



Exposogas

NEWSLETTER

**INSIDE
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EDITORIAL

We are happy to deliver the 3rd newsletter of the EXPOSOGAS project. This is a Horizon 2020 Twinning project that will promote the training and career development of researchers in the field of occupational and environmental health sciences. Special focus is paid on workers directly involved with oil and gas activities, and the general population in surrounding communities, using human exposome tools. We hope you will find this newsletter informative. If you have any questions or comments, please get in touch with us!

Konstantinos C. Makris, PhD
EXPOSOGAS project coordinator

What is EXPOSOGAS about?

EXPOSOGAS is a 3-year project funded by the European Union, which aims to develop the research capacity of the Cyprus International Institute for Environmental and Public Health (CII) in using the human exposome platform and tools. EXPOSOGAS will use the exposome framework for assessing, managing and communicating information about the overall health risk of hydrocarbons operations to workers and the general population.

What is the human exposome?

The human exposome is a relatively new framework for conducting research. The exposome concept was first coined by the cancer epidemiologist Dr. Christopher Wild in 2005, who defined it as the cumulative set of all non-genetic (i.e. environmental) exposures which an individual experiences from the moment of conception throughout their life. Thus, exposome studies focus on the effects of multiple environmental exposure and consequent health-related outcomes.

What is EXPOSOGAS interested in?

EXPOSOGAS is interested in oil/gas operations that often involve exposures to multiple chemicals, shift work, noise, high temperatures, and ergonomic and psychological factors and the collective impact on health that these multiple exposures have. Important operation stages of hydrocarbons occur throughout the industry lifecycle and include the preparation and installation, production, transport, storage, distribution, use and end of life activities and each of these will affect health differently, thus increased training is necessary in order to be able to establish how health is affected across the stages.

Why focus on the oil and gas industry in Cyprus?

The oil and gas industry in Cyprus is growing fast, especially with the recent discovery of the natural gas reserves in the Cypriot exclusive economic zone (EEZ). In order to increase the autonomy and energy independence of the Southern European region, the EEZ region is of primary importance. However, given the expansion of the oil and gas sector in Cyprus, there is also a need to similarly increase the capacity of the occupational and environmental health sciences in maintaining active surveillance of affected communities.

How will we do this?

Primarily by promoting the training and career development of CII researchers in the field of occupational and environmental health sciences through training that teaches them how to apply the exposome concept and related technologies on workers directly involved with oil/gas activities. EXPOSOGAS is actively trying to engage stakeholders and the general public to express their views as a means of furthering the exposomic framework.

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- Training sessions at CII
- Webinars
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- Publication: Exposome-based public health interventions for infectious diseases in urban settings

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our [website](#)
and our [Facebook Page](#)

PROJECT ACTIVITIES

Baseline assessment of environment and health indicators in communities around the Vasilikos Energy Center, Cyprus



On Thursday 25th June 2020, a face to face meeting took place at Kalavasos village, Cyprus regarding the project: "Baseline assessment of environment and health indicators in communities around the Vasilikos Energy Center, Limassol Cyprus". The meeting was attended by the community leaders of the nine communities of the Vasilikos area (Mari, Zygi, Pentakomo, Asgata, Kalavasos, Psematismenos, Maroni, Tochni and Choirokoitia) and representatives of the Cyprus International Institute for Environmental and Public Health (CII) of the Cyprus University of Technology.

- The purpose of the meeting was to present our project to the community leaders of the area and listen to their issues regarding the development of the industrial area of Vasilikos energy center (VEC). In addition, the community leaders were particularly keen to discussing the future development of the whole area and note the concerns and worries of the community councils. A brief presentation of the proposed training project was made and a discussion followed. The community representatives were expressing their concerns about the project, due to the fact they had an unfortunate situation in the past regarding a previous project. They asked several questions regarding the funding, and independence of the project and the participating scientific team respectively.
- All the community leaders, when all their questions were answered, were willing to contribute to the project. Some of the community leaders shared their concerns regarding the participation of the general public in the survey which they considered being non-essential. However, the importance of the participation of the residents of the area was put forward by Dr. Makris. All of the community leaders expressed their opinion, that they would like to have a study focused on the prediction of cumulative health effects of the industrial development in the area. It was explained to them that this would be a highly uncertain modeling task with results being most likely inconclusive.
- Overall, the meeting was extremely useful to convene with the leaders of 9 neighboring communities with a total of about 5500 permanent residents. It was a useful and informative meeting in order to understand and note the concerns and thoughts of the community leaders, where the project will take place. All of the community leaders agreed to engage into further discussions for the collaboration between CII and their communities.

Training events



- ❑ **On-site measurements of BTEX** (benzene, toluene, ethylbenzene and xylene), noise and PM levels in the surrounding communities of Vasilikos industrial area at various time points are conducted in specific areas of each community by **EXPOSOGAS** researchers. These passive samplers and sensors are installed in various points/house yards in the Vasilikos area in different time points (3 different sampling times, two weeks apart for each sampling campaign) to check spatial and temporal variation in their levels.



- ❑ Also, samplers/sensors will be placed in the Limassol city center and will be compared with governmental data for the station in Mari/Zygi. The levels of the above substances are collected with Radiello passive samplers, while PM and noise will be also collected with Purple air sensors (Utah, USA). The selection of the locations of the samplers in the Vasilikos area will be based on environmental factors such as the weather (route of wind etc.), land morphology.

We want to hear your views!

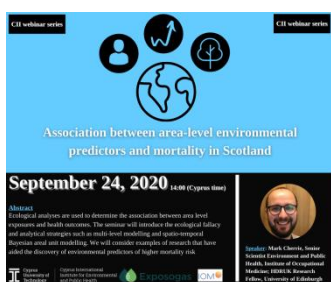


The EXPOSOGAS research project is keen to engage with stakeholders who have an interest in the activities of the oil and gas industry. If you are a member of the government, the public, industry or an academic, please get in touch with us and introduce yourself via [our website contact form](#) or over a message through [our Facebook page!](#)

For more info, please visit our website: www.exposogas.eu and [our Facebook Page](#)

Webinars

Every month at least one webinar is scheduled to advance public health training for young researchers. These webinars include the use of novel exposome technologies such as sensors, big data and smart phone applications for the assessment of the external exposome; human biomonitoring, omics platforms and bioinformatics, for the internal exposome, and toxicokinetic models that can help bridge the relationship between the external and internal exposomes.



Dr. Mark Cherrie, Webinar on September 24, 2020

“Association between area-level environmental predictors and morality in Scotland”

Dr. Mark Cherrie, Senior Scientist Environment and Public Health, Institute of Occupational Medicine, HDRUK Research Fellow, University of Edinburgh, presented a webinar on September 24 in which he introduced the ecological fallacy and analytical strategies such as multi-level modelling and spatio-temporal Bayesian areal unit modelling



Dr. Mark Cherrie, Webinar on July 30, 2020

“Detecting spatial clusters of deaths in Scotland”

Dr. Mark Cherrie, Senior Scientist Environment and Public Health, Institute of Occupational Medicine, HDRUK Research Fellow, University of Edinburgh, presented a webinar on July 30 to the CI's students and researchers on the topic "Detecting spatial clusters of deaths in Scotland". Spatial cluster analyses are used to uncover higher or lower expected sets of events in time and space. The seminar introduced standardisation, global/local spatial autocorrelation and disease mapping.



Dr. Sander Ruiter 's Webinar on May 26, 2020.

“Hands on Data Analysis Webinar Training in R”

Dr. Sander Ruiter, Risk assessment, TNO, The Netherlands presented a webinar on May 26 to the CI's students and researchers on the topic "Hands on Data Analysis Webinar Training in R".

The aim of this webinar was to give student an impression of how programming in R works, how to find their way in writing their first lines of code and provide an insight in analysis steps that are specific for handling real-time sensor measurement data.

Presentations, courses, conferences

European Human Exposome Network

In 2020, Water and Health Lab participated in the grand opening of the European Human Exposome Network that took place at the European Commission premises. Europe is the global leader in the new and upcoming field of the human exposome that is anticipated to complement the human genome progress



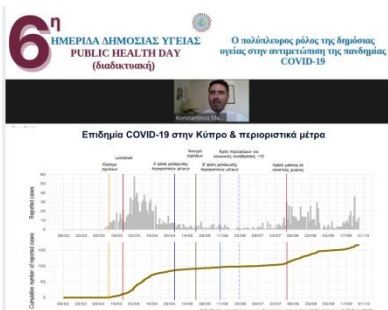
European Human Exposome Network



Application of human exposome concept in evaluating COVID-19 response

- Exposome@school:** The scientific findings of our Exposome@School | COVID-19 study were presented at the International Society of Exposure Science (ISES)¹ conference last September 2020. The study objective was to assess the lifestyle changes in primary school children using the methodological framework of exposome. Thus, we set up a study where parents filled an online questionnaire about their children's habits before and after the lockdown period. The online questionnaire was available from the 1st of June until the 17th of July. Based on the results, the study's children (n=1510) profile after the schools' reopening was presented in comparison with the pre-lockdown period. Based on an ExWAS analysis, reduced physical activity, increased screen time and sugar consumption, were the main negative lockdown effects. However, we observed an increase in hand hygiene and a decrease in the fast food consumption. Also, the children's compliance to the implemented measures was linked with habits' changes. [Link: https://intlexposurescience.org/meetings/2020-meeting](https://intlexposurescience.org/meetings/2020-meeting)

- Exposome@home:** The scientific findings of our Exposome@Home | COVID-19 study were presented (through a poster) at the *International Society for Environmental Epidemiology (ISEE) conference*, August 2020 and through a presentation at the 6th annual *Cyprus Public Health Day*. Our lab set up the study (survey in two phases) to assess exposome changes in the general population of Cyprus during the lockdown period and their degree of compliance to the implemented measures of restricted mobility. The online questionnaire for the first phase was available during the period of lockdown measures (mid-March till end of April 2020). Results from the first phase showed sex differences in the number of social contacts and in their levels of state anxiety, perhaps due to different responsibilities and lifestyle. The compliance to the implemented measures as of in the spring 2020, may be linked with the fact that the measures were mandatory. The second phase (after the lockdown period) of the study will begin recruitment towards the end of October 2020. [Link: https://isee2020virtual.org/](https://isee2020virtual.org/)



Dr. Konstantinos Makris at the 6th Public Health Day in Cyprus



Publication

Exposome-based public health interventions for infectious diseases in urban settings



This work highlights the use of a comprehensive systems-based approach of the exposome for better capturing the population-wide and individual-level variability in SARS-CoV-2 spread and its associated urban and individual exposures towards improved guidance and response.

Highlights

- ☐ Exposome approaches can aid the development of comprehensive public health measures.
 - ☐ Exposomic tools can be integrated in infectious diseases surveillance/monitoring in urban areas.
 - ☐ The exposome could aid in risk assessment, preparedness and response to events of public health impact.
- The work was published in the journal "Environment International" (<https://doi.org/10.1016/j.envint.2020.106246>).
 - The EXPOSOGAS project receives funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 810995

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