

## Workshop abstracts

### Workshop 1

Topic: Methods for uncertainty analysis

Title: Quantifying uncertainty with structured expert judgement

Authors: Anca Hanea (1), Victoria Hemming (1), Tina Nane (2)

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Time/Date: Wednesday, February 20, 2:00–5:30 pm

#### Abstract:

Expert judgement may be required to inform a range of tasks under uncertainty, including, model development, estimates of probabilities and quantities, and to inform prioritisation tasks. In this workshop we concentrate on the elicitation and aggregation of expert judgements related to uncertain events and quantities. For quantitative estimates, a common approach is to elicit a point estimate. However, there are strong theoretical and practical arguments to say that the proper representation of experts' knowledge about uncertain quantities is through probability distributions.

Repeated evidence also indicates that these judgements should be elicited from multiple experts. However, challenges arise when the model requires a single probability distribution, which means that the various judgements must be aggregated. This aggregation can be done by the experts themselves, through a process of interaction that is designed to encourage consensus (behavioural aggregation). Alternatively, it may be done externally, by applying an aggregation formula (mathematical aggregation). We will present and motivate a third (combined) way of aggregation which combines the IDEA protocol for structured expert judgement with the mathematical aggregation scheme of the Classical Model (CM) (i.e. the weighted linear combination of judgements, where weights are calculated based on experts' prior performance on similar tasks).

At the end of this workshop participants will be familiar with both the IDEA and the CM protocols. They will benefit from a series of hands on exercises, lecture style explanations, a list of relevant literature, and relevant contacts in the field. The workshop is aimed at professionals, academics, policymakers, regulators, and (MSc, PhD) students who are, or will soon be involved in decision problems or risk analysis modelling with scarce resources, and insufficient data.

## Workshop 2

Topic: Dialogues on uncertainty in an open society

Title: Let's play at giving uncertainty a protagonist role in science stories! – A Dubitarte workshop making use of ludo-pedagogy

Authors: Catherine Leclercq (1), Laura Martino (2), Giorgia Nicolo' (1), Anthony Smith (2), Domagoj Vrbos (2)

Affiliations: (1) Dubitarte Project, Rome, Italy,  
(2) European Food Safety Authority, Parma, Italy

Time/Date: Wednesday, February 20, 2:00–5:30 pm

### Abstract:

Opening the door to uncertainty, to the unknown or little known, often induces fear and may lead actors in the scientific risk assessment area to conceal or minimise uncertainty. A researcher may be afraid to reduce his/her credibility when acknowledging that uncertainty in his/her findings is high. A policy maker may fear that his/her decisions will be questioned if all the uncertainty they are based on is revealed. A journalist or a knowledge broker may feel that, by communicating uncertainty, he/she will not be able to give clear answers to lay people.

The first goal of this workshop is to allow participants to question themselves on the deeper meaning and implications of uncertainty and trust and on their own intellectual honesty and critical mind. The second goal is to enhance their awareness and their ability to deal with uncertainty in risk analysis.

The workshop consists of a series of collective games developed by the presenters using the ludo-pedagogy methodology (for more information see [www.dubitarte.com](http://www.dubitarte.com)). Participants experience their contact with the unknown in an unusual way. After ice-breaker activities, participants are invited to play games where “uncertainty” takes the form of objects or characters that they either just imagine based on a description, or see, or even touch. Participants experience playing different roles (risk assessor, risk manager, risk communicator) and having different attitudes towards “uncertainty” with the use of case studies. They also experience manipulating “uncertainty”. These games are followed by a group discussion on the implications of different strategies to deal with uncertainty in the area of risk/benefit analysis. The workshop ends with the reading of a literary passage with music background. Participants are invited to a cold-set restitution by filling out a questionnaire after the workshop.

This workshop is targeted at scientists, risk assessors, policy makers and communicators.

### Workshop 3

Topic: Accounting for uncertainty in decision making

Title: Accounting for uncertainty in data-poor scenarios: cases studies on risk analysis in food safety

Author: Alberto Mantovani

Affiliation: Istituto Superiore di Sanità, Rome, Italy

Time/Date: Wednesday, February 20, 10:30 am–5:00 pm

#### Abstract:

##### *A) Background*

Uncertainty analysis is an essential component and a main challenge for risk assessment, with many examples provided by EFSA activities. A specific area of concern is provided by data-poor scenarios that, nevertheless, call for timely, and even fast, decision making.

Such scenarios may include:

- Risk analysis in countries where data collection still present gaps, yet, public health and/or regulatory decisions have to be taken.
- Emergencies when risk assessors are requested to provide fast advice with limited information available.
- Emerging issues leading risk assessors and risk managers to deal with data-poor scenarios

##### *B) Goals*

The workshop will exploit a set of case studies in order to derive lessons and to discuss a possible set of recommendations on how to account for uncertainties in risk analysis when dealing with data-poor scenarios.

##### *C) Format*

The workshop will start at 10.30 and end at 17.00. After a short introduction by the presenter, four case studies will be presented (30 minutes each).

A guided discussion will follow on lessons from the case studies; active contributions by participants will be elicited. The final round-up will identify a possible set of recommendations.

##### *D) Contents*

The four case studies will be presented by

- Alberto Mantovani, Istituto Superiore di Sanità, Italy (risk assessment of data-poor issues: solvents, thorium)
- Elizabeta Micovic, Administration for Food Safety, Slovenia (risk management/communication in emergencies: natural substances, biocides)
- Rusudan Tsiklauri, Saba Kobakhidze, National Food Authority, Georgia (assessing food monitoring data in Georgia)
- Olaf Mosbach-Schulz, EFSA (emerging issues in plant health as a model)

The guided discussion will pivot on the lessons learnt from the case studies, including how to frame questions, categorise uncertainties and communication between risk assessors and risk managers/policy makers.

##### *E) Target audience*

Risk assessors and risk managers from EU and EU-acceding/ neighboring countries.

## Workshop 4

Topic: Methods for uncertainty analysis

Title: Quantification and communication of epistemic uncertainty by precise and bounded probability

Authors: Ullrika Sahlin (1), Scott Ferson (2)

Affiliations: (1) Lund University, Sweden,  
(2) University of Liverpool, UK

Time/Date: Wednesday, February 20, 2:00–5:30 pm

### Abstract:

3.5 hours, including breaks

In this workshop, we will discuss the benefits and disadvantages of two alternative expressions for epistemic uncertainty: precise probability and bounds on probability, including verbal encapsulations that encode uncertainty. The quantification will be demonstrated using open-source code for the R programming environment. We will then compare expressions from these two approaches and discuss them in light of research and principles of risk analysis. The workshop will also present research from risk communication literature and an overview of experiments comparing the success in communicating epistemic uncertainty by bounds or precise probability. The question we would like to answer is, when and why to use bounds or not? The workshop will explain and focus on the difference between aleatory and epistemic uncertainty. It will address two problems drawn from existing EFSA opinions, one with medium and one with weak background knowledge.

The target audience for this workshop are scientific experts, experts on uncertainty analysis and communicators.

## Workshop 5

Topic: Communication of uncertainties

Title: Communicating uncertainty in Europe: implementation challenges and next steps

Authors: Frederic Boudier (1), Magda Osman (2), Peter Ayton (3), Sarah Jenkins (4), Martin Neil (5), Elizabeth Surkovic

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(2) Queen Mary University of London, UK  
(3) City University of London, UK  
(4) University College London, UK  
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(6) UK Government Office for Science

### Abstract:

The communication of uncertainties has been a core concern of risk studies. Several guides have produced (e.g. Morgan and Henrion 1992, Thompson and Graham 1996) and yet there is a lack of scientific consensus about how to best communicate uncertainties (Joslyn and LeClerck 2013; Keenan *et al.* 2014; Bostrom *et al.* 2015; Fischhoff 2015). Fischhoff and Davis (2014) have stressed that the communication of uncertainties requires identifying the facts relevant to recipients decisions, characterising the relevant uncertainties, assessing their magnitude, drafting possible messages and evaluating their success. European agencies, most notably the European Food Safety Authority (EFSA), offer clear and actionable advice about how to conduct uncertainty assessment and how to communicate uncertainties. EFSA, however, is likely to struggle with a number of challenges as it rolls out its current policy: how to ensure that the best available methodologies or the best available science on science communication are used? What will be the relationship between the agency's uncertainty and transparency policy? How to ensure that beyond risk assessment the new communication model meets the needs of risk managers and society? How to account for variations in personal and national needs? The goal of this workshop is to explore the challenges and struggles that EFSA may encounter in implementing the 2018 Guidance on Uncertainty in EFSA Scientific Assessments and Guidance on Communication of Uncertainty in Scientific Assessment.

The format of this workshop will be a panel of experts who will present a short perspective on uncertainty communication in the transparency era, the psychological relevance of causality in reducing uncertainty, challenges of uncertainty communication, communicating uncertainty – the role of format, causality, the ignored Component guiding us through a world of uncertainties in risk assessment, followed by an interactive exchange and discussion with the participants.

The target audience will be EFSA and national risk assessors, risk managers, communication scientist and professionals.