Searching Help for Public Health Higher Degree Students and Researchers.

When you embark on a higher degree the dreaded literature review will loom large in your early preparations. It can seem rather daunting, but if you follow a few simple rules you'll save time, and avoid a lot of confusion and frustration. Essentially you are dealing with two simple components - language, and logic. These notes are to help you with both. I've concentrated on PubMed and Embase, but there will be other databases you need to consider.

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Introduction

One of the problems we all have is that we expect other people to call things by the same name that we do. Even if they don’t, in normal conversation this is not a problem, as we rapidly process the alternatives as equivalents. So if I talk about sickness, and you talk about illness it really doesn’t matter, as we still understand one another. Databases (with very few exceptions) don’t work like this. Instead they search only the exact words we use (including misspellings!). This means that for comprehensive searching you need to provide them with as many possible alternatives as you can.

We’ll begin with PubMed, using the following topic as an example

*health policy and the economics of obesity*

Many postgraduate topics will be more complex, but this is a simple example to demonstrate general principles. As long as you understand these principles you will be able to construct even highly complex searches.

The first step in any search, and the most time consuming, is the construction of an appropriate list of terms for each database you intend to search. Different databases (for example PubMed and Embase) have different indexing languages, so you will need to create a separate search strategy for each one.

First you must analyse the components of your search. In this example there are three:-

*Obesity*  *Economics*  *Health Policy*

This structure will be reflected in all searches, regardless of the database you choose….now read on.
PubMed Field Codes

When searching either PubMed it's important to tell the database where to look for words - titles of articles, abstracts, the indexing language of the database. To do this you need to use field codes. They will make a great difference to the effectiveness of your search!

PubMed has a wide range of field codes, but those you're most likely to use are:

[mh] to search for Mesh terms
  e.g. obesity[mh] This search will include not only the term Obesity, but the more specific terms in the list below it. This is called "exploding" terms, and is PubMed's default setting.

[mh:noexp] if you don't want to explode the search term
  e.g. economics[mh:noexp] will search only for the term Economics, not the more specific terms in the list below it

[majr] to restrict your search to major indexing terms only
  e.g. obesity[majr]

[sh] MeSH Subheadings are used with MeSH terms to help describe more completely a particular aspect of a subject - for example neoplasms/diagnosis. PubMed allows you to "free float" subheadings, and this can be a useful option.

[tiab] to search for words in titles and abstracts - this is essential for searching the most recent literature
  e.g. obesity[tiab]

[tw] Includes all words and numbers in the title, abstract, MeSH terms, MeSH Subheadings, Publication Types, Substance Names, Personal Name as Subject, Corporate Author, Secondary Source, and Other Terms. Preferred over [tiab] for systematic reviews.

Note: If you search using [tw] you will find any MeSH term containing the word or phrase, but MeSH terms will NOT be exploded!

This will mean you also have to search the MeSH term [mh] if you want to capture the explosion.

[all] Untagged terms and terms tagged with [all fields] are processed using Automatic Term Mapping. Terms that do not map are searched in all search fields except for Place of Publication and Transliterated Title.

Note: Terms enclosed in double quotes or truncated will be searched in all fields and not processed using automatic term mapping.

[ta] to search for (Medline) journal titles or title abbreviations
  e.g. Am J Bioeth[ta]
  American Journal of Bioethics[ta]
PubMed Useful Tips

- When you get to the PubMed home page right click on the MeSH Database link and open it in a new tab - this will allow you to have MeSH open in one tab, and PubMed open in the other. That way it's easy to move between looking up terms and testing searches.

- Look in the Search Details box (right hand side of the search screen) to see how PubMed has interpreted your search.

- Click on the Title of an article to see MeSH terms used to index it.

- Use the Entry Terms lists in MeSH to find words to search in titles and abstracts - remember MeSH alone will not produce a comprehensive search, and at times the concept you’re dealing with may not even have an appropriate MeSH term. Entry terms are NOT MeSH but may appear in titles and abstracts of articles.

- Remember that PubMed “explodes” all MeSH terms automatically to search more specific subcategories. Always check MeSH headings to see the lists of more specific terms.

- Use truncation (*) ONLY for words in titles or abstracts. DO NOT TRUNCATE MeSH TERMS.

- Add limits (such as English language or date limits) only when you have completed your search.

Language Part 1 - looking for MeSH

Your most important task at this stage is to create a Word document in which you will gradually build an accurate map of your search strategy. To do this you’ll use a table, or logic grid, and simply add words to the appropriate columns as you go.

You’ll be performing mini searches to test various terms and combinations in order to find the best words for your final search. Eventually you will discard all of these searches and construct a comprehensive search using the lists of terms you have created in your Word document.

PubMed has a thesaurus called MeSH - which is simply an acronym for Medical Subject Headings. This is the indexing language of Medline. Indexers select terms from the MeSH thesaurus, and attach them to articles to describe their subject content.

1. Open a Word document and set up a logic grid - you’ll need a column for each concept.

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Economics</th>
<th>Health Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Open two web page tabs— one for PubMed, and one for MeSH (there’s a link to the MeSH database on the right of the PubMed home page. Right click with your mouse to open a new tab).

3. Look up obesity as a MeSH. You’ll see that there is a list of subcategories of obesity listed underneath the main heading.

   Obesity
   - Obesity, Abdominal
   - Obesity Hypoventilation Syndrome
   - Obesity, Morbid
   - Prader-Willi Syndrome

   If you want to search all categories it’s very easy, as PubMed’s default is to do what’s called exploding MeSH terms, and it will search all of the terms in the list.

   If you look above the heading for Obesity in the list you’ll see Overnutrition, and you may decide that this option is preferable.

   Overnutrition
   - Obesity
     - Obesity, Abdominal
     - Obesity Hypoventilation Syndrome
     - Obesity, Morbid
     - Prader-Willi Syndrome

   If you choose Overnutrition PubMed will automatically “explode” the term to include obesity and its variant forms.

4. Look up economics as a MeSH Economics has a large range of more specific terms in the hierarchy beneath it, and as PubMed’s default is to explode terms, all of these will be searched.

   Scroll back up the MeSH page to look at the Entry terms for Economics
Entry Terms are NOT MeSH! They are synonyms or alternative terms that have been rejected for MeSH.

If indexers see these terms in abstracts or titles, or authors’ keywords, then they apply the appropriate MeSH - in this case it would be Economics. However Entry Terms are a useful starting point for finding synonyms, or alternative terms that you could search in the abstracts and titles of articles.

5. Look up health policy in MeSH

Under Health Policy you’ll see a list of more specific subcategories. As PubMed’s default is to explode the MeSH terms, it will automatically search all of the terms in the list.

- Health Care Reform
- Nutrition Policy
6. Scroll back up the MeSH page to look at the Entry Terms. This list of Entry Terms will provide useful supplementary terms to add to your search to find words in titles or abstracts of articles.

**Entry Terms:**
- Health Policies
- Policies, Health
- Policy, Health
- National Health Policy
- Health Policies, National
- Health Policy, National
- National Health Policies
- Policies, National Health
- Policy, National Health

**Remember - these Entry Terms are NOT MeSH**

7. Now update your logic grid with the MeSH terms you've chosen.

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Economics</th>
<th>Health Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>overnutrition[mh]</td>
<td>economics[mh]</td>
<td>health policy[mh]</td>
</tr>
</tbody>
</table>

It will be useful to look at a number of articles to see if different MeSH are used. Sometimes there is considerable variation in the way indexers interpret content.

8. Simply click on the title of the article you want to investigate. This will display the article details, plus its abstract, and a link to allow you to view the MeSH Terms.

The article I have chosen is "Changing the future of obesity..." but you would be wise to choose a number of articles to see if the same indexing terms appeared in each one.

**Changing the future of obesity: science, policy, and action.**


PMID: 21872752 [PubMed - indexed for MEDLINE]
The terms of interest from this list are those concerning obesity, economics, and health policy.

Terms with an asterisk after them are Major terms, and represent the most important subject aspects of the article. Those without an asterisk are Minor terms, and represent less important aspects of the article’s content.

NOTE the asterisk here is NOT a wildcard.

In this example the indexing term Obesity has /economics as a subheading.

NOTE:- When searching, using subheadings is very risky, as indexing at this level is rather variable. Some indexers will use the MeSH term Economics, while some will choose the subheading /economics.

It is preferable when searching to use economics[mh] OR economics[sh]. This will cover both options, and will retrieve Economics as a MeSH term, as well as Economics as a subheading.
**Language Part 2 - looking for words in other fields**

PubMed contains thousands of new articles waiting to be indexed with MeSH, and the only way to search this material is by looking for words in titles and abstracts.

Very new material will be labelled either

[PubMed - as supplied by publisher]

**example below**

**Thinness and obesity: A model of food consumption, health concerns, and social pressure.**
Dragone D, Savorelli L.
J Health Econ. 2011 Oct 20. [Epub ahead of print]
PMID: 22119344 [PubMed - as supplied by publisher]

or [PubMed - in process]

**example below**

**Obesity, overview of an epidemic.**
Mitchell NS, Catenacci VA, Wyatt HR, Hill JO.
PMID: 22098799 [PubMed - in process]

and will **NOT** have indexing (MeSH) terms added to it.

Even when articles have been indexed, title and abstract searching is useful, as indexers quite often vary in the way they interpret content of an article.

1. Use lists of **Entry Terms** from MeSH to give you ideas for words to search in titles or abstracts. You will probably think of additional possibilities.

2. Check titles and abstracts of articles from your initial search for additional synonyms and other alternative words to add to your search.

3. Add these terms to the logic grid - the list below is not intended to be comprehensive, but will give you an idea of how to build a search. If phrases are to be searched in titles and abstracts, most databases use inverted commas to enclose the phrase, and ensure that words are not searched independently. PubMed does not require this.
When you have finished collecting terms you are ready to search. Most databases require that Boolean operators are in upper case, and PubMed is no exception. So it's important when searching PubMed to use AND, OR, NOT to connect your search terms.

You will need to OR the individual words in each column, and then AND the groups of words together - remembering to use parentheses around the groups of terms from each column to preserve the logic of your search.

PubMed's tutorial gives a clear explanation of how Boolean logic works.

This is how the search will appear :-

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Economics</th>
<th>Health Policy</th>
</tr>
</thead>
</table>
When you have long lists of terms it's much easier to search each column separately, then combine them.

Note: When searching each column separately you don’t need to use parentheses around the groups of terms. When you combine the separate searches, PubMed will treat them as if each search is enclosed in parentheses, and your logic will work.

**Performing the search**

Now that you’ve done all the hard work, executing the search is easy!

- Click on the **Advanced** option - just below the PubMed search box - and clear your search history.
- Return to the PubMed home page.
- Copy and paste the first set of terms into PubMed, and search.
- Clear the search box.
- Now copy and paste the second set of terms into PubMed, and search.
- Clear the search box.
- Now copy and paste the third set of terms into PubMed, and search.
- Once you have performed the three searches click on the **Advanced** option again. This will display your search history, and allow you to combine the results - using **AND**.

<table>
<thead>
<tr>
<th>Search</th>
<th>Add to builder</th>
<th>Query</th>
<th>Items found</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4</td>
<td>Add</td>
<td>Search (#1 AND #2 AND #3)</td>
<td>581</td>
</tr>
</tbody>
</table>

Each term from each column will now cross match with each term from the other columns.

**Applying Limits**

When the final results are displayed you can use the filters on the left hand side of the screen to add language, date, or other limits to your search. Limits in PubMed should be applied with caution.

Language and date limits can safely be applied to all searches, and will not eliminate new material.

However age ranges, species limits, sex limits, and some publication types, e.g. Clinical trial, will restrict results to Medline only, and will eliminate new unindexed articles (PubMed, PubMed - in process, PubMed - as supplied by publisher).
**Summary**

- Create a logic grid with one column for each concept
- Look for appropriate **MeSH terms** – remember there may be multiple MeSH terms you could use for a concept, or there may not be a MeSH term to describe a concept you are looking for.
- Look for words to search in titles and abstracts – check the **Entry Terms** listed in MeSH for suggestions, as well as words appearing in titles and abstracts of articles you find
- If you are worried about how a word or phrase will work in titles or abstracts, test it by doing a title search. For example - `cbt[ti]`
- Add these to your logic grid
- Click on **Advanced**, and clear your search history
- Perform the search
- **Add limits** – such as language, publication date, age ranges

**Dealing with Results**

- You can save your search - and re-run it at any time.
- You can set up an alert - which will automatically notify you of new material on your topic.
- You can export your search results to EndNote.

Notes (and videos) on all of these are available on my [PubMed Help page](#).

**Embase**

In your Word document you'll need to create a new table or logic grid for your Embase search, and simply add words to the appropriate columns as you go.

As you did with PubMed, you'll be performing mini searches to test various terms and combinations in order to find the best words for your final search. Eventually you will discard all of these searches and construct a comprehensive search using the lists of terms you have created in your Word document. Embase includes all Medline data from 1996, but it doesn't include the new unindexed material that you will find in PubMed, nor does it allow the level of sophistication in searching that you will find in PubMed. In other words it's **NOT** an alternative to PubMed.

Embase, like PubMed, has an indexing language. This is called Emtree, and is the equivalent of PubMed's MeSH. However its field names, and the way in which they are applied, are very different from PubMed, and unlike PubMed it does not automatically explode terms - you have to instruct it to do so.
Embase Useful Tips

- Use two browser windows or tabs in Embase – one for Advanced Search, and one for Emtree. That way it’s easy to move between looking up terms and testing searches.

- Click on Index Terms to see the Emtree terms used for a particular article.

- Use the Synonyms lists in Emtree to find words to search in titles and abstracts - remember Emtree alone will not produce a comprehensive search, and at times the concept you’re dealing with may not even have an appropriate Emtree term.

- Be aware that Embase does NOT explode Emtree terms automatically to search more specific subcategories. You have to tell it to do so.

- Always check Emtree headings to see the lists of more specific terms before you explode them.

- In Embase you need to enclose all phrases in inverted commas, otherwise the words will be searched separately, and they may be found nowhere near one another. It doesn’t matter whether you use single or double quotation marks as long as you are consistent.

- Check Embase wildcard and truncation options - they have now been expanded.

- Multiple fields can be searched at the same time. e.g. neoplas*:ti,ab,

- Use the Advanced Search screen, and always turn off the “Map to preferred term in Emtree” option. This will turn off all mapping options, leaving you in control of your search.

- Add limits (such as English language, age, or date limits) only when you have completed your search.
Embase Field Codes

When searching Embase it's important to tell the database where to look for words - titles of articles, abstracts, the indexing language of the database. To do this you need to use field codes. They will make a great difference to the effectiveness of your search!

If you search a word or phrase without a field name attached, Embase will map your term to what it thinks is an appropriate Emtree term, it will explode that term, and it will also search your word as free text in all fields. This may produce some rather unexpected results, and is generally NOT RECOMMENDED for advanced searching where greater precision and control are needed.

Embase has a wide range of field codes, but those you're most likely to use are:-

/DE - to search for an exact Emtree heading

  e.g. neoplasm/DE This search will retrieve articles indexed ONLY with the general term neoplasm. It will NOT search the narrower, more specific terms in the subject tree

:DE - to search for words or phrases anywhere in an Emtree heading

  e.g. neoplasm:DE This search will retrieve articles where the word neoplasm occurs somewhere in the Emtree heading. It will NOT explode the term, but it will often find additional material where the word neoplasm is not the only word in the heading. e.g. myeloproliferative neoplasm

/EXP - to explode terms to include narrower more specific terms listed in the subject tree, as well as the general term

  e.g. neoplasm/exp

/MAJR - to restrict your search to major indexing terms only

  e.g. neoplasm/MAJR

/SYN - to explode an Emtree term and to search that term in all searchable fields. All of the Synonyms listed in Emtree for that term will also be searched in all fields. The narrower terms in the subject tree will be searched only as indexing terms NOT in other fields.

  e.g. neoplasm/SYN

:LNK to "free float subheadings in Embase, so that they are not attached to a specific index term

  e.g. "adverse drug reaction":LNK

Subheadings are listed under drug subheadings, routes of drug administration, and disease subheadings

:TI - to search for words or phrases in titles of articles

  e.g. neoplasm*:TI

:AB - to search for words or phrases in abstracts of articles

  e.g. neoplasm*:AB

:JT - to search for an exact journal title

  e.g. "New England Journal of Medicine":JT

:TA - to search for an abbreviated journal title

  e.g. "new engl j med":TA

To search a word or a phrase in ALL FIELDS simply type it into the Advanced Search box, and uncheck the “Map to preferred term in Emtree” option.
Language Part 1 – looking for Emtree terms

1. Open a Word document and set up a logic grid - you’ll need a column for each concept. In this example there are three. Column one will contain words relating to cancer, column two will contain words relating to fatigue, and column three will contain words relating to nursing.

2. Open two browser windows - one for Embase Advanced Search (use the drop down box under Search at the top left of your screen) and one for Emtree. (use the drop down box under Browse at the top left of your screen). Right click on the link to open Emtree in a new tab.

3. At the Advanced Search screen turn off the “Map to preferred term in Emtree” option. This will turn off all mapping options leaving you in control of your search.

4. Perform a simple search in Embase, using your own words - obesity AND economics AND “health policy”.

5. Scroll through the results to see if there are any articles that look as if they’re on your topic.

6. Once you have found a suitable article click on Indexing Terms. This will display a list of Emtree terms. The article I have chosen is “Reducing Sugar-Sweetened Beverage Consumption: Evidence, Policies, and Economics”

And the indexing is

When you look at the indexing (Emtree) terms you can see that, the indexing language is different from PubMed
7. Look up obesity in Emtree

Rather than exploding the term it may be better to search the general term, and a selection of the narrower terms

8. Look at the synonyms listed further down the screen

These could be searched in titles and abstracts.

Embase allows a number of possibilities to allow very broad searching, including the following:

a. If you search obesity/exp the term will be exploded to include all of the narrower terms.

b. If you search obesity/syn then the following will happen:

- The term obesity will be exploded
- The term obesity will be searched in all fields
- All of the synonyms listed will be searched in all fields
- The narrower terms in the exploded subject tree will be searched only as indexing terms

**Option b. is unique to Embase**

9. Look up health economics in Emtree

Notice that the term above it in the hierarchy - **economic aspect** may also be of interest
There are other options revealed in the list which may also be worth investigating. Remember that whatever you decide will affect the final result of your search. It’s up to you to determine how broad or narrow you want your search to be.

10. Look up health care policy in Emtree

This is a single Emtree term with no subcategories

You could search just that term – "health care policy"/de, or you could search "health care policy"/syn to include the list of synonyms which would then be searched in all fields.

You may want to test both of these terms to see whether to include only one, or perhaps both.

11. Look up policy in Emtree

This is also a single Emtree term with no subcategories

You could search just that term – policy/de, or you could search policy/syn to include the list of synonyms which would then be searched in all fields. Notice that the synonyms for policy are quite different from the synonyms for health care policy.

12. When you are happy with the indexing terms you have collected, update your logic grid with the appropriate Emtree terms

Note: When searching EMBASE ALL phrases must be enclosed in inverted commas. It doesn’t matter whether you use double or single quotes, as long as you’re consistent.
Language Part 2 – looking for words in other fields

1. Use lists of terms you have already used in PubMed to provide ideas for synonymous words and phrases to search in titles or abstracts - you will probably think of additional possibilities.

2. Check titles and abstracts of articles from your Embase search for additional synonyms and other alternative words to add to your search.

3. If you have used /syn with the Emtree terms in your search then you will already have included the synonymous words and phrases suggested by Emtree (these synonyms are the equivalent of the Entry terms in MeSH). If you have used /exp /de or :de with the Emtree terms in your search, then you will need to check the appropriate synonyms lists for additional words and phrases to search in titles and abstracts.

4. Add these terms to the logic grid, remembering that ALL phrases must be enclosed in inverted commas (quotes)

<table>
<thead>
<tr>
<th>Obesity</th>
<th>Economics</th>
<th>Health Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overnutrition/de</td>
<td>“health economics”/de</td>
<td>“health care policy”/syn</td>
</tr>
<tr>
<td>Obesity/syn]</td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td>OR</td>
<td>“economic aspect”/de</td>
<td>‘health care policies”:ti,ab</td>
</tr>
<tr>
<td>obesity:ti,ab OR</td>
<td>Economics/de</td>
<td>OR</td>
</tr>
<tr>
<td>obese:ti,ab OR</td>
<td>economics:ti,ab</td>
<td>“healthcare policies”:ti,ab</td>
</tr>
<tr>
<td>obesogenic:ti,ab OR</td>
<td>economic:ti,ab</td>
<td>OR</td>
</tr>
<tr>
<td>overnutrition:ti,ab</td>
<td>“health care rationing”:ti,ab</td>
<td>“healthcare reforms”:ti,ab</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>“healthcare rationing”:ti,ab</td>
<td>“nutrition policies”:ti,ab</td>
</tr>
<tr>
<td></td>
<td>cost:ti,ab</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>costs:ti,ab</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>costing:ti,ab</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>“health expenditure”:ti,ab</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td>“health expenditures”:ti,ab</td>
<td>OR</td>
</tr>
</tbody>
</table>

Notice that some phrases and words appear to have been omitted when this strategy is compared with the PubMed strategy. This is because they were included as part of the /syn searches.

For example “health policy” was included in the synonym list for health care policy, but “health policies” was omitted. “Health care reform” was included, but “healthcare reforms” was omitted, as was “health care reforms”.

Synonyms

health care reform; health policy; healthcare policy; healthcare reform; nutrition policy; patient protection and affordable care act; policy, health care
Logic

When you have finished collecting terms you are ready to search. You will need to OR the individual words in each column, and then AND the columns together.

This is how the table contents are converted to a search strategy:

First column

overnutrition/de OR obesity/syn OR obesity:ti,ab OR obese:ti,ab OR obesogenic:ti,ab OR overnutrition:ti,ab

AND

Second column

"health economics"/de OR "economic aspect"/de OR economics/de OR economics:ti,ab OR economic:ti,ab OR "health care rationing":ti,ab OR "healthcare rationing":ti,ab OR cost:ti,ab OR costs:ti,ab OR costing:ti,ab OR "health expenditure":ti,ab OR "health expenditures":ti,ab

AND

Third column

"health care policy"/syn OR "health care policies":ti,ab OR "healthcare policies":ti,ab OR policy/syn OR "health policies":ti,ab OR "health care reforms":ti,ab OR "healthcare reforms":ti,ab OR "nutrition policies":ti,ab

When you have long lists of terms it's much easier to search each column separately, then combine them.

Note: - When searching each column separately you don't need to use parentheses around the groups of terms. When you combine the separate searches, Embase will treat them as if each search is enclosed in parentheses, and your logic will work.

Performing the Search

- Go to the Results page, click on Search History, and delete all previous searches
- Go back to the Advanced Search page
- Make sure the "Map to preferred term in Emtree" option is turned off
- Copy and paste the first set of terms into Embase, and search
- Now that you've turned off mapping, you can simply use the search box at the top of the results screen for the rest of your searches. So copy and paste the second set of terms into Embase, and search
- Now copy and paste the third set of terms into Embase, and search
- Once you have performed the three searches click in each search box to select the three searches, make sure the AND option is selected, and click on Combine

Applying Limits

Select the limits you want from the options in the toolbar at the top of the screen.
Then press Enter to rerun your final search with the limits applied.

**Summary**

- Create a logic grid with one column for each concept.
- Look for appropriate Emtree terms
- Look for words to search in titles and abstracts – check the Synonyms listed with Emtree terms for suggestions, as well as words appearing in titles and abstracts of articles you find.
- Add these to your logic grid.
- Perform the search
- Add limits.

**Dealing with Results**

- You can save your search and rerun it at any time
- You can set up an alert – which will automatically notify you of new material on your topic
- You can export your results to EndNote

Instructions for all of these are available on my [Embase Help page](#).

**Other Databases**

There will be other databases, apart from PubMed, that will be useful for your topic, and you’ll find a list on my [databases page](#).

The biggest of these is Scopus, and although it doesn't have the sophisticated subject search capability of PubMed it has some extremely useful features which will allow you to extend your search with very little effort.

Its greatest strength is its citation searching capacity. You can easily “translate” a PubMed search for Scopus, and while it may produce many of the same articles, there will be lots of additional material, and you will have some extra options available.

To see these additional features:

- Copy and paste the title of the article below into the Scopus Search box. You'll need to enclose the title in inverted commas

"Changing the future of obesity: Science, policy, and action"
• Set the in box to Article Title, and search

Once the result is displayed

You can

• Access the full text of the article
• View a list or articles which have subsequently cited this reference by clicking on the number at the right of the display
• View the abstract and references of the article by clicking on the article title. Each reference in the list also has links to full text, as well as its own abstract and references, and number of times cited.

This means that from a single article you can explore a wide range of related material.

**Systematic Reviews**

Systematic reviews (in the strictest sense) require extremely rigorous searching, and include grey literature, but in practice the term "systematic review" is used to refer to a range of approaches, from exhaustive searching of the literature, involving many databases, and including searching grey literature, to searches involving a predetermined set of databases, with no consideration of grey literature.

Before embarking on a systematic review, always check with your supervisor to clarify what is expected in terms of the range of databases, and other sources to be searched.

Below are some links which should help to clarify what is involved. Additional information can be found on my evidence based medicine page.

**What is a systematic review?**
By Pippa Hemingway and Nic Brereton. 2nd. ed. Hayward Medical Communications, 2009.

**Finding studies for systematic reviews: a resource list for researchers**
Provides a list of databases recommended by the Centre for Reviews and Dissemination at the University of York. However not all of these databases may be relevant for a particular topic.

**PROSPERO**
PROSPERO is the first open access online facility to prospectively register systematic reviews.

**Systematic Reviews: CRD’s guidance for undertaking reviews in healthcare**
Guidelines developed and published by the NHS Centre for Reviews and Dissemination, which can be used as a framework for carrying out systematic reviews or used for information by organisations commissioning reviews.

**Search Filters**
Below are links to a range of search filters developed by expert groups. You may find them useful in developing your own search strategies.

**Cochrane Search filters**

**ISSG Search Filters**
The InterTASC Information Specialists’ Sub-Group (ISSG) is the group of information professionals supporting research groups within England and Scotland providing technology assessments to the National Institute for Health and Care Excellence (NICE) and other associated Information Specialists.

**Search filters used by SIGN**
SIGN is the Scottish Intercollegiate Guidelines Network, which develops evidence based clinical practice guidelines for the National Health Service (NHS) in Scotland.

**Checklist for Completed Searches**

When you have done all of your searches it’s best to check to make sure that they are as complete as possible, and that the searches for all databases are very similar - in fact all of the words and phrases that you have searched in fields outside the databases’ indexing languages (MeSH, Emtree etc) should be the same in each search.

- Have you searched indexing terms (MeSH, Emtree etc) in other fields?
  
  Searching health as a MeSH will explode the term, but won’t look for the word in other fields – all indexing terms need to be searched in other fields, such as titles and abstracts.
  
  e.g. health[policy][mh] OR health policy[tw] The only exception to this would be where terms are inverted – e.g. models, economic[mh], in which case you would search economic model*[tiab]

- Have you looked extensively for synonyms and related words and phrases which may appear in titles and abstracts – have you included PubMed’s Entry terms and Embase’s Synonyms in your list. Have you then tested each of them before including them in your search? I usually do a title search for words or phrases I want to use, just to make sure they work.

- Have you allowed for British and American spelling in words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.)?
  
  e.g. tumor*[tiab] OR tumour*[tiab]

- Have you allowed for both singular and plural forms of words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.)?
  
  e.g. woman*[tiab] OR women*[tiab]

- Are your lists of words and phrases to be searched outside the indexing languages (MeSH, Emtree etc.) identical across all databases searched – in other words are your searches as similar as possible?

- Have you applied limits to your searches? In PubMed language and date limits can be used safely, but age ranges, species limits, sex limits, and some publication types, e.g. Clinical trial, will restrict results to Medline only, and will eliminate new unindexed articles

- If you have excluded certain indexing terms, or terms in titles and abstracts, could this have compromised your search?
  
  e.g. excluding child[mh] will exclude articles which deal with BOTH adults and children.