Supplementing evidence with expert beliefs: within health sector complexities and considerations

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Purpose of this workshop

- To consider the complexities of different contexts for decision making in healthcare.

- Discuss the considerations for using experts' beliefs within these contexts.
  - Open up the possibility for wider applied use of expert elicitation and research into appropriate methods.

- **Introduction and rationale to use experts' beliefs in health.**
- **Different contexts in which elicitation techniques have been applied.**

Start polling questions.

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Rationale

- Evidence is needed to enable robust and defensible decision making across health care contexts.

- Experimental evidence challenging to collect in some contexts:

  – Communicable diseases, public health, emerging technologies.

- Experts' beliefs can be used to inform allocation, reimbursement and prioritisation decisions.

  – Can inform level of uncertainty for future data collection.

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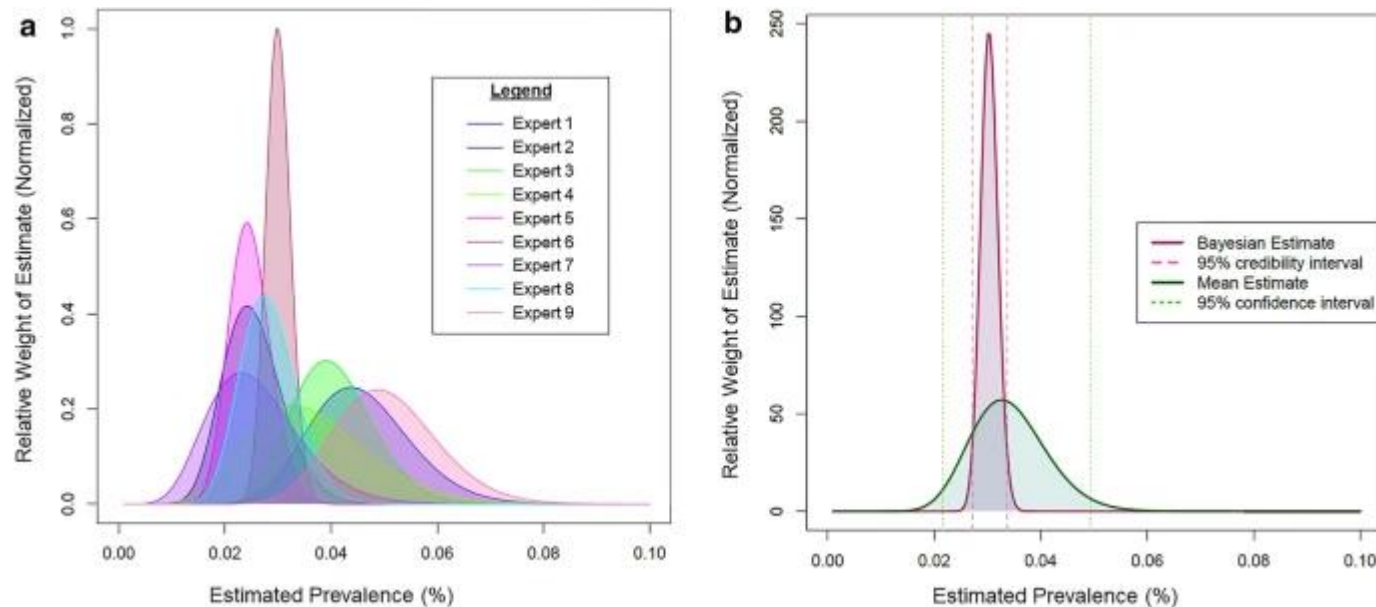# Expert elicitation overview

- Process of obtaining probabilistic belief statements from experts about unknown quantities or parameters.
- Elicitation provides the additional information needed to reach a decision when empirical evidence is lacking.
- Often refers to quantitative processes.
  - Experts beliefs used as inputs into evidence generation or interpreting evidence.
  - Experts beliefs are encoded.
- Qualitative process also possible
  - Uncertainty expressed at "unlikely", "most likely"
- 'Experts' observe outcomes of interest or use adaptive skills.

Health contexts in which expert elicitation has been applied

- Structured expert elicitation most often used in HTA, specifically cost-effectiveness studies
    - Van Hest: Review of 25 company submissions appraised by NICE expert judgement used in 23/25 company submissions.
- Estimate opportunity cost of health – Soares, et al, 2021.
- Design, analysis, interpretation of clinical studies – sample size calculations, Best et al.
- Pharmacoeconomics, public health, early technologies….

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Example: Psoriasis Prevalence and Severity

- Papp, et al 2021 elicited unknown parameters in dermatology – Delphi process, fitting and averaging across 11 dermatologists.

Source: Papp, K.A., Gniadecki, R., Beecker, J. *et al.* Psoriasis Prevalence and Severity by Expert Elicitation. *Dermatol Ther (Heidelb)* **11**, 1053–1064 (2021)

Example 2: Importance of possible SARS-CoV-2 transmission routes and the effectiveness of mitigations

- Freeman, et al 2021 elicited ranges for 123 variables on the likelihood of transmission by different routes.
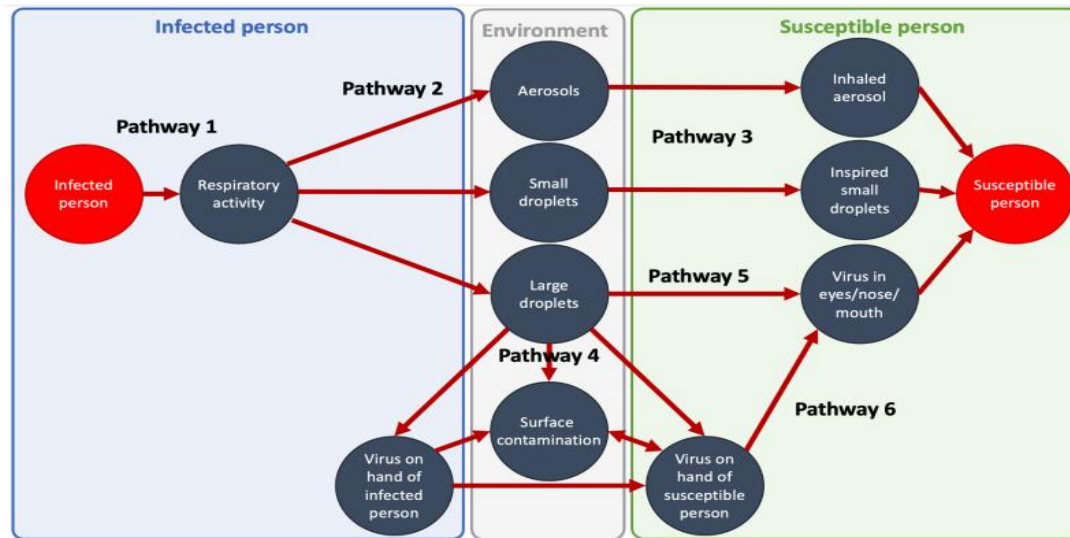
Figure 2 Division of the transmission diagram into different pathways to allow participants to select those that reflected their expertise.

Source: Freeman ALJ, Parker S, Noakes C, et al. Expert elicitation on the relative importance of possible SARS-CoV-2 transmission routes and the effectiveness of mitigations. BMJ Open 2021;11:e050869.

Poll Question 1

- In which contexts have you applied structure expert elicitation?
- - HTA (National policy level)
- - HTA (local/regional level)
- - Global health
- - Rare diseases
- - Priority setting/planning
- - Trial design
- - Other

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Potential challenges across different contexts

- Multiple methods exist for SEE.
  - Lack of empirical evidence on which methods are appropriate for which type of application.
- Health care decision making processes may involve complexities and impose constraints that restrict the use of formal methods for elicitation.
  - Time/pressures
  - Resources/expertise
  - Relevant experts

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Presenters

– Victoria Shaffer. Cognitive heuristics and their resulting biases in expert judgment, environmental constraints on judgment, learning from experience, and strategies for debiasing judgments.

– Dina Jankovic. Use of experts' beliefs to generate prior evidence to inform the evaluation of complex and early stage interventions.

– Abigail Colson. Use of experts' beliefs in the global health setting, prioritisation and system strengthening.

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