The systematic search for studies
Basic Cochrane Review course 2012

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Searching for information

- Means searching for in formation in an article

- Characterise information by one or more concepts (PICO S)
    - disease: depression
    - study-design: cohort study

- Translate into search terms for the specific database

- Search with one or a combination of search terms
    - rare disease: satoyoshi syndrome: search term: satoyoshi
    - asthma AND occupation*
    - asthma AND occupation* AND mould

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Exercise

- Which concepts can be found in the following request for information?

    - What is the best therapy for a teacher with voice problems?

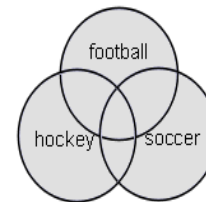**Finnish Institute of Occupational Health**
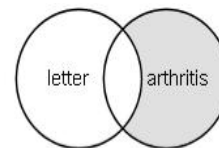
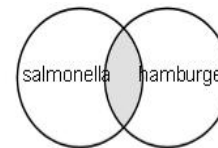# Boolean Operators
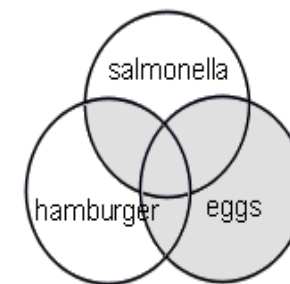
- Use Boolean operators: AND OR NOT

- football OR hockey OR soccer

- Arthritis NOT letter

- Salmonella AND hamburger

- Salmonella AND (hamburger OR eggs)

- Salmonella AND hamburger OR eggs

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How many results?

- Sensitive:
  - Finds all but at the cost of a lot of rubbish
  - High number needed to read

- Specific:
  - Finds little rubbish but not all that is available
  - Low number needed to read

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Searching for studies

www.cochrane-handbook.org

Part 2: General methods for Cochrane reviews

Chapter 6: Searching for studies

reference:

Lefebvre C, Manheimer E, Glanville J. Chapter 6: Searching for studies. In: Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions.*

Available from www.cochrane-handbook.org.

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Searching for studies - Key points (Lefebvre et al.)

- The Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE should be searched for all Cochrane reviews

- Searches should seek high sensitivity, which may result in relatively low precision.

- Too many *different* search concepts should be avoided, but a wide variety of search terms should be combined with OR within *each* concept.

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Search strategies - Structure of a search strategy

- a search strategy to identify studies for a Cochrane review will typically have three sets of terms:

- P: terms to search for the health condition of interest, i.e. the population

- I: terms to search for the intervention(s) evaluated

- S: terms to search for the types of study design to be included (typically a 'filter' for randomized trials)

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Sources to search

Bibliographic databases

- Medline/PubMed
- Embase
  - use text words and controlled vocabulary
- Cochrane Central Register of Controlled trials
- Subject-specific databases
  - BIOSIS
  - CINAHL
  - PsycINFO
  - etc.

- Citation Indexes
  - Science Citation Index
  - Social Sciences Citation Index
  - etc

- (dissertations and thesis databases
- grey literature databases
- Journals and other non-bibliographic database sources)

COSH databases

- osh.cochrane.org

- The COSH databases contain references (i.e. NOT full articles) to studies relating to the prevention and treatment of occupational or work-related diseases, injuries and disorders. (at present years 1992-2007)

- EBM studies (randomized controlled trials, controlled clinical trials, and interrupted time-series)

- Before-After studies (uncontrolled before-after measurement only)

- Systematic reviews

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Medline / PubMed

- ## MEDLINE
  - over 20 million references to journal articles in life sciences with a concentration on biomedicine
  - indexed with NLM's Medical Subject Headings

- ## PubMed
  - free version of MEDLINE (also includes up-to-date citations not yet indexed for MEDLINE and some additional records)
  - time coverage: generally from 1949 to present

www.nlm.nih.gov/pubs/factsheets/medline.html

www.nlm.nih.gov/pubs/factsheets/pubmed.html

www.nlm.nih.gov/pubs/factsheets/dif_med_pub.html

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MeSH
Medical Subject Headings

- MeSH is the National Library of Medicine's controlled vocabulary thesaurus.
  - 25,186 descriptors in 2009 MeSH
  - hierarchy (MeSH Tree)
  - used for indexing and searching in Medline/PubMed
  - continually revised and updated

- MeSH Database
  - http://www.ncbi.nlm.nih.gov/sites/entrez?db=mesh

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Search fields and field codes in PubMed

- All Fields [ALL]
- Author[AU]
- First Author Name [1AU]
- MeSH Term[MH]
- MeSH Major Topic[MAJR]
- MeSH Subheading[SH]
- Substance Name[NM]
- Publication Type[PT]
- Text Word[TW]
- Title[TI]
- Title/Abstract[TIAB]

PubMed

MeSH Terms:

- Adolescent
- Adult
- Aged
- Arousal/drug effects
- Caffeine/therapeutic use*
- Central Nervous System Stimulants/therapeutic use*
- Circadian Rhythm
- Cross-Over Studies
- Disorders of Excessive Somnolence/drug therapy*
- Disorders of Excessive Somnolence/etiology*
- Female
- Humans
- Laboratories
- Male
- Middle Aged
- Occupational Diseases/complications
- Psychomotor Performance/drug effects
- Reaction Time/drug effects
- Sleep*
- Sleep Disorders, Circadian Rhythm/complications*

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PubMed

Publication Types:

- Randomized Controlled Trial
- Research Support, U.S. Gov't, P.H.S.

Substances:

- Central Nervous System Stimulants
- Caffeine

Grant Support:

- R01 OH03966/OH/NIOSH CDC HHS/United States

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Search filters

- Designed to retrieve specific types of records

- a search filters web site developed by the UK InterTASC Information Specialists Subgroup (ISSG)

- www.york.ac.uk/inst/crd/intertasc

- lists methodological search filters and provides critical appraisals of the various filters

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The Cochrane Highly Sensitive Search Strategies for identifying randomized trials in MEDLINE

sensitivity-maximizing version (2008 revision) PubMed format

#1 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]

#2 animals [mh] NOT (humans [mh] AND animals [mh])

#3 (#1 NOT #2)

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The Cochrane Highly Sensitive Search Strategies for identifying randomized trials in MEDLINE

sensitivity- and precision-maximizing version (2008 revision); PubMed format

#1 randomized controlled trial [pt] OR controlled clinical trial[pt] OR randomized [tiab] OR placebo [tiab] OR clinical trials as topic [mesh: noexp] OR randomly [tiab] OR trial [ti]

#2 animals [mh] NOT (humans [mh] AND animals [mh])

#3 (#1 NOT #2)

where

- [pt] denotes a Publication Type term
- [tiab] denotes a word in the title or abstract
- [sh] denotes a subheading
- [mh] denotes a Medical Subject Heading (MeSH) term
- [ti] denotes a word in the title
- [1au] means first author
- [au] means author

Our search strategies

- The COSH most sensitive search strategy for occupational health intervention studies:

  (effect*[tw] OR control[tw] OR controls*[tw] OR controla*[tw] OR controle*[tw] OR controli*[tw] OR controll*[tw] OR evaluation*[tw] OR program*[tw]) AND (work[tw] OR works*[tw] OR work'*[tw] OR worka*[tw] OR worke*[tw] OR workg*[tw] OR worki*[tw] OR workl*[tw] OR workp*[tw] OR occupation*[tw] OR prevention*[tw] OR protect*[tw])

- The COSH most specific search strategy for occupational health intervention studies:

  (program[tw] OR "prevention and control"[sh]) AND (occupational [tw] OR worker*[tw])

  http://osh.cochrane.org/search-strategies

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Exercise Searching

- You are involved in a review *on the effectiveness of repairing buildings that are affected by mould (mold) in decreasing respiratory symptoms.* You start with looking for randomised controlled trials.

- Exercise:
  - Make the appropriate PICO S
  - Translate into search terms
  - Search PubMed with your search terms
  - Make a list of RCTs that evaluated mould remediation in buildings for decreasing respiratory symptoms

Search Strategy Mould Review

- Respiratory Symptoms and Diseases
  - 1 exp Respiratory Tract Diseases/
  - 2 exp Respiratory Tract Infections/
  - 3 (respiratory adj3 (infection* or disease* or symptom*)).tw.
  - 4 Sick Building Syndrome/
  - 5 sick building syndrome.tw.
  - 6 exp Otitis Media/
  - 7 Common Cold/
  - 8 Influenza, Human/
  - 9 Asthma/
  - 10 exp Rhinitis/
  - 11 exp Sinusitis/ or exp Conjunctivitis/ or exp Eye Disease/microbiology
  - 12 Cough/
  - 13 (otitis media or wheez* or common cold* or influenza* or asthma* or rhinit* or sinusit* or conjunctivit* or eye symptom* or cough*).tw.
  - 14 or/1-13
- Water damage or Mould
  - 15 Humidity/
  - 16 exp Fungi/
  - 17 Water/
  - 18 Air Microbiology/
  - 19 Air Pollution, Indoor/
  - 20 (damp* or moistur* or humid* or mould* or mold* or condensation* or fungal* or fungi* or water vapour* or water vapor* or micro?organism* or spore*).tw.
  - 21 or/15-20
- Reparation of Building
  - 22 (repair* or renovat* or remediat* or rebuild* or reconstruct* or drain* or remov* or reparat* or reduc* or dehumidificat* or refurbis* or recapsul* or decontaminat* or dry or drying).tw.
- Final combination of concepts
  - 23 14 AND 21 AND 22

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Results Mould Review

- Burr ML, et al. Effects on patients with asthma of eradicating visible indoor mould: a randomised controlled study. Thorax 2007;62:766-771.

- Howden-Chapman P, et al. Effect of insulating existing houses on health inequality: cluster randomised study in the community. BMJ 2007;334:460

- Kercsman CM, et al. Reduction in asthma morbidity in children as a result of home remediation aimed at moisture sources. Environmental Health Perspectives 2006;114:1574-1580.