WCERE 2018
What Are the Knowns and Unknowns in the Valuation of Exposure to Hazardous Chemicals?

Pre-Conference Report
The WCERE 2018 pre-conference on 25 June 2018 was organised by SDSN Northern Europe, a regional network within the global UN Sustainable Development Solution Network, in collaboration with the Department of Economics at the University of Gothenburg, the FRAM Centre for Future Chemical Risk Assessment and Management Strategies, the Swedish Agency for Marine and Water Management and the Swedish Environmental Protection Agency. SDSN Northern Europe is hosted by Gothenburg Centre for Sustainable Development at Chalmers University of Technology and the University of Gothenburg, Sweden. The event was arranged with the support of the European Association of Environmental and Resource Economists.
Chemicals Policy:
What Are the Knowns and Unknowns in the Valuation of Exposure to Hazardous Chemicals?

Economic valuation of the costs and benefits of regulatory action is often required before legislation on hazardous chemicals is passed. However, such valuation is complicated by data limitations, information asymmetries and substantial uncertainties regarding for example dose-response relationships. This workshop brought together experts from regulatory agencies and academia to identify what we regard today as good practice in economic valuation of chemicals and outline an agenda for further research and improved practice.

Background
Chemical production and use are Janus-faced. On the one hand, chemicals are crucial to human society. They provide or facilitate for example healthcare, food production, various consumer products and general societal infrastructure. The chemical industry is also an important economic sector. In Europe alone, it accounts for 7% of industrial production and directly employs more than one million people in 83 000 companies.

On the other hand, there is growing evidence of the substantial negative impacts of chemical production and use on health and ecosystems. The recent Lancet Commission on pollution and health describes chemical pollution as ‘a great and growing global problem... [whose] contribution to the global burden of disease is almost certainly underestimated’.

Due to the difficulties of tracing exposures and determining what levels of risk they pose, it is challenging to quantify the risks associated with toxic chemicals. Only a fraction of the more than 140 000 industrial chemicals put on the market since 1950 have undergone rigorous testing for safety or toxicity. There is also growing concern that industrial chemicals can cause endocrine disruption including e.g. negative effects on metabolism, reproduction and neurodevelopment.

According to economic theory, the optimum use of chemicals occurs when the marginal benefit of the use equals the marginal costs associated with the risks involved, including possible damage to the environment, adverse health effects and regulatory costs. However, in practice economic valuation is difficult due to lack of data and substantial uncertainties regarding dose-response relationships. For many hazardous chemicals, only few valuation studies have been conducted or are lacking all together. Most studies focus on valuing tangible endpoints such as mortality and cancer. Considerably fewer studies include valuation of endpoints such as loss of IQ points, reproductive disorders, obesity and diabetes, which are associated with exposure to certain
The following questions were discussed:

• Which are the key challenges faced by regulatory agencies in the assessment of costs and benefits of chemicals regulation?
• What health endpoints, more than mortality and cancer, should economic valuation of the benefits of chemical regulation focus on?
• How can environmental effects of chemical exposure be valued?
• How should information asymmetries in the valuation of the costs of chemical regulation be dealt with?
• What are promising approaches to tackle the challenges identified?

hazardous substances. Using value transfer techniques is common so that estimates of health costs from chemical exposure found in one study can be used also in other studies. Hence, when regulatory agencies are to assess the costs and benefits of proposals to restrict the use of hazardous chemicals, they are faced with considerable challenges.

Key issues discussed
This workshop aimed at identifying what we today regard as good practice in economic valuation of chemicals and outlined an agenda for generating further knowledge on valuation methodologies for chemicals as well as their practical application for the purpose of regulating specific (groups of) chemicals.

The workshop linked to earlier work led by OECD around socio-economic analysis of chemicals involving experts from environment and health agencies in OECD countries and researchers in environmental and health economics (http://www.oecd.org/environment/sacame.htm).
Summary of workshop discussion
The workshop began with brief presentations of key challenges faced by regulatory agencies in the assessment of costs and benefits of chemicals regulation. These included:

- Incomplete understanding of the pathways from chemical use, complex exposures to environment and health impacts. Large heterogeneity and uncertainty.
- Benefit estimates often only include select health endpoints for which data exists, but fail to include benefits of regulation linked to broader health and environmental effects.
- Scaling up problems—how to show that regulation has benefits for all of Europe? Even for well-studied substances such as lead we have insufficient data to credibly scale up local studies on benefits from restricting lead in gunshots to the European level.
- Chronic/long-term morbidity endpoints are difficult to value.
- Moving from regulation of specific substances to groups of chemicals is even more complex.
- Estimates of the costs of regulation are in most cases more tangible than the benefits—cost of substituting specific chemicals, firm closures, unemployment etc. But how accurate are these estimates, given strategic bias and information asymmetries between industry and regulators?

The discussion on valuation of different types of effects of chemical exposure came to focus on environmental endpoints since participants found this to be a neglected area compared with health endpoints.

- Estimates of environmental effects of chemical pollution are scant and rarely figure in regulatory decision making on chemicals. There was a consensus that much more could be done in relation to the valuation of environmental effects of chemicals.
- In contrast to many of the health benefits from chemical regulation, environmental benefits have mainly public good characteristics. This has implications for valuation, with stated preference (SP) studies being the standard approach in the valuation of public goods.
- However, it is challenging to perform...
SP studies related to chemicals and environmental effects (high complexity, low probabilities etc.). People do not really understand what chemicals do and what the implications of reducing their risks may be (e.g. should we get rid of PBTs?). How can we develop credible scenarios with alternatives that people understand and are able to choose between?

• There is also a sense that decision makers perceive SP studies as less reliable than cost of illness estimates. However, well conducted contingent valuation and choice experiment studies can provide valuable insights and capture values that are not reflected in cost of illness studies.

• The many lessons learned from the extensive research on SP studies are relevant also for the valuation of chemicals. The use of voting and other deliberative approaches could also be explored.

The topic of how to value the costs of chemical regulation for companies and society was briefly discussed towards the end of the workshop.

• Asymmetric information – difficulties obtaining information on industrial processes and how proposed interventions will affect them.

• Can we improve the availability and use of production and market data, and better predict market reactions?

• In order to take information asymmetries and strategic behaviour into account, a potential approach is to assume that close substitutes to the regulated chemical(s) exist (i.e. close to zero cost) unless industry can prove that this is not the case.

• Learn from literature on cost of compliance and employment effects of environmental regulation.

The workshop concluded with some forward-looking ideas and suggestions:

• Create forums for further dialogue and joint work among (eco)toxicologists, and health and environmental economists. A joint session on environmental valuation at SETAC 2019 in Helsinki could be a tangible next step.

• Arrange thematic sessions on chemicals at economics conferences to get more economists interested in doing chemical-related research.

• Collaborate with OECD and member state agencies on a planned project with a multi-country valuation of a number of health endpoints. The same questionnaires will be used in all participating countries and the work will be coordinated by OECD and implemented by member state agencies or independent researchers.

• Cooperate in multidisciplinary work under the ONE HEALTH umbrella.

• Explore further the literature on (deep) uncertainty to better understand how economic valuation can be conducted in the context of constrained and uncertain information surrounding chemical regulation.
Participants

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What Are the Knowns and Unknowns in the Valuation of Exposure to Hazardous Chemicals?
Supply and Demand of Environmental Economic Policy Advice

6th World Congress of Environmental and Resource Economists (WCERE) Pre-Conference Report

Background
Successful management of many of the environmental, economic and social challenges that humanity is currently facing requires collective action both between and within states. The Paris Agreement and the adoption of the 2030 Agenda for Sustainable Development are examples of agreements that aim to foster such cooperation and collective action. However, implementation of global agreements in practice often requires quite bold policymaking at state level, and here social scientists have a crucial role to play by suggesting and evaluating sound policies that promote greener economies. The need for evidence-based policy advice is larger than ever before and looking ahead, the demand will most likely continue to increase.

One challenge to sound policy making, in particular at Swedish agencies, is that most practitioners responsible for the management of environmental resources and issues are natural scientists. This is a challenge since environmental matters also need to be dealt with from a social science perspective and require the involvement of practitioners with a background in social sciences, not least environmental economists with expertise in the design, implementation and evaluation of policies. However, many aspects of environmental economic policymaking in practice are inherently complex and far from simple textbook models. Moving into the real world adds layers of complexity for example in the form of political restrictions and goals, temporal and dynamic effects, ethical considerations, imperfect information, uncertainty and behavioural constraints. Practitioners need to make decisions within this complex context with limited resources and time.

Hence, the existence of platforms that can facilitate and enable communication on equal terms between the research and policy communities is essential. Large academic conferences such as the World Congress in Environmental and Resource Economics (WCERE) gather experts in environmental economics from all over the world and have great potential to improve the interaction between leading academics and experts at agencies and organisations working with environmental policies. Traditionally, policy sessions at such gatherings are organised such that scientists give policy recommendations. We think that these sessions can be greatly improved if instead an interface for dialogue is created.

The 6th World Congress in Environmental and Resource Economics (WCERE) was an opportunity to improve the interaction between environmental economists at agencies and those in academia. This pre-conference used practitioners’ questions at Swedish agencies as a starting point for such interaction. Academics and experts at agencies and organisations involved in policy work were brought together in five parallel workshops: fisheries management, biodiversity protection, circular economy, climate change and chemicals. The overall aim of the workshops was to strengthen the role of environmental economics in Swedish policy. Each workshop, which consisted of up to 10 experts and a chair, with a balance between practitioners and researchers, aimed to provide participants with new insights by addressing practical problems faced in policymaking and to strengthen networks of environmental economists.
Lessons learned

• Despite the short time available (3-hour workshops), there was room for plenty of new reflections, discussions and building of new networks. Several suggestions for continued collaboration between researchers and agency representatives were made, including joint workshops and studies. As one practitioner said, ‘I wish my everyday work had more time for reflections of this kind.’

• It is important to build up infrastructure and resources for more frequent interaction between scientists and practitioners.

• The participation of international experts was highly appreciated as it broadened the national perspective on the issues discussed.

• The format of mixed and balanced groups worked well and was rewarding to all participants.

• If the goal is to increase the likelihood that the discussions will have a direct impact on the work at the agencies, it is important to address specific issues of direct relevance to them. During these pre-conference workshops, the broader questions in the biodiversity and circular economy workshop led to a more general level of discussions compared to the other workshops with narrow and specific questions well embedded in the agencies work.

• Each workshop chair benefitted from the preparatory coaching on the meeting technique most appropriate for their workshop. The meeting techniques were applied to encourage active participation and make everyone’s voice heard. This was particularly important in the larger groups.

• The participants strongly appreciated that the only thing they needed to do to prepare for a workshop was to read a short background text (see text for each workshop). Remember that each participant is already an expert on the topics discussed at the workshops they were invited to participate in.
References

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