Systematic reviews

How to do them without going crazy

What is a systematic review?

- Attempt to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question.
- It uses explicit, systematic methods that are selected with a view to minimizing bias, to provide more reliable findings
- It has clearly stated set of objectives with pre-defined eligibility criteria for studies;
- It has explicit, reproducible methodology;
- It has a systematic search that attempts to identify all studies that would meet the eligibility criteria

What is a systematic review?

- Many systematic reviews contain meta-analyses. Meta-analysis is the use of statistical methods to summarize the results of independent studies.
- By combining information from all relevant studies, meta-analyses can provide more precise estimates of the effects (or prevalence etc) than those derived from the individual studies included within a review.
- They also facilitate investigations of the consistency of evidence across studies, and the exploration of differences across studies.

Steps in a systematic review

- Design a question
- PICO
- Design a search strategy
- Conduct searches
- Review abstracts and titles
- Obtain full text
- Extract data
- Risk of bias
- Analyse data

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Designing a research question

- Most important part of doing a systematic review
- If you go wrong at this stage, you will have problems throughout
- Think it through, and you will make your life easier
- PICOS

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PICOS

- P-articipants
- I-nterventions
- C-omparisons
- O-utcomes
- S-tudy designs

PICOS

- Participants
  - What is your population of interest?
  - For example: pregnant women, patients with acute rheumatic fever
- Interventions
  - Calcium supplementation, anti-inflammatory drugs
- Comparisons
  - Placebo, any other treatment
- Outcomes
  - Hypertensive disease, reduction in hospital stay
- Study designs
  - RCTs, cohort studies

Other designs

- Prevalence studies
- Population-Women of reproductive age
- Outcome-People with obstetric fistula
- Study designs-Cohort studies, cross-sectional studies

Inclusion/exclusion criteria

- Exclusion based on pre-existing conditions
- Time frame
- Language restrictions
- Regions of the world

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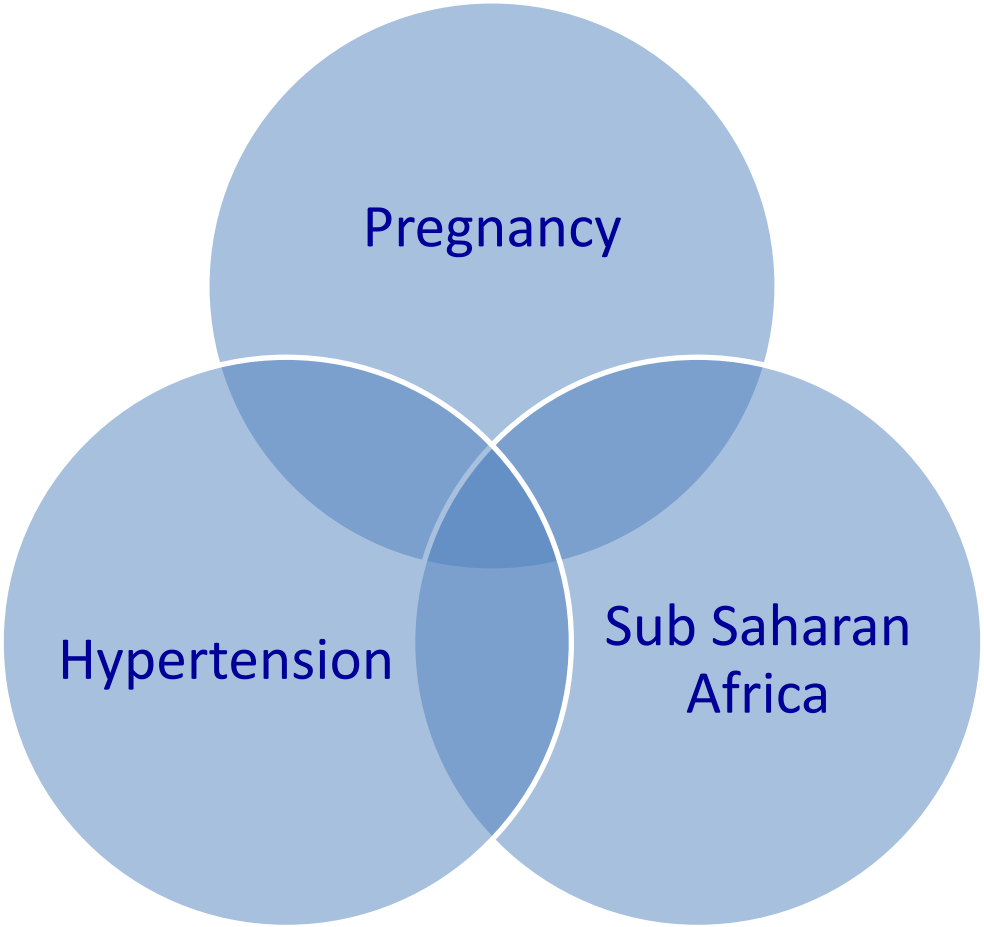
Search Strategy

- Trade off between being specific and sensitive
- Needs to be very inclusive and systematic
- Mesh Subject headings and free text
- http://www.ncbi.nlm.nih.gov/pubmed

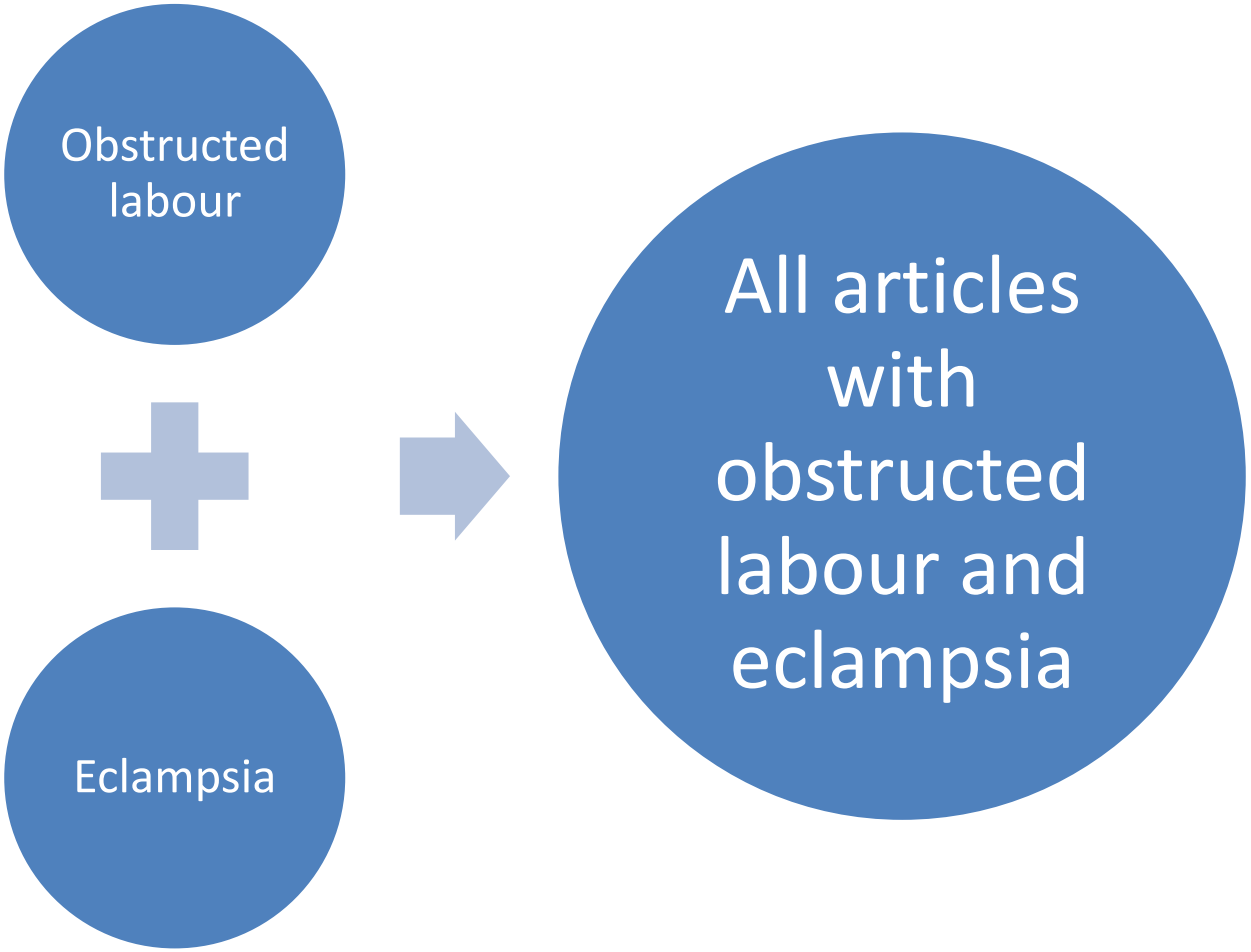
Boolean Operators

- Ands , ors and nots
- In general do NOT use NOTs
  - If necessary use not nots
- Ands restrict
- Ors increase

AND



OR


Obstructed labour
Eclampsia
All articles with obstructed labour and eclampsia

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Conduct a search

- Databases
  - Medline (Pubmed)
  - Embase
  - Web of Science
  - Cochrane library
  - Popline
  - WHO regional databases
    - IMEMR-Eastern Mediterranean Region
    - LILACS-Latin American and the Caribbean
    - AIM-Sub Saharan Africa

A-Z list of databases

All databases listed are available to LSHTM staff and students from any computer with an internet connection. If required, login with your network username and password (DL students logon with your University of London Portal username and password).

- **ABI/INFORM Global** (business & management)
  About this database | available via Senate House Library
- **Academic Search Complete** (general academia)
  About this database | available via Senate House Library
- **ADOLEC** (adolescent health)
  About this database | Freely available
- **Africa-Wide Information** (Africa)
  About this database | Access offsite
- **Anthropology Plus** (anthropology)
  About this database | available via Senate House Library
- **BASE** (general academic)
  About this database | Freely available
- **BDENF** (nursing)
  About this database | Freely available
- **BIOETICA** (bioethics)
  About this database | Freely available
- **Biology Browser** (life sciences)
  About this database | Freely available
- **BIOSIS Citation Index** (life sciences)
  About this database | Access offsite
- **Business Source Premier** (business)
  About this database | available via Senate House Library

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Go through titles abstracts

- How many records identified?
- Ideally should have two people screening abstracts
- Reference management software
  - Endnote
  - Reference manager

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Full text

- LSHTM
  - You can with two clicks get many full text articles through endnote
- UCL
- Senate house
- Interlibrary loan
- British Library
- Contact authors

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Extract data

- Best to use a pre-designed, pretested form
- Access
- Best to have double extraction (at least a certain percentage)

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Risk of Bias

- Now tools for looking at quality are discouraged
- ROB tools in observational studies are unreliable and discouraged
- Ottawa-Newcastle

Risk of Bias-RCTs

- Random sequence generation
- Allocation concealment
- Randomisation
- Blinding of participants and personal
- Blinding of outcome
- Incomplete outcome reporting
- Selective reporting
- Publication bias

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