



Evidence based innovation, quality of information and its use in risk assessment and risk management

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Paris Risk Group



Use of Social Sciences for Risk Assessment

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Rapport in het kort

De Paris Risk Group (PRG) is een netwerk van onderzoekers in de sociale- en maatschappijwetenschappen die werkzaam zijn bij onderzoeksinstituten van de overheid en instellingen (universiteiten) op het gebied van volksgezondheid, arbeid, voeding, consumentenproducten en milieu en veiligheid.

Een van de activiteiten is een jaarlijkse thematische bijeenkomst. In dit briefrapport treft u de verslaglegging van de 3^e jaarlijkse bijeenkomst van de Paris Risk Group (PRG) aan. De bijeenkomst werd gehouden bij het RIVM in Bilthoven op 17 en 18 juni 2015.

Sociale wetenschappen bieden methoden (KBA, “solution-focused” risicoschatting) en instrumenten (beslissingsondersteuning) om de relevantie en begrijpelijkheid van beleidsmaatregelen te verbeteren. Ook bieden ze een beter begrip van consumentengedrag (bijvoorbeeld voedingskeuze) en de positie van belanghebbenden (‘stakeholders’ in vaccinatie vraagstukken). Sociale wetenschappen bieden aangrijpingspunten om maatschappelijke bezorgdheid over milieu en gezondheidsthema’s in context te plaatsen en te analyseren. Ze geven ook inzicht in de rol van verschillende typen van kennis (“expert knowledge”) en de invloed van de manier waarop problemen worden weergegeven (“framing”). Tot slot, ze bieden alternatieven voor de manier waarop wij met risico’s om willen gaan (“risk governance”).

Alles bij elkaar liet de bijeenkomst zien dat de sociale wetenschappen een heel specifieke bijdrage kunnen leveren in de vorm van kennis die de traditionele natuurwetenschappelijke kennis die doorgaans in risicoschattingen wordt gebruikt overstijgt.

Summary

The workshop theme was “evidence based innovation, quality of information and its use in risk assessment and risk management”. Innovation is a currently a strategic issue for governments and institutions, at the local, state and international level. Innovation is enshrined in the European Union strategy for 2020, as a way to create “smart, sustainable and inclusive growth”. The idea behind the numerous calls for innovation is that advance in science and technologies yield societal benefits and drive economic growth. However, innovations change the way we live and risk agencies are called upon to assess the sanitary and environmental consequences. The task is challenging, given the uncertainties and controversies at stake when it is needed to predict the future. The questions raised in society are thus not just “yes” and “no” questions: they are rather about identifying the uncertainties, the alternate choices, the purposes and reasons of developing a technology, identifying who leads and who loses. The workshop showed that in that context, social sciences make a specific contribution by providing additional types of knowledge beyond the ones produces by the “natural sciences” traditionally used in risk assessment and can testify of methodological innovations to inform decision making. The thematic sessions, mostly building on case studies, illustrated these specific contributions of the social sciences to the ongoing debates surrounding innovation, risk assessment and decision making.

Session 1A on cost benefits analysis, decision support systems and tool and session 3A on solution-focused risk assessment) presented how social sciences provided methods and tools to improve the relevance and comprehensiveness of recommendations on regulatory measures, their impacts and their alternatives. Session 1B (food safety and consumers) and 4A (viruses and infectious diseases) provided a better understanding of the behaviours and the positioning of stakeholders. Session 4B (participation and innovation) and session 5B (animal welfare and husbandry) provided analysis of societal concerns surrounding environment and public health issues. Session 3A shed light on critical points of expert appraisal, the procedures for selecting and validating knowledge or the effects of disciplinary framing. Finally, several sessions (Session 2A on complexity and precautionary approaches; 2B on bridging the science-policy gap and 5A on risk governance) provided insights on provide insights on new modes of governance, going beyond traditional risk analysis.

The workshop thus illustrated how social sciences, within risk agencies, bring innovative approaches to different aspects of risk analysis. The Paris Risk Group website and Yammer page serve as platforms to exchange about and promote such approaches as well as to stimulate collaborations: all participants of the workshop and all network members are invited to animate those platforms, by posting news, documents, creating subgroups, sharing information about calls for funding and publications.

The next workshop will be organised in June 2nd and 3rd, 2016, in Berlin, by the German Federal Institute for Risk Assessment.

Introduction

In January 2013, following an international survey undertaken in 2012 by the French agency for food, environmental and occupational safety (Anses) and the Centre de sociologie des organisations (CSO), the Paris Risk Group (PRG), a network of social scientists working in or with risk agencies on food, environment, public and occupational health and consumer safety across Europe and beyond, held its first workshop.

After a second meeting, hosted by the Food Standards Agency (FSA) in London in March 2014, the third annual workshop of the PRG was held in 2015. It was hosted by and held at the National Institute for Public Health and the Environment (RIVM) on June 18th and 19th, in Bilthoven, the Netherlands. It gathered about 45 participants from 8 different countries (mainly EU) involved in risk assessment and/or risk management activities. These are the proceedings of this meeting at RIVM.

The overall theme of the workshop is 'Evidence based innovation, the quality of information and its use in risk assessment and risk management'. Innovation is considered an important tool for governments and institutions to drive economic growth, create jobs, build a green society and improve quality of life: we innovate because we can (technically possible) or have to (budgets down) or want to (ambitious aims).

Risk agencies are called upon to provide scientific evidence regarding the consequences of innovation. In that context, social sciences, by providing additional types of knowledge, beyond the "natural sciences", can make a specific contribution. Social sciences can offer insights on adapting the risk analysis process to the more complex, ambiguous and uncertain issues at stake with innovation. Social sciences can help to shed light on critical points of expert appraisal, the procedures for selecting and validating knowledge or the effects of disciplinary framing, thereby improving the transparency and the rigor of the assessments. Social sciences can provide a better understanding of the behaviour and the positioning of stakeholders. They also provide analysis of societal concerns surrounding environment and public health issues in relation to innovations considered, improving the relevance and the comprehensiveness of recommendations on regulatory measures, on their impacts and other solutions.

Thereby, with 'evidence based innovation' we mean that the empirically founded contribution from the social sciences can improve the risk information and risk assessments carried out in the context of development of innovative technologies and new products put on the market.

Program

The program consisted of plenary and parallel sessions during the two-day workshop.

The workshop was opened by Dr. Els van Schie, director of the Environment and Safety division of RIVM. Ric van Poll and Eve Feinblatt gave some background information on the Paris Risk Group and the theme of the workshop.

Below the presentations given during the plenary and parallel sessions are presented: title – presenter – abstract. In addition, the parallel sessions are introduced by a session theme. The power point presentations can be found in a separate appendix in order of presentation.

Plenary sessions

Each of the workshop days started with plenary presentations.

Thursday, June 18th

Plenary 1: Innovation and ambivalent attitudes: implications for risk communication.

Danielle Timmermans, Chief Science Officer Risk communication, RIVM, Professor, Professor Public Health Risk Communication VU University Medical Centre, Amsterdam – Netherlands.

Due to circumstances this presentation was cancelled, yet the abstract and PowerPoint presentations are made available.

Innovations are often encountered not only with enthusiasm but also with feelings of fear and uncertainty. The public often is ambivalent about innovations and has conflicting beliefs and feelings. It is to be expected that a large minority is ambivalent towards e.g. base stations, nanotechnology etc. When having ambivalent feelings towards an object, people cope with this in two ways, i.e. problem focused coping by selecting and processing information in order to create a consistent attitude and emotional focused coping by seeking for order elsewhere, e.g. belief in science. In order to resolve the ambivalence one has to be able to trust an authority (e.g. science, government) to be in control. It has been shown that trust in authorities relates to a lower perceived risk about a hazard and more acceptance. However, often communication about the risks related to the hazard does not increase people's trust because the language is ambiguous also leading miscommunication. When communicating about innovations and its risks one should address the ambivalence of the public,

take into account the different ways of coping and pay attention to the risk language.

Plenary 2: Perceived risks and benefits of wind energy developments: Insights from the debate on Wind Energy

Goda Perlaviciute - Post-doc in Environmental Psychology, University of Groningen – Netherlands

Producing wind energy on a large scale has important environmental, economic, and societal consequences. How do people evaluate different pros and cons of wind energy developments? This is an important question, since such evaluations determine public acceptability, which is key for realizing wind energy projects. Based on a large-scale literature review, we identified key contextual and psychological factors that drive public evaluations of wind energy. Contextual factors determine the risks, costs and benefits of wind energy developments, e.g. noise and visual impact, community compensations, and environmental impact. Contextual factors alone, however, do not fully explain people's evaluations, and especially do not explain many individual differences in evaluations. General psychological factors, particularly values, play an important role in this respect. People evaluate wind energy positively if they think it supports their important values, while they evaluate it negatively if they see it as a threat to their values. People are motivated to support their value-based evaluations. As a result, values can colour people's evaluations of various characteristics of wind energy, even if these characteristics are not important to them based on their values. This could explain why supporters and opponents hold conflicting beliefs about wind energy, for example as illustrated by "green versus green" debate.

Friday, June 19th

Plenary 3: Claims about risk and benefits as ingredients of innovation

Harro Van Lente – Professor of Science and Technology Studies, Maastricht University – Netherlands

Claims about risks and benefits of new technologies are not innocent. They will circulate and affect the strategies of firms, research institutes, policy makers and society at large. Moreover, since such strategies are interdependent, claims about risks and benefits may lead to strategic games which, in their turn, may boost developments or lead to stale mate positions. The lecture will highlight some typical patterns of innovation and

will draw from examples of nanotechnology. It will also address the question how risk analysis can be a productive part of the dynamics of innovation.

Plenary 4: Complexity and Mode 3 Knowledge: Connecting Risk Information and Risk Narratives

Harry Kunneman – Professor in Social Philosophy, University of Humanistic Studies – Netherlands

My point of departure is provided by the idea of 'evidence based innovation', as defined in the invitation for this workshop in terms of 'the improvement of risk information and risk assessment by way of empirically founded contributions from the social sciences'. In order to really improve risk information and risk assessment, the additional types of knowledge to be provided by the social sciences, ("beyond the natural sciences") should be based not only on empirically founded knowledge but also on narrative sources of knowledge and insight. This is my central thesis, which I will argue in three steps. I start with a short analysis of the complexity of risks and their assessment, using insights from critical complexity thinking (Cilliers 1998, 2011; Giampietro 2013, Kunneman 2015). In a second step I will elucidate the complexity of risk information and risk assessment in terms of the interplay between three forms or 'modes' of knowledge. On this basis I will argue in conclusion that the improvement of risk assessment asks for the investment of considerable time and effort by social scientists in the moral riches of the 'risk narratives' connected with the risk information they provide.

Parallel sessions

Thursday, June 18th

Session 1A: Cost-benefit analysis, decision support systems and tools

Chair: Hans Keune - Political Scientist, Research Institute for Nature and Forest (INBO) and 'Belgian Biodiversity Platform' - Belgium

Beverly Bishop - Chief Social Researcher, Health and Safety Executive (HSE) - UK

Key challenges in the field of environment and health are the interpretation of research data and the translation into policy measures. In many social and environmental systems, it is difficult to estimate the likely occurrence of a risk event and its direct and indirect effects on a diverse range of subjects. Calculation of risk and its effects necessarily entails analyzing many factors that are associated with uncertainty – subjective preferences, lack of data, incomplete understanding of data, and institutional factors. This session will explore current practice and innovations around the use of cost-benefit analysis, multi-criteria analysis and other tools designed to improve decision support for risk governance.

▪ The role of CBA/CEA in EU decisions regarding chemical safety

Thomas Öberg – Chairman of the Committee for Socio-economic Analysis, European Chemicals Agency

Socio-economic analysis (SEA), a form of regulatory impact analysis, plays an important role in the assessment of restriction proposals and applications for authorisations under the REACH regulation. The assessment of impacts through SEA considers the health and environmental benefits, the associated costs and other socio-economic impacts of a regulatory action. In many cases costs and benefits can be compared through a full cost-benefit assessment, but sometimes lack of data limits the assessment to break-even calculations or cost-efficiency comparisons. The approach taken by ECHA's Committee for Socio-economic Analysis (SEAC) in the assessment of different restriction proposals and authorisation applications will be reviewed. Experience gained indicates that the assessment of impacts on health and environment is an area requiring further development. An additional challenge to the assessment of risk and socio-economic impacts stems from substances that are characterised by hazard properties as being persistent, bioaccumulating and toxic (PBT) or very persistent and very bioaccumulating (vPvB). Progress in developing a framework for SEA of these PBT/vPvB substances will also be discussed.

▪ **Improving Risk-Risk Trade-Offs: an Experimental Approach**

Susan Chilton – Professor of Economics, Newcastle University - UK

The Risk-Risk Trade-Off (RTO) method is a technique used to elicit the relative trade-off between changes in morbidity and mortality risk in stated preference surveys. The responses can be used to inform the (relative) values or weights that should be given to different accidents in Cost Benefit Analyses (CBA) of projects that reduce the risk of death or injury. A priori, the method is likely to suffer from at least some of the problems that are found in stated preference surveys. This study shows that the estimates from a RTO study can be improved by employing a pre-survey learning experiment and using a frame that focuses on the total risk or risks that respondents face.

▪ **Negotiated Complexity: Framing Multi-Criteria Decision Support in Environmental Health Practice**

Hans Keune - Political Scientist, INBO and 'Belgian Biodiversity Platform'-Belgium

The complexity we take into account when dealing with complex issues and the way we deal with that complexity is not given or self-evident, it is framed and negotiated. Based on two environmental health decision support case studies we address a set of key methodological choices, crucial in shaping the multi-criteria decision support and illuminate how they followed from transdisciplinary collaboration and negotiation: diversity tolerance, dealing with uncertainty and difference of opinion, weight of information and the epistemological divide between traditional closed and alternative open paradigms. The case studies exemplify the growing conviction amongst methodologists that, especially regarding complex issues, best methods do not exist as such: methods are chosen and tailored in practice and the quality to a large extent is dependent on the process in which methodological development is embedded. We hope to contribute to making explicit the importance of methodological decision making regarding environmental health complexity.

- **The socio-economic cost of indoor air pollutants in France: method, results and perspectives for public policy**

Thomas Bayeux - Risk and Society Unit, ANSES – France

The evaluation of the socio-economic costs of indoor air pollution makes it possible to identify key-pollutants and to prioritize public policies to reduce associated exposure. For the first time in France, such an evaluation was carried out for a selection of pollutants and costs. Indoor pollution associated to the selected pollutants was estimated to cost around €20 billion in France in 2004 due to premature deaths, medical costs, lost productivity, and related impacts. Despite different methods and data, similar evaluations previously carried out in other countries provided figures within the same order of magnitude.

Session A1 clearly showed challenges and opportunities for dealing with complexity. Several science-policy settings and decision support methods were reflected upon. There is a clear need for integration of diversity of forms of knowledge and data, viewpoints and understandings (both experts and stakeholders). In order to make this functional to policy and decision making clear procedures are needed for structuring all information, reducing complexity in a transparent and functional manner and a clear understanding of and communication about uncertainties, ambiguity and knowledge gaps. The combination of knowledge challenges and socio-political importance and urgency of the issues tackled in the different cases, make this an even more demanding endeavour, but also an important direction in future risk assessment and management research and practice, with quite some bridge building challenges ahead.

Session 1B: Food: safety and consumers

Chair: Helen Atkinson - Food Standards Agency UK

Trevor Webb - Food Standards Australia New Zealand

This session will reflect on the role and contribution of the social sciences in the area of food, focusing particular attention on food safety and consumers.

- **Domestic kitchen practices: a view from the UK FSA**

Helen Atkinson - Principal Social Science Research Officer, Food Standards Agency, UK

To inform its work, the FSA commissioned a package of work on domestic food safety practices, including a qualitative and ethnographic study in 20 UK households. This study shed light on potential pathways to foodborne illness, and drew attention to alternative ways to understand risk. In my presentation I will focus on the approach, findings and insights from this study.

- **Consumer information on prevention of biological hazards: conditions and criteria of effectiveness for various information measures**

Eve Feinblatt - ANSES, French Agency for Food, Environmental and Occupational Health & Safety - France

I will present the work carried out at the ANSES by a multidisciplinary working group, composed of experts in life sciences and social sciences, on recommendations to consumers to prevent biological hazards. In May 2012, the ANSES received a formal request for an Opinion on consumption recommendation statements on food labelling to prevent biological hazards. A working group involving experts in microbiology, mathematical modelling, epidemiology, sociology, psychology, and marketing was put in place. The working group decided to tackle not only labelling but a set of preventive measures that could be applied by the consumer. The working group first identified the hazard-food combinations for which a change in consumer practices could result in a reduction in risks, the main tools for communicating to the consumer with regard to the microbiological risks and the indicators enabling the effectiveness of the information measures to be assessed. This work was finalized in a report published in May 2014. Subsequently, the working group carried out quantitative assessments of the health impact of information measures and upstream control measures

as well as cost-effectiveness analysis on three hazard-food combinations: - Shiga toxin-producing E. coli (STEC) / minced meat - L. monocytogenes / Ready -to-eat food - Campylobacter / poultry meat; and prioritized different communication strategies according to targeted populations and effects.

- **Trust makers, breakers and brokers: Trust in the Australian food system following food incidents.**

Trevor Webb - Principal Social Scientist, Food Standards Australia, New Zealand

While risk management in food regulation seeks to reduce the level of risk that consumers are exposed to, it is unable to remove all risk. Food safety incidents and scares will periodically take place, and may cause serious erosion of the trust and confidence that consumers have in the food system. In this presentation I will present findings from a study that has explored the roles and actions of food regulators, the food industry and the media in response to food incidents with a specific focus on trust.

The presentations within this session 1B highlighted various approaches which have, and are, being used to better understand the views and practices of different stakeholders in the field of food safety. A unifying theme was the use of innovative methods to achieve each of the study aims ranging from the application of new models to understand the roles and actions of stakeholders in response to food incidents, to an ethnographic approach to explore domestic kitchen practices in a number of UK households. Together, the presentations in this session served to demonstrate a unique position for social science in bringing both these approaches and the resulting knowledge to areas of risk management.

Session 2A: Nano: complexity and precautionary approaches

Chair: Astrid Epp –Department Risk Communication, Federal Institute for Risk Assessment (BfR) – Germany

The development of new technologies often is accompanied by new or unknown risks, thus putting risk agencies and risk management institutions into a quandary: they have to enable innovation and, at the same time, protect human health and the environment. This task is even more difficult as risks in modern societies have to be described as a new type of risk, so-called ‘systemic risks’ (OECD 2003). Systemic risks are characterized by their embeddedness into a larger context of social, political and economic consequences. Against this background, novel modes of (risk) governance have to be developed. This session will present examples for new modes of governing novel risks.

▪ What is an uncertain risk? A scoping review

Tom Janssen – PhD student, RIVM – Netherlands

Some researchers propose a sharp distinction between uncertain risks and traditional risk. The basis of this distinction however is not very clear. When does an uncertain risk become a ‘known’ risk? One interpretation is that the concept of uncertain risk suggests there is uncertainty regarding the presence of a hazard, i.e. the potential of adverse health effects. Once the potential of adverse health effects is determined one could state a risk is demonstrated and hence a ‘known’ risk is born. Another interpretation is that the concept of uncertain risk relates to all uncertainties surrounding a risk appraisal such as uncertainties regarding vulnerability assessment and socio-economic impacts. The different interpretations might have very different consequences for risk management, risk evaluation and risk communication. The current study is a conceptual review with the goal to gain more insight in the conceptual usage of “uncertain risk” in the (environmental health) risk domain. We aim to answer three research questions: i) Can scientifically uncertain risks be distinguished from scientifically not-uncertain risks? ii) (If so :) On the basis of what characteristics are scientifically uncertain risks distinguishable from scientifically not-uncertain risks? And iii) to what extent are scientifically uncertain risks dealt with differently than scientifically not-uncertain risks in the risk governance process? Multiple inclusion/ exclusion criteria were used in order to determine eligible articles. The results will be presented and projected on the nanotechnology case.

▪ **Governance of Nanotechnology – Research, Protection, Communication**

Astrid Epp - Unit Risk Research, Perception, Early Detection and Impact Assessment, Department Risk Communication, BfR – Germany

Nanotechnology can be considered as a key enabling technology. But even so, the development of nanotechnology and especially the development of so-called nano-products is accompanied by still unsolved questions concerning their safety. This is even more important, the more nanotechnology and its applications will penetrate various social realms. It will change workplaces, consumer goods, medical treatment, production processes, to name only a few. As with all new technologies, there is both a knowledge base of new insights and experience as well as a large amount of uncertain knowledge. Assessment of the consequences of new technologies is therefore of key importance when societies open the door to new technical challenges. Against this background, the talk will outline the various activities that have been unfolded at the German government level, aiming at a socially responsible development of nanotechnology. It will present the current results of a representative population survey carried out in 2012 and from a media analysis for the years 2008-2013. Additionally, the first assessment of the joint research strategy will be presented, for which the state of over 80 research projects on the opportunities and risk aspects of nanotechnology was scrutinised in great detail. By so doing, the strategy of governmental agencies will be outlined that aims at the responsible development and implementation of a new technology and that, at the same time, can also be understood as a reaction to less successful introductions of new technologies.

With respect to Nanotechnology session 2A dealt with the question how innovation can be enabled while at the same unknown risks for human health and the environment may occur. Two perspectives were presented that highlighted different aspects of this problem.

The first presentation was dedicated to the distinction between scientifically uncertain risks and scientifically certain risks and its relevance for regulatory decisions. Based upon results from the research project PUR SA(N)G (Perceptions of Uncertain Risks in Societal Groups) the conclusion was drawn that uncertain risks "are not definitely determinable risks due to uncertainty regarding the causal relationship between (for example) a substance or activities and suspected adverse health effects due to insufficient evidence for the causal relationship or inherent hazardous properties". Consequently, this kind of uncertainty demands for risk management strategies which at the same time should be inherently precautionary and robust and flexible in order to adapt to progressive insights.

The second presentation showed a practical approach by introducing the implementation of nanotechnology in Germany as a new mode of governance. Based upon the assumptions that nanotechnology is applied in many consumer products while its scientific risk assessment of nanomaterials still is in a statu nascendi and, additionally, nanotechnology cannot be experienced through the senses, it was claimed that public perception and acceptance is important for the social embedding of nanotechnology. Consequently, a variety of activities such as stakeholder dialogues and consumer conferences were unfolded, giving the actors in the field of nanotechnology the opportunity to accompany its implementation. Here the conclusion was drawn that a new mode of governance can be one decisive factor for a successful implementation of a novel technology.

Session 2B: Bridging the policy-science gap

Chair: Frederic Boudier – Assistant Professor, Department of Technology and Society Studies, Maastricht University – Netherlands

In this session the latest evidence on the impact of more transparency particularly in the food area on citizens and the questions that this raises for policy will be addressed. The session will also provide an overview of the use of the social sciences in Australian and New Zealand food regulation.

- **Regulatory transparency in Europe: more science needed**

Frederic Boudier – Assistant Professor, Department of Technology and Society Studies, Maastricht University – Netherlands

Over the past 15-20 years, the EU as well as national governments have been subjected to mounting social demands for more openness and transparency. Society has also become more sensitive to perceived conflicts of interests. Government's response has often been to devise transparency policies as a way to re-gain the trust of European citizens. These developments have been particularly significant in the food and pharmaceutical areas, with distinct similarities and differences in the way regulators have responded to these challenges. One recent trend has been to release raw risk assessment data online ranging from veterinary reports to clinical trials. The impact of these developments on evidence-based policy has only started to be consistently evaluated. This paper will convey the latest evidence on the impact of more transparency on citizens and the questions that this raises for policy.

- **Social sciences and Australian food regulation**

Trevor Webb - Section Manager, Behaviour & Regulatory Analysis Section, Food Standards Australia New Zealand (FSANZ) - Australia/New Zealand

Food Standards Australia New Zealand's (FSANZ) approach to risk analysis is based on the three-component approach of risk assessment, risk management and risk communication adopted by the Codex Alimentarius Commission. The natural sciences provide the disciplinary underpinning for much of the risk assessment, while risk management draws in a range of other disciplines and skills. Increasingly, FSANZ is using evidence from the social sciences, including economics, to inform the development of food regulatory standards. This paper will provide an overview of the use of the social sciences in Australian and New Zealand food regulation. Through the paper and subsequent discussion I would like to start a conversation with delegates on how evidence from the social sciences is used in risk analyses carried out in other agencies.

Both speakers stressed in session 2B the importance of injecting more science into risk analysis. Risk management and risk communication need to be science-informed. Both natural and social sciences need to play a role into developing a coherent approach to policy. Too often regulatory decisions – such as promoting transparency- have been ill-tested. Unintended consequences may result. For example empirical evidence shows that the wrong information on the risk of a given medicine may prompt patients to stop taking their drugs, putting their health at greater risk. One place to start is therefore to test and evaluate policy as part of the risk analysis approach. The experience of Australia and New Zealand also shows that a multi-disciplinary approach is essential and yet challenging in practice. Multidisciplinary approaches require to carefully manage different streams of knowledge. In turn this approach requires critical adaptation from within Government.

Session 3A: Solution Focused Risk Assessment

Chair: Leo Posthuma – Senior Research, Centre for Sustainability, Environment and Health, RIVM – Netherlands

The term Solution-focused risk assessment was coined in 2009, based on studies of the U.S. National Academy of Sciences in the realm of risk assessment. They concluded that the utility of risk assessments for decision making would be improved by initial focus on options to manage risks next to factors potentially causing risks. The latter provides risk insights, the former would additionally provide decision utility by exploring alternative solution scenarios. Scholars discuss the idea, and applications start to emerge. These expand into the complement of risk - solution-focused sustainability assessment, with a key role (also) for social sciences. The session addresses these innovations on the utility of risk assessments from various angles.

Solution-focused risk and sustainability assessments: an inspiring paradigm made operational

- **Leo Posthuma – Senior Researcher, Centre for Sustainability, Environment and Health, RIVM – Netherlands**

The year 2009 marked a proposed paradigm change in the context of risk assessment: shouldn't risk assessment be valid (scientifically) as well as useful (for decision making)? A proposal was made to create so-called solution-focused approaches. In this presentation, we have adopted this paradigm, and applied it to both risk- as well as sustainability assessment. Risk and sustainability are two sides of a coin (the negative 'risky' one, and the positive 'sustainability' one), though sustainability assessment considers a suite of indicators, rather than focusing on single-risk entities. We developed an operational (process) approach, which can be applied when problems are recognized as 'wicked', blending a suite of existing frameworks and principles, amongst others the risk governance framework. We applied the approach to various cases, in which complex environmental (human and ecosystem health) problems were to be solved. The cases are discussed, following the (process) approach, and the strengths and weaknesses of the approach and its predecessors are considered. Some cases, unresolved for many years, were developed into scientifically sound and societally accepted solutions, given the novel paradigm.

- **A problem solving turn in environment and health expertise: examples of a change in practice (expert elicitation) and focus (nature based solutions), and integrating opportunities and challenges ahead**

Hans Keune - Political Scientist, INBO and 'Belgian Biodiversity Platform' - Belgium

The field of environmental health science over the past decades largely has focused on health risks, mainly those caused by man-made products and technologies. As both the environmental health aspects and the societal aspects characterize these phenomena as complex issues, or wicked problems, a lot of expert effort was put into trying to solve complexity, or at least to contribute in diminishing uncertainties. We doubt if this is a good strategy, for at least two reasons. 1) We may doubt whether trying to solve complexity is a good strategy: we think accepting limited understanding and trying to find a solution oriented way forward is more valid. 2) The issues concern often severe health risks that cannot always wait for endless scientific research: considering potential abatement strategies based on limited, but often considerable scientific insight seems much more legitimate from a societal perspective. Recently the field of environmental health seems to open up to studying environmental health benefits, e.g. focusing on health benefits from living close to green space. Two related concepts from the field of nature conservation, ecosystem services and nature based solutions, may help bridge the environmental health risk and nature health benefit foci. What seems neglected in the field of nature related health benefits is taking into account potential nature related health risks such as emerging infectious diseases. We will discuss opportunities and challenges of more integrated approaches and collaboration between the different expert communities on the basis of recent developments and concrete examples.

- **Pitch "Nature-based solutions and healthy urban living: clashing experiences" Followed by moderated group discussion on opportunities and frictions**

Hanneke Kruize - Researcher, Healthy Urban Living, RIVM – Netherlands (no abstract available)

One session was devoted to Solution-focused risk assessment (SfRA). Various trends, both in Europe and the US, highlight the need for a paradigm-shift towards addressing optional scenarios for solving risk problems upfront in the assessment process. The session considered this from three angles, being the SfRA-paradigm itself - originating from the U.S., the idea of Nature-based solutions, and the aspect of strengths and weaknesses of implementing the idea. Dr. Leo Posthuma introduced the SfRA paradigm, Dr. Hans Keune highlighted the recent EU-approach to Nature-based Solutions, and Dr. Hanneke Kruize explored the practical aspects of using these themes in practice. She could explore that from experiences of a recent EU-meeting in Ghent. Though there are issues to be solved in practice, as shown by the Ghent meeting, it was clear whether and how social sciences and natural sciences meet, given these concepts, in solving urgent risk and sustainability problems. A follow-up on this meeting is considered, to improve the utility of risk assessments, whilst aligning social and natural sciences.

Session 3B: Role of expert in decision making

Chair: Benoit Vergriette – Chief of Risk and Society Unit, ANSES - France

Scientific agencies are required to contribute to science-based regulations by providing risk assessments issued by experts groups: the rationale is that the scientific process attempts to minimize the influence of values because they introduce biases into decisions. Such a value-free or “scientific purity” perspective, based on the separation between risk assessment and risk management, will be questioned through three presentations /case studies.

▪ Introducing social sciences in risk assessment: the case of ANSES

Daniel Benamouzig – Senior Researcher, Centre for the Sociology of Organizations, National Centre for Scientific Research – France

Social sciences are now involved in Health Safety & Environment Agencies. In France, social scientists have been participating in working groups for several years, particularly those set up to provide expertise on controversial issues such as nanomaterials, pesticides or endocrine disruptors. Our presentation will provide the conclusions of an ongoing research conducted on the uses of social sciences in working groups at ANSES. The research is based on the qualitative analysis of five working groups (through interviews, observations and the analysis of written material). It uncovers a growing familiarity and a general process of acculturation towards social sciences among agency staff and experts, in spite of a poorly specified initial mandate given to social scientists. To overcome difficulties, social scientists have developed a set of strategies based on their specific knowledge, a certain level of ignorance and a critical reflexivity. Capitalizing on such strategies, the agency should clarify what it expects from the involvement of social scientists in expert procedures, beyond a mere participation.

▪ Different roles and viewpoints of scientists as policy advisors - the case of electromagnetic fields

Sander Clahsen – PhD candidate, Institute for Risk Assessment Sciences, Utrecht University – Netherlands

Scientific experts differ in the way they provide policy advice on complex issues such as electromagnetic fields. For example, whereas some experts may feel their primary task is to carry out fundamental research, others may actively engage in the policy dialogue. The literature only provides theoretical, ideal-typical ideas about expert roles, with little empirical underpinning. To gain more insight into these different roles from an

empirical point of view, an international study was conducted on three cases: electromagnetic fields (EMF), particulate matter, and antimicrobial resistance. These cases were chosen due to their complex and -scientific-uncertain nature, allowing scientists to interpret uncertain information differently, which may affect their policy advice. Q-methodology was used in order to explore different expert roles. Data was collected with the web-based program POETQ, among international experts who were selected through a structured expert nominee system. In total 32 EMF experts participated. Each expert evaluated and ranked 38 statements describing different aspects of the ways in which experts may see their role as policy advisors. Responses were analyzed using factor analysis in the PQMethod program. Results indicate that experts indeed differ in their interpretation of uncertainty and their own role in the policy dialogue surrounding EMF. Four different roles were discerned and consequently labelled: early warners, pro-science experts, status quo and issue advocates. The main differences between these groups are their attitude towards precautionary measures, the necessity to monitor health effects and/or increase research activities, the need to explicate different viewpoints within the expert community and their view on who should be involved in the process of providing policy advice (stakeholders, scientists, and citizens).

▪ **Informed Expert with Impaired Judgment, the Circular Problematic of Conflict of Interest**

Josquin Debaz – Researcher at Groupe de Sociologie Pragmatique et Réflexive, School of Advanced Studies in Social Sciences - France

In this presentation, I will address the topic of conflicts of interest as an ongoing challenge, for which health and environment issues served as a testing ground in recent decades. Risk evaluation and regulation, having limited resources and caught in the crossfire between a willingness to ensure “independent expertise” and a need for qualified experts, are stuck in a continuous process of conflicts of interest. Recent work has underlined the dependence of the regulatory system on the private sector at the financial, intellectual and organizational levels. Moreover, a series of media scandals has shown the existence of specific systems of power and has raised calls for a shift of mind and for the moralization of these activities. As a world crossing research field grounded on strong ethical principles and important economic interests, risk evaluation and regulation demands constant vigilance at all levels, from personal self-reflexivity to collective supervision.

Session 3B features 3 stimulating presentations from 3 different perspectives: one about the experience of the Anses in introducing social scientist in various group of experts, one about the issue of conflicts of interests in research and scientific expertise and one about a research project on the different roles of experts when providing policy advice in the field of electromagnetic fields.

Four main conclusions can be drawn from this session; 1) scientific expertise relies on expert judgement and expert judgement is not value free because experts have different views of their role in the decision making process. There is probably a need to raise awareness of natural scientists about such considerations, 2) When integrating social science in risk assessment activities (which mean in expert groups mainly composed of natural scientists), there is a need to clarify as far as possible what is the expected added value, 3) clarifying the role and the mandate given to social sciences in an expert group must also be considered from a collective perspective because it impacts the traditional risk assessment framing. It is probably a collective responsibility (both from the expert groups itself and the Agency staff in charge of coordinating the expert groups) to properly frame a risk assessment mandate as a result of a multidisciplinary approach extended to new disciplines in order to enrich the decision making process and, 4) conflicts of interests should be seen from a broader perspective that only the one of financial collusion. Dealing with conflict of interests probably needs constant and collective vigilance through different tools or initiatives, both inside and outside institutions, as it has also to do with moral constraints, ethics and accountability both at individual and collective level.

Friday, June 19th

Session 4A: Viruses and infectious diseases

Chair: Aura Timen - Head National Coordination Centre for Communicable Disease Control (LCI), RIVM - Netherlands

In this session we will explore risk perception and information needs to improve preventive behaviour during outbreaks.

- **Public perceptions, knowledge, preventive behaviour and sources of information during a large-scale Salmonella outbreak in the Netherlands: An online survey**

Desiree Beaujean – Head Guidelines Department, National Coordination Centre for Communicable Disease Control (LCI), RIVM – Netherlands

In the beginning of August 2012, a large-scale outbreak of Salmonella Thompson occurred in the Netherlands. Due to an uncertain course of events, decisions have large consequences, the general public is stressed, and the media is eager for news. In these circumstances, health organizations should inform the public about the situation and persuade them to take preventive actions. To be effective in this endeavour, they should use the communication channels the general public expects them to use, and provide the public with the information they want and need. Research on the information behaviour of the general public during infectious disease outbreaks is scarce. But this knowledge is crucial in serving the general public in their information needs, and in maximizing citizen compliance with preventive advice. We developed an online survey to assess the general public's perceptions, knowledge, preventive behaviour, and information use during the 2012 Salmonella Thompson outbreak.

- **Knowledge, perceptions and information needs of Dutch public and healthcare workers regarding Ebola: a 2014 survey**

Lianne Schol – Policy Advisor, Centre for Infectious Disease Control, RIVM – Netherlands

We present the results of a study that aiming to investigate the level of knowledge, risk perception, use of information sources and information

needs of the general public and healthcare workers (HCW) in the Netherlands with regard to Ebola. An online survey was administered to a representative sample of the Dutch general public and to three groups of HCW in December 2014. We will reflect on the applicability of the results to improve preventive behaviour and facilitate risk management.

- **Exploring risk perception and information needs to improve preventive behaviour during outbreaks engaging the individual and the public**

Aura Timen, MD, Ph.D, Head National Co-ordination Centre for Outbreak Management, RIVM-Centre for Infectious Diseases, Bilthoven – Netherlands

The first presentation of session 4A shows the results of an online survey general public's perceptions, knowledge, preventive behavior, and information use during Salmonella Thompson outbreak in autumn 2012 in the Netherlands

The main conclusion was that although public perception about severity is correct, there is no indication for intention to take preventive measures. It is important to get in touch with the public during an outbreak. So, public health organizations should use traditional media, and news and newspaper websites to inform the public to increase knowledge about Salmonella infections and stimulate public to check for possibly contaminated products at their home, and to increase kitchen hygiene.

The second presentation was concerned with the question what does an outbreak of Ebola in West Africa mean for the Netherlands?

With an on-line questionnaire the researchers investigated the level of knowledge, perceptions, use of information sources, and information needs of the general public and healthcare workers (HCW) in the Netherlands with regard to Ebola. People were aware of the Ebola outbreak however lacked knowledge on human to human transmission. Ebola was considered a severe health threat. The main conclusion was that information should specifically be tailored to the target groups in risk communication efforts and mass media could be adequately used to inform the general public.

So, outbreak management is in the first place outbreak recognition and control measures. It involves having (at least) knowledge of but ideally grip on processes that influence uptake of measures by the population. It also involves systems to monitor development of perceptions, information needs and social interactions to be able to provide answers to the public.

Session 4B: Participation and innovation and innovations in participation

Chair: Eve Feinblatt - Risk and Society Unit, French Agency for Food, Environmental and Occupational Health & Safety – France

In view of the possible large-scale transformations on society imposed by scientific and technical innovations, public expectations concerning risk control and demands for transparency and participation are high. In response, various organizations have launched initiatives intended to take into account the contribution of a diversity of stakeholders in risk assessment and risk management processes. The results and effects of different modes of stakeholder participation will be tackled through three presentations/case studies.

▪ Anses dialogue committee on « Nanomaterials & Health »

Régine Boutrais – In charge of developing relationships with stakeholders, ANSES– France

The rapid development of technologies, such as nanotechnologies (but also biotechnologies, radiofrequencies or synthetic biology) and the numerous products and devices available on the market raise a growing public concern as to their potential negative impacts on health. Scientific controversies and limits in risk assessment methods have generated distrust in science and the safety of these technologies. The national public debate held in France on nanotechnologies (2009-2010) was very tumultuous because various groups (NGOs) contest the use of these technologies and traditional risk governance. They demand a better transparency in the decision-making process as to technological choices and a more democratic governance of public policies in the field of environmental health. As part of its general process of opening up expertise to civil society (charter signed in 2011) through stakeholders' involvement at various levels, Anses decided in 2012 to set up a dialogue committee on "Nanomaterials & health". Its objective is to discuss the state of knowledge as to the dangers resulting from exposure to nanomaterials, risk assessment methodologies used, uncertainties and going scientific debates. It also aims at enriching work orientations of the expert group in charge of nanomaterials within the agency. This communication will present a synthesis of this experimental process.

▪ **SynBio Politics. Exploring political views on synthetic biology in The Netherlands**

Virgil Rerimassie – Researcher, Technology Assessment Department, Rathenau Institute – Netherlands

In order to promote the proper societal embedding of synthetic biology, the Rathenau Instituut has been actively involved in stimulating dialogue on the emerging field since 2006. One of the efforts was organizing a 'Meeting of Young Minds' in 2011: a youth debate between 'future synthetic biologists and future politicians'. The former were represented by participants of the international Genetically Engineered Machines competition (iGEM), the latter by political youth organizations (PYOs), linked to Dutch political parties. The Rathenau Instituut found seven PYOs - varying from rightwing to leftwing and green to Christian - willing to commit to an intensive process aimed at formulating a tentative partisan opinion on synthetic biology and defending it amongst fellow PYOs and iGEM participants. Given the little amount of available data on how political parties gauge synthetic biology and its potential risks, an analysis of the debate may contribute to the understanding of where potential political sensibilities and concerns may arise.

Session 4B built bridges with the two previous keynotes from Pr. Harry Von Lente on claims about risks and benefits and Pr. Harry Kunneman on complexity and his call for moral richness of narratives. Although the two cases presented differed by the object of innovation and the duration of the experience, both testified of a movement from considering participation as a traditional “up-down” discussion to considering participation as a way to trigger interaction and collaboration between scientists, risk agencies, and different types of stakeholders. Both presenters pointed out the difficulty of measuring the actual effects of their experiences, the efforts that had to be made to reach out for participants, and questioned the conditions that made the participatory processes successful: the fact that the innovative technologies at stake were not objects of controversy was an important factor in making the dialogue possible. However, the experiences create a precedent for upstream engagement of stakeholders and participate in building a culture of dialogue.

Session 5A: Risk governance

Chair: Jeroen Devilee – Researcher on Risk & Society, RIVM – Netherlands

Risk governance is a predominantly theoretical concept with its roots in social science. The impact of risk governance is still limited. This is mainly due to the fact that for a successful implementation of risk governance it needs to be adopted by institutes for risk assessment. In this session we will pay attention to the transition from risk assessment to risk governance in these institutes. We will describe types of risk governance and what types of problems are encountered that are no part of the theoretical concepts.

- **Obstacles for integrated risk governance. When normative models meet everyday practices in an Institute for Public Health and Environment**

Jeroen Devilee – Researcher on Risk & Society, RIVM – Netherlands

In the presentation the findings of the RIVM I-Scan risk are shown. This project studies the way that RIVM handles difficult, uncertain and ambiguous projects like nanosilica, shale gas and synthetic biology, The session addresses the innovation processes that are needed at RIVM to implement risk governance that is known on a conceptual level, but faces a lot of practical hurdles.

- **Opening the social sciences participation tool box to stimulate risk governance practices**

Aschwin Ramadhin – Internship, RIVM – Netherlands

He presented an activity within in the context of the Grenelle project. The goal of his project is to make an inventory of activities at the RIVM that include stakeholders and to assess the quality of these activities. Characteristic of stakeholder engagement is that it is often more or less 'hidden' in projects. An innovative approach to develop an assessment system for the quality of stakeholder engagement will be shown.

The first presentation in session 5A addressed the innovation processes that are needed at RIVM to implement risk governance that is known on a conceptual level, but faces a lot of practical hurdles. In the discussion the audience was surprised by the bottom up approach, the financial stimuli, broad but generic strategic programme, without specific top down arrangements

The second presentation showed an innovative approach to develop an assessment system for the quality of stakeholder engagement. Comments by the audience resulted in the idea that a real assessment probably is not possible and that therefore the instrument better be reflexive or should have the form of a checklist.

Session 5B: Animal welfare/Animal husbandry

Chair: Jenny Buckland – Social Researcher, Department for Environment, Food and Rural Affairs – UK

Theme: Husbandry practices have changed fundamentally since 1950, in the context of intensification. Innovations (such as the development of new ways of breeding) have impacted the complex relationships existing between humans and farm animals. Social sciences can provide a better understanding of the mobilizations around animal health and animal welfare, which are some of the core concerns for European risk agencies.

- **Record-keeping, regulation and animal welfare: Understanding farmer perceptions and practices**

Maria Paula Escobar-Tello – Research Associate, Department of Geography, King's College London – UK

Record-keeping legal requirements are often presented to UK farmers as a light touch burden that is intended for their benefit: these are records that farmers should already be keeping anyway because they should be the basis on which animal welfare is ensured at the farm anyhow. Under this logic, regulators bewilder at farmers' complaints about the burden and uselessness of legally required animal welfare records and at low levels of compliance with these requirements. This presentation is based on research that was asked to provide answers to such puzzle: if they are there for their benefit and farmers should already be keeping them, why do farmers fail to keep and use animal welfare records? The results indicate that farmers and regulators think differently about the role and usefulness of records as the foundation stones of good animal husbandry practices geared towards

- **Typology of the French NGOs working on "Animal Welfare"**

Marine Spaak – formerly Risk and Society Unit, ANSES – France

Animals have become a very important part of the western civilisations. The human-animal relationships are complex and their complexity increases if we consider that there is not such a thing as « the animal », but rather different animal species. We are likely to treat in a different way animals belonging to one species or another. Indeed, while pets may be loved as proper members of the family, farm animals are not always considered as sentient beings. Some points of criticism directed at industrial farming concern the high density of animals, the mutilations and the extremely painful transport and slaughter. To fight against this, some citizens have

chosen to create or join organizations dedicated to animal protection. Condemning animal abuses, pushing for animal welfare in farming or fighting for the complete abolition of animal exploitation, the organizations have very different goals, argumentaries and strategies. The subject of this study is to establish a typology of these organizations. In France, there are two major ideologies: the « abolitionnistes » consider that animal exploitation is immoral and the « réformistes » fight for better animal welfare. In addition to these categories, there are also other forms of mobilizations such as sanctuaries for cats and dogs. Despite the limits of the typology exercise, which implies hiding what happens at the boundaries of the different categories, we try to define in this thesis the highlights of animal protection, from the perspective of organizations' stakeholders.

The first presentation in session 5B gave us an important insight into the differing perspectives of regulators and the regulated on risk management in animal health. Regulators consider formal record keeping to be the cornerstone of good animal husbandry, whereas farmers see it as largely unrelated to the important job of caring for their animals on a daily basis. This clash of perspectives leaves both parties unsatisfied: farmers feel burdened by administration and patronised by regulators, and regulators lack confidence that animal health risks are being adequately managed. Now that social science has unearthed this issue, how can the regulatory regime innovate to ensure all actors can work together efficiently and effectively to both manage risks and provide adequate assurance that risks are being managed?

The second presentation raised the question of what we mean by innovation: does technological progress always mean innovation for all, or are some innovations for farmers actually regressions for animals? Marine then presented a typology of NGOs working in the field of animal welfare and animal rights, highlighting how organisations differ not only in their beliefs and goals, but also in their modes of action and interaction with agencies. Through such elucidation of the voices and values in the field, risk agencies can gain better insight into the ethical risks they manage alongside objective risks (such as risk to human health), and how these risks can overlap and compete with each other.

Appendix 1: Participants, affiliation, e-mail address

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