Exercises

# Chapter 5: Searching the literature

## Exercise 5.1: A case study of the search process

Box 5.4 details methods of identifying literature for a systematic review on housing interventions for ‘housing-vulnerable’ adults and the relation to wellbeing (Chambers et al., 2018). The team retrieved 4540 unique references. Consider their approach and answer these questions:

1. How do you rate this search in terms of the number and types of sources searched? Is this adequate?

This is a broad review looking at multiple vulnerable populations and types of intervention. Searches cover multiple databases covering the health and social sciences, plus websites for grey literature. After a pilot search found very few papers, the authors have taken the sensible decision not to include terms relating to their outcome of interest (well-being) and to run a broad search for their populations and interventions of interest. This may explain the large number of references they have retrieved; however, clearly defined eligibility criteria applied during the study selection process should ensure a manageable number of included papers. Supplementary methods such as citation searching and expert advice mitigate any risk of missing relevant studies.

2. What disadvantages are there in the author’s search approach?

Searching multiple databases is time-consuming, and when the search strategy is broad, as in this example, the search can retrieve very large numbers of results. This will increase the time needed to spend on the next stage of your review (study selection). However, it is difficult to see how this could be avoided without narrowing the scope of the review question. Sometimes a broad search is inevitable when the studies in which you are interested display considerable heterogeneity.

3. What aspects of the search process in the case study might be applied to your own review?

Think about:

∙ How the disciplines covered by each of the databases searched in the case study may be relevant or irrelevant to your own topic.

∙ Which techniques might be most important to your question. For example, if studies in your topic generally have poor abstracts or are inconsistently indexed in electronic databases, you might want to focus on spending more time using other techniques such as contacting experts or citation searching, rather than searching every database that may have some relevance for your review.

## Exercise 5.2: Examining search strategies

These sample search strings cover diverse topics and database platforms. Look at each in turn, and consider:

∙ How would you rate the search? Have the concepts of the research question (population, intervention/exposure, outcome(s), etc.) been successfully translated into search terms? Are there any other search terms that you might have included?

∙ What types of searching (thesaurus searching, **free-text** searching) have been used and are these appropriate?

∙ Which search tools have been used (Boolean operators, truncation, etc.)? Have these tools been used successfully?

### Research question A – Electricity pylons and schools

Is the location of schools near electromagnetic fields from electricity pylons liable to have adverse health effects on schoolchildren?

####  Suggested Search Strategy for MEDLINE via OvidSP

1. exp Schools/

2. school\*.ti,ab.

3. 1 or 2

4. location\*.ti,ab.

5. near.ti,ab.

6. next to.ti,ab.

7. adjacen\*.ti,ab.

8. proximity.ti,ab.

9. 4 or 5 or 6 or 7 or 8

10. 3 and 9

11. exp Electromagnetic Fields/

12. electromagnetic\* field\*.ti,ab.

13. 11 or 12

14. 10 and 13

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Response:

Note that the outcome (‘adverse health effects’) was not included – this was because using the population (school children) and exposure (electromagnetic fields) and the context of school location was focused enough. This search makes use of both subject searching and free-text searching. Note that there are several synonyms used for the ‘location’ concept.

∙ This search uses Boolean logic successfully, by combining terms relating to the same concept (e.g., synonyms) with OR and then the totals for different concepts (e.g., population and intervention terms) with AND. Truncation (\*) has been used where appropriate.

###  Research question B – ICT interventions to facilitate maths problem-solving

Do information and communications technology (ICT) interventions improve primary schoolchildren’s performance in solving maths problems?

#### Suggested Search Strategy for ERIC via EBSCO

S1 DE "Elementary Schools"

S2 primary school\*

S3 DE "Children"

S4 child\* or infant\* or junior\*

S5 S1 OR S2 OR S3 OR S4

S6 (DE "Problem Solving")

S7 DE "Information Technology"

S8 ICT or "I.T." or information technolog\* or ("information and communication\* technolog\*" or computer\* or tablet or iPad\* or hand-held device\*)

S9 S7 OR S8

S10 DE "Mathematics Achievement" OR DE "Mathematics Skills"

S11 math or maths or mathematics or numeracy

S12 S10 or S11

S13 S5 AND S6 AND S9 AND S12

### Response:

This search strategy utilises thesaurus terms (DE = descriptor) and free text terms for each concept (e.g., the population of primary school children, the intervention of ICT in maths, and the outcome of problem-solving). Again, appropriate synonyms are used – particularly note the different terminology to describe the population and the use of acronyms and full definition regarding ICT.

###  Research question C – the benefits of solar-powered travel

Is the provision of solar-powered cars likely to result in benefits to society in an industrialised nation?

NB – this search focuses on environmental and financial benefits.

#### Suggested Search Strategy for

#### Science and Social Sciences Citation Indexes via Web of Science:

*#1 Topic = (solar power\*) AND (car\* OR vehicle\* OR automobile\*)*

*#2 Topic = (environment\* OR pollut\* OR emission\*)*

*#3 Topic = (financ\* OR econom\* OR cost effective\* OR cost benefit\*)*

*#4 Topic = #2 OR #3*

*#5 Topic = #1 AND #4*

### Response:

Note this search only uses free-text searching. This is because Web of Science does not have any subject headings, so thesaurus searching is not possible. The search makes good use of truncation (\*) and synonyms, particularly for the concept of “cars” and the outcomes (benefits to society). Note that the outcomes have been specifically defined – examples of financial and environmental benefits. This is a good idea as studies are more likely to focus on (and therefore the name) specific outcomes, rather than benefits to society as a whole concept.

### Research question D

Is early discharge of stroke patients from the hospital into the community more effective than standard hospital care?

#### Suggested Search Strategy for EMBASE via Ovid:

1. exp stroke patient/ or exp stroke/

2. stroke\*.ti,ab.

3. cerebrovascular accident\*.ti,ab.

4. 1 or 2 or 3

5. exp hospital discharge/

6. early adj2 discharge\*.ti,ab.

7. 5 or 6

8. 4 and 7

9. meta-analys:.mp. or search:.tw. or review.pt.

10. 8 and 9

Note how this search demonstrates the use of a search filter (Step 9), in this case, devised by the Health Information Research Unit at McMaster University. Although shorter than many published filters, this short string has been found to successfully retrieve 92% of systematic reviews when validated against a “gold standard” set of articles (Wilczynski et al., 2007).

### Response:

This search uses both thesaurus searching and free-text searching for the population (stroke patients) and the intervention (early hospital discharge). Note that two relevant thesaurus terms have been found for the intervention – ‘stroke patient’, ‘stroke’. In addition, note that the thesaurus term for the intervention is ‘hospital discharge’ – although this is a broader concept than ‘early discharge’ it is likely that any studies about early discharge would be indexed with this heading. Depending on the number of papers retrieved, you might also consider expanding this concept with related terms like ‘length of stay’; particularly as the search filter will limit results to systematic reviews only