Systematic Review Literature Searches - The Librarian as Collaborator

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Stephen B. Thacker CDC Library

Brown Bag Presentation for DLPSS

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11:30 AM – 12:30 PM

Center for Surveillance, Epidemiology, and Laboratory Services

Division of Epidemiology, Analysis, and Library Services

Stephen B. Thacker CDC Library Overview

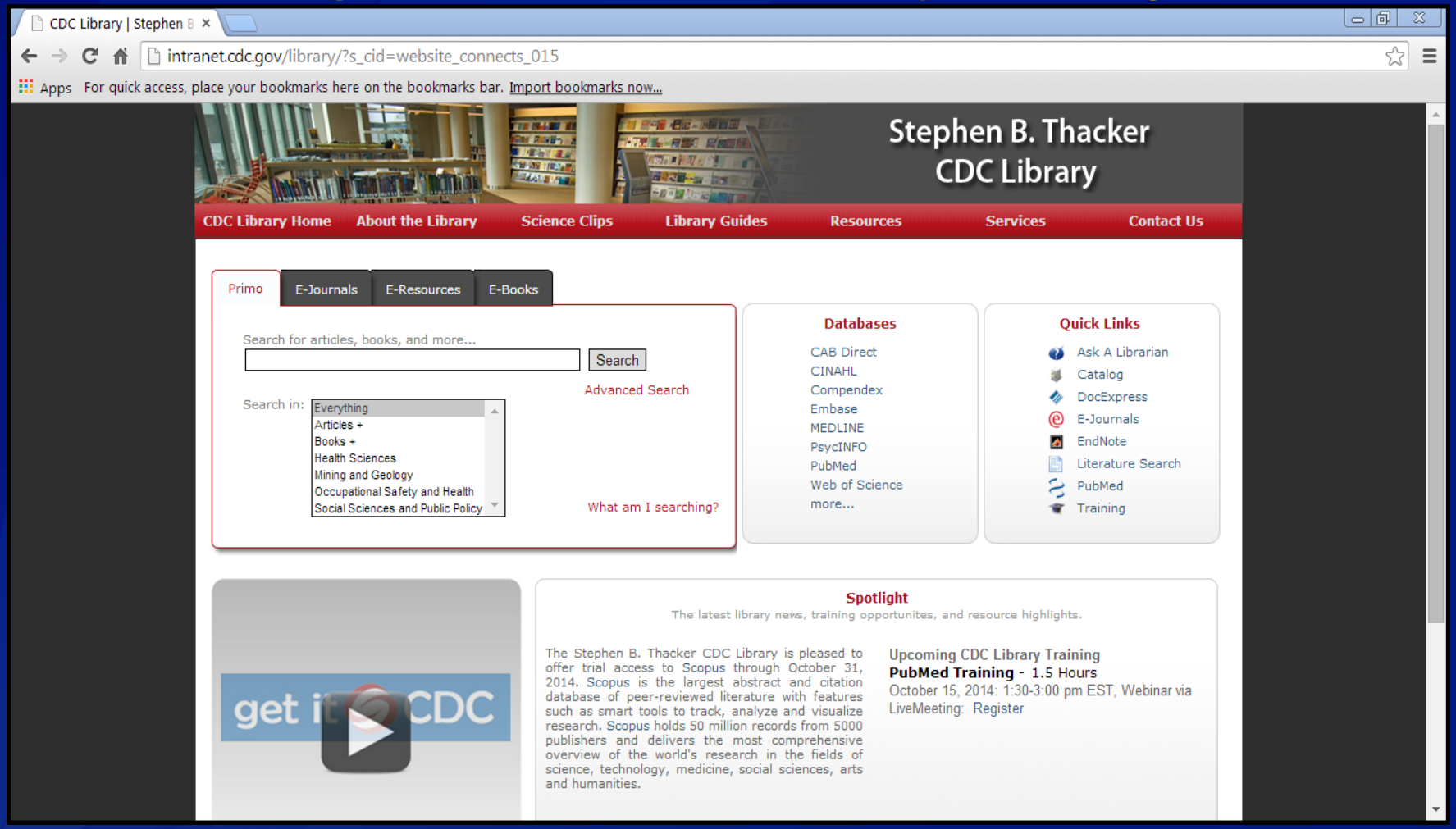
- **Organizational Home**: Division of Public Health Information Dissemination (DPHID) - Center for Surveillance, Epidemiology, and Laboratory Sciences (CSELS)
- **Mission**: Serve as CDC's hub for research, information exchange, and learning
- **Potential Users**: Approximately 15,500 CDC employees, contractors, and fellows domestically and internationally
- **Collections**: Diverse health science content available electronically and in print. 97,564 unique titles available across all collections and branches
- **Systems**: 6 integrated library systems are utilized to manage library functions and patron access to electronic resources
- **Branch Libraries**: 5 locations throughout the U.S.

At-A-Glance: Resources and Services

Library services are available to all employees (FTEs, Credentialed Contractors, and Fellows), domestic and international.

- **Access to journal articles and books**: More than 97,000 titles electronically and in print available through CDC's collection and Interlibrary Loan
- **Reference Services**: Searches of library catalogues and online bibliographic databases to locate information about a specific topic or support for development of research papers or projects
- **Training**: Formal and informal education opportunities to introduce new products, services, and information management methods and to assist researchers
- ***Science Clips***: An online bibliographical digest featuring scientific articles/publications to enhance awareness of emerging scientific knowledge
- **Working Space**: Workspace, meeting rooms, and touchdown stations available for use

Stephen B. Thacker CDC Library Home Page



12 Reasons to include a Librarian on your next Systematic Review

1. To determine if your proposed systematic review has been done before
2. To help formulate your clinical questions(s)
3. To clarify and refine your search strategy
4. To help define your inclusion and exclusion criteria
5. To determine which databases are appropriate to search based on the scope, date range, and subject content of your systematic review
6. To avoid potential problems with nomenclature in your search strategies
7. To have an expert on hand with knowledge on individual database accessibility and of the different search syntax/truncation requirements for each database
8. To have an expert on hand with knowledge on searching not just published journal articles, but also areas of grey literature like book chapters, ongoing trials, conference abstracts, white papers, and even unpublished studies
9. To collect and file the “yes” articles from the initial search screening, either manually or through interlibrary loan
10. For help in writing the “methodology” section of the systematic review
11. To generate the final bibliography
12. To give your systematic review the added credibility of including a librarian as part of the research team, as recommended by the Institute of Medicine, the Cochrane Collaboration, and the Medical Library Association

Source: “Biofeedback Newsletter” University of South Alabama Biomedical Library Issue 101, May 2014

Systematic Reviews Need Systematic Searchers - McGowan

- **Abstract**

This paper will provide a description of the methods, skills, and knowledge of expert searchers working on systematic review teams.

- **BRIEF DESCRIPTION:**

Systematic reviews and meta-analyses are very important to health care practitioners, who need to keep abreast of the medical literature and make informed decisions. Searching is a critical part of conducting these systematic reviews, as errors made in the search process potentially result in a biased or otherwise incomplete evidence base for the review. Searches for systematic reviews need to be constructed to maximize recall and deal effectively with a number of potentially biasing factors. Librarians who conduct the searches for systematic reviews must be experts.

- **DISCUSSION/CONCLUSION**:

Expert searchers need to understand the specifics about data structure and functions of bibliographic and specialized databases, as well as the technical and methodological issues of searching. Search methodology must be based on research about retrieval practices, and it is vital that expert searchers keep informed about, advocate for, and, moreover, conduct research in information retrieval. Expert searchers are an important part of the systematic review team, crucial throughout the review process-from the development of the proposal and research question to publication.

[1]McGowan J; Sampson, M . “Systematic Reviews Need Systematic Searchers.” J Med Libr Assoc. 2005 January;93(1):74-80.

Librarian as Collaborator

- Systematic Reviews of the literature require **expert, exhaustive searches** - librarians have a master's degree in library science and certain librarians have specialized training and expertise in the type of searches needed for systematic reviews.

- "Searching is a critical part of conducting the systematic review, as errors in the search process potentially result in a biased or otherwise incomplete evidence base."[1]

- The literature search process must be transparent and replicable.

[1]McGowan J; Sampson, M . "Systematic Reviews Need Systematic Searchers." J Med Libr Assoc. 2005 January;93(1):74-80.

Regular Literature Searches vs. Systematic Review Literature Searches

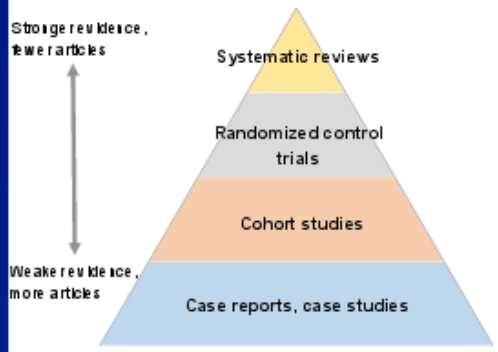
Regular Lit Search	Systematic Review Lit Search
One database OK	At least two/three databases up to dozens
Sample of good references	Exhaustive list of references
Few irrelevant citations	Many irrelevant citations
Results in dozens	Results in thousands or tens of thousands
Search with controlled vocab only OK	Search controlled vocab, title/abstract words
Results in Word or text file are manageable	Bibliographic management software a must (EndNote, etc.)
Can be less defined topic	Inclusion/Exclusion criteria, must answer specific question (e.g., PICO)
Search terms/key words are sufficient	Reproducible, fully documented search strategies
One author is OK	Three or more authors
Lit search portion may only take a day to complete	Lit search may take three weeks

Differences Between Systematic Review and Literature Review

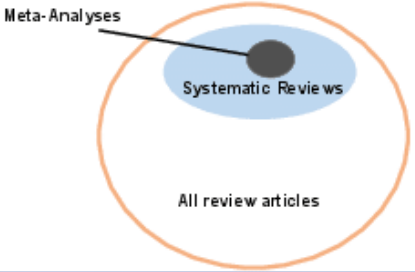
What's In a Name?: The Difference Between a Systematic Review and a Literature Review and Why It Matters

Lynn Kysh, MLIS • Information Services Librarian • University of Southern California, Norris Medical Library

A note about evidence... In evidence-based practice, systematic reviews are considered one of the highest levels of information.



A note about meta-analyses... A meta-analysis is the use of statistical methods to combine data from studies included in a systematic review. Not all systematic reviews include a meta-analysis.

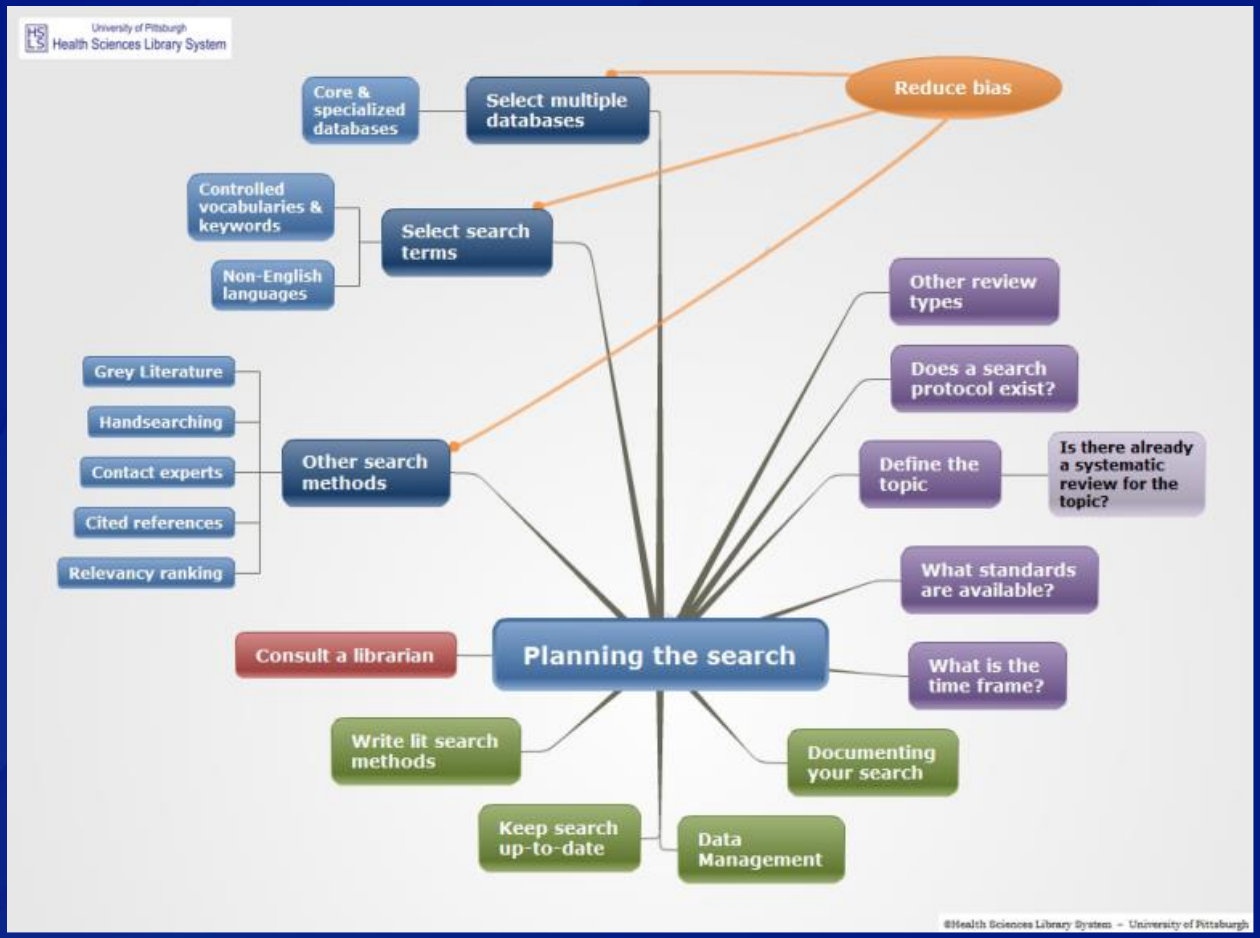


Librarians expertly understand information needs and are able to connect questions to the appropriate publications. However, faculty, students, and clinicians often do not have as much practice in this set of skills. The common confusion between systematic reviews and literature reviews exemplifies this disconnect. True, both systematic reviews and literatures combat information overload in the health sciences by providing summaries of the literature published on a topic. However, they vary significantly in terms of goals, components, and value in research, publication, and evidence-based practice. Librarians can work against this disconnect by educating their library patrons of these key differences and thereby support research and evidence-based practice.

	Systematic Review	Literature Review
Definition	High-level overview of primary research on a focused question that identifies, selects, synthesizes, and appraises all high quality research evidence relevant to that question.	Qualitatively summarizes evidence on a topic using informal or subjective methods to collect and interpret studies.
Goals	Answer a focused clinical question Eliminate bias	Provide summary or overview of topic
Question	Clearly defined and answerable clinical question Recommend using PICO as a guide	Can be a general topic or a specific question
Components	Pre-specified eligibility criteria Systematic search strategy Assessment of the validity of findings Interpretation and presentation of results Reference list	Introduction Methods Discussion Conclusion Reference list
Number of Authors	Three or more	One or more
Timeline	Months to years Average eighteen months	Weeks to months
Requirements	Thorough knowledge of topic Perform searches of all relevant databases Statistical analysis resources (for meta-analysis)	Understanding of topic Perform searches of one or more databases
Value	Connects practicing clinicians to high quality evidence Supports evidence-based practice	Provides summary of literature on a topic

By Lynn Kysch USC – Norris Medical Library. Poster presentation from Medical Library Group of Southern California & Arizona (MLGSCA) and the Northern California and Nevada Medical Library Group (NCNMLG) Joint Meeting in July 2013

MindMap - Planning the Search



From the University of Pittsburgh Health Sciences Library Services Systematic Review LibGuide
http://hsls.libguides.com/c.php?g=36029&p=228581

Librarian as Collaborator

- Plan
- Search
- Deliver
- Report
- Update
- Train

PRISMA Checklist See #7 Describe all Information Sources

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	

Librarian as Collaborator – Plan

- Include librarian in planning session(s)
- Important for developing search vocabulary terms, choosing databases to search
- Overview of question and concepts
- Share example documents already found with librarian – 3 to 5 “sentinel articles” that represent all desired concepts, meet all inclusion/exclusion criteria

Librarian as Collaborator – Plan

- Term generation – key words, synonyms
- Alternate spellings (UK)
- Acronyms and abbreviations
- Commercial product names (drugs, vaccines)
- Archaic terms
- New technology terms
- Multiple ways of expressing one concept
- Consult thesauri for controlled vocabulary
- Read full text of select articles

Librarian as Collaborator – Search

- Identify Databases to be Searched
- Develop Search Strategies and Run Searches
- Document Search Strategies, Number of Results
- Manage Search Results in EndNote

Cochrane Checklist for Developing Search Strategy

B. CHECKLIST FOR DEVELOPING A SEARCH STRATEGY

1.	Define text words	
2.	Determine synonyms for the text words	
3.	Control for different spellings or using appropriate truncations	
4.	Consider brand names when searching for a specific drug treatment	
5.	Perform test searches – I	
6.	Identify "controlled vocabulary" (keywords) used for the indexing of databases (MeSH for MEDLINE, EMTREE for EMBASE)	
7.	Decide on whether to perform an "exploded" or a "focussed" search for keywords	
8.	Check if all words are spelled correctly!!!!	
9.	Combine logically all search terms	
10.	Perform test searches – II	
11.	Customise the syntax of your search strategy to the specific databases	

How to Develop a Search Strategy for a Cochrane Review

http://chmg.cochrane.org/sites/chmg.cochrane.org/files/uploads/How%20to%20develop%20a%20search%20strategy-support-manual.pdf

Databases

- PubMed
- Medline (OVID)
- Web of Knowledge/SCOPUS
- Cochrane Library
- Embase
- PsycINFO
- CINAHL
- EconLit
- ERIC
- Sociological Abstracts
- CAB Direct/Global Health
- LILACS
- Agricola
- Social Services Abstracts

- Campbell http://www.campbellcollaboration.org/
- CRD-York http://www.york.ac.uk/inst/crd/
- DTIC http://www.dtic.mil/dtic/
- SIGLE http://www.opengrey.eu/
- WorldCat http://worldcat.org
- CDC OSH Database
- NLM Gateway
- Dissertation Abstracts
- Lexis/Nexis
- JSTOR
- Google / Google Scholar
- ABI/Inform
- PAIS
- NTIS

Databases

Things to consider…

- There may be other databases that need to be searched, depending on the subject.
- Librarians have access to and knowledge of hundreds of specialized databases.
- Search strategies need to be adjusted to the database.
- Different databases have different controlled vocabularies or no controlled vocabularies.
- Different search interfaces may not all be able to handle lengthy search strings.

Librarian as Collaborator - Search

- Specify search limits – years of publication, age groups, gender, language(s) of publication, geographic, animal studies, human subjects, specific populations
- Types of studies - trials, cohort, case-control, case reports, reviews, longitudinal, or any type?
- Types of interventions – search “intervention*” or “program*” but also be specific and search specific actions/activities
- Types of publications - peer-reviewed journal articles, editorials, letters, comments, corrections, retractions, books, book chapters, conferences, technical reports, government reports, grey literature, web sites, economic analyses, dissertations, theses

Librarian as Collaborator - Search

Search hedges/filters are pre-tested strategies that assist in limiting search results to a specific sub-set of the database.

Example – PubMed filter to find systematic reviews -

(systematic review [ti] OR meta-analysis [pt] OR meta-analysis [ti] OR systematic literature review [ti] OR
(systematic review [tiab] AND review [pt]) OR consensus development conference [pt] OR
practice guideline [pt] OR cochrane database syst rev [ta] OR acp journal club [ta] OR
health technol assess [ta] OR evid rep technol assess summ [ta])
OR
((evidence based[ti] OR evidence-based medicine [mh] OR best practice* [ti] OR evidence synthesis [tiab])
AND
(review [pt] OR diseases category[mh] OR behavior and behavior mechanisms [mh] OR therapeutics [mh] OR
evaluation studies[pt] OR validation studies[pt] OR guideline [pt]))
OR
((systematic [tw] OR systematically [tw] OR critical [tiab] OR (study selection [tw]) OR
(predetermined [tw] OR inclusion [tw] AND criteri* [tw]) OR exclusion criteri* [tw] OR main outcome measures [tw] OR
standard of care [tw] OR standards of care [tw])
AND
(survey [tiab] OR surveys [tiab] OR overview* [tw] OR review [tiab] OR reviews [tiab] OR search* [tw] OR
handsearch [tw] OR analysis [tiab] OR critique [tiab] OR appraisal [tw] OR (reduction [tw]AND (risk [mh] OR risk [tw]) AND (death OR recurrence)))
AND
(literature [tiab] OR articles [tiab] OR publications [tiab] OR publication [tiab] OR
bibliography [tiab] OR bibliographies [tiab] OR published [tiab] OR
unpublished [tw] OR citation [tw] OR citations [tw] OR database [tiab] OR internet [tiab] OR textbooks [tiab] OR
references [tw] OR scales [tw] OR papers [tw] OR datasets [tw] OR trials [tiab] OR meta-analy* [tw] OR
(clinical [tiab] AND studies [tiab]) OR treatment outcome [mh] OR treatment outcome [tw]))
NOT (letter [pt] OR newspaper article [pt] OR comment [pt])

Librarian as Collaborator - Search

Where to find Hedges/Filters –

- **Health Services Research -**
  http://www.nlm.nih.gov/nichsr/hedges/search.html
- **BestBets**
  http://bestbets.org/links/search-strategies.php
- **McMaster**
  http://hiru.mcmaster.ca/hiru/HIRU_Hedges_home.aspx
- **PubMed special queries**
  http://www.nlm.nih.gov/bsd/special_queries.html
- **PubMed Clinical Queries (includes systematic reviews)**
  http://www.ncbi.nlm.nih.gov/pubmed/clinical

Librarian as Collaborator - Search

Search

- Run a test search
- See if it picks up the sentinel articles
- Get feedback on test search results
- Revise search strategies if necessary
- Run searches in all databases
- Import all results into EndNote library
- Remove duplicates using EndNote feature and manually

Librarian as Collaborator - Search

Search terms

- Controlled vocabulary
- Related terms
- Subheadings
- Words in titles
- Words in abstracts
- Phrases – adjacency searching
- Truncation
- Equivalent terms across databases
- Medline – MeSH = Influenza Vaccines
- MeSH broader term = Viral Vaccines

Librarian as Collaborator - Search

Search terms – Example

Web of Science – no controlled vocabulary

- - search TS= “flu vaccin*” or TS=“influenza vaccin*” or TS=“flu shot*” [phrase with truncation]
- **-** search (TS=(vaccin* NEAR influenza)) [proximity within 15 words]
- - search TS=(Afluria or Agriflu or Agrippal or Fluarix or Flulaval or Flumist or Flushield or Fluvax or Fluvirin or Fluzone or Vaxigrip) [commercial product names]

Librarian as Collaborator - Search

Embase : Controlled Vocabulary

EMTREE search for influenza vaccine

Embase EMTREE = influenza vaccine
[Used for] 113 terms

admune
aflunov
afluria
agriflu
agrippal
agrippal s1
alorbat
anflu
anti grippe vaccine
anti influenza vaccine
antiinfluenza vaccine
fluinsure
flulaval
flumist
fluogen
fluvax
fluviral
fluviral s/f
fluvirin
fluvirine
fluviron
flustat
influenza virus A H1N1 vaccine
influenza virus a2
influenza virus a2-taiwan vaccin
fluzone pfs
fluzone preservative-free pediatric
fluzone sv
focetria
flushield
polyvalent influenza vaccine 1967
preflucel
prepandemic influenza vaccine
prepandemic influenza vaccine (H5N1)
prepandrix
previgrip
pumarix
sandovac
skf 106160
trivalent (drug)
vacciflu
vaccine,influenza
vaxigrip
vepacel
x-flu
gammaflu
grippovac
H1N1 influenza vaccine
humenza
idflu
inflexal
inflexal berna
inflexal berna
polyvalent vaccine
inflexal v
influenza A (H1N1) vaccine

influenza a vaccine
influenza a virus vaccine
influenza a2 vaccine
influenza b vaccine
influenza vaccine (H1N1)
influenza vaccines
influenza virus A H1N1 vaccine
influenza virus a2 vaccine
influenza virus a2-taiwan vaccine
influenza virus b vaccine
influenza virus vaccine
influenza virus vaccine (H1N1)
influenza virus vaccine (H5N1)
influenza virus vaccine (split virion, nactivated)
influenza virus vaccine live
influject
influpozzi
influsplit
influsplit tetra
influvac
influvac s
intanza
inviro[illegible]
iv[illegible]
iradogen
live attenuated influenza vaccine
adjupanrix
admune
aflunov
afluria
aggripal
agriflu
agrippal
agrippal s1
alorbat
anflu
anti grippe vaccine
anti influenza vaccine
antiinfluenza vaccine
arepanrix
b type influenza vaccine
batrevac
begrivac
begrivac f
begrivac s
bvx m001
celtura
celvapan
chiromas
daronrix
flu immune
flu imune
flu vaccine
flu-vac
fluad
fluad vaccine

fluarix
fluarix tetra
fluax
flublok
Flucelvax
fluenz
fluenz tetra
flugen
flugene
fluinsure
flulaval
flumist
fluogen
flushield
flustat
fluvax
fluviral
fluviral s/f
fluvirin
fluvirine
fluviron
fluzone
fluzone pf
fluzone preservative-free pediatric
fluzone sv
focetria
foclivia
gammaflu
grippovac
H1N1 influenza vaccine
humenza
idflu
inflexal
inflexal berna
inflexal berna polyvalent vaccine
inflexal v
influenza A (H1N1) vaccine
influenza a vaccine
influenza a virus vaccine
influenza a2 vaccine
influenza b vaccine
influenza vaccine (H1N1)
influenza vaccines
influenza virus A H1N1 vaccine
influenza virus a2 vaccine
influenza virus a2-taiwan vaccine
influenza virus b vaccine
influenza virus vaccine
influenza virus vaccine (H1N1)
influenza virus vaccine (H5N1)
influenza virus vaccine (split virion, inactivated)
influenza virus vaccine live
influject
influpozzi
influsplit
influsplit tetra

influvac
influvac s
intanza
inviro[illegible]
iv[illegible]
iradogen
live attenuated
influenza vaccine
live influenza vaccine
mastaflu
medi 3314
medi3314
mfv ject
multimeric 001
multimeric 001 vaccine
munevan
mutagrip
nivgrip
optaflu
pandemic influenza vaccine
pandemic influenza vaccine (H5N1)
pandemic influenza vaccine H5N1 Baxter
pandemrix
panenza
panvax
pf 4522625
pf4522625
polyvalent influenza vaccine
polyvalent influenza vaccine 1967
sandovac
ive influenza vaccine
mastaflu
medi 3314
medi3314
mfv ject
multimeric 001
vaccine
munevan
mutagrip
nivgrip
optaflu
preflucel
prepandemic
influenza vaccine
Prepandemic
influenza vaccine (H5N1)
prepandrix
previgrip
pumarix
skf 106160
trivalent (drug)
vacciflu
vaccine,influenza
vaxigrip
vepacel
x-flu

Keyword Search in PubMed – Topic is Economics of School-Based Health Centers/Clinics

- #1 (sbhc) or (sbhcs) or (school located) or (school based health care) or (school based health service) or (school based health center*) or (school based health centre*)or (school health centre*)or(school based health clinic*) or (school based clinic*) or (school clinic*) or (school based clinical) or (school health clinic*) or (school located immunization) or (school located vaccination) or (school dental) or (school based primary care) or (school based mental) or (school based adolescent health care)or (school physician*) or (school doctor*) or (school based doctor*) or (school dentist*) or (school based primary health care) or (school wellness policy)

- #2 ((intervent*) or (prevent*)or (quantitative) or (program evaluation) or (prevent*) or (pilot project*) or (trial*) or (summative evaluation) or (treatment outcome*) or (program effect*) or (treatment effect*) or (diagnosis) or (eval*) or (effective*) or (success*))

- #3 ((truant*) or (truancy) or (attendance) or (absent*) or (miss* school) or (economic*) or (cost) or (benefit) or (cost-benefit) or (benefit-cost)or (utility) or (cost-utility)or (expenditure) or (expense*) or (fee) or (cost effectiveness) or (cost of illness) or (burden of illness) or (funding*) or (efficiency) or ($) or (dollar*) or (QALY) or (quality-adjusted-life-year) or (DALY))

- #4 (developing countr*) or (Latin America*) or (Asia*) or (Mexic*) or (Central America*) or (South America*) or (Africa*)

- **#5 #1 AND #2 AND #3) NOT #4**

Results …

How PubMed Interprets the Keyword Search (31,169 citations found)

(((truant[All Fields] OR truant's[All Fields] OR truanted[All Fields] OR truanting[All Fields] OR truantr[All Fields] OR truants[All Fields] OR truants'[All Fields]) OR truancy[All Fields] OR attendance[All Fields] OR (absent[All Fields] OR absent'[All Fields] OR absenta[All Fields] OR absentations[All Fields] OR absente[All Fields] OR absented[All Fields] OR absentee[All Fields] OR absenteeim[All Fields] OR absenteeism[All Fields] OR absenteeism'[All Fields] OR absenteeisms[All Fields] OR absenteeistic[All Fields] OR absentees[All Fields] OR absentees'[All Fields] OR absenteesim[All Fields] OR absentei[All Fields] OR absenteism[All Fields] OR absenteisme[All Fields] OR absenteismo[All Fields] OR absenteismului[All Fields] OR absenteite[All Fields] OR absentele[All Fields] OR absentes[All Fields] OR absentfor[All Fields] OR absentia[All Fields] OR absentia'[All Fields] OR absentia4[All Fields] OR absentin[All Fields] OR absenting[All Fields] OR absention[All Fields] OR absentism[All Fields] OR absentismo[All Fields] OR absentismus[All Fields] OR absentizam[All Fields] OR absentizma[All Fields] OR absentizmus[All Fields] OR absently[All Fields] OR absentminded[All Fields] OR absentmindedly[All Fields] OR absentmindedness[All Fields] OR absentol[All Fields] OR absentone[All Fields] OR absentotherapie[All Fields] OR absentotherapy[All Fields] OR absents[All Fields]) OR ((miss[All Fields] OR miss'[All Fields] OR miss'n[All Fields] OR missa[All Fields] OR missable[All Fields] OR missabougou[All Fields] OR missachten[All Fields] OR missachtet[All Fields] OR missachtete[All Fields] OR missachtung[All Fields] OR missack[All Fields] OR missad[All Fields] OR missadaptation[All Fields] OR missade[All Fields] OR missadjustment[All Fields] OR missae[All Fields] OR missael[All Fields] OR missaen[All Fields] OR missaggia[All Fields] OR missaghi[All Fields] OR missaghian[All Fields] OR missaghp[All Fields] OR missagia[All Fields] OR missagilia[All Fields] OR missaglia[All Fields] OR missailidis[All Fields] OR missailidou[All Fields] OR missaillidis[All Fields] OR missair[All Fields] OR missak[All Fields] OR missaka[All Fields] OR missakaw[All Fields] OR missakian[All Fields] OR missal[All Fields] OR missala[All Fields] OR missale[All Fields] OR missalek[All Fields] OR missaleva[All Fields] OR missali[All Fields] OR missaligned[All Fields] OR missall[All Fields] OR missalla[All Fields] OR missama[All Fields] OR missamari[All Fields] OR missamou[All Fields] OR missampled[All Fields] OR missampling[All Fields] OR missan[All Fields] OR missana[All Fields] OR missanabie[All Fields] OR missanabiecree[All Fields] OR missanda[All Fields] OR missanelli[All Fields] OR missanjo[All Fields] OR missankov[All Fields] OR missano[All Fields] OR missanpassade[All Fields] OR missanpassning[All Fields] OR missant[All Fields] OR missao[All Fields] OR missaoui[All Fields] OR missaouia[All Fields] OR missaouinabiha[All Fields] OR missaouinahiba[All Fields] OR missapeared[All Fields] OR missapplication[All Fields] OR missappropriate[All Fields] OR missar[All Fields] OR missarelli[All Fields] OR missaridis[All Fields] OR missas[All Fields] OR missasauga[All Fields] OR missassembly[All Fields] OR missassi[All Fields] OR missassigned[All Fields] OR missassignment[All Fields] OR missat[All Fields] OR missath[All Fields] OR missau[All Fields] OR missaukee[All Fields] OR missault[All Fields] OR missauri[All Fields] OR missavage[All Fields] OR missawa[All Fields] OR missaye[All Fields] OR missbach[All Fields] OR missbakej[All Fields] OR missbakh[All Fields] OR missbedomt[All Fields] OR missbefinden[All Fields] OR missbeildung[All Fields] OR missberger[All Fields] OR missbichler[All Fields] OR missbidlungsrate[All Fields] OR missbidungen[All Fields] OR missbidungskonstitution[All Fields] OR missbildade[All Fields] OR missbildat[All Fields] OR missbildeten[All Fields] OR] OR missbildungsfrage[All Fields] OR…

Keyword Strategy Adjusted to PubMed (3328 citations found)

- #1 ("school health services"[mesh] or "school based" or “sbhc” or “sbhcs” or "school physican" or "school physicians" or "school nurse" or "school nurses" or "school wellness" or "school located" or "school doctor" or "school doctors" or "school dentisty" or "school dentists" or "school dentistry" or "school health" or "school mental health")

- #2 ("Intervention Studies"[Mesh] OR "Evidence-Based Practice"[Mesh]) OR "Program Evaluation"[Mesh]) OR ("Evaluation Studies as Topic"[Mesh] OR "Meta-Analysis" [Publication Type])) OR ("prevention and control" [Subheading] OR "Primary Prevention"[Mesh])) OR "Pilot Projects"[Mesh]) OR ("Clinical Trials as Topic"[Mesh] OR "Controlled Clinical Trial" [Publication Type] OR "Pragmatic Clinical Trial" [Publication Type] OR "Randomized Controlled Trial" [Publication Type] OR "Clinical Trial" [Publication Type] OR "Pragmatic Clinical Trials as Topic"[Mesh])) OR ("Evaluation Studies" [Publication Type] OR "Nursing Evaluation Research"[Mesh] OR "Health Care Quality, Access, and Evaluation"[Mesh] OR "Health Care Evaluation Mechanisms"[Mesh])) OR "Treatment Outcome"[Mesh]) OR ("diagnosis" [Subheading] OR "Delayed Diagnosis"[Mesh] OR "Early Diagnosis"[Mesh] OR "Nursing Diagnosis"[Mesh] OR "Diagnosis, Dual (Psychiatry)"[Mesh] OR "Diagnosis, Differential"[Mesh] OR "Diagnosis, Oral"[Mesh] OR "Diagnosis, Computer-Assisted"[Mesh] OR "Diagnosis"[Mesh]))) OR (intervent* or prevent*[tiab] or "quantitative"[tiab] or "program evaluation" or "pilot project" or "trial"[tiab] or "trials"[tiab] or "summative evalution" or "treatment outcome" or "treatment outcomes" or "program effect" or "program effects" or "program effectiveness" or "program's effectiveness" or "treatment effect" or "treatment effects" or "treatment effectiveness" or outcome*[tiab] or "diagnosis"[tiab] or "diagnoses"[tiab] or evaluat*[tiab] or effective*[tiab] or success*[tiab])

- #3 ("Economics"[Mesh] OR "economics" [Subheading] OR "Economics, Nursing"[Mesh]) OR ("Costs and Cost Analysis"[Mesh] OR "Cost Savings"[Mesh] OR "Cost-Benefit Analysis"[Mesh] OR "Health Care Costs"[Mesh])) OR ("Capital Expenditures"[Mesh] OR "Health Expenditures"[Mesh])) OR "Fees and Charges"[Mesh]) OR "Cost of Illness"[Mesh]) OR "Capital Financing"[Mesh]) OR "Efficiency"[Mesh]) OR "Quality-Adjusted Life Years"[Mesh])) OR ("daly"[tiab] or "qaly"[tiab] or "quality adjusted life years"[tiab] or "dollar"[tiab] or "dollars"[tiab] or "efficiency"[tiab] or "funding"[tiab] or "burden of illness"[tiab] or "cost of illness"[tiab] or "cost"[tiab] or "costs"[tiab] or "costly"[tiab] or "truant"[tiab] or “truants”[tiab] or "truancy"[tiab] or "attendance"[tiab] or "absent"[tiab] or "absences"[tiab] or "miss school"[tiab] or "missed school"[tiab] or "missing school"[tiab] or "missed days"[tiab] or "economic"[tiab] or "economics"[tiab] or "benefit"[tiab] or "benefits"[tiab] or "utility"[tiab] or "expenditure"[tiab] or "expenditures"[tiab] or "expense"[tiab] or "expenses"[tiab] or "fee"[tiab] or "fees"[tiab])

- #4 #1 AND #2 AND #3

Librarian as Collaborator – Deliver

Deliverables:

- One EndNote Library file with results from all databases searched with duplicates removed
- Additional search results that could not be imported into Endnote.
- Search documentation

Librarian as Collaborator - Report

Search Documentation

- Brief narrative describing search
- List of databases/platforms
- Descriptions of database scope/ time period covered
- Dates of searches
- Number of results in each database
- Types of documents included (journal articles, books, book chapters, conference proceedings, etc.)
- Inclusion, exclusion criteria

Librarian as Collaborator - Report

Search Documentation

- Provide an explanation for any other studies searched or included (e.g., hand-searches, reference checks, expert searches).
- Save search strategies both within the databases and in the documentation for future updates. Keep print as well as electronic files of documentation.
- Document name of database, platform provider, date(s) searched, COMPLETE strategies for each database.

Example of a Results Table

Database	Database Span	Run Date	Citations Retrieved
Medline OVID (R)	1946-present	4/17/2014	6425
Embase OVID	1988-present	4/17/2014	10768
PsychInfo OVID	1910-present	4/18/2014	825
CINAHL EbscoHost	1981-present	4/18/2014	4205
Web of Science*	1980-present	4/16/2014	894
Cochrane Library Database	1996-present	4/17/2104	821
FedRip EbscoHost	Current	4/18/2014	429

Librarian as Collaborator - Update

How frequently to update search?

- AHRQ Technical Review – Updating Systematic Reviews
- Subjective – depends on the topic
- Lit search should be done less than 12 months from publication of review

http://archive.ahrq.gov/downloads/pub/evidence/pdf/sysrev/sysrev.pdf

Librarian as Collaborator - Train

Ongoing Training Classes from Stephen B. Thacker CDC Library

- **PubMed Training**
- **Basic Search Techniques**
- **Discover Your Library**
- **EndNote Training**

All training sessions are open to all CDC staff, but space is limited. Registration via the CDC University/HHS Learning Portal is required for all sessions.

Systematic Review Searching Resources

Standards:

- Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.
- IOM (Institute of Medicine). 2011. *Finding What Works in Health Care: Standards for Systematic Reviews.* Washington, DC: The National Academies Press.) Available from http://www.iom.edu/Reports/2011/Finding-What-Works-in-Health-Care-Standards-for-Systematic-Reviews.aspx

Cochrane Literature Searching:

- http://www.cochrane.org/about-us/evidence-based-health-care/webliography/books/litsearch

Guidelines:

- Umscheid CA. A Primer on Performing Systematic Reviews and Meta-analyses. Clin Infect Dis. 2013 Sep;57(5):725-34. doi: 10.1093/cid/cit333. Epub 2013 May 22.
- Liberati A., et al. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. PLoS Medicine 6(7): e1000100.

Systematic Review LibGuides:

- Health Sciences Library Systems U Pitt http://hsls.libguides.com/content.php?pid=465546&sid=3811822
- Texas A&M University Research Guides http://guides.library.tamu.edu/systematicreviews

More Resources on Systematic Review Searching

Finding Search Filters:

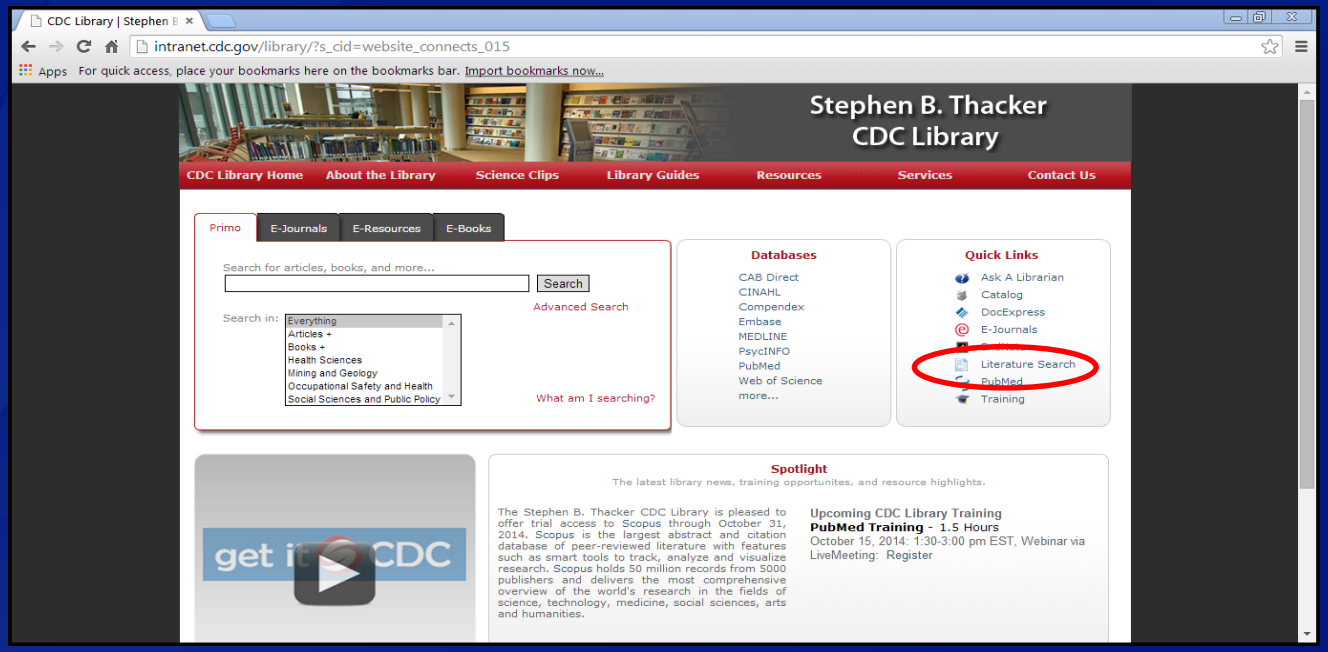
- http://hiru.mcmaster.ca/hiru/HIRU_Hedges_home.aspx Filters by the Hedges team (McMaster University)
- Jenkins M (2004). Evaluation of methodological filters – a review. Health Information and Libraries Journal, 21, 148-163. PMID: 15318913
- Jenkins M & Johnson F. (2004). Awareness, use and opinions of methodological search filters used for the retrieval of evidence-based medical literature – a survey. Health Information and Libraries Journal, 21, 33-43. PMID: 15023207

Additional Reading:

- Beverley CA, Booth A, Bath PA. The role of the information specialist in the systematic review process: a health information case study. Health Info Libr J. 2003 Jun;20(2):65-74.
- Centre for Reviews and Dissemination, University of York,. (2008). Systematic Reviews: CRD's guidance for undertaking reviews in health care. York, UK: CRD, University of York. http://www.york.ac.uk/inst/crd/index_guidance.htm
- Reeves S, Koppel I, Barr H, Freeth D, Hammick M. Twelve tips for undertaking a systematic review. Med Teach. 2002 Jul;24(4):358-63
- Klem M, Saghafi E, Abromitis R, Stover A, Dew M, Pilkonis, P. (2009). Building PROMIS item banks: Librarians as co-investigators. Quality of Life Research, 18(7), 881-888.
- Sampson, M., & McGowan, J. (2006). Errors in search strategies were identified by type and frequency. *Journal of Clinical Epidemiology, 59*(10), 1057-1063

Literature Search Support

- Stephen B. Thacker CDC Library has an online form that may be used to request literature searches – right side of main web page under “Quick Links”
- The systematic review process typical requires extensive effort, and the typical turnaround time for a literature search for it is 3 weeks though it may take longer.
- Library staff will contact you if additional information is needed to complete your search. If you have questions or would like additional information, please call (404) 639-1717.



Questions?

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Joanna Taliano – 404-639-1596 jtaliano@cdc.gov
Stephen B. Thacker CDC Library
Roybal Campus Building 19, 1st floor
8:00am – 4:30pm (After hours: Card key access)
404-639-1717 reference desk
cdclibrary@cdc.gov
http://intranet.cdc.gov/library/

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info