A Sea of Citations:
Where to fish to catch the most?

or

Which bibliographic databases to use and why?

Charlie Wessel, MLS  Email: cbw@pitt.edu
Health Sciences Library System
University of Pittsburgh
A Sea of Citations

- Reasons for searching multiple databases
- Core databases used in systematic reviews of health care interventions
- Locating and evaluating specialized/regional databases
- Hidden features of PubMed and Embase
Methods for Conducting SRs

Cochrane Collaboration

• Cochrane Handbook for Systematic Reviews of Interventions
• Methodological Expectations of Cochrane Intervention Reviews (MECIR): Standards for the conduct and reporting of new Cochrane Intervention Reviews, reporting of protocols and the planning, conduct and reporting of updates

Effective Health Care Program –AHRQ (Agency for Healthcare Quality)

• Methods Guide for Effectiveness and Comparative Effectiveness Reviews

Institute of Medicine; Board on Health Care Services; Committee on Standards for Systematic Reviews of Comparative Effectiveness Research; Jill Eden, Laura Levit, Alfred Berg, and Sally Morton, Editors Finding what works in health care: standards for systematic reviews. Washington, DC: The National Academies Press. 2011

CRD (Centre for Reviews and Dissemination) - University of York, Heslington, York, UK


Methods/Reporting guidelines Keeping Current

PubMed SR Methods filter sysrev_methods [sb]

• Learn more about it here

Methods Library - Article Alert AHRQ's Effective Healthcare Program Scientific Resource Center | subscribe to this list |

Effective Health Care Program –AHRQ (Agency for Healthcare Quality) Methods Document Search

Equator Network (Enhancing the QUAlity and Transparency Of health Research)
DOI: http://dx.doi.org/10.1136/ebmed-2016-110552

There is a need for additional strategies for performing systematic reviews (SRs) to improve translation of findings into practice and influence health policy. SRs critically appraise research methodology and determine level of evidence of research findings. The standard type of SR identifies randomized controlled trials (RCTs) as providing the most valid data and highest level of evidence. RCTs are not among the most frequently used research design in disability and health research. RCTs usually measure impairments for the primary research outcome rather than improved function, participation or societal integration. It forces a choice between "validity" and "utility/relevance." Other approaches have effectively been used to assess the validity of alternative research designs, whose outcomes focus on function and patient-reported outcomes. We propose that utilizing existing evaluation tools that measure knowledge, dissemination and utility of findings, may help improve the translation of findings into practice and health policy.
DOI: http://dx.doi.org/10.1016/j.dhjo.2016.07.001

Clinical research is frequently hampered by flaws in its design or conduct. Such biases have been well documented. However, reports of clinical research may also be biased and present results in a more favourable way than they deserve or downplay harms. Such ‘spin’ in reporting has been demonstrated empirically. This short commentary summarises some of the problems with spin in reports of clinical research as well as signposts to some of the empirical evidence demonstrating its effect.
<table>
<thead>
<tr>
<th>Type of reporting bias</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication bias</td>
<td>The <em>publication</em> or <em>non-publication</em> of research findings, depending on the nature and direction of the results</td>
</tr>
<tr>
<td>Time lag bias</td>
<td>The <em>rapid</em> or <em>delayed publication</em> of research findings, depending on the nature and direction of the results</td>
</tr>
<tr>
<td>Multiple (duplicate) publication bias</td>
<td>The <em>multiple</em> or <em>singular publication</em> of research findings, depending on the nature and direction of the results</td>
</tr>
<tr>
<td>Location bias</td>
<td>The <em>publication</em> of research findings in journals with different ease of access or levels of indexing in standard databases, depending on the nature and direction of results.</td>
</tr>
<tr>
<td>Citation bias</td>
<td>The <em>citation</em> or <em>non-citation</em> of research findings, depending on the nature and direction of the results</td>
</tr>
<tr>
<td>Language bias</td>
<td>The <em>publication</em> of research findings <em>in a particular language</em>, depending on the nature and direction of the results</td>
</tr>
<tr>
<td>Outcome reporting bias</td>
<td>The <em>selective reporting of some outcomes but not others</em>, depending on the nature and direction of the results</td>
</tr>
</tbody>
</table>
Why search more than 1 database?

- Topic Coverage/comprehensiveness
- Geographic region/Language
- Search interface/functionality
- Vocabulary/indexing
  - thesaurus vs keyword

<table>
<thead>
<tr>
<th>Database</th>
<th>Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indexing</td>
<td>Selection criteria</td>
</tr>
<tr>
<td>Language</td>
<td>Publication types</td>
</tr>
<tr>
<td>Country of Origin</td>
<td>Years covered</td>
</tr>
</tbody>
</table>
Why search more than 1 database?

Only 30% - 80% of all known published randomized trials were identifiable using MEDLINE (depending on specialty or specific topic)


Relying exclusively on a MEDLINE search may retrieve a set of reports unrepresentative of all reports that would have been identified through a comprehensive search of several sources.

Why search more than 1 database?

The degree of citation overlap varies widely according to the topic but studies comparing searches of MEDLINE & EMBASE, have generally concluded that a comprehensive search requires that both databases be searched.

**6.2.1.3** MEDLINE and EMBASE. IN: Cochrane Handbook for Systematic Reviews of Interventions. Version 5.1.0 [updated March 2011]

Although MEDLINE and EMBASE searches tend not to identify the same sets of references, they have been found to return similar numbers of relevant references.

“The selection of databases is ideally based on the potential contribution of each database to the project or on the potential for bias if a database is excluded, as supported by research evidence. “(Sampson, 2003)

Will the studies found [or not found] influence the results of the meta-analysis?
### TABLE 3-2 Expert Suggestions for Conducting the Search Process and Addressing Reporting Bias

<table>
<thead>
<tr>
<th>Expertise required for the search:</th>
<th>AHRQ</th>
<th>CRD</th>
<th>Cochrane</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Work with a librarian or other information specialist with SR training to plan the search strategy</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Use an independent librarian or other information specialist to peer review the search strategy</td>
<td>√</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search:</th>
<th>AHRQ</th>
<th>CRD</th>
<th>Cochrane</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bibliographic databases</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Citation indexes</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Databases of unpublished and ongoing studies</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Grey-literature databases</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Handsearch selected and conference abstracts</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Literature cited by eligible studies</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Regional bibliographic databases</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Studies reported in languages other than English</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Subject-specific databases</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>• Web/Internet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Contact:                                                                                  |      |     |          |
| • Researchers to clarify study eligibility, study characteristics, and risk of bias        |      |     |          |
| • Study sponsors and researchers to submit unpublished data                               | √    | √   | √        |
Recommended Standards for Finding and Accessing Individual Studies (Institute of Medicine, 2011)

Standard 3.1 Conduct a comprehensive systematic search for evidence

Standard 3.1.4 Search bibliographic databases

Standard 3.1.8 Search subject-specific databases if other databases are unlikely to provide all relevant evidence

Standard 3.1.9 Search regional bibliographic databases if other databases are unlikely to provide all relevant evidence
Which bibliographic databases to search?

All Cochrane Reviews:

- Cochrane Central Register of Controlled Trials (CENTRAL)
- MEDLINE
- EMBASE

“The three bibliographic databases generally considered to be the most important sources to search for reports of trials”

Which bibliographic databases to search?

**Effective Health Care Program – AHRQ (Agency for Healthcare Quality)**

Search at least two databases:

- Begin with MEDLINE including in-process and other non-indexed citations
- And the Cochrane Central Register of Controlled Trials (CENTRAL)
- If topic researched primarily outside of the U.S. search databases with international coverage such as EMBASE
Which bibliographic databases to search?

IOM Standard 3.1.4: Search bibliographic databases

- Cochrane Central Register of Controlled Trials (CENTRAL)
- MEDLINE
- EMBASE
- Database of Abstracts of Reviews of Effects (DARE) Centre for Reviews and Dissemination (York University)

IOM Standard BOX 3-2 Bibliographic Databases
Status of the 26 million+ citations in PubMed

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Citations supplied electronically when first received.</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Partial</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations from issues of journals published before journal selected for MEDLINE® indexing (records received prior to late 2003).</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations from non-MEDLINE journals (records received prior to June 2005).</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations in review for inclusion in MEDLINE</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fully indexed citations.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations originally printed in hardcopy indexes published from 1947 through 1965 that have not yet had all of their original subject terms mapped to current MeSH.</td>
<td>Partial</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Out-of-scope articles from selectively indexed MEDLINE journals</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Since late 2003, citations from issues of journals published prior to selection for MEDLINE indexing</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Since June 2005, citations from non-MEDLINE journals.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations for articles with full-text in PubMed Central® (PMC) that would not normally be in PubMed.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Citations for selected books and book chapters in the NCBI Books database.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
# MEDLINE Citation Counts

<table>
<thead>
<tr>
<th>Number of Journals in MEDLINE</th>
<th>Number of Citations in MEDLINE</th>
<th>Total Citations¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,623²</td>
<td>869,666</td>
<td>23,531,948</td>
</tr>
</tbody>
</table>

## MEDLINE® Citation Counts by Year of Publication (as of mid - November 2015) *

MEDLINE consists of completed citations indexed with MeSH® (Medical Subject Headings®).

<table>
<thead>
<tr>
<th>Year of Publication</th>
<th>Total # Citations</th>
<th># Citations Published in US</th>
<th>%s Citations Published in US</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015¹</td>
<td>246,372</td>
<td>116,665</td>
<td>47%</td>
</tr>
<tr>
<td>2014</td>
<td>811,002</td>
<td>344,358</td>
<td>42%</td>
</tr>
<tr>
<td>2013</td>
<td>847,333</td>
<td>361,742</td>
<td>43%</td>
</tr>
<tr>
<td>2012</td>
<td>809,155</td>
<td>348,503</td>
<td>43%</td>
</tr>
<tr>
<td>2011</td>
<td>766,523</td>
<td>330,247</td>
<td>43%</td>
</tr>
<tr>
<td>2010</td>
<td>733,763</td>
<td>316,107</td>
<td>43%</td>
</tr>
<tr>
<td>2009</td>
<td>707,106</td>
<td>310,552</td>
<td>44%</td>
</tr>
<tr>
<td>2008</td>
<td>685,807</td>
<td>305,187</td>
<td>45%</td>
</tr>
</tbody>
</table>
Ovid MEDLINE

- Ovid MEDLINE 1946 to -*
- Ovid MEDLINE Daily Update*
- Ovid MEDLINE In-Process & Other Non-Indexed Citations*
- Ovid MEDLINE Epub Ahead of Print*

*day behind PubMed
MEDLINE Indexing

The average cost of indexing a MEDLINE article is $9.40; and special situations, such as the average cost of $4.90 to add a gene link, only add to the expense. https://ii.nlm.nih.gov/About/index.shtml

- 27,883 MeSH headings with 87,000 entry terms.
- MeSH heading may be further qualified by selections from 83 topical Subheadings (SHs)
- In addition there are 232,000 Supplementary
- Daily update

MEDLINE/PubMed Year-End Processing Activities for 2016
- Ovid Medline – gap of new items added between November and January when NLM updates MeSH
- More in-process records in PubMed than MEDLINE records until update is completed mid December
MEDLINE Indexing

NLM Medical Text Indexer (MTI) - Natural Language Processing technology

MTI indexing

- partially automates the standard indexing process and provides the initial indexing for a citation
- For approx. 350 journals
- Human indexer reviews this MIT indexing
  - modifies it as required
  - adding any missed terms
  - removing any incorrect terms
  - supplying Publication Types
EMBASE.com

- 30 million+ citations
- 8,500+ currently published journals
- Includes 6 million+ citations and 2,900 journals not covered by MEDLINE
- Articles-inPress and In-Process
- Conference abstracts
  - biomedical, drug and medical device conferences back to 2009
  - 6,000+ conferences covering 2 million+ conference abstract citations
- EMBASE Classic (1947-1973)
Articles-inPress, In-Process Conference Abstracts

- Automated procedures for provisional indexing with Emtree terms until fully manually indexed
- Terms are selected by an algorithm applied to the text of titles, abstracts and author keywords
  
  - The algorithm differentiates major and minor index terms
  - At this point:
    - Additional terms and subheadings are not indexed
    - Does not index trade names, manufacturer names, clinical trial numbers and molecular sequence numbers
EMTREE

- 70,000+ terms
- 290,000+ synonyms
- 14 facets (topic-specific taxonomies)
  - Largest facet “Drugs and Chemicals”
    - where half of the terms and 60% of synonyms reside
    - Emtree contains:
      - all drug generic names described by FDA and EMA
      - all International Non-Proprietary Names (INNs) described by WHO from 2000
      - extended coverage of Trade Names described by many major pharmaceutical companies.
- over 3,000 specific terms for medical devices

EMBASE Content
EMBASE Indexing Guide
Outcomes in Adults With Acute Liver Failure Between 1998 and 2013: An Observational Cohort Study.


Abstract

BACKGROUND: Acute liver failure (ALF) is a rare syndrome of severe, rapid-onset hepatic dysfunction without prior advanced liver disease, that is associated with high morbidity and mortality. Intensive care and liver transplantation provide support and rescue, respectively.

OBJECTIVE: To determine whether changes in causes, disease severity, treatment, or 21-day outcomes have occurred in recent years among adult patients with ALF referred to U.S. tertiary care centers.

DESIGN: Prospective observational cohort study. (ClinicalTrials.gov: NCT00518440)

SETTING: 31 liver disease and transplant centers in the United States.

PATIENTS: Consecutively enrolled patients without prior advanced liver disease with ALF (n = 2070).

MEASUREMENTS: Clinical features, treatment, and 21-day outcomes were compared over time annually for trends and were also stratified into two 8-year periods (1998 to 2005 and 2006 to 2013).

RESULTS: Overall clinical characteristics, disease severity, and distribution of causes remained similar throughout the study period. The 21-day survival rates increased between the two 8-year periods (overall, 67.1% vs. 75.3%; transplant-free survival [TFS], 45.1% vs. 56.2%; posttransplantation survival, 88.3% vs. 96.3% [P < 0.01 for each]). Reductions in red blood cell infusions (44.3% vs. 27.8%), plasma infusions (65.2% vs. 47.1%), mechanical ventilation (65.7% vs. 56.1%), and vasopressors (34.9% vs. 27.8%) were observed, as well as increased use of N-acetylcysteine (48.9% vs. 69.3% overall; 15.8% vs. 49.4% [P < 0.001] in patients with ALF not due to acetaminophen toxicity). When examined longitudinally, overall survival and TFS increased throughout the 16-year period.

LIMITATIONS: The duration of enrollment, the number of patients enrolled, and possibly the approaches to care varied among participating sites. The results may not be generalizable beyond such specialized centers.

CONCLUSION: Although characteristics and severity of ALF changed little over 16 years, overall survival and TFS improved significantly. The effects of specific changes in intensive care practice on survival warrant further study.

PRIMARY FUNDING SOURCE: National Institutes of Health.

Outcomes in adults with acute liver failure between 1998 and 2013: An observational cohort study


Annals of Internal Medicine 2016 164:11 (724-732)

To publish to the full text

Links @ Phil, UPMC

Abstract

Background: Acute liver failure (ALF) is a rare syndrome of severe, rapid-onset hepatic dysfunction without prior advanced liver disease that is associated with high morbidity and mortality. Intensive care and liver transplantation provide support and rescue, respectively. Objective: To determine whether changes in causes, disease severity, treatment, or 21-day outcomes have occurred in recent years among adult patients with ALF referred to U.S. tertiary care centers. Design: Prospective observational cohort study. (ClinicalTrials.gov: NCT00518440) Setting: Liver disease and transplant centers in the United States. Patients: Consecutively enrolled patients without prior advanced liver disease with ALF (n = 2070). Measurements: Clinical features, treatment, and 21-day outcomes were compared over time annually for trends and were stratified into 2-year periods (1998 to 2005 and 2006 to 2013). Results: Overall clinical characteristics, disease severity, and distribution of causes remained similar throughout the study period. The 21-day survival rates increased between the two 8-year periods (overall, 1% vs. 75.6%; transplant-free survival [TFS]: 45.1% vs. 56.2%; posttransplantation survival, 88.3% vs. 96.3% [P < 0.010 for each]). Reductions in red blood cell infusions (44.3% vs. 27.6%), plasma infusions (65.2% vs. 47.1%), mechanical ventilation (65.7% vs. 56.1%), and suppressors (34.5% vs. 27.8%) were observed, as was increased use of N-acetylcySTEine (48.9% vs. 69.3% overall; 15.3% vs. 49.4% [P < 0.001] in patients with ALF not due to acetaminophen toxicity). When examined longitudinally, overall survival and TFS increased throughout the 16-year period. Limitations: The duration of enrollment, the number of patients enrolled, and possibly the approaches to care varied among participating sites. The results may not be generalizable beyond such specialized centers. Conclusion: Although characteristics and severity of ALF changed little over 16 years, overall survival and TFS improved significantly. The effects of specific changes in intensive care practice on survival warrant further study.

2016 American College of Physicians.

Drug Terms

- acetylcysteine
- bilirubin
- creatinine
- paracetamol

Disease Terms

- acute liver failure
- autoimmune hepatitis
- Budd Chiari syndrome
- hepatitis B
- liver ischemia
- liver toxicity
- toxic hepatitis
- Wilson disease

Other Terms

- article
- artificial ventilation
- assisted ventilation
- clinical feature
- cohort analysis
- comorbidity
- disease severity
- erythrocyte transfusion
- female
- human
- liver transplantation
- major clinical study
- male
- observational study
- outcome assessment
- overall survival
- plasma transfusion
- priority journal
- prospective study
- survival rate
- survival time
- treatment duration
- United States

Author Addresses

Abu N: Division of Gastroenterology and Hepatology, Medical University of South Carolina, 114 Dougherty Street, Charleston, SC, United States.

CAS Registry Numbers

- acetylcysteine (616-91-1)
- bilirubin (18422-02-1)
- creatinine (19230-81-9)
- paracetamol (103-90-2)
Cochrane Central Register of Controlled Trials (CENTRAL)

- 964,387 records on Oct 21, 2016
- ~3/5 of records from MEDLINE
- others from
  - EMBASE
  - Cochrane’s 50 Review Groups’ Specialised Register
  - Handsearch Results Register
Cochrane Central Register of Controlled Trials (CENTRAL)

“Each month, CENTRAL is re-built using records from the four sources mentioned above, in the following order of precedence: (1) MEDLINE, (2) EMBASE, (3) handsearch results and (4) Specialised Registers. Therefore, for example, if a Specialised Register record matches to an existing MEDLINE or EMBASE record, the MEDLINE or EMBASE source record will be preferentially published.”

CENTRAL creation details. The Cochrane Library.
Recommended Standards for Finding and Accessing Individual Studies (Institute of Medicine, 2011)

Standard 3.1 Conduct a comprehensive systematic search for evidence

Standard 3.1.4 Search **bibliographic databases**

Standard 3.1.8 Search **subject-specific databases** if other databases are unlikely to provide all relevant evidence

Standard 3.1.9 Search **regional bibliographic databases** if other databases are unlikely to provide all relevant evidence
Specialized databases

- Comprehensive coverage of a specific topic or area
  - Some supported by professional associations
  - Relevance is the main inclusion criteria
  - Maybe subscription based

- Can index journals, online books, conference proceedings, dissertations, patents, government documents, other grey lit items

- Citation tracking often not available

(Gasparyan et al 2016)
### Specialized Databases

 vetor document number 29

**Table 4**

<table>
<thead>
<tr>
<th>Extended methods</th>
<th>Acupuncture</th>
<th>Lipid lowering</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal communication</td>
<td>27 (31.8%)</td>
<td>45 (20.7%)</td>
<td>72 (23.8%)</td>
</tr>
<tr>
<td>Specialized database</td>
<td>17 (20.0%)</td>
<td>79 (36.4%)</td>
<td>96 (31.8%)</td>
</tr>
<tr>
<td>Reference lists</td>
<td>28 (32.9%)</td>
<td>48 (22.1%)</td>
<td>76 (25.2%)</td>
</tr>
<tr>
<td>Hand searching</td>
<td>13 (15.3%)</td>
<td>45 (20.7%)</td>
<td>58 (19.2%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>85 (100.0%)</strong></td>
<td><strong>217 (100.0%)</strong></td>
<td><strong>302 (100.0%)</strong></td>
</tr>
</tbody>
</table>

(Helmer, 2001)
Finding specialized databases

- Look at other systematic reviews
  - In subject area
  - In journal where you intend to publish

- Discipline specific journals
  - Use Ulrich’s or similar product to see where journals are indexed
  - Journal websites may also say where indexed
  - Use Journal Citation Reports or other tool to determine highest impact factors and other criteria

- Association websites

- Vendors (EBSCO, Ovid, ProQuest)
Finding specialized databases

Appendix B in Relevo (2011) has nice table of specialized databases

<table>
<thead>
<tr>
<th>Database</th>
<th>URL</th>
<th>Topic Coverage</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2-SPECTR (Campbell Collaboration’s Social, Psychological, Educational and Criminology Trials Register)</td>
<td><a href="http://geb9101.gse.upenn.edu/">http://geb9101.gse.upenn.edu/</a></td>
<td>Trial Register for Social Sciences (similar to DARE)</td>
<td>Petrosio, 2000</td>
</tr>
<tr>
<td>ERIC (Education Resources Information Center)</td>
<td><a href="http://www.eric.ed.gov/">http://www.eric.ed.gov/</a></td>
<td>Education, including the education of health care professionals as well as educational interventions for patients</td>
<td>Anon, 2006</td>
</tr>
</tbody>
</table>
NLM Databases & Electronic Resources
Databases to search in other subject areas

- Social, behavioural, education and health sciences*
  - Applied Social Science Index and Abstracts
  - CENTRAL
  - ERIC
  - International Bibliography of the Social Sciences
  - MEDLINE
  - PsycINFO
  - Sociological Abstracts

- Agri-Food Public Health*
  - EMBASE
  - MEDLINE
  - AGRICOLA
  - CAB International
    - AGORA (Global Online Research in Agriculture)
  - Food Science & Technology Abstracts
  - Ingenta Connect
  - BIOSIS
  - Web of Science


### Electronic databases relevant to public health and health promotion*

- **Psychology**
  - PsycINFO
  - PsycLIT

- **Sociology**
  - Sociofile
  - Sociological Abstracts
  - Social Science Citation Index
  - Social Policy and Practice

- **Education**
  - ERIC
  - C2-SPECTR (Campbell Collaboration Social, Psychological, Educational and Criminological Trials Register) [http://www.campbellcollaboration.org](http://www.campbellcollaboration.org)
  - REEL (Research Evidence in Education Library, EPPI-Centre) [http://eppi.ioe.ac.uk](http://eppi.ioe.ac.uk)

- **Transport**
  - NTIS (National Technical Information Service)
  - TRID (Transport Research Information Service)
  - TRANSPORT – Ovid

- **Biomedical**
  - CINAHL
  - LILACS
  - Web of Science
  - MEDLINE
  - EMBASE
  - CENTRAL
  - Scopus

---

*Table 21.3.a: Electronic databases relevant to public health and health promotion. Cochrane Handbook for Systematic Reviews of Interventions. Version 5.1.0. updated March 2011*
Electronic databases relevant to public health and health promotion*

Physical activity
- SPORTDiscus

HP/PH
- BiblioMap
- TRoPHI (Trials Register of Promoting Health Interventions)
- DoPHER (Database of Promoting Health Effectiveness Reviews)

Evidence Search (National Institute for Health and Clinical Excellence)
- CAB Global Health

Other
- Popline (population health, family planning)
- Enviroline (environmental health) – available on Dialog
- Toxfile (toxicology) – available on Dialog
- Econlit (economics)

Campbell Collaboration is a nonprofit organization that aims to help people make well-informed decisions about the effects of interventions in the social, behavioral, and educational arenas. More specifically, it helps people make well-informed decisions by preparing, maintaining and disseminating systematic reviews in education, crime and justice, social welfare and international development. It is a sister initiative of the Cochrane Collaboration.
Recommended Standards for Finding and Accessing Individual Studies (Institute of Medicine, 2011)

Standard 3.1 Conduct a comprehensive systematic search for evidence

Standard 3.1.4 Search **bibliographic databases**

Standard 3.1.8 Search **subject-specific databases** if other databases are unlikely to provide all relevant evidence

Standard 3.1.9 Search **regional bibliographic databases** if other databases are unlikely to provide all relevant evidence
Where to find biomedical articles from Spain & Latin America?

(Bonfill et al 2015)
LILACS (Latin American and Caribbean Health Sciences Literature)

- By the Latin American and Caribbean Center on Health Sciences Information or BIREME was founded in Brazil in 1967 as the Biblioteca Regional de Medicina (Regional Library of Medicine, hence the acronym BIREME), a specialized center of the Pan-American Health Organization (PAHO) / World Health Organization (WHO)

- Registers health scientific-technical literature published by Latin American and Caribbean authors

- Interface and abstracts in English, Portuguese and Spanish

- Includes theses, books, book chapters, congresses/conferences, scientific-technical reports, journal articles, etc. in the health area

- MeSH is used to index each citation
LILACS

- 27 countries
- 906 journals
- 764,254 records
- 634,721 articles
- 86,109 monographies
- 35,819 thesis
- 350,044 full texts

Last update: November 18, 2016

Recommendation for Open Access and Online Content in LILACS
What did this regional database add?

Manriquez 2008
- SRs done in dermatology
- Ran a search in LILACS
- Found additional pertinent articles for 27% of the SRs

Clark & Castro 2002
- Looked at SRs published in 5 major medical journals
- Ran a search in LILACS
- Found additional pertinent articles for 63% of the SRs
Other Regional Indexes

- **African Index Medicus** (AIM)

- **Index Medicus for the Eastern Mediterranean Region** (IMEMR): Afghanistan, Bahrain, Egypt, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, occupied Palestinian territory, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.

- **Index Medicus for the South-East Asian Region** (IMSEAR): Bangladesh, Bhutan, Democratic People’s Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste

- **Western Pacific Region Index Medicus** (WPRIM): American Samoa, Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, French Polynesia, Guam, Hong Kong-China, Japan, Kiribati, Lao People’s Democratic Republic, Macao-China, Malaysia, Marshall Islands, Micronesia, Federated States of Mongolia, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Pitcairn Islands, Republic of Korea, Samoa, Singapore, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Viet Nam, Wallis and Futuna

World Health Organization’ **Global Index Medicus**
Regional Resources

World Health Organization

- **WHOLIS (KMS)**
  - Bibliographic database
  - WHO and Regional Representative Offices
  - Journal articles, technical and political documents
  - [Tutorial](#)

- **Scientific Electronic Library Online**
  - Open access model
  - 1,249 scientific journals, >13 million citations
  - Brazil, Chile, Cuba, Spain, Venezuela, other Latin American countries
Regional Resources

Search worldwide, life-sciences literature

Search more than abstracts
- Abstracts (31.1 million, including 26 million from PubMed)
- Full text articles (3.7 million)
- Patents (4.2 million)
- Agricola records (618,700)
- NHS clinical guidelines (760)

Link to public databases
Explore protein, gene, species and disease records directly from articles:
- UniProt
- Protein Data Bank (PDBe)
- European Nucleotide Archive (ENA)
- Wikipedia and other lay summaries

Get credit for your work
ORCID is a unique identifier for researchers which distinguishes you from every other researcher, and makes it easier to find your work.

Use our claiming tool to link your Europe PMC articles to your ORCID
Link articles to your ORCID

About Europe PMC
Learn how we use text-mining

Regional Resources

**Indian Medlars Centre**

- **IndMED**
  - Bibliographic database of ~100 Indian biomedical journals
  - 1985 to present
  - Supplements international indexing services like PubMed

- **medIND**
  - Free full-text of >50 journals indexed in IndMED
  - Peer reviewed
Regional Resources

- **KCI Korean Journal Database**
  - ~2000 scholarly journals (>1500 new to Web of Science (WOS))
  - Open access and subscription titles
  - Available through WOS (not at Pitt)

- **Chinese Science Citation Database**
  - ~1200 top scholarly publications from China
  - ~2 million records total
  - Non-English product
  - Presents much of information in simplified Chinese and English
  - Available through WOS (not at Pitt)
Regional Databases via Web of Science
Contribution of databases to SR results


The objective of this study: examine the potential impact on the results of existing SRs if searching was restricted to select bibliographic databases.

Image credit: thegoldguys.blogspot.com/
Hartling et al methodology

- Cochrane Child Health Register of 1,400 systematic reviews published in CDSR

- Included all systematic reviews that had at least one meta-analysis from three Cochrane review groups
  - Acute Respiratory Infections (ARI) n=57
  - Infectious Diseases (ID) n=38
  - Development, Psychosocial and Learning Problems (DPLP) n=34

- Sampled 50 reviews to develop a sample database list:

  Excluded:
  - Meta-search databases (SciSearch)
  - Citation databases
  - Trial registries
  - Regional subsets-MEDLINE
  - Dissertation databases
  - “Highly” Specialized databases
  - CENTRAL Database
Hartling et al methodology

Selected 10 databases

- Ovid Medline (1946-Current)
- BIOSIS Citation Index via Thomson Reuters Web of Knowledge (1926-Current)
- CAB Direct via CABI (1910-Current)
- CINAHL Plus with Full Text via EBSCOhost (1937-Current)
- Ovid Embase (1974-Current)
- Ovid ERIC (1965-Current)
- Ovid HaPI - Health and Psychosocial Instruments- (1985-Current)
- Ovid IPA - International Pharmaceutical Abstracts (1965-Current)
- LILACS via BIREME Virtual health Library (inception-Current)
- Ovid PsycINFO (1806-Current)
Hartling et al methodology

- Listed all studies included in the primary meta-analysis for each SR.
  - Designated as the primary outcome
  - If not specified selected the first meta-analysis
- For each meta-analysis they searched the ten databases to see how many of the trials were in each
- Recorded how many studies were not indexed in MEDLINE and how many of these were indexed in each of the additional database

- For each meta-analysis they re-analyzed the data for changes in effect based on studies identified:
  - only in MEDLINE
  - MEDLINE + BIOSIS
  - MEDLINE + EMBASE
- For the DPLY meta-analyses they found more indexed in PsycINFO with less in MEDLINE. So they combined studies identified:
  - (PsycINFO + MEDLINE) + BIOSIS
  - (PsycINFO + MEDLINE) + EMBASE
Table 2

Databases where trials were found that were not found in Medline

<table>
<thead>
<tr>
<th>Database</th>
<th>Acute Respiratory Infections (n = 57 meta-analyses)</th>
<th>Infectious Diseases (n = 38 meta-analyses)</th>
<th>Developmental, Psychosocial and Learning Problems (n = 34 meta-analyses)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Trials Found (of 398)º</td>
<td>Total Trials Found (of 238)º</td>
<td>Total Trials Found (of 144)º</td>
</tr>
<tr>
<td></td>
<td>Number found that were not in MedLine (of 65)</td>
<td>Number found that were not in MedLine (of 32)</td>
<td>Number found that were not in MedLine or PsycINFO (of 23)</td>
</tr>
<tr>
<td>Medline</td>
<td>333 (84%)</td>
<td>206 (87%)</td>
<td>-</td>
</tr>
<tr>
<td>BIOSIS</td>
<td>258</td>
<td>164</td>
<td>72</td>
</tr>
<tr>
<td>CAB</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Direct</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CINAHL</td>
<td>75</td>
<td>32</td>
<td>43</td>
</tr>
<tr>
<td>EMBASE</td>
<td>310</td>
<td>178</td>
<td>84</td>
</tr>
<tr>
<td>ERIC</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>HAPI</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IPA</td>
<td>104</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>LILACS</td>
<td>0</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>PsycINFO</td>
<td>8</td>
<td>3</td>
<td>121 (84 %)</td>
</tr>
</tbody>
</table>

ºPercentages do not match those in Table 1; the percentages here are an average across all trials (by review group)

¹Number of trials not found in any database was 26 for ARI, 18 for ID, and 12 for DLP. Number of systematic reviews with ≥1 trial not found in any database was 10 for ARI, 9 for ID, and 8 for DLP

²Total trials found in Medline and/or PsycINFO
In a nut (clam) shell here’s what they found

- Majority of relevant studies appear in a limited number of databases
- Results of meta-analysis with the majority of studies in the limited number of databases do not change effect estimates

This suggests searching only these select databases may not introduce bias in terms of effect estimates.
Here’s what they found

- Clinical areas of acute respiratory diseases; infectious diseases highest yield from:
  
  MEDLINE + EMBASE  
  or  
  MEDLINE + BIOSIS

- Developmental, Psychosocial and Learning Problems highest yield from:
  
  MEDLINE + PsycINFO
Hartling et “the pearl to take home”

- When conducting SRs on healthcare interventions it is appropriate to limit the numbers of databases to search
- The majority of trials in clinical areas found in MEDLINE & EMBASE or MEDLINE & BIOSIS
- Use of specialized or subject specific databases for specific topics will find additional citations
- If you find a small number of studies searching these few databases search more databases
- Supplement with other search methods
Deciding when to stop (Cooper et al, 2009)

- Have you identified and searched all databases that are likely to contain a significant # of citations?
- Have you verified there are no systematic biased omissions e.g. not excluded non-English articles?
- Have you adjusted search strategy with additional terms as you examined highly relevant citations?
- As you tested new search terms or used complementary databases how many new, unique relevant citations did you identify?

- You are done if you answer yes to:
  - Is the identification of new references in your last 3 searches down to less than 1%?
  - After hours of searching you have located any new relevant citations

- You are not done if you answer yes to:
  - Are you still finding new relevant citations?
When is enough database searching enough?

- Would one more database reference, one more study, one more trial make a difference?
- Are you confident in the integrity of your search and found studies?
  - (Shultz SM et al. 2009)
- When time runs out and you had enough!
HSLS librarians are:

- good at casting the neat in the right sea (database)
- with the right bait (search strategy)
- to catch the most fish (citations) !!!!

The fishing was good; it was the catching that was bad.

Good things come to those who bait.
References


References


References


- Manriquez JJ. Searching the LILACS database could improve systematic reviews in dermatology. *Arch Dermatol* 2009;145(8):947-948.


References


