Search Methods for Systematic and Scoping Reviews

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## Agenda

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Objectives

- Describe the **stages** in a systematic/scoping review
- Be aware of **guidelines** for creating a systematic review
- Develop a **question** suitable for a systematic review
- Know which **sources** you need to use for your systematic review
- Acquire **skills** to conduct a structured and replicable search strategy
- Learn about **tools** such as citation management software for managing the process
"A Systematic Review attempts to identify, appraise and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a given research question. Researchers conducting Systematic Reviews use explicit methods aimed at minimizing bias, in order to produce more reliable findings that can be used to inform decision making."

From the Cochrane Handbook for Systematic Reviews of Interventions: http://handbook.cochrane.org
Scoping reviews and other synthesis methods

- **Scoping reviews** map the literature on a research question. Often have a broader research question than systematic reviews, and might not appraise the quality of included studies. Conducting a scoping review uses many of the same methods as a systematic review.

- A **meta-analysis** pools and analyzes data from included studies. It may or may not include a systematic review component.

- There are many other types of reviews. One useful resource: [www.cihr-irsc.gc.ca/e/36331.html](http://www.cihr-irsc.gc.ca/e/36331.html)
## Literature Reviews vs Systematic Reviews

<table>
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<tr>
<th>Literature review</th>
<th>Systematic review</th>
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<tr>
<td>● Self selected topic of interest</td>
<td>● Answers defined, focused question</td>
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<tr>
<td>● Summary of what is known</td>
<td>● Critical appraisal and analysis</td>
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<tr>
<td>● Lacks description of process</td>
<td>● Explicit and accountable methods</td>
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<tr>
<td>● No criteria for why studies were included</td>
<td>● Replicable and updatable</td>
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<tr>
<td>● Secondary research</td>
<td>● Primary research</td>
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Guidelines for systematic and scoping reviews

The PRISMA checklists for systematic and scoping reviews outline what should be reported in a published review:

- [www.equator-network.org/reporting-guidelines/prisma/](www.equator-network.org/reporting-guidelines/prisma/)

More detailed guidance is available from several organizations:

- For health sciences systematic reviews of interventions: [training.cochrane.org/handbook](training.cochrane.org/handbook)
- For social sciences systematic reviews: [campbellcollaboration.org/research-resources/](campbellcollaboration.org/research-resources/)
- For scoping reviews: [wiki.joannabriggs.org/display/MANUAL/Chapter+11%3A+Scoping+reviews](wiki.joannabriggs.org/display/MANUAL/Chapter+11%3A+Scoping+reviews)
Systematic and scoping review process
(adapted from Cochrane Handbook)

Stage 1: Planning the Review
1. Forming a review team
2. Initial exploratory searches and question development
3. Developing a protocol

Stage 2: Identifying and evaluating studies
4. Conducting a systematic search
5. Screening studies

Stage 3: Extracting and synthesizing data
6. Conducting data extraction
7. Conducting data synthesis

Stage 4: Reporting
8. Reporting the findings
PART 2: HOW TO STRUCTURE A SEARCH STRATEGY
Defining your research question

Taking time to clearly define your research question at the beginning of your review process will:

- Help inform a decision based on the answer
- Clarify inclusion/exclusion criteria
- Develop a well-constructed, efficient yet comprehensive, search
Conceptual frameworks help

- Clarify the search topic
- Identify the main concepts
- Develop a range of possible search terms for each concept
- Build a search strategy based on the possible search terms

One framework is PICO
Another is PCC
Others: SPICE, PESICO, SPIDER, ECLIPSE, etc.
Patient / Problem / Population

Intervention / Item of interest

Comparison

Outcome

May be phrased as:
Among P does I (versus C) affect O?
Example

What treatments or counselling are effective in preventing or managing depression in people experiencing recurrent pregnancy loss?
Among people with recurrent pregnancy loss, does counselling or self help improve prevention or management of depression?
It is often not helpful to search for every aspect of the research question. Instead, start your search with:

- P and I, or I and O elements
- You might also add study design terms, if you are limiting to specific types of study in your eligibility criteria.

Not all questions fit the PICO framework. Whatever your research question is, it’s important to identify its 2 or 3 main concepts to guide your database search.
Activity – 5 minutes

What is YOUR question?

Use the PICO or Articles and Databases worksheet to identify the different elements of your question.
PART 3: STARTING YOUR SEARCH
Before you start your review, you’ll want to find out if there are any existing or in-progress systematic reviews. Check:

Health sciences:
- Epistemonikos (published reviews) [www.epistemonikos.org/](http://www.epistemonikos.org/)
- Prospero (protocols for in-progress reviews) [www.crd.York.ac.uk/PROSPERO](http://www.crd.York.ac.uk/PROSPERO)

Other disciplines:
- Google Scholar search for topic with limit to intitle:systematic intitle:review (or scoping review, or review protocol)
- Database search with publication type limit “review” or “systematic review”
Activity: searching for reviews and protocols
- 5 minutes

For health sciences topics:
Search for your topic in:
● www.epistemonikos.org/
● www.crd.York.ac.uk/PROSPERO

For other topics:
● Check Google Scholar with topic terms and intitle:systematic review or intitle:scoping review
● Add the word protocol to find reviews in progress
PubMed, MEDLINE, and Ovid MEDLINE

Ovid MEDLINE includes all the content of PubMed, with a one-day delay - not just MEDLINE articles.

MeSH and keyword searching

**MeSH terms** (Medical Subject Headings) are tags added to articles to describe their content. A MeSH term brings together articles on a topic.

**Keyword** or **free text** searching looks for an exact match for the words you type in. This is important to find recently published articles and new concepts which won’t be found with MeSH.

For a systematic review, combine MeSH and keywords for each of your concepts with OR.

For an overview of searching Ovid MEDLINE, please see these videos: [guides.library.ubc.ca/medline]
Keyword search tools

Because you’re searching for an exact match for the words you type in, it’s important to use a variety of synonyms when searching by keyword. Tools you can use in Ovid MEDLINE to expand your keyword search include:

**Truncation**: find different word endings
Example: forest* will find forest, forester, forestry, forested

**Wildcards**: replace 0-1 characters within a word
Example: p?ediatric will find paediatric or pediatric

**Proximity/Adjacency**: search for words within a specified range
Example: occupation* adj3 health will find these two words within 3 words of each other, in either order, so results would include:
- occupational health
- health impacts of occupational exposures
- occupational and environmental health
Building your search strategy

Think about:

- Alternate spellings – analyze/analyse, fetus/foetus
- Alternate endings – learner/learns/learning
- Synonyms – doctor/physician/clinician
- Trade names/generics – iClicker/audience response system
- Acronyms – task-based learning or TBL
- Antonyms – success/failure, increase/decrease
- Homonyms – same word – different meanings, eg:
  - Patient educators (patients who educate doctors)
  - Patient educators (people who educate patients)
Combining concepts (Boolean logic)

Example: In undergraduate education, does the use of classroom response technology improve learning outcomes?

Use **OR** to create a large set of synonyms

Use **AND** to find articles containing all three of your concepts

Use **NOT** to remove a known undesired concept or set - avoid for systematic reviews.

**OR** = More (undergraduates OR college students OR postsecondary students)

**AND** = Less (classroom response AND learning)
Improved Educational Outcomes
OR
Learning Outcomes

Set 1
OR
Clickers
Electronic voting systems

Audience response systems

Set 2
OR
Undergraduates
College students
Postsecondary students

Set 3

OR = More (clickers OR electronic voting systems)
AND = Less (clickers AND learning outcomes)

Limits in Ovid MEDLINE

Ovid MEDLINE offers several limits to refine search results - age groups, human, publication dates, publication types, languages, and more. However, for systematic review searching, using these limits may exclude relevant articles.

Talk with your librarian about ways to limit the number of search results, if needed. **Search filters** may be available to narrow your search down to particular populations or study designs.
PART 4: SEARCHING OTHER SOURCES AND PREPARING FOR PUBLICATION
Sources for systematic and scoping review searching

It’s essential to search more than one database for a systematic or scoping review. Check the research guide for your subject and talk with your librarian for more database suggestions:
guides.library.ubc.ca

Beyond bibliographic databases, you may also search for unpublished or grey literature. Sources and techniques for searching the grey literature can be found at:
guides.library.ubc.ca/greylitforhealth

In addition to searching Google, Google Scholar, or individual websites for grey literature, you might make use of supplemental techniques such as:
● looking through reference lists of relevant articles
● searching for articles which cite relevant articles
● reaching out to experts in a field
Database results from Ovid MEDLINE, Web of Science, or other replicable sources can be reported in the first box of your PRISMA flow diagram. Results from Google Scholar, reference list searching, or other non-replicable sources can be reported in the “additional records” box.
Reporting your search

The Centre for Reviews and Dissemination’s Systematic Reviews: Guidance for Undertaking Reviews in Health Care has useful examples for describing your literature search in your review:

- Appendix 2 for search strategy examples
- Appendix 3 for documenting the search
Example methods section: databases

Search methods for identification of studies

Electronic searches

We searched the following electronic databases:
Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library). Searched 18 February 2011.
LILACS. Searched 21 February 2011.
POPLINE. Searched 21 February 2011.
Science Citation Index (1970 to 19 February 2011). Searched 21 February 2011.
metaRegister of Clinical Trials. Searched 23 February 2011.
The search strategies for each database are in Appendix 1.
We did not apply any data or language restrictions, and no translation of relevant data was necessary.
Example methods section: grey literature

Searching other resources
We searched through the bibliographies of included studies and asked authors of included studies for lists of other studies that should be considered for inclusion. For assistance in identifying ongoing or unpublished studies, on 25 January 2011, we contacted the Sprinkles Global Health Initiatives, the Home Fortification Technical Advisory Group, the nutrition section of the United Nations Children’s Fund (UNICEF), the World Food Programme (WFP), the Micronutrient Initiative (MI), the Global Alliance for Improved Nutrition (GAIN), Helen Keller International (HKI), Sight and Life Foundation, the Departments of Nutrition for Health and Development from the World Health Organization (WHO) and the U.S. Centres for Disease Control and Prevention (CDC).

The International Clinical Trials Registry Platform (ICTRP) was also searched for any ongoing or planned trials (24 January 2011). We did not apply any language restrictions.
Tools for managing references and screening

- Create a table in Excel or Word to keep track of search terms you’ve tried in different databases.
- Most databases allow you to save your search history and set up alerts for new results.
- Use citation management software such as RefWorks, Mendeley, or EndNote to store and deduplicate your results.
- You can export results to Excel for screening, or to custom screening tools such as Covidence or Rayyan. You may also screen within RefWorks or other tools using folders.
Librarian support for systematic and scoping reviews

UBC Librarians may be available to assist with systematic review searches:

• For review of search strategies
• As team members (as required by some granting agencies)
• As authors of the methodology section