Capacity Building in Environment and Health
COST Action IS1408
Industrially Contaminated Sites and Health Network (ICSHNet)

Report of the international training school on environmental health in industrially contaminated sites

Aristotle University of Thessaloniki, Greece, 7-10 February 2017

COST is supported by the EU
Framework Programme Horizon 2020

Summary

As part of the COST Action Industrially Contaminated Sites and Health Network (ICSHNet) a training school was successfully held in Thessaloniki in February 2017 with the aim to strengthen in-country capacity to face the environmental health challenges posed by Industrially Contaminated Sites (ICSs). 46 early career investigators from 25 countries participated in the 4-day workshop led by 21 lecturers, introducing concepts and methods used in epidemiology, exposure assessment and health impact assessment. As well as plenary and practical sessions, there was much student participation with most presenting posters showing real-life issues in their respective countries related to health and environmental pollution arising from ICSs. The course was well received with the evaluation scoring the course very highly.

Keywords:

INDUSTRIAL CONTAMINATED SITES
PUBLIC HEALTH
ENVIRONMENT
TRAINING
COST ACTION
EUROPE

For more information about the COST Action, visit the Action website:

http://www.icshnet.eu

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Contributors

This report was produced as a result of the training school for early career investigators under the COST Action, created in order to strengthen in country capacity to face the environmental health challenges posed by Industrially Contaminated sites (7-10 February 2017, Thessaloniki, Greece).

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1. Introduction

1.1 Background

Capacity building in environment and health has been recognized as a critical need among Member States of the WHO European Region. More and more, countries are faced with the challenge of addressing the growing burden of disease arising from environmental exposures, oftentimes unprepared [1]. The European Cooperation in Science and Technology (COST) is a pan-European intergovernmental framework working to address these issues. Its mission is to enable break-through scientific and technological developments leading to new concepts and products and thereby contribute to strengthening Europe's research and innovation capacities [2]. It allows researchers, engineers and scholars to jointly develop their own ideas and take new initiatives across all fields of science and technology, while promoting multi- and interdisciplinary approaches. COST aims at fostering a better integration of less research-intensive countries to the knowledge hubs of the European Research Area [2]. COST Actions are a flexible, fast, effective and efficient networking instrument for researchers, engineers and scholars to cooperate and coordinate nationally funded research activities. COST Actions allow European researchers to jointly develop their own ideas in any science and technology field [3].

1.2 The issue

In Europe, earlier industrialization and poor environmental management practices have left a legacy of thousands of contaminated sites. Past and current industrial activities can cause local and diffuse contamination, mainly chemicals, to such an extent that it might affect human health by compromising air quality, altering soil functions, entering the food chain, and polluting groundwater and surface water [2, 4]. These stressors are arising near the point source, but not always, affecting communities of population, especially vulnerable subgroups [4]. Waste related activities have a sizeable proportion of all activities at reported contaminated sites in European Environmental Agency (EEA) member country. Thus, the management of waste is demanding and challenging in all European countries, with important implications for human health and the environment [5]. The European Union legislation and a clear strategic direction have helped to achieve a significant progress in many countries. Even more, waste and contaminated sites was one of the priorities of the Declaration of the Sixth Ministerial Conference on Environment and Health held in Ostrava 2017 and a focus of its Annex 1, the compendium of possible actions to enhance environment and health at the national level [6]. However, in many cases, informal, uncontrolled or poorly managed practices and use of old technologies resulted in negative human health impacts such as increase of cancer risk, congenital anomalies, and respiratory diseases. Additionally, less severe health and well-being outcomes are important, such as annoyance due to odour, or a general deterioration of local environment [5].

1.3 Solving the issue

The Cost Action Industrially Contaminated Sites and Health Network (ICSHNet), was launched in 2015 and aims to develop a common European response to these issues. The Action aims at establishing and consolidating a European Network of experts and relevant institutions, and developing a common framework for research through conferences, workshops, training and dissemination activities. It is currently involving researchers and experts from 33 Countries. The Network will clarify knowledge gaps and research priorities; support collection of relevant data and information; stimulate

development of harmonized methodology; promote collaborative research initiatives; and develop guidance and resources on risk assessment, management and communication.

The training school "Environmental health in industrially contaminated sites" was one of the milestones of this Action, created to strengthen the in-country capacity to respond to the environmental health challenges posed by industrially contaminated sites (ICSs), through the training of early career investigators (ECI). These researchers are essential to the success of this Action and for spreading knowledge methods through different scientific communities in the future.

1.4 Aim of the training course

The aim of this training course was to strengthen in-country capacity to respond to the environmental health challenges posed by Industrially Contaminated sites (ICSs) by creating and assisting a European "cohort" of investigators dealing with Industrial contamination and population health issues. The course aimed to provide these researchers with a scientific basis on knowledge of methods along with risk and uncertainty of the research, also matched to practical skills for evaluating the health effects and impact of industrially contaminated sites (see Annex 1 - Training course program).

1.5 Target audience

The target audience were ECI, PhD students, and researchers from government agencies and research institutes of health or environment, university departments, and other sectors related to industrial contamination and health.

The main criteria for eligibility was for candidates to have some experience or training in exposure assessment, epidemiology or health impact assessment, or dealing with ICSs.
All 33 countries participating in the Action were asked to identify and propose students to attend the training school. Some students were funded by the Action, while others were funded by their institutions.

2. Participation in the training school

The selected students participating represented a wide geographic spread, ensuring a uniform distribution across the ICS Network countries. 25 out of 33 countries involved in the Action (76%) identified candidates to participate in the training.

A total number of 46 trainees, well balanced by gender (54% females), with an age range of 24 to 56 years, attended the school. Figure 1 shows the represented countries.

Figure 1. Countries represented by participants

The majority of students were involved in research and 40 were early career investigators (87%). Most of them (23) came from university departments, 16 from public health institutes/agencies, 5 from environmental agencies, and 2 from other institutions/companies (see Figure 2 and Annex 3 - List of participants' affiliations).

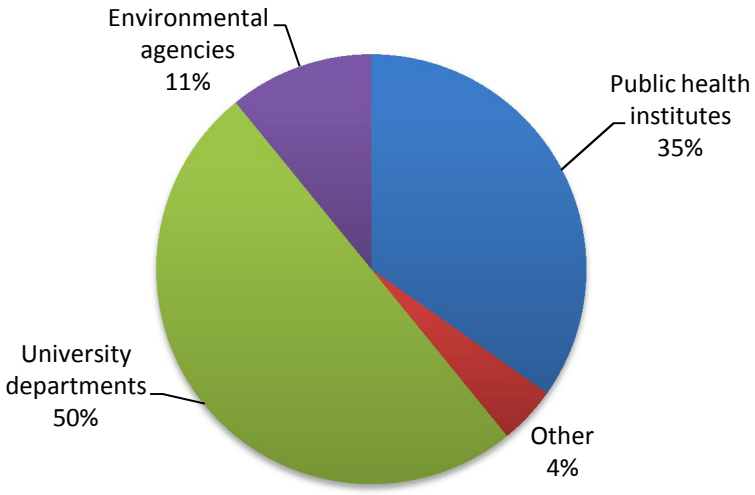

Figure 2. Main affiliations of participants

Trainees were mainly working/had previous experience in the environmental health sector (48%), followed by those involved in the environmental field (37%) and working the public health sector (15%), see Figure 3.

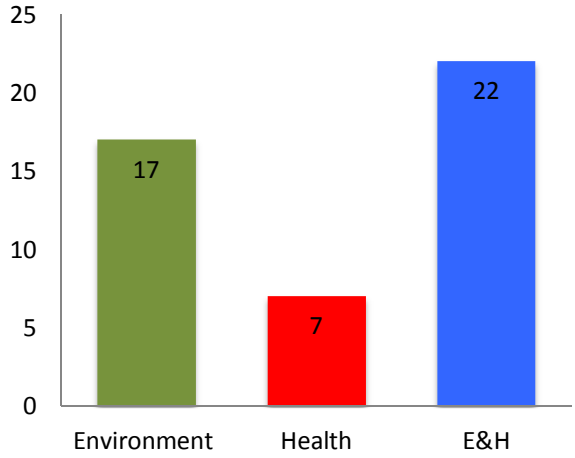

Figure 3. Main field of activity of participants

3. How the package was developed

Materials were based on available knowledge, literature and evidence, compiled by the faculty staff, which included a wide range of researchers and academics in Environmental Public Health, from several countries and institutions (see Annex 2 - List of trainers and lecturers).

The materials for the course were developed so as to cater for the different skills required to assess the issues surrounding ICS. Examples of these materials include: introduction to concepts and methodologies used to assess the environmental and public health impacts of ICS; illustration of applications in international case studies; and practical student exercises that placed the learning into context of real-life ICS scenarios. The format of this Training School could be adapted to local environment and health problems and used within a broad variety of audiences.

The package developed also took into consideration the diversity in the student cohort of professional, language, and country-perspectives in ICS backgrounds. The materials used ensured that the knowledge and learning outcomes of the course had captured the majority of the student body.

4. Learning objectives

The objectives of the training school were to provide key principles and methods to deal with environmental health issues of industrially contaminated sites. Methods and tools were presented to:

- examine the exposure and health profile of populations affected by ICSs
- estimate the health impact of living on or near to ICSs
- identify public health priorities for research and preventive actions
- interact and communicate with relevant counterparts.

5. Training curriculum: faculty, contents and structure

5.1 Faculty

The faculty included experts from different disciplines, also reflected in the course content. Members of the faculty had extensive expertise in all aspects of the training course, from exposure, epidemiology and health impact assessment, to policy and risk communication. Most faculty members have also extensive expertise in international training in different settings.

5.2 Course content

The course included:

- Plenary sessions and discussions
- Lectures of principles and methodologies for exposure, health, and impacts assessment
- Lectures of case studies, placing the principles and concepts into context
- Practicals: hands-on data analyses, reviews of case studies, discussion sessions
- Use of mixed media: computer-based, presentations, round-table discussions
- Discussion on posters presenting cases of ICSs in participant countries.

The Planning team of the Training School were Tony Fletcher, Kees de Hoogh, Marco Martuzzi and Ivano Iavarone. For a full list of trainers and lecturers see Annex 2.

5.3 Course structure

The structure of the course was built around 4 training modules (see Annex 1 - The training school programme), each lasting one day with a different focus as follows:

Day 1. Plenary Day. Course: Plenary lectures
Shared with the Action management and participating scientists. It comprised invited keynote lectures introducing topics relevant to the Action more generally and the aims of the training school specifically, a complex multi-stakeholder case study of a local controversial contamination scenario, and introductory session for the students to be introduced to faculty and each other.

Day 2. Course: Epidemiology
The aim of the day was to introduce environmental epidemiological principles, recognizing that the student body included some with prior experience of epidemiology and was able to learn more deeply about the methods for studying ICS in detail and others who were new to epidemiology and needed more to understand the principles, so they can critically examine published work. Epidemiology can potentially identify whether or not there is a health risk, quantify the magnitude of the risk and monitor whether that risk falls following clean-up. Good design and good exposure assessment underpin reliable results. Topics covered included choice of study designs, approaches to analysing data, how to synthesise evidence from multiple studies, and a detailed illustration of such studies in the presentation of the example of SENTIERI epidemiology studies carried out in Italy.

Day 3. Course: Exposure assessment
The aim of the day was to give the students an introduction to environmental exposure assessment relevant to industrially contaminated sites including a description of methods and tools for all possible pathways (air, soil, water, food). A broad range of issues were covered including: the difference between measuring and modelling, exposure misclassification, temporal and spatial exposure scales,

the use of GIS in exposure science, strengths and limitations of human biomonitoring studies to evaluate environmental exposure solutions. The students were also given a hands-on software experience, using the open-source software INTEGRA, to perform an exposure assessment (EA) in a case study setting. Afterwards there was time to share experiences and come up with solutions solving some of the problems faced by the students.

Day 4. Course: Health Impact Assessment (HIA)
The aim of day was to describe the rationale, objectives, methods and tools for assessments of the health impacts of environmental risk factors and determinants relevant for industrially contaminated sites. The day built on and logically followed the previous two days, where epidemiological and exposure assessment tools were covered: risks and exposure data both contribute to deriving health impacts, which can be expressed through various metrics, and these were taught in the course through theory and examples. Strong emphasis was also put on the available practical resources and tools for impact assessment, with a session on tools based on the R freeware software package. The different sessions presented and promoted discussions on relevant applications, case studies, examples, needs, while paying attention to feasibility, inequalities and environmental justice, interpretation and communication of results.

6. Student work groups

Active learning was ensured by having students working in small groups for discussions and practical exercises, as well as listening to lectures. Students were assigned to small groups of 6 mixed by country and background so they worked with new people. Each day a long session was devoted to these groups, led by one of the tutors, visiting in turn and reviewing the posters brought by the students. Thus, students developed skills both how to present their work and how to debate and provide constructive feedback. These sessions were highlighted as especially valuable in the student feedback at the end of the course.

Well in advance of the course, students were invited to prepare conference-style posters to share examples of their experience on ICS research in their country. This aimed to facilitate students learning from each other and discussing together how best to respond to these different situations.
27 posters were displayed for three days. The list of posters can be found in Annex 4, and they are available in the supplementary material.
The posters include: ICS situation from specific country/area; specific local ICS example or an overview of the number of different types or solutions (ICS scenarios); an exposure investigation of ICS, with some measurements (ICS exposure); an epidemiological study of people living near ICS (ICS epidemiology); the estimated risk or number of diseases in an ICS exposed population (ICS health impacts). Poster will be made available in the Action Website (http://www.icshnet.eu).

7. Evaluation of the course

Each day an evaluation form was handed out and most students completed this. Forms were anonymous and there was the opportunity to score the whole day (in terms of overall rating, quality of presentations, clarity of objectives and relevance to the students work). Scoring was on a 5-point scale from poor to very good. Each individual session was scored, and students could provide free field written comments. In addition, at the end of the course there was a general evaluation session with the students together. The detailed feedback was much appreciated and more detailed assessments of

each session will help the teaching faculty in developing and adapting the course or their specific teaching.

Overall each day was evaluated as good to very good by 90% or more of participants and scores for individual sessions were similar (see Figures 4 & 5). The course aims were fully met according to student assessment. The diversity of topics was well appreciated, and the student participatory elements, especially the poster sessions, were highlighted in particular. As of this, students suggested to shift the balance to shorter more concise lectures and add instead more practicals to consolidate learning.

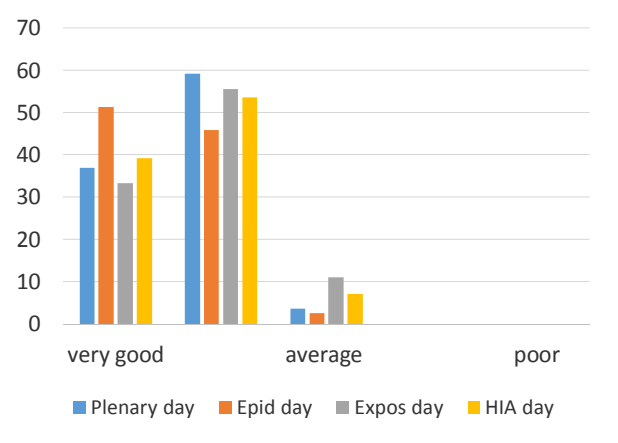

Figure 4. Overall evaluations of each day

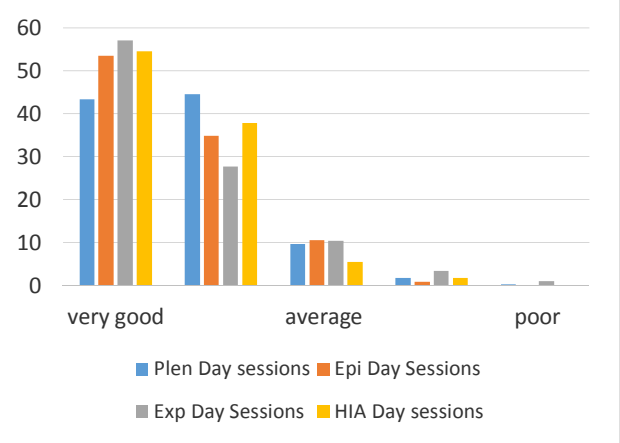

Figure 5. Overall evaluations of all sessions up to 44 evaluations of 34 sessions

For each day was realised a summary with the main points of the feedback and comment on the lessons learnt as follows:

Day 1. Plenary Day

Overall the day was positively evaluated (see Figure 6). The range of plenary speakers was appreciated and each individual received high scores. Additionally, the participants considered that would be useful to receive a summary with the outcomes of the COST action working groups.

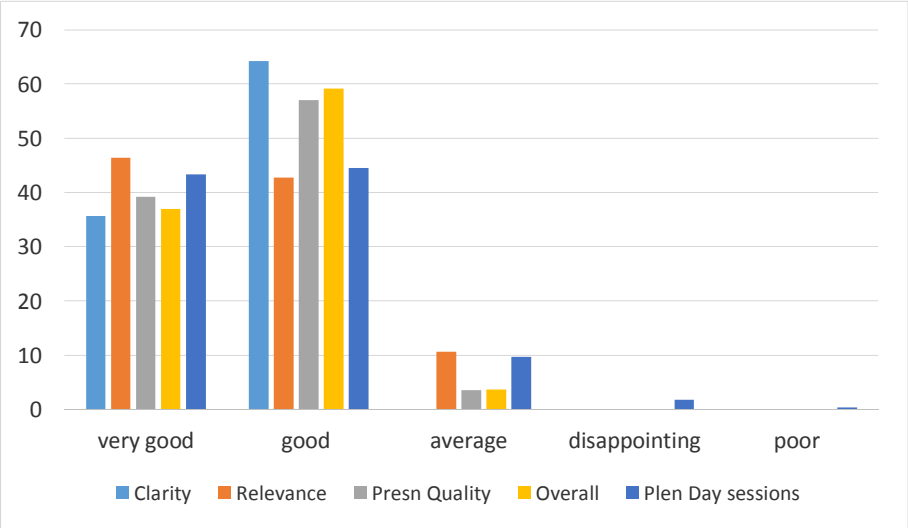

Figure 6. Overall evaluations, Plenary Day % by category for 28 forms returned

The Gold mining case study was scored positively by students (see Figure 7). The time for discussion and exploration of the very contrasting positions on the risk and what to do about it was reduced because of several longer speeches. The ground rules on debating, and in particular timekeeping have been suggested to be better established in future trainings. However, the day went well, with students

appreciating both the external speakers' engagement that brought relevant issues to the Action, and the discussion around a local real-life controversial case study. Having stakeholders who can participate from a local scenario brings the policy issues into focus. Also suggested was some more feedback on work in progress and presentations on achievements from the Action working groups.

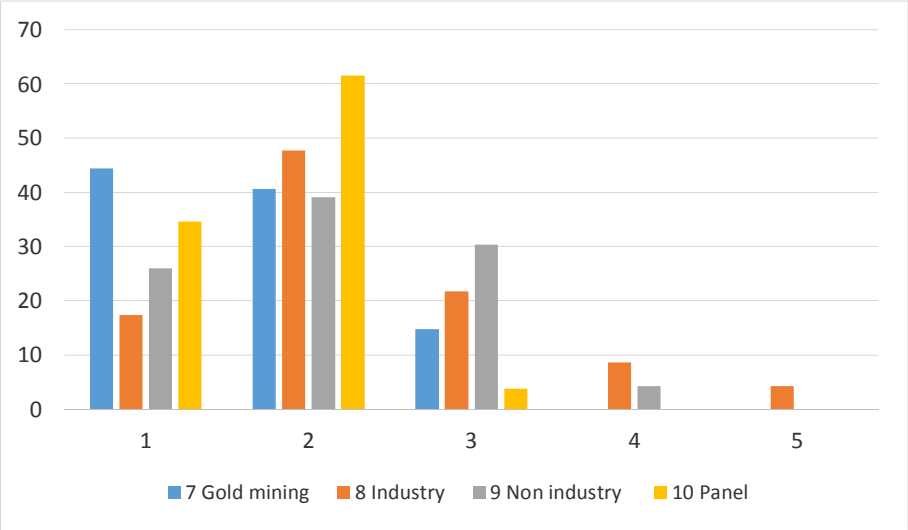

Figure 7. Session by session evaluation, Gold Mining session % by category for 28 forms returned

Day 2. Epidemiology

Overall the day was positively evaluated (see Figure 8). The range of plenary lectures was appreciated and each individual received high scores. The teaching method involving a balance of lectures and hands-on practicals was appreciated. However, several participants commented that the balance was a little too much to lectures and more hands-on practicals would be advised in the future. The lower score of relevance than the other days, reflected the fact that fewer of students had experience in or expectation that they would do environmental epidemiology than other skills.

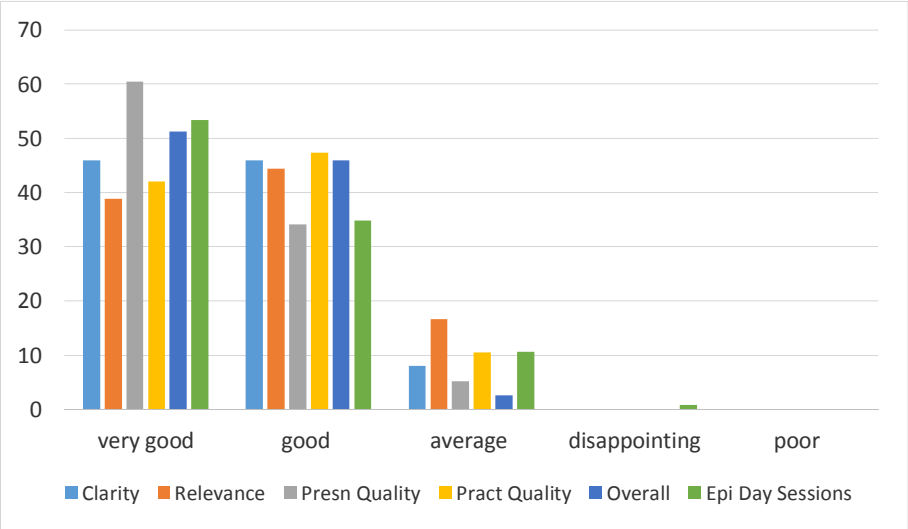

Figure 8. Overall evaluations, DAY 2 Epidemiology % by category for 38 forms returned

Day 3. Exposure

Overall the day was positively evaluated (see Figure 9). The range of plenary lectures was appreciated, especially the first introduction, but there was more variability than the other days. There were concerns that some lectures tried to go through too many detailed slides. Several people commented that the long introductory lecture did not leave much time for the practical activities.

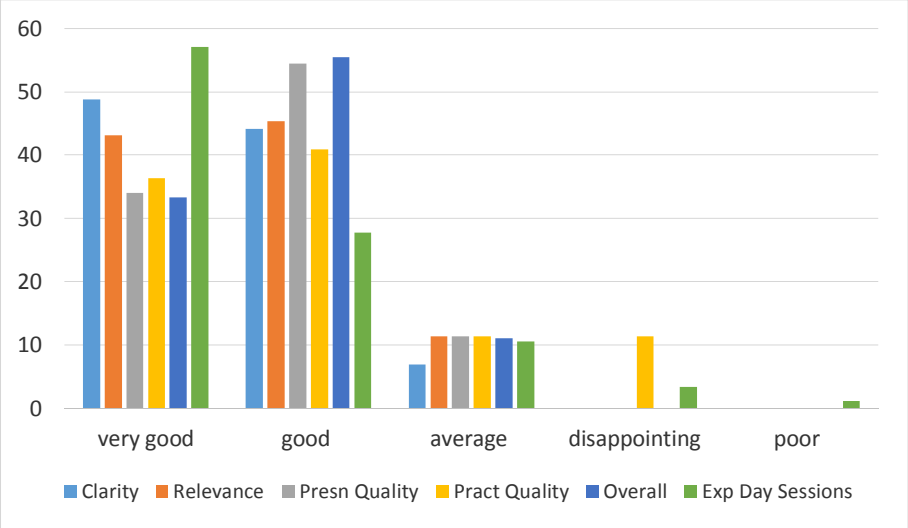

Figure 9. Overall evaluations, DAY 3 Exposure % by category for 44 forms returned

Day 4. Health Impact Assessment (HIA)

Overall the day was positively evaluated (see Figure 10). The range of plenary lectures was appreciated, and the poster session in particular, stood out as working well. Similar with the other days, the students commented that they appreciated the hands-on practicals and suggested to shorten the lectures and extend the practical sessions.

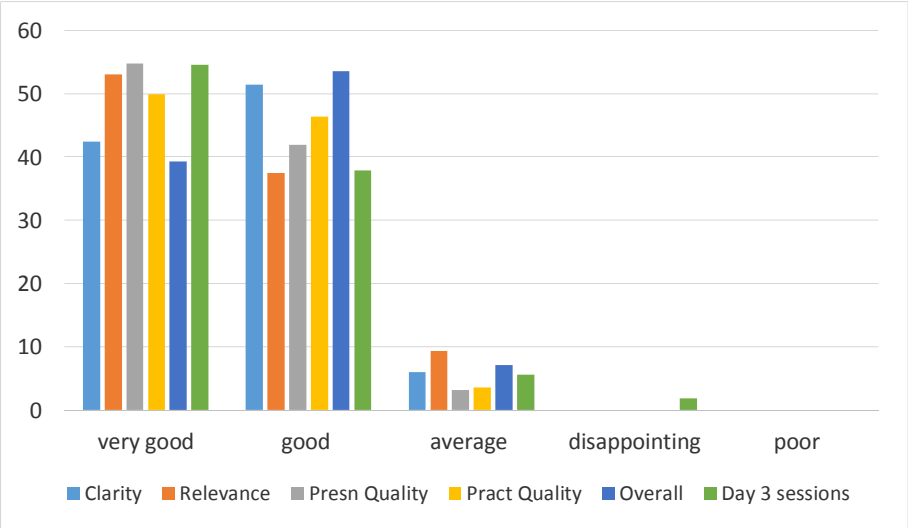

Figure 10. Overall evaluations, DAY 4 HIA % by category for 35 forms returned

8. Conclusions

Building capacity is an obvious need. The burden of issues related to ICS is substantial and yet there is a great need in most countries to continue tackling these issues. Training is one of the main priorities in capacity building and is essential to address such issues. The training part of the COST Action Industrially Contaminated Sites and Health Network (ICSHNet) held in Thessaloniki was developed specifically to support and facilitate countries dealing with environmental health issues of ICSs to develop their expertise and be more effective. The training course proved successful and provided trainers with tools to better address these issues. Even more, it will further contribute to improving and strengthening training materials.

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Annex 1. Training school program

Day 1. Plenary Conference

09:30 - The Action's environmental health challenges

- ICSs, a valid category for epidemiological research, or for PH action? M. Kogevinas, Spain
- When is epidemiologic research a helpful response to environmental pollution and when is it not?
  D. Savitz, USA
- Facing the complexity of HIA in ICSs: the exposome paradigm, D. Sarigiannis, Greece

11:30 - Research and health policy tools

- The European Information Platform on Chemical Monitoring (IPCheM): extension of the human biomonitoring module and possible contribution to the ICSHNet COST Action, S. Dalla Costa and A. Paya Perez, Italy
- The contribution of human biomonitoring in the assessment of exposure and biological effects in populations living in ICSs G. Schoeters, Belgium
- Facing the challenges of communication in ICSs: do's, don'ts, traps. I.Loots, Belgium

Afternoon Session

14:00 - The Greek ICS case-study of Gold mining: a reality check for the COST Action in dealing with stakeholders

Stakeholders involved in the arena present their views on the social, occupational, industrial, environmental and public health issues

16:15 - Panel discussion: industrially contaminated sites – what beyond complexity?

17:30 - Intro to the Action training school – students and trainers get to know. R. Pasetto, Italy

Day 2. Epidemiology - Coordinator, Tony Fletcher, Public Health England, UK

Time	Title	Description	Trainers
9.00 – 9:30	Introduction to epidemiology	Welcome, intro to epidemiology as relevant to ICS, the range of design options	T. Fletcher
9:30 – 10:00	ICSs	Defining the issue	I. Iavarone
10:00-10:45	Evidence of harm from ICS	Synthesising, integrating and replicating epi data on ICS	F. Forastiere
11:15-12:15	Descriptive Epi in ICS	The SENTIERI approach: combining epidemiology evidence a population health profiles in ICSs	R. Pasetto
12:15-13:00	Student poster session 1	Presentation and review of posters from student participants, with focus on health studies	All
14:00 – 14:45	Sources of data	Studies examples: geographic, survey and cohort data, risks and rates and impacts	C. Ancona
14:45 – 15:30	Practical 1.1 Data analyses	Group work: Understanding example results – analyses and interpretation	A. Zeka
16:00-16:45	Further epidemiology	Reviewing evidence, synthesising from multiple studies, assessing quality, including confounding	T. Fletcher
16:45 – 17:30	Practical 1.2 Study options	Group work: Given a scenario choosing the best epidemiology design	All
17:30-17:45	Conclusion		T. Fletcher

Day 3. Exposure Assessment - Coordinator, Kees de Hoogh, Swiss Tropical and Public Health Institute, CH

Time	Title	Description	Trainers
9.00 – 9:45	General principles of environmental exposure assessment (EA)	Definition of exposure, why does it matter, Understand principles of EA the link to Environmental Epidemiology (EE). Cumulative measures and mixtures. Difference between measuring and modelling. Exposure misclassification. Use of Geographic information system (GIS)	K. de Hoogh
9:45 – 10:30	Assessing exposure in ICS for epidemiology, risk assessment and HIA	Understand role of Exposure assessment for epidemiology & HIA. Identification of major compounds relevant to industrial processes. Environmental Multimedia processes – media exchange. Temporal and spatial exposure scales	D. Sarigiannis
11:00 – 11:45	The use of GIS in exposure modelling	Short introduction to GIS. What can GIS do in terms of exposure assessment. Examples of GIS functionality – i.e. proximity, buffering.	K. de Hoogh
11:45-12:30	Student poster session 2	Presentation and review of posters from student participants, with focus on exposure assessment	All
13:30 – 15.00	Practical 2.1	Introduction to the open source software INTEGRA: Multi-pathway exposure upon environmental release of toxic substances (persistent and non-persistent compounds) and expected biomonitoring levels	S. Karakitsios, K. de Hoogh
15:30 – 16:15	The use of human biomonitoring in exposure assessment	Strengths and limitations of human biomonitoring studies (HBM) to evaluate environmental exposure situations. Selecting a study design for HBM studies. Using questionnaire data and environmental data in combination with HBM data. Interpretation of HBM data at the group level and at individual level	G. Schoeters
16:15 – 17:30	Practical 2.2	Use INTEGRA to run through case study	All
17:30 – 18:00	Conclusion		K. de Hoogh

Day 4. Health Impact Assessment - Coordinator, Marco Martuzzi, WHO, Bonn – Germany

Time	Title	Description	Trainers
9:00 – 9:30	What do we talk about when we talk about HIA	Difference between estimating effects and impacts; different nature of produced knowledge and evidence; changing focus on policy response.	M. Martuzzi
9:30 – 10:15	Risk assessment	Risk assessment: definition, metrics, practices, example	S. Dack
10:15 – 10:30	Practical 3.1	Students calculate risks and impacts of single risk factors. Real life or fictitious simple examples, workable with hand-held calculators.	S. Dack, M. Martuzzi
11:00-11:45	Integrated HIA and Environmental Burden of Disease	Combining multiple exposures and multiple health outcomes in one analysis. Heterogeneous evidence from systematic reviews	O. Hanninen A. Ranzi
11:45-12:45	Practical 3.2	Students calculate impacts and EBoD, using PCs	O. Hanninen A. Ranzi
13:45 – 14:30	Student poster session 3	Presentation and review of posters, with focus on health impact assessment	All
14:30 – 16:00	Intro to R and Practical 3.3	Use PM2.5 simple sheet for introducing R (Practical 1 from Estonia). Application to an ICS case-study - Students calculate risks and impacts in R	G. Shaddick, M. Thomas
16:30 – 17:00	Continue Practical 3.3	Practical 1 from Estonia Common currencies for HIA (continued). Closing remarks: Tools and resources for HIA. Limitations and perspectives in HIA of ICSs. Inequities, inequalities, environmental justice. Dealing with uncertainty. The policy arena	M. Martuzzi
17:00 – 17:45	Conclusions & evaluation	Evaluations, conclusions, farewell	T. Fletcher, K.de Hoogh, M. Martuzzi

Annex 2. List of trainers and lecturers

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5. Banda Amra, University of Sarajevo, Faculty of Science, Bosnia and Herzegovina
6. Cerza Francesco, Dept of Epidemiology, Lazio Region, Italy
7. Chapizanis Dimitris, Dept of Chemical Engineering, Aristotle University of Thessaloniki, Greece
8. Cidlinová Anna, National Institute of Public Helth, Czech Republic
9. Dimovska Mirjana, National Institute of Public Health, fYR Macedonia
10. Đurović Dijana, Insitute of Public Health, Montenegro
11. Ferencz Iozsef Lorand, University of Medicine and Pharmacy Targu Mures, Romania
12. Flueckiger Benjamin, Swiss Tropical and Public Health Institute, Switzerland
13. Furxhi Irini, Dept of Chemical Engineering, Aristotle University of Thessaloniki, Greece
14. Gaengler Stephanie, Cyprus University of Technology, Cyprus
15. Handakas Evangelos, Dept of Chemical Engineering, Aristotle University of Thessaloniki, Greece
16. Harzia Hedi, Health Board, Estonia
17. Idavain Jane, Tartu University, Estonia
18. Istvan Marion, Dept of Epidemiology and Public Health, Rennes University hospital, France
19. Janev Holcer Nataša, Croatian Institute for Public Health, Croatia
20. Jelić Marina, Institute of Public Health of Serbia "dr Milan Jovanović Batut", Serbia
21. Jelicic Pavle, Croatian Institute for Public Health, Croatia
22. Kauppi Sari Finnish Environment Institute (SYKE), Finland
23. Keken Zdenek, Czech University of Life Sciences Faculty of Environmental Sciences, Czech Republic
24. Kermenidou Marianthi, Dept of Chemical Engineering, Aristotle University of Thessaloniki, Greece
25. Kowalski Michal, Dept of Air Protection, Silesian University of Technology, Poland
26. Kukec Andreja, National Institute of Public Health, Slovenia
27. Candeias Carla, Institute of Public Health, Porto and Universidade de Aveiro, Portugal
28. Marsili Daniela, Istituto Superiore di Sanità (Italian Institute of Health), Italy
29. Mattei Francesca, Dept of Epidemiology, Lazio Region, Italy
30. Nikoli Thomai, Institute of Industrial and Forage Crops, Greece
31. Öztürk Fatma, Abant Izzet Baysal University, Turkey
32. Papadaki Kristi, Dept of Chemical Engineering, Aristotle University of Thessaloniki, Greece
33. Pavličić Nevenka, University of Montenegro
34. Pérez Carrascosa Francisco Miguel, Complejo Hospitalario Granada, Spain
35. Pramuk Vladimír, GEO Slovakia
36. Roshi Enver, Dept of Public Health, Faculty of Medicine, University of Medicine, Tirana, Albania
37. Rumrich Isabell, University of Eastern Finland and National Institute for Health and Welfare, Finland
38. Santos Silva Pestana Diogo Francisco, Universidade Nova de Lisboa, NOVA Medical School, Faculdade de Ciências Médicas, Portugal
39. Selman Kasim, Sharklab International- Sharklab Adria, Sarajevo, Bosnia and Herzegovina
40. Seyidov Nabil, Public Health and Reforms Center of Ministry of Health, Azerbaijan
41. Stubberfield Jonathan, James Hutton Institute; The University of Nottingham, United Kingdom
42. Szigeti Tamas, National Public Health Center, Hungary
43. Tasic Visa, Mining and Metallurgy Institute Bor (Bor, Serbia), Serbia
44. Tetsman Ina, Vilnius Gediminas Technical University, Lithuania
45. Vaccari Lorenzo Vaccari, Arpa Emilia Romagna, Italy
46. Xanthi Andrianou, Cyprus International Institute for Environmental and Public Health, Cyprus

Annex 4. List of posters presented by participating countries

1. Albania, Principal industrially contaminated hot spots in Albania
2. Azerbaijan, Health effects of oil contamination in Azerbaijan
3. Bosnia and Herzegovina, Air pollution and its possible relation to respiratory health in major industrial centers in Bosnia and Herzegovina - case presentation: Zenica, Sarajevo and Tuzla
4. Croatia, Overview of the contaminated sites in Croatia
5. Cyprus, Brain cancer cluster around a factory emitting dichloromethane in a residential area in Cyprus
6. Estonia, Health impacts of the oil shale sector in eastern Estonia
7. Finland, Industrial contamination in Finland: the case of river Kymijoki
8. France, Industrially contaminated sites and fetal growth: the Timoun cohort in the French West Indies (Guadeloupe).
9. Hungary, Exposure to asbestos in Hungary: past, present and future
10. Italy, A communication strategy in contaminated sites as a prevention tool for informed policy
11. Italy, Biomonitoring of the general population living near a modern solid waste incinerator: results from a pilot study and proposal for a simulation of a multi-pathways exposure with Merlin-Expo
12. Italy, Individual exposure assessment to air pollution in an industrially contaminated site of Central Italy
13. Italy, The effect of environmental pollution on mortality in a cohort of people living in an industrial area of Central Italy
14. Montenegro, Industrial contaminated sites and health risk assessment in Montenegro
15. Poland, Industrially contaminated cities – 4 cases in Poland
16. Portugal, The impact of Panasqueira mine (Central Portugal) in the ecosystems and human health
17. Republic of Macedonia, Industrial contamination around lead and zinc smelter plant
18. Romania, Environmental impact of phosphogypsum waste dump in Bacau, Romania
19. Romania, The remains of chemical plant, from Tarnaveni, Romania, an ecological bomb
20. Serbia, Industrial contaminated areas in Serbia
21. Serbia, Long-term trends in concentration of SO2 near copper smelter Bor, Serbia
22. Slovakia, Human health risk assessment for exposure to anthropogenic sediments-relicts of the accident on the landfill in a central part of the upper Nitra basin, Slovakia
23. Slovenia, Different methodological approaches for exposure outdoor air pollution and health risk assessment on respiratory diseases by children: the case of Zasavje region, Slovenia
24. Spain, Historical exposure to persistent organic pollutants and risk of incident hypertension
25. Switzerland, Swiss experience: to remediate or not to remediate
26. Turkey, Temporal variations of aerosol chemical composition in Dilovasi industrial region (Kocaeli, Turkey) between 2015 and 2016
27. UK, A novel approach for the estimation of health risks associated with urban gardening