unexplained Cardio-Metabolic and Pulmonary Disease (CMPD) risk in urban populations and to gain insights into mediating biological mechanisms and causality. To do so we will develop tools to link External and Internal Urban Exposome measures to CMPD. The project will create a long-term sustainable toolbox and infrastructure that can be used to generate knowledge on the Urban Exposome and the translation of this knowledge into actionable information for citizens, public sector policy makers, and private sector companies.

## HEAP

HEAP will provide an efficient platform (including informatics infrastructure and software platform) for handling and analysing large amounts of data on environmental exposures and their health effects. The platform will be populated in particular with i) data from large-population-based cohorts analysed with high- throughput technologies such as analysis of microbes with metagenomics and analysis of the effects of the environment on the genome (epigenomics); ii) data from large and population-based cohorts on the health effects of purchased products (consumer receipts cohorts); and iii) data from volunteer cohorts that carry sensors for comprehensive and continuous monitoring of environmental exposures.

## Network Activities M16-M30

All nine research projects signed a collaboration agreement and EHEN is coordinated via a 15-month rotating leadership of network coordinating teams, as described in table 1.

Table 1: schedule for rotating leadership of EHEN

Months	Network coordinating team
M1 - M15	EXPANSE and HEAP
M16 - M30	ATHLETE and EQUAL-LIFE



M31 - M45	LONGITOOLS and EXIMIOUS
M46 - M60	EPHOR, REMEDIA and HEDIMED

## Network Working Groups

Over the period M16-M30, EHEN has maintained three working groups that were formed in the first period:

- **Metadata:** Works towards FAIRness of the (exposome) data within the network, including the development of a common data catalogue, agreement on metadata standards between EHEN consortia and means of insuring sustainability of data and tools.
- **Communication and Dissemination:** Aims to strategize, harmonise and complement the communication and dissemination in the EHEN network including communicating the network's research findings for the target audiences.
- **Ethics and Law:** Aims to exchange ethics and regulations knowledge to support data processing and data sharing in EHEN.

The updated EHEN Deliverable Report # 10 presents the working groups, leads and members as well as the Terms of References for the work. In a separate paragraph below, the need, requirements and feasibility of forming additional working groups in the future are discussed (also described in Report 10).

## Metadata WG

### Activities in month 16-30:

The WG meetings were held on: 25 Nov 2020, 16 Mar 2021 and 24 May 2022

Four separate subgroups have been set up and chaired by representatives of different EHEN projects:

- Omics data: *Roxana Merino, HEAP*
- Medical and clinical data: *Justiina Ronkainen, LongITools*
- Chemical exposure data: *Richard Hulek, EXPANSE*
- Metadata catalogue itself: *Morris Swertz, ATHLETE and LongITools*

The current numbers of members of the different subgroups are as follows:

Sub-group	ATHLETE	EPHOR	Equal-Life	EXIMIOUS	EXPANSE	HEAP	HEDIMED	LongITools	REMEDIA
Omics	3	1	2	1	1	2	2	1	3
Medical and clinical	1	1	1	2				1	3
Chemical exposure	2		2	1	1				
Catalogue	3*	1	1	1		2		2*	2

\*2 members of the group are working on two different EHEN projects, ATHLETE and LongITools and as such are counted twice

The subgroups have met and will continue to meet separately in order to discuss ways of coming to a common harmonised data model within their chosen area. A full member list is available on Eduuni and in the updated WG deliverable (report 10).

Per subgroup the following progress has been made:



## **Omics subgroup**

- 3 meetings have been held (7 July 2021, 26 Oct 2021, 21 April 2022)
- A shared document for contributing to the omics metadata has been set up
- A first draft of the omics metadata has been established, ready for internal review

## **Chemical exposure subgroup**

- Metadata from questionnaires, GEO-coded models and measured lab data has been considered to produce a first draft of the chemical exposure metadata
- This first draft was presented to the group in Barcelona

## **Medical and clinical data subgroup**

- Discussions between LongITools, ATHLETE and EPHOR
- Newcomers to the subgroup: EXIMIOUS and REMEDIA
- New harmonisation protocols have been agreed upon:
  - o LongITools: Cardiometabolic outcomes in adults and use of health care
  - o ATHLETE: Specific cardiometabolic, mental health and respiratory outcomes
  - o EPHOR: Occupational variables

## **Metadata catalogue**

- Regular email discussions and meeting on 28 Oct 2021
- Great advances have been made in improvements to the interface to the catalogue, with help from the ATHLETE, LongITools, IMI Conception, EMA Minerva and EUCAN-Connect projects
- The catalogue was presented at the EHEN internal scientific meeting in Barcelona on 24 May 2022. See <http://data-catalogue.molgeniscloud.org>

## **Communication and Dissemination WG**

### **Activities in month 16-30:**

#### **Stakeholder Inventory**

This activity is currently ongoing and aims to catalogue common stakeholders across the network with the purpose of streamlining and coordinating outreach to said stakeholders. Through this cross-project mapping exercise, the WG will prepare an internal stakeholder inventory for the Network, which will be updated periodically. The stakeholder inventory focuses primarily on common stakeholders that operate at European and high-level national level, rather than specific local stakeholders. It sets the groundwork for a more efficient approach to the communication and dissemination activities of the Network, aiming to prevent the same stakeholder from being approached multiple times for involvement or calls to action.

#### **Update and maintenance of tools and materials:**

- The WG has created an internal content calendar and social media planner, which is available from the EDUUNI platform. WG members are invited to add upcoming events and publications to this online calendar, which is reviewed and used as a basis for online content creation at the start of each WG meeting.



- The WG has brought together an overview of free online stock image and video databases, which is available on the EDUUNI platform: [https://tt.eduuni.fi/sites/ou-European\\_Human\\_Exposome\\_Network-LONGITOOLS/ layouts/15/start.aspx#/SitePages/Home.aspx?RootFolder=%2Fsites%2Fou%2DEuropean%5FHuman%5FExposome%5FNetwork%2DLONGITOOLS%2FDocuments%2FWG%20Communication%20Dissemination%2FSub%2Dgroup%20Task%203%20%2D%20C%26D%20Tools&FolderCTID=0x012000A81498B1577](https://tt.eduuni.fi/sites/ou-European_Human_Exposome_Network-LONGITOOLS/layouts/15/start.aspx#/SitePages/Home.aspx?RootFolder=%2Fsites%2Fou%2DEuropean%5FHuman%5FExposome%5FNetwork%2DLONGITOOLS%2FDocuments%2FWG%20Communication%20Dissemination%2FSub%2Dgroup%20Task%203%20%2D%20C%26D%20Tools&FolderCTID=0x012000A81498B1577)
- The WG has developed a collated project overview spreadsheet, that is available from the shared EDUUNI platform (July 2021)
- EHEN identity & templates have been developed and approved by the network and include a logo, stamp, a Word template and PowerPoint slides. Partners across EHEN are encouraged to use these materials in their own communications, and are available from the shared EDUUNI platform.
- The European Human Exposome Network website is available at <https://www.humanexposome.eu/> and links to the Networks' nine individual projects' websites. Acting as a central hub, it can be used as point of reference for the entire Network. The website aims at extending awareness of the results of the Network at the broadest possible international scale.

New content is added on a frequent basis and is decided upon during WG meetings. Each project is responsible for delivery of news and event items and other project specific information as well as items that might be of interest from a Network perspective. Since launch, 14 news articles have been added to the website. An interactive network map was also added (September 2021).

Real-time updates and news on the Exposome and from the network shared by the projects on social media are collected through the EHEN website's social media feed widget.

The HEAP project is responsible for maintaining and updating the website throughout the duration of EHEN.

## **Inventory of key (exploitable) results relevant for joint Network dissemination**

Development of stakeholder engagement strategy based on the project C&D plans and key exploitable results: A stakeholder engagement strategy will be developed on the basis of the above-mentioned stakeholder mapping exercise, while accounting for the GDPR requirements for sharing these lists.

The nine projects that form the network will develop or have already developed their own strategies for stakeholder engagement; these have been detailed in project specific communication and dissemination plans. To streamline stakeholder engagement between projects, the Communication and Dissemination WG, with representatives from each project, will develop the EHEN stakeholder engagement strategy.

## **Continued communication and dissemination of results, focusing on the key (exploitable) results**

The website of EHEN can be found at: [www.humanexposome.eu](http://www.humanexposome.eu). The C&D WG continues to add new content to the EHEN website on a frequent basis, which is decided upon during WG meetings. Each project is responsible for delivery of news and event items and other project specific information as well as items that might be of interest from a Network perspective.

Updates during the last period include:

- 10 news posts





- Toolbox page
- Working Group page
- Two newsletters were published
- Two social media feeds (one for events and one general exposome) that is updated weekly
- Events calendar updates: 20 events posts

EHEN-wide news and findings are disseminated through the bi-annual EHEN newsletter, two editions of which have thus far been published. This preparation of the 3<sup>rd</sup> and 4<sup>th</sup> Network newsletters are due in month 30 and 45.

Other channels for communication and dissemination, such as a joint Frequently Asked Questions (FAQ) page on the EHEN website and a joint EHEN animated video, have been discussed by the WG and will be revisited during the final stage of the project.

### **Blueprint for development of Network virtual toolbox:**

The WG has developed a blueprint for the Network's virtual toolbox, which was presented at the 2022 EHEN scientific meeting in Barcelona. Through the selection of agreed-upon search criteria (including target audience, health outcome, and type of tool), users of the toolbox will be able to quickly access the different tools as they are being published by the different projects. A first version of this central hub of exposome tools is available on the EHEN website: <https://www.humanexposome.eu/toolbox/>

The updated Communication and Dissemination Strategy (CDS) deliverable, describing the above activities is due in M36.

### **WG meeting dates during this period were the following:**

Meeting 3 – 30 June 2021

Meeting 4 – 1 October 2021

Meeting 5 – 16 November 2021

Meeting 6 – 20 January 2022

Meeting 7 – 31 March 2022

Meeting 8 – 12 May 2022

All the documentation concerning the WG Com-Dis has been saved on the Eduuni platform [in the dedicated folder, including notes from each of the WG meeting mentioned above.](#)

## **Ethics and Law WG**

### **Activities in month 16-30:**

The remit of this WG is to exchange ideas, documents and best practices and in that way to learn from each other and avoiding 'reinventing the wheel' in other consortia. There were no EHEN wide 'products' foreseen. Regular online meetings included presentations about amongst other things:

- The position of the EDPB on 'broad consent' and its implications for cohort studies based on broad consent



- SCC and Transfer Impact Assessment for data exchange with the USA (in so far as the SCC are applicable to the institution with whom data are exchanged)
- Data transfer within Europe
- Big data research in the context of exposome research
- Joint controllers in large research consortia
- Preliminary results of a study on specific ethical aspects of exposome research
- A comparison of the specific ethical questions which the EU had requested for each of the consortia
- A first discussion on the concept of equity in exposome research
- The survey on participant facing governance of cohorts

## Additional WG's

**In the first months of the Network**, the first three EHEN WGs were formed as described in the original Report 10: Ethics and Law, Communication and Dissemination, and Metadata. In these first months it was also decided that it was too early to start more WGs and that the need for new WGs would be discussed in subsequent network meetings. Progress of these WGs was discussed at each EHEN board meeting since. Activities in the M16-M30 period are described above and in the updated Report 10.

**At the first EHEN Network day** (online – 16 March 2021) each of the 8 topics for possible WGs (listed above) were the theme of break-out sessions, including the 3 existing WG themes. These sessions aimed to give Network partners a chance to meet each other around a common theme and to see whether there was interest and momentum within this community to start-up a new WG (for the 5 not already established). Each session was also asked to discuss topics that people would find of interest to do within a potential new WG. Conclusions from these break-out sessions did not show enough interest to start new WGs at that point, but also showed that the three already established WGs were working well and were actively progressing with their work plans. Given these conclusions, no new WGs were established and it was decided in the handover meeting of April 2021 (handover from Expanse-HEAP to Equal-Life ATHLETE) to closely monitor the ongoing WGs as well as the need for new WGs.

**EHEN board meetings** during the M16-M30 period (meetings 4 to 7) included the monitoring of the ongoing WGs and discussed new WGs (Appendix IV). Specifically, it was discussed whether the online toolbox group (now included in the Communication and Dissemination WG) should form a separate WG, but it was decided that this would function better as a subgroup. Also, in this period, informal ad-hoc cross-project collaborations have started (e.g. online meetings on statistical methods, on urban exposome), but these were not yet well-enough developed to be established as EHEN WGs. These cross-EHEN collaborations are stepping stones towards established WGs later on, when relevance for all projects and leadership have been established. Also, *ad-hoc* cross-project activities could co-exist next to the WG's, provided that the members of EHEN are kept informed about the results.

**At the second EHEN meeting** (the hybrid conference in Barcelona 24-25 May 2022), a survey was held among the participants including questions on the needs for further WGs. Suggestions were made and these are now taken forward by the new coordination team (LongiTools and Eximious). The next EHEN board will again include strategic discussions on the establishment of additional WGs to support joint-activities by the network.

**In conclusion**, the first 30 months of EHEN have shown that there is willingness from the EHEN partners to participate in and lead WGs, even with only limited funding available for this work. The ongoing WGs are active and have been successful in bringing people together from the different projects together to work on topics that are essential to the success of EHEN. We have also learned that WGs can only be established once

a strategic need has been observed across the majority of projects. They also follow the natural course of the project as the established WGs support the infrastructure of the EHEN in its first phase (Legal and ethical aspects, Data sharing and communication and dissemination). Future EHEN WGs should be established once the following points are clearly demonstrated: i) acknowledged needs from all the projects, ii) transferable expertise and availability for co-leadership to ensure multidisciplinary. Continued active monitoring and discussion in the EHEN board are recommended.

## EHEN Board Meetings

The EHEN board meetings in the period between April 2021 and June 2022 are summarized in table 2. For the minutes we refer to Annex 1. They can also be found in Eduuni.

Table 2: EHEN meetings

Date	Type of meeting	Remark
29-06-2021	EHEN board meeting #4	Minutes in Annex 1
16-09-2021	EHEN board meeting #5	Minutes in Annex 1
09-12-2021	EHEN board meeting #6	Minutes in Annex 1
05-04-2022	EHEN board meeting #7	Minutes in Annex 1

## Event Activities

### EHEN Network Day<sup>1</sup>

On Tuesday 16 March 2021 we hosted a fully virtual and interactive EHEN Network Day for the whole EHEN community. Nine Young Investigators gave an overview of the research projects and shared project updates of the nine projects. The Principal Investigators of the nine projects introduced the participants to the Working Groups and hosted the break-out sessions, where we discussed and explored topics we would like to (further) collaborate on:

- Metadata and sustainability;
- Communication and dissemination;
- Ethical and legal issues;

### EHEN Online Conference<sup>1</sup>

On Friday 11 June 2021, the EHEN (coordinated by Expanse and Heap) hosted an online conference for our community and our stakeholders titled: “Decoding the exposome: the biggest influencer on health”. The conference programme included three keynote presentations, two panel discussions and a number of break-out outs, enabling participants to hear from each other of the nine EHEN projects. Nearly 500 individuals registered for this meeting. Overall, there was a general feeling that exposome science has matured: people are recognizing that this is different to what was before it, and we are moving away from one exposure, one disease.

Keynote speaker Dr. Rick Woychik (Director of the National Institute of Environmental Health Sciences) talked about the challenges to defining the exposome, the need to operationalize on a global scale and the aspiration of a global exposome project. Annette Peters (Helmholtz Zentrum München) talked about the key

<sup>1</sup> Activity planned during the previous coordination team but falling within current period



characteristics of environmental risks, combined with some insights out of HERA as outlook towards the future. Michael Snyder (Stanford University) talked his work on big data, to try to identify personal exposures and see how they associate with human health.

During the policy stakeholder panel discussion, messages included:

1. Only by understanding the human exposome can we create better prevention strategies;
2. We have to substantially enhance our knowledge of the risks, since only 50% of them are known;
3. Researchers can help to find where policies can be strengthened;
4. Policy makers need to be open to research and endorse it.

During the scientific stakeholder panel session, questions were asked about what is missing, do we understand how to address and how to measure the exposome?

1. Big data doesn't necessarily equal big knowledge and correlation does not mean causality. We have to work on a set of very rigorous approaches. Yes, we could use genetic approaches, but in order to replicate you have to have studies in existence to replicate from and they are not there;
2. How can we move the conversation from an academic one into a policy one? We have to provide incentives to produce national strategies. Science should be available to the public.

## ISEE<sup>1</sup>

During ISEE (August 23-26 2021) a symposium across EHEN projects was organized with contributions of several PI's.

## Green week<sup>1</sup>

During the Green week (June 3, 2021) a symposium was organized "Filling the knowledge gaps on exposure to pollution: a holistic approach with the Human Exposome Network"

## Webinars and courses

For an overview of other EHEN related activities such as webinars, courses, summer school etc. we refer to the EHEN website: [www.humanexposome.eu](http://www.humanexposome.eu)

## EHEN Internal Scientific Meeting

On 24 - 25 May 2022, the EHEN Internal Scientific Meeting was organized in a hybrid format in Barcelona (Spain) and online via Zoom. The Scientific Meeting stretched a total of 1.5 day, inviting all members of the nine different projects to join. A total of 298 people registered in advance to the meeting. A total number of 143 were welcomed in-person in Barcelona, and a total of 110 people online on 24 May and 78 people online on 25 May.

After a welcome by the EHEN co-chair, Carmen Laplaza Santos, Head of Health Innovations & Ecosystems Unit at the European Commission, opened the plenary meeting on Day 1. Further, the plenary sessions provided room for the three working groups and nine individual projects to present their updates and highlights to all participants.

In the run-up to the meeting, (young) researchers from all projects were invited to hand in an abstract on their work within the scope of EHEN, providing a solid basis for the scientific meeting. A total of 67 abstracts was submitted, which were reviewed by two EHEN members and based on scoring selected for various presentation formats; as 8-10 minute presentations during the plenary session, as part of one of eight breakout sessions, or as a 2-minute elevator pitches (including posters to provide additional information). The program of the meeting built on the topics of the abstracts to be presented, pooling those that had overlapping subjects (see annex 2 for the sessions and the assigned abstract presentations).

Next to the parallel sessions dedicated to abstract presentations, there were also 3 parallel sessions allocated for the three working groups to host one hour working session.

On the final day, during the closing session chaired by PhD students and postdocs from Equal-Life and Athlete, Sylvain Sebert (LongITools) presented the results of an EHEN survey held among the meeting's in person participants. This provided insights considering the added value of EHEN and future opportunities and priorities within EHEN, gladly to be taken up by the next coordinators.

The panel discussion that followed allowed for the nine project coordinators and the audience to discuss the added value of EHEN and ideas for future activities. Susan Prescott and Joana Lobo Vicente both members of the Network Advisory Board, shared their visions and reflected on the network's activities and engaged with the project coordinators during the closing discussion. The recording of Susan Prescott is available at the Eduuni platform in the dedicated folder.

Challenging questions were posed during the panel discussion regarding Policy Advise and the focus on Human Health. *How and what to communicate to the public and policymakers. Should EHEN merely share its scientific results, or also advise or even prescribe their findings to, for example, guide and improve health behaviour or city planning? And: how is the EHEN taking into account the health of our planet?*

## EHEN Deliverables in period M16-M30

Report 8: Policy Strategy - Joint strategy for science to policy translation of the scientific evidence generated by the network – EPHOR/REMEDIA/HEDIMED (planned M18 – revised version M30)

Report 2: Handover document to next coordinating team – ATHLETE/EQUAL-LIFE (M30)

## Network Advisory Board

The EPHOR, HEDIMED and REMEDIA teams were in charge of the creation of a Network Advisory Board (EHEN deliverable: Report #4 submitted in April 2020). The report has been updated June 22, 2022.

Different people were approached and 5 members agreed to participate:

- Jacqueline BOWMAN-BUSATO, EU Policy Lead at the European Association for the Study of Obesity (EASO)
- Panagiotis CHASLARIDIS, Policy Advisor at the European Federation of Allergy and Airways Diseases Patients' Associations (EFA)
- Vicente FRANCO GARCÍA, Policy Officer at the DG Environment, European Commission
- Joana LOBO VICENTE, Chemicals, Environment & Human Health Expert at the European Environment Agency (EEA)
- Susan PRESCOTT, Professor of Paediatrics at the School of Medicine of the University of Western Australia and President of InVivo PlanetaryHealth

In order to properly welcome these NAB members, the EPHOR, HEDIMED and REMEDIA teams organised a meeting between the NAB and all the project coordinators on 24/9/2020. Subsequently an advisory board



meeting was held 9/12/2021. All members of the NAB were invited to join the EHEN scientific Conference in May and to also contribute to the panel discussion on EHEN's added value and future activities.

All the documentation concerning the NAB has been saved on the Eduuni platform in the dedicated folder.

Non-disclosure agreements, prepared by the HEAP team in the Collaboration Agreement, have now all been signed.

Name/project	Status
Jacqueline BOWMAN-BUSATO	Signed
Panagiotis CHASLARIDIS	Signed
Vicente FRANCO GARCÍA	Signed
Joana LOBO VICENTE	Signed
Susan PRESCOTT	Signed
ATHLETE	Signed
EPHOR	Signed
EQUAL-LIFE	Signed
EXIMIOUS	Signed
EXPANSE	Signed
HEAP	Signed
HEDIMED	Signed
LONGITOOLS	Signed
REMEDIA	Signed

## Publications

The special issue of the journal Environmental Epidemiology which outlines the European Human Exposome Project is finalized. Each of the projects have submitted a manuscript describing the design of their project. These manuscripts have been reviewed and published [Source link to still be obtained by Roel, Jelle, Joakim]. The nine project papers were complemented by an introduction written by the editors of the special issue: Roel Vermeulen and Joakim Dillner and two commentaries by experts in the Exposome field and the European Commission. The special issue was completed in April 2022.

1. Vlaanderen J, de Hoogh K, Hoek G, Peters A, Probst-Hensch N, Scalbert A, Melén E, Tonne C, de Wit GA, Chadeau-Hyam M, Katsouyanni K. Developing the building blocks to elucidate the impact of the urban exposome on cardiometabolic-pulmonary disease: The EU EXPANSE project. Environmental Epidemiology. 2021 Aug;5(4).
2. Ronkainen, J., Nedelec, R., Atehortua, A., Balkhiyarova, Z., Cascarano, A., Dang, V. N., ... & Sebert, S. (2022). LongITools: Dynamic longitudinal exposome trajectories in cardiovascular and metabolic noncommunicable diseases. Environmental Epidemiology, 6(1), e184.
3. Vrijheid M, Basagaña X, Gonzalez JR, Jaddoe VW, Jensen G, Keun HC, McEachan RR, Porcel J, Siroux V, Swertz MA, Thomsen C. Advancing tools for human early lifecourse exposome research and translation (ATHLETE): Project overview. Environmental Epidemiology. 2021 Oct;5(5).
4. Van Kamp I, Waye KP, Kanninen K, Gulliver J, Bozzon A, Psyllidis A, Boshuizen H, Selander J, van den Hazel P, Brambilla M, Foraster M. Early environmental quality and life-course mental health effects: The Equal-Life project. Environmental Epidemiology. 2022 Feb 1;6(1):e183.
5. Benjdir M, Audureau É, Beresniak A, Coll P, Epaud R, Fiedler K, Jacquemin B, Niddam L, Pandis SN, Pohlmann G, Sandanger TM. Assessing the impact of exposome on the course of chronic obstructive pulmonary disease and cystic fibrosis: The REMEDIA European Project Approach. Environmental



Epidemiology. 2021 Aug;5(4).

6. Ronsmans, S., Hougaard, K. S., Nawrot, T. S., Plusquin, M., Huaux, F., Cruz, M. J., ... & Hoet, P. H. (2022). The EXIMIOUS project—Mapping exposure-induced immune effects: connecting the exposome and the immunome. *Environmental Epidemiology*, 6(1).
7. Pronk, A., Loh, M., Kuijpers, E., Albin, M., Selander, J., Godderis, L., ... & EPHOR Consortium. (2022). Applying the exposome concept to working life health: The EU EPHOR project. *Environmental Epidemiology*, 6(2).
8. Martinez, R. M., Müller, H., Negru, S., Ormenisan, A., Mühr, L. S. A., Zhang, X., ... & Dillner, J. (2021). Human exposome assessment platform. *Environmental Epidemiology*, 5(6).
9. Laiho, Jutta E.; Laitinen, Olli H.; Malkamäki, Johannes; Puustinen, Leena; Sinkkonen, Akib; Pärkkä, Juhac; Hyöty, Heikki, HEDIMED Investigator group Exposomic determinants of immune-mediated diseases (2022) Special focus on type 1 diabetes, celiac disease, asthma, and allergies: The HEDIMED project approach *Environmental Epidemiology*: 6 (3)

## Handover meeting and recommendations

A meeting was held is planned on June 22, 2022 between the parting coordinators Martine Vrijheid (ATHLETE) and Irene van Kamp (EQUAL-LIFE) to the next coordinator Sylvain Sebert (LONGiTOOLS) and Peter Hoet (EXIMIOUS) to complete the handover of the coordination of EHEN.

### Conclusions and handover recommendations and opportunities

In the past coordination period the EHEN has grown in its role and although hindered by the pandemic recent events in- person have strengthened the network and allowed the PI's and (young) researchers to meet in person and follow and discuss the state of the art in the different projects.

The working groups have been formed and restructured involving representatives from all nine projects and settled in their roles. The ethics WG has indicated that it is hard to keep all on board. All working groups have done work that is relevant for all projects and have made considerable progress. In the period to come it is important that this work is translated to exposome research (within EHEN and beyond). A point of concern is that the conclusions from the working groups are not systematically transferred to the work or that the impact is limited to certain PI's and projects.

The Board meetings with the PIs, the project officers and the advisory board can play a role in this. Although these meetings; four in total, were well attended, lively and informative it was felt that time was too short to discuss content matters as above. One option could be to expand from one and a half to two hours since the WG updates & discussion took a significant time of these meetings

Finally, drawing from the experiences of the M16-M30 period, it is suggested that several activities could be considered to be taken up during the next periods, including:

- Webinars and symposia series on specific topics;
- EHEN Policy Symposium;
- EHEN Exposome Course;
- Exchange of PhD students and secondment of young researchers;
- Additional funding to be considered such as a COST action or other schemes;
- Strengthen the global network on Exposome.





## Annex 1: Minutes of EHEN Board meetings

### Minutes EHEN board meeting 4 – 29 June 2021

<b>Meeting Title</b>	<b>European Human Exposome Network Coordination meeting #4</b>
<b>Date</b>	29.06.2021
<b>Time</b>	15:00 – 16:00 CEST
<b>Meeting Aims</b>	<ul style="list-style-type: none"> <li>Update on the European Human Exposome Network</li> </ul>
<b>Meeting Chairs</b>	Irene van Kamp and Martine Vrijheid

### Agenda

Item	Time	Title	Who
1.	14:55	Connection by callers	all
2.	15:00 (3')	Welcome	Coordination team
3.	15:03 (20')	Update from the Working Groups (5 min. each + discussion)	
		Metadata	Morris Swertz (TBC)
		Communication and dissemination	Génon Jensen
		Ethics and law	Evert-Ben van Veen
4.	15:23 (15')	<p>1. How do we report the activities of WPX: a joint report (i.e we all include the same report that we are doing together) or independent reports by each projects (Project report how they contributed to EHEN during this period).</p> <p>2. How and what to share within EHEN. As per the grant and the collaboration agreements we agreed to share our technical reports (Narrative part B of the periodic report).</p>	Coordination team
5.	15:38 (15')	<p>Debriefing EHEN Network Day and Conference</p> <p>Future events –what kind of EHEN events you would like to see?</p>	Coordination team
6.	15:53 (2')	JEE Special issue – Update	Coordination team
7.	15:55	AOB and next meeting announcement	Coordinating team

### Attendees





## European Human Exposome Network coordinators

Project	Name	Institution
<b>ATHLETE</b>	Martine Vrijheid Rodney Ortiz	ISGlobal
<b>HEAP</b>	Helena Andersson on behalf of Joakim Dillner	Karolinska Institute
<b>HEDIMED</b>	Heikki Hyöty Jutta Laiho	University of Tampere
<b>EPHOR</b>	Rob Stierum	Netherlands Organization for Applied Scientific Research
<b>EQUAL-LIFE</b>	Irene van Kamp	National Institute for Public Health and the Environment
<b>EXIMIOUS</b>	Peter Hoet	KU Leuven
<b>EXPANSE</b>	Roel Vermeulen	Utrecht University
<b>LONGITOOLS</b>	Sylvain Sebert Teija Juola	University of Oulu
<b>REMEDIA</b>	Sophie Lanone	INSERM

## European Commission – The Environment and Health Team

### Name

**None for this meeting**

Update from the Working Groups

### Metadata WG - Morris Swertz

- Shared presentation from the EHEN event in June
- First action plan – 4 sub-groups created
  - Omics data – Roxana Martinez from HEAP
  - Chemical exposome - Richard Hůlek from EXPANSE
  - Medical and clinical data - Justiina Ronkainen from LongITools
  - EHEN data catalogue – Morris Swertz from ATHLETE and LongITools
- Working groups will collect information from the projects in the next 4 month
- Next meeting 7th July – action delegate 2-3 persons per consortium to represent each consortium to participate actively



- Total number of participants per consortium depends on areas of specialization

**Action point** – Morris will contact the Project Coordinators so that they can check the contact list and fill in gaps on essential people that should be contacted to participate in the sub-groups.

## Q&A

- What is the goal at the end of the 5 years? Ideally is to have a network-based catalogue

## Communication and dissemination WG - Génon Jensen

- WG developed communication tools (website, logo, stamp, presentation template)
  - Website have social media widget and public deliverables
- Promotion of EHEN visibility mainly during Green Week
  - Blog post on EU Zero Pollution Action plan
- Next steps include
  - Development of a Newsletter (added value over project specific newsletter will be a key issue)
  - Updating Communication and Dissemination strategy (deliverable)
  - Development of a virtual toolbox
    - Roel: centralized gateway to link to all the projects
    - Martine: the first years need to focus on developing a strategy for this gateway. The gateway would make the project tools “findable”, e.g. through an inventory with links to project-specific websites.
    - Heikki: this could be a way to highlight how the exposome affects different diseases
  - Inventory of stakeholders
- WG will meet 30<sup>th</sup> June

## Ethics and law WG - Evert-Ben van Veen

- WG to exchange ideas and strategy and prevent same work by all the projects
- 2 meetings so far
- Focus on two topics
  - Consent
    - Confidentiality agreements – next meeting for September – Equal Life will present ethics
  - GDPR
    - Compared approaches, prepared response to the EDPB when it releases the draft of guidelines on research for the autumn – will comment on it as a group
    - GDPR interpretation makes it more difficult to have long-term cohorts

## Q&A

Roel: there is a pressing issue that the EHEN needs to be diligent about - broad consent is not possible anymore in some countries, so this impacts cohorts in the long-term

- If a specific objective was not specified in the consent form, you cannot continue anymore; the broad goal does not cover this anymore
- Interpretation on Germany and some other countries is very narrow

Sylvain: this is an opportunity for communication and dissemination to prepare a common response. It is not inevitable, so we may be able to influence this policy. We need to work together in the policy report as part of engagement activities

Roel: Just to stress that it really is extremely urgent. Until today I was under the impression we would be able to work around it and that it would not happen soon. However, since this morning I am extremely concerned



as we were stopped dead in our tracks with a strict interpretation of the law. If this prevails, cohort research is dead (and so will EHEN).

**Action point** – Roel will be contacting Evert-Ben about a common response. Quick follow-up needed.

## Reporting and sharing

1. How do we report the activities of WPX (network activities)? As a joint report (i.e. we all include the same report that we are doing together) or as independent reports by each projects (projects report how they contributed to EHEN during this period)?

Irene and Martine propose not opt for joint report, to leave it to each project to complete their activities in that shared WP.

- It was agreed by all participants

2. How and what to share within EHEN. As per the grant and the collaboration agreements we agreed to share our technical reports (Narrative part B of the periodic report). Irene and Martine propose to share the extended summary (part B), but not the details of all the WPs.

Sylvain:

- one report for the commission and one for the group
- There is an Article in the Grant Agreement which states it is mandatory to share the report

Martine asked if any of the projects will not be happy not sharing the part B

- This is a question for all the partners
- Coordinators signed the Network agreement on behalf of partners, not as coordinators

Martine: sharing should be a basic principle of the Network, but this does need approval from partners.

**Action point** – All partners to check with their partners to see if they are willing to share part B of the periodic report. Also, add further discussion to the agenda for the next meeting (Sept 2021).

## Debriefing EHEN Network Day and Conference

Roel:

- Around 500 registered and 265 attended, and 90+ have joined platform to see videos
- Keynotes are recorded and available, a question remains, for how long they want them to be out there.
- It was difficult to get people engage to get things moving in the planning - learned lesson for next times.
- Evaluations
  - Sylvain: feedback was not anonymous – review the survey to allow anonymity.

Feedback

- Breakout sessions were fantastic - more breakout sessions
- The organisation of inviting speakers for the breakout sessions could be improved

## Future events –what kind of EHEN events you would like to see?

- Martine checked WPX (Cluster activities) and there are no public events planned until the last year
- Martine and Irene propose a scientific meeting within the network with breakouts, before summer 2022, if possible in-person.
- Sylvain: it is difficult such a large network, but be more inclusive for PhD and Postdoc. Perhaps a hybrid
- Peter: need to find a way to do a hybrid



- Roel: good to split the internal network and the external public events – we need to think of more public events.

## JEE Special issue – Update

Roel:

- 3 papers accepted, others are in revision, and for two it is difficult to find good reviewers
- Plan is to finalize all in the summer and write the introduction
- Corresponding authors will be notified

## AOB and next meeting announcement

### Policy Strategy Deliverable - EPHOR/REMEDIA/HEDIMED (M18)

- Heikki: need feedback by tomorrow. Document is short, minor comments can be adapted, but there are more in depth comments, it may entail a delay in submission
- Sylvain: due to covid we generally have a 3-month delay door. This is joint report by the network. Wonder if its best to have a joint discussion of a common network strategy
- Martine: best to give people a chance to review the deliverable
  - Deliverable may come back with more comments from EC (as was case in C&D document); obtaining an extension should not be an issue
  - For the communication & dissemination strategy, the Commission wanted concrete ideas of action, “who is doing what” rather than general strategy that is missing details. To generally announce that the network is going to do something was not good enough for the officers- the doc was revised accordingly and resubmitted.

**Action point** – Heikki will share the deliverable to gather comments in one document and will ask extension until the end of September.

### Next meetings

- 16th Sept. 15-16:30h with EC
- 9th Dec. at 9-10:30h with EC and advisors

## Minutes EHEN board meeting 5 -16 September 2021

<b>Meeting Title</b>	<b>European Human Exposome Network meeting #5</b>
<b>Location</b>	Online meeting
<b>Date</b>	16.09.2021
<b>Time</b>	15:00 – 16:30 CET
<b>Meeting Aims</b>	Update on the European Human Exposome Network
<b>Meeting Chairs</b>	Irene van Kamp and Martine Vrijheid

## Agenda

Item	Time	Title	Who
1.	14:55	Connection by callers	all
2.	15:00 (10')	Welcome and introductions round	Coordination team, all



3.	15:10 (30')	Update on WGs and discussion on need for new WGs	Coordination team, all
4.	15:40 (10')	Network events: <ul style="list-style-type: none"> <li>Ideas for internal scientific network meeting 2022</li> <li>Ideas for external/public events</li> </ul>	all
5.	15:50 (5')	Deliverables: Policy Strategy Deliverable – update	Heikki Hyöty
6.	15:55 (5')	Sharing of reports (part B technical report)	Coordination team
7.	16:00 (15')	Ethics issues – update on the issues surrounding broad consent (stricture rules for cohort data) and EHEN responses	Roel Vermeulen will send an update
8.	16:15 (5')	JEE special issue – update	Roel Vermeulen will send an update
9.	16:20 (10')	Other	

## Attendees

### European Human Exposome Network coordinators

Project	Name	Institution
<b>ATHLETE</b>	Martine Vrijheid	ISGlobal
<b>HEAP</b>	Joakim Dilner (not able to attend)– Helena Andersson, Roxana Merino Martinez	Karolinska Institute
<b>HEDIMED</b>	Heikki Hyöty – Jutta Laiho	University of Tampere
<b>EPHOR</b>	Anjoeka Pronk (not able to attend) – Rob Stierum	Netherlands Organization for Applied Scientific Research
<b>EQUAL-LIFE</b>	Irene van Kamp – Julia Hartmann	National Institute for Public Health and the Environment
<b>EXIMIOUS</b>	Peter Hoet	KU Leuven
<b>EXPANSE</b>	Roel Vermeulen – was not able to attend	Utrecht University



<b>LONGITOOLS</b>	Sylvain Sebert – Teija Joula	University of Oulu
<b>REMEDIA</b>	Sophie Lanone (Not able to attend) – Roberta Zanchi, Kristina Fiedler	INSERM

European Commission – The Environment and Health Team

Name
Rita Araujo
<b>Nerea Aizpurua</b>
<b>Laia Quiros</b>

Update on WGs and discussion on need for new WGs

Communication & Dissemination WG (Martine)

- See presentation
- Metadata toolbox – Make inventory on all the tools from the nine projects: courses, tutorials, statistical toolbox, etc. It is not a tool itself but a communication tool so that everything is in one place, rather than having to look at each toolbox.
  - Being discussed if it should be a sub-group of the Comms WG (at the moment it is)

**Action/Follow up: Will ask the toolbox WG to present in the next coordination meeting the 9th December.**

Metadata WG

- See presentation
- Continue to work as 4 sub-groups:
  - Catalogue (Morris Swertz – ATHLETE & LongITools),
  - Medical exposome (Justiina Ronkainen - LongITools),
  - Chemical exposome (Richard Hulek - EXPANSE),
  - Omics (Roxana Merino - HEAP)
- New metadata model is ready for rollout (in ATHLETE and LongITools).
- Call to all other projects to add to the catalogue for synergies.
  - If other projects are interested in implementing this catalogue mode, please contact Morris Swertz ([m.a.swertz@gmail.com](mailto:m.a.swertz@gmail.com)).

**Action – All projects to make sure that they have someone participating on each subgroup relevant to them. Here is the list:** [https://docs.google.com/spreadsheets/d/1K\\_LGqf3eZIULAoLgEWzFdeSDJtx-yjrgpsDvJbllYKM/edit#gid=1128899596](https://docs.google.com/spreadsheets/d/1K_LGqf3eZIULAoLgEWzFdeSDJtx-yjrgpsDvJbllYKM/edit#gid=1128899596)

Ethics WP

- See presentation
- Next meeting 23rd September, where informed consent for cohort studies will be the focus. Related to the discussion of last meeting, due to interpretation of the GDPR, broad consent may not be sufficient for secondary use of data collected by cohorts. That could endanger the exposome projects.
- This group is critical also for data/sample transfers between EU and the US.



**Action** - Ask ethics group to discuss the possibility of sending a letter to a journal as EHEN on what could happen if cohorts cannot continue their work due to this GDPR interpretation.

## Network events: Brainstorming session

- Ideas for internal scientific EHEN meeting 2022 (around June)
  - Duration (1 or 1.5 days)
  - In-person? Hybrid?
  - Location: open, can be Barcelona, Bilthoven (where current network coordinators are located) or any other place that EHEN partners want to promote
  - Keynotes from outside are possibility, but this is an internal meeting
  - Sessions by senior and junior researchers, organized around topics with a focus on interrelations between the projects
    - Call for abstracts for JR researchers
    - Have PIs have a presentation on the science for the reporting period, to put science in the context of the project, to promote a general exchange rather than just the specific aspects that can be scattered and miss the whole picture
    - Methodological point of views, experience, on areas such as satellite data. Workshops on these kind of issues that can be of use to projects
    - Have parallel sessions
- Ideas for other events:
  - EHEN Symposium series focusing on the role of the exposome in important topics such as air pollution, social inequalities, urban health, EDCs... How can an exposome approach help?
  - To reach a wider audience, promote EHEN (visibility), etc.
  - Coordination group needed to collect ideas.

## **Action**

- For the internal scientific EHEN meeting: Irene and Martine to draft a first outline and find date(s).

– For the EHEN Symposium idea: Create a common document to circulate around. Irene and Martine will start the discussion and find a small group to push this forward.

## Deliverables: Policy Strategy Deliverable – update

**Action** - Jutta Laiho circulated a draft for comments. Doc to be submitted by the end of this month, within 10 days approx.

## Sharing of reports (part B technical report)

**Decision** – Projects present at the meeting agreed that the Part B – the narrative portion of the periodic report will be shared among the nine projects once it is approved by the European Commission. Each project will consult their partners to remove any sensitive part of their report.

Ethics issues – update on the issues surrounding broad consent (stricture rules for cohort data) and EHEN responses

Roel will update on the next meeting, 9th December

## JEE special issue – update

At the moment 3 of the projects have been accepted (EXPANSE, ATHLETE, REMEDIA). The others have been reviewed and we are waiting revisions, to be sent by **15th November**.

## Other

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Rita Araujo, EU Officer

- Chemical strategy – she will share information and agenda of the EU chemical strategy for EHEN input
  - Can be good to have the catalogue as resource as well
- Exchange of ideas on potential collaboration opportunities at the global level on the Exposome. It could be the priorities and needs for an international collaborative approach on the Exposome topic, promoting the exchange of ideas and knowledge on procedures, approaches and data (e.g. data sharing and harmonisation, networking, knowledge transfer).

**Action - Prepare 1 page with EHEN priority initiatives that would be relevant to explore under international cooperation: interests on exploring, connecting and networking with other countries (which are the most relevant players in the field at the international level?).**

Upcoming events

Online forum ‘**The Clean Air Debate: The Lifelong Impact of Air Pollution**’ on Wednesday 29th September 2021 at 17:00 CEST

<https://longitools.org/news/the-clean-air-debate-the-lifelong-impact-of-air-pollution/>

## Minutes EHEN board meeting 6 – 9 December 2021

<b>Meeting Title</b>	European Human Exposome Network meeting #6
<b>Location</b>	<a href="#">Click here to join the meeting</a>
<b>Date</b>	09.12.2021
<b>Time</b>	09:00 – 10:30 CET
<b>Meeting Aims</b>	<ul style="list-style-type: none"> <li>• Inform Advisory Board</li> <li>• Update on Scientific Meeting 2022</li> </ul>
<b>Meeting Chairs</b>	Irene van Kamp and Martine Vrijheid

## Agenda

Item	Time	Title	Who
1.	08:45	Connection by callers	all
2.	09:00 (5')	Welcome	Coordination team
3.	09:05 (20')	Update on EHEN activities: <ul style="list-style-type: none"> <li>• progress working groups</li> <li>• past conferences and events</li> <li>• future activities</li> </ul>	Coordination team
3.	09:25 (20')	Time for feedback/questions on past EHEN activities and discussion of future activities	Advisory Board
4.	09:45 (10')	Time for feedback/questions EC Project Officers	EC Project officers
5.	09:55 (25')	EHEN Scientific Meeting 2022: <ul style="list-style-type: none"> <li>• inform on event</li> <li>• call for Scientific Meeting Committee Members</li> <li>• feedback and discussion on meeting format and content (PIs, NAB and EC officers)</li> </ul>	Coordination team



6.	10:20 (5')	Update on sharing Part B periodic report	Coordination team
7.	10:25 (5')	Any other business <ul style="list-style-type: none"><li>• Endocrine disrupting chemicals - DG ENV portfolio</li><li>• Strategic Research and Innovation Plan (SRIP) for Chemicals in the Green Deal Era – input by 22<sup>nd</sup> Dec.</li></ul>	

## Attendees

### European Human Exposome Network coordinators

Project	Name	Institution
ATHLETE	Martine Vrijheid Rodney Ortiz	ISGlobal
HEAP	Joakim Dilner Helena Andersson	Karolinska Institute
HEDIMED	Heikki Hyöty Jutta Laiho	University of Tampere
EPHOR	Anjoeka Pronk Astrid AG Kruizinga	Netherlands Organization for Applied Scientific Research
EQUAL-LIFE	Irene van Kamp Julia Hartmann Kim van Wijk	National Institute for Public Health and the Environment
EXIMIOUS	Peter Hoet Manosij Ghosh	KU Leuven
EXPANSE	Roel Vermeulen Jelle Vlaanderen	Utrecht University
LONGITOOLS	Sylvain Sebert Teija Juola	University of Oulu
REMEDIA	Sophie Lanone Roberta Zanchi	INSERM

### European Commission

Name
Rita Araujo
Laia Quiros
Nerea Aizpurua



## Advisory Board

Name	Affiliation
Jacqueline Bowman-Busato	EU Policy Lead, European Association for the Study of Obesity
Panagiotis Chaslaridis	Policy Advisor, European Federation of Allergy and Airways Diseases Patients Associations
Vicente FRANCO GARCÍA	Policy Officer, Unit Clean Air, DG Environment, European Commission
Joana LOBO VICENTE	Chemicals, Environment & Human Health Expert, European Environment Agency

## Update on EHEN activities

- progress working groups
- past conferences and events
- future activities

See presentation attached

## Time for feedback/questions on past EHEN activities and discussion of future activities

### Advisor Vicente Franco

- On GDPR concerns - contact desk officer in Justice DG to start addressing if it becomes a problem
- Would like to read the policy strategy, even to comment on the final draft before it is published
- Network shows positive cohesive work and visibility with website and working groups

### Advisor Joana Lobo Vicente

- In addition to the communication of reports, project outputs and newsletter, it would be good to have different communication products tailored to different actors such as advisory board, consortium members, stakeholders
  - Go beyond scientific publication and have target key messages
  - For policymakers have short policy briefs
    - Need a strategy on how we are going to link EHEN results to policy
    - Can have events to discuss with policy makers, and use confidential channels with policy makers even before publication
    - Legislative process take time, so the sooner we inform policy makers the better

Martine acknowledged that is a work-in-progress, currently mapping stakeholders and key messages to translate as network, but it will take time to build distinct network messages and not individual project messages.

### EC Policy Officer Rita Araujo



- On dissemination and participation in events and conferences
  - Conference in March in Brussels by French presidency is important (Martine has been invited to represent EHEN)
  - Endocrine Disruptors Forum, May 10-11 in Paris, one full day dedicated to research projects and results that could be presented
    - EHEN to present as a cluster
- EHEN website - add public deliverables for download
- Catalogue, if planning for health outcomes, does it include collecting info on environmental data?
  - Which level of environmental data?
  - In EXPANSE all the maps of geospatial information will be available
    - Jelle - Facility open accessible about the exposure at EU level, open to potential cohorts and individuals will be able add their address to obtain relevant information to them
    - Equal-Life collaborates with EXPANSE on noise and air pollution modelling
  - Sylvain – there is a need to feedback to the metadata WG that it is not only about chemical data but other areas as well
- DG environment wants to give the floor to research projects working on endocrine disruptors to look at complementarities, aside from projects like HBM4EU
  - EHEN have not been involved on these meetings before, so would like to get input from EHEN on these meetings. Will look to have an EHEN-wide presence. and presentation. EHEN projects that include chemicals:
    - Athlete (Environmental)
    - Expanse (Environmental)
    - Ephor (Occupational)
    - Eximious (Occupational)
    - Hedimed (Indoor)
    - Remedia (Experimental)

## Action

- Contact ethics WG to share ideas to set an ad hoc meeting on GDPR with DG Justice. Could also be part of a short Q&A session or an ethics symposium.
- Share Policy report to advisors and get their input for the final document. (policy deliverable is attached to these minutes)
- Provide meeting feedback to ethics, metadata & communications working groups.



## EHEN Scientific Meeting 2022:

### Inform on event

In principle, it will be for 1.5 days (24-25 May 2022) in hybrid (in-person / online) mode with several key notes and plenary, but the core are the breakout sessions to be decided after receiving abstracts, with up to 60 parallel presentations.

### Call for Scientific Meeting Committee Members

Form a small organizing committee

- Sylvain (LongITools)
- Sophie (REMEDIA)
- Manosij (EXIMIOUS)
- Astrid / Anjoeka (EPHOR)
- Jutta (HEDIMED)

### Feedback and discussion on meeting format and content (PIs, NAB and EC officers)

- Consider including link to related projects: HBM4EU/PARC, EIRENE.
- Keep the scientific focus
- Opportunities for junior researchers, but mixed with other researchers, not just exclusive sessions for junior researchers (will depend on abstracts)
- Consider prize for best abstract

### Update on sharing Part B periodic report

Once all the project reports have been accepted by the EU, they will be shared with EHEN projects and advisors

### Action

- Sylvain will explore having an EHEN exclusive folder in Eduuni platform for document sharing
- In this folder, the EHEN deliverables can also be shared. Non-public deliverables cannot be shared through the website, but can be made available to the NAB through Eduuni.

### Any other business

### Endocrine disrupting chemicals - DG ENV portfolio

Discussed above

Strategic Research and Innovation Plan (SRIP) for Chemicals in the Green Deal Era – input by 22nd Dec.

- EHEN participated in the webinar, represented by HEAL (ATHLETE) partner and we received a request to provide input for the plan.



- Martine sent an email to the project PIs. We ask the projects to gather inputs from their partners and send this to Martine/Irene so that EHEN can provide one consolidated feedback.

## Action

- Send document to each of the 9 project partners and [ask for project-wide input to be sent to Martine and Irene by 17<sup>th</sup> Dec](#), so they can submit on behalf of EHEN by the deadline on the 22nd Dec.
  - If you have specific partners working on this issue, please send directly to them and ask them to look carefully

## Training & courses

- It was proposed to have a network-wide training courses to raise visibility
  - Building on experiences from EPHOR, Utrecht, ISGlobal
  - This can be later in the project to present results in a training form, such as tools, statistical scripts
  - Can include integration of omics or longitudinal analysis
  - Building an Erasmus+ network
  - It would be good to see different approaches on how we approach to the exposome

## Action

- Add as agenda item for the next EHEN Board meeting

## Minutes EHEN board meeting 7 – 5 April 2022

<b>Meeting Title</b>	European Human Exposome Network meeting #7
<b>Location</b>	<a href="#">Click here to join the meeting</a>
<b>Date</b>	05.04.2022
<b>Time</b>	11:00 – 12:30 CET
<b>Meeting Aims</b>	Update on WGs, Scientific Meeting 2022, other
<b>Meeting Chairs</b>	Irene van Kamp and Martine Vrijheid

## Agenda

Item	Time	Title	Who
1.	10:45	Connection by callers	all
2.	11:00 (5')	Welcome	Coordination team
3.	11:05 (30')	Update on EHEN activities: Progress working groups (5' each + discussion) Ethics & Law Metadata Communications	WG Leads
4.	11:35 (15')	Inventory of tools for EHEN website	Astrid Kruizinga (EPHOR)
5.	11:50 (10')	EHEN website	Rita Araujo
6.	12:00 (10')	Scientific meeting update May 2022	Coordination team
7.	12:10 (5')	Feedback from the Chemical Exposome and Public Health event	Martine Vrijheid (ATHLETE)
8.	12:15 (10')	Exposome whitepaper	Rita Araujo (EU Officer)
9.	12:25 (5')	Any other business Follow-up sharing Part B periodic report Project review meeting <a href="#">HORIZON-HLTH-2023-ENVHLTH- 2.04</a> : Global coordination of exposome research	Coordination team
10.	12:30	End	



## Attendees

### European Human Exposome Network coordinators

Project	Name	Institution
ATHLETE	Martine Vrijheid Rodney Ortiz	ISGlobal
HEAP	Joakim Dilner Helena Andersson Heather Coombs	Karolinska Institute IARC
HEDIMED	Heikki Hyöty Jutta Laiho	University of Tampere
EPHOR	Anjoeka Pronk Astrid AG Kruizinga	Netherlands Organization for Applied Scientific Research
EQUAL-LIFE	Irene van Kamp Kim van Wijk	National Institute for Public Health and the Environment
EXIMIOUS	Peter Hoet Manosij Ghosh Katrijn Broothaerts	KU Leuven
EXPANSE	Roel Vermeulen Jelle Vlaanderen	Utrecht University
LONGITOOLS	Sylvain Sebert Teija Juola	University of Oulu
REMEDIA	Sophie Lanone Roberta Zanchi	INSERM

### European Commission

Name
Rita Araujo
Laia Quiros
Nerea Aizpurua

### Working Groups

Name	Affiliation
Eleanor Hyde	Metadata WG, UMCG, ATHLETE & LongITools
Evet-Ben van Veen Alma Besic	Ethics & Law WG, MLCF, HEAP
Ivonne Leenen	Communications & Dissemination WG, HEAL, ATHLETE





<b>Julianna Angelova</b>	
<b>Peter van den Hazel</b>	Communications & Dissemination WG, INCHEs, EQUAL-LIFE

## Update from Working Groups (WGs)

### Ethics & Law WG (Evert-Ben van Veen)

This WG has been addressing

Personal - anonymised data

Ethics WPs in the consortia

Working on a survey on ethics issues in cohorts and other data sources

Aims to bring light on how cohorts and consent are organized in Europe

Outcome will be available by the end of the year

Beyond EHEN projects – other cohorts and biobanks will be reached

Will brief to the network during the meeting 24<sup>th</sup> May

### Metadata WG (Eleanor Hyde)

See presentation

The metadata catalogue currently involves 6 projects already collaborating voluntarily

Other projects are welcome to join

There are different kinds of metadata projects and different ways to go about it, the effort is for interoperability catalogue

Need to consider that projects have different time windows and pace in harmonizing their data

This effort builds on LifeCycle\* and EUCAN-Connect and expanding, and is thus a wider European WG, not just limited to EHEN.

Some EHEN projects started in their own platform and don't have additional budget for this

To be discussed, possibly to add as WG topic in May

The expectation from the EU is not to have one platform, but an idea on how the platforms are interconnected and how the information is made available by the end of the cluster

Several projects that are not currently involved in the metadata catalogue expressed interest and will contact the coordinators of the WG.

### Communication & Dissemination WG (Ivonne Leenen)

See presentation

Next steps, important to consider what action to consider for EU Green Week (30<sup>th</sup> May - 5<sup>th</sup> June.

Options include:

Focus on profile papers combined with a summary of EHEN conference

Updating 2021 EHEN blogpost with new policy developments

Focus on innovation & what stakeholders can expect from EHEN results

Focus on HEAP June symposium (featuring speakers from the Network)

Input on this link to the Green Week and ideas are welcome

EQUAL-LIFE is preparing a WG session for the EHEN meeting in May

Working on a common stakeholder inventory Identifying stakeholder group is ongoing, and aim is to avoid double sharing to specific actors

Focus is on stakeholders at EU level, and not national or local level

At the time, will create one inventory, and will explore possibility of target sub-groups for

Policy dissemination

Next WG meeting is on 12 May



## Inventory of tools for EHEN website (Astrid, Roberta and Heather)

It will be in the form of a searchable database, where you provide input such as characteristics, categories of variables to select, i.e. stakeholders, external or internal exposome, outcome. Then will appear results with a short description and link to the tool on the specific projects pages  
Each project needs to provide a description and a link to the tool  
There is progress at the moment and they will do the best to make a demonstration in the EHEN meeting in May, but it depends how far the work is by the time of the meeting

## EHEN website

Request to add a short description of each of the WG and contact person for people outside the project  
Make public deliverables accessible on the website  
A call was made to think of ways to improve and regroup the website since it will be the long-term legacy of the network, suggestions are welcomed

## EHEN midterm review

Two deliverables will be re-opened to be updated  
Deliverable about the WGs in EHEN  
Deliverable about the Network Advisory Board  
The Commission will launch an EHEN midterm review for month 36 (December 2022)  
Projects will need to prepare a short, concise and to the point report with:  
Intro  
Description of individual projects  
Description of WGs  
Description of other actions in the cluster  
The evaluation is intended to coincide with the periodic review of projects  
Will also include the coordination handover deliverable  
Includes meeting with experts  
It was recommended that instead of looking for external experts, to use the Network Advisory Board for the review process  
A question was raised that the reporting period ends in month 36 (Dec. 2022) but projects have 2 months after to prepare a report, so they will be submitted in month 38 (end of February 2023)  
Rita will send an email about this report to clarify the process and what it entails

## Scientific meeting update

67 abstracts received and reviewed by the scientific committee  
The overall agenda was reviewed and a proposal for the final session discussed, which will be a panel with PIs and Network Advisory Board members reflecting on the year ahead.  
The event includes:  
Plenary, breakout sessions, WG sessions, and elevator pitches



Presentations can be made online, don't have to be in-person mode

The programme will give an opportunity to all the abstracts received

Each project will have a maximum of 30 persons attending in-person mode to the event, but online access will be provided to all the 9 project consortia

## Feedback from the Chemical Exposome and Public Health event

Martine presented EHEN at the "Chemical exposome and public health: a scientific challenge to be met within the framework of the European "One Health" strategy" led by French institutions in Belgium on 15<sup>th</sup> March.

The idea was to promote a French national initiative that brings together labs working on exposomics methods for chemical biomarker work. In the launching of this network, they included intervention from other initiatives in the field:

EHEN, HBM4EU, EIRENE, PARC (this will start in May)

The idea is to create links between initiatives and national hub efforts

## Exposome white paper to be written

On connecting molecular biology and big data to study the exposome

EHEN will be involved

Martine is involved on the European landscape

EU will discuss funding and policy

Martine will suggest to the main authors to consider EHEN PIs

Short contributions, 400 word per section

EC officer called for a description of EHEN to be included in the white paper.

## Project reports part B

**Action:** Rodney will follow up with each of the projects, to be uploaded at EDUUNI platform

## Funding call on global exposome coordination

Will be discussed at later stage with the PIs

An interim coordinators meeting will be arranged

Possibility on the 2<sup>nd</sup> day in the afternoon when the meeting ends

**Action:** Kim and Rodney will check with all PIs to see what are the schedules

Rita clarified that the text for the call is confidential and is still being drafted with National Contact Points of Member States and Commission services, so it may change and the decision on launching the CSA call is under consideration. It may not go through. If it does, it will not be launched until September.



## Annex 2: Program Conference 2022

EHEN SCIENTIFIC MEETING | 24 – 25 MAY | BARCELONA - Hybrid

PRBB building auditorium ([Barcelona Biomedical Research Park](#)), Dr. Aiguader, 88, 08003 - In [Google Map](#) (Need to enter through the building main entrance in Dr. Aiguader Street, which is opposite side to the beach)

Contact via whatsapp: Rodney Ortiz: +34691945832; Kim van Wijk: +31642966828

[CLICK TO JOIN PLENARY SESSION ON ZOOM](#)

Passcode: 933742

*(This link is for plenary the two days. For the breakout sessions, please follow the Zoom links in the programme below, they are for your convenience to choose)*

Please click to fill a brief survey about EHEN, which can also be found in the following link or QR [https://kuleuven.eu.qualtrics.com/jfe/form/SV\\_4TxicqDCHleNdP0](https://kuleuven.eu.qualtrics.com/jfe/form/SV_4TxicqDCHleNdP0)



### Programme:

Day 1 – 24 May 2022: Full day – 9:00-17:30h (CET)

9.00-10.30 Plenary – Chair: Irene van Kamp, EHEN Coordinator; Co-chair: Maria Foraster, EQUAL-LIFE

9.00-9.15 Welcome; Irene van Kamp, EHEN Coordinator  
Carmen Laplaza Santos, Head of Health Innovations & Ecosystems Unit, DG RTD, European Commission

9.15-9.55 WG updates (WG leaders – 15' each)  
▪ WG 1 – Communication and Dissemination  
▪ WG 2 – MetaData

Discussion

9.55-10.30 Project highlights (PI or other delegate – 10' each):  
▪ REMEDIA  
▪ HEDIMED  
▪ HEAP

10.30-11.00 *Coffee\**

11.00-12.30 Breakout sessions 1

*6 abstracts per session – title, author, EHEN project(s), institution(s) at the end of this document*

Session 1	Session 2	Session 3	Session 4
Exposome and respiratory and mental health Chair: Sophie Lanone, REMEDIA	Exposome statistical methods and fair data Chair: Sylvain Seibert, LongITools	Exposure assessment and sensors Chair: Roxana Merino Martinez, HEAP	Multi-omics and epigenomics signatures of the exposome Chair: Jelle Vlaanderen, EXPANSE
<a href="#">CLICK TO JOIN SESSION 1</a> <a href="https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlyY2RmUm52R0NMYlFJZz09">https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlyY2RmUm52R0NMYlFJZz09</a> Passcode: 933742	<a href="#">CLICK TO JOIN SESSION 2</a> <a href="https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09">https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09</a> Passcode: 706418	<a href="#">CLICK TO JOIN SESSION 3</a> <a href="https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09">https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09</a> Passcode: 159206	<a href="#">CLICK TO JOIN SESSION 4</a> <a href="https://us06web.zoom.us/j/84939229022?pwd=V3kzcEpXRXNuYV RiTnFFSGRPWxo3QT09">https://us06web.zoom.us/j/84939229022?pwd=V3kzcEpXRXNuYV RiTnFFSGRPWxo3QT09</a> Passcode: 777866
ROOM: Auditorium	ROOM: Marie Curie	ROOM: Charles Darwin	ROOM: Ramon y Cajal

12.30-13.30 *Lunch\**



13.30-15.00 Plenary – Chair: Peter Hoet; Co-chair: Jeroen Vanoirbeek, EXIMIOUS

Selected presentations:

1. *Early-life environmental exposures and blood pressure trajectories from childhood to early adulthood: a LongITools study.* Ana Goncalves Soares, LONGITOOLS, University of Bristol.
2. *Impact of air quality on respiratory and cardiovascular health: sub-city scale approach.* Libor Šulc, ATHLETE / EXPANSE, RECETOX.
3. *Cardiovascular disease risk prediction using machine learning and exposome predictors.* Angélica Atehortúa, LONGITOOLS, University of Barcelona.
4. *Equity considerations in interventions within Equal-Life: Development of a logic model framework for assessing the equity impacts of urban interventions.* Maddie White, EQUAL-LIFE, University of Bremen.
5. *Early-life urban exposome, brain structural connectivity and morphology in preadolescents.* Anne-Claire Binter, ATHLETE, ISGlobal.
6. *Identifying cleaning products associated with short-term work-related respiratory symptoms: a workforce-based study in domestic cleaners.* Steven Ronsmans, EXIMIOUS, KU Leuven.

15.00-15.30 Coffee\*

15.30-16.15 Elevator pitches – Chair: Léa Maitre; Co-chair: Jean-Baptiste Guimbaud, ATHLETE  
13 abstracts selected for the session – title, author, EHEN project(s), institution(s) at the end of this document

16.30-17.30 Working groups  
3 parallel WG meetings / workshops

WG1: Communication & Dissemination (Workshop)	WG2: Ethics & Law (Workshop)	WG3: Metadata (Open meeting)
Chair: Peter van den Hazel, Equal- Life	Chair: Evert-Ben van Veen, HEAP	Chair: Morris Swertz, ATHLETE, LongITools
<a href="#">CLICK TO JOIN WG 1</a> <a href="https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlya2RmUm52R0NMYlFJZz09">https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlya2RmUm52R0NMYlFJZz09</a> Passcode: 933742 ROOM: Auditorium	<a href="#">CLICK TO JOIN WG 2</a> <a href="https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09">https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09</a> Access code: 706418 ROOM: Marie Curie	<a href="#">CLICK TO JOIN WG 3</a> <a href="https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09">https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09</a> Passcode: 159206 ROOM: Charles Darwin

## 20.00h EHEN Cocktail Dinner\*

Restaurant: Xiroi Ca la Nuri, Passeig Marítim de la Nova Icària, 38, 08005 – ([In Google maps](#))

\*Coffee breaks, lunches and network cocktail dinner will be covered by ATHLETE and EQUAL-LIFE



Day 2 – 25 May 2022: Half day – 9:00-13:30h (CET)

[CLICK TO JOIN PLENARY SESSION ON ZOOM](#)

Passcode: 933742

*(This link is for plenary the two days. For the breakout sessions, please follow the Zoom links in the programme below, they are for your convenience to choose)*

9.00-10.30 Plenary – Chair: Martine Vrijheid, EHEN Coordinator; Co-chair: Serena Fossati 9.00-

9.20 WG updates (WG leader – 15')

- WG Ethics & Law

Discussion

9.20-10.30 Project highlights (PI or other delegate – 10' each)

- LongITools
- EXPANSE
- EXIMIOUS
- Equal-Life
- EPHOR
- ATHLETE

10.30-11.00 *Coffee\**

11.00-12.30 Breakout sessions 2

*6 abstracts per session – title, author, EHEN project(s), institution(s) at the end of this document*

Session 5	Session 6	Session 7	Session 8
Metabolome / proteome / microbiome signatures of the exposome Chair: Heikki Hyöty, HEDIMED	Exposome and cardiometabolic health Chair: Martine Vrijheid, ATHLETE	Interventions, stakeholders, citizen science Chair: Gordana Ristovska, EQUAL-LIFE	Occupational exposome Chair: Anjoeka Pronk, EPHOR
<a href="https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlyY2RmUm52R0NMYiJFZz09">CLICK TO JOIN SESSION 5</a> <a href="https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlyY2RmUm52R0NMYiJFZz09">https://us06web.zoom.us/j/81812070455?pwd=TURzTkRnWGlyY2RmUm52R0NMYiJFZz09</a> Passcode: 933742	<a href="https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09">CLICK TO JOIN SESSION 6</a> <a href="https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09">https://us06web.zoom.us/j/83603130239?pwd=ZC8zQmJ2bWdDL3d4dlhqc0tOMTM4Zz09</a> Passcode: 706418	<a href="https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09">CLICK TO JOIN SESSION 7</a> <a href="https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09">https://us06web.zoom.us/j/85895429378?pwd=WHFnSkhBMGxqMlZmNUFXUIBaazh3Zz09</a> Passcode: 159206	<a href="https://us06web.zoom.us/j/84939229022?pwd=V3kzcEpXRNUYV RiTnFFSGRPWxo3QT09">CLICK TO JOIN SESSION 8</a> <a href="https://us06web.zoom.us/j/84939229022?pwd=V3kzcEpXRNUYV RiTnFFSGRPWxo3QT09">https://us06web.zoom.us/j/84939229022?pwd=V3kzcEpXRNUYV RiTnFFSGRPWxo3QT09</a> Passcode: 777866
ROOM: Auditorium	ROOM: Marie Curie	ROOM: Charles Darwin	ROOM: Ramon y Cajal

12.45-13.30 Plenary - Moderators: Sammie Jansen, Augusto Anguita-Ruiz, Vasileios Miliadis

Panel discussion 9 PIs & NAB

- Added value of EHEN?
- Priorities for EHEN in the next year. Reflections of the NAB

Closure of the meeting (Martine Vrijheid, EHEN Coordinator)

13.30 *Lunch - networking\**

*\*Coffee breaks, lunches and network dinner will be covered by ATHLETE and EQUAL-LIFE*



## Working Group session descriptions

24 May - 16.30-17.30

### Communication & Dissemination:

How can I identify and map out my stakeholders? How can I best interact with my stakeholders and what level of participation can I expect from each stakeholder group? Come join the break-out session of Working Group 1 (Communication & Dissemination) to explore these and other questions on stakeholder engagement. We will introduce key concepts such as stakeholder analysis and engagement, and invite you to think alongside with us by participating in an interactive mobile phone session.

ROOM: Auditorium - [CLICK TO JOIN WG 1](#)

**Ethics & Law:** The Working Group on ethics and law will discuss ongoing work of members of the WG. First, there is a presentation about the legal possibilities of data exchange with the USA, including the newest developments at the EU level. Second, the results of exposome research could contribute to a further focus on preventive and predictive (public) health. The ethical aspects of detecting early health-related risk factors and predicting future health outcomes will be discussed. Finally, most cohorts for exposome research are based on consent of the participants. Yet, broad consent is challenged by the EU data protection law. We aim for alternatives which are doable for the cohort owners and launch the survey on participant facing governance of cohorts and explain its rationale.

ROOM: Marie Curie - [CLICK TO JOIN WG 2](#)

**Metadata:** The Working Group on metadata will discuss the following:

Updates from the four different subgroup leads

Omics: Roxana Merino Martinez, HEAP project

Chemical exposure: Richard Hulek, RECETOX project

Medical and clinical data: Justiina Ronkainen, LongITools project

Metadata catalogue: Morris Swertz, ATHLETE and LongITools projects

Plans for the metadata WG for the coming period: what do we want to achieve in the near future?

Short workshop in uploading data into the catalogue with the opportunity to do some uploading yourself (make sure you bring your laptop if you'd like to take part) – OR the opportunity to discuss with others in the group in smaller groups, as people see the need.

ROOM: Charles Darwin - [CLICK TO JOIN WG 3](#)

## Abstracts, listed per session

### BREAKOUT SESSIONS

24<sup>th</sup> May - 11.00-12.30 - Session 1 Exposome and respiratory and mental health

Chair: Sophie Lanone; Co-chair: Céline-Hivda Yegen, REMEDIA

- *Clusters of exposome components and their association with lung function evolution during the youth: methodological considerations for unsupervised analyses of ALSPAC and PELAGIE cohorts in the REMEDIA project.* Etienne Audureau, REMEDIA, INSERM.
- *Effects of physical activity, air pollution, and inhaled dose on lung function in 6-9 year-old children.* Sarah Koch, ATHLETE, ISGlobal.
- *Exposome approach in the REMEDIA project: a literature review to decipher the role of environmental factors involved in cystic fibrosis and chronic obstructive pulmonary disease.* Pascal Baptiste, REMEDIA, CHIC/INSERM.





- *Exposure to Green Spaces and Multiple Child Health Outcomes across Europe: an outcome-wide approach.* Amanda Fernandes, ATHLETE, ISGlobal.
- *Exposome, mental health and cognitive development among children and adolescents: conceptual and path models on potential mediators in Equal-Life.* Natalia Vincens, EQUAL-LIFE, University of Gothenburg.
- *Adverse outcome pathways on brain development: a bridge between epidemiology and toxicology research.* Ellen Hessel, ATHLETE, National Institute for Public Health and the Environment (RIVM).

## 24<sup>th</sup> May - 11.00-12.30 - Session 2 Exposome statistical methods and fair data

Chair: Sylvain Sebert, LongITools; Co-chair: Jean-Baptiste Guimbaud, ATHLETE

- *Comparison of exposome-based machine learning models for the diagnosis of neurodegenerative and neurovascular disorders.* Marina Camacho, LONGITOOLS, BCN-AIM laboratory, Mathematics and Computer Science Faculty, University of Barcelona.
- *Fairness and Bias Correction in Machine learning Based Prediction of Mental Illness: A Case Study in Adolescence.* Vien Dang, LONGITOOLS, Universitat de Barcelona.
- *Variable importance: a data-driven search for exposome features that affect child development.* Sanne Meijering, EQUAL-LIFE, RIVM.
- *Sharing and analyzing data using DataSHIELD Armadillo.* Morris Swertz, ATHLETE / LONGITOOLS, UMCg.
- *Non-disclosive federated exposome data analysis with DataSHIELD and Bioconductor in multi-cohort consortia.* Xavier Escribà Montagut, ATHLETE, ISGlobal.
- *HEAP FAIR Toolbox for exposome data management.* Patrick Nitsche, HEAP, Medical University of Graz.

## 24<sup>th</sup> May - 11.00-12.30 - Session 3 Exposure assessment and sensors

Chair: Roxana Merino Martinez; Co-chair: Helena Andersson, HEAP

- *Hyperlocal Variation of Nitrogen Dioxide, Black Carbon, and Ultrafine Particles measured with Google Street View Cars in Amsterdam and Copenhagen.* Jules Kerckhoffs, EXPANSE / LONGITOOLS, Institute for Risk Assessment Sciences.
- *Development of a generic correction method for low-cost PM sensors.* Sander Ruiter, EPHOR, TNO.
- *The urban exposome profile of Limassol, Cyprus: integration of biomonitoring data with drinking water and quality of life indicators.* Corina Konstantinou, EPHOR, Cyprus International Institute for Environmental and Public Health, Cyprus University of Technology.
- *Measuring urban greenspace accessibility from mobile settings.* Roos Teeuwen, EQUAL-LIFE, Delft University of Technology.
- *Monitoring exposures during pregnancy with frequently sampled wearable sensors.* Ville Pimenoff, HEAP, Tampere University.
- *Consumer data Collection in Denmark.* Frederik Trier Møller, HEAP, Statens Serum Institut.



24<sup>th</sup> May - 11.00-12.30 - Session 4 Multi-omics and epigenomics signatures of the exposome

Chair: Jelle Vlaanderen, EXPANSE; Co-chair: Nikos Stratakis, ATHLETE

- *Epigenome-wide study of exposure to green spaces and blood methylation.* Sofía Aguilar Lacasaña, ATHLETE, ISGlobal.
- *High- dimensional immune cell profiling of human blood cells using mass cytometry (CYTOF) after exposure to chemicals and/or particles & in occupational and autoimmune cohorts.* Evangel Kummari, EXIMIOUS, Norwegian Institute of Public Health.
- *Association between childhood exposure to non-persistent endocrine disrupting chemicals and multi-omic markers in a population-based child cohort.* Lorenzo Fabbri, ATHLETE, ISGlobal.
- *Multi-omics signatures of exposure to disinfection by-products in swimming.* Sonia Dagnino, EXPANSE / LONGITOOLS, Imperial College London.
- *Fetal exposure to a mixture of phthalates and bisphenols and DNA methylation at birth. An exploratory analysis in the Generation R Study.* Chalana Sol, ATHLETE, Erasmus MC.
- *The human neural progenitor test (hNPT) as in vitro assay to assess cellular features of developmental neurotoxicity caused by environmental toxicants.* Victoria de Leeuw, ATHLETE, National Institute for Public Health and the Environment (RIVM).

25<sup>th</sup> May - 11.00-12.30 - Session 5 Metabolome/proteome/microbiome signatures of the exposome

Chair: Heikki Hyöty; Co-chair: Olli Laitinen, HEDIMED

- *Optimization of two multiplexing technologies for the screening of antibodies against multiple microbes.* Olli Laitinen, HEDIMED, Tampere University.
- *“HPV-meta”: HPV detection in RNA sequencing data.* Laila Sara Arroyo Mühr, HEAP, Karolinska Institutet
- *Urine metabolome and chemical exposome of the HELIX-ATHLETE MoBA cohort: A case study of data repurposing from the HELIX European Children Cohorts.* Cristina Balcells, ATHLETE, Imperial College London.
- *Nature-based high-diversity microbiome exposure trial (PREVALL) for the prevention of IgE mediated allergy.* Aki Sinkkonen, HEDIMED, Natural Resources Institute Finland.
- *Childhood exposome: Environmental microbiota in urban and rural playgrounds.* Marja I. Roslund, HEDIMED, Natural Resources Institute Finland.
- *Development of new proteomics-based susceptibility biomarkers for assessing risk of developing mental health disorders in childhood and adolescence.* Katja Kanninen, EQUAL-LIFE, University of Eastern Finland.



## 25<sup>th</sup> May - 11.00-12.30 - Session 6 Exposome and cardiometabolic health

Chair: Martine Vrijheid; Co-chair: Serena Fossati, ATHLETE

- *Air pollution and obesity and physical growth from infancy to later childhood in 11 European birth cohorts.* Serena Fossati, ATHLETE, ISGlobal.
- *Metabolic biomarkers of diet quality in European children are associated with metabolic health.* Alexandros Siskos, ATHLETE, Imperial College London.
- *Nutritional modulation of associations between persistent organic pollutants during pregnancy and childhood obesity.* German Cano-Sancho, ATHLETE, ISGlobal.
- *Multi-layer molecular signatures of liver injury in European children.* Nikos Stratakis, ATHLETE, ISGlobal.
- *An exposome-wide association study on body mass index in adolescents using the National Health and Nutrition Examination Survey (NHANES) 2003-2004 and 2013-2014 data.* Nadine Haddad, EPHOR, Cyprus International Institute for Environmental and Public Health.
- *Profiling changes in the urinary metabolome of urban dwellers upon their short-term stay in a nearby cooler nature-based area during summer in Cyprus.* Konstantinos C. Makris, EPHOR, Cyprus University of Technology.

## 25<sup>th</sup> May - 11.00-12.30 - Session 7 Interventions, stakeholders, citizen science

Chair: Gordana Ristovska; Co-chair: Sonja Jeram, EQUAL-LIFE

- *Interventions to reduce endocrine-disrupting compounds from dietary intake and personal care products: a scoping review.* Tiffany Yang, ATHLETE, Bradford Teaching Hospitals NHS Foundation Trust.
- *Impact of the COVID-19 Pandemic and Associated Lockdown Measures on the Management, Health, environment and Behaviour of the Cystic Fibrosis Population in France During 2020 (MUCONFIN).* Ralph Epaud, REMEDIA, Centre intercommunal de Créteil.
- *Perceptions among primary school children during urban school travel: Photovoice results from a co-produced intervention study.* Mònica Ubalde-López, ATHLETE, ISGlobal.
- *"We care about clean air": harnessing school-age citizen scientists to identify patterns of exposure to pollution and co-producing opportunities for change.* Tiffany Yang, ATHLETE, Bradford Teaching Hospitals NHS Foundation Trust.
- *Connecting science with policy through stakeholder's involvement for better mental health of children.* Gordana Ristovska, EQUAL-LIFE, Institute of Public Health of Republic of North Macedonia.
- *Moving from exposome science to intervention practice: digital toolbox creation to support activities in the field of children's mental health and cognitive development.* Anna Sandionigi, EQUAL-LIFE, Quantia Consulting.



25<sup>th</sup> May - 11.00-12.30 - Session 8 Occupational exposome

Chair: Anjoeka Pronk, EPHOR; Manosij Ghosh, EXIMIOUS / EPHOR

- *Inventory of European cohorts with information on occupational exposures. A first step towards the EPHOR mega cohort.* Michelle Turner, EPHOR, ISGlobal.
- *Knowledge gaps in associations between occupational exposures and their health effects: inform priority setting.* Karina Undem, EPHOR, National Institute of Occupational Health, Norway (STAMI).
- *Self-sampling techniques for monitoring the internal exposome as part of the EU EPHOR project.* Eline Verscheure, EPHOR, KU Leuven.
- *The pre-conceptional and early pregnancy occupational exposome: preliminary analyses in the NINFEA birth cohort.* Antonio d'Errico, ATHLETE, Cancer Epidemiology Unit, University of Turin.
- *Artificial Intelligence for exploring associations between occupational exposures and autoimmune disease.* Alessandro Ranieri, EXIMIOUS, Biogenity.
- *Association between markers of inflammation and exposure to endotoxin as measured using different methods.* Anne Mette Madsen, EXIMIOUS, The National Research Center for the Working Environment.

24<sup>th</sup> May - 15.30-16.15 - ELEVATOR PITCH SESSION

Chair: Léa Maitre; Co-chair: Jean-Baptiste Guimbaud, ATHLETE

- *METHOD & DESIGN: How to simulate realistic episodes of atmospheric pollution at the laboratory for exposome studies purposes.* Juan Camilo Macias Rodriguez, REMEDIA, LISA UMR CNRS 7583.
- *Evaluation of the combined effect of exposure to air pollution and noise in pulmonary manifestation of cystic fibrosis disease.* Céline-Hivda Yegen, REMEDIA, Institut Mondor de Recherche Biomédicale (IMRB)- Inserm U955.
- *Prenatal exposure to air pollution: a susceptibility factor to develop Chronic Obstructive Pulmonary Disease (COPD)?* Zhuyi Lu, REMEDIA, The Mondor Institute for Biomedical Research (IMRB, U955 Inserm - Université Paris Est Créteil, UPEC).
- *Co-accessibility of public spaces: Towards age-inclusive and accessible public spaces.*
- Vasileios Miliadis, EQUAL-LIFE, Delft University of Technology.
- *Designing an exposome indicator for sleep as a mediator for mental health in children and its development.* Dick Botteldooren, Equal-Life, Ghent University.
- *Assessment of occupational exposure to styrene in a Fibreglass Reinforced Plastics Industry.*
- Rani Claus, EXIMIOUS, KU Leuven.
- *Stability selection for enhanced variable selection and graphical models: methodological developments, simulation study and real data applications.* Barbara Bodinier, EXPANSE / LONGITOOLS, Imperial College London.
- *First 1,000 days of life exposure using monthly Land Use Regression model for longitudinal birth cohort ELSPAC.* Ondrej Mikes, ATHLETE / EXPANSE, RECETOX.
- *Exposures and the epigenome: linking the environment with inherited risk factors.* Chiara Herzog, HEAP, Universität Innsbruck.

- *Genetic regulation of newborn telomere length is mediated and modified by DNA methylation.* Congrong Wang, ATHLETE, Hasselt University.
- *Modulation of fruit microbiome by food processing and horticultural practices.* Wisnu Adi Wicaksono, HEDIMED, Graz University of Technology.
- *Exposure to silica: what does biomonitoring tell us?* Chiara Longo, EXIMIOUS, Université Catholique de Louvain.
- *Microbiota-associated metabolites influence integrity of the blood–brain barrier.* Lesley Hoyles, ATHLETE, Nottingham Trent University.