Systematic Searching

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Zuverlässige Evidenz.
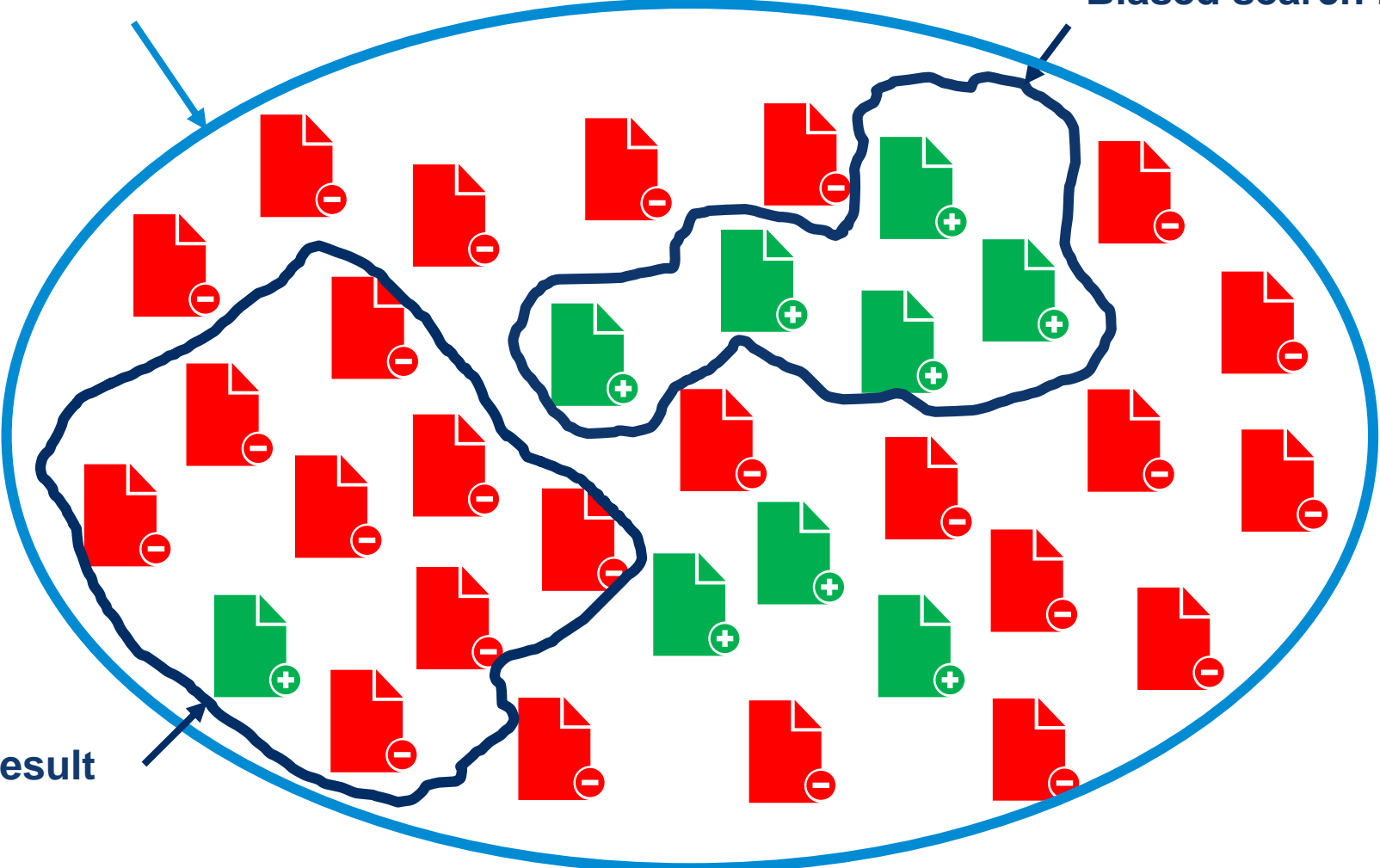
Informierte Entscheidungen.

Bessere Gesundheit.

Sensitive systematic literature searches

are the foundation of systematic reviews and health technology assessments

Goal: finding all the studies

Methodological Expectations of Cochrane Intervention Reviews (MECIR)

C19	**Planning the search**
	Plan in advance the methods to be used for identifying studies. Design searches to capture as many studies as possible that meet the eligibility criteria, ensuring that relevant time periods and sources are covered and not restricted by language or publication status.
C24	**Searching general bibliographic databases and CENTRAL**
	Search the Cochrane Review Group's (CRG's) Specialized Register (internally, e.g. via the Cochrane Register of Studies, or externally via CENTRAL). Ensure that CENTRAL, MEDLINE (e.g. via PubMed) and Embase (if Embase is available to either the CRG or the review author), have been searched (either for the review or for the Review Group's Specialized Register).
C25	**Searching specialist bibliographic databases**
	Search appropriate national, regional and subject-specific bibliographic databases.
C26	**Searching for different types of evidence**
	If the review has specific eligibility criteria around study design to address adverse effects, economic issues or qualitative research questions, undertake searches to address them.
C27	**Searching trials registers**
	Search trials registers and repositories of results, where relevant to the topic, through ClinicalTrials.gov, the WHO International Clinical Trials Registry Platform (ICTRP) portal and other sources as appropriate.
C28	**Searching for grey literature**
	Search relevant grey literature sources such as reports, dissertations, theses, databases and databases of conference abstracts.
C29	**Searching within other reviews**
	Search within previous reviews on the same topic.
C30	**Searching reference lists**
	Check reference lists in included studies and any relevant systematic reviews identified.
C31	**Searching by contacting relevant individuals and organizations**
	Contact relevant individuals and organizations for information about unpublished or ongoing studies.
C32	**Structuring search strategies for bibliographic databases**
	Inform the structure of search strategies in bibliographic databases around the main concepts of the review, using appropriate elements from PICO and study design. In structuring the search, maximize sensitivity whilst striving for reasonable precision. Ensure correct use of the 'AND' and 'OR' operators.
C33	**Developing search strategies for bibliographic databases**
	Identify appropriate controlled vocabulary (e.g. MeSH, Emtree, including 'exploded' terms) and free-text terms (considering, for example, spelling variants, synonyms, acronyms, truncation and proximity operators).
C34	**Using search filters**
	Use specially designed and tested search filters where appropriate including the Cochrane Highly Sensitive Search Strategies for identifying randomized trials in MEDLINE, but do not use filters in pre-filtered databases e.g. do not use a randomized trial filter in CENTRAL or a systematic review filter in DARE.
C35	**Restricting database searches**
	Justify the use of any restrictions in the search strategy on publication date and publication format.

How do we get there?

EUnetHTA recommendations

1. **Information specialists** should form an integral part of the project team of a systematic review from the beginning of the project.

2. A systematic review should regularly include a **search for unpublished literature** to identify both unpublished studies, and unpublished data from published studies.

3. Besides MEDLINE, other **bibliographic databases** such as Embase and CENTRAL should be searched to identify all published relevant studies on the topic of interest.

4. Individual search strategies must be **developed for selected databases** using both free-text terms and, if available, subject headings.

Conduct of the search

5. Search strategies should undergo **peer reviewing** to ensure high-quality search strategies.

6. The search process should be **documented** in real time and **reported** in a transparent manner.

Documentation

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Systematic search process

1. Preparation

2. Database searching

3. Supplementary searching

4. Documentation & Reporting

1. Preparation

Planning a systematic search

Information sources   **Search terms**   **Search strategy**

Builder

| Title/Abstr ⌄ | refugee* OR asylum | ⊖ | Show index list |
| OR ⌄ | MeSH Ter ⌄ | refugee | ⊖ ⊕ | Show index list |

Search or Add to history

PubMed Advanced Search Builder (https://www.ncbi.nlm.nih.gov/pubmed/advanced)

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2. Database searching

At least 2 bibliographic databases

2. Database searching

Transparent & reproducible

Boolean Operators	Subject headings

**AND
OR
NOT**

Manchester City Library (CC BY-SA 2.0)

3. Supplementary searching

Find additional documents & unpublished data

Hand search | **Reference lists** | **Study registers** | **Experts** | **Websites**

NIH U.S. National Library of Medicine

ClinicalTrials.gov

References

[1] Ganann R, Ciliska D, Thomas H. Expediting systematic reviews: methods and implications of rapid reviews. Implement Sci 2010; 5:56.

[2] Hartling LG, Guise J-M, Kato E, Anderson J, Aronson N, Belinson S, et al. EPC Methods: An Exploration of Methods and Context for the Production of Rapid Reviews. Portland, Oregon: AHRQ Agency for Healthcare Research and Quality: Scientific Resource Center; 2015.

[3] Reynen E, Robson R, Ivory J, Hwee J, Straus SE, Pham B, et al. A retrospective comparison of systematic reviews with same-topic rapid reviews. J Clin Epidemiol 2018;96:23−34.

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4. Documentation & Reporting

PRISMA

Information sources	7	**Describe all information sources** (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and **date last searched**.
Search	8	Present **full electronic search strategy for at least one database**, including any limits used, such that it could be repeated.

(Moher, Liberati et al. 2009)

4. Documentation & Reporting

Methods section: Summary of all search methods

Literature search strategy

We conducted a systematic literature search of Ovid MEDLINE, PsycINFO (via Ebsco), CINAHL (The Cumulative Index to Nursing and Allied Health Literature, via Ebsco), PubMed (for non-MEDLINE content) and Scopus for the period from January, 1st 1990 to October, 17th 2017. An experienced information specialist developed a search strategy using a combination of different MeSH (Medical subject headings) terms and variations of free-text key words (consisting of search terms for 'refugees' AND 'minors' AND 'mental disorders' AND 'Europe'). We did not limit the search to any specific languages. The search strategy was developed in Ovid MEDLINE and adapted for the other databases. The detailed search strategy, which we tested using known relevant articles, is available in Additional Material 1. Additionally, we complemented electronic searches by checking reference lists of pertinent review articles and using forward citation tracking of key articles in the field. We further conducted grey literature searches considering government surveillance data, reports from World Health Organization (WHO), United Nations High Commissioner for Refugees (UNHCR), the European Council on Refugees and Exiles (ECRE) and Médecins Sans Frontières (MSF).

(Kien, Sommer et al. 2019)

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4. Documentation & Reporting

Appendix: At least 1 database search strategy

Additional Material 1: Search Strategy

Ovid MEDLINE(R) 1946 to October Week 1 2017,
Ovid MEDLINE(R) Epub Ahead of Print October 13, 2017,
Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations October 13, 2017,
Ovid MEDLINE(R) Daily Update October 13, 2017

#	Search	Hints
1	exp Refugees/	8752
2	refugee*.ti,ab,kf.	8763
3	asylum.ti,ab,kf.	2805
4	displaced.ti.	4027
5	displaced person*.ab,kf.	480
6	(forced adj (migra* or displace* or immigra*)).ti,ab,kf.	308
7	or/1-6	17181
8	psychology.fs.	961891
9	exp Mental Health/	31270
10	exp Mental Disorders/	1169106
11	exp Stress, Psychological/	117967

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Information Specialists / Librarians

Tasks & time requirements of IS/librarians in the systematic search process:

- Span the whole review process: protocol → writing phase

- Median time requirement 18.5 hours per review, but large variance

- Time spent can depend on librarian experience, but also review topic

(Bullers, Howard et al. 2018)

Information specialists/librarians

- Many systematic reviews do not involve information specialists

- But their participation in the review process…

  - Increases adherence to search guidance

  - Improves search strategy quality

  - Improves search process reporting (e.g. PRISMA compliance)

(Koffel 2015, Rethlefsen, Farrell et al. 2015, Meert, Torabi et al. 2016)
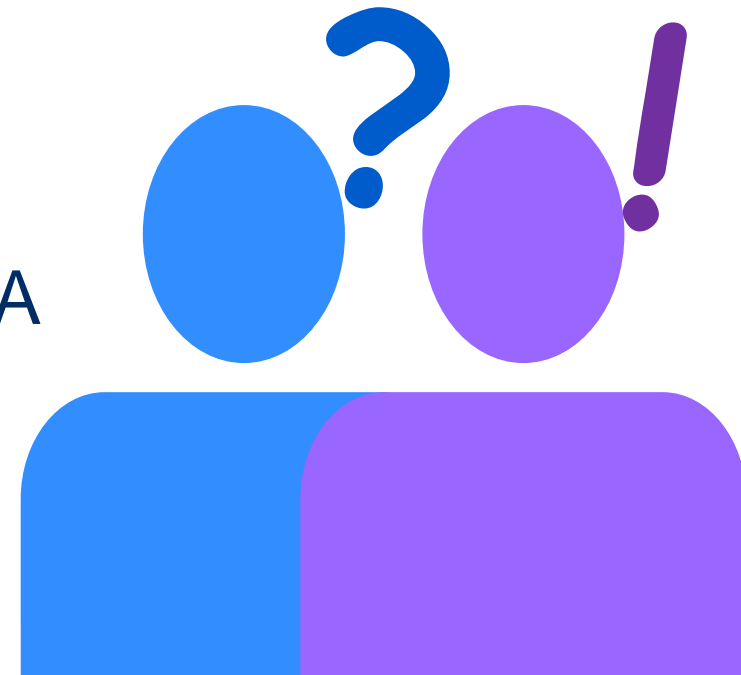
Quality assurance & Peer review

- <u>Feedback</u>: PRESS (Peer Review of Electronic Search Strategies) checklist

- <u>Test references</u>: Check if search strategy finds known relevant studies

- <u>Reporting</u>: Check search process is reported correctly (e.g. PRISMA compliant)

Preparation-Phase

Before completing the review
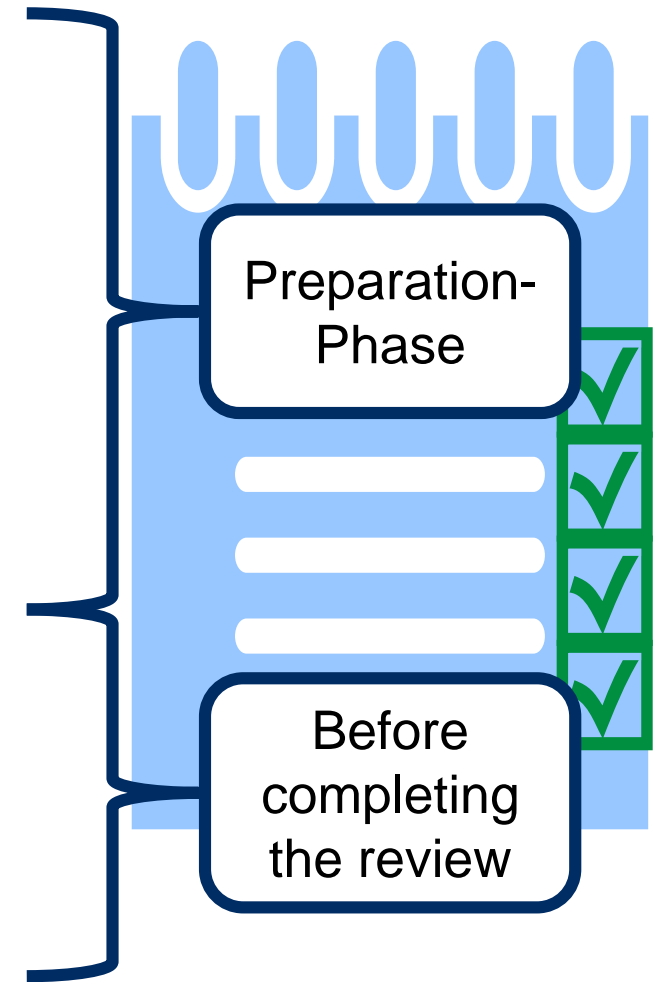
Why is it necessary?

- 30% of 238 systematic reviews that claimed to be PRISMA compliant did not report all information sources and a full search strategy.

- 78.1% of 137 systematic reviews published in January 2018 had errors in their Medline/PubMed search that affected sensitivity.

- 53% of 59 Cochrane reviews published in 2015 had errors in their Medline/PubMed search that affected sensitivity or precision.

(Franco, Garrote et al. 2018, de Kock, Ross et al. 2019, Salvador-Olivan, Marco-Cuenca et al. 2019)

Take home messages

- Evaluate the search process of reviews you read.

- When conducting a systematic review, get expert help…

- …and implement quality assurance measures.

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