

Scientific Report

COST-STSM-FP1204-13823, Matilda van den Bosch

STSM Topic: Associations between health and environment.

Host: Michael Depledge, European Centre for Environment and Human Health, ECEHH, Truro, UK, 20131021 – 20131103

The aim of the STSM was to establish contact with the ECEHH and enhance the networking, in order to take advantage of shared research interests. This would potentially lead to mutual research applications and projects.

The Centre was launched in May 2011 with support from the European Regional Development Fund and European Social Fund Convergence programme for Cornwall and the Isles of Scilly. The Centre hosts experts from diverse disciplines that include epidemiology, policy analysis, systematic reviews, health economics, chemistry and microbiology. The team works to break from traditional disciplinary silos; conceiving and undertaking projects that cross disciplinary boundaries.

My visit to the Centre was most fruitful and provided lots of inspiration and ideas for future research topics and collaborations. It was a very valuable stay to me, and the leadership as well as the staff were exceptionally welcoming and accommodated me well into their workplace and collegial atmosphere. Altogether, I can honestly state that the two weeks were even more rewarding and important than I had expected and I will definitely return to continue the now initiated exploration of common research opportunities.

Activities

- Seminar for the colleagues at the Centre with individual presentation of myself and my research activities and work at my home university. Followed by open discussion and questions.
- Meeting invitations to the research staff at the Centre. Both in advance and at place.
- Daily participation in the Centre's activities and meetings.
- Daily discussions with staff at the Centre
- Mail discussions with Professor Lora Fleming and Dr Mathew White.
- Visit to the University of Exeter, Streatham Campus and St Luke's Campus

Achievements

- I had the opportunity to engage in several meetings and discussions with the funder and Chair of the Advisory Board of the Centre
 - *Professor Michael Depledge*, both at the Centre and at his workplace at St Luke's campus at the University of Exeter. This was utterly inspiring and rewarding for my work. Professor Depledge's research interests include the impact of climate change on health and wellbeing, the effects of chemical body burdens on human health and the environment, and finding ways of communicating scientific information to policymakers and politicians. He is a world known scientist in this area and his impact

on European research direction and coordination is substantial. He has a vast worldwide network with expertise in the public health and environment sectors. Our discussions were broad and Professor Depledge introduced me to several concepts and activities going on at the Centre and in Europe as well as in US. Among many other things we talked about Horizon Scanning, a method that is implemented at the centre for predicting future scenarios and coming research topics, likely to emerge. The method uses web-based search to identify and examine trends, potential threats, opportunities, and likely future developments. The results can be used for informing policies and decisions. The main responsible for the Horizon Scanning at the centre is Dr Marco Palomino.

Other topics we elaborated on included citizen science, cost-benefit analyses, how environmental chemicals affect the disease burden and in general the body burden of contaminants. More specifically we also talked about activities or projects, such as The Blue Gym, Inhabitat, the Bupa Well World Project, and Tele-wellbeing. Connected to these discussions we talked about possibilities for me to contribute to and to participate in any project. Professor Depledge mentioned several potential funding opportunities to be further explored.

As a first step of working together, Professor Depledge invited me to be a member of a WHO task force within their 10 Essential Public Health Operations (EPHOs), where our operation (EPHO3) will address health protection including environmental occupational, food safety and others. This will imply regular meetings with the Advisory Committee for EPHO3, including me and Professor Depledge, together with a few other, e.g. Professor Anthony Kessel and Professor Fiona Adshead.

- Several productive appointments with most of the Centre's research staff, present during my visit. For example:
 - *Dr Ruth Garside* about techniques for Systematic Reviews, a shared activity of ours. We discussed, among many other things, the possibility to link material from our respective systematic reports. Dr Garside and her team have previously published in the Cochrane library of systematic reviews and they have a new paper soon to be published on health effect of conservation activities. Dr Garside is involved in collaborations for environmental evidence, dealing with for example ecosystem services and public health.
 - *Dr Ian Frampton* about neuropsychology and brain-imaging techniques for exploring neurological mechanisms behind the positive effects of nature to human health. Dr Frampton and his team work mainly at the Streatham Campus of the University of Exeter and they have performed a few pilot studies using functional Magnetic Resonance Imaging (fMRI) in order to elucidate brain responses to photos of nature. The preliminary results are indicative of reactions in stress regulating parts of the brain. We discussed a collaboration between our universities to further develop a prototype for a functional Near Infrared Spectroscopy (fNIRS) model, which we have in our research group together with Lund University. Our idea is to test neurological reactions in real outdoor settings and we talked about possible study plans and design of experiments.
 - *Dr Benedict Wheeler* and *Dr Rebecca Lovell* about their use of Geographical Information Systems (GIS) in ecological studies concerned with relationships

between access to blue or green areas and public health. We discussed common factors between my studies and the studies they perform within the programme Beyond Green space, and I introduced them to Urban Atlas. Dr Ben Wheeler is a well-known expert in GIS analyses and we discussed the potential for creating objective GIS-correlates to subjective green experience values, a project that has been going on at my university for a while, but that would need input from international data for validation. We also discussed potential for including socioeconomic variables in such indicators. Dr Rebecca Lovell's research is mostly focused on the health and wellbeing benefits of higher quality and bio-diverse spaces and places. This is something which is very much in line with my interests and the opportunities for collaborations seem vast. We also discussed a variety of possible proxies for biodiversity that can be easily monitored and estimated.

- *Dr Nicholas Osborne* about general issues linked to research on environment and health. He showed a particular interest in the indicator for exposure to allergenic pollen, a tool that I am currently involved in developing as a consultancy assignment for WHO. Dr Osborne has himself worked a lot with allergens and for example connection to atopic eczema.

- *Dr Ian Alcock* about epidemiological data and analyses. Dr Alcock has exploited the British Household Data (BHPS), which turned out to be an excellent resource with up to now 18 waves of a substantial amount of data for a cohort of 10 000 persons. Together with demographic data the database also contains scores on GHQ-12 and life satisfactory. This is possible to combine with geographical data and draw conclusions about place based health effects. The land use data the Dr Alcock has used is a British database called the Generalised Land Use Database (GLUD), published by the Office for National Statistics, UK. He has for example studied samples that have moved from one kind of environment to another, which is interesting considering that I have worked with similar kind of data, though only containing two waves of a southern Swedish population. We decided to collaborate on a mutual article, based on results from Dr Alcock's data analyses of health disparities between urban and rural areas, a topic that interests me a lot. I will bring hypothesis formulations and theoretical ideas to the paper, as well as being involved in the analyses. 58 705 person-wave observations are in the estimation sample, guaranteeing significant results.

Follow-up

- A research application for funding from the Sound Environment Centre at Lund University was written during my stay at the Centre. The proposed study would include experiments in the Virtual Laboratory at Lund University, testing effects of different sounds in natural environments on stressed individuals. I am main applicant and several researchers from the Centre are listed as co-applicants.
- An article is planned together with Dr Ian Alcock.

- On-going planning and explorations for collaboration on studies of physiological monitoring of reactions to green environments together with Professor Michael Depledge, Dr Mathew White, and Dr Ian Frampton.
- Continued collaboration with Professor Michael Depledge within EPHO3, as part of WHO:s Public Health Action Programme.
- Well established contact with Professor Michael Depledge and active, on-going mail-discussions on opportunities for funding of mutual research projects.