Assessing the impact of searching fewer databases in rapid reviews

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Potential conflicts of interest

- This research was funded by Cochrane Austria.
- No other potential or actual conflicts of interest in relation to this presentation.
Decision making needs reliable evidence syntheses.
Systematic Reviews

• Most **reliable & valid** support for decision-making
• Synthesis of all evidence about a research question
• Systematic methods minimize bias
• Takes 6-12 months to complete

Rapid Reviews

• Based on systematic review methods: processes are accelerated and methods are streamlined
• Takes 5–12 weeks to complete
• **Reliability of conclusions?**
Research question

Do bodies of evidence that are based on abbreviated literature searches lead to different conclusions compared with those based on comprehensive, systematic literature searches?
METHODS
Sample selection

60 randomly selected Cochrane reviews

Main inclusion criteria

- Authors were able to draw a conclusion
- Summary of findings tables
- Reproducible Meta-analyses
- Used MEDLINE, EMBASE, and Central
14 search abbreviated search approaches compared to original comprehensive search

<table>
<thead>
<tr>
<th>Database coverage</th>
<th>MEDLINE</th>
<th>EMBASE</th>
<th>Central</th>
<th>MEDLINE + EMBASE</th>
<th>MEDLINE + Central</th>
<th>Central + EMBASE</th>
<th>MEDLINE + Central + EMBASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td># of included references indexed in a database</td>
<td># of included references cited in the review</td>
<td>x100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+ Search of reference lists of relevant publications

Database coverage: 
\[
\frac{\text{# of included references indexed in a database}}{\text{# of included references cited in the review}} \times 100
\]

Recall: 
\[
\frac{\text{# of included references retrieved by a search approach}}{\text{# of included references cited in the review}} \times 100
\]
Research Process

1. Run searches
2. Check partially found studies
3. Recalculate MA & create new SoF tables
4. Web-based survey Cochrane authors
5. Non-inferiority analysis
Non-inferiority analysis

Non-inferiority margin
(Wagner et al. 2017)
RESULTS
## Review characteristics

### Type of intervention

<table>
<thead>
<tr>
<th>Intervention Type</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacological (drugs, vaccines)</td>
<td>30 (50%)</td>
</tr>
<tr>
<td>Non-pharmacological (psychological, educational, dietary, physical exercise, complex interventions, screening, surgery, management strategies)</td>
<td>30 (50%)</td>
</tr>
</tbody>
</table>

### Study design of included studies

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCT only or RCT+quasi-RCT</td>
<td>53 (88%)</td>
</tr>
<tr>
<td>RCT+controlled clinical trial, before-after study or interrupted time series</td>
<td>7 (12%)</td>
</tr>
</tbody>
</table>

### Information sources

<table>
<thead>
<tr>
<th>Source Type</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medline, Embase, Central</td>
<td>60 (100%)</td>
</tr>
<tr>
<td>At least 2 other types of information sources</td>
<td>60 (100%)</td>
</tr>
<tr>
<td>Other bibliographic databases</td>
<td>56 (93%)</td>
</tr>
<tr>
<td>Grey literature and unpublished data</td>
<td>59 (98%)</td>
</tr>
<tr>
<td>Other sources (reference lists, citation tracking, handsearch)</td>
<td>56 (93%)</td>
</tr>
</tbody>
</table>
Database coverage

Were the included references indexed in any of the databases?

Median & interquartile range of database coverage (n=60)

Medline

Embase

Central

M+E

M+C

C+E

M+E+C

References indexed

M=Medline E=Embase C=Central

Median
Recall

Were the included references found by the search strategies?

Median & interquartile range of search strategy recall without/with added reference list checking (n=60)

M=Medline E=Embase C=Central R=Reference list checking
Impact on overall conclusion if

Discordant conclusion = any change in conclusion

• less certainty, but the same direction of conclusion
• opposite conclusion (= changed direction of conclusion)
• no conclusion possible
## Conclusions of abbreviated searches

<table>
<thead>
<tr>
<th>Conclusion does not change</th>
<th>M</th>
<th>M+R</th>
<th>E</th>
<th>E+R</th>
<th>C</th>
<th>C+R</th>
<th>M+E</th>
<th>M+E+R</th>
<th>M+C</th>
<th>M+C+R</th>
<th>C+E</th>
<th>C+E+R</th>
<th>M+C+E</th>
<th>M+C+E+R</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>50</td>
<td>44</td>
<td>49</td>
<td>47</td>
<td>47</td>
<td></td>
<td>50</td>
<td>53</td>
<td>53</td>
<td>50</td>
<td>54</td>
<td>52</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Same conclusion with less certainty</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Opposite conclusion</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Conclusion is no longer possible</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<td>3</td>
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<td>3</td>
</tr>
</tbody>
</table>

M=Medline  E=Embase  C=Central  R=Reference list checking
Any change in conclusion

Proportion of conclusions with any changes and 95% confidence interval for each search approach (without/with added reference list checking) (n=60)
Impact on overall conclusion if

Disconcordant conclusion

= Opposite conclusion only
Proportion of opposite conclusions and 95% confidence interval for each search approach (without/with reference list checking) (n=60)
Same conclusion, less certain • Opposite conclusion • No conclusion possible

Conclusion stays the same

References found (n=60)
Pharmacological vs non-pharma. reviews

- Proportion of "conclusions with any change" in reviews on non-pharmacological interventions (n= 30)
- Proportion of "conclusions with any change" in reviews on pharmacological interventions (n= 30)
Recall pharma. vs non-pharma reviews

Median recall of non-pharma. reviews (n=30)

Median recall of pharmacological reviews (n=30)

M=Medline  E=Embase  C=Central  R=Reference list checking
Conclusions depending on number of included studies

- Proportion of "conclusions with any change" in reviews including fewer than ten primary studies (n=22)
- Proportion of "conclusions with any change" in reviews including ten or more primary studies (n=38)
Recall: number of included studies

Median recall of reviews with fewer than ten included studies (n=22)

Median recall of reviews with ten or more included studies (n=38)

M=Medline E=Embase C=Central R=Reference list checking
DISCUSSION
Conclusion

• If decision-makers are willing to accept less certainty and a small risk for opposite conclusions, some abbreviated searches are viable options for rapid evidence syntheses.

• Decisions demanding high certainty require comprehensive searches.

• Impact of abbreviated searches depends on type of intervention, „size“ of the topic, and definition of „changed conclusion“
Discussion

Limitations:

- Central is only useful for RCTs
- External validity (raw database entries vs. real-life)
- Reference entries

Points for discussion:

Limiting the number of databases searched could be more suitable for rapid reviews of pharmacological interventions

⇒ Different streamlined methods for different intervention-types?
**More information**

**Study protocol:**

**Main analysis:**
Thank you to the authors of the Cochrane Reviews & our team

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Search specialists:
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