



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

McMaster University EPC

State of the Evidence: Health IT Evidence-Based Practice Center Reports Track 1 Medication Management

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**Evidence Report
MM and HIT
Fall 2010**

June 3 2010



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State of the Evidence: Retrieval

Objectives

- Look at the literature of health IT and its challenges
- Finding citations—theoretical calculations
- Finding citations—practical help
 - For those who need everything
 - For those who need just some of the best

Values for those who seek information

- Calculate the size of a literature—*know when to stop searching for those producing systematic reviews*
- Understand how a literature is *indexed*—*how to improve your retrievals in MEDLINE with new tools*
- Build on information retrieval work of others
 - Searching filters
 - AHRQ websites and others
 - Federated searching



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Problems with retrieval in health IT

- New fast paced area with moving definitions



Problems with retrieval in health IT

- New fast paced area with moving definitions
- 118 Medline citations with “meaningful use”

#	OR	Mesh
63	<input type="checkbox"/>	<u>Humans</u>
35	<input type="checkbox"/>	<u>United States</u>
22	<input type="checkbox"/>	<u>American Recovery and Reinvestment Act</u>
19	<input type="checkbox"/>	<u>Female</u>
18	<input type="checkbox"/>	<u>Male</u>
16	<input type="checkbox"/>	<u>Diffusion of Innovation</u>
11	<input type="checkbox"/>	<u>Adult</u>
10	<input type="checkbox"/>	<u>Child</u>
8	<input type="checkbox"/>	<u>Child, Preschool</u>
8	<input type="checkbox"/>	<u>Middle Aged</u>



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Problems with retrieval in health IT

- New, fast paced area with moving definitions
- Differences across disciplines, counties
- Difference across time
- Our discipline is weak in its theoretical foundation
- Lots of commercial development with little testing—not much published in clinical (hard core) literature
- Lots of inhouse development with small budgets—again not much published
- Ongoing development (ever changing)—not the sort of material that lends itself to clinical evaluation/publishing



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Problems with retrieval in health IT

Getting what you cannot have

Absolute zero

Perpetual motion

All the literature on a topic



Capture Mark Recapture Statistical Methods

Alternate Names

capture-recapture

capture-mark-recapture

mark-recapture

sight-resight

mark-release-recapture

multiple systems estimation

band recovery

Calculate what the total size of a literature (stop)



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Capture Mark Recapture Statistical Methods

Lincoln-Peterson method

Poisson regression/modeling

Jolly-Seber method

Scnabel estimate



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Examples from biology and medicine

Estimate of a population by multiple sampling

Fish in a pond

Deer in Woodley Park

Polar bears

Asthma in a community

Theoretical maximum number of relevant citations
on a topic



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Method calculating population size

Fish in a pond

1. Go fishing and capture some fish
2. Put them back after marking them
3. Go fishing again (same methods or different ones)
4. Count the number of fish caught each time and number re-caught
5. Calculate the whole population of fish

Asthma in a community

1. Identify children who have asthma by using clinic records
2. Note their names (i.e., mark them)
3. Identify children in the school system who have asthma
4. Count the number of children with asthma in both systems noting overlap
5. Calculate the whole population of asthma

Formula for (2 samples) calculation

N = total population—what you want

M = marked in your first sampling foray

C = total caught or identified in second foray

R = total capture in first foray

$$N = MC/R$$

$$N = \{[(M+1)(C+1)]/R+1\} - 1$$

$$\text{Var } N = [(M+1)(C+1)(M-R)(C-R)]/[(R+1)(R+1)(R+2)]$$



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Formula for (>2 samples) calculation

Get better results with > 2 sampling times/methods

Need a statistician

Need some help—AHRQ?



Example: Health IT and Osteoporosis

First screen results

Medline + Embase	1177 found	1729 calculated
Add CINAHL	1210 found	1739 calculated
Add EBMR	1246 found	1838 calculated

...tried but could not find the “missing” 500-600

Example: Health IT and Osteoporosis

Final included RCTs with 95% Confidence Intervals

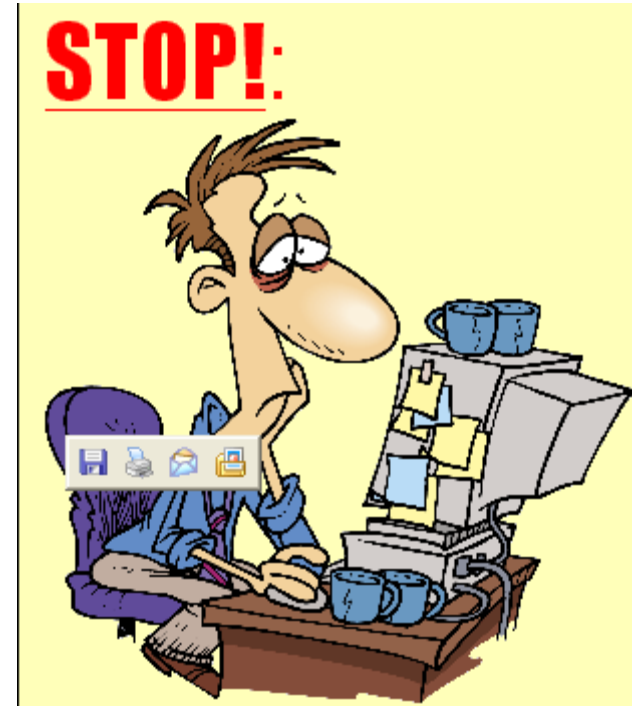
Databases	Found	Calculated	Missing
Medline + Embase	34	44 (36-81)	10 (4-27)
Add CINAHL	36	46 (40-63)	10 (4-27)
Add EBMR	39	48 (42-63)	9 (3-24)

...found 81% of the theoretical domain of articles

...tried but could not find the “missing” 9-10 articles

Move on to

Help for those
who are **not** doing
comprehensive searching



Search using the work of others—Filters

Searching Filters: Sets of search strategies that are designed to find only a certain subset of literature

- Randomized controlled trials
- Etiology or diagnostic studies
- Qualitative studies
- Costs or economics studies
- Appropriateness or outcomes studies
- Nephrology, palliative care, mental health, knowledge translation




Search using the work of others—Filters

NCBI Resources [x] How To [x] My NCBI Sign In

PubMed.gov
U.S. National Library of Medicine
National Institutes of Health

Search: PubMed [v] Limits Advanced search Help

[Search] [Clear]



PubMed

PubMed comprises more than 19 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites.

Using PubMed

[PubMed Quick Start Guide](#)

[Full Text Articles](#)

[PubMed FAQs](#)

[PubMed Tutorials](#)

[New and Noteworthy](#) 

PubMed Tools

[Single Citation Matcher](#)

[Batch Citation Matcher](#)

[Clinical Queries](#)

[Topic-Specific Queries](#)

More Resources

[MeSH Database](#)

[Journals Database](#)

[Clinical Trials](#)

[E-Utilities](#)

[LinkOut](#)



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Search using the work of others—Filters

United States
National Library of Medicine
National Institutes of Health

Search NLM Web Site
 Go

[NLM Home](#) | [Contact NLM](#) | [Site Map](#) | [FAQs](#)

[Home](#) > [Library Catalogs and Services](#) > [Reference and Customer Services](#)

MEDLINE/PubMed Search & Electronic Health Record Information Resources

[Printer-friendly Version](#)

The Electronic Health Record search focuses on all aspects of the Electronic Health Record. Subjects include: implementation, attitudes, beliefs and use, data privacy, health data standards and consumer access to the EHR and personal health records (PHRs).

The US Department of Health and Human Services (HHS) defines the electronic health record as "An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization." The National Library of Medicine® is a major participant in electronic health record development.

MEDLINE/PubMed Search

Perform the electronic health record search in PubMed to retrieve citations to journal literature.

See the [details](#) of the search strategy.



Search using the work of others—Filters

NCBI Resources How To My NCBI Sign In

PubMed.gov Search: PubMed RSS Save search Limits Advanced

U.S. National Library of Medicine National Institutes of Health

Search: horway and (health information exchange [tw] OR hie [tw] OR rhio [tw] OR req

Display Settings: Summary, 20 per page, Sorted by Recently Added

Send to:

<< First < Prev Page 1 Next > Last >>

Results: 1 to 20 of 4962

- [The quality of home care nurses' documentation in new electronic patient records.](#)
1. Gjevjon ER, Hellesø R.
J Clin Nurs. 2010 Jan;19(1-2):100-8.
PMID: 20500248 [PubMed - in process]
[Related citations](#)
- [The new ICD-10-CM guidelines. Highlights of the 2010 changes.](#)
2. Barta A.
J AHIMA. 2010 May;81(5):54-6. No abstract available.
PMID: 20496639 [PubMed - in process]
[Related citations](#)

Filter your results:

- All (4962)
- [Review \(134\)](#)
- [Free Full Text \(1216\)](#)

[Manage Filters](#)

1189 free full-text articles in PubMed Central

- ▶ Presentation of the 2008 Morris F. Collen Award to Robert A. Gre [J Am Med Inform Assoc. 2009]
- ▶ Expanding the extent of a UMLS semantic type via group neighbor [J Am Med Inform Assoc. 2009]
- ▶ Automated database mediation using ontological metac [J Am Med Inform Assoc. 2009]

» See all (1189)...

Use the work of others—Analysis of items

Getting started

Define your question (like in PubMed), optionally set restrictions, press 'start PubReMiner'

Browser Search Plugin

[Matt](#)

Find Experts

Quickly identify experts in the field by viewing the top ranked authors associated with your query

Research Interest

Google pubreminer Search + Share >> Sign In

PubMed PubReMiner

Detailed analysis of PubMed Search results

Enter your PubMed Question

Start reminding PubMed for: "computerized clinical decision support" or CDSS

Fieldtype: All

Publicationtype: All

FromDate: YYYY/MM/DD (Optional)

ToDate: YYYY/MM/DD (Optional)

AbstractLimit: 1000

Start PubReMiner Reset

Use the work of others—Analysis of items

#	OR	Year	#	OR	Journal	#	OR	Author
30	<input type="checkbox"/>	<u>2010</u>	28	<input type="checkbox"/>	<u>AMIA Annu Symp Proc</u>	14	<input type="checkbox"/>	<u>BODOR N</u>
72	<input type="checkbox"/>	<u>2009</u>	21	<input type="checkbox"/>	<u>Stud Health Technol Inform</u>	7	<input type="checkbox"/>	<u>ADDINGTON D</u>
52	<input type="checkbox"/>	<u>2008</u>	14	<input type="checkbox"/>	<u>Nucleic Acids Res</u>	7	<input type="checkbox"/>	<u>LANCON C</u>
41	<input type="checkbox"/>	<u>2007</u>	11	<input type="checkbox"/>	<u>J Am Med Inform Assoc</u>	7	<input type="checkbox"/>	<u>POP E</u>
49	<input type="checkbox"/>	<u>2006</u>	10	<input type="checkbox"/>	<u>DNA Res</u>	7	<input type="checkbox"/>	<u>REINE G</u>
34	<input type="checkbox"/>	<u>2005</u>	9	<input type="checkbox"/>	<u>Int J Med Inform</u>	6	<input type="checkbox"/>	<u>AUQUIER P</u>
27	<input type="checkbox"/>	<u>2004</u>	9	<input type="checkbox"/>	<u>Schizophr Res</u>	5	<input type="checkbox"/>	<u>BERNARD D</u>
31	<input type="checkbox"/>	<u>2003</u>	8	<input type="checkbox"/>	<u>BMC Genomics</u>	5	<input type="checkbox"/>	<u>BULLARD MJ</u>
21	<input type="checkbox"/>	<u>2002</u>	7	<input type="checkbox"/>	<u>BMC Med Inform Decis Mak</u>	5	<input type="checkbox"/>	<u>HAYNES RB</u>
11	<input type="checkbox"/>	<u>2001</u>	6	<input type="checkbox"/>	<u>Gene</u>	5	<input type="checkbox"/>	<u>HOLROYD BR</u>
24	<input type="checkbox"/>	<u>2000</u>	6	<input type="checkbox"/>	<u>Inform Prim Care</u>	5	<input type="checkbox"/>	<u>NAGASE T</u>
11	<input type="checkbox"/>	<u>1999</u>	6	<input type="checkbox"/>	<u>Methods Inf Med</u>	5	<input type="checkbox"/>	<u>OHARA O</u>
10	<input type="checkbox"/>	<u>1998</u>	6	<input type="checkbox"/>	<u>Proc AMIA Symp</u>	5	<input type="checkbox"/>	<u>PARKHILL J</u>

CDSS



Use the work of others—Analysis of items

#	OR	Mesh	
268	<input type="checkbox"/>	<u>Humans</u>	P
111	<input type="checkbox"/>	<u>Male</u>	P
109	<input type="checkbox"/>	<u>Female</u>	P
89	<input type="checkbox"/>	<u>Decision Support Systems, Clinical</u>	P
76	<input type="checkbox"/>	<u>Adult</u>	P
65	<input type="checkbox"/>	<u>Middle Aged</u>	P
49	<input type="checkbox"/>	<u>Molecular Sequence Data</u>	P
46	<input type="checkbox"/>	<u>Animals</u>	P
44	<input type="checkbox"/>	<u>Aged</u>	P
34	<input type="checkbox"/>	<u>Base Sequence</u>	P
33	<input type="checkbox"/>	<u>Decision Making, Computer-Assisted</u>	P
33	<input type="checkbox"/>	<u>Schizophrenic Psychology</u>	P
30	<input type="checkbox"/>	<u>Practice Guidelines as Topic</u>	P

#	OR	Country
115	<input type="checkbox"/>	<u>UNITED STATES</u>
48	<input type="checkbox"/>	<u>UNITED KINGDOM</u>
36	<input type="checkbox"/>	<u>JAPAN</u>
27	<input type="checkbox"/>	<u>FRANCE</u>
20	<input type="checkbox"/>	<u>CANADA</u>
20	<input type="checkbox"/>	<u>CHINA</u>
19	<input type="checkbox"/>	<u>NETHERLANDS</u>
17	<input type="checkbox"/>	<u>ITALY</u>
14	<input type="checkbox"/>	<u>GERMANY</u>
11	<input type="checkbox"/>	<u>AUSTRALIA</u>
8	<input type="checkbox"/>	<u>KOREA</u>
7	<input type="checkbox"/>	<u>ISRAEL</u>

CDSS



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...Work of others: Trust other's sites

The screenshot shows the AHRQ website interface. At the top, there is a navigation bar with the U.S. Department of Health & Human Services logo and the text "U.S. Department of Health & Human Services". To the right, there is a "Skip Navigation" link and the website address "www.hhs.gov". Below this is the AHRQ logo and the text "Agency for Healthcare Research and Quality" and "Advancing Excellence in Health Care". A search bar with a "Go" button is located on the right. A horizontal menu contains links for "Health IT Home", "AHRQ", "Contact Us", "Site Map", "What's New", "Browse", "Print", and "E-mail Updates". A large banner for the "AHRQ NATIONAL RESOURCE CENTER" features the text "HEALTH INFORMATION TECHNOLOGY" and "Best Practices Transforming Quality, Safety, and Efficiency". On the left, a vertical navigation menu lists various categories, with "KNOWLEDGE LIBRARY" highlighted by a red circle. Below this menu, the "KNOWLEDGE LIBRARY" section is introduced with a magnifying glass icon. The text describes the library's content, which is organized into "Core Collection" and "Partner Contributions".

U.S. Department of Health & Human Services

Skip Navigation
www.hhs.gov

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Search Go

www.ahrq.gov

Health IT Home | AHRQ | Contact Us | Site Map | What's New | Browse | Print | E-mail Updates |

HOME
ABOUT
EVENTS
AHRQ-FUNDED PROJECTS
HEALTH IT TOOLS
KNOWLEDGE LIBRARY
Health IT Bibliography
Key Topics
Features Archive
Survey Compendium
FUNDING OPPORTUNITIES

AHRQ NATIONAL RESOURCE CENTER
HEALTH INFORMATION TECHNOLOGY
Best Practices Transforming Quality, Safety, and Efficiency

KNOWLEDGE LIBRARY

The Knowledge Library contains both evidenced-based and theoretical content gathered by health IT experts. The content is organized into two categories: Core Collection and Partner Contributions. The Core Collection contains items found by AHRQ National Resource Center experts to be of exceptional quality and central to the health IT discipline. Partner Contributions include content provided by professional societies and non-profit organizations experienced in health IT.

...Work of others: Federated searching

Google trip database Search Share Sidewiki Check Translate AutoFill Sign

Home Login Register Labs (NEW!)

trip database

personal health records and cancer Search Advanced Search History Search Tips

Below are links to articles providing background knowledge relating to cancer

[Wikipedia](#) [Wrong Diagnosis](#) [Merck Manual](#) [National Cancer Institute](#)

[Search Trip just for "cancer"](#)

Filter Your Search [what is this?](#)

Advertisement
Ads by Google

Free EHR
Online Electronic Health Records
Fast, Free, Secure
Set Up!

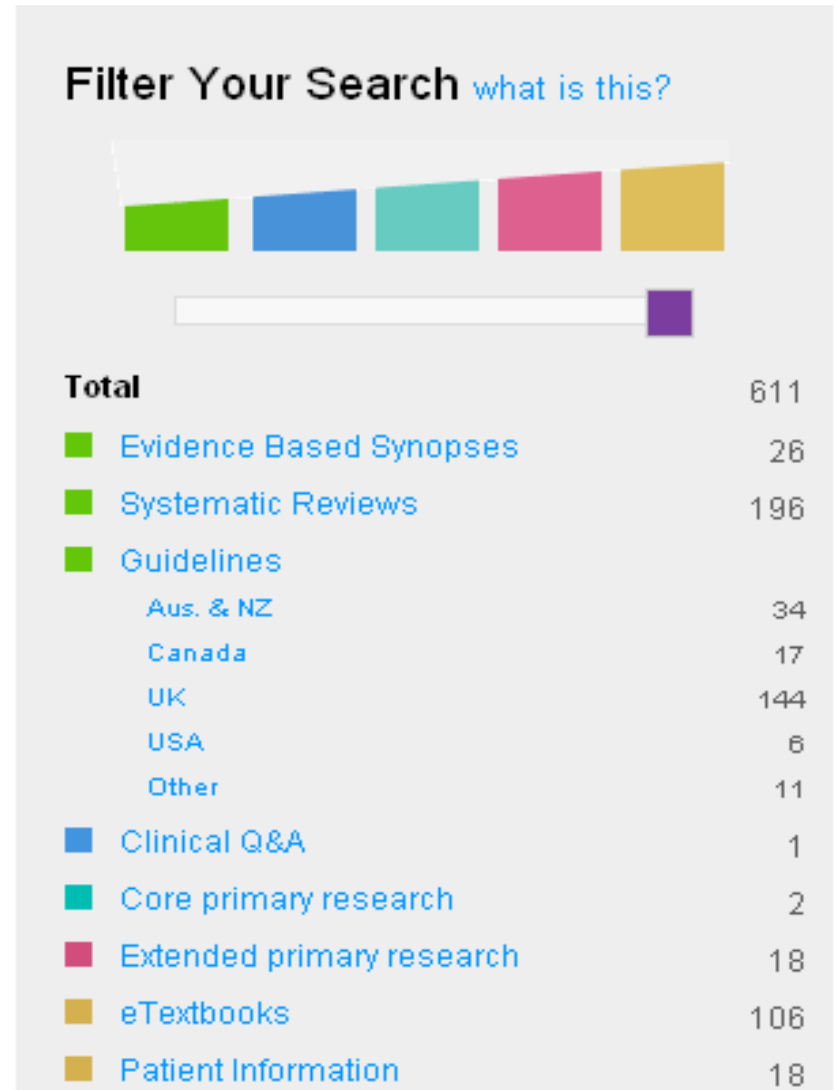


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...Work of others: Federated Searching

TRIP database

1. Does the patient-held record improve continuity of care and related outcomes in cancer? Health Expectations 2007;10(1):75-91



...Work of others: Federated Searching

Google dare database of abstracts of reviews of effe Search Share Sidewiki Sign In

NHS
National Institute for Health Research
Help | Why log in? | Login

Centre for Reviews and Dissemination

Search

All these words
 Any of these words
(Searches using AND/OR/NOT combinations override the above)

personal health records and cancer **search**

Year published From - [restrictions info](#)

10 results per page

Home
Results
MeSH
Search history

All results DARE NHS EED HTA

DARE
Database of Abstracts of Reviews of Effects

DARE contains 15,000 abstracts of systematically assessed reviews and details of all Cochrane reviews on the effects of interventions used in health care.

More information about DARE can be found in the **Help section**

Add one of the following suffixes to your search term to apply the appropriate restriction

- :au - restrict by author name
- :ti - restrict by title
- :ty - restrict by record type
- :la - restrict by language
- :pb - restrict by publisher name
- :co - restrict by country of origin (NHS EED and HTA only)

Click on Help for more detailed advice on restriction searching.

...Work of others: Federated Searching

Search

All these words
 Any of these words
(Searches using AND/OR/NOT combinations override the above)

Year published From - restrictions info
 10 results per page

personal health records and cancer: 11 documents found

[Home](#)
[Results](#)
[MeSH](#)
[Search history](#)

Select Database	Title	Year published	Author	Source	Record type
<input type="checkbox"/> DARE	Does the patient-held record improve continuity and related outcomes in cancer care: a systematic review	2007	Gysels M, Richardson A, Higginson I J	Health Expectations	Abstract
<input type="checkbox"/> DARE	Outcomes of elderly survivors of intensive care: a review of the literature	2005	Hennessy D, Juzwishin K, Yergens D, Noseworthy T, Doig C	Chest	Abstract
<input type="checkbox"/> DARE	Cancer peer support programs: do they work?	2004	Campbell H S, Phaneuf M R, Deane K	Patient Education and Counseling	Abstract

Summary:

- Searching for health IT is hard
- Get some help from work of others
- Build a relationship with a librarian
- If you need to do comprehensive searching think about stopping rules



Questions