



Risk assessments: Validation, gut feeling and cognitive biases (Plinius Medal Lecture)

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Risk management is ideally based on comprehensive risk assessments quantifying the current risk and its reduction for different mitigation strategies. Given the pivotal role of risk assessments, this contribution discusses the basis for our confidence in risk assessments. Traditional validation, i.e. comparing model simulations with past observations, is often not possible since the assessment typically contains extreme events and their impacts that have not been observed before. In this situation, the assessment is strongly based on assumptions, expert judgement and best guess. This is an unfavorable situation as humans fall prey to cognitive biases, such as ‘illusion of certainty’, ‘overconfidence’ or ‘recency bias’. Such biases operate specifically in complex situations with many factors involved, when uncertainty is high and events are probabilistic, or when close learning feedback loops are missing – aspects that all apply to risk assessments. We reflect on the role of gut feeling in risk assessments, illustrate the pitfalls of cognitive biases, and discuss the possibilities for better understanding how confident we can be in the numbers resulting from risk assessments.