



Planning and Conducting an Effective Literature Search

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Five steps to an effective literature search

This handbook will take you through the five steps to running an effective literature search. These are:

1. Defining your search topic
2. Choosing the resources to search
3. Choosing your search terms
4. Compiling your search strategy and running your search
5. Finding the full text

Working through these steps will ensure that your search is effective and efficient. You are more likely to find relevant information with less effort.

1 Defining your search topic

You will be searching a massive body of published literature; the PubMed database alone contains citations for over 20 million journal articles. Unless you are very specific about what it is you want to find it will be difficult and frustrating to extract anything useful.

1.1 Asking questions

The best way to define your search topic is to ask questions. Turn your topic into a question that you need the literature to answer. Then ask more questions about the type of information you want to find to answer this question.

- What **type of information** will best answer the question? Journal articles? Statistics? Official reports?
- Which **areas of the world** are you interested in? Is the location important?
- Are you interested in a particular **population or patient group**?
- How far back in **time** can you search before the information becomes irrelevant?

Example

My topic: I want to find evidence on the cost-effectiveness of screening for open-angle glaucoma

Question I need to answer: Is there any evidence that open-angle glaucoma screening is cost-effective?

Type of information required: Journal articles and research reports

Other important limits: Must be information relevant to the NHS

1.2 Identifying concepts

Most searching tools will not work very well if you just type in your question. You need to search logically by splitting your question into concepts.

Break your question into the concepts that every paper you find must contain to be relevant. If you have more than 3 concepts your question is probably too complicated, you will not find many papers that address all of your subjects together.

Example

My question is: **Is there any evidence that open-angle glaucoma screening is cost-effective?**

In order to find information to answer this question, I need to find items covering three subjects simultaneously. These are the search concepts:

open-angle glaucoma
screening
cost-effectiveness

If an item does not cover all of these subjects, it is not going to answer my initial question.

1.3 Exercise 1

Choose a topic that you are considering for your summer project.

Turn the topic into a question. What is your question?

.....
What are the search concepts you need to include in your search?
.....

Are any of the following limits on the information you need important?

How far back in time do you want to search for information?
.....

Which languages should the research be written in?
.....

Which areas of the world are you interested in? This could be specific countries and/or types of location (e.g. urban populations or Thailand or sub-Saharan Africa)
.....

Is there anything about the patients/participants which is important?
Note: such as age, gender, socio-economic background, ethnic group
.....

2 Choosing the most appropriate search tools

The Library provides access to a wide variety of databases, each covering a different sub-set of information. Which databases you choose to search will depend on the topic of your search and the type of information you are looking for.

In order to obtain a comprehensive set of results, you should search as many resources as are applicable to your search topic. There will inevitably be some overlap between results obtained from each source, however much of the information contained in the source is unique.

The most popular database used at LSHTM are listed overleaf. Details of all of the bibliographic databases available from LSHTM Library are available on the Library databases webpage (www.lshtm.ac.uk/library/databases/databasesall.html). This includes resources covering specific disciplines or geographic areas.

2.1 Comparison of popular databases at LSHTM

Name	Subject coverage	Why should I search it?
Global Health/Global Health Archive	International public health	The most comprehensive public health database. Very good international coverage, especially from LMIC. Available via the OvidSP interface, allows you to build complex search strategies.
Medline	Medicine and biomedicine	Very wide coverage of most topics within the areas of clinical and laboratory medicine, health and related professions. Most researchers at LSHTM will find useful information here. Available via the OvidSP interface which allows you to build complex search strategies.
Embase	Medicine and biomedicine	Wide coverage of most topics within the areas of clinical and laboratory medicine, health and related professions. Particularly strong in pharmaceutical information. Available via the OvidSP interface which allows you to build complex search strategies.
Web of Science	Science, social sciences and arts & humanities	Covers practically all academic subjects, so very useful if your topic covers several different disciplines. Provides citation information allowing you to identify related publications.
Cochrane Library	Healthcare interventions	Contains the full-text of Cochrane systematic reviews. These are the “gold standard” reviews of healthcare interventions. The Cochrane Library also contains a database of economic evaluations, healthcare technology assessments and a clinical trials register.
CINAHL Plus	Nursing, midwifery and allied health information	Good for information on health promotion and patient education. Indexes a wide range of information including grey literature.
Popline	Family planning, population studies, reproductive & maternal health	Indexes a wide range of information including grey literature. Very strong coverage of material about and from LMIC
ELDIS	Information related to development.	Excellent source for finding grey literature from and about LMIC.

3 Choosing search terms

You should think quite carefully about which search terms you use. The terms you enter into the resource will determine the results you retrieve.

3.1 Textwords

Textwords are often called keywords or free-text searching. Use textwords to search the text of the article, usually limited to the title and abstract rather than the full text. To make your textword search as comprehensive as possible, you should enter all the synonyms you can think of for each concept.

Remember to include:

- UK and US spelling (organisation or organization)
- UK and US terminology (physiotherapist or physical therapist)
- abbreviations and non-abbreviated terms (HIV or human immunodeficiency virus)
- disease names and their vectors (if appropriate) (malaria or anopheles or plasmodium)
- generic and trade drug names (if appropriate) (Prozac or Fluoxetine)

Example:

Our concepts include open angle glaucoma. Below is a list of synonyms for this concept:

open-angle glaucoma	open angle glaucoma
simple glaucoma	compensative glaucoma
pigmentary glaucoma	glaucoma simplex
glaucoma simplices	

As you get more familiar with your subject, you will develop a very comprehensive list of terms. Keep adding to the list as you find more words.

3.2 Exercise 2

Go back to the question and resulting concepts you came up with in exercise 1. For each concept, write down a list of synonyms.

Concept 1

Concept 2

Concept 3

3.3 Subject headings

Many databases have a second way to search for articles on a particular subject. This is using subject headings. You may also see it referred to as thesaurus searching or MeSH searching.

When we search by subject heading we are not searching the terms the author has used in the title or the abstract, we are searching index terms that have been applied to each article to show what it is about. Each database uses its own hierarchy of index terms, the Medline system is the most widely known and is called MeSH (Medical Subject Headings).

The advantage of using subject headings to search for articles is that you do not have to think of all the synonyms and alternate phrases that may appear in the title or abstract. You just need to choose the subject headings which cover the topics you are interested in.

Example

Hernandez RA. Burr JM. Vale LD. OAG Screening Project Group. Economic evaluation of screening for open-angle glaucoma. International Journal of Technology Assessment in Health Care. 24(2):203-11, 2008.

This article is indexed with the following subject headings in Medline:

- Adult
- Age Factors
- Aged
- Allied Health Personnel/organization & administration
- Cohort Studies
- Cost-Benefit Analysis
- *Glaucoma, Open-Angle/diagnosis
- Glaucoma, Open-Angle/epidemiology
- Great Britain
- Humans
- Male
- Markov Chains
- *Mass Screening/economics
- *Mass Screening/methods
- Middle Aged
- Optometry/organization & administration
- Prevalence
- Quality of Live
- Sensitivity and Specificity
- Vision Disorders/economics
- Vision Disorders/prevention & control

As noted above, the subject headings are arranged in a hierarchy. You can use this hierarchy to broaden or narrow your search. Below is the hierarchy for the open-angle glaucoma subject heading in MeSH. The numbers correspond to the number of articles indexed with that subject heading.

Eye Diseases	30352
Ocular Hypertension	4020
Glaucoma	27321
Glaucoma, Open-Angle	8002
Hydrophthalmos	303

Exploding your term automatically searches for articles indexed with any of the narrower terms appearing underneath it in the hierarchy. So, if you explode the term Glaucoma, Open-Angle, as well as finding the 8002 articles found under that subject, you will also find the 303 indexed under Hydrophthalmos.

4 Compiling your search strategy and running the search

Once you have chosen your search terms you then must combine them into a search strategy which can be entered into search tools. Many of databases have built in functions to allow you to take account of different word endings, differences in spelling or the proximity and order of words in sentences.

Not all of the resources allow you to use all of these functions and the syntax used can vary between databases. Please check the 'About this database' link on the Library databases pages or the help pages supplied with the resource itself.

4.1 Truncation

Truncation is used with textwords and allows you to specify different endings to words. Just enter the root of the word and the database truncation symbol (usually an asterisk). The database will then search for any word which starts with that root.

Example

Organisa* will find organisation, organisational, organisations. It will not find organised.

4.2 Wildcards

Wildcards are used with textwords and allow you to make allowances for differences in spelling, plural forms etc.

A number of the databases have two forms of wildcards: mandated wildcards and optional wildcards.

A mandated wildcard allows for differences in spelling, where a character must be present.

Example

In the OvidSP databases, the mandated wildcard symbol is a hash or pound sign (#).

Organi#ation will find organisation and organization, wom#n will find woman or women.

An optional wildcard allows for a character to be present or absent. This is particularly useful for differentiating between UK and US spelling.

Example

In the OvidSP databases, the optional wildcard symbol is a question mark (?).

Tumo?r will find both tumour and tumor.

4.3 Proximity searching

Proximity searching is also used with textwords and allows you to specify how close together different words should be to each other. This is particularly useful where you are looking for information on a subject where the vocabulary used can be very variable.

Example

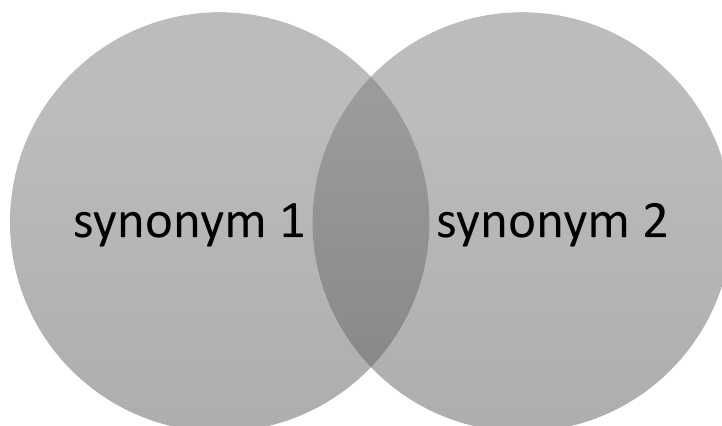
In the OvidSP databases, use $ADJn$ between words, where n is the maximum number of words permitted between your terms.

If you add $ADJ4$ between the words it will find them in any order within 4 words of each other. lung $ADJ4$ cancer will find cancer of the lung, lung cancer etc.

4.4 Combining terms together using Boolean operators

As you can see, we can very quickly build up a long list of search terms. We need to tell the search system how we want these terms combined together. To do this we use special words called Boolean operators, AND and OR.

OR



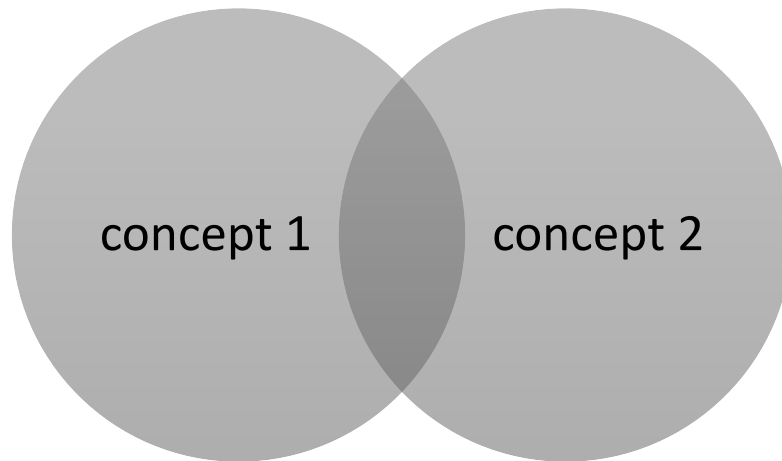
Use OR when you are entering your synonyms. OR will find articles with one or more of your terms. In the example shown in the Venn diagram above, both the lighter grey areas and the dark grey areas will be found.

Example

entering open angle glaucoma or simple glaucoma will find articles containing the phrase open angle glaucoma, it will also find articles containing the phrase simple glaucoma and it will also find article containing both terms.

You should also use OR when you combine your textword and subject heading searches together for the same concept.

AND



Use AND when you are combining different concepts together. AND will find articles with all of your terms. In the example shown in the Venn diagram above, only the dark grey area will be retrieved.

Example

Entering mass screening and open angle glaucoma will find articles with both phrases. Any items only containing one of the terms will not be found.

4.5 Putting it all together

I recommend that you use both subject headings and textwords to search for items on a particular subject. This gives you two different ways to make sure you retrieve an item, reducing your chances of missing something important.

Most databases allow you to build up a search in stages, remembering each search step as you go in the search history. They give each step of your search a number which you can use to combine searches together.

Thus, you can build up a search for a three-concept topic as shown below.

1. Concept 1 title and abstract search
2. Concept 1 subject heading search
3. 1 or 2
4. Concept 2 title and abstract search
5. Concept 2 subject heading search
6. 4 or 5
7. Concept 3 title and abstract search
8. Concept 3 subject heading search
9. 7 or 8
10. 3 and 6 and 9

Example

My search to answer the question: Is there any evidence that open-angle glaucoma screening is cost-effective would look like this in Ovid Medline

1. (open-angle or simple* or compensa* or pigmentary) adj1 (glaucoma*)
2. exp Glaucoma, Open-Angle/
3. 1 or 2
4. screening
5. exp Mass Screening/
6. 4 or 5
7. cost-analysis or cost-benefit or cost-effective* or economic*
8. cost-benefit analysis/
9. 7 or 8
- 10.3 and 6 and 9

5 Finding full text

Most databases do not contain the full text of the papers. There are two main ways to find the full text papers available from LSHTM.

1. Via the Library Catalogue.
Links to all of our electronic subscriptions are available from the Library Catalogue. Details on how to use the Library Catalogue and find information in the library are given on our webpages www.lshtm.ac.uk/library/collections/using_catalogue.html
2. Via the SFX@LSHTM button.
The SFX button is available on most of the School's database subscriptions and links you directly from your results to the full text of the article (if available).

When you click the SFX button, the SFX window will appear.

Library & Archives Service

Title: Achieving effective coverage: The importance of quality and use considerations in scaling up bed net distribution programs for malaria control and prevention

Source: The American journal of tropical medicine and hygiene [0002-9637] Medlin yr:2007 vol:77 iss:5 pg:212 -212

Full text available via **Highwire Press American Society of Tropical Medicine and Hygiene**

Year: Volume: Issue: Start Page: **GO**

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5.1 Accessing information not held at LSHTM

You can apply for a SCONUL Access card from the LSHTM Library Enquiries Desk. This will allow you reference access to the print resources of most UK academic libraries. Please see www.access.sconul.ac.uk for more information about the scheme.

You also have the option of requesting a copy of the title you need via our inter-loans service. Full details of the service can be found at www.lshtm.ac.uk/library/iloans/.

Please do contact hannah.wood@lshtm.ac.uk if you have any further questions, or would like to arrange a one-to-one appointment for literature search support.