Systematic reviews & evidence syntheses

Searching for studies
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Plan for today

• Take you through the theory underpinning the search process
• From question formulation to documenting your search
• For practical help
• Contact your outreach librarian
What is a systematic review? (1)

A systematic review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question.

https://www.cochranelibrary.com/about/about-cochrane-reviews
What is a systematic review? (2)

Researchers conducting systematic reviews use explicit, systematic methods that are selected with a view aimed at minimizing bias, to produce more reliable findings to inform decision making.

https://www.cochranelibrary.com/about/about-cochrane-reviews
Systematic review  V  Literature review

1. Registered protocol 1. No protocol
2. Focused question 2. General question
3. Full report of search strategy 3. Brief report of search keywords
4. Searches across multiple databases 4. Searches of 1 or 2 sources
5. Includes grey literature 5. Includes known literature
6. Pre-specified inclusion/exclusion criteria 6. No criteria for inclusion/exclusion
7. Risk of bias assessment 7. No quality assessment
Do you need to do a systematic review?

- Would a literature review with a systematic approach to searching be sufficient?
- Make sure you choose the **Right Review** for your question?
Types of systematic review

• Systematic review of:
  • Intervention studies, diagnostic studies, prognostic studies, qualitative studies, economic evaluations, IPD...
• Mixed methods & realist reviews
• Rapid reviews
• Scoping reviews & systematic maps
• Living reviews
• Systematic overviews
Common search methods

- Formulate a question
- Identify existing reviews
- Develop a search strategy
- Run the search across multiple databases
- Use additional search methods to identify unpublished “grey” literature
- Manage & screen results
- Document the search
Formulating a search question (1)

- **PICO** = Population, intervention, control, outcome
- **PICOS** = Population, intervention, control, outcome, study type
- **PECO** = Population, exposure, control, outcome
- **PIRT** = Population, index test, reference test, target condition
- **SPIDER** = sample, phenomenon of interest, design, evaluation, research type
Formulating a search question (2)

Delayed antibiotic prescriptions for respiratory infections

- **P =**
- **I =**
- **C =**
- **O =**
Delayed antibiotic prescriptions for respiratory infections

- **P** = Respiratory infections
- **I** = Delayed antibiotic prescription
- **C** = Immediate or no prescription
- **O** = Symptom resolution, side effects, hospitalisations, costs...
Formulating a search question (4)

Delayed antibiotic prescriptions for respiratory infections

- **P** = Respiratory infections
- **I** = Delayed antibiotic prescription
- **C** = Immediate or no prescription
- **O** = symptom alleviation, side effects, costs...

Key search criteria in **BOLD**
Identifying existing reviews

• Ongoing reviews
  • PROSPERO

• Reviews published in journals
  • Search PubMed and limit to systematic reviews

• Reviews from regional or national health care organisations
  • TRIPdatabase
Developing a protocol – PRISMA-P

• Once you’ve decided to pursue your own systematic review, start a protocol
  • Helps with developing the search
  • Identifies what you need to do at each stage of the process
  • Makes the review easier to publish
Registering a protocol

Where to deposit your protocol?

- **PROSPERO**
- Publish in a journal which accepts protocols
- Preprint archive (e.g. medRxiv) or open science repository (e.g. OSF)
Developing a search strategy

• Identify keywords
• Find subject headings
• Apply search filters [Hedges] for study type (if appropriate)
• Combine the search strings
• Weigh up whether to apply limits to your search...bias
Editing & finalising the search

• Test the search
  • Does it capture key papers?
  • Are there too many irrelevant papers?
• Share your search strategy with colleagues or a librarian
  • Ask for comments on coverage, relevance, accuracy...
• Review & finalise – iterative process
1. Exp Respiratory Tract Infections
2. (respiratory infection* or respiratory tract infection* or urti or lrti).mp.
3. (sinusitis or otitis media or tonsillitis or sore throat or common cold or influenza or bronchitis or pneumonia or chest infection*).ti,ab,kw.
4. Or/1-3
5. Exp Anti-Bacterial Agents/
6. (antibiotic* or anti-biotic*).ti,ab,kw.
7. 5 or 6
8. (delay* adj15 prescri*).ti,ab,kw.
9. 4 and 7 and 8
Searching across multiple databases (1)

• Choose which databases to search
• Adapt the search for each database – use **Polyglot**
• Export the results into reference management or review management software
Searching across multiple databases (3)

- **ASSIA** – social care & social work
- **CAB Abstracts** – agriculture, environment & nutrition
- **Cochrane Library** – systematic reviews & trials
- **CINAHL** – nursing & allied health
- **Embase** – health & medicine
- **Global Health** – population health
- **Medline** – health & medicine
- **PEDRO** – physiotherapy
- **PsycINFO** – psychiatry & psychology
- **Science Citation Index** – science
- **Scopus** – multidisciplinary

[Database A-Z list via SOLO]
Searching for grey literature (1)

- Conference abstracts
- Theses
- Study protocols
- Preprints
- Official documents – reports, statistics, case studies...
- Organisational reports
Searching for grey literature (2)

- Forward & backward citation tracking
- Related articles linking
- Hand-searching conference reports & journals
- Searching trial registers
- Searching preprint archives
- Web searching
- Contacting authors, experts & organisations
Managing your results

• **Reference management** software is essential
• Endnote, Refworks, Zotero...
• De-duplicating results
• Screening
• Locating & storing PDFs
• Writing up your review
Review management software (1)

- A gold standard systematic review is conducted by a team:
  - Double screening
  - Double data extraction
  - Double quality assessment

- You can use a combination of reference management, ExCel, Word...
- Review management software makes this easier
Review management software (2)

• Things to consider:
  • Ease of use
  • Cost - Free, one off payment, subscription...
  • Compatibility with other software & devices
  • User support

• Examples of software:
  • Covidence, EPPI-Reviewer, Rayyan
Document your search – **PRISMA-S**

You need to record:

- Databases searched
- Search terms used
- Date of last search
- Additional search methods used
- Total number of references retrieved
- Number of duplicates excluded
- Number of references excluded at Title/Abstract and Full-text stage
- Final number included in analysis
• Include a summary of the search methods in the body of your review
• Include the numbers in a flow chart
• Include a full copy of the exact search strategies for all databases in an appendix
WHEN WILL IT END?