



ISES Europe

Regional Chapter

Advancing Exposure Science in Europe – today's results for a safer future

Summary Report of the fourth European Exposure Science Workshop

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ISES Europe Report

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Workshop Report of the Europe Chapter Workshop 2024

Advancing Exposure Science in Europe – today's results for a safer future

International Society of Exposure Science

19–21 March 2024, Berlin

Exposure science is essential to assess possible health or environmental risks in the different regulatory and non-regulatory frameworks. As with all parts of our lives, exposure science has also been challenged in recent years, e.g., by climate change, by growing industrialisation or by technical enhancements, especially connected to artificial intelligence. The 2024 annual workshop of ISES Europe brought together scientists from all fields of exposure science (dietary exposure, occupational exposure, environmental exposure, consumer exposure, radiation exposure) to share new approaches and results addressing those challenges and contributing to today's results for a safer future.



Program and abstract book

The program, the abstract book and additional information about the workshop are documented on the homepage of the BfR Academy. The information is available for download

Workshop Homepage of the BfR Academy:

<https://www.bfr-akademie.de/english/archive/2024/ises2024.html>

Abstract book:

https://www.bfr-akademie.de/media/wysiwyg/2024/ises2024/abstracts_ISES2024.pdf (DOI: [10.17590/20240502-092320-0](https://doi.org/10.17590/20240502-092320-0))

Program:

https://www.bfr-akademie.de/media/wysiwyg/2024/ises2024/programme_ISES2024.pdf,
appendix (information on parallel oral and poster sessions)

https://www.bfr-akademie.de/media/wysiwyg/2024/ises2024/programme_appendix_ISES2024.pdf

ISES Europe introduction

After previous successful ISES Europe Chapter meetings in Dortmund, Bilthoven and Ispra, the next milestone was our workshop in Berlin. With this series of regional meetings in Europe we are shaping a scientific community and a strong position for exposure science in Europe.

With the great support of the local organising committee and the generous offer for using the facilities at BfR we have been able to organise an inspiring meeting. The scientific programme was well organised by a large group of active ISES Europe chapter members and offered excellent opportunities for presentation and interaction.

The student and new researcher's programme offered good networking opportunities for early career researchers to get to know each other. The awards ceremony clearly showed that we have young talents in our group which holds a promise for the future.

The strategy for exposure science and the roadmap for the further development of the field of exposure science in Europe 2020-2030 offer guidance to achieve our goals. With the engagement of the new ISES Europe Chapter board and working groups, the necessary steps will be taken to move forward with the agreed prioritised topics.

With this event we have given ourselves a push to 2025 in Lisbon for the next opportunity to meet all of you again!

Paul Scheepers

President ISES Europe Chapter

ISES Europe 2024 Participation

The workshop was attended by a wide variety of exposure scientists from all over Europe. Also, guests from the United States and from Taiwan were welcomed in Berlin. Overall, 135 participants from academia, authorities, consultants and industry attended the workshop on the BfR premises (see figure 1), 6 participants attended online.

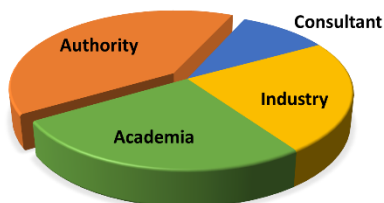


Figure 1 Participants on the BfR premises in Berlin-Marienfelde

Statistical data about the workshop

Some information about the different aspects of the workshop are summarised in the figures below (figures 2 – 4).

Where are they coming from?

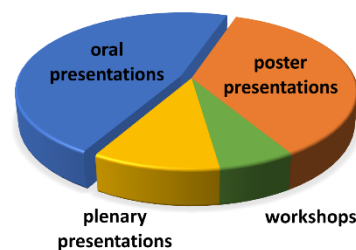


scientific contributors

- Academia 26 %
- Authorities 40 %
- Consultant 10 %
- Industry 23 %

Figure 2 Professional background of the participants

What are they doing?



94 scientific contributions

- Posters 34, including 5 in the student competition
- Workshops of the ISES Europe Working Groups: 6
- Oral presentations in parallel sessions: 44
- Plenary presentations: 11

Figure 3 Various scientific and strategic contributions to the workshop

The largest group of participants came from public authorities (40%) followed by participants from the university sector (academia, 26%), industry (23%) and consulting companies (10%) (see figure 2). During the workshop, participants contributed differently to the scientific program. It is worth mentioning that that the strategic contributions were less relevant during this workshop than during the first three ISES Europe Workshops. Therefore, it was possible to attach higher importance and priority to the scientific contributions and therefore more time was given to them (see figure 3).

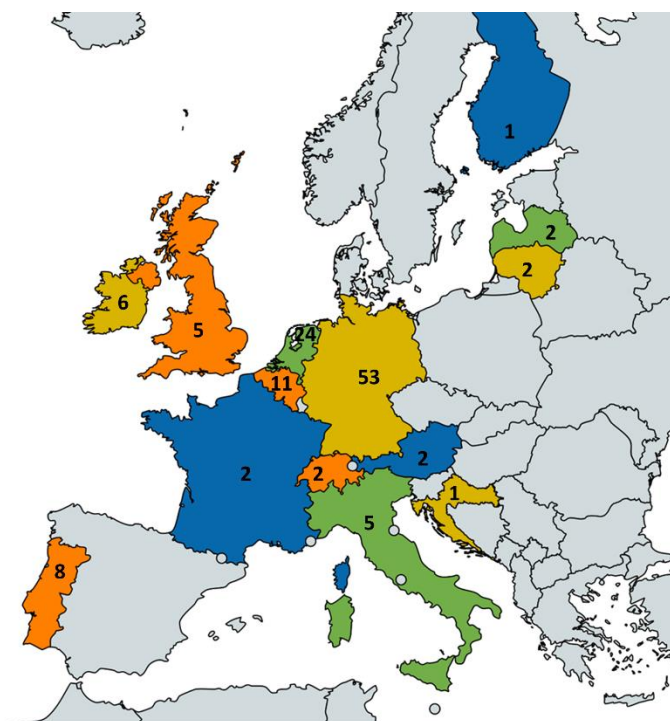


Figure 4 Geographical distribution of the European participants, non-European participants are not included in this figure (created with mapchart.net)

Most of the participants were from Germany, followed by Dutch scientists and colleagues from Belgium. Surprisingly, only a few or no participants came from Northern Europe and Eastern Europe (see figure 4). In the future, ISES Europe will try to attract exposure science colleagues from these countries to participate in the ISES Europe workshops.

Keynote Summaries

During the workshop, four outstanding scientists presented different aspects of exposure science as keynote lectures. These keynote lectures covered the role exposure science in a circular economy, research activities of the hosting institute regarding consumer exposure, exposure to biological agents and exposure data quality.

Exposure Science in a Circular Economy. What are we circulating?

Paul T.J. Scheepers, Radboud University, Nijmegen, The Netherlands

The concept of a circular economy is one of the cornerstones of the plan to achieve the sustainability goals. This policy is implemented by circulation of materials to secure an efficient use, reducing waste streams. This would lead to a more efficient use of natural resources and a reduced reliance on non-renewable feedstocks. From an economic perspective this increases efficiency.

The concept of circularity has gained traction triggering innovative technology solutions. The public embraces this concept as a principle observed in nature itself and individuals become engaged and apply it to their own households, communities and businesses.

In this contribution the focus will be on materials that are labelled as hazardous to humans and the environment. Most of these materials are now increasingly being re-used in an attempt to close the circle by reducing waste streams of these chemicals.

Some examples illustrate how difficult it can be to achieve true circularity for some hazardous materials such as in mining of metals and fossil fuels. Another example is the processing of electronic waste (e-waste). Loose ends with emissions to the environment may become a potential threat to human health and the environment if operations are not well engineered and supervision by authorities is not adequate. An attempt will be made to identify the challenges for exposure science, related to production, use and reuse of hazardous chemicals in electronic consumer products.

Consumer exposure research for a targeted European chemicals regulation (REACH)

Astrid Heiland, German Federal Institute for Risk Assessment, Berlin, DE

Consumer behaviour surveys are suitable for determining exposure parameters such as use frequency, amount of product used, and exposure/application time. They are also essential to gather information surrounding the application, the specific habits of consumers, the awareness of use instructions and safety measures implemented by the manufacturer. However, it is challenging to enquire about the information in a way that reliable results are obtained. Therefore, a feasibility study of consumer behaviour was initiated in 2016 to assess the usefulness of different survey methods depending on six sentinel consumer product types. Taking these results into account, the BfR conducted further studies on consumer patterns especially in the DIY sector as there is a particular lack of data in this area. The data makes it possible to update the current exposure defaults in fact sheets and exposure modelling tools, to define new exposure scenarios for consumer products conquering the market, e.g. with new (advanced) materials or compositions, to review the efficiency of already implemented risk management measures, and tailored regulatory actions.

Assessing biological exposures in the omics era

Lidwien Smit, Utrecht University, Utrecht, NL

Traditionally, the environmental and occupational health field has placed emphasis on chemical pollutants and the risk of non-communicable diseases, such as cancer and non-malignant respiratory diseases. Despite the significant public health impact of exposure to both infectious and non-infectious biological agents in residential, school, and work environments, the exposure science and occupational safety and health communities have devoted relatively little attention to the biological exposome. However, several developments are changing the landscape. The COVID-19 pandemic has reinforced the need to protect individuals from exposure to bioaerosols, while another major development in the field is the increasing use of molecular methods to assess the microbiome and virome in human and environmental samples.

Evaluating bioaerosol exposure risks is a complex task due to the dynamic and diverse nature of bioaerosols, limitations of available measurement methods, and the absence of environmental and occupational exposure limits. Several recent examples of studies, showcasing innovative bioaerosol measurement and modelling techniques and their application in exposure assessment and epidemiological studies are presented. Differences and similarities between chemical and biological exposure assessment addressed. Ultimately, biological exposome research should help to elucidate exposure-response relationships, leading to improved risk assessment and prevention.

Strengthening data quality and exploring new data streams to face future challenges in exposure assessment

Bruno Dujardin, European Food Safety Authority (EFSA), IT

Since its establishment in 2002, EFSA has acquired robust expertise in the field of dietary exposure, one of the key components of chemical risk assessment in food. This has resulted in the building of the Comprehensive European Food Consumption Database and a wealth of chemical monitoring data in food have been collected for a wide range of chemical compounds. These advancements have played a crucial role in building the risk assessment capacity in the EU, but continuous improvements are needed to address new social and scientific challenges.

There is an increasing demand for scientific risk assessment that is faster and more accurate, while ensuring a high level of consumer protection. Depending on the chemical domain, concerns may be raised for subpopulations with specific dietary needs, e.g., in the area of nutrition and food additives, or risk managers may also call for increased level of protection, e.g., exposure estimates covering up to 99.9% of the population for the risk assessment of pesticides (as opposed to 95% in other chemical domains). To address these challenges, a continuous improvement of the data quality will be key, and several activities in this remit are already ongoing. Furthermore, there will be a need to explore new data streams that will complement the data already collected by EFSA. A project investigating new opportunities regarding monitoring and surveillance data for chemicals has therefore been recently initiated.

Student Events

During the ISES Europe 2024 workshop several activities were specifically planned for students and new researchers in the field of exposure science. These activities included a student poster competition and a walking tour in the city centre of Berlin.

Student Poster Competition

The European Chapter of the International Society of Exposure Science held its first student poster competition during the ISES Europe 2024 workshop. This was a very successful event, and there were three winners. It is worth mentioning that besides chemicals, other types of stressors and their exposure to humans were presented in this student poster competition. As a matter of fact, indeed, the first and second place in the competition presented non-chemical stressors. It is planned that these non-chemical stressors should play a bigger role in ISES Europe in the future.

1st Place: Watch the power! Monitoring of magnetic fields from high-voltage power lines. (P2 - 4.2.4)

We designed a novel sensor that can measure 50 Hz magnetic fields. The sensor is needed to accurately quantify the long-term magnetic exposure in the vicinity of high voltage power lines. The sensor can measure both low fields, around 0.4 μT , for which a possible statistical relationship to long-term exposure and health effects is found and, high fields, 100 μT and 200 μT , which correspond to reference levels set by EU and scientific community. Such a sensor was tested for about 4 months, in which it had a high uptime of 96% and a typical deviation of less than 5% with regard to the baseline.

Kenneth Deprez

Ghent University/ IMEC-WAVES,
Ghent, BE



Kenneth Deprez received the M.Sc. degree in electronics and information and communication technologies (ICT) engineering technology from Ghent University, Ghent, Belgium and is currently

pursuing the Ph.D. degree with the Wireless, Acoustic, Environment and Expert Systems (WAVES) Group, Department of Information Technology.

2nd Place: Assessing microbial contamination and particulate matter exposure in Portuguese poultry facilities (P3 - 4.3.2)

The prevalent airborne microorganisms in animal production facilities are poorly described in terms of quantity, composition, and risk category. This study aims to characterize microbial contamination in poultry pavilions using a multi-approach protocol for sampling and analyses. Samples will be collected weekly from each pavilion, following birds growth cycle, during two seasons. Indoor air, bedding material and feed samples will be collected. Dust will be collected from surface swabs and electrostatic dust collectors. In addition, particle concentration measurement and environmental parameters will be registered. The expected results will help determine potential sources of microbial contamination, characterize the risk associated with exposure, and identify priority areas for action to mitigate microbial exposure.

Bianca Gomes

Universidade de Lisboa, Lisbon, PT
and Escola Superior de Tecnologia e Saúde (ESTeSL), Lisbon, PT



Bianca Gomes, is a PhD student in Sustainability. She completed her master's degree in Human Biology and Environment in 2021 with distinction. Bianca is a researcher at two Portuguese Research Centers and has participated in national and international projects on microorganisms, air quality, food safety, and resistant mycobiota. Currently, as a PhD student, her research focuses on describing microbial exposure in poultry environment from a One Health perspective, with the aim of extending the study to different areas such as microbiology, global health, epidemiology and sustainability.

3rd Place: Characterising exposures to neonicotinoid insecticides in Ireland (P6 - 4.6.3)

Neonicotinoid insecticides and neonicotinoid-like insecticides (NNIs) are the most widely used insecticides worldwide. The EIRE 'neonicotinoid Insecticide exposures' project aims to characterise exposures to NNIs among Irish families using a human biomonitoring strategy. Urine samples (n=227) were analysed for seven major NNIs (imidacloprid, acetamiprid, thiacloprid, thiamethoxam, clothianidin, flupyradifurone, and sulfoxaflor) and nine of their metabolites and 76% of the study population exposed to at least one NNI. However, all exposures were less than 0.1% of the Acceptable Daily Intake (ADI). The EIRE project has indicated widespread exposure to NNIs among the general Irish population.

Darragh M. Doherty

University College Dublin, Dublin, IE

Darragh Doherty is a PhD student working in the Conway Institute in University College Dublin. Darragh graduated from the University of Galway in 2022 with a BSc in Biomedical Science, specialising in pharmacology. His research focuses on conducting environmental and occupational human biomonitoring studies of pesticides in Ireland.



There were cash prizes across the awards, and each of the winners received a one-year student membership with the International Society of Exposure Science (ISES) to assist with their career progression.

Additional Student Events

For new attendees, attending ISES Europe workshops for the first time and at the beginning of their career the student representatives in the Scientific Committee organised a “New Attendee Gathering” on the first day of the workshop. This gathering facilitated the on-boarding of students and new researchers into the exposure science community.

An additional event for students and new researchers was a walking tour in Berlin City Centre. This offered the opportunity to get to know each other in a informal environment and simultaneously enjoy the vibrant atmosphere of Berlin.

Poster Guided Tours

Not only for students and new researchers but for all poster presenters guided tours to posters were offered to the workshop participants. In 7 guided tours, guides from the BfR visited the different thematic sessions present in the poster presentation:

- P1: Food and dietary exposure and other exposure related topics
- P2: Innovative technologies and monitoring
- P3: Workplace, public spaces, airborne exposure
- P4: Food and dietary exposure
- P5: Advances in exposure modelling
- P6: Progress in data generation for refined exposure assessments
- P7: Advances in exposure modelling II and
- P8: New developments for mixture exposure assessment

These guided tours guaranteed a much higher attention to poster presenters than usually in achieved during scientific conferences. The poster presenters had usually an audience of 10 to 20 workshop participants.

ISES Europe Cross Collaboration Session

Alison Conolly provided a presentation on general key findings and questions & challenges identified during the workshop, both for ISES Europe as scientific society but also for exposure science in Europe.

Exposure Science Terminology

The use of aligned and standardised terminology in exposure science is crucial for interpretation and ensuring the appropriate message is delivered. It reduces ambiguity and allows for more straightforward comparisons across studies. Though numerous relevant glossaries currently exist, there are variations across them, and many are not focused specifically on exposure science.

The ISES Europe Education, Training and Communication working group have been working on harmonising this terminology since 2018 (Heinemeyer, G. et al. 2022¹), and is currently with a cross-collaboration with other working groups to develop the next iteration that will contribute to their online glossary (<https://ises-europe.org/exposure-science-glossary-terms-ises-europe-chapter-statement>).

The group will continue these efforts to build the exposure science glossary and has identified a need for more expertise across disciplines due to the inter-/multi-disciplinary nature of exposure science.

¹ Heinemeyer, G., Connolly, A., von Goetz, N. et al. Towards further harmonization of a glossary for exposure science—an ISES Europe statement. *J Expo Sci Environ Epidemiol* 32, 526–529 (2022).
<https://doi.org/10.1038/s41370-021-00390-w>.

Training Courses

The ISES Europe Education, Training and Communication working group are also currently working on developing learning materials to contribute to their certification process. These materials are to provide information on the minimum information requirement that certified exposure sciences should know across a number of domains understood as exposure scientists.

The ISES Europe board will seek experts to contribute to the development of exposure science videos and to join the evaluation team that reviews exposure scientists' portfolios submitted for certification.

Funding Opportunities

ISES Europe has identified the need for funding to grow the European Chapter and also to contribute to the activities being conducted via the working groups. The board have suggested that there is a possibility of developing a working group focused on identifying funding opportunities and working with key members across the working groups to apply for these funding opportunities. This position remains open, and there will be a call for volunteers to work on this initiative.

Another funding opportunity could be to increase the number of institutional memberships across Europe and make their institutions' logos more prominent on the ISES Europe website. To date, the European Chapter has five institutional memberships with ISES.

Key Challenges

Communication

One of the main challenges facing the ISES Europe board is maintaining the website, utilising it to maximise impact, and communicating materials to the wider community.

Formerly, the technical secretary used to assist with the website, but this option is no longer available for the chapter. The board is seeking volunteers who could assist with updating the website and further technical assistance to utilise the website for the working groups, as there are restricted access areas on the website that could be used for storing materials. There is a potential that volunteers, e.g. student members or IT units in companies/institutions, could assist.

Suggestions have been to use the ISES Global website, but this would mean removing our Chapters website. Other options being discussed are to pay someone to do casual work updating the website but this would require financial support.

Seeking volunteers

One of the working groups, the Data Analytics and Repositories, has been dormant for over a year. Though we have a sufficient list of willing participants and an identified need and strategy (Kosnik, M. et al. 2022²) for this working group, there is currently no working group chair.

The ISES Board are seeking someone to lead this initiative and if you are interested, please contact the board.

Summaries from the Working Groups

Data and Analytics working group: Alison Conolly (as substitute for a missing chair)

There is an interest in the Data Analytics and Repositories group, but a chair is missing. That is the reason why this working group has been dormant for over a year. Though a sufficient list of willing participants for this working group is available and an identified need and strategy for this working group.

Three key messages are identified for the Data Analytics and Repositories group

- Transparency and availability of data is a key requirement for exposure science.
- Harmonization of data would be necessary in order to make better use of exposure data.
- A case study would be needed for the working group to initiate new activities.

Model working group: Urs Schlüter (chair)

The working group is still in alignment with the goals set in the strategy paper (Schlüter, U. et al. 2022³) and is pursuing the action plan that was developed as a concretisation of the strategy. This includes three active sub-groups in the working group.

Collaboration also outside ISES Europe is needed, such as PARC, Expo Advance, etc., in order to increase the impact of the strategy.

ISES should be a place where all stakeholders can participate, incl. industry. The working group wants to be a platform for open discussion of all aspects of exposure modelling.

It is an important message of the working group to all stakeholder that exposure modelling is not the last option, it is a key tool in risk assessment. This needs to be communicated to all stakeholders,

² Marissa B. Kosnik, Stylianos Kephelopoulos, Amalia Muñoz, Nicolò Aurisano, Alberto Cusinato, Sani Dimitroulopoulou, Jaroslav Slobodnik, Jonathas De Mello, Maryam Zare Jeedi, Claudia Cascio, Andreas Ahrens, Yuri Bruinen de Bruin, Lothar Lieck, Peter Fantke, Advancing exposure data analytics and repositories as part of the European Exposure Science Strategy 2020–2030, *Environment International*, 170, 2022, 107610, <https://doi.org/10.1016/j.envint.2022.107610>.

³ Schlüter, U., Meyer, J., Ahrens, A. et al. Exposure modelling in Europe: how to pave the road for the future as part of the European Exposure Science Strategy 2020–2030. *J Expo Sci Environ Epidemiol* 32, 499–512 (2022). <https://doi.org/10.1038/s41370-022-00455-4>.

especially the political level and the decision-making level in order to improve the acceptance of exposure modelling. Therefore, a good collaboration with the policy working group is necessary.

Education, Training and Communication (ETC) working group: Alison Conolly (chair)

There is a lot of support for an ES certification system for practicing exposure scientist. During the workshop, there was a lot of interest in developing a framework for a 'Exposure Scientist Certification'. To achieve these goals, it will be essential to identify the people, companies and institutions that would be interested in such an initiative and whether these respective groups would utilise such a system for their recruitment strategies (i.e., highlight that one of the desirable criteria would be for potential candidates to have an exposure scientist certification).

Additionally, it was identified that there is a need for experts to develop this framework, create learning materials and examination materials and for experts to review portfolios for prospective candidates for certification.

There is a need to develop ES courses and to seek funding for the development

The need for exposure science expertise across many institutions, research and policy bodies is becoming more and more evident and providing educational programmes to create the next generation of exposure scientists has been identified as a need. Creating a postgraduate programme with learning outcomes mapped to the European Qualifications Framework (EQF) will be essential but also requires expertise and funding to fulfil such an ambition.

Harmonization of terminology is key

The harmonisation of exposure science terminology is essential for scientific publications, guidance documents, outreach and dissemination and contributing to the policy to science initiatives, and this work will continue with the chapter and requires expertise from a range of exposure scientists within different remits (i.e., legislation, research, industry etc.).

Human Biomonitoring (HBM) working group: Maryam Zare Jeddi (chair)

The working group on HBM considers it necessary to better collaborate with external parties, such as PARC, Exposome (e.g., EPHOR project <https://www.ephor-project.eu/>) and others. It is important that HBM becomes an easy and simple tool also for occupational hygiene. To achieve this the development of a communication protocol is deemed necessary and beneficial.

More targeted HBM programmes are necessary.

Within ISES Europe a close collaboration with the following working groups shall be achieved: Data and Analytics working group. This is relevant in particular for the HBM data subgroup, ETC working group and the Model working group, especially about the question on how to combine PBPK modelling and HBM data.

Policy working group: Jos Bessems (chair)

Jos has been appointed as new chair of the working group. In the meeting during the workshop there was energy to reinitialize the working group. The meeting was attended by approximately 20 people in person.

However, additional members for the working seem necessary. Therefore, a call is directed to all ISES members to ask for new members for the policy working group.

The working group identified the following key messages for the future work:

In order to showcase that exposure science can be utilized to inform EU policy making it is important to have relevant exposure information available during the crucial entry points into the policy cycle (see e.g., REACH Authorization and Restriction).

AOB

A lack of participants from the European Commission and relevant EU institutions was observed at the Workshop. To this end it was also proposed to invite (keynote) speakers from these institutions during the next workshop/conference.

The key message of ISES Europe need to be better communicated: Exposure science should be promoted as a solution provider, currently it is often and unjustly perceived as too complex and too time consuming.

Actions

The following actions points were identified during the session about the summaries from the working groups:

- The ISES Europe board shall look for support for the ISES Europe website
- There is a general call for:
 - Data and Analytics working group chair
 - Policy working group members
 - Expert reviewers for ES certification
- ISES Europe shall consider the establishment of a Funding working group that can systematically look for additional funding opportunities
- Invite members of European Commission and the EU institutions as speakers to next workshop
- Improve collaboration with external parties, such as PARC (and others). It was proposed that this should be done via the Policy working group.

- Promote Exposure Science better as a solution provider by more simple and improved communication.
- Reach out to companies/institutions to see if an Exposure Science certificate would be of help to hire experts in this field

ISES Europe Chapter Membership Meeting

Participants

Approximately 50 in the room and 7 online

Welcome

The President welcomed the members on site and online. All members of ISES Europe received a personal invitation to attend this membership meeting with the agenda and a link provided to connect online for those who were not able to come to Berlin in person. If such personalised invitation was received by e-mail this confirms the membership of ISES Europe Chapter and the right to vote for proposals during this meeting.

ISES Europe bylaws (for approval)

Over the past two years a proposal for new bylaws was prepared by the ISES Europe Board. These new bylaws substitute the bylaws of 2017 that supported establishing ISES Europe as an informal association. New bylaws were needed regarding requirements for associations also in line with new EU rules, including banking and financial rules. The new bylaws have been prepared in collaboration with ISES Global to ensure that the new bylaws are in line with the agreed collaboration between ISES Global and the regional chapters. The President expresses his gratitude for the financial support received from ISES Global to cover the expenses of a legal notary lawyer.

The proposal for the new bylaws was sent to the ISES Europe members in December 2023 and was discussed during an online meeting on January 24th 2024, to which all ISES Europe members were invited. A recording of this meeting is available on the member pages of the ISES global website. The Board received no proposals for changes. This proposal is now submitted for approval.

The President presented the most important changes: the official and short name of the European chapter, the definition of Europe as a geographical region, an extension of the board from five to eight members, introduction the system of president-elect and past-president (also used by ISES Global), next to the acting president (for reasons of work continuity).

In the future, the board has proposed to establish ISES Europe as a European cross-border non-profit organisation. Then, ISES would no longer be dependent on a member state for its registration and bank account (currently the Netherlands). The implementation of this plan has not yet been completed and could take a few years. The Board will study this option to see if there are benefits.

During the meeting, Radu Duca suggested extending the board membership term by one year, allowing the board members to be elected for three-years with only one extension of three years (instead of a two-year term with the option to renew after two and four years). The Board prefers to have a renewal of board membership to be proposed to and approved by the membership meeting every two years as this seems to be an acceptable compromise between continuity of the ISES Europe board and an acceptable commitment of two years.

There were no more questions or proposals for changes to the proposal of the bylaws. The proposal was accepted by acclamation (no objections or abstentions noted).

Current and proposed new board members (for approval)

The following board members would like to continue as board members for another term: Paul T.J. Scheepers (President), **Jos Bessems** (Treasurer), **Alison Connolly**, and **Urs Schlüter (General board members)**.

Following the nominations and ballots received during the online elections for the ISES Europe Chapter board membership, the following candidates were proposed to be assigned as new general board members for a two-year term: **Gerald Bachler**, **Karen S. Galea** and **Susana Viegas**. Additionally, **Sewon Lee** was proposed as the early career representative board member for a term of two years.

An van Nieuwenhuysen will step down from the Board. The President thanks her for her contributions on behalf of the board.

The President also would like to thank Sarah Dee for her continuous support of the board. She acted as technical secretary and organised board meetings, membership communications, and elections and contributed to providing continuous updates on the ISES Europe chapter website.

The President asked the membership to take a vote on the dismissal of one board member, renewal of the board membership with four persons and assignment of four new board members. The proposal was accepted by acclamation (no objections or abstentions noted).

On the new board, the tasks of secretary and chapter delegate will be assigned. The Board is interested in candidates who would take the role of treasurer. The Board also accommodates board members to step down from the board in 2025 with the intention to remain involved as working group chairs. In addition to these positions, the board is interested in candidates interested to become the new treasurer or president. The Board plans to organise new elections that will be scheduled for 2025. Any candidates interested in nominating themselves for these open positions are invited to contact the Board.

Finances and audit committee (for approval)

The Treasurer gave an overview of the current financial status. In line with the new bylaws, the Board proposed to assign an audit committee of two members for checking the ISES Europe administration for 2024. They will be asked to report on their findings after they have completed their work early 2025.

The President asked the membership to take a vote on the assignment of Sophie Ndaw and Wouter ter Burg as members of the audit committee. The proposal was accepted by acclamation (no objections or abstentions noted).

Other business / questions

There were no further business and there were no further questions.

Closure

The President thanked the members on site and online for their participation.

Main messages from the workshop

During different sessions, including the scientific sessions (key notes, parallel oral sessions, poster presentations) and the strategic sessions (working group meetings, chapter membership meeting) a couple of key messages have been identified:

- All ISES Europe working group identified topics for cross-collaboration between the working group. Therefore, a closer collaboration is considered sensible and necessary.
- At several occasions during the workshop a better collaboration with external parties, such as PARC, Exposome initiatives (e.g., EPHOR project <https://www.ephor-project.eu/>) and others, was suggested in order to make better use of resources and avoid unnecessary duplication of work.
- A lack of participants from the European Commission and relevant EU institutions was observed at the workshop. It was also proposed to invite (keynote) speakers from these institutions for the next workshop.
- A lack of participants from a couple of European countries (especially countries in northern and eastern Europe, France and Spain) was observed at the workshop. ISES Europe will try to attract exposure science colleagues from these countries to participate in the ISES Europe workshops.
- It is planned that non-chemical stressors should play a bigger role in ISES Europe in the future. The board shall investigate if a working group for exposure to biological agents and physical stressors should be established.

- The ISES Europe board are seeking someone to lead the data repositories and analytics working group. Everybody who might be interested in this should contact the ISES Europe board.
- The key message of ISES Europe needs to be better communicated: Exposure science should be promoted as a solution provider, currently it is often and unjustly perceived as too complex and too time consuming.
- ISES Europe is extremely grateful to the hosting institute of this workshop, the German Bundesinstitut für Risikobewertung (BfR) and the staff of BfR for the perfect organisation of the workshop and unlimited hospitality to IESSE Europe.

Scientific Committee

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