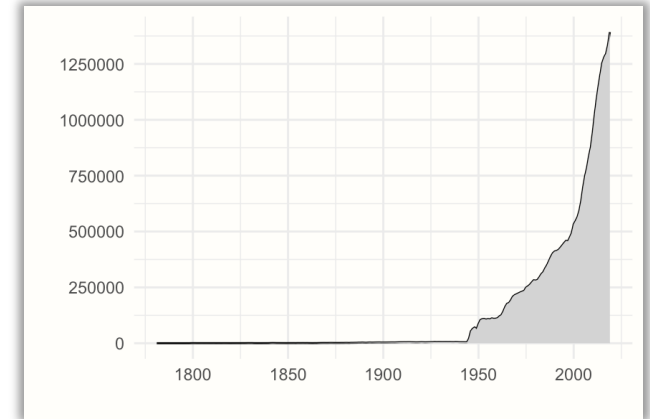


Searching Bibliographical Databases

After defining research questions using the PICO, the next step is to find trials that have examined this research question and that can be included in the meta-analysis

- Transform eligibility criteria into search strings for electronic bibliographical databases
- Select adequate databases

If possible, include information specialists or librarians (e.g. at the university)!



Articles indexed in PubMed by year, 1781-2019

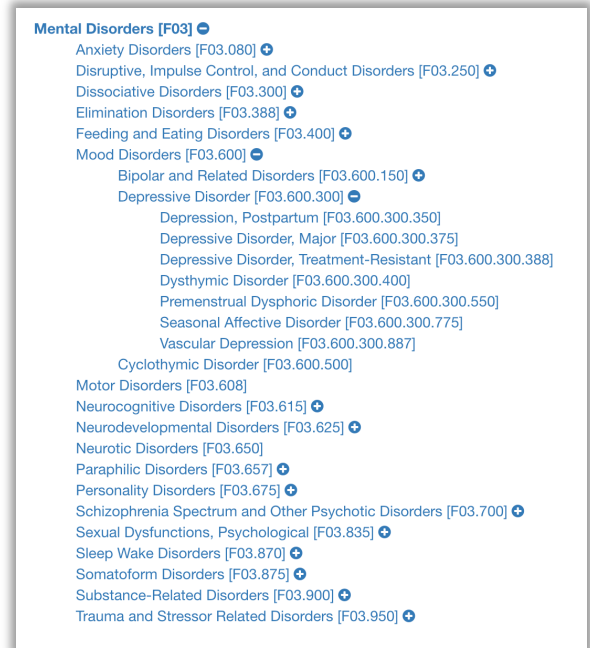
Commonly Used Databases

Database		
Core databases		
Pubmed	Database of the US National Library of Medicine	www.ncbi.nlm.nih.gov/pubmed
PsycInfo	Database from the American Psychological Association on behavioral and social sciences	www.apa.org/pubs/databases/psycinfo
Cochrane Central Register of Controlled Trials (CENTRAL)	Database of randomized trials in health care	
Embase	30 million abstracts and indices from published, peer-reviewed biomedical literature, in-press publications and conferences are available on Embase.	www.elsevier.com/solutions/embase-biomedical-research
Subject specific databases		
Bibliomap	On Health promotion research	https://eppi.ioe.ac.uk/webdatabases/Intro.aspx?ID=7
CINAHL (nursing science)	Cumulative Index to Nursing and Allied Health Literature. Access to CINAHL is provided on the Web by EBSCO Publishing, Ovid Technologies and ProQuest	
ERIC (education-related literature)	Educational Resources Information Center (ERIC) is a large database on educational-related literature, supported by the U.S. Department of Education's Office of Educational Research and Improvement and is administered by the U.S. National Library of Education (NLE).	http://eric.ed.gov
AgeLine (aging issues)	AgeLine indexes 213 journals, books, book chapters and reports. Designed for researchers, professionals, students and general consumers, AgeLine addresses aging issues from individual, national and global perspectives.	www.ebscohost.com/academic/ageline

Citation databases		
Thompson Reuters' web of knowledge	Thompson Reuters' citation database	www.webofknowledge.com
Scopus	Elsevier' citation database	www.elsevier.com/solutions/scopus
Google Scholar	The largest citation database developed by Google	scholar.google.com
National and regional databases		
Latin America: LILACS		http://lilacs.bvsalud.org/en/
Chinese Biomedical Literature Database (CBM)	Institute of Medical Information & Library	www.imicams.ac.cn/publish/default/eng
China National Knowledge Infrastructure (chkd-cnki)	Database of Chinese studies	http://oversea.cnki.net/kns55/default.aspx
indMED	Database covering peer reviewed Indian biomedical journals	http://indmed.nic.in/indmed.html
Dissertations and theses		
ProQuest dissertations	Database of dissertations	www.proquest.com/products-services/dissertations
ProQuest dissertations UK & Ireland	Database of dissertations Great Britain and Ireland	www.proquest.com/products-services/pqdt_uk_ireland.html
Deutsche National Bibliothek	The German National Library (Deutsche National Bibliothek) offers access to German dissertations	www.dnb.de/DE/Wir/Kooperation/dissonline/dissonline_node.html
CNKI	Database of Chinese theses	http://oversea.cnki.net/kns55/Nav/CDMDNavi.aspx?NaviID=36&XueKE=1
Other reviews and guidelines		
DARE	The "Database of Abstracts of Reviews of Effects" of the University of York	www.crd.york.ac.uk/CRDWeb
National Guideline Clearinghouse	NGC is a public resource for evidence-based clinical practice guidelines	www.guideline.gov
Trial registers		http://apps.who.int/trialsearch/

Search Strings

- Developing search strings **is not easy** - develop a search strategy, test and evaluate it, and adapt if necessary.
- Balance sensitivity and precision in your search to find a **middle ground between broad and narrow searches**.
- Use both **text and key words** in your searches, as key words are attached to papers separately from the abstract and title.
- Find key words by looking at studies that meet your inclusion criteria or by searching the database's thesaurus.
- Each database has its own **taxonomy**, such as MeSH for PubMed and Emtree for Embase, which can be searched by entering the right key words.



meshb.nlm.nih.gov

Special Operators

- **Boolean operators** (AND, OR, NOT) can be used to combine search terms, and thus get more specific results when searching in databases.
- **Brackets** can be used to group search terms and specify which terms should be connected with AND, OR, or NOT, e.g.: (“depression” OR “anxiety”) AND “therapy”.
- **Truncation** (*), **wildcards** (?), and **proximity operators** can be used to expand and refine searches in databases. For example:
 - Truncation: “random*”
 - Wildcard: “randomi?ed”
 - Proximity operator: “depression adj3 disorder”, which returns records where “depression” and “disorder” are within 3 words of each other in any order

Special Operators

- **Search filters** are helpful when conducting searches.
 - The "InterTASC Information Specialists' Sub-Group Search Filter Resource" website offers an overview of search filters for various types of studies in biomedical databases (york.ac.uk/inst/crd/intertasc).
- Cochrane has developed a highly sensitive **search string for randomized trials** (for PubMed)

```
((randomized controlled trial [pt]) OR  
(controlled clinical trial [pt]) OR  
(randomized [tiab]) OR  
(placebo [tiab]) OR  
(drug therapy [sh]) OR  
(randomly [tiab]) OR  
(trial [tiab]) OR  
(groups [tiab]))  
NOT  
((animals [mh] NOT humans [mh]))
```

Search Strings: An Simple Example

Suppose that you want to do a meta-analysis of **cognitive behavior therapy** for **depression** compared with **waitlist control groups**, and that you would start your search in PubMed:

```
(“depressive disorder, major” [MeSH Terms] OR  
“depressive disorder” [MeSH Terms])  
AND  
(Cogniti* AND (therapy OR treatment OR intervent*))  
AND  
(randomized controlled trial [pt] OR  
controlled clinical trial [pt] OR  
randomized [tiab] OR  
randomly [tiab])
```

Search Strings: An Simple Example

Suppose that you want to do a meta-analysis of **cognitive behavior therapy** for **depression** compared with **waitlist control groups**, and that you would start your search in PubMed:

```
(“depressive disorder, major” [MeSH Terms] OR  
“depressive disorder” [MeSH Terms])  
AND  
(Cogniti* AND (therapy OR treatment OR intervent*))  
AND  
(randomized controlled trial [pt] OR  
controlled clinical trial [pt] OR  
randomized [tiab] OR  
randomly [tiab])
```

→ Is there something missing?

Search Strings: An Simple Example

- The string searches for all kinds (i) populations and (ii) control groups.
 - On Pubmed, it yields 3,164 results (2023-04-14), which is manageable in practice.
- **Better be general/sensitive than miss studies with strings that are too specific!**

```
("depressive disorder, major" [MeSH Terms] OR  
"depressive disorder" [MeSH Terms])  
AND  
(Cogniti* AND (therapy OR treatment OR intervent*))  
AND  
(randomized controlled trial [pt] OR  
controlled clinical trial [pt] OR  
randomized [tiab] OR  
randomly [tiab])
```

→ **Is there something missing?**



The PubMed Search Mask

pubmed.ncbi.nlm.nih.gov/advanced/



String Builder (Terms)

Query Box

(Complete Strings)

Search History
(with hits)

The screenshot shows the PubMed Advanced Search Builder interface. The top header includes the NIH logo, 'National Library of Medicine', 'National Center for Biotechnology Information', and a 'Log in' button. Below the header, the title 'PubMed Advanced Search Builder' is displayed. The interface is divided into three main sections, each highlighted by a blue box and a line pointing to a label on the left:

- String Builder (Terms):** This section includes the 'Add terms to the query box' area. It features a dropdown menu set to 'All Fields', a text input field for 'Enter a search term', and a blue 'ADD' button with a dropdown arrow. A 'Show Index' link is located below the 'ADD' button.
- Query Box:** This section contains a large text input field for 'Enter / edit your search query here' and a blue 'Search' button with a dropdown arrow.
- Search History (with hits):** This section is titled 'History and Search Details' and includes 'Download' and 'Delete' icons. It contains a table with the following data:

Search	Actions	Details	Query	Results	Time
#1	...	>	Search: ("depressive disorder, major" [MeSH Terms] OR "depressive disorder" [MeSH Terms]) AND (Cogniti* AND (therapy OR treatment OR intervent*)) AND (randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized [tiab] OR randomly [tiab])	3,164	08:15:39

Below the table, it says 'Showing 1 to 1 of 1 entries'.

Other Methods

Apart from searching bibliographical databases, other methods to identify studies for inclusion in a meta-analysis include:

- Going through the **references of the included studies** to see if additional trials were cited
- Searching for **earlier meta-analyses** or **treatment guidelines** that may have identified studies that were missed
- **Hand searching major journals** to identify additional studies
- Contacting **key experts** in the field for information on recently finished or ongoing studies
- Identifying unpublished studies through **trial registers**, such as the Clinical Trials Search Portal from the WHO (ICTRP).



who.int/clinical-trials-registry-platform

Develop Your Own Search!

In groups:

- Use the PubMed Advanced Search (pubmed.ncbi.nlm.nih.gov/advanced) to develop a search string for the PICO you developed in the last session
- Use the search builder, Boolean operators, truncation, wildcards, etc. to find a good search string
- Find MeSH terms and use them to improve your search (meshb.nlm.nih.gov)
- Eyeball if the search provides “good” hits that might fulfill your eligibility criteria
- 1,000-10,000 hits are usually optimal
- The Cochrane RCT Filter can be found below

