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Uncertainties about the Communication of Uncertainties

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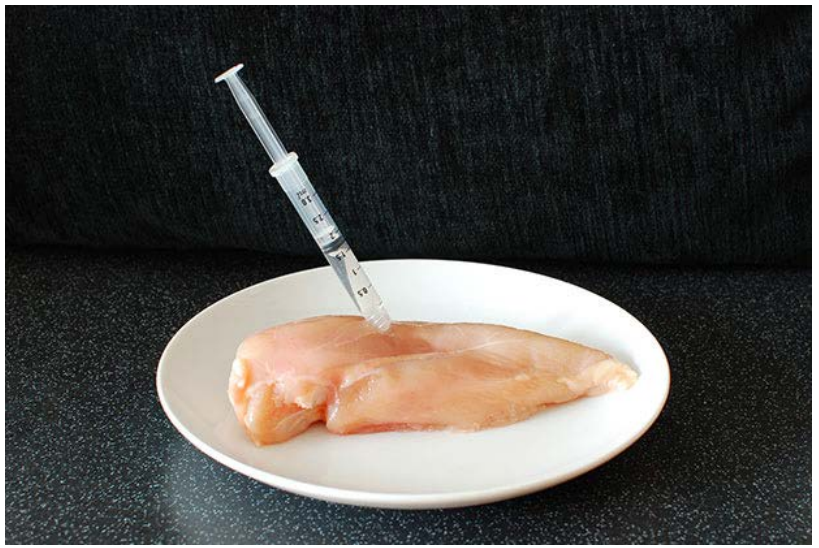
Uncertainty Communication: EFSA



EFSA: Communication of Uncertainty

GUIDANCE DOCUMENT

EFSA Journal

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Guidance on Communication of Uncertainty in Scientific Assessments

European Food Safety Authority,
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Abstract

This document provides guidance for communicators on how to communicate the various expressions of uncertainty described in EFSA's document: 'Guidance on uncertainty analysis in scientific assessments'. It also contains specific guidance for assessors on how best to report the various expressions of uncertainty. The document provides a template for identifying expressions of

Why should uncertainties be communicated?

- Provide the information that peopled need to make informed decisions
- Communication of uncertainties increase trust
  - No empirical support for such a claim, however
- Higher level of acceptance of scientific results
  - No empirical support for such a claim, however

Communication of Uncertainty: Challenges

- Most of the risk communication research has focused on risks to individuals from medical interventions
- In the case of EFSA
  - Mostly epistemic uncertainties
  - Not frequentist, but subjective probabilities
  - Expert judgments
- Almost none research exists about how to communicate subjective probabilities

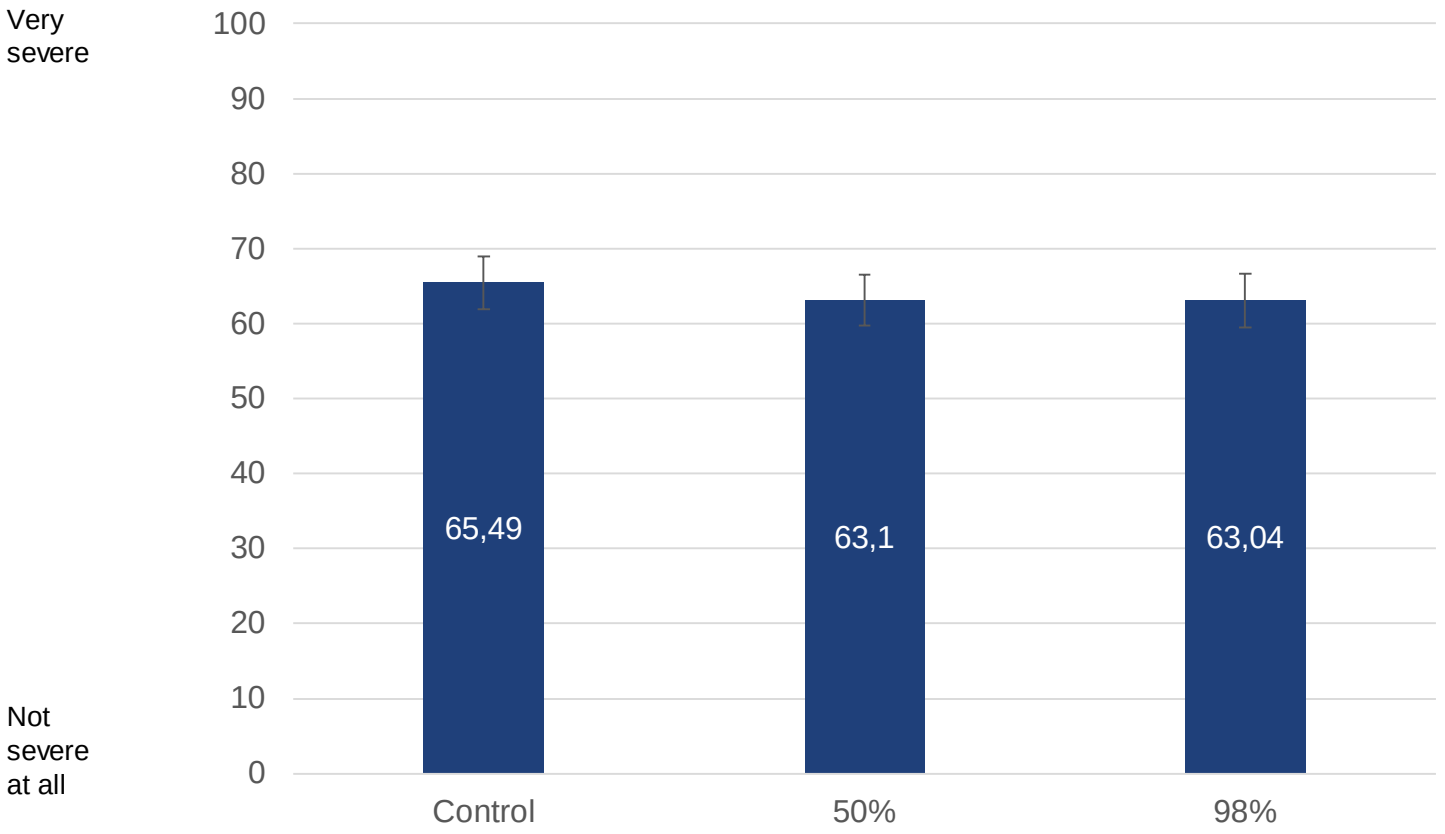
EFSA Example for Entry Level: Communicating a Probability Distribution

- “Experts estimated that, on average in Europe, 16 out of 100 slaughtered dairy cows are pregnant. Their assessment is based on limited data, but experts are 50% certain that the European average is between 9 and 27, and 98% certain it is between 2 and 60.”

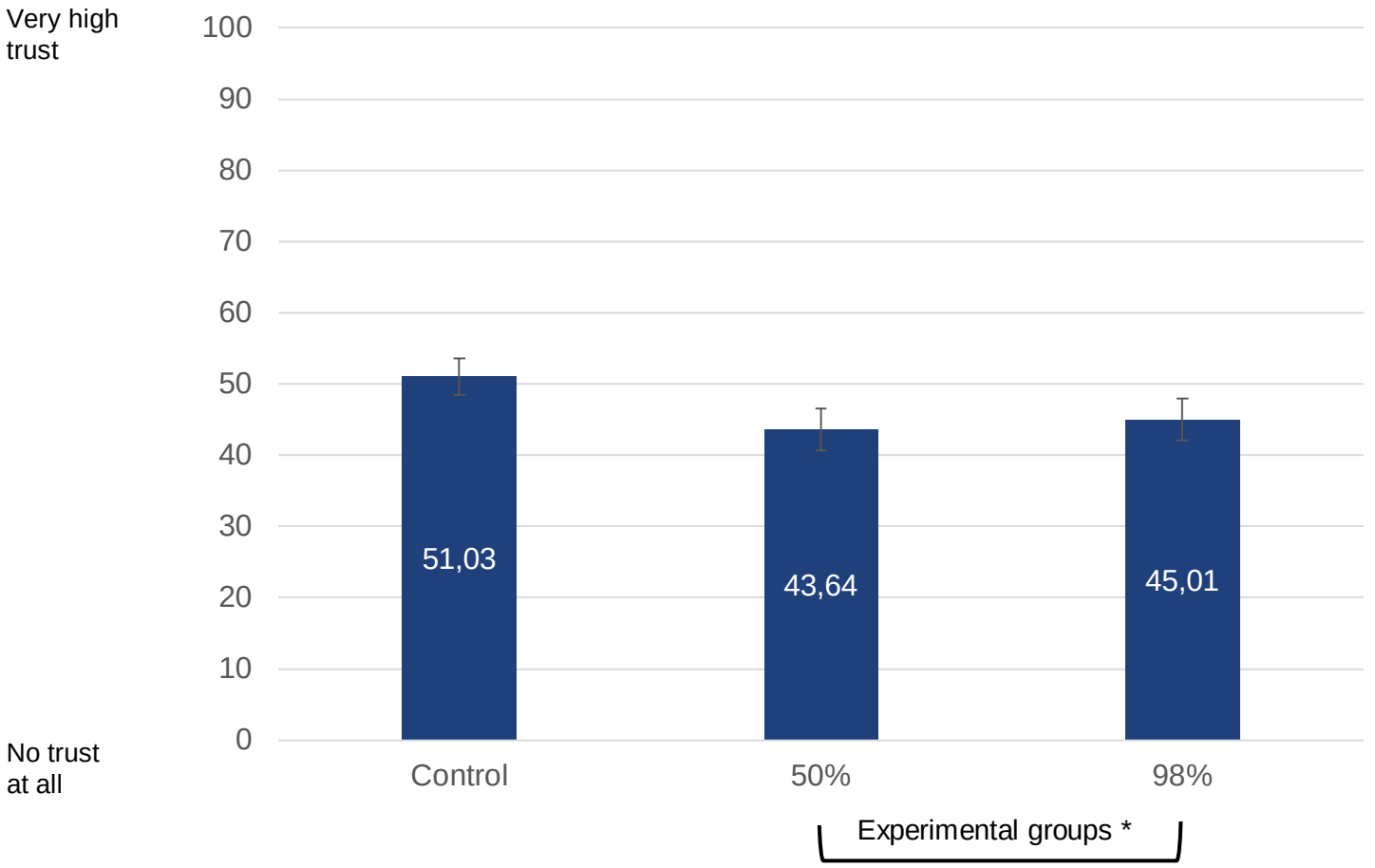
Experiment 1

- “A group of experts estimated how often in Europe a slaughtered cow is pregnant…
  - According to the estimates of the experts 16 out of 100 slaughtered cows are pregnant” (no uncertainty group)
  - According to the estimates of the experts with a probability of 50% between 9 and 27 of 100 slaughtered cows are pregnant” (50% uncertainty group)
  - According to the estimates of the experts with a probability of 98% between 2 and 60 of 100 slaughtered cows are pregnant” (50% uncertainty group)
- Internet Survey
  - N=221

How severe do you assess the following situation to be?



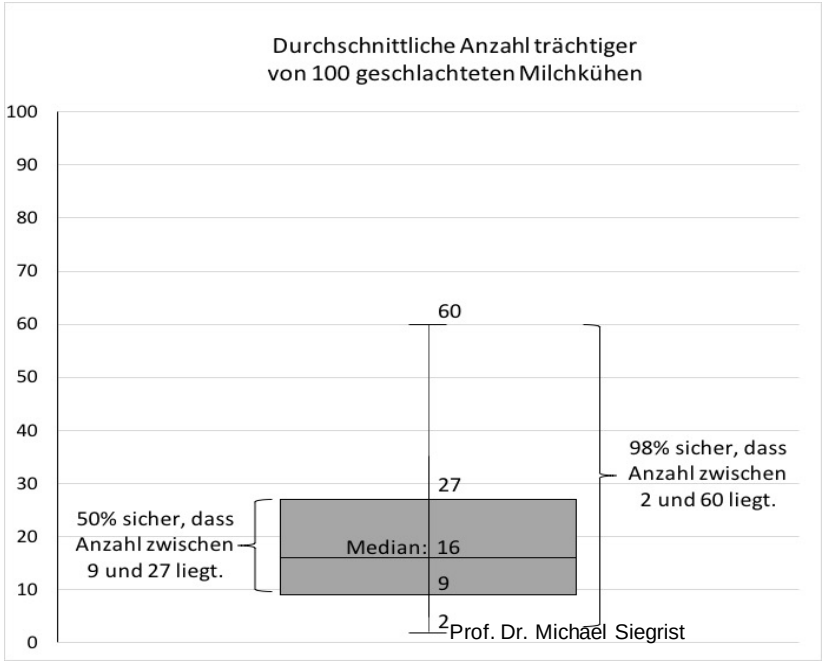
How much do you trust such an estimate of the experts?



* Control group significantly different from the pooled experimental groups.

Experiment 2

- No Uncertainty: “Experts of the European Food Safety Authority (EFSA) estimated that, on average in Europe, 16 out of 100 slaughtered dairy cows are pregnant.”
- Uncertainty: “….. Their assessment is based on limited data, but experts are 50% certain that the European average is between 9 and 27 dairy cows, and 98% certain it is between 2 and 60 dairy cows.”
- Uncertainty and Boxplot: ….



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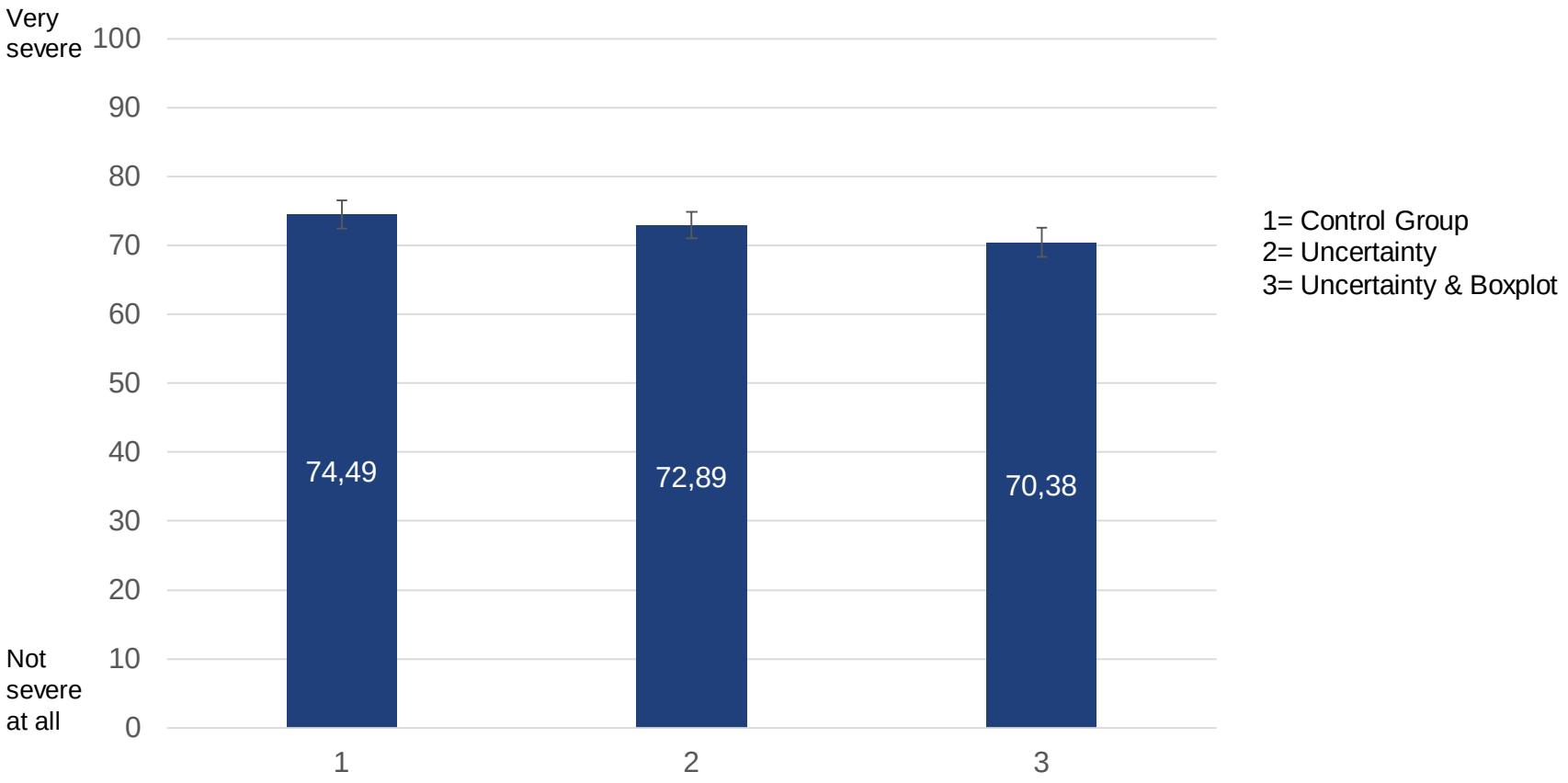
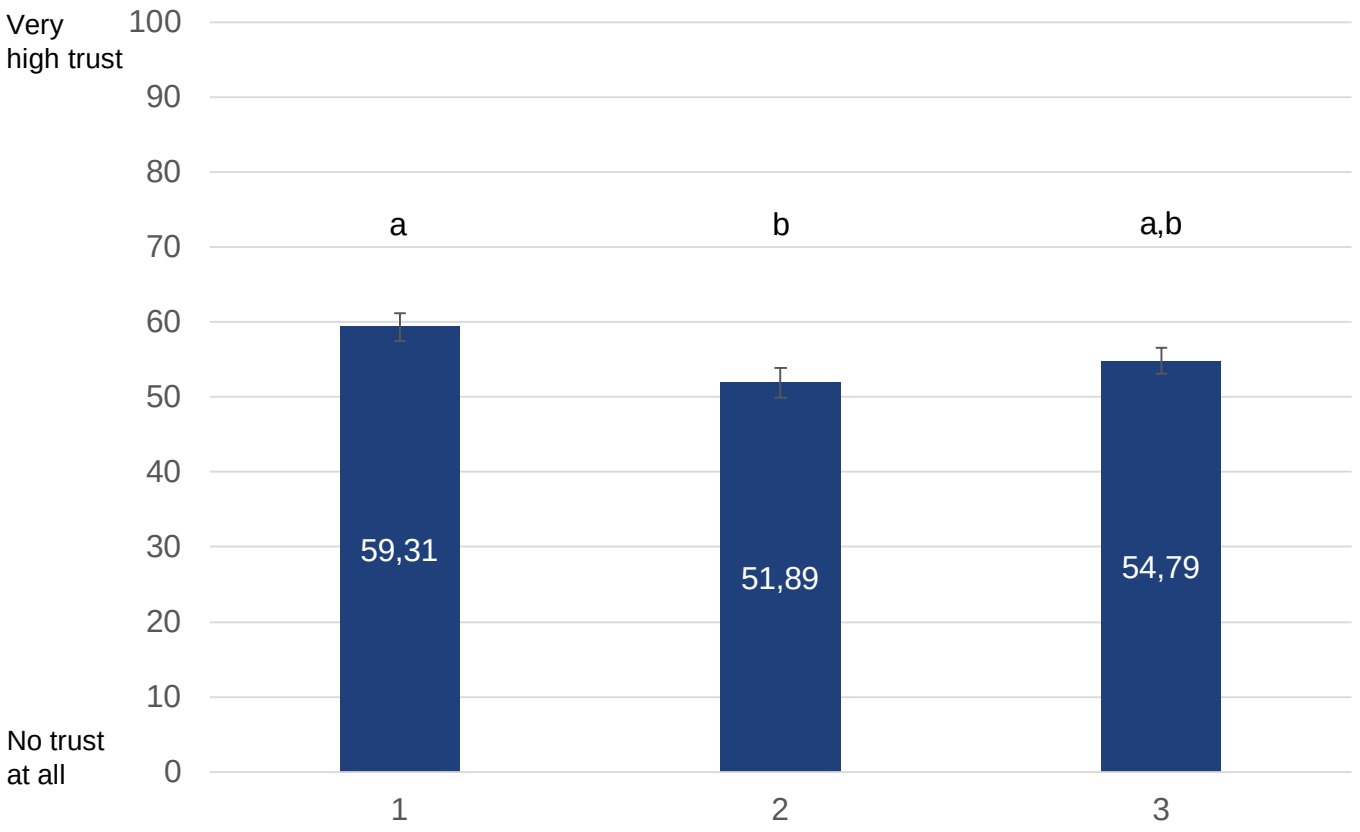
Sample

- Participants from an Internet panel
- N = 501
- Participants were randomly assigned to one of the three conditions.

Results: Perceived Severity



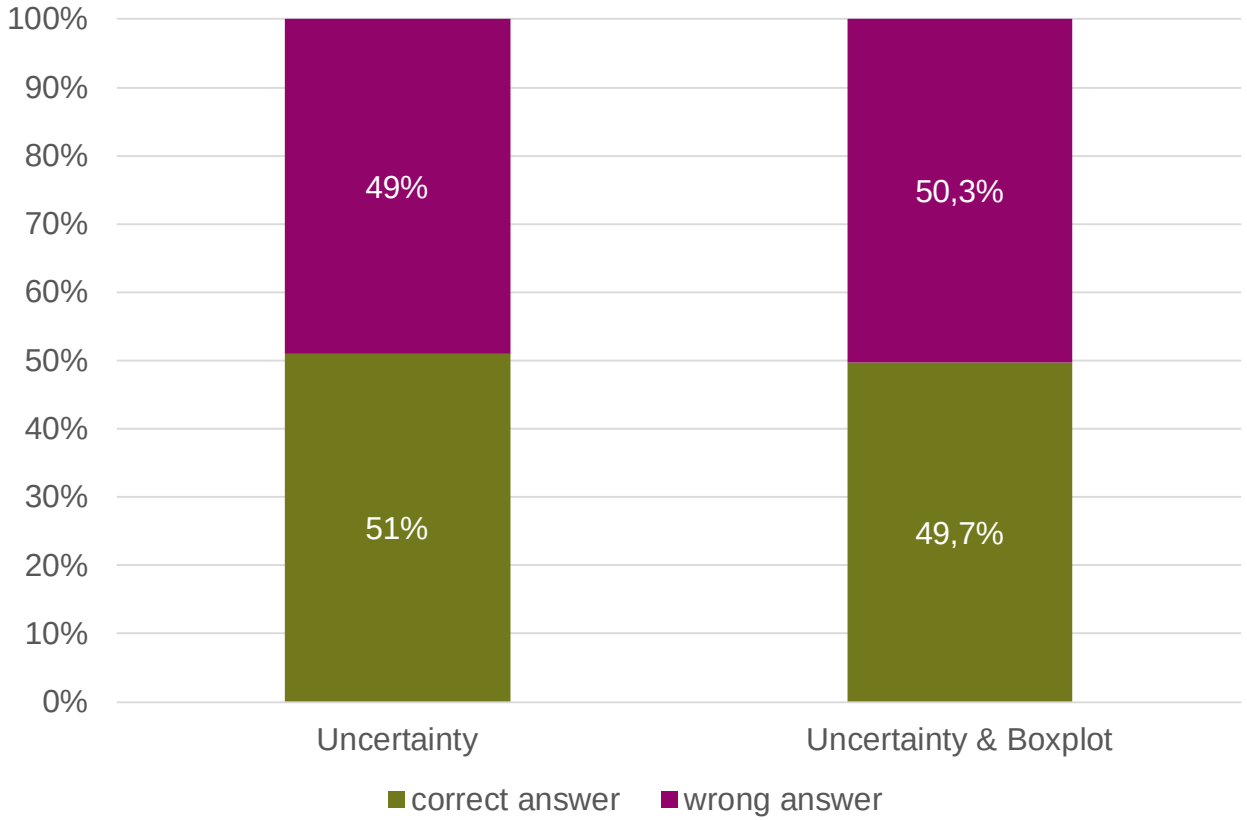
Results: Perceived Trust

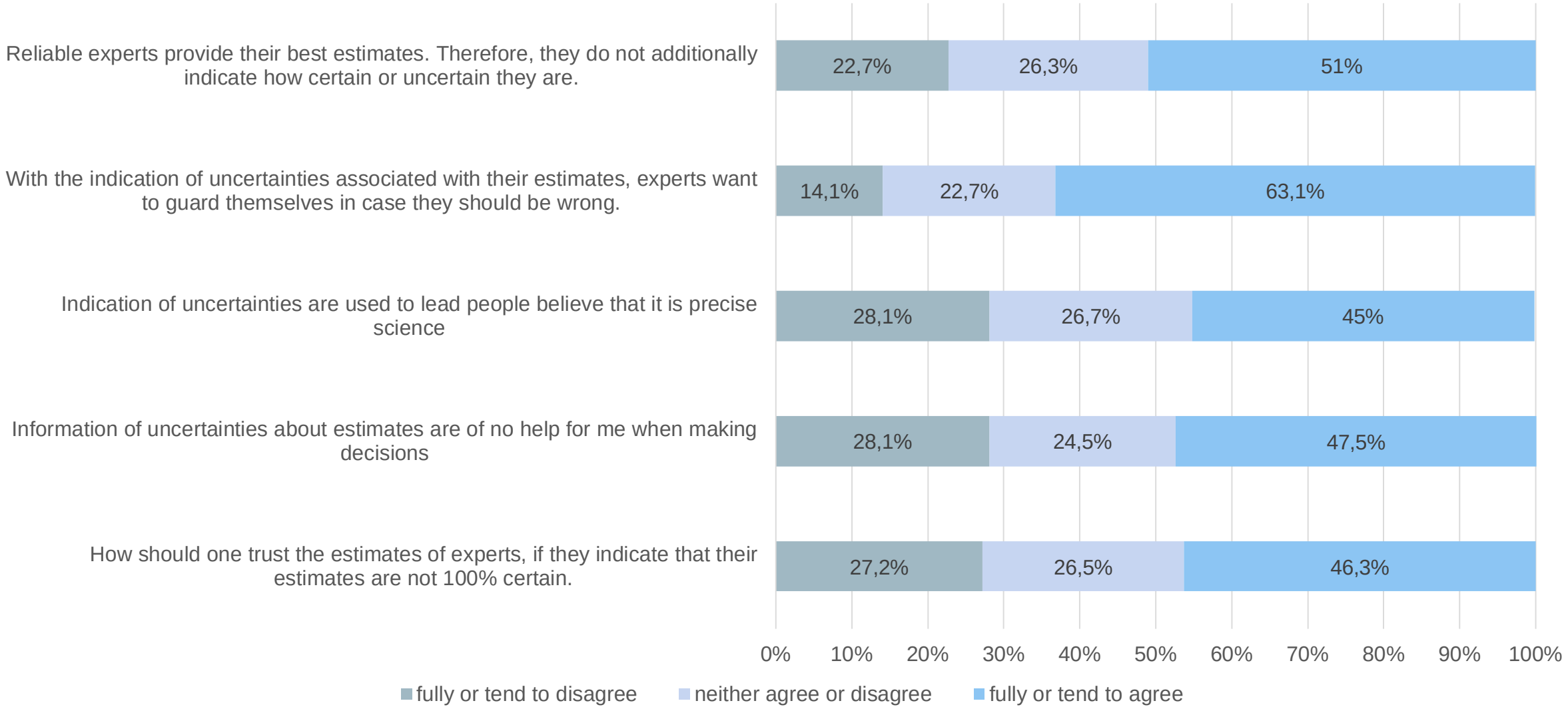


1= Control Group
2= Uncertainty
3= Uncertainty & Boxplot

Results: Understanding

- Out of 100 slaughtered dairy cows maximal 60 dairy cows were pregnant (false)




Reliable experts provide their best estimates. Therefore, they do not additionally indicate how certain or uncertain they are.
22,7%
26,3%
51%
With the indication of uncertainties associated with their estimates, experts want to guard themselves in case they should be wrong.
14,1%
22,7%
63,1%
Indication of uncertainties are used to lead people believe that it is precise science
28,1%
26,7%
45%
Information of uncertainties about estimates are of no help for me when making decisions
28,1%
24,5%
47,5%
How should one trust the estimates of experts, if they indicate that their estimates are not 100% certain.
27,2%
26,5%
46,3%
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
fully or tend to disagree
neither agree or disagree
fully or tend to agree

Conclusions

- Providing information about uncertainties did not have an impact on perceived severity
- Providing information about uncertainties can result in decreased trust in the information
  - Positive effects were not observed
- About half of the participants were not able to correctly answer a simple question about a boxplot
- Providing information about uncertainties is not perceived as a strength, but as a weakness by many lay-people