Using Evidence Elicited from Experts in Decision Making:

Case study – NPWT for pressure ulcers

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slides kindly provided by Marta Soares, CHE, University of York

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Expert elicitation in HTA

• Expert elicitation is occasionally used in HTA to quantify unknown parameters
  – Absence or sparse information on particular key parameters
• No standard protocols for the conduct of elicitation assessments
  – Consensus (eg. Delphi) and mathematical (eg. synthesis) approaches – focus on the later
• Increased emphasis on characterising uncertainty in decisions has led to increased interest in this field.

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Negative Pressure Wound Therapy (NPWT or TNP) for severe pressure ulcers

- Limited and sparse evidence base
  Unclear clinical and cost effectiveness

- NPWT and comparators used in the UK NHS
  Substantial practical experience by health carers

**Decision/policy problem**

- Is NPWT cost effective?
- Is further research of value?

> Soares et al (2011) Methods to elicit experts’ beliefs over uncertain quantities: application to a cost effectiveness transition model of negative pressure wound therapy for severe pressure ulceration. Statistics in Medicine, 30 p2363-80


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**Decision model – Markov model**

Information needs

- For some parameters there were no data available
  *e.g.* complications, discontinuation, surgery rates
- For some there were sparse data
  *e.g.* treatments effects (hazard and hazard ratios)
- For others there were robust data available
  mortality

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Aims of the elicitation exercise

To design and conduct an elicitation exercise that allowed:

• experts to formulate quantitative judgements about their own beliefs on multiple uncertain quantities
• results to reflect coherent and valid (face validity) representations of uncertainty for quantities for which sparse or no data were available,
• these beliefs to inform the NPWT decision model

Constructing the exercise

1) Experts elicited the proportion of patients healed with comparator treatment

2) “Do you think the proportion healed would be different if instead of the comparator patients were treated with A?”
   "No, the proportion of patients would be the same",
   “I don’t know” or
   "Yes, the proportion of patients would differ”.

3) If yes, experts elicited proportion healed with A conditioned on a value for the effectiveness of the comparator (the mode of the elicited distribution for comparator)
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Eliciting distributions

- graphic format, the histogram technique [van Noortwijk JM, 1992]
  - fixed interval method based on the probability density function.

Conduct of the exercise

- Face to face, computer based (Excel VBA) exercise
- Experienced facilitator + tutors
- More than 30 questions, 18 uncertain (*not shown here*)
- Multiple experts (N=23)
- Extensive training over
  - The concept of uncertainty
  - The method of eliciting distributions
  - Impact of bias
  - The computer instrument
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Results

- Proportion healed using hydrocolloid (HC)

*Think of UK patients with at least one debrided grade 3 or 4 pressure ulcer (greater than 5 cm² in area).*

*Six months after starting treatment with HC, what proportion of patients who are alive do you think would have a healed reference ulcer?*
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Proportion of patients healed with Hydrocolloid (HC)

Further transformation to Log hazard of healing
Normal, mean=-3.74, CI= [-5.96 to -1.52]

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Impact of elicited data over cost effectiveness

Existing data
TNP = negative pressure wound therapy;
ALG = alginate;
F = foam;
HC = hydrocolloid

Existing + elicited data

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Considerations in eliciting evidence from experts

• How to construct an elicitation exercise
  – Whose beliefs? What to elicit?
  – Pilot the exercise with experts to finalise design

• How to conduct an elicitation exercise
  – Should make process simple and easy to understand
  – Face to face exercises are seen as better
  – Training

• How to synthesise beliefs from multiple experts
  – Consensus methods vs Mathematical methods

• How to assess the adequacy
  – Internal consistency
  – Fit for purpose
  – Scoring rules or Calibration

References


> Chaloner K, Rhame FS. Quantifying and documenting prior beliefs in clinical trials. Statistics in Medicine, 2001;20(4):581–600;


> Soares MO, Bojke L, Dumville J, Iglesias C, Cullum N, Claxton K. Methods to elicit experts’ beliefs over uncertain quantities: application to a cost effectiveness transition model of negative pressure wound therapy for severe pressure ulceration. Statistics in Medicine, 2011, 30 p2363-80;