

Expert elicitation techniques: Informing application in HTA decision-making

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Introduction

- > Health Technology Assessment (HTA) bodies require evidence relating to the burden of illness, long-term epidemiological trends of disease, comparative effectiveness, cost-effectiveness and/or budget impact to assess the value of a technology.^{1,2}
- > Often, the evidence used to infer the value of technology can be uncertain.^{3,4} For example, in instances where the extrapolation of evidence is required to apply findings to larger population sizes or extended time points.
- > In these instances, leveraging the insights of experts who have adequate and appropriate subject knowledge on a particular topic can be useful to elicit key data of interest to inform healthcare decision-making in HTA.
- > Expert elicitation is one technique that can be useful to generate evidence using experts' judgement in the absence of existing data or published literature and/or characterise uncertainty to support the assessment of new therapies.⁴
- > Dependent on research objectives, the selection of an appropriate expert elicitation technique can vary. Quantitative techniques typically seek to obtain insights from experts in a quantitative or statistical form, for example uncertain data points, estimates, or durations and probability distributions and are typically conducted using structured expert elicitation techniques, including (but not limited to): the Sheffield Elicitation Framework (SHELF), Cooke's Classical Model and the Delphi method.^{4,8} Qualitative techniques typically seek to obtain descriptive qualitative insights with justifications and/or detailed rationales from experts and leverage techniques including (but not limited to): individual interviews, focus groups, consensus panels, nominal group techniques and the Delphi method.^{4,9,10}
- > The application and implementation of expert elicitation in recent years has become increasingly important to inform healthcare decision-making.
- > However, limited guidance exists for expert elicitation in HTA literature, and previous research has highlighted vast heterogeneity in the methodologies used and a lack of consideration for any existing guidance on the topic.¹¹
- > Following the identification of such heterogeneity, previous research concluded that there is a lack of evidence available to determine which of these methods is most appropriate across the whole of health-care decision-making.⁴ Reference protocols have been developed to provide clarity on methods for collecting and using experts' judgements, and to consider when alternative methodology may be required in particular contexts.⁴
- > We therefore aimed to review use of expert elicitation methodologies within published HTA literature and to define appropriate implementation and use for HTA decision-making.

Methods

- > A targeted literature review (TLR) was conducted to summarise the use of expert elicitation methods in HTA.
- > Literature within MEDLINE exploring the use of expert elicitation methods within HTA decision-making was captured and reviewed to assess the prior use of elicitation techniques in healthcare decision-making, alongside best practice recommendations within best practice guidance and HTA guidelines.
- > Following the review, we identified the typical situations where expert elicitation was used in the context of HTA decision-making.
- > To build upon existing guidance where available and reference protocols, we developed a roadmap framework to guide and support appropriate methodological choices across a variety of contexts for those seeking to conduct expert elicitation exercises.

Results

- > The TLR found that expert elicitation is accepted as a methodology by numerous HTA bodies.
- > Examples of elicitation methodologies were identified with both quantitative and qualitative focus (Table 1).

Focus	Examples (list not exhaustive)
Quantitative	Utility value derivation, quantifying uncertainty, long-term extrapolations, and real-world dosing patterns and responses ¹²⁻¹⁷
Qualitative	Strategic planning and feasibility assessments for inclusion in HTA submissions and positioning, validation of non-conventional model inputs, understanding key drivers of uncertainty, burden of illness studies, and consensus derivation. ¹⁸⁻²¹

- > The use of expert elicitation to help generate evidence with potential HTA implications was identified across a range of therapeutic areas and settings, however variability in the methodologies and approaches employed to target key research objectives were noted.
- > Given the variability identified, HTA guidance was reviewed to explore the potential influence of such examples in HTA decision making.
- > As noted in existing reference protocols, no standard guidelines exist to conduct expert elicitation in HTA, but there are a number of generic guidance to help guide appropriate method selection and study design.⁴
- > An overview of the availability of guidance on expert elicitation methods across HTA organisations is presented below in Figure 1.

Figure 1. Summary of the availability of guidance on expert elicitation methods across HTA organisations

Country/HTA body	AUS: PBAC	CAN: CADTH	Eng & Wales: NICE	FR: HAS	DE: IGMG	IRL: HCA	NL: ZIN	NOR: NOIC	POL: ADAMT	POR: INFARMED	SCOT: SMC	SE: SBU	Thailand: HIRP	USA: FDA
Elicitation guidance provided?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Key themes across guidance	Expert elicitation is appropriate for use if there is a lack of data to inform the required value and associated distributions and/or when attempting to reduce or estimate uncertainty. Core components for inclusion and documentation of: the identification of variables, identification of experts, training and preparation, conduct of elicitation and post-elicitation analyses.													

- > Key themes across HTA guidance that emerged included:
 - The use expert elicitation is appropriate if there is a lack of data to inform values and associated distributions and/or when attempting to reduce or estimate uncertainty
 - Formal methods must be adhered to following best practice principles to manage bias and adhere to validated processes to obtain results with the highest level of objectivity feasible.

Results (continued)

- > Key differences across HTA guidance included:
 - Specification for specific country level data to be leveraged within the elicitation exercise
 - Preferences for methodologies employed for the elicitation exercise.

"In the absence of empirical evidence from randomised-controlled trials, non-randomised studies, or registries, or when considered appropriate by the committee taking into account all other available evidence, expert elicitation can be used to provide evidence... Structured approaches should adhere to existing protocols (such as the Medical Research Council protocol)"
National Institute for Health and Care Excellence, Health Technology Evaluations: the manual, UK (2022)²²

"In the absence of sufficient data for informing parameter estimates, the elicitation of quantitative input from relevant experts may be useful"
Canada's Drug and Health Technology Agency, Guidelines for the Economic Evaluation of Health Technologies (2017)²³

"Where data are clearly lacking, it is recommended to ask a panel of experts to provide data for 'input' in a model or for the design of a model. One of the common methods to organize expert panels is the Delphi method. If an expert panel is consulted, the way in which the experts were selected must be clearly explained so that their expertise and independence can be verified. The following information should be provided: the data collection method, the process through which consensus, where needed, was achieved, and the analysis method. Furthermore, the data provided by the expert panel should be specified and the impact of uncertainty on the results must be elucidated through sensitivity analyses"
National Health Care Institute, Guideline for Economic Evaluations in Healthcare, the Netherlands (2016)²⁴

"Experts' opinions may be used to justify the choice of the data or to justify the relevance of the data or assumptions tested in a sensitivity analysis, so long as the method used to obtain these opinions is detailed (criteria used to select the experts, number of experts approached and who responded, disclosures of potential interests, method used to record the opinions, questions asked, and identification of the data documented through experts' opinions). For quantitative parameters, a formal method of elicitation is preferable"
HAS Choices in Methods for Economic Evaluation Methodological Guidance, France (2020)²⁵

- > Guidance on patient and healthcare professional involvement from the European network for Health Technology Assessment Joint Action (EUnetHTA JA) currently do not comment upon the use of expert elicitation and preferred methodologies.²⁶
- > Notably, HTA guidelines in France referred to the Australian guidelines for preparing submissions to the Pharmaceutical Benefits Advisory Committee to outline exemplar methodologies, ranging from questionnaire-based surveys involving a statistical analysis, to the qualitative or quantitative summarising of interviews across a selected panel of experts.^{25,27} Additionally, guidelines in Europe favoured methods that adhered to best practice guidance as outlined in existing literature.^{3,4,11,28-30}
- > Guidelines refer to the use of such methodologies to inform HTA submissions, with example uses including: defining clinical or unmet need, assessing potential alterations to clinical management pathways and algorithms, assessing clinical importance and patient relevance of outcomes, modifying patterns of healthcare resource use, predicting healthcare resource impact, estimate proportions and or probabilities in relation to outcomes of interest, and predicting treatment use following the emergence of a new therapy.²⁷
- > Following the review, a road map of potential uses was developed to help facilitate methodology choices, study design and implementation across an array of market access research questions, while following good practice principles detailed in published literature.

Figure 2. Road map of potential uses to help facilitate methodology choices

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graph TD
    A([Is existing evidence or could existing evidence and/or patient level data be used to target research objectives?]) -- Yes --> B[EE not required]
    A -- No --> C([Elicitation method selection: What is the nature of the research objective?])
    C --> D[Quantitative]
    C --> E[Qualitative]
    D --> F([What are the intended outputs of the study?])
    F --> G[Consensus derivation to inform treatment use]
    F --> H[Estimates of comparative efficacy in absence of indirect comparisons]
    F --> I[Long-term extrapolations of efficacy or HRQoL rates]
    F --> J[Estimates of real-world consumption]
    F --> K[Evaluation of multiple concepts for inclusion in economic assessments]
    G --> L[Delphi panel]
    H --> M[SEE]
    I --> N[SEE]
    J --> O[SEE]
    K --> P[Delphi panel]
    E --> Q[Burden depiction]
    E --> R[Exploration of meaningful outcomes and/or endpoint selection]
    E --> S[Informing treatment guidelines]
    Q --> T[Modified Delphi panel with potential for leveraging SHELF]
    R --> U[SHELF, Cooke's classical method, MRC protocol]
    S --> V[Modified Delphi panel with potential for adaptation of analyses leveraging MCDA]
    T --> W[Modified Delphi panel deriving consensus statements to inform decision making]
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Conclusions

- > There is currently a lack of guidance available to determine which elicitation methods are most appropriate within health-care decision-making.⁴
- > Generic guidance across HTA bodies exists for the conduct of elicitation methodologies with key themes and commonalities identified across the literature.^{3,4,11,22,24,25,27-30}
- > In contrast, at a broader level, guidelines on patient and healthcare professional involvement from EUnetHTA JA currently do not comment upon the use of expert elicitation and preferred methodologies; it is currently unclear where expert elicitation will sit within the expert involvement framework.²⁶
- > Following a review of published literature, HTA guidelines and research leveraging a variety of elicitation techniques to date, we present a roadmap framework to help guide appropriate method selection and study design when considering potential use and application of elicitation techniques, to provide HTAs with reliable information to inform their decision-making in the absence of patient-level data.

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