Health Economics Group

Economic approaches to research priority setting

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Introduction

- Lecturer in Health Economics, University of East Anglia
- Decision analytic modelling
- Economic evaluation alongside clinical trials
- Efficient research design
Plan

• The cycle of evidence (economics?) based medicine
• A quantitative approach to research priority setting
  – Value of information analysis
• Methodological research questions
  – How can we adapt the principles to prioritise Cochrane reviews?
Cycle of ‘economics based medicine’

1. Define the decision problem
2. Systematic review & Economic Evaluation
3. Primary studies (RCT, epidemiological etc)
4. Decision: More research worthwhile?
5. Value of information analysis
6. Decision: Adopt or reject new technology?
7. End research into current decision problem
The adoption decision: economic evaluation

- The comparison of two or more courses of action in terms of their costs and consequences\(^1\)

\[
\frac{C_2 - C_1}{E_2 - E_1} \leq \lambda
\]

<table>
<thead>
<tr>
<th></th>
<th>£</th>
<th>QALYs</th>
<th>ICER</th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>£1,084</td>
<td>1.621</td>
<td></td>
</tr>
<tr>
<td>Old</td>
<td>£872</td>
<td>1.605</td>
<td></td>
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<tr>
<td>Increment</td>
<td>£213</td>
<td>0.015</td>
<td>£14,200</td>
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1. Drummond et al. 2005
From ICERs to Net Benefit

\[
\frac{C_2 - C_1}{E_2 - E_1} \leq \lambda
\]

\[
\lambda (E_2 - E_1) - (C_2 - C_1) \geq 0
\]

\[
\lambda \Delta E - \Delta C \geq 0
\]

\[
INB \geq 0
\]

\[
b \geq 0
\]
Approach to economic evaluation

- Decision modelling & Monte Carlo Simulation

- Costs
- Effectiveness (probabilities)
- Decision model (Decision tree, Markov chain etc)
- Health state Utilities
- Incremental Net Benefit

E.g. Briggs, Sculpher & Claxton 2006
The research decision: Value of Information Analysis
The research decision: Value of Information Analysis
### Ranking alternative research projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Expected Net Benefit of Sampling</th>
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<tbody>
<tr>
<td>RCT A</td>
<td>£250,000,000</td>
</tr>
<tr>
<td>RCT B</td>
<td>£100,000,000</td>
</tr>
<tr>
<td>RCT C</td>
<td>£10,800,000</td>
</tr>
<tr>
<td>RCT D</td>
<td>£7,350,000</td>
</tr>
<tr>
<td>RCT E</td>
<td>£1,500,000</td>
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Prioritising Cochrane Reviews – initial thoughts

- ENBS of updating a Cochrane review?

  Decision uncertainty → Expected loss → Recommendation for new trials
Prioritising Cochrane Reviews – initial thoughts

1. Define the decision problem
2. Systematic review & Economic Evaluation
   - Decision: Adopt or reject new technology?
3. Primary studies (RCT, epidemiological etc)
4. Decision: More research worthwhile?
5. Value of information analysis
6. End research into current decision problem

Primary studies are the foundation for further analysis, leading to decisions on whether to pursue more research or end the investigation.
Prioritising Cochrane Reviews – initial thoughts

• Factors affecting the value of updating a review
  – Current decision uncertainty
  – Number of new trials
    • Specifically number of observations
  – Cost of the review

• Discussion points
  – International transferability of results – VoI implications
    • What is the correct scope for a Cochrane review? (Global?)
    • Possible to generalise for purposes of prioritising?
  – How much analysis is too much?!
    • Technical solution vs ‘gut feeling’
References