IDENTIFICATION OF HEALTH STATE UTILITY VALUES FOR HEALTH ECONOMIC MODELS: EMPIRICAL TESTING OF ALTERNATIVE SEARCH METHODS

AUTHORS

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Objectives

- The information needs of cost-effectiveness models are difficult to address using search methods that have been developed for systematic literature reviews (SLRs) of clinical effectiveness.

- The aim of this study is to compare the effectiveness of different search methods for identification of utility inputs for cost-effectiveness models through a case study in ulcerative colitis (UC).

Methods

- This analysis included a comparison of systematic review search methods (usual practice) with two alternative search methods; iterative searching and rapid review.

- The identified utility values were tested in an executable cost-effectiveness model developed for UC, and differences in efficiency of searching and identified inputs were compared between the search methods.

- Data identified were included in the cost-effectiveness model, and model results were compared.

- Table 1 summarizes the efficiency measure that were used to evaluate the search methods.

Table 1. Search efficiency measures

Measure	Description
Time & burden (quantitative)	• Time is measured in 5-minute increments on a tracking sheet to indicate the number of hours spent, reported as total time • Precision is calculated by dividing the total number of articles found with the number of true positives • Number needed to read (NNR) is defined as the number of irrelevant citations a reviewer must screen for each relevant citation found

Relevance (qualitative)	• Following considerations determine whether the study might be relevant for the health economic model:
	  ○ Were all known relevant citations identified, and were they all needed for modelling?
	  ○ If all known relevant citations were not identified, did it make any difference for modelling?
	  ○ If new relevant citations (that were not identified by usual practice search) were identified, did they make a difference for modelling?

Results

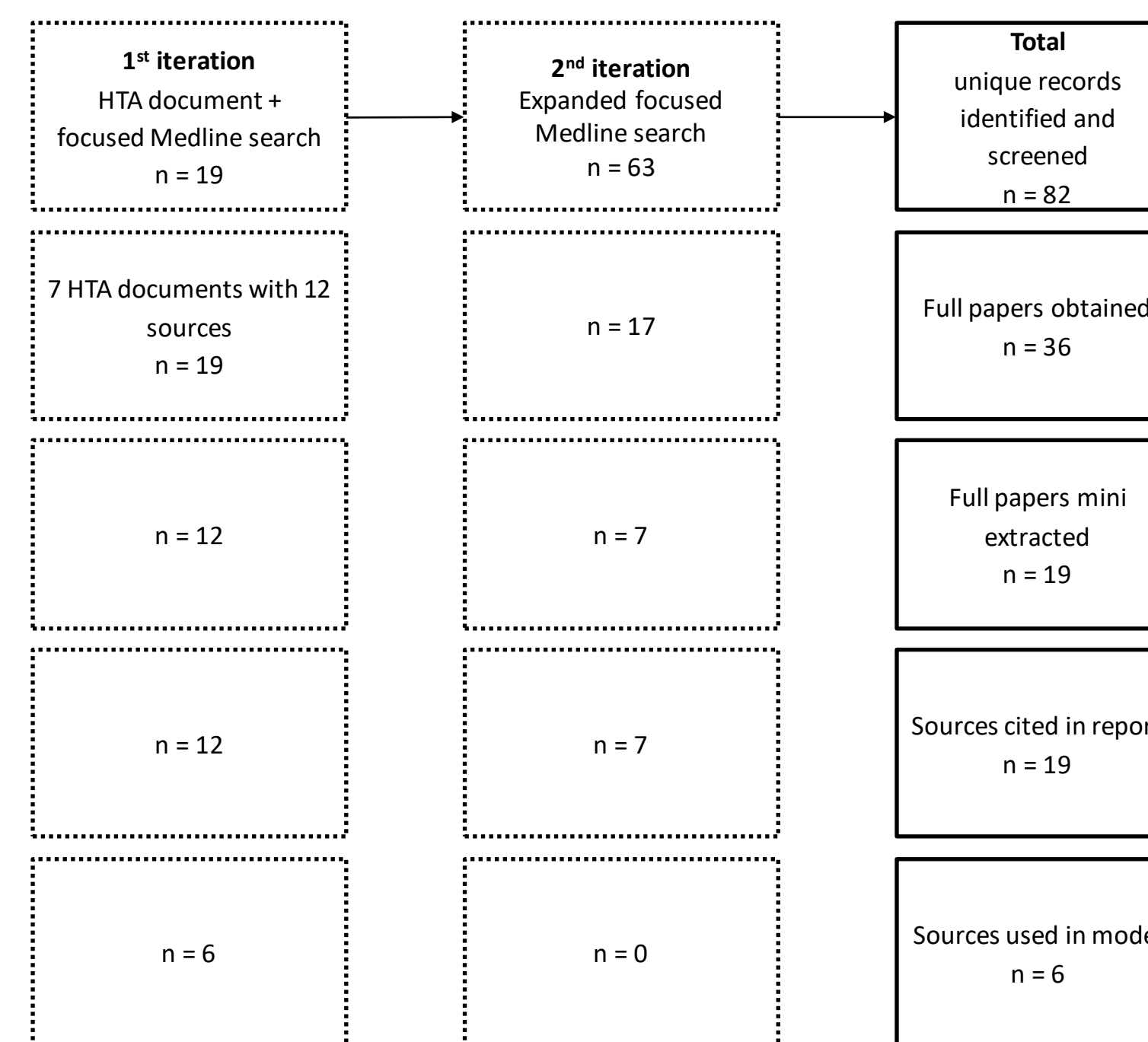- Usual practice search was comprehensive bibliographic database searching in several bibliographic databases.

Figure 1. Iterative search framework – Example

Bibliographic database search elements	
Sampling	Focused sampling in the words appearing in the title only
Type of studies	No limitation
Sources	MEDLINE (via ProQuest Dialog)
Limits	Time limit from January 2022 – present
Terms used	(ti(ulcerative colitis) OR ti(inflammatory bowel)) and (ti(health utility))
Conceptual limitations	No conceptual limit
Non-database search elements	
Approaches	NICE Technology Appraisal Guidance in UC were reviewed: https://www.nice.org.uk/guidance/conditions-and-diseases/digestive-tract-conditions/inflammatory-bowel-disease/products?GuidanceProgramme=TA
Source names	Upadacitinib: https://www.nice.org.uk/guidance/ta856 Ozanimod: https://www.nice.org.uk/guidance/ta828 Filgotinib: https://www.nice.org.uk/guidance/ta792 Ustekinumab: https://www.nice.org.uk/guidance/ta633 Tofacitinib: https://www.nice.org.uk/guidance/ta547 Vedolizumab: https://www.nice.org.uk/guidance/ta342 Infliximab, adalimumab, golimumab: https://www.nice.org.uk/guidance/ta329
Search dates	30 January – 9 February 2023
Limits	Past 10 years (January 2013 – January 2023)

Results

- Iterative search was run for two iterations. The first iteration was focused on health technology assessments and second was a bibliographic database search.

- Figure 1 shows the iterative search framework that was used to transparently record all the alternative searches. It is populated for iterative search (iteration 1) as an example. Figure 2 shows results from iterations 1 and 2.

Figure 2. Iterative search results for two iterations

- Rapid review was a targeted search only in one database (Medline), with restricted synonyms and limiting parts of the search to abstract only (Total n=129).

- The usual practice SLR method identified the most publications for consideration to be used in the model; 28 versus 19 and 11 from iterative searching and rapid review, respectively.

Results

- The number of publications finally used in the model was similar across the search methods.

- The SLR was found to be the least precise search method, with precision of 5% compared to 23% and 9% for iterative and rapid review methods, respectively.

- The time required to develop the search strategy, run searches and review the publications, was considerably longer for the SLR than for the two alternatives; 1440 minutes versus 380 and 440 minutes for iterative and rapid review, respectively.

- Table 2 summarizes the results from all the search methods.

- No significant differences were observed in the model results between the data identified through the different search methods.

Table 2. Summary of search efficiency results

Search Method	Number of items to select	Studies		Precision%		NNR		Time
		Report	Model	Report	Model	Report	Model	In mins
Usual Practice search	562	28	6	5	1	20	94	1,440
Iterative search	82	19	6	23	7	4	14	380
Rapid review	129	11	2	9	2	12	65	440

Conclusion

- While the SLR method identified the most publications, the alternative search methods were more efficient (more precise and took less time), without changing the economic conclusions generated from the cost-effectiveness model.