

HEALS Newsletter

Health and Environment-wide Associations based on Large population Surveys

Project No 603946 of the European Union's Seventh Framework Programme



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Editorial Note

Welcome to the sixth issue of the HEALS Newsletter!

This issue summarizes the *3rd HEALS Annual Meeting* that was held in Leiden (The Netherlands), and was organized by TNO. It also describes the 8th International Conference on Children's Health and the Environment (INCHES 2016), which was held in Barcelona (Catalonia), in September 2016, in which two HEALS partners, IDAEA-CSIC and the University Hospital München, were actively involved. A HEALS–HELIX session was organized in this meeting.

The issue also includes three articles reporting HEALS progress which concern the Environment-Wide Association Studies (EWAS) on asthma, diabetes, obesity, neurodevelopmental and neurodegenerative disorders (Vinh Phuc Luu and Isabella Annesi-Maesano), the inclusion of a tool for indoor environmental assessment for the EXHES study (Eduardo de Oliveira) and the study on cadmium

exposure in males and lactating females that has been recently published by researchers from the Jozef Stefan Institute in Ljubljana (Slovenia).

The *Who is Who* section shows the professional profiles of several researchers actively involved in HEALS, such as Milena Horvat, Gemma Calamandrei, Stephan Böse-O'Reilly and Andrew Povey.

Finally, the issue also lists the scientific publications, presentations at meetings, workshops, conferences, and other dissemination activities performed by the HEALS researchers after June 2016. On this occasion, the list of lectures to describe the HEALS activities is significantly extended.

Interesting forthcoming events for HEALS participants and exposome researchers are also announced.

Our best wishes for a happy and productive 2017!



HEALS

wishes you a

2 1 7 HAPPY NEW YEAR

HEALS Annual Meeting in Leiden

by ANJOEKA PRONK and ROB STIERUM

Netherlands Organization for Applied Science Research (TNO)
Leiden, The Netherlands

The third annual meeting of the HEALS project took place at TNO in Leiden (NL). In his opening speech Prof. Keurentjens (TNO CSO) emphasized the relevance of interdisciplinary research for TNO and for the health studies in general in which exposome research constitutes a significant contribution.



Exposome and genome, the genetic makeup of an individual

are two complimentary determinants of the individual's health. The exposomic characterisation of all environmental exposures (including lifestyle factors), as they occur during the course of early life (from prenatal onwards) until old age is an essential tool for the identification of the human health stressors. Only 10-20% of the individual diseases can be related to the genome. Characterization of the exposome may contribute substantially to a better understanding of the causes of health and disease. In turn, unravelling the exposome will help to develop practical intervention strategies to prevent disease and improve healthy aging.

During the meeting, significant results were presented and discussed:

- on systems biology for the characterization of environmental exposure in relation to child neurodevelopment.
- on combination of sensor data with 'agent based modelling' (interactions between people, goods, locations and time) for simulating environmental exposure in large populations.

The meeting was complemented with a visit to the Tyrannosaurus Rex at the Museum Naturalis in Leiden.

8th International Conference on Children's Health and the Environment (INCHES)

by JOAN O. GRIMALT

Institute of Environmental Assessment and Water Research (IDAEA-CSIC)
Barcelona, Catalonia, Spain

On September 14–16th, 2016, it was celebrated in Barcelona the 8th International Conference on Children's Health and the Environment (INCHES). This meeting was organized by the International Network on Children's Health, Environment and Safety Conference, specifically by Dr. Peter van den Hazel, President of INCHES, Stephan Böse-O'Reilly (University Hospital Munich) and Joan O. Grimalt (IDAEA-CSIC) acting as local organizer. On this occasion the Conference was supported by several EU Projects such as HEALS, HELIX and CROME-LIFE.

The conference was celebrated at the premises of the Parc de Recerca Biomèdica de Barcelona (PRBB). About two hundred and fifty people among researchers of academia, Ph.D. students, and government research bodies, Health Service representatives and various stakeholders participated in the conference.

The opening ceremony was chaired by the Commissioner of Health of the City Hall of Barcelona, who gave the opening speech. She welcomed the audience, acknowledging the multilevel approach

of the researchers interested on characterization of the exposome and its related health effects. She stressed the importance of informed and timely communication to the citizens on environmental health issues.



She was accompanied by Dr. Peter van den Hazel, President of INCHES, and Joan O. Grimalt, Principal Investigator of the HEALS group in Barcelona. Before that, the opening ceremony was also chaired by these two last persons together with Mark Nieuwenhuijsen from the newly formed Institute ISGlobal and Principal Investigator of HELIX.



The meeting was also attended by leading representatives of the World Health Organization such as Maria Neira, Marie Noel Brune, Dorota Jarosinka and Enriko Todaka.

The scientific program included about 140 lectures, short oral presentations and posters presented by scientists from 34 countries covering a broad spectrum of topics. The abstracts of these presentations were published in the **Journal of Health and Pollution**, Vol. 6, No. 12 (December 2016) pp. S1-S154.

The topics were related to: health effects of pollutants in children (such as pesticides, heavy metals, air pollution, tobacco), prenatal exposures, reproductive health, cancer, obesity, biomonitoring, climate change, sustainable development, e-waste, radiology, safety and injury prevention, training for pediatricians and health policy regarding children environmental health, children's environmental rights and health centres and speciality units devoted to this topic.

A special issue of the journal **Environmental Research** is now in preparation with the presentations at this Barcelona Meeting. Thirty papers were submitted for publication to this issue and they are under evaluation.

The results reported at this Conference had high impact in the media who showed particular interest in relation to the problems related with mercury in the Mediterranean Sea and the health effects of atmospheric pollution in urban areas. News concerning this INCHES meeting appeared in the newspapers: *La Vanguardia* (2 times), *ABC*, *20 Minutos*, *Diario de Ferrol*, *El Ideal Gallego*, *El Progreso*, *El Punt Avui*, *Diario de Arousa*, *El Periodico* (2 times), *Mediterraneo* and others. They also appeared in the news of TV3 (Public Catalan TV) and Radio 5 (Public Spanish Radio).

All sessions presented at the 8th International Conference on Children's Health and Environment are included at the Abstracts Conference Proceedings of the Journal of Health and Pollution:

<http://www.journalhealthpollution.org/doi/pdf/10.5696/2156-9614-6.12.S1?code=bsie-site>

Public Health Perspectives: Insights from EWAS could have important policy implication

by VINH PHUC LUU and ISABELLA ANNESI-MAESANO

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As medical doctors in Public Health, we are writing this note to provide hints on disease prevention, so to contribute to the reflection that the HEALS community has to have on this issue.

The HEALS project will contribute to research of adverse health impacts of environmental factors in the case of diseases such as asthma, diabetes and obesity, and neurodevelopmental and neurodegenerative disorders, through its Environment-Wide Association Study (EWAS) approach. Exposure to all kind of pollutants is known to be higher in urban areas. In 2017, around 75% of the European population lives in urban areas, according to the European environment agency. Some of these pollutants like particle matters, phthalates and phenols have been reported to have an adverse impact on health thus making exposure to pollutions a particular concern for the scientific community.

The EWAS study design adopted in HEALS consists of collecting all available data on the exposome, which comprises every environmental exposure to which the individual is exposed to, from conception to onwards. The expected results of this investigation will be the identification of all stressors with adverse impact on health, to assess their risk on health. One of the assets of the HEALS project, through the EWAS approach, concerns the characterization of the

interactions between stressors. Indeed, EWAS will allow identifying to which extent the combination of several factors will concur in the development of the mentioned diseases. This is important because in real life, individuals are exposed simultaneously to several factors that interact each other and this can vary during the lifespan. For instance, it is well-known that the impact of air pollution is modulated by the genetic background, the diet, the physical activity, obesity and comorbidities, among others. Most environmental agents have degrees of exposure intensity, usually varying over time. Even if an exposure is not time-dependent, the resulting disease risk is likely to be modified by temporal factors like age or duration of exposure. In addition, many environmental factors are multi-dimensional; air pollution, for example, is a complex mixture of gases and particles with differing biological effects.

This new evidence will help defining prevention plans to reduce risks for the already exposed populations. Still, many questions need to be answered: what stressor(s) should be dealt with in priority? Those to which highest number of people are exposed or those with most severe impacts on health, namely the vulnerable groups? What prevention plan should be made? How can public policies help in terms of prevention? It has been argued that public health

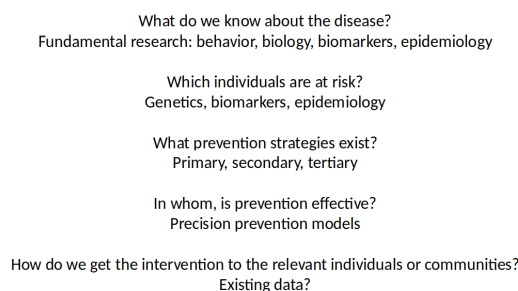
interventions aimed at the whole population may be more effective. However, this need to be discussed. Stressors with more severe health impact usually concern less people than those with less severe health impact. This means that collective preventive actions focusing on stressors with more severe health impact will reduce health risks more efficiently, but will target fewer individuals. It will thus have less impact at population scale. Conversely, collective preventive actions against more frequent stressors will impact more individuals and the global effect at population scale will most probably be higher. The best preventive plan should be global and include preventive actions both at collective and individual scale. Moreover, exposure to stressors is often linked to non-specific environmental factors like the level of education and socio-economic status. It is crucial to take these factors into account to optimize the efficiency of such prevention programs.

It cannot be excluded, however, that the EWAS approach will lead to "precision prevention", through risk prediction models, targeting both individuals and groups. Precision prevention has to be intended as the use of biologic, behavioral, socioeconomic and epidemiologic data to devise and implement strategies tailored to reducing health risks in a specific individual or group of individuals.

Actually HEALS is amassing enough data on biological samples, genetic and epigenetic marks, environmental exposures, diet, lifestyle and diseases phenotypes to be able to work on the precision prevention piece of the puzzle in the case of the mentioned diseases by estimating the risks and predicting the outcomes. The framework for precision prevention has to address several questions (Figure 1). Furthermore, precision prevention requires the evalua-

tion of additional aspects such as the zones in which the needs are important, and how geo-spatial epidemiology can give insight into this question. Furthermore, the costs and benefits have also to be evaluated.

Figure 1: Framework for precision prevention



Whereas precision medicine focuses on treating an existing disease, precision prevention consists in tailoring behavioral interventions to individual's characteristics. As previously said, this implies overcoming psychosocial barriers, emphasizing achievable goals, adapting to families' differing economic or cultural circumstances.

All these actions will give directions to 'create environments favorable to health', as mentioned in the Ottawa Charter in 1986, reinforced by the Shanghai Charter in 2016.

Introducing the EXHES/HEALS 'Checklist' A tool for indoor environmental assessment

by EDUARDO DE OLIVEIRA

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The EXHES study, part of HEALS EC exposome project, has a target population of twin children to be followed from their birth and aims at undertaking an adequate assessment and characterization of the physical environment where the twins will spend most of the time of their early life, *i.e.*, the house where the newborns will live their first years.

In a study to be conducted in ten EU countries*, the safeguard of the objectivity and rigor of the collected information requires procedures that are as identical as possible between all the partners. To that end, the identification and characterization of the items under appreciation must be as objective as possible bearing in mind the differences between countries, construction practices and technologies, and routines in the living trends of families. Only with such care, applied to the whole universe under study, the associations between the nature/quality of the main children's surrounding environment at home and the health conditions of all can give a reliable representation of the impact of indoor air and health.

Two 'checklists' were produced:

- a rather detailed one, actually not tested for this specific

propose but supported on INEGI's experience on indoor air quality (IAQ) for over 20 years since the EU Offices Audit Project (1) in 1993-1994 and,

- a second one, that integrates the contributions from the several associated HEALS-EXHES members, namely, from Regensburg-GE partners.

Both checklists can be translated into the relevant languages and made available as electronic-based tools provided by HEALS and operated using the HEALS iPads. The storage of all the collected data in real-time will be made in a central memory.

Actions on the assessment of the IAQ status and other correlated environmental issues to check relevant data regarding children's exposures in their homes are planned to be performed at two moments: at birth and two years after the delivery.

Two reasons led to choose the short version checklist for completion at the maternity hospital upon birth, the confinement of the 'case study' where for quite some time the environment will be very much limited to the home or part of it, and the difficulties

associated to the lack of expertise of the person intended to be filling in the checklist (the father) on the building features. Two years after the children's birth, scheduled home visits by trained researchers, involving a more extensive environmental audit, will be performed.

Overall, the information gathered by the EXHES "checklists" is thought to yield significant contributions towards a better understanding on the level and nature of indoor air pollution in the houses, as well as on the real impact of early life exposures on children's health and in their individual "exposome".

*Croatia, France, Germany, Greece, Italy, Poland, Portugal, Slovenia, Spain and United Kingdom.

References

1. Bluyssen PM, Oliveira Fernandes E, Groes L, Clausen G, Fanger PO, Valbjorn O *et al.* (1996) European Indoor Air Quality Audit Project in 56 Office Buildings. *Indoor Air* 6(4): 221–38. <http://doi.wiley.com/10.1111/j.1600-0668.1996.00002>

Low cadmium exposure in males and lactating females – estimation of biomarkers

by ANKA STAJNKO, INGRID FALNOGA, JANJA SNOJ TRATNIK, DARJA MAZEJ, MARTA JAGODIC, MLADEN KRSNIK, ALFRED B. KOBAL, MARIJA PREZELJ, LIJANA KONONENKO, MILENA HORVAT

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The appropriateness of spot urine and/or blood cadmium (Cd) exposure biomarkers and their relationships with renal function biomarkers were evaluated in this study, based on the data from Slovenian population (1081 participants, 548 males, 533 lactating females, 2007–2015) environmentally exposed to very low levels of Cd; geometric mean of Cd in blood and spot urine samples were 0.27 ng/mL and 0.19 ng/mL. Observed conflicting results after normalisation of low-Cd levels in urine by creatinine were attributed to high differences in measurement sensitivity for Cd and creatinine and suggested that the concentrations of Cd in blood are a superior biomarker. Positive associations of renal function biomarkers were observed with Cd in urine but not with Cd in blood. Some of those associations (particularly with alpha-1-microglobuline – A1M) were

significantly influenced by current and pre-pregnancy smoking, Pb and Se levels. The present study supports previous observations of A. Bernard (2016) stating that the use of urine Cd for associations with renal function biomarkers at low environmental Cd exposure is questionable due to physiological variability and normalisation bias in the urine spot samples.

References

1. Bernard, A., 2016. Confusion about cadmium risks: the unrecognized limitations of an extrapolated paradigm. *Environ. Health Perspect.* 124, 1–5.

This contribution is a synopsis of the paper published at *Environmental Research* 152: 109–119 (2017).

WHO is WHO



Prof. dr. **Milena Horvat** is Head of the Department of Environmental Sciences at the Jožef Stefan Institute since 1997 and Dean of the International Postgraduate School Jožef Stefan since 2016. She was coordinator of the Center of Excellence of Environmental Technologies (2004–2009) and currently coordinates two EU projects: ERA Chair Iso-food (Isotopic techniques in food safety, security and traceability) (2014–2019),

and MASSTWIN (Spreading Excellence in widening participation in support of mass spectrometry and related techniques in health, Environment and Food Analysis) (2016–2019). Her recently awarded EURAMET project MercOx "Traceability of oxidized mercury mea-

surements" (2017–2020) also falls into her main domain of interest in analytical chemistry. Her main expertise falls into mercury research activities which are interdisciplinary and cover the areas of analytical chemistry, human health with a focus on exposure science, contaminated sites, marine environment, and lately also clean technologies and sensor development. Based on her basic training and education as analytical chemist, she developed and significantly contributed to standardisation and harmonisation of analytical methods and production of reference materials. By this she contributed to international comparability of data on a global scale. She was very active in the United Nations activities and EU and she significantly contributed to the following reports of global importance: WHO Environmental Health Criteria 101 (1991); UNEP, Global Mercury Assessment Report (2002); EU DG ENV, Position paper on mercury (2001); UNEP, Global mercury Assessment Report (2013). Her main contribution to HEALS encompasses activities related

to scientific networking, human biomonitoring, the use of existing studies, such as PHIME in the context of exposome approach and EXES study protocol and implementation. She has been author and co-author of over 210 SCI journal articles and 24 book chapters related to the development of analytical methods in the areas of characterization and identification of mercury contaminated sites, biogeochemical cycling of mercury in terrestrial and aquatic environment, mercury in industry and biomonitoring as part of the exposure assessment of humans and ecosystems. She presented 50 invited lectures at international conferences, symposia and workshops, and over 400 presentations at international conferences. She organized several international conferences and workshops, and was guest editor of 16 special issues of journals, including Environmental Health Perspectives, Environmental Research, Analytical and Bioanalytical Chemistry and Marine Chemistry. She received an award for her international research activities (Ambassador of Sciences in 2002), and in 2014 she received a national Zois award for her research excellence. She was supervisor of 13 PhD thesis and several master and bachelor degree theses.



PD Dr. med. **Stephan Böse-O'Reilly** is a paediatrician and Master of Public Health with a special degree in Environmental Medicine. He is an Assistant Professor in Hall i.T in Austria at UMIT (University for Health Sciences, Medical Informatics and Technology) where he is the

head of the program on Prevention, Environmental Health at the Department of Public Health, Health Services. At the University Hospital Munich he works for the Institute and Outpatient Clinic for Occupational, Social and Environmental Medicine, leading the HEALS workgroup there. One of the HEALS projects is to create a model for mercury (PBBK - physiologically based biokinetic model), based on existing data. As leader of work-package 18 "training on HEALS methodology and tools" he is responsible for the internal and external training events. At present he is involved in the development of a new anti-chelating agent to treat chronic mercury intoxication with EMRES, a private pharmaceutical SME. He is engaged in a World Bank project to rehabilitate a lead contaminated area in Zambia, especially in empowering the health care sector to diagnose and treat chronic lead intoxicated children. Since 1998 he has been involved in the planning and implementation of over 15 successful mercury related international environmental health projects in Africa, Asia and Latin America. Health assessment and training, as well as networking including intergovernmental agencies are his main areas of interest. He is a member of the chair board of International Network Children's Health Environment and Safety (INCHES) and as such involved in the ongoing WHO process of Environment and Health in Europe. As a physician he is engaged in health policies, functioning both as a paediatrician and as an environmental health specialist. A health care system is a fascinating system; many different actors work together and create a more or less functioning system. With his public health and scientific background, and at the same time his continuous working as a practicing paediatrician, he can appreciate all aspects and acknowledge the various factors as important – the role of clinicians, the role of policy makers and the role of scientists, not to forget the patients themselves. His main interest is to prevent children from disease by helping to optimize the policy – science interface; especially in his zone of knowledge - children's environmental health. For many

years as a clinical paediatrician, he has been caring for sick children, and his intention now for the second phase of his working life is to focus more on prevention, since he believes some of the health problems he saw could be avoided with more and better prevention. The exposome concept is the best way to identify those important factors for children's health. He enjoys being part of the HEALS team of excellent researchers.



Dr. **Andrew Povey** is currently a Reader in Molecular Epidemiology in the Centre for Occupational and Environmental Health at the University of Manchester. He was a PhD student at the University of London but did most of this research work at the International Agency for Research on Cancer (Lyon, France). He then went to the National Cancer Institute in Bethesda, USA as a post-doc before returning to Britain and the University of Manchester via Swansea University and the Paterson Institute for Cancer Research. His research interests focus on the role that chemicals play in causing ill-health in human populations and his research spans the range from basic laboratory research to population studies and has resulted in more than 110 papers. In the laboratory, his group works on biomarkers of exposure and susceptibility to chemical toxicants, particularly in relation to alkylating agents, known genotoxic agents to which exposure is unavoidable. He has also carried out population studies examining associations between adverse health outcomes (for example male infertility) and occupational and environmental exposures (such as pesticides). He has been a member of the UK Advisory Committee on Pesticides and has recently been appointed a member of the UK Committee on Mutagenicity of Chemicals in Food, Consumer Products and the Environment. Within HEALS, Dr. Povey is contributing to WPs 1, 4, 5, 14 and 17.



Dr. **Gemma Calamandrei**, biologist (University of Rome "Sapienza", 1984), is presently First Researcher at the Center for Behavioural Sciences and Mental Health of the Italian National Health Institute (ISS), the leading scientific and technical public body of the Italian National Health Service. She was appointed as Researcher at the ISS in 1987 and completed her training in Behavioural Neurosciences at the University of Cambridge (U.K.) from 1989 to 1991. Back to the ISS, she headed the Comparative Psychology Unit from 1993 to 2001. In 2006 she became the Director of the Neurotoxicology and Neuroendocrinology Unit. During the years, she has attained recognized expertise in the study of neurodevelopment and related disorders, with a specific focus on the influence of the environmental factors on brain and behaviour maturation. She has carried out and coordinated research on animal models of neurodevelopmental disorders, studying the neurobehavioural and neuroendocrine effects of fetal and neonatal exposure to chemical agents and environmental stressors (psychoactive drugs, pesticides, metals, perinatal hypoxia, and maternal stress). More recently she has expanded her focus

to the clinical and epidemiological field to investigate the environmental risk factors for children's mental health. Dr. Calamandrei is the author or coauthor of more than 100 peer-reviewed papers on international journals, several book chapters, and technical reports at EU and national level on topics related to children's health and the environment. She has an H-index of 29. She has been responsible for or participated in several Public Health Projects at the national and international level, and contributed to preparation of the European Health and Environment Strategy 2004-2010 as expert of the Technical Working Group on "Neurodevelopmental disorders" in the SCALE initiative. She has served as scientific expert in the revision of the OECD Testing Guidelines 426 on Developmental Neurotoxicity (2006-2008) and in the elaboration of the EFSA Scientific Opinion on the risks for child health related to the pres-

ence of bisphenol A in foodstuffs (2012-2015). She serves as national expert in the OECD Environment and Health Programme and scientific reviewer of Adverse Outcome Pathways for OECD. She is also involved in educational courses for the National Health Service personnel on topics related with etiology, prevention and diagnosis of neurodevelopmental disorders and developmental disabilities. In collaboration with the University of Rome "Sapienza" both graduate and PhD students are trained in her laboratory, in addition to Erasmus visiting students from different EU countries. In HEALS Dr. Calamandrei is the leader of Work Package 15, and is involved in WP5 (identification of omic biomarkers for neurodevelopmental and neurodegenerative diseases) and WP17 (selection of neuropsychological tests for the EXHES study).

Publications

The scientific contributions of the HEALS Project are hosted on ZENODO, an open digital repository that enables researchers, scientists, EU projects and institutions to share and showcase multidisciplinary research results (data and publications).

The collection of HEALS scientific papers stored in ZENODO can be found in the following website:

<https://zenodo.org/collection/user-heals>

The papers published since June 2016 are the following:

- Sarigiannis DA, Karakitsios SP, Handakas E *et al.* (2016) Integrated exposure and risk characterization of bisphenol-A in Europe. *Food Chem Toxicol.* 98: 134–147.
- Stajniko A, Falnoga I, Tratnik JS *et al.* (2016) Low cadmium exposure in males and lactating females—estimation of biomarkers. *Environ Res.* 152: 109–119.
- D'Errico M, Parlanti E, Pascucci B *et al.* (2016) Single nucleotide polymorphisms in DNA glycosylases: from function to disease. *Free Radic Biol Med.* S0891-5849(16)31089–9.
- K. Polanska, A. Krol, W. Sobala *et al.* (2016) Selenium status during pregnancy and child psychomotor development—Polish Mother and Child Cohort study. *Pediatr Res.* 79(6): 863–869.

- K. Polanska, A. Krol, D. Merez-Kot *et al.* (2016) Maternal stress during pregnancy and neurodevelopmental outcomes of children during the first two years of life. *J Paediatr Child Health.* 53(3): 263–270.
- L. Birks, M. Casas, A.M. Garcia *et al.* (2016) Occupational Exposure to Endocrine-Disrupting Chemicals and Birth Weight and Length of Gestation: A European Meta-Analysis. *Environ Health Perspect.* 124(11): 1785–1793.
- K. Polanska, A. Krol, P. Kaluzny *et al.* (2016) Estimation of Saliva Cotinine Cut-Off Points for Active and Passive Smoking during Pregnancy—Polish Mother and Child Cohort (REPRO-PL). *Int. J. Environ. Res. Public Health* 13(12): 1216.
- V. Karri, M. Schuhmacher and V. Kumar (2016) Heavy metals (Pb, Cd, As and MeHg) as risk factors for cognitive dysfunction: A general review of metal mixture mechanism in brain. *Environmental Toxicology and Pharmacology* 48: 203–213.
- N. Steckling, B. Devleeschauwer, J. Winkelkemper *et al.* (2017) Disability weights for chronic mercury intoxication resulting from gold mining activities: results from an online pairwise comparisons survey. *Int J Environ Res Public Health.* 14(1): 57.

Presentations at International Meetings

Dissemination and networking activities since June 2016 included the participation of several HEALS members at international workshops, conferences and scientific events hereinafter summarised:

- **K. Polanska (NIOM)** *Impact of air pollution on pregnancy duration, birth outcomes and children's health—Polish Mother and Child Cohort* (Lecture). 24th International Conference on Modelling, Monitoring and Management of Air Pollution. Crete, Greece. 20–22nd June 2016.
- **R.P. Sharma (URV)** *Application of PBPK/PD Model for Assessing Risk to Children Focusing on PFOS related Development Effect* (Lecture). DIOXIN 2016. Firenze, Italy. 28th

August – 2nd September 2016.

- **N. Steckling (LMU)** *Disability weights for chronic metallic mercury vapor intoxication to improve estimates of the burden of disease resulting from mercury use in gold mining* (Lecture). 28th Annual Conference ISEE. Rome, Italy. 1-4th September 2016.
- **N. Steckling (LMU and HEALS Consortium)** *Guidelines for biomarkers of exposure for Health and Environment-wide Associations based on Large population Surveys (HEALS)* (Poster presentation). 28th Annual Conference ISEE. Rome, Italy. 1-4th September 2016.

- **K. Polanska (NIOM, ISS)** *Maternal stress during pregnancy and neurodevelopmental outcomes of children during the first two years of life* (Poster presentation). 28th Annual Conference ISEE. Rome, Italy. 1–4th September 2016.
- **K. Polanska (NIOM, ISS)** *Selenium status during pregnancy and child neurodevelopment* (Poster presentation). 28th Annual Conference ISEE. Rome, Italy. 1–4th September 2016.
- **N. Steckling (LMU and HEALS Consortium)** *Guidelines for biomarkers of exposure for Health and Environment-wide Associations based on Large population Surveys (HEALS)*. 28th Annual Conference ISEE. Rome, Italy. 1–4th September 2016.
- **J. Cherrie (IOM)** *Use of sensors in occupational exposure assessment* (Lecture). Mini-symposium on the Occupational Exposome. Epidemiology in Occupational Health Conference. Barcelona, Catalonia, Spain. 4–7th September 2016.
- **V. Karri (URV)** *Improving the Neurotoxicity Mechanism: Proteomics Analysis of Heavy Metals exposure on Hippocampal HT22 Cell Line* (Lecture). 52nd European Congress EUROTOX. Seville, Spain. 4–7th September 2016.
- **D. Sarigiannis (AUTH)** *Exposome analysis of polyaromatic hydrocarbons* (Lecture). 52nd European Congress EUROTOX. Seville, Spain. 4–7th September 2016.
- **D. Sarigiannis (AUTH, NIOM)** *Pathway analysis of pre-natal exposure to phthalates and child motor development* (Lecture). 52nd European Congress EUROTOX. Seville, Spain. 4–7th September 2016.
- **D. Sarigiannis (AUTH)** *Development and evaluation of QSAR models for use in toxicokinetic modelling of "data poor" industrial chemicals* (Lecture). 52nd European Congress EUROTOX. Seville, Spain. 4–7th September 2016.
- **S. Bose-O'Reilly (LMU)** *Health hazards of artisanal and small-scale gold mining*. 25th EPICOH on Epidemiology in Occupational Health Conference. Barcelona, Catalonia. 5–7th September 2016.
- **J.S. Tratnik (JSI)** *Neurodevelopment, low level mercury exposure and genetic polymorphisms in birth cohorts from Slovenia and Croatia* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES) Conference. Barcelona, Catalonia. 14–16th September 2016.
- **N. Steckling (LMU)** *Children's Environmental Burden of Disease: Review of Key Findings and General Methodology* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **M.A. Martínez (URV)** *Prenatal Early Exposure to the Environmental Endocrine Disruptors* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **K. Polanska (NIOM, ISS)** *Maternal lifestyle during pregnancy and child neurodevelopment* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **E. Junqué (CSIC)** *Persistent pollutants in food items from Menorca Island* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **B.L. van Drooge (CSIC)** *Polycyclic aromatic hydrocarbons from traffic exhausts in primary schools and cognitive development of children* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **M. Gari (CSIC)** *Temporal trends of organochlorine compounds and PBDEs from utero until 4 years of age in the Asturias INMA cohort* (Lecture). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **N. Bravo (CSIC)** *Organohalogenated pollutants in Argentinean postpartum women living in Salta and Ushuaia* (Poster). 8th International Conference on Children's Health, Environment and Safety (INCHES). Barcelona, Catalonia. 14–16th September 2016.
- **K. Hertoghs (GenomeSCAN, HEALS Consortium)** *Generation of omics data using 'challenging samples'* (Poster presentation). International Society of Exposure Science (ISES) Conference. Utrecht, The Netherlands. 9–13th October 2016.
- **V. Karri (URV)** *Improving Risk assessment of Metal mixture for Neurotoxicity: in-vitro Toxicological interactions studies of metal mixture* (Lecture). International Society of Exposure Science (ISES) Conference. Utrecht, The Netherlands. 9–13th October 2016.
- **R.P. Sharma (URV)** *Developing PBPK/PD model to characterize the mixture effect of TCDD and DEHP altering estradiol kinetic in ovary via crosstalk mechanism* (Lecture). International Society of Exposure Science (ISES) Conference. Utrecht, The Netherlands. 9–13th October 2016.
- **R. Barouki (UPD)** *The human exposome and contaminant mixture effects* (Lecture). 19th International Congress on In Vitro Toxicology. Juan les Pins, France. 17–20th October 2016.
- **A. Leblanc (UPD & AUTH)** *HEALS: α European Exposome Project in Relation to Health: exposure of hepatic HepaRG cells to α mixture of persistent organic pollutants and modifications in carbohydrate metabolism* (Poster presentation). 19th International Congress on In Vitro Toxicology. Juan les Pins, France. 17–20th October 2016.
- **B.L. van Drooge (CSIC)** *Comprehensive Analysis of Volatile Organic Compounds in Atmospheres that are Under Influence of the Emissions from α Chlor-alkali Plant* (Lecture). XVI SECyTA Annual Meeting. Seville, Spain. 2–4th November 2016.
- **M. Gari (CSIC)** *Development of methodologies for the quantification of urinary metabolites of organophosphate and pyrethroid pesticides and its application in agricultural populations from Catalonia and Galicia* (Poster presentation). XVI SECyTA Annual Meeting. Seville, Spain. 2–4th November 2016.

Other dissemination activities

- **URV** Several researchers participated in a 2-day Scientific Retreat which IISPV organized at Parador de Tortosa (Tortosa, Tarragona, Spain) on 16–17th November 2016. During the Retreat, scientists of different research groups within IISPV presented recent findings of their own projects and research lines. Dr. Joaquim Rovira performed an oral communication entitled “Prenatal early exposure to environmental endocrine disruptors”, which is part of the HEALS project. Dr. Vikas Ku-

mar described models developed in the HEALS and EuroMix projects: “Application of a PBPK/PD model to understand the neurotoxicity pathway of PFOS via microRNA”.

Retrieved from:

- <http://www.iispv.cat/novetats/1150/iispv-celebra-el-seu-primer-retreat-cientific>

Forthcoming Events

HEALS meetings

- **4th HEALS Annual Meeting**
22–25th October 2017, Island of San Servolo, Venice (Italy)
<http://www.heals-eu.eu/>

Other related meetings

- **27th Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC Europe)**
7–11 May 2017, Brussels (Belgium)
<http://brussels.setac.org/>
- **2nd European Cancer Epigenetics Conference**
11–13th May 2017, Heidelberg (Germany)
<https://www.dkfz.de/en/ecec2017/>
- **European Human Genetics Conference (ESGH)**
27–30th May 2017, Copenhagen (Denmark)
<https://2017.esgh.org/>
- **European Medical and Biological Engineering Conference (EMBEC)**
11–15th June 2017, Tampere (Finland)
<http://embec2017.org/>
- **16th International Symposium of Trace Elements in Man and Animals (TEMA)**
26–29th June 2017, Saint Petersburg (Russia)
<http://www.tema16.org/>
- **European Respiratory Society International Congress (ERS)**
9–13th September 2017, Milan (Italy)
<https://erscongress.org/>
- **53rd Congress of the European Societies of Toxicology (EUROTOX)**
10–13th September 2017, Bratislava (Slovak Republic)
<http://www.eurotox2017.com/>
- **19th Annual Scientific Conference of the International Society of Environmental Epidemiology (ISEE)**
24–28th September 2017, Sydney (Australia)
<http://www.isee2017.com/>
- **19th International Symposium on Environmental Pollution and its Impact on Life in the Mediterranean Region (MESAEP)**
4–6th October 2017, Rome (Italy)
<http://www.mesaep.org/>
- **International Society of Exposure Science Annual Meeting (ISES)**
15–19th October 2017, Durham, North Carolina (USA)
<http://intlexposurescience.org/ISES2017/>

Editorial Board

Prof. Joan O. Grimalt Dr. Mercè Garí



Editorial Information

If you wish to contribute to the *Newsletter* or share information for publication, please contact Mercè Garí:

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