

Web-searching for health technology assessment reports

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Why talk about web-searching?

1. To consider **method** used for web-searching;
2. To consider **how to record** web-searching.



Overview

1. What is web-searching in the context of health technology assessment (HTA) reports? **(slides 4-8)**
 - i. Content of web-searching;
 - ii. Methods for web-searching;
 - iii. Recording web-searching;
2. A review of how web-searching is carried out for HTA reports **(slides 9-32)**;
3. Do we need to think more critically about web-searching for HTA reports? **(slides 33-39)**



1. What is web-searching: Case study

Gehanno *et al.* *BMC Medical Informatics and Decision Making* 2013, **13**:7
<http://www.biomedcentral.com/1472-6947/13/7>

 **BMC**
Medical Informatics & Decision Making

RESEARCH ARTICLE

Open Access

Is the coverage of google scholar enough to be used alone for systematic reviews

Jean-François Gehanno^{1,2*}, Laetitia Rollin^{1,2} and Stefan Darmoni²

Abstract

Background: In searches for clinical trials and systematic reviews, it is said that Google Scholar (GS) should never be used in isolation, but in addition to PubMed, Cochrane, and other trusted sources of information. We therefore performed a study to assess the coverage of GS specifically for the studies included in systematic reviews and evaluate if GS was sensitive enough to be used alone for systematic reviews.

Methods: All the original studies included in 29 systematic reviews published in the Cochrane Database Syst Rev or in the JAMA in 2009 were gathered in a gold standard database. GS was searched for all these studies one by one to assess the percentage of studies which could have been identified by searching only GS.

Results: All the 738 original studies included in the gold standard database were retrieved in GS (100%).

Conclusion: The coverage of GS for the studies included in the systematic reviews is 100%. If the authors of the 29 systematic reviews had used only GS, no reference would have been missed. With some improvement in the research options, to increase its precision, GS could become the leading bibliographic database in medicine and could be used alone for systematic reviews.

Keywords: Bibliometrics, Google scholar, Information retrieval methods, Systematic reviews



1. What is web-searching: Case study

Some problems...

- Search expressions in Google Scholar are limited to 256 characters;
- Search terms can't be truncated;
- Search structure limited compared to bibliographic databases;
- Limited to first 1000 references.

Source: Boeker M, Vach W and Motschall E. Google Scholar as replacement for systematic literature searches: good relative recall and precision are not enough. *BMC Med Res Methodol.* 2013; 13: 131.



1. What is web-searching: Content

Grey literature

- Reports-including preprints; preliminary progress and advanced reports; institutional, internal, technical, and statistical reports; research memoranda...;
- Theses;
- Conference proceedings;
- Technical specifications and standards;
- Translations (not distributed commercially);
- Bibliographies;
- Technical and commercial documentation;
- Official documents (issued in limited numbers).

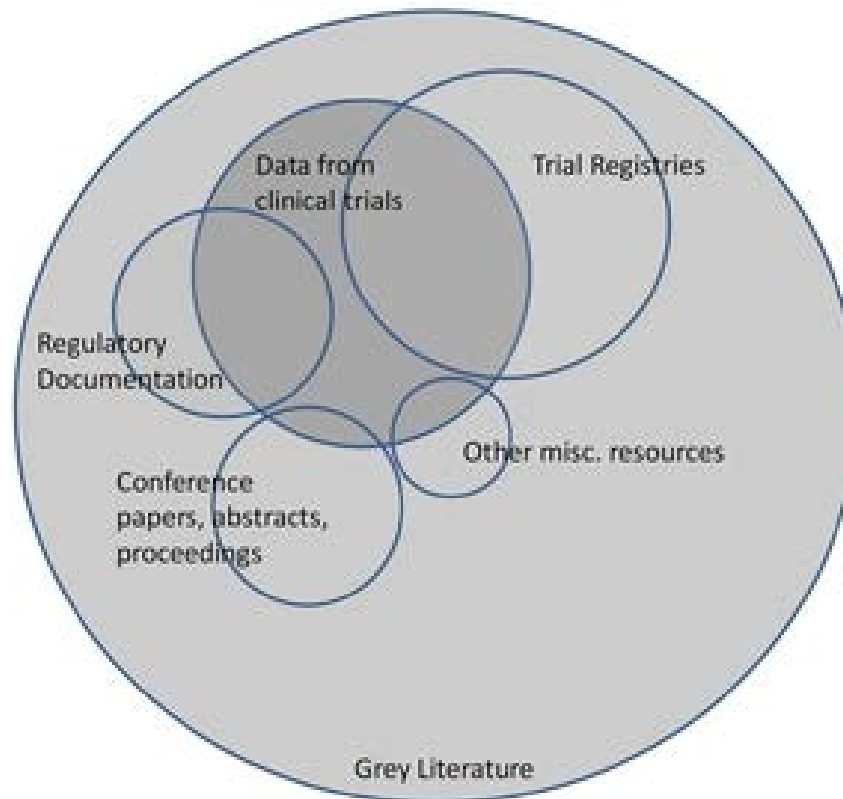
Source: Alberani V, De Castro Pietrangeli P and Mazza AM. The use of grey literature in health sciences: a preliminary survey. Bull Med Libr Assoc. 1990; 78(4): 358–363.

“That which is produced on all levels of government, academia, business and industry in print and electronic formats, but which is not controlled by commercial publishers.”

Source: International Conference on Grey Literature in Luxembourg 1997



1. What is web-searching: Content



Source: Relevo, R. Searching the Grey Literature: Where To Look and What To Expect. AHRQ 2011 Annual Conference

Useful guide to websites for HTA: Health Technology Assessment on the Net International: 2013

Source: <http://www.ihe.ca/documents/HTA%20on%20the%20Net%202013.pdf>

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1. What is web-searching: Methods and recording

1. Search engines;
2. Websites*

***Important fact:** 96% of the internet is not indexed by search engines and is only accessible via websites. This content is known as the “Deep Web”.

“Systematic literature searches undertaken to identify evidence of clinical and cost effectiveness should be thorough, **transparent and reproducible**. These searches will also minimise 'dissemination biases' (Song et al. 2000), such as publication bias and database bias, that may affect the results of reviews.”

Source: NICE: The guidelines manual.

<http://publications.nice.org.uk/the-guidelines-manual-pmg6/identifying-the-evidence-literature-searching-and-evidence-submission>



2. Web-searching for HTA





2. Web-searching for HTA: My experience

Database: MEDLINE

Host: Ovid

Data Parameters: 1946 to November Week 3 2012

Date Searched: 4/1/2013

Searcher: SB

Hits: 285

1. (tend?nopath* or paratend?nopath*).tw.
2. (tend?n?s?s or tend?nitis or p?r?ten???itis).tw.
3. tendinopathy/
4. bursitis.tw.
5. bursitis/
6. or/1-5
7. (elbow? or "common extensor origin").tw.
8. elbow/
9. elbow joint/
10. or/7-9
11. 6 and 10
12. ("lateral epicondylitis" or "medial epicondylitis" or "elbow pain?").tw.
13. ((tennis or golfer* or row* or shooter* or archer*) adj1 elbow?).tw.
14. tennis elbow/
15. or/11-14
16. (random* or "controlled trial?" or "clinical trial?" or rct?).tw.
17. Randomized controlled trial.pt.
18. ("systematic review?" or "meta-analys?s" or "meta analys?s" or metaanalys?s).tw.
19. meta-analysis.pt.
20. or/16-19
21. 15 and 20
22. limit 21 to (english language and yr="1990 -Current")

Source: Long L, Briscoe S, Cooper C, Hyde C and Crathorne L. Effectiveness and cost-effectiveness of conservative interventions for tendinopathy: an overview of systematic reviews of clinical effectiveness and systematic review of economic evaluations (monograph in press) **[NIHR funded project]**



2. Web-searching for HTA: My experience

“The internet was searched for background information.”



2. Web-searching for HTA: Guidelines

“NICE encourages the use of supplementary searching techniques when it is known, or reasonably likely, that relevant evidence is...not indexed in bibliographic databases....Supplementary searching techniques should follow the **same principles of transparency and reproducibility as other search methods.**”

Source: Developing NICE guidelines: the manual: Draft for consultation 1 April to 30 June 2014.

http://www.nice.org.uk/media/095/FE/Developing_NICE_guidelines_manual_draft_for_consultation.pdf



2. Web-searching for HTA: Guidelines

“There is little empirical evidence as to the value of using general internet search engines such as Google to identify potential studies (Eysenbach 2001). Searching research funders’ and device manufacturers’ web sites might be fruitful. Searching pharmaceutical industry web sites may be useful, in particular their trials registers, covered in Section 6.2.3.3.

“If internet searches are conducted, it is recommended that review authors should file a print copy or save locally an electronic copy of details of information about any possibly relevant study found on the internet, rather than simply ‘book-marking’ the site, in case the record of the trial is removed or altered at a later stage. **It is important to keep a record of the date the web site was accessed for citation purposes.”**

Source: The Cochrane handbook.

<http://handbook.cochrane.org/>



2. Web-searching for HTA: Guidelines

“Internet searching can be a useful means of retrieving grey literature, such as unpublished papers, reports and conference abstracts. **Identifying and scanning specific relevant websites will usually be more practical than using a general search engine such as ‘Google’.**

“Reviews of transport and ‘welfare to work’ programmes have reported how Internet searching of potentially relevant websites was effective in identifying additional studies to those retrieved from databases.

“It is worth considering using the Internet when investigating a topic area where it is likely that studies have been published informally rather than in a journal indexed in a bibliographic database. **Internet searching should be carried out in as structured a way as possible and the procedure documented** (see Appendix 3).”

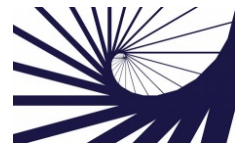
Source: Systematic Reviews: CRD’s guidance for undertaking reviews in health care.
http://www.york.ac.uk/inst/crd/pdf/Systematic_Reviews.pdf



2. Web-searching: Data-extraction checklist

Excerpt from data-extraction form:

Named search-engine?	Google <input type="checkbox"/>	<u>Google Scholar</u> <input type="checkbox"/>	<u>Dogpile</u> <input type="checkbox"/>	<u>Metacrawler</u> <input type="checkbox"/>
	No <input type="checkbox"/>	Other: <input type="text"/>		
Date(s) searched?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Free-text terms?	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Results recorded?	Yes <input type="checkbox"/>	No or not clear (e.g. not in PRISMA) <input type="checkbox"/>		
Free text				



2. Web-searching: Content

Include references to web-searching of:

- medical societies, government websites, charities, manufactures websites, patient support groups and social media;
- general use of search engines;

and web-searching for:

- technology details (e.g. specifications or licensing details);
- costs data;
- government or charity reports (e.g. overview of population & intervention);
- statistics;
- patient data or patient views (e.g. online discussion forums);
- unpublished studies.

Exclude references to web-searching for:

- conference abstracts;
- theses;

or using:

- grey literature databases (e.g. TRIP, NHS Evidence, clinicaltrials.gov).



2. Web-searching for HTA: Results

No. of reports

HTA reports published from 2004 -2013: 528

HTA reports that mention web-searching: 107*

*Excluding grey literature databases and conference abstract searching.

Method of web-searching

Search-engine: 50

Website searching: 86

Search-engine *and* website searching: 29



2. Web-searching for HTA: Results

Web-searching using search-engine

<i>Search engine</i>	<i>No. of reports*</i>
Google	22
Copernic	18
Google Scholar	9
AltaVista**	5
Dogpile	3

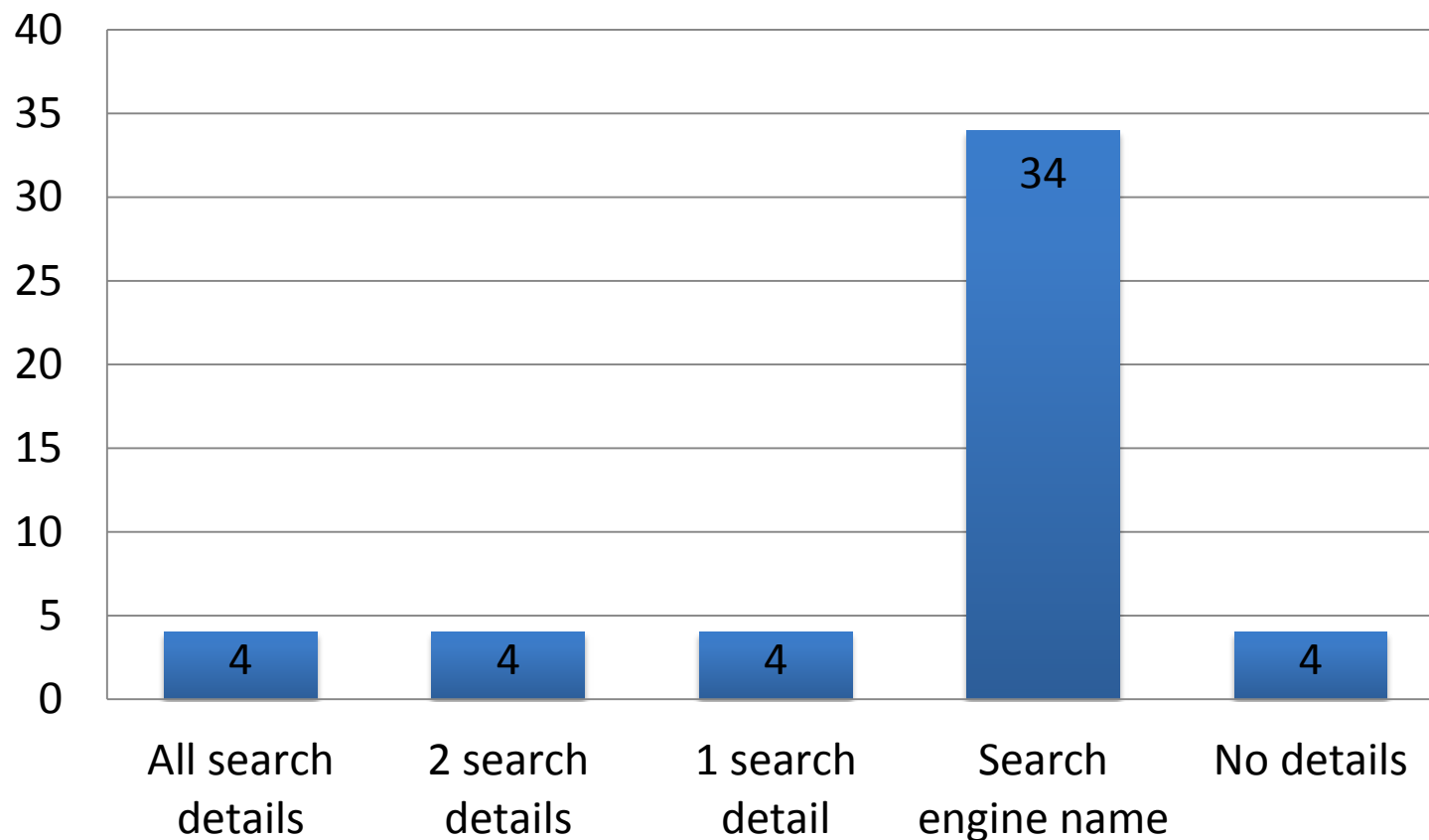
*Some reports cite more than one search engine.

****Important fact:** The graph that shows Google usage figures ascending as AltaVista usage figures decline has been called the “Google-AltaVista X”. AltaVista was shut down in July 2013.



2. Web-searching for HTA: Results

Details recorded about search engine usage





2. Web-searching for HTA: Results

Examples: Web-searching using search engines



2. Web-searching for HTA: Results

- “General search engines on the internet will be searched (e.g. Google).”
- “Keyword searching of the World Wide Web was undertaken using the Google search engine.”
- “A metasearch engine was used to search the Internet, and links were followed up.”
- “Keyword searching of the WWW was undertaken using the Google search engine.”
- “Sources such as Google Scholar were searched.”



2. Web-searching for HTA: Results

Searches of the internet

“Searches were made by means of the **Google** search engine (www.google.com) **using the search terms listed in Appendix 7**. It is acknowledged that other Google search options, such as date, geographic location and file type, could have been used to narrow the results, but this was felt to be too exclusive, as it was important to capture as broad a range of results as possible.

“The first 100 results returned by each search strategy were scanned for relevance and those judged to be potentially relevant were followed up. As only the first 100 results were to be examined, it was decided to break down the list of search terms into smaller search strings to avoid the danger that a long string would result in the first 100 results being relevant to only the first search term.

“These were then combined with search terms on study methods or general outcome. **The number of results returned for each search string can be found in Appendix 8...**

“...A total of 15 documents/articles were identified through searches of the internet, included in the endnote database, and entered into the full text assessment stage.”

Source: Carr SM et al. An evidence synthesis of qualitative and quantitative research on component intervention techniques, effectiveness, cost-effectiveness, equity and acceptability of different versions of health-related lifestyle advisor role in improving health. 2011; 15(9):1-299



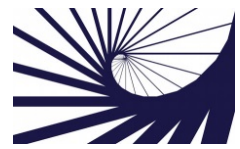
2. Web-searching for HTA: Results

Appendix 7

Search strategy for Google:

1. “health trainer”
2. “lifestyle adviser” OR “lifestyle advisor” OR “lifestyle trainer” OR “lifestyle coach”
3. “lay health worker” OR “lay health adviser” OR “lay health advisor” OR “lay health supporter”...
- ...27. “lay worker” OR “untrained worker” OR “unlicensed worker” OR “nonprofessional worker” OR “non professional worker” OR “paraprofessional worker” OR “paramedical worker”
28. doula OR douladural OR monitrice

Source: SM Carr, *ibid.*



2. Web-searching for HTA: Results

Appendix 8

Results returned for each Google search string:

- “lifestyle adviser” OR “lifestyle advisor” OR “lifestyle trainer” OR “lifestyle coach” 744
- “lay practitioner” OR “lay leader” OR “lay midwife” 15,200
- “health activist” OR “health aide” OR “health advocate” OR “health coach”... 191,000
- “community champion” OR “health champion” 1210
- “community wellness advocate” 19
- “outreach worker” OR “outreach specialist” 83,900
- health (“natural helper”) 377...

Source: SM Carr, *ibid.*



2. Web-searching for HTA: Results

Google Search Engine.

Accessed via www.google.co.uk Searched 1 and 2 December 2003. Each line searched separately. Retrieved 11 records.

Haematuria “diagnostic technique”

Hematuria “diagnostic technique”

Haematuria “diagnostic algorithm”

Hematuria “diagnostic algorithm”

Haematuria “diagnostic procedure”

Hematuria “diagnostic procedure”

Haematuria “diagnostic rule”

Hematuria “diagnostic rule”

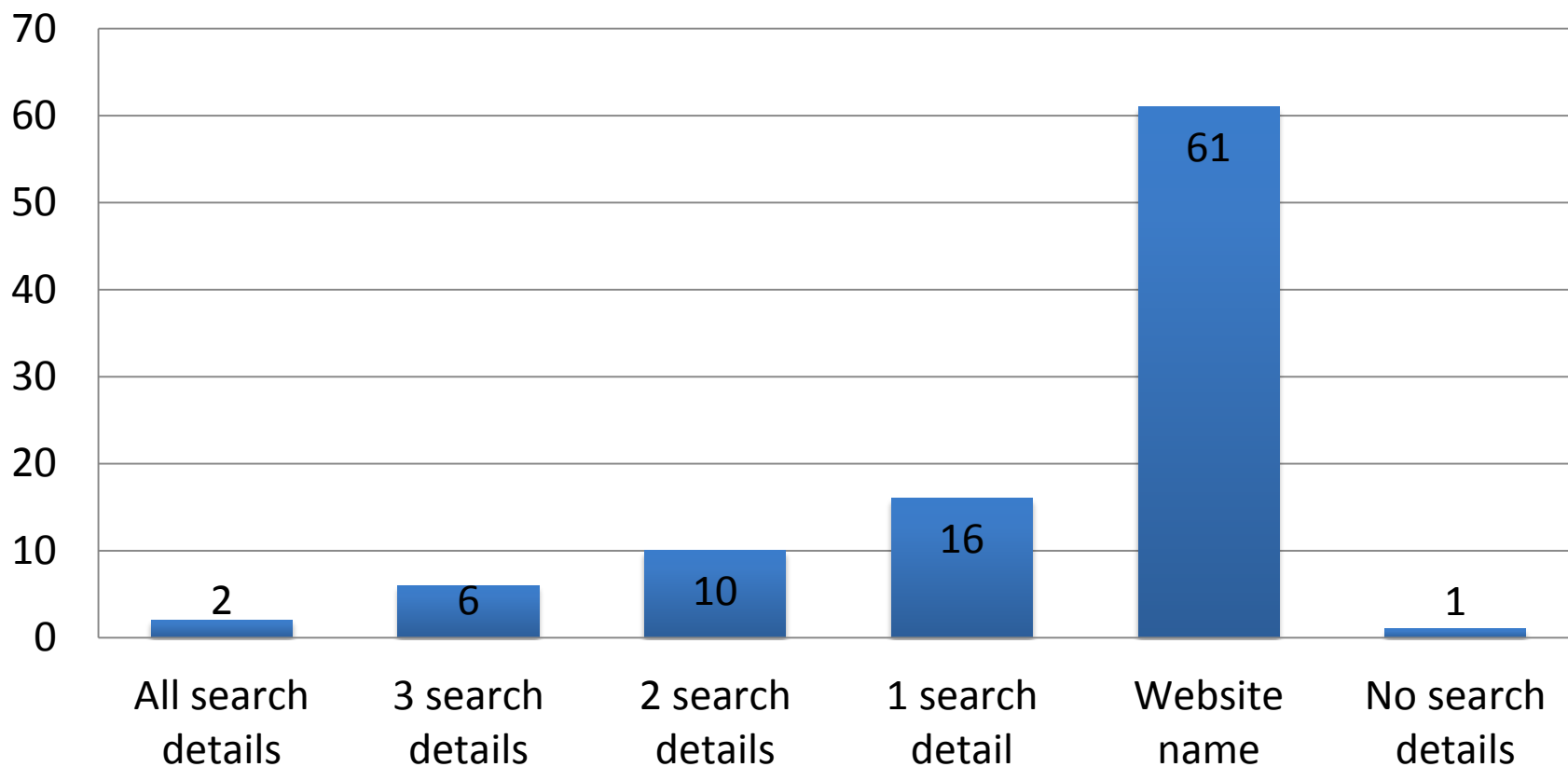
Haematuria “ diagnostic tool”....

Source: Rodgers M et al. Diagnostic tests and algorithms used in the investigation of haematuria: systematic reviews and economic evaluation. 2006; 10(18):1-281.



2. Web-searching for HTA: Results

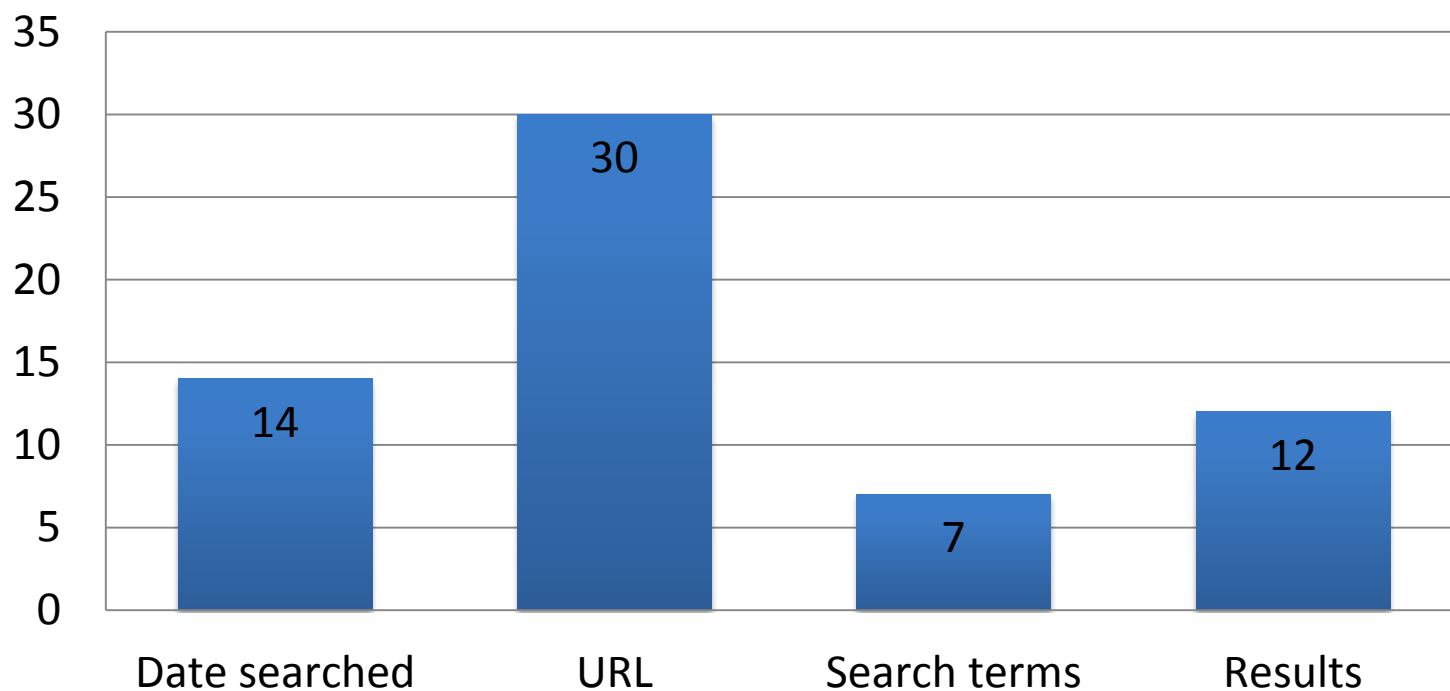
Details recorded about website searching

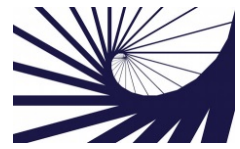




2. Web-searching for HTA: Results

Details recorded about website searching





2. Web-searching for HTA: Results

Examples: Web-searching using websites



2. Web-searching for HTA: Results

Searches were also undertaken on several Internet resources.

- International Cancer Research Portfolio (ICRP) (Internet - <http://www.cancerportfolio.org/>)
- National Cancer Institute Clinical Trials PDQ (Internet
<http://www.cancer.gov/Search/SearchClinicalTrialsAdvanced.aspx>)
- American Society of Clinical Oncology (Internet - <http://www.asco.org>)

Source: Collins R et al. A systematic review and economic model of the effectiveness and cost-effectiveness of docetaxel in combination with prednisone or prednisolone for the treatment of hormonerefractory metastatic prostate cancer. 2007; 11(2):1-179.



2. Web-searching for HTA: Results

US Food and Drug Administration website were searched as well as the website of the main EECF manufacturer, Vasomedical.

Vasomedical website (www.vasomedical.com/)

This site **has a browsable section entitled “latest Health Information”**, which yielded **one result**.

Searched on **13 December 2007**

Retrieved 97 hits

Source: McKenna C et al. Enhanced external counterpulsation for the treatment of stable angina and heart failure: a systematic review and economic analysis. 2009; 13(24): 1-127.



2. Web-searching for HTA: Results

Searches of specific websites

“The **websites below** were searched on the **dates shown**, using the onsite search engines **with single search terms**: ‘health trainer’, ‘lay health worker’, ‘health trainer evaluation’, ‘lay health worker evaluation’, ‘health trainer effectiveness’, ‘lay health worker effectiveness’, ‘health improvement’, ‘lay health worker health improvement’ and ‘health trainer health improvement’:

- National Audit Office [www.nao.org.uk (accessed 16 October 2008)]
- Home Office [www.homeoffice.gov.uk (accessed 16 October 2008)]
- Office of the Deputy Prime Minister [www.odpm.gov.uk, now www.communities.gov.uk (accessed 16 October 2008)]
- International Standard Randomised Controlled Trial Number (ISRCTN) Register [www.controlled-trials.com/isrctn (accessed 16 October 2008)]
- Joseph Rowntree Foundation [www.jrf.org.uk (accessed 16 October 2008)]...

“...Results of these searches produced a total of 5225 references. A breakdown of the search results for each website can be found in Appendix 9.”

Source: Carr SM et al. An evidence synthesis of qualitative and quantitative research on component intervention techniques, effectiveness, cost-effectiveness, equity and acceptability of different versions of health-related lifestyle advisor role in improving health. 2011; 15(9):1-299



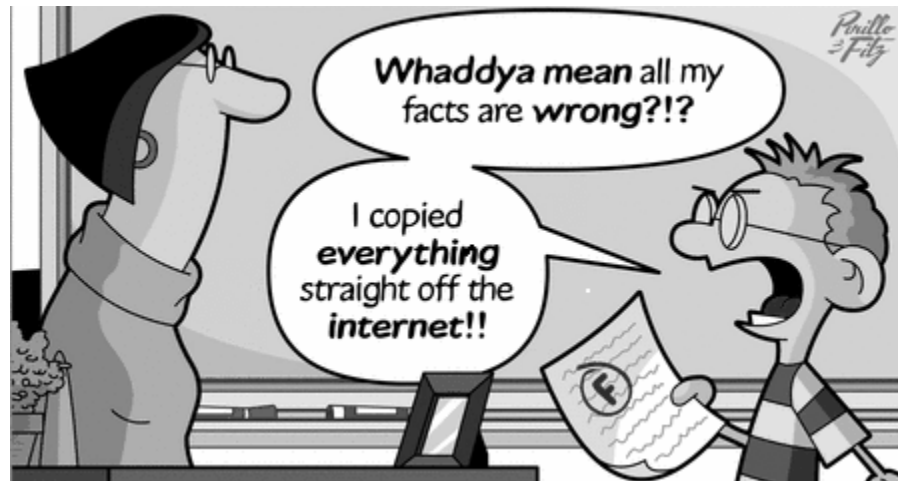
2. Web-searching for HTA: Results

Website	URL	Number of results received	Date searched
The National Audit Office	www.nao.org.uk	61	16 October 2008
The Home Office	www.homeoffice.gov.uk	54	16 October 2008
The Joseph Rowntree Foundation	www.jrf.org.uk	4312	16 October 2008
The Office of the Deputy Prime Minister	www.odpm.gov.uk	191	16 October 2008

Source: SM Carr, *ibid.*



3. Critical evaluation





3. Critical evaluation: Methods for web-searching

Search engines:

1. The “filter bubble”.

Source: Eli Pariser. The Filter Bubble: What the Internet Is Hiding from You. 2011; New York: Penguin Press.

- <https://startpage.com/>

- <http://www.dogpile.com/>

2. Google algorithm changes. (500 per year, 12 experiments per search).

Source: Karen Blakeman Finding research information on the web: how to make the most Google and other free search tools. Science Progress. 2013; 96(1):1-24.

- <https://duckduckgo.com/>

3. Evidence-based web-searching?

Source: Liupu Wang et al. Using internet search engines to obtain medical information: a comparative study. J Med Internet Res. 2012; 14(3):e74



3. Critical evaluation: Methods for web-searching

Websites:

- Each website will have its own search options...
- Perhaps details of search process should be recorded?

US Food and Drug Administration website were searched as well as the website of the main EECP manufacturer, [Vasomedical](#).

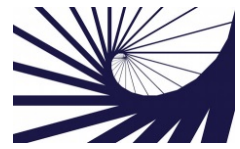
[Vasomedical](#) website (www.vasomedical.com/)

This site has a [browsable](#) section entitled “latest Health Information”, which yielded **one result**.

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Source: C McKenna, C McDaid, S Suekarran, N Hawkins, K Claxton, K Light, M Chester, J Cleland, N Woolacott* and M Sculpher (2009) Enhanced external [counterpulsation](#) for the treatment of stable angina and heart failure: a systematic review and economic analysis. 13(24): 1-127



3. Critical evaluation: Recording web-searching

Three proposals for recording web-searching:

1. **Weak proposal:** Web-searching is not worth recording.
2. **Moderate proposal:** Web-searching should be transparent.



3. Critical evaluation: Recording web-searching

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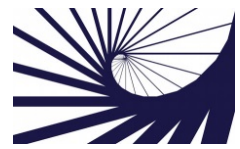
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Haematuria “diagnostic tool”....

Source: M Rodgers, J Nixon, S Hempel, T Aho, J Kelly, D Neal, S Duffy, G Ritchie, J Kleijnen and M Westwood (2006) Diagnostic tests and algorithms used in the investigation of haematuria: systematic reviews and economic evaluation. 10(18):1-281



3. Critical evaluation: Recording web-searching

Three proposals for recording web-searching:

1. **Weak proposal:** Web-searching is not worth recording.
2. **Moderate proposal:** Web-searching should be transparent.
3. **Strong proposal:** Web-searching should be transparent *and* reproducible.



Summary

- 1. Not much is written about web-searching for HTA** (Perhaps because it's a simple process or too vague to capture scientifically?)
- 2. HTA reports reflect this lack of structure about web-searching.**
- 3. There are good and bad ways to carry out and record web-searching.**
- 4. This could be worth exploring further with experimentation and guidelines?**



Thank you for listening.

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