What are the issues in finding economic evaluations for technology assessment?

HTAi IRG Pre-Conference Workshop -- June 6, 2010

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Acknowledgements

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- York Health Economics Consortium (YHEC)

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Outline – Finding Economic Evaluations

- Introduction
- Economic evaluation resources
- How far do resources overlap?
- Search strategies
  - Search terms and term combinations
  - Searching economic evaluation databases
  - Searching large biomedical databases
- Discussion
Introduction

- Many HTAs require an economic component
- Need to identify and review economic evaluations and models
- Well established resources provide access to economic evaluations
- Increasing evidence on efficient ways to search for economic evidence
Types of economic resources

- Economic evaluation databases
- Major biomedical databases
- Health technology assessment resources
- Health economic resources
- Organizational websites
- Working papers or reports (grey literature)
Economic evaluation resources

- Most HTA guidance recommends starting with resources that collect economic evaluations (NHS EED, HEED)
- Then follow up with top-off searches of large biomedical bibliographic databases (MEDLINE, EMBASE)
- Pragmatic approach to maximize efficiency of searching
NHS Economic Evaluation Database

- Very large database of health care economic evaluations
- Coverage: early 1990s to present
- Mainly derived from MEDLINE and EMBASE searches
- Also identifies records from handsearching journals
- Evaluations identified and categorized by experts
- Detailed summaries plus critical appraisal
- Process creates possible delays so published guidance recommends additional searching in MEDLINE/EMBASE
Another large database of health care economic evaluations
Compiled in similar manner to NHS EED
Detailed abstracts but no critiques of methods of studies
Extensive categorizations:
  - ICD-9 codes
  - Drug names
  - ATC codes
Other databases for economic evaluations

- CEA (Cost-Effectiveness Analysis) Registry
  Extracts cost-effectiveness ratios and utility weight scores

- RePEc database (Research Papers in Economics)
  900,000 items of interest, over 780,000 available online

- PEDE (Pediatric Economic Database Evaluation)
  Pediatric focus, includes categorizations, current to 2008

- Base CODECS (COonnaissances et Décision en EConomie de la Santé)
  French context, detailed summaries plus critical appraisal, not updated since 2003
Other databases

- **DARE (Database of Abstracts of Reviews of Effects)**
  Critical appraisals of systematic reviews

- **HTA**
  Descriptions of and links to technology assessments

- **MEDLINE & EMBASE**
  Large biomedical databases, require search filters to retrieve economic evaluations

- **Econlit**
  Indexes economic journals only, yields few reports of economic evaluations in healthcare (value of database?)
How far do resources overlap?

- Overlap between resources exist, but little published on scale of overlap

- Royle and Waugh 2003 assessed 19 economic HTAs:
  - MEDLINE + EMBASE (86.6% of included studies)
  - NHS EED (40.2%)
  - MEDLINE + EMBASE + NHS EED (94.8%)

- Alton et al. 2006
  - An NHS EED searched supplemented by MEDLINE search was effective

- Studies hampered by varying definitions of economic evaluations and database currency issues.

- Collaborative websites to collect data could help to build evidence picture.
Links to databases

- NHS EED, DARE & HTA: [http://www.crd.york.ac.uk/CRDWeb/](http://www.crd.york.ac.uk/CRDWeb/) [also available via Wiley subscription]
- HEED (subscription service): [http://www3.interscience.wiley.com/cgi-bin/mrwhome/114130635/HOME](http://www3.interscience.wiley.com/cgi-bin/mrwhome/114130635/HOME)
- CEA Registry: [https://research.tufts-nemc.org/cear/default.aspx](https://research.tufts-nemc.org/cear/default.aspx)
- RePEc: [http://ideas.repec.org/](http://ideas.repec.org/)
- PEDE: [http://pede.ccb.sickkids.ca/pede/index.jsp](http://pede.ccb.sickkids.ca/pede/index.jsp)
- Base CODECS: [http://infodoc.inserm.fr/codecs/codecs.nsf](http://infodoc.inserm.fr/codecs/codecs.nsf)
- Other resources: [http://www.healtheconomics.com/database.cfm](http://www.healtheconomics.com/database.cfm)
Searching databases

- What are efficient ways to identify economic evaluations in
  - Economic evaluation databases
  - Major bibliographic databases
Search strategies: economic evaluation databases

- Using elements of PICO
- Usually no need to add a detailed economic concept
- Even NHS EED and HEED contain different types of records so searches can be focused onto economic evaluations
- NHS EED example
  - #1 (smok* or tobacco or cigarette*) AND nicotine
  - #2 ("economic evaluation":ty or "provisional abstract":ty) NOT ("partial":ty or "outcome":ty)
  - #3 #1 AND #2
- Note: NHS EED planning to remove cost, methods and outcome valuation records, so strategy may become simpler
Search strategies: economic evaluation databases

- HEED field: ‘Type of economic evaluation’
  - Cost benefit analysis
  - Cost consequences analysis
  - Cost of illness
  - Cost utility analysis
  - Cost minimisation analysis
  - Cost effectiveness analysis
  - Cost analysis

- Example search: (ab=nicotine or ti=nicotine) AND ee=(utility or effectiveness or benefit)
HEED example
Search strategies: large biomedical databases

- Economic evaluation records form a very small proportion of total records in databases
- Searching requires PICO search strategies PLUS detailed set of economics search terms
- Which search terms?
- Use published search filters?
  - ISSG Search Filter Resource (http://www.york.ac.uk/inst/crd/intertasc/)
Economic filters on the ISSG website

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**Home > Resources > InterTASC > Economic evaluations**

**Economic evaluations**

Evaluations of the performance of filters can be found below the table.

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But which filter is ‘best’?

- Many search filters have been published
- Few have been extensively tested or validated
- Glanville, Kaunelis and Mensinkai research funded by CADTH
- Tested the performance of 13 MEDLINE filters and 8 EMBASE filters in two large sets of economic evaluations:
  - 1,957 MEDLINE records
  - 1,876 EMBASE records
Search filters for MEDLINE: highest sensitivity

<table>
<thead>
<tr>
<th>Filter</th>
<th>Filter abbreviation</th>
<th>Number of MEDLINE records identified</th>
<th>Number of gold standard records identified (out of 1,955 total records)</th>
<th>Sensitivity</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Quality Improvement Scotland Full</td>
<td>QISF</td>
<td>457,569</td>
<td>1,955</td>
<td>1.000</td>
<td>0.004</td>
</tr>
<tr>
<td>NHS Quality Improvement Scotland Brief</td>
<td>QISB</td>
<td>111,551</td>
<td>1,955</td>
<td>1.000</td>
<td>0.018</td>
</tr>
<tr>
<td>NHS EED</td>
<td>NHS</td>
<td>48,917</td>
<td>1,953</td>
<td>0.999</td>
<td>0.040</td>
</tr>
<tr>
<td>Royle and Waugh</td>
<td>RW</td>
<td>67,521</td>
<td>1,948</td>
<td>0.996</td>
<td>0.029</td>
</tr>
</tbody>
</table>
# Search filters for MEDLINE: best precision

<table>
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<tr>
<th>Filter</th>
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<th>Precision</th>
</tr>
</thead>
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<tr>
<td>MEDLINE G</td>
<td>MG</td>
<td>5,479</td>
<td>1,408</td>
<td>0.720</td>
<td>0.257</td>
</tr>
<tr>
<td>Sassi selective filter B</td>
<td>SASB</td>
<td>5,829</td>
<td>1,329</td>
<td>0.680</td>
<td>0.228</td>
</tr>
<tr>
<td>Sassi selective filter C</td>
<td>SASC</td>
<td>6,316</td>
<td>1,393</td>
<td>0.713</td>
<td>0.221</td>
</tr>
<tr>
<td>Wilczynski best specificity</td>
<td>WSPEC</td>
<td>8,907</td>
<td>1,375</td>
<td>0.703</td>
<td>0.154</td>
</tr>
<tr>
<td>Grady</td>
<td>GR</td>
<td>12,389</td>
<td>1,651</td>
<td>0.845</td>
<td>0.133</td>
</tr>
<tr>
<td>Sassi selective filter A</td>
<td>SASA</td>
<td>15,608</td>
<td>1,643</td>
<td>0.840</td>
<td>0.105</td>
</tr>
</tbody>
</table>
## Search filters for EMBASE: highest sensitivity

<table>
<thead>
<tr>
<th>Filter</th>
<th>Filter abbreviation</th>
<th>Number of EMBASE records identified</th>
<th>Number of gold standard records identified (out of 1,873 total records)</th>
<th>Sensitivity</th>
<th>Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHS Quality Improvement Scotland</td>
<td>QIS</td>
<td>109,684</td>
<td>1,872</td>
<td>1.000</td>
<td>0.017</td>
</tr>
<tr>
<td>CADTH</td>
<td>CADTH</td>
<td>124,167</td>
<td>1,871</td>
<td>0.999</td>
<td>0.015</td>
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<tr>
<td>NHS EED</td>
<td>NHS</td>
<td>65,207</td>
<td>1,868</td>
<td>0.997</td>
<td>0.029</td>
</tr>
<tr>
<td>Royle and Waugh</td>
<td>RW</td>
<td>85,778</td>
<td>1,868</td>
<td>0.997</td>
<td>0.022</td>
</tr>
</tbody>
</table>
## Search filters for EMBASE: best precision

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<th>Precision</th>
</tr>
</thead>
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<tr>
<td>EMBASE F</td>
<td>EF</td>
<td>2,162</td>
<td>1,067</td>
<td>0.570</td>
<td>0.494</td>
</tr>
<tr>
<td>EMBASE A</td>
<td>EA</td>
<td>3,553</td>
<td>1,028</td>
<td>0.549</td>
<td>0.289</td>
</tr>
<tr>
<td>EMBASE H</td>
<td>EH</td>
<td>5,047</td>
<td>1,341</td>
<td>0.716</td>
<td>0.266</td>
</tr>
<tr>
<td>McKinlay best specificity</td>
<td>MCKSPEC</td>
<td>4,946</td>
<td>1,174</td>
<td>0.627</td>
<td>0.237</td>
</tr>
<tr>
<td>NHS EED plus EMBASE G</td>
<td>NHSG</td>
<td>13,091</td>
<td>1,743</td>
<td>0.931</td>
<td>0.133</td>
</tr>
<tr>
<td>Royle and Waugh plus EMBASE G</td>
<td>RWG</td>
<td>13,330</td>
<td>1,743</td>
<td>0.931</td>
<td>0.131</td>
</tr>
<tr>
<td>NHS QIS plus EMBASE G</td>
<td>QISG</td>
<td>13,338</td>
<td>1,743</td>
<td>0.931</td>
<td>0.131</td>
</tr>
<tr>
<td>EMBASE G</td>
<td>EG</td>
<td>13,396</td>
<td>1,743</td>
<td>0.931</td>
<td>0.130</td>
</tr>
<tr>
<td>EMBASE B</td>
<td>EB</td>
<td>13,637</td>
<td>1,595</td>
<td>0.852</td>
<td>0.117</td>
</tr>
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Search filters research report

Glanville J, Fleetwood K, Yellowlees A, Kaunelis D, Mensinkai S. *Development and Testing of Search Filters to Identify Economic Evaluations in MEDLINE and EMBASE*. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2009.

Why is it so difficult to identify economic evaluations efficiently?

- Imprecision about and within the target records
  - lack of agreement on the definition of economic evaluations
  - authors of economic evaluations may not report their methods clearly
  - authors may describe their study methods incorrectly. Index terms for economic evaluations may not be consistently applied by indexers
  - economic evaluations which do not have the most appropriate indexing term
  - records with economic evaluation indexing terms which are not economic evaluations
  - ‘careless use’ of terminology – ‘an economic evaluation is warranted’
What next?

n Are low performing filters a problem?
   n If yes then we may need
      n Further investigations into search filter design
      n Exploration of different search filter approaches – e.g. poster on semantic text analysis at this conference
      n Other approaches?
   n If no, then what works?
Discussion points

- Do you use NHS EED and HEED routinely
  - As part of a search algorithm?
  - Relative values of the resources?
  - Overlaps?

- Do you use search filters?
  - Which ones and why?
  - What are your experiences of search filters?
  - Can one filter catch all? Do you have varying requirements?