

# Communicating Chemical Risks

The role of risk perception and communication for characterizing and managing cumulative stressors



Christina Benighaus, Guest Editor–Dialogik  
Hans Løkke Coordinator – NERI

## Meeting the Challenge of Communicating Chemical Risks

2<sup>nd</sup> NoMiracle Open Workshop,  
Stuttgart, April 2007

Communicating about chemicals is a challenging task for risk managers in companies and regulatory authorities. The Second Open Workshop in Stuttgart was organised by NoMiracle partner DIALOGIK. It focused on good practice in risk communication and “How can we do better?”. Case studies examining the perception and management of risks, from the chemical as well as from other sectors like food safety and public health governance, gave insights into how the wide range of risks can be handled and communicated.

The workshop invited a broad audience of stakeholders from companies, NGOs, regulators, EU representatives, academia (especially young researchers and Ph.D. students from different disciplines) and project partners from similar EU projects. Individual invitations were sent to experts of target group and the announcements were disseminated among associations, industries and regulatory authorities. As well, the workshop was offered as a student seminar at the University of Stuttgart. Around 50 participants accepted the invitation and a wide, interdisciplinary audience discussed some ambitious topics.

Much of the workshop was devoted to discussion and intensive exchange of arguments and practical advice, with only a few short presentations. In this way the organisers proposed a unique format, including innovative methods like the World Café

brainstorming exercise, but unfolding along the following classic sequence: *what* (perception and communication), *how* (methods), *to what purpose* (for assessment and management) with which *results*.

### In this issue

1. Communicating Chemical Risks
2. NoMiracle Second Open Workshop on “Communicating Chemical Risks”  
Stakeholder Feedback Descriptions of courses
4. Risk Governance Framework
6. Lessons for Good Risk Communication
7. Variation and Meaning of Expert Views on Multiple Risks and Uncertainties: Insights from NoMiracle Work
9. Use and Disuse of Risk Information – The Significance of Information Frameworks in Integrated Risk Assessment and Management
10. Panel Discussion: Addressing the Challenge
11. Case Studies: Experiences from other EU-Risk-Projects
13. World Café
15. Specific Features of Chemical Risk Affecting Communication
16. NoMiracle co-ordination

## NoMiracle Newsletter No. 9

NOvel Methods for Integrated Risk Assessment of Cumulative stressors in Europe

In this Newsletter, we present insights from the main workshop talks, panel discussions and World Café; workshop case studies; the workshop evaluation by Advisory Board members. Two NoMiracle deliverables on risk perception and communication are summarised.

Overall, this Newsletter gives a panorama of how perceptions of chemical risk by the general public, involved stakeholders and experts may affect their assessment and management. And it highlights learning about how communication between technicians, regulators, and other stakeholders may be improved.

# NoMiracle Second Open Workshop on “Communicating Chemical Risks” Stakeholder Feedback

Two NoMiracle Advisory Board members participated in the 2<sup>nd</sup> Workshop, and provided feedback. Speakers obtained high marks. The advisors formulate specific suggestions for perception- and communication-related work in NoMiracle.

“Many thanks to Prof Renn and Mrs Benighaus for the whole organisation, particularly for the special meeting centre; the character as a former villa still shines through and made a comfortable background for discussions.”



Research Pillar 4 Leader Ad Ragas and Advisory Board Member Peter van den Hazel share a beer at the World Café

**Dr. Peter van den Hazel** International Society of Doctors for the Environment (ISDE) and Public Health Services Gelderland Midden NoMiracle Advisory Board member

## Strategies and Instrumental Goals

The 2<sup>nd</sup> Workshop agenda was interesting and appropriate. The theoretical and instrumental roles of risk perception studies and risk communication were well put forward. The function of chemical risk communication for enhancing risk analysis and management was well argued, as was the importance of using this knowledge to increase the quality of EU policy making. In the discussions this relevance was highlighted by panel questions and answers in the different fields of Public health or Food safety.

The participation of the coordinators of other EU-projects was a good initiative and increases the visibility of NoMiracle in Europe.

The innovative “World Café” discussion format was well chosen and refreshing. The terms complexity, uncertainty and ambiguity were well addressed in the Café.

### Suggestions

**Combination effects** and their role in risk perception and risk communication should continue to be discussed in the future. What features of risk perception and risk communication are still valid in regard to combination exposure/effects?

It would be beneficial to the NoMiracle project to give some attention to the improvement of knowledge and procedures around using **comparative risk assessments**. Are risk comparisons of any benefit in the field of health and environment, and more specifically when we are dealing with multiple risks?

It is understood that the timeline between the different activities within the project is not always synchronised. As the project advances, workshop learning and the approaches, methods and results of Research Pillar 4 on Risk assessment should become more directly linked.

The need to develop communication fit to different stakeholders was well accepted and highlighted. It would be useful to discuss and find consensus on the identity and needs of the 'NoMiracle' audience. Looking at different settings, the mapping systems developed in RP4 as **simplified graphic tools** could be useful items within risk communication on chemical risks.



Dr. Jürg Oliver Straub\* – F. Hoffmann-La Roche Ltd  
NoMiracle Advisory Board member

---

### Integrating the various parts of risk analysis

While I am aware of the importance of risk communication (RC) in societal discussion, perception and acceptance (or not) of risks, this NoMiracle workshop was useful for thinking about RC's integration. Not all types of risk assessment (RA) necessarily or explicitly comprise the whole range of problem framing, actual assessment, evaluation and management, with their interlinking communication aspects.

My own work, regulatory ERA for pharmaceuticals, follows the recent EMEA guideline which in turn is based on the EU Technical Guidance Document for RA for chemicals and biocides and comprises additional information from established pesticides and veterinary pharmaceuticals ERA. As this ERA is integrated into a broad regulatory network, several aspects of a complete RA procedure are implicitly or explicitly contained in

the guideline: i.e., most of framing, evaluation and at least some management options. This means that 'my' type of ERA is nearly completely technical, on the physical assessment level and dealing with (natural) scientific interpretations of tests and data in a given framework that implicitly contains evaluation in its data requirements and decision criteria. It also means that communication is mainly on a technical level, too, between myself and the regulators who are also scientists working within the boundaries of the same guideline. Performing mainly technical ERAs within a given system is not uncommon as regards chemicals, pesticides, biocides and both veterinary and human pharmaceuticals. Similarly, food safety RA and also many engineering RAs look into structural and functional integrity under various assumptions. While this technical RA explicitly covers only part of the whole RA cycle, at least some of the other aspects of a whole RA cycle are in some way integrated. Thus, within the whole RA complex, technical RA may be a special sub-

\*Dr. Straub's comments reflect his personal experience and are not to be construed as an official F. Hoffmann-La Roche Ltd. position

discipline that is characterised by formalisation through guidelines which in turn already contain and refer to the results of scientific, political and (possibly, hopefully) societal discussion and evaluation. Hence, RC with/to regulators is mainly on a technical level. In turn, RC to/with the public and media, if needed, firstly must make reference to the criteria and boundary conditions laid down in the respective guidelines and secondly should explain how these criteria came to be formulated and integrated. In this way, RC about chemical risk assessment may differ from more general kinds of RA and RC.

What does this mean within NoMiracle? I personally believe that the main inputs from NoMiracle will be firmly on the technical side. We want to improve RA, which for me means that we need new and better tools to assess potential risks arising from complex situations with a higher degree of certainty, ie, as Prof Renn put it, based on better evidence and integration of this evidence and eventually being less dependent on black-box precaution. However, as personal, societal or cultural ambiguity will still be in the system, like a ghost in the machine, I believe that the RC work in NoMiracle remains important and will need to keep a high profile.



Prof. Ortwin Renn – DIALOGIK

### Suggestions

Recognition of the need for better **integration of RC**, whether on a mainly technical side or wider-reaching in scope, might come out of this gathering. An editorial or review on the continuum of the whole RA cycle and the differences between the whole cycle and technical RA might be useful. This review could consider the nature, scope and importance of RC in the various disciplines of RA.

One possible product from this workshop might be a sketch or proposal or **code of good practice for RC**. While Prof Renn said not to 'expect miracles from RC', we did discuss in the World Café some possibilities to improve RC, centred mainly on trust. I think that mutual respect is probably a prerequisite basis for trust. Respect also integrates well with honesty as another necessity for good RC.

We should seek clarification on the connection between the **precautionary principle** in RA (as applied precaution in the form of safety factors or worst-case assumptions or similar), and framing or evaluation aspects of the whole RA cycle. While part of precaution reflects scientific uncertainty in the data and complexity of the situations, an important part of precaution seems to be based in personal, societal/political or cultural values. The application of precaution in RA and RC, but also the reduction of precautionary measures when warranted through the availability of better scientific basic data might be worth a discussion or publication within NoMiracle.

---

## Risk Governance Framework

**Governance** refers to actions, processes, traditions and institutions, by which authority is exercised and collectively binding decisions are taken and implemented. Risk governance applies

this process to the societal handling of risk. In addition, it suggests normative principles of good governance within the processes of conventional risk identification, assessment, management and

communication. Risk governance thus incorporates such criteria as accountability, participation and transparency within the procedures and structures by which risk-related decisions are made.

Without good risk governance systems in place, many problems might occur such as:

- Unfair competition and unbalanced distribution of risks and benefits because of differing assessment and management principles
- Unfair burden sharing amongst generations, social groups, and regions
- Focus on low-probability, but high-profile risks to the neglect of higher-probability, but lower-profile risks
- Inadequate consideration of risk tradeoffs in management strategies
- Costly regulations
- Strategic business decisions failing to take into account the impact of public perceptions about risk
- Loss of public confidence and trust in risk managers

We have developed a framework of risk governance that tries to address these problems (IRGC 2005). It addresses the needs of policy-makers and regulators to take decisions on matters where there are some risks involved that may harm society, the environment or the economy. Many of these risks are now complex, uncertain, or even ambiguous. In most cases, the potential benefits and risks are interwoven. Our goal is to facilitate better understanding of risks - their scientific, political, social, and economic contexts - and how to manage them.

The risk governance framework comprises 5 phases, illustrated in Figure 1. These phases may unfold in a partially simultaneous way, and there is feedback between them; in particular, communication about risks and stakeholder involvement may take place in different manners throughout the governance process.

At each phase, a conclusion is made upon which decisions can be taken. These decisions are the result of coming to a certain understanding in the

risk analysis process. In this framework “governance gaps” are understood as deficits at one or several of the 5 phases, not necessarily at the main decision phase (which deals with whether the risk will be taken or not, and accompanied or not by mitigation or reduction measures).

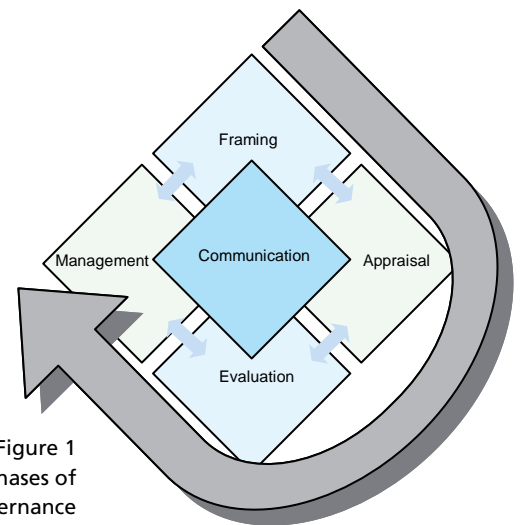


Figure 1  
The five phases of risk governance

The framework is also meant to provide a tool that enables arbitration or mediation between various interests, stakeholders, risks and opportunities. It is intended for leaders in government, business, academia, non-governmental organizations, and communities who are responsible for risk decisions, in particular about global and systemic risks.

**Our framework is characterized by four main aspects:**

- Underlying our framework first of all is an assumption: that risk handling does not start with risk management. It starts well before, at what we call ‘risk pre-assessment’ or ‘risk identification’. The framework emphasizes the importance of this ‘pre-assessment phase’ in which the essential properties of the risk issues, their analysis, evaluation, and in some cases, potential risk management options, are identified early. This step helps to promote agreement on the framing of the discussion from the outset, thereby

avoiding damaging omissions that could undermine the process later.

- The second important point is that risks originating from a natural, a technological, an economic, or an environmental cause do not necessarily require different governance methods. What is more critical is whether a given risk is simple, complex, uncertain or ambiguous. It is this characterisation of the risk—in part, a cultural determination—that guides how the risk can be handled.
- The third aspect is the recognition of variety in the risk cultures around the world, which will



Dr. Peter Wiedemann – Programme Group  
Humans, Environment, Technology (MUT)  
of the Research Centre Jülich, Germany

require different management methods. Also, as risk cultures vary over time and level of development, the timing issue is a key criterion. What is possible here may not be possible there. What is not possible today at a certain place may be possible tomorrow.

- The final aspect to notice about our risk governance framework is the utmost importance given to risk communication and the involvement of various identified stakeholders.

### Reference:

International Risk Governance Council (IRGC):  
White Paper No1 *Risk Governance – Towards an  
Integrative Approach*, written by Ortwin Renn with an  
Annex by Peter Graham. IRGC: Geneva 2005.

---

# Lessons for Good Risk Communication

“Precautionary measures can trigger concerns and amplify risk perception”, the first key note speaker Dr. Peter Wiedemann made clear in his presentation. As experimental studies have shown, informing people about precautionary measures may not decrease the perception of risk – as may be expected by regulators and policy-makers – but rather increase perceived risk. This effect should be taken into account when disseminating information about precautionary measures.

Dr. Peter Wiedemann also explored the influence of risk stories in societal representation of risk events. These narratives often follow a certain sequence: First there is the casting of persons in particular roles, followed by ascribing objectives and motives. The story is dramatised by attributing logic to the event, and the consequences and harm are described. The final step comes in formulating a conclusion or lesson to be drawn (moral of the story). Depending on how the actors and the other story elements are portrayed, risk

perceptions can be either amplified or attenuated – without changing the actual magnitude of the risk. This sensitivity to the context in which a risk is presented is a characteristic of risk perception of which risk managers should be aware.

- Good risk communication aims at the empowerment of the people, i.e. supports their competencies to understand and make decisions about risks.
- Provide a balanced and reasonable description of the evidence on which the risk assessment is based.
- Perceived social responsibility by risk creators can improve their role in the story.
- Test your message. Be aware of unintended effects.

<http://www.fz-juelich.de/inb/inb-mut>  
[P.Wiedemann@fz-juelich.de](mailto:P.Wiedemann@fz-juelich.de)



Jari Lyytimäki,  
Timo Assmuth and  
Mikael Hildén – SYKE

## NoMiracle Newsletter No. 9

NOvel Methods for Integrated Risk Assessment of  
Cumulative stressors in Europe

# Variation and Meaning of Expert Views on Multiple Risks and Uncertainties: Insights from NoMiracle Work

In the 'risk society', perception and communication of environmental risks have been increasingly surveyed and investigated. While public perceptions of risks from chemicals, e.g. in food, are well studied, relatively little attention has been paid to the perception by experts, nor to the production and use of information on chemical risks.

For NoMiracle an understanding of how experts view chemical and environmental risks, their assessment and management is essential. The experts' views on these matters are likely to affect the use of novel methods for assessment. To provide new insights into the risk experts' mindset we developed a survey that raised three issues related to the NoMiracle work. In the first part respondents were requested to ponder for whom different pieces of risk information would be particularly relevant. In the second part views on different aspects of uncertainty and risks were solicited by asking for agreement or disagreement with a number of claims. The third part explored the respondents' willingness and ability to use risk maps (as developed by NoMiracle to present the data gathered in assessment).

The survey itself represented a novel method. It was a web-based survey providing each respondent with a personal link, which allowed us to encourage non-respondents without irritating those who had already responded and even to check the time it took to fill in the survey. The survey also used other features of the ICT, for example allowing respondents to drag and drop

items rather than simply ticking boxes. The survey was e-mailed to 952 persons in most EU and some other countries, mainly the USA. The 247 replies suffice for explorative analyses of views. The survey will be followed up by an analysis of thematic interviews with experts in Commission DGs and stakeholder groups.

Respondents placed altogether 18 different pieces of risk information in a grid showing increasing importance for regulatory risk management on one axis and importance for public risk debates on the other. The items covered information that is likely to be delivered by novel methods, for example, "quantitative information on cumulative risks from multiple stressors". A large majority of respondents regarded this information to be at least moderately important for both regulatory processes and public debates, but the scatter was wide and some attributed only marginal importance to this information. Other tendencies could also be seen. For example, "narrative descriptions of risks" were seen to be of considerable importance for public debates, whereas "empirical validation of model simulations" was seen to be of importance mainly for regulatory experts. The scatter suggested, however, that there is no strong consensus among experts on what information should be produced for whom.

The scatter is also a recurring feature of the responses to specific claims about risks. For example, there was a strong bimodal distribution in the responses to the claim that "all risks to human

## NoMiracle Newsletter No. 9

---

NOvel Methods for Integrated Risk Assessment of  
Cumulative stressors in Europe

health can be compared in quantitative terms". About half of the respondents disagreed with this claim, whereas half agreed with it. Similar bimodal distributions were observed in several other claims related to the core of the NoMiracle work, for example "the precautionary principle conflicts with evidence-based risk management" and "it is possible to fully standardize risk assessment at a European level". These results indicate that it is challenging to introduce novel methods and probably also reflect some of the difficulties that materialised in the preparation of REACH.

The risk maps in the survey displayed first three individual risk assessments and then a combined map using colour coding. Respondents were asked to grade the risks in a set of grid squares and also to consider the usefulness of the risk maps. The respondents were on average able to grade the risks "correctly" relative to a calculated index. The observed correspondence between the visual and calculated rankings of aggregated risk level in grids suggests that people exposed to such maps are able to grasp and process information of multi-dimensional nature even when combined color schemes produced varied patterns in grids of a detailed map. More than half of the respondents were, however, concerned that risk maps could be misleading, although nearly as many thought that such maps are good for informing decision makers.

Overall a wide scatter in the responses is a typical feature of the survey results, which is slightly surprising, given that all respondents can be considered experts in various aspects of risk assessment and management. Attempts to find easy explanations for the scatter by using background information such as field of expertise, employment or gender largely failed to give conclusive results, although some tendencies could be identified. For example, respondents from administration and industry saw less of a need to describe variability of risks in public debates, whereas university researchers and NGO experts stressed it.

The variability in the responses thus suggests that there is great and genuine value-based variability in views of risks and uncertainty. This variability will inevitably also affect policy formulation and implementation, including the use of novel assessment methods. There are always elements of interpretation, and the methods proposed for assessments should therefore be transparent with respect to assumptions and values. The variability also indicates that stakeholder consultation and participation is likely to have an important role to play in resolving value-based conflicts related to assessments and especially risk management. This strongly suggests that novel methods for assessment should not only be scientifically rigorous but also contribute to making risk assessment and management open-ended social learning processes.

### The full report:

Assmuth, T., Lyytimäki, J., Hildén, M., Lindholm, M. and Münier, B. 2007. What do experts and stakeholders think about chemical risks and uncertainties. *The Finnish Environment* 22, 117 p. Also available on the web:

<http://www.ymparisto.fi/default.asp?contentid=241573&lan=en>

# Use and Disuse of Risk Information – The Significance of Information Frameworks in Integrated Risk Assessment and Management

Mikael Hildén and Timo Assmuth – SYKE

Providing information on risks is a challenging task. It is not simply about producing novel methods that can produce new kinds of information. Risk concepts are used in a wide range of meanings, and different uses and users emphasise different aspects of risks.

Based on the work in NoMiracle we have examined different frameworks for the use of risk information especially from the perspective of integrated risk assessment. The study has been accepted for publication in *Environmental Science & Policy*. By frameworks we understand the conceptual and procedural constructs within which information is assimilated, processed and given meaning.

We analyzed frameworks for information in integrated risk assessment and management, focusing on issues related to environmental and health risks of chemicals and their regulation at the EU level. The key issue was how various aspects of integrated risk information are handled in different frameworks, and how information is or is not supplied and given meaning. We constructed conceptual models of key types and functions of these frameworks. The study mainly addressed integration in relation to policy, concentrating on risk evaluation and risk-benefit considerations, on interaction of assessment and management, and on policy-level uncertainties.

One lesson learned is that the policy level clearly influences the frameworks. For example, at a general policy level it is relatively easy to raise new complex issues and link them with others, because

the framework itself is flexible and can adopt new concepts and lines of argument relatively easily. It is much more challenging and demanding to achieve integration at an operational level where there are specific requirements, including requirements on legal certainty, that arise from rigorous and specialized procedures. Hence one should be clear about which level of information and of its uses one tries to address with integrated assessments. The interaction of assessment with new information and new scientific frameworks in complex and controversial risk regulation contexts such as the REACH legislation in EU chemicals control is particularly demanding.

We conclude that by paying better attention to the nature of the frameworks it is possible to focus on the most crucial aspects of integration. In this way it is possible to develop appropriate flexible assessments and methods that focus on key complexities and issues without getting entrenched in details of minor significance for the policy problem at hand.

#### **For more details:**

Timo Assmuth and Mikael Hildén (in press): The significance of information frameworks in integrated risk assessment and management. *Environmental Science & Policy*

[http://www.elsevier.com/wps/find/journaldescription.cws\\_home/601264/description#description](http://www.elsevier.com/wps/find/journaldescription.cws_home/601264/description#description)

# Panel Discussion: Addressing the Challenges

Christina Benighaus – DIALOGIK



Workshop View  
Marvin and Nils Benighaus, the "future generation" at  
the communicating Chemical Risks Workshop World Café

## Invited experts for this panel:

Prof. Herbert F. Bender – *BASF*

Dr. Jürg Oliver Straub\* - *F. Hoffmann – La Roche Ltd*

Dr. Filip Cnudde – *EU-project "SAFE FOODS"*

Peter Van den Hazel – *Public Health Service Gelderland Midden*

"An open and regular contact with NGOs is recommendable for huge companies", debated Prof. Herbert F. Bender. His company BASF enters into conversation with active groups before something happens. They try to understand groups' ideas and arguments, and to compare these with their own position. It happens that the positions are different, and the managers in charge try to make clear that a risk free industry does simply not exist. Prof. Bender argues that it is not the point whether there is a risk or not, but rather, if the risk is tolerable or not.

"We try to avoid numbers and technicalities as much as possible", explained Dr. Jürg Oliver Straub as one of his golden rules. He is not trying to hide the issue, but to explain there is a problem, and that everybody could be exposed at any moment, even in this room. The public often accepts that there is a minimal unavoidable risk, whereas politicians may be more apt to reject the possibility.

"The food safety sector is not easy to compare with the chemical industry", stated Dr. Filip Cnudde at the outset. Outrage emotions are al-

ways very strong, and because we all are food consumers, in the food sector everybody feels highly involved. Food becomes part of everyone, and therefore risks are imposed involuntarily in a widespread manner. Risks from the chemical industry tend to be more localized for the people living in the neighbourhood of a chemical plant. In communicating about food safety, Filip Cnudde recommends limiting one's ambitions to clear transmission of the information that the people absolutely need.

The job of Peter Van den Hazel entails translating the results of the risk assessments to risk regulators and to other target groups as well. While visiting politicians, informing them about risks, and what could go wrong, he is often confronted with hidden agendas. Mr Hazel always tries to make clear to politicians and risk regulators the importance of being very transparent, and advises them to use all the data the risk assessment has provided them with.

\*Dr. Straub's comments reflect his personal experience and are not to be construed as an official F. Hoffmann-La Roche Ltd. position

## Case Studies: Experiences from other EU-Risk-Projects

“The participation of the coordinators of other EU projects was a good initiative and increases the visibility of NoMiracle in Europe,” said Peter Van den Hazel (NoMiracle Advisory Board member).

In three case studies the project partners of comparable EU projects STARC (Stakeholders and Risk Communication), PHIME (Public health impact of long-term, low-level mixed element exposure in susceptible populations strata) and SAFE FOODS gave ideas and valuable hints about how risk communication to and with stakeholders on the complex topic of cumulative risks. These hints can be taken into account in carrying out the NoMiracle master cases, as of the end of 2007.

### Case study 1: Stakeholders and Risk Communication (STARC)

“STARC analysed several national approaches and actual practice on how to involve stakeholders, and identified good practice in risk communication”, summarised David Wright in the presentation of the first case study. His insights in this project after its close in 2006, and recommendations are:

- Start risk communication at an early stage. Stakeholders and even the public could bring information that otherwise would not come to light. They could contribute with values and opinions that are probably different from the experts’.
- Stakeholders and policy-makers must have a good “feel” for how stakeholders (and the public) perceive risks. It is important to collect and evaluate empirical information obtained through surveys, focus groups or interviews about stakeholder judgements. It could be done by consulting regular government surveys.
- Journalists tend to treat risk issues differently from the way technical and scientific people



David Wright  
– Trilateral  
Research &  
Consulting

do. Risk actors should meet the practical requirements of the media in an emergency and develop a working relationship where there is recognition that the goals of the media and the risk communicator do sometimes coincide.

- Work out risk communication plans or guidelines, as in the UK and a few other countries, which will avoid the need for risk managers and risk communicators to “re-invent the wheel” for every separate risk management strategy.

Please have a look at the project webpage. Here you find “Risk Communication practices” and other material on risk communication approaches.

<http://starc.jrc.it>

### Case study 2: Public health impact of long-term low-level mixed element exposure in susceptible population strata (PHIME)

Prof. Dr. Staffan  
Skerfving  
– University Hospital,  
Lund, Sweden



“PHIME has just recently started, and it is presently developing a mostly technical approach for assessing risks”, stated Staffan Skerfving when introducing the second case study, “but a complicated risk communication challenge can be foreseen and hopefully will be solved during the project.”

He illustrated the need to collect sound scientific data to underlie risk communication to different target groups with the example of the fish paradox, well-known in some expert circles.

Eating fish is healthy and unhealthy at the same time: Fish is a main source of exposure to mercury in the general population. The level of mercury in fish is high in lakes, rivers and coastal waters as a result of local contamination mainly from industries. But large predatory fish in the oceans, such as tuna, shark, halibut and swordfish, may also contain high concentrations, as a result of global pollution and natural sources. This could lead to the message: “Eat less fish!”

At the same time, fish is the major dietary source of omega-3 polyunsaturated fatty acids (PUFAs). This essential fatty acid is currently highlighted to the public as an important element in a healthy-heart diet. There are fairly strong data indicating a favourable effect of intake of fish and PUFAs during pregnancy on the IQ of children. This leads to the message: “While expecting, eat as much fish as you can!”

Hence, with respect to the fetal brain, there are two counteracting agents in fish: Methylmercury means a risk, while PUFAs are beneficial. In addition, fish is an important source of selenium, which may also be beneficial.

How can we communicate information aiming at protection of the brain and heart from the negative effect of methylmercury, while we simultaneously highlight the population benefit from PUFAs and selenium? If we warn fertile women, we may cause a reduction of their fish intake, which may result in lack of the positive effects not only for the fetus, but also for the adult subject, and the whole family if the women are those in charge of preparing meals for the household.

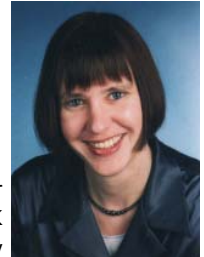
Risk communication needs careful consideration, and accurate risk-benefit analysis of effects on the different scales, which is an undeveloped area.

<http://www.PHIME.org>

### Case study 3: Governance of Food Safety (SAFE FOODS)

Food safety policy in Europe is currently particularly interesting as a field of empirical risk research

Dr. Marion Dreyer  
– DIALOGIK  
Stuttgart, Germany



as it is striving to revise the rules and routines of food safety governance including participatory approaches and policies. The reconsideration of stakeholder and citizen involvement raises various hotly debated issues.

Marion Dreyer presented in this third case study a proposal for how to design and put into practice a more structured approach to stakeholder and public involvement which seeks to address some of these issues. Major elements of this proposal are two food safety institutions at the interface of risk assessment and risk management (Interface Committee and Internet Forum) and a “Guidance tool for extended participation”.

### 1. Interface Committee

This new Committee would involve managers, assessors and key stakeholders, and bear responsibility for framing (sets or advises on terms of reference for the risk assessment) and evaluation (advice on tolerability/acceptability judgement). The WP5 team of the SAFE FOODS project has considered two options for implementation:

**Option 1:** Steering Committee. Mandate is to deal with all cases (and to set the terms of reference).

**Option 2:** Advisory Committee. Mandate is to deal only with specific challenging cases, including conditions of scientific uncertainty and/or socio-political ambiguity, and to advise on the terms of reference.

This proposal is likely to provoke questions of representativeness, power, and fairness which can be – at least in part – addressed by the second “interface institution”, the Internet Forum.

### 2. Internet Forum

The proposed online function would be open to the public and allow for consultation as well as deliberation processes. The idea is to organise the Internet Forum in four platforms relating to the main governance stages: Framing, Assessment, Evaluation, Management (see Framework article by Ortwin Renn, this issue). The platform can provide an entry point for a diversity of viewpoints, and at the same time function as an early-warning system for highly controversial issues

### 3. Guidance Tool for Extended Participation

The “guidance tool for extended participation” recommends additional participatory processes (going beyond the Interface Committee and the Internet Forum) for those food safety threats which are associated with high levels of scientific uncertainty and/or socio-political ambiguity. For these more intractable food safety problems a broad participatory programme can lead to governance outcomes that are better informed, better balanced, and socially more robust.

<http://www.safefoods.nl/default.aspx>



## World Café

By Ludger Benighaus – Guest organizer

The World Café is an innovative yet simple methodology for hosting conversations about questions that matter. These conversations link and build on each other as people move between groups, cross-pollinate ideas, and discover new insights into the questions or issues that are most important in their life, work, or community. All participants were seated around small tables with about five persons each. After 30 minutes the groups were newly mixed. One person remained seated as a host of the table, and he or she greeted four new guests. Every participant had the chance to discuss the issues with new neighbours at the table. The results of the “Café-Table-Groups” were intensively debated afterwards in the plenum. ([www.theworldcafe.com](http://www.theworldcafe.com)).

### Results of the World Café and discussion in the plenum

In the late afternoon of the first day the workshop participants discussed issues of risk communication in a coffeehouse ambience, the “World Café”.

During the plenary discussion of the results of the World Café, moderator Ortwin Renn asked a provocative question: “Is there something special about communicating chemical risks, or can the normal procedures be followed?” Chemicals are often perceived negatively in society, while due to the perceived benefits the reputation of pharmaceuticals – chemicals in themselves – is much more positive. Chemicals are a very abstract, artificial good, and the widespread stereotypical image is

## NoMiracle Newsletter No. 9

NOvel Methods for Integrated Risk Assessment of Cumulative stressors in Europe

At the World Café:  
NoMiracle partner Mikael Hilden, Lodewijk Wendel de Joode (Expertise Centre Risk and Crisis Communication, Ministry of the Interior and Kingdom Relations, NL), Julia Houghton (Institute of Food Research, UK) and Filip Cnudde (SAFE FOODS)



that they could be toxic and harm people. Many consumers cannot see a direct association with a useful product. Often they are not aware of the benefits or positive effects of chemicals. They are suspicious of a substance whenever it is perceived as risky, even if the exposure is harmless.

The main ideas and results of the Coffeehouse discussion, about success factors, social and cultural concerns and design of the communication process for chemicals, are summarized here.

### Success factors in risk communication

Similar to many other tasks outside the risk sector, a clear view of the goals of risk communication could be helpful to plan actions and to review success after the risk handling process is finished. At one of the Coffeehouse tables, the participants set up three goals of risk communication:

- Help people to help themselves.
- Help people to prepare their own risk responsibility. They have to be prepared to help themselves to act in a crisis.
- Help people realize that a risk-free society can not exist.

### Know the audience and the target group

Risk communication is an ongoing process and consists of learning. Before the risk communicator can set up a communication concept, he needs to know his audience and its requirements. The risk

communicator should be aware of the audience, of the people to be addressed with the risk issue and their concerns, and what might be the dominating risk perception. It is good to know through which media channels the audience prefers to be informed, and who is talking to whom with what level of success (language, amount of information, public and press).

Building up a relationship to the main target groups is not an easy task. Trust is the source of a good relationship. Use trustworthy sources, and be clear on facts, opinions and values. The relationship with the media could be improved by background talks conducted several times a year. Here, the managers from the industry could inform the press which incidents had happened and how the company reacted. This helps the press to get additional information.

### Be aware of concerns of the public

One of the ideas discussed at one of the World Café tables went into the direction of collecting concerns when starting the risk assessment process. An initial list of social and cultural concerns could be worked out, analysed internally, and then discussed with a group of stakeholders who judge which of the concerns are right, and which could be disregarded. This list of concerns is only to have something in hand right at the starting point of the risk process. New concerns could come up, whereas others might disappear after a while.

Another way to get to know about risk concerns might be to investigate risk perception over time. Risk perception questions could be integrated into running and regularly conducted surveys. Such monitoring approaches would show changes and dynamics.

Within the normal process of the risk identification and assessment, an additional chapter on "Social and cultural concerns" could be added.

### Risk Comparisons as a communication method

Risk comparisons were seen in the plenary to be controversial. Comparing risks in the right way demonstrates how risky a substance is in reality and puts probabilities in another perspective, but one has to be careful. Risk managers should always compare risks that are in the same class (voluntary or involuntary, individual or collective, etc.), to avoid mistrust and anger on the side of the target group.

## Specific Features of Chemical Risk Affecting Communication

Christina Benighaus – DIALOGIK

The "basic rules of risk communication have never been changed", one participant stated during the plenary discussion after the World Café, and this is true for chemicals as well. However, the participants brought up many other factors which affect risk communication in the chemical sector and make it special compared to other risk sources:

1. **Unfamiliarity:** Ordinary persons are not familiar with chemicals and can't see the benefits as clearly as the risks. Better educational programmes, for people of all ages, would help to overcome this factor.
2. **Artificiality:** Chemicals are perceived as artificial, no matter which specific substance is involved. Similarly to the case of factor 1, teaching and informing would be likely to raise the level of acceptance.
3. **Involuntariness:** People face a lack of personal control and have the feeling of being exposed to chemicals involuntarily. In order to weaken this factor, more involvement of people in appropriate risk assessment steps is essential (see articles in this issue by Renn and Dreyer).
4. **Collective memory:** Collective memory of incidents in the chemical field is very salient. Risk managers could handle this actively and show people how risk assessment and safety procedures have improved over the years.
5. **Negative reputation:** Chemistry and chemicals hold a negative reputation associated with a lack of trust in managers. Here participation is needed to build up societal trust in the assessment and regulatory procedures (see articles in this issue by Straub and Dreyer).

## NoMiracle Newsletter No. 9

NOvel Methods for Integrated Risk Assessment of  
Cumulative stressors in Europe

## NoMiracle co-ordination

Visit NoMiracle and subscribe to  
the Newsletter at: <http://nomiracle.jrc.it>

### For further information contact

NoMiracle Secretariat  
E-mail: [nomiracle@dmu.dk](mailto:nomiracle@dmu.dk)

- Project co-ordinator and Editor responsible  
under the press law\*:

**Dr. Hans Løkke**

National Environmental Research Institute,  
University of Aarhus  
Vejlsovej 25, P.O. Box 314,  
DK-8600 Silkeborg, Denmark  
Phone +45 8920 1482  
Fax +45 8920 1414  
E-mail: [hlo@dmu.dk](mailto:hlo@dmu.dk)

- Databases and selection of scenarios:

**Dr. Hanne Bach**

National Environmental Research Institute,  
University of Aarhus, Denmark  
E-mail: [hba@dmu.dk](mailto:hba@dmu.dk)

- Exposure assessment:

**Professor Gerrit Schüürmann**

UFZ, Umweltforschungszentrum Leipzig,  
Germany  
E-mail: [gerrit.schuurmann@ufz.de](mailto:gerrit.schuurmann@ufz.de)

- Effects assessment:

**Dr. Dave Spurgeon**

NERC, Centre for Ecology and Hydrology,  
United Kingdom  
E-mail: [dasp@ceh.ac.uk](mailto:dasp@ceh.ac.uk)

- Risk Assessment:

**Dr. Ad Ragas**

Radboud Universiteit Nijmegen,  
The Netherlands.  
E-mail: [A.Ragas@science.ru.nl](mailto:A.Ragas@science.ru.nl)

The integrated project NoMiracle  
is funded by the European Commissions  
Sixth Framework Programme.

EC Scientific Officer for the project:  
Dr. Jürgen Büsing.

\*Articles in the NoMiracle Newsletter do not necessarily  
reflect the attitude of the NoMiracle Newsletter.

The NoMiracle Newsletter is published by  
National Environmental Research Institute,  
University of Aarhus  
ISSN: 1902-6226