

# An Introduction to Evidence-Informed Public Health and A Compendium of Critical Appraisal Tools for Public Health Practice

Donna Ciliska • Helen Thomas • Cathy Buffett

**February, 2008**

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National Collaborating Centre  
for Methods and Tools

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# An Introduction to Evidence-Informed Public Health and A Compendium of Critical Appraisal Tools for Public Health Practice

Prepared for the National Collaborating Centre for Methods and Tools by

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## Preamble

This is one of the first publications produced by the National Collaborating Centre for Methods and Tools. Since this paper was originally written in 2008, there have been many changes to the public health landscape in Canada. Additional resources are now available that were not included in this paper. For more information on the concepts discussed in this paper, and links to additional public health resources, please consult the NCCMT website: [www.nccmt.ca](http://www.nccmt.ca).

# Executive Summary

## Purpose

This background paper defines and summarizes the concept of Evidence-Informed Public Health (EIPH) recognizing that, to use evidence in public health practice and policy development, one must first critically appraise the available research that provides the basis for that evidence.

This paper addresses the need for critical appraisal of primary research studies and systematic reviews to inform effective public health practice. It also outlines a hierarchy of quality of research evidence that can be used to inform public health policy and program delivery.

For that reason, this paper presents some of the more commonly used critical appraisal tools. These tools provide basic guidelines and checklists for public health professionals to evaluate the quality of research when reading the literature. Web links in the compendium that accompanies this paper will direct users to some of the most current and usable tools.

## Methods

Relevant literature collected and reviewed for this background paper comprises all literature (grey and published) used for the environmental scan for the National Collaborating Centre for Methods and Tools (Ciliska et al., 2006), including an update of that literature, and a review of relevant references and websites.

## Conclusions

The highest quality evidence available is vital to the interactive process of moving knowledge into practice in the complex world of public health; however, the time constraints typically faced by public health practitioners can preclude a consistent implementation of the principles of evidence-informed decision-making. Critical appraisal provides an efficient method of reviewing evidence for its quality, and is an important part of the process of evidenced-informed practice and policy development. The use of quality checklists and other tools can provide a systematic and effective means to help identify rigorous studies with valid conclusions for potential implementation and assessment.

## Introduction

Evidence-Informed Public Health (EIPH) depends on good sound evidence. Although decisions to develop and implement new programs and services must be grounded in best practices, the methods and frameworks needed to inform knowledge and translate evidence into practice are often considered time consuming and difficult to understand.

Public health professionals live in a world of heavy workloads, inadequate staffing and insufficient dedicated resources. Especially in the face these realities, critical appraisal of existing evidence is fundamental to the search for quality evidence to inform the process of public health decision making.

Critical appraisal, as described by public health professionals within the Environmental Scan for the National Collaborating Centre for Methods and Tools (NCCMT) (Ciliska et al., 2006), included the use of users' guides to assess the rigor/strength of research; standardized methods of quality assessment of primary studies and reviews of evidence; and up-to-date and easy-to-use tools to rate the quality of evidence/research. The compendium of tools can assist with this critical appraisal.

## Primary Audience

Primary audiences for this paper include busy public health managers and policy makers who may have little or no experience in assessing qualitative or quantitative research.

## Literature Search

The comprehensive search for published literature from 1996-2006 is described fully in the NCCMT Environmental Scan (Ciliska et al., 2006). An update of the initial search was conducted in February 2007. Of the literature collected, 51 articles were retrieved for review. Appendix 3 of the Environmental Scan (Ciliska et al., 2006) provided a valuable list of relevant websites that were scanned in order to identify current tools and literature. Personal databases of McMaster faculty who teach courses in critical appraisal were reviewed to ensure the currency and relevance of available literature and websites. Two other reviews that assessed critical appraisal tools, primarily from the perspective of the systematic reviewer (Deeks et al., 2003; West et al., 2002), provided additional sources for consideration.



## Introduction to Evidence-Informed Public Health

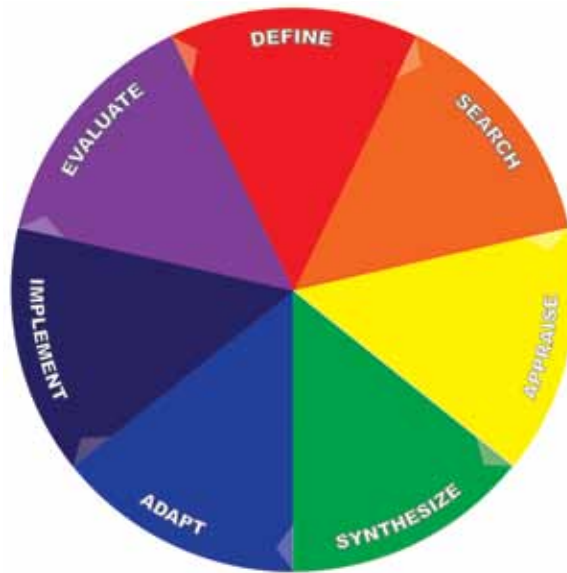
EIPH is rooted in evidence-based medicine (EBM), a term coined by Guyatt et al. in 1992 (Cullum et al., 2008). Under Guyatt's leadership, the Evidence-Based Medicine Work Group published a series of articles for the *Journal of the American Medical Association* between 1993 and 2000 that outlined the criteria for evaluating current evidence to support clinical decisions. These articles formed the basis of most existing critical appraisal tools. Acceptance for EBM has grown substantially over the past fifteen years among nurses and other health professionals including public health practitioners (Gandelman et al., 2006; Kohatsu et al., 2004; Rychetnik & Wise, 2004).

The expansion of EBM to include evidence-based public health (EBPH) (Kohatsu et al., 2004) is defined as “the process of integrating science-based interventions with community preferences to improve the health of populations.”

Evidence-Informed Public Health builds on the ideas of EBM and EBPH, but acknowledges the many factors, beyond simply the evidence, that influence decision-making. EIPH is a complex, multi-disciplinary process that occurs within dynamic and ever-changing communities and encompasses different sectors of society.

EIPH has several distinct stages: define, search, appraise, synthesize, adapt, implement and evaluate (see Figure 1). At each step, there are resources and best practices that can inform and improve the process. Methods and tools are available to help public health practitioners and policy makers hone their EIPH skills.

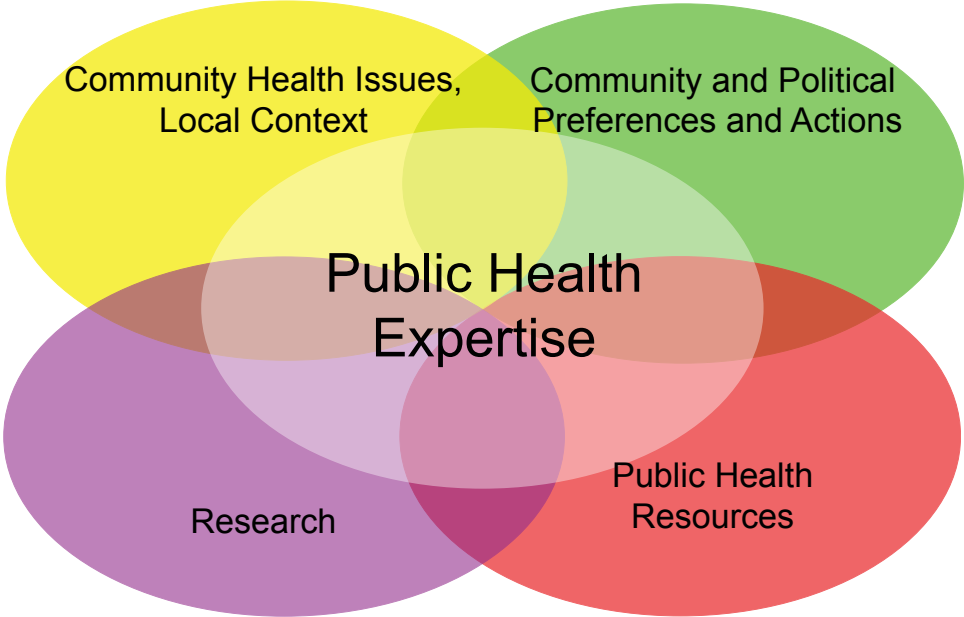
**FIGURE 1: Stages in Evidence-Informed Public Health**



<b>Stage in EIPH</b>	<b>Description</b>
DEFINE	Clearly define the question or problem.
SEARCH	Efficiently search for research evidence
APPRAISE	Critically and efficiently appraise the research sources
SYNTHESIZE	Interpret/ form recommendations for practice based on the literature found
ADAPT	Adapt the information to a local context
IMPLEMENT	Decide whether (and plan how) to implement the adapted evidence into practice or policy
EVALUATE	Evaluate the effectiveness of implementation efforts

EIPH does not happen in a vacuum. Figure 2 illustrates the intersecting components of effective public health decision making and offers a way to visualize the spectrum of factors to be considered toward developing and providing the best public health interventions possible. Generic clinical expertise can provide a valuable understanding of the integration of the components required to make effective clinical decisions (Dicenso et al., 2005). Effective evaluation of evidence to support public health practice must address these multidimensional issues.

**FIGURE 2: A model for evidence-informed decision making in public health**



# Critical Appraisal – Is the Evidence Good Enough?

It has been estimated that less than 20% of published literature is scientifically sound, leaving health practitioners with the often overwhelming task of sorting the valid, sound and useful literature from the invalid and ineffectual (Demaerschalk, 2004; Rychetnik & Wise, 2004). So, how can public health professionals decide if the evidence they find is good enough? The answer lies in a critical appraisal of the research evidence.

Three questions need to be answered for the purpose of critically appraising research specific to public health practice (Rychetnik et al., 2002):

1. Is the research valid, sound and applicable to my situation?
2. What outcomes can I expect if I implement this research?
3. Will my target population be able to use this research?

Critical appraisal tools or checklists can facilitate the process and help practitioners to readily understand why an intervention may appear to be effective in one setting, but ineffective in another (Rychetnik et al., 2002).

## Quality Evidence for Public Health Practice

This section discusses the elements to consider when critically appraising evidence for decision making in public health.

### *Formulating practice/policy questions using the Population, Intervention, Comparison, Outcome (PICO) formula*

There are four elements to framing a question about an intervention program or treatment: **Population**, **Intervention**, **Comparison** and **Outcome (PICO)**.

(Fineout-Overholt & Johnston, 2005). Outlining the search terms in the PICO format helps to develop a focused search strategy for collecting the available evidence for critical appraisal. Figure 3 provides some examples of relevant public health research questions (adapted from DiCenso et al., 2005).

**FIGURE 3: Examples of Research Questions Relevant to Public Health**

<b>Question Type</b>	<b>Example</b>
Effectiveness of Interventions	Can a multi-component obesity prevention program in a secondary school increase adolescent physical activity?
Diagnosis (Assessment or Screening)	Can a school-based surveillance program for absenteeism over 10% indicate early influenza activity in a community?

<b>Question Type</b>	<b>Example</b>
Prognosis	What are the health effects in young children due to chronic consumption of private well water containing excessive lead concentrations?
Harm	Are there any long term adverse reactions associated with immunization for meningococcal disease in young adults?
Quality Improvement	For adult patients who require chemoprophylaxis for tuberculosis infection, are office/clinic visits three times a week for directly observed drug therapy as effective as daily home visits by public health nurses?
Economic Evaluation	Is social marketing for community prevention strategies for West Nile Virus cost effective in rural communities?
Clinical Prediction Guide	Are there demographic and psychosocial risk factors that can be used to develop a predictive index for HPV infection in females under 20 years of age?

Understanding the meaning of health issues; target population experiences, beliefs or attitudes What are adolescent experiences of seeking peer-counselling for sexual health matters in secondary schools

The following example of the PICO formulation uses the effectiveness question from Table 1 to answer the question: Can a multi-component obesity prevention program in a secondary school increase adolescent physical activity?

- Population** - secondary school students
- Intervention** - multi-component obesity prevention program
- Comparison** - usual health and physical activity courses
- Outcome** - levels of physical activity/ rates of obesity

### *Types of Research*

EBM was founded largely on quantitative research; however both quantitative and qualitative research contribute important knowledge to public health and can answer different questions of interest related to public health interventions.

Public health programs and actions must be not only effective, but appropriate for our communities and target populations. EIPH effectively transfers knowledge from both quantitative and qualitative research. (Context or experience questions are best answered by qualitative research, so the PS question frame is used: **P**atient / **P**opulation and **S**ituation.)

An understanding of the factors that support or impede the delivery of public health actions is seldom found solely in quantitative studies of effectiveness (Jackson & Waters, 2005). Qualitative information is critical to determining the community relevance of a program or

intervention. It provides public health practitioners with essential information about the effectiveness of interventions, and the contextual circumstances in which these interventions were delivered or could work.

The usefulness of a recently proposed hierarchy of evidence for qualitative research has not yet been conclusively established (Daly et al., 2007).

### Systematic Reviews - Important Keys for EIPH

Systematic reviews identify, appraise and summarize evidence that is relevant to a particular research question (DiCenso et al., 2005; Rychetnik & Wise, 2004). They are “reviews of clearly formulated questions that use systemic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyse data from the studies included in the reviews” (Waters et al., 2006) Expert panels are assembled to collaboratively conduct systematic reviews (Thomas et al., 2004; Waters et al., 2006) and can consider both quantitative and qualitative research. Whenever possible, good quality systematic reviews of the evidence, rather than single studies, should be used for public health practice decisions.

In 1998, the Effective Public Health Practice Project (EPHPP) began to systematically summarize research evidence to inform public health practice and policy for the Ontario Ministry of Health and local provincial health units. EPHPP developed a standardized tool to appraise individual studies for systematic reviews and summarized worldwide collaborative efforts to maintain databases for this purpose (Thomas et al., 2004). An exhaustive report assessed ways of appraising non-randomized intervention studies (Deeks et al., 2003). Of the 197 tools reviewed, only six were considered adequate for use in performing systematic reviews; the Thomas tool was one of these six superior tools.

Good systematic reviews or overviews are particularly helpful for busy public health practitioners because the evidence has already been found, the quality of that evidence evaluated, and the findings summarized for a specific question of interest (Ciliska et al., 2001; Jackson & Waters, 2004). However, one cannot assume that all systematic reviews are good, and therefore, they too need to be critically appraised.

### Pre-processed Evidence

Pre-processed evidence is an important and readily available resource for public health professionals. Pre-processed evidence has already been reviewed for methodological rigour by an individual or group who has then summarized the best quality evidence for consideration in public health practice. Systematic reviews, guidelines, EB textbook/journal summaries, clinical decision-making tools all fall under pre-processed information. Many on-line resources and products are kept current and are readily accessible.

Databases of pre-processed evidence can be accessed through health-evidence.ca, the Effective Public Health Practice Project, the Cochrane Library, the Centre for Reviews and Dissemination at the University of York (UK), the Canadian Task Force on Preventive Health Care, the Guide to Community Preventive Services (US) and the Scottish Intercollegiate Guidelines Network (SIGN). SIGN has produced an excellent workbook to develop clinical guidelines, which includes in its appendices six methodology checklists (tools) to critically appraise quantitative research studies, economic evaluation and systematic reviews. Links to these tools are included in Appendix 1.

## Economic Evaluation

Public health interventions are challenging to evaluate and synthesize because of their complexity, the possible involvement of professionals from a variety of disciplines, the unique features of the context of the study setting, the characteristics of the study population, and other methodological issues (Lin, 2004; Rychetnik et al., 2002; Waters et al., 2006).

Despite the challenges, decisions to implement new public health interventions or programs (or to maintain current practices) should be based on methodological economic evaluations (Birch & Gafni, 2003), and not simple cost-benefit analyses. Economic evaluation helps to determine whether the relative values of different outcomes and consequences of an intervention are worth the associated costs in both dollars and health risks. Public health practitioners must also evaluate whether the estimated costs associated with effective interventions seem realistic for their local settings.

There are relatively few economic evaluations in public health to date. Appendix 1 contains a link to the United Kingdom National Health Service Economic Evaluation Database, a free resource that summarizes evidence and includes an economic evaluation tool.

## Meta-Synthesis

Meta-synthesis incorporates the findings from multiple qualitative studies and can increase the transferability or generalizability of findings for public health practice. Meta-synthesis can enhance our understanding of the processes involved for the population of interest or for health care delivery, and inform decision making for policy and program development.

## Considering the Research

Research must always be critically appraised for its methodological rigour. The dilemma facing public health is that a randomized controlled trial (RCT) is not always feasible for a variety of reasons (e.g. cost, social constraints, ethical issues). Furthermore, as in all areas of health/medicine, not all RCTs of public health interventions have strong methodology.

Once selected, evidence can be organized or grouped according to its susceptibility to bias (Rychetnik & Wise, 2004). A hierarchy of evidence provides a way to rate the quality of evidence, where the same research question has been studied using different research methods or approaches.

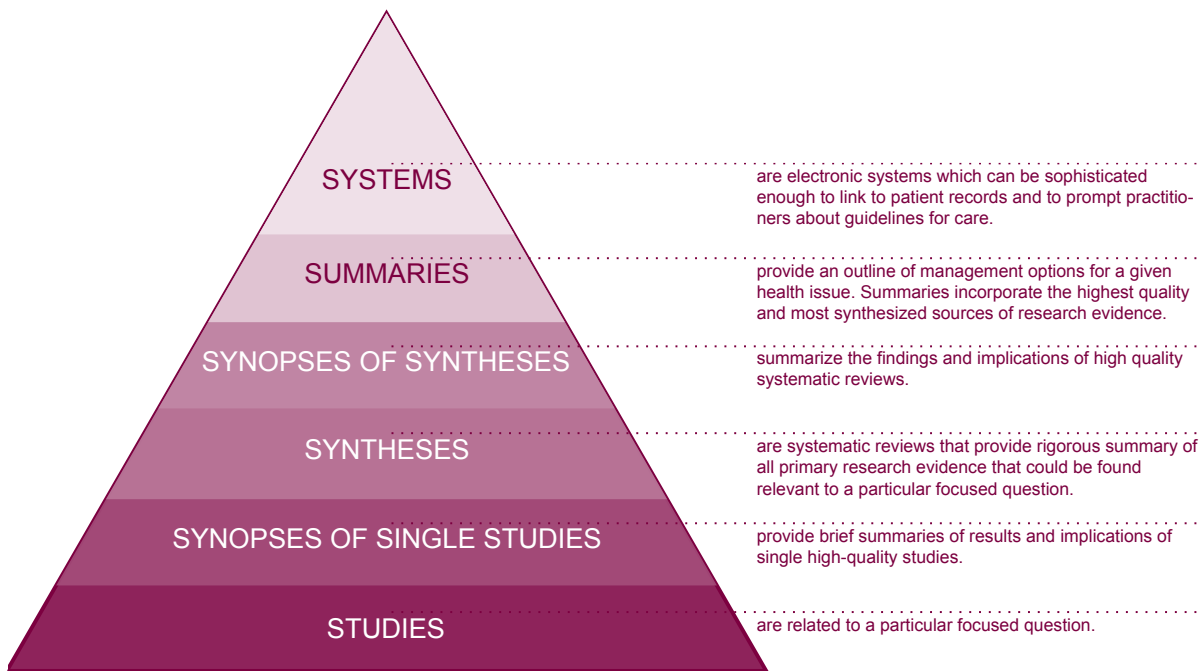
By identifying the strongest evidence, the hierarchy allows practitioners to 1) limit a search and 2) consider when to weigh alternative approaches or interventions for program delivery in public health. Figure 4 summarizes the hierarchy of strength of quantitative evidence for treatment or public health interventions (adapted from Dicenso, Ciliska, & Guyatt, 2005).

**Figure 4: A Hierarchy of Strength of Evidence for Treatment/ Intervention Decisions (Quantitative Research)**

<i>Relative Strength of Evidence (with 1 being the strongest)</i>	<i>Type of Evidence</i>
1	systematic review of randomized controlled trials
2	systematic review of observational studies addressing population health important outcomes
3	single randomized trial
4	single observational study addressing population important outcomes
5	physiologic and epidemiological study (e.g., study of infection prevalence, prevalence of cardiovascular risk factors)

A hierarchy or order can also indicate the strength of pre-processed evidence (see Figure 5).

**FIGURE 5: The 6S hierarchy of pre-processed research evidence (Adapted by DiCenso, Bayley, & Haynes, 2009)**



**Systems**

practice guidelines, decision pathways, or evidence-based summaries of a public health practice that provide public health professionals with much of the information needed to guide the intervention/action

**Summaries**

provide an outline of management options for a given health issue. Summaries incorporate the highest quality and most synthesized sources of research evidence.



### Synopses of syntheses

brief summaries of reviews with key methodological details and results

### Syntheses (systematic reviews)

overviews of systematic reviews that provide public health professionals with all the evidence that addresses a focused public health question

### Synopses of single studies

brief summaries of individual studies with key methodological details and results

### Single studies

those studies selected by an organization and pre-processed based on high relevance and characterized by study designs that minimize bias and thus permit a high strength of inference

*Note:* Although samples may have been randomly allocated to either control or intervention groups, other sources of bias may not have been addressed; for example, researchers may not have implemented the blinding of outcome assessors and/or there may be very high drop-out rates. Given that, in most interventions, drop-outs are least likely to have accomplished the outcome goal (e.g. quit smoking, avoid adolescent pregnancy), this can skew the results. Alternatively, some cohort studies have strong methodology, so excluding them from systematic reviews could be an error.

## Tools

This document provides a compilation of selected tools and recommendations for critically appraising relevant research for EIPH; it does not provide detailed discussion about each of the tools or checklists.

Appendix 1 includes a summary of the websites of leading organizations and links to critical appraisal tools for public health professionals. Recommendations are indicated for the use of various tools by public health practitioners and policy makers. Relevant links to current pre-processed evidence are also provided.

## Discussion and Conclusions

Critical appraisal provides a method of reviewing the quality of methods of research articles, as one step in EIPH. Critically appraised research is needed as part of an interactive process moving knowledge into practice in the complex world of public health. The use of quality checklists and other tools helps to provide a systematic and efficient means to identify rigorous studies for application to clinical practice or policy development.

This background document provides a brief discussion of some of the key concepts related to EIPH and critical appraisal for public health practice. A compendium of resources that are important to EIPH, including helpful websites and links to relevant tools, can further support the implementation of EIPH among the target audience.

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# Appendix 1 - Compendium of Critical Appraisal Tools

## Purpose

To provide some tools for conducting critical appraisal (step 3 below).

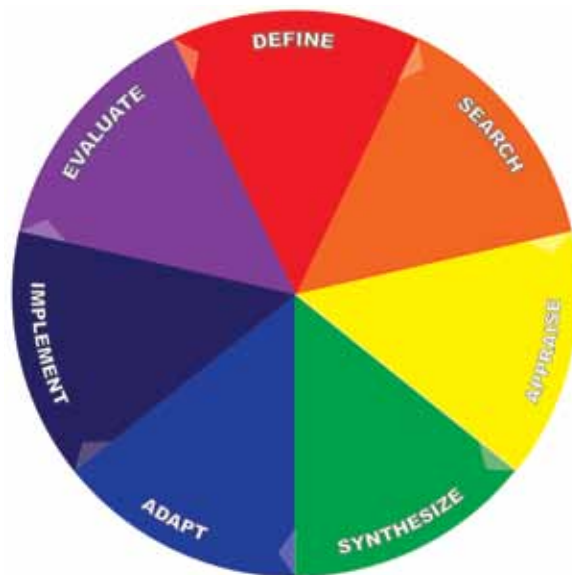
## Audience

Public health decision makers in practice or policy.

## Introduction to Evidence-Informed Public Health

The evidence-informed decision-making process includes the following steps:

### Stages in Evidence-Informed Public Health



<b>Stage in EIPH</b>	<b>Description</b>
DEFINE	Clearly define the question or problem.
SEARCH	Efficiently search for research evidence
APPRAISE	Critically and efficiently appraise the research sources
SYNTHESIZE	Interpret/ form recommendations for practice based on the literature found
ADAPT	Adapt the information to a local context
IMPLEMENT	Decide whether (and plan how) to implement the adapted evidence into practice or policy
EVALUATE	Evaluate the effectiveness of implementation efforts

## How to use this tool

Consider the type of question you are asking (first column); then consider the type of evidence you have found. That will lead you to what tool to use.

This is not an exhaustive list of critical appraisal tools; merely a listing of tools that are commonly used.

The status **Recommended** indicates that the tool 1) was judged as relevant for most studies in public health, and 2) includes an explanation of criteria within the tool, so the use of the criteria are self-explanatory.

<i>Type of Research</i>	<i>Website Link</i>	<i>Type of Study - Link to Tools</i>
<b>Quantitative</b> <ul style="list-style-type: none"> <li>• What is the effectiveness of....?</li> <li>• What is the result of exposure to...? (causation or harm)</li> <li>• Guidelines for...?</li> </ul>	Critical Appraisal Skills Programme (CASP) (UK): <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/">http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/</a></li> </ul> <p style="text-align: center; color: #800080; font-weight: bold;">Recommended</p>	randomized control trials: <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/rct%20appraisal%20tool.pdf">http://www.sph.nhs.uk/sph-files/rct%20appraisal%20tool.pdf</a></li> </ul> cohort studies: <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/cohort%2012%20questions.pdf">http://www.sph.nhs.uk/sph-files/cohort%2012%20questions.pdf</a></li> </ul> case control studies: <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/Case%20Control%2011%20Questions.pdf">http://www.sph.nhs.uk/sph-files/Case%20Control%2011%20Questions.pdf</a></li> </ul> diagnostic studies: <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/Diagnostic%20Tests%2012%20Questions.pdf">http://www.sph.nhs.uk/sph-files/Diagnostic%20Tests%2012%20Questions.pdf</a></li> </ul>

<b>Type of Research</b>	<b>Website Link</b>	<b>Type of Study - Link to Tools</b>
	<p>Scottish Intercollegiate Guidelines Network (SIGN):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sign.ac.uk/">http://www.sign.ac.uk/</a></li> </ul>	<p>randomized control trials tool and guidelines:</p> <p>checklist:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/checklist2.html">http://sign.ac.uk/guidelines/fulltext/50/checklist2.html</a></li> </ul> <p>notes on use:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/notes2.html">http://sign.ac.uk/guidelines/fulltext/50/notes2.html</a></li> </ul> <p>cohort studies tool and guidelines:</p> <p>checklist:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/checklist3.html">http://sign.ac.uk/guidelines/fulltext/50/checklist3.html</a></li> </ul> <p>notes on use:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/notes3.html">http://sign.ac.uk/guidelines/fulltext/50/notes3.html</a></li> </ul> <p>case-control studies tool and guidelines:</p> <p>checklist:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/checklist4.html">http://sign.ac.uk/guidelines/fulltext/50/checklist4.html</a></li> </ul> <p>notes on use:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/notes4.html">http://sign.ac.uk/guidelines/fulltext/50/notes4.html</a></li> </ul> <p>diagnostic studies tool and guidelines:</p> <p>checklist:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/checklist5.html">http://sign.ac.uk/guidelines/fulltext/50/checklist5.html</a></li> </ul> <p>notes on use:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/notes5.html">http://sign.ac.uk/guidelines/fulltext/50/notes5.html</a></li> </ul>
<p><b>Qualitative</b></p> <ul style="list-style-type: none"> <li>• What is the experience of or meaning of..?</li> </ul>	<p>Critical Appraisal Skills Programme (CASP) (UK):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/">http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/</a></li> </ul> <p><b>Recommended</b></p>	<p>qualitative research studies:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/Qualitative%20Appraisal%20Tool.pdf">http://www.sph.nhs.uk/sph-files/Qualitative%20Appraisal%20Tool.pdf</a></li> </ul>

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	<p>Reading Qualitative Studies</p> <p>Sandelowski M., &amp; Barroso J. (2002), Reading Qualitative Studies. <i>International Journal of Qualitative Methods</i> 2002, 1(1)</p> <p>Article link:</p> <ul style="list-style-type: none"> <li>• <a href="http://ejournals.library.ualberta.ca/index.php/IJQM/article/view/4615/3764">http://ejournals.library.ualberta.ca/index.php/IJQM/article/view/4615/3764</a></li> </ul> <p>Evaluating non-randomised intervention studies</p> <p>Deeks J.J., Dinnes J., D'Amico R., Sowden A.J., Sakarovitch C., Song F., et al. (2003). Evaluating non-randomised intervention studies. <i>Health Technology Assess.</i> 7(27).</p> <p>Article link:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.hta.ac.uk/fullmono/mon727.pdf">http://www.hta.ac.uk/fullmono/mon727.pdf</a></li> </ul>	
<p><b>Systematic Reviews</b></p> <ul style="list-style-type: none"> <li>• What is the effectiveness of...?</li> </ul>	<p>Critical Appraisal Skills Programme (CASP) (UK):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/">http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/</a></li> </ul> <p>Recommended for critical appraisal of systematic reviews</p> <p>Scottish Intercollegiate Guidelines Network (SIGN):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sign.ac.uk/">http://www.sign.ac.uk/</a></li> </ul> <p>Cochrane Handbook for Systematic Reviews of Interventions</p> <ul style="list-style-type: none"> <li>• <a href="http://www.cochrane.org/">http://www.cochrane.org/</a></li> </ul>	<p>systematic reviews:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/S.Reviews%20Appraisal%20Tool.pdf">http://www.sph.nhs.uk/sph-files/S.Reviews%20Appraisal%20Tool.pdf</a></li> </ul> <p>Systematic reviews and meta-analysis tools and guidelines:</p> <p>checklist:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/checklist1.html">http://sign.ac.uk/guidelines/fulltext/50/checklist1.html</a></li> </ul> <p>notes on use:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/notes1.html">http://sign.ac.uk/guidelines/fulltext/50/notes1.html</a></li> </ul> <p>Handbook link:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.cochrane-handbook.org/">http://www.cochrane-handbook.org/</a></li> </ul>



<b>Type of Research</b>	<b>Website Link</b>	<b>Type of Study - Link to Tools</b>
	<p>Centre for Reviews and Dissemination (CRD) University of York (UK):</p> <p>Undertaking systematic reviews of research on effectiveness, CRD's guidance for those carrying out or commissioning reviews</p> <p>Systematic reviews, CRD's guidance for undertaking reviews in health care</p> <ul style="list-style-type: none"> <li>• <a href="http://www.york.ac.uk/inst/crd/">http://www.york.ac.uk/inst/crd/</a></li> </ul>	<p>Handbook link</p> <ul style="list-style-type: none"> <li>• <a href="http://www.york.ac.uk/inst/crd/SysRev/!SSL!/WebHelp/SysRev3.htm">http://www.york.ac.uk/inst/crd/SysRev/!SSL!/WebHelp/SysRev3.htm</a></li> </ul>
	<p>Evidence for Policy and Practice Information and Coordinating Centre (EPPI-centre) (University of London, UK):</p> <ul style="list-style-type: none"> <li>• <a href="http://eppi.ioe.ac.uk/cms/">http://eppi.ioe.ac.uk/cms/</a></li> </ul>	<p>Methods: Stages of a Systematic review link:</p> <ul style="list-style-type: none"> <li>• <a href="http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=89">http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=89</a></li> </ul> <p>Quality Assessment and Relevance of evidence:</p> <ul style="list-style-type: none"> <li>• <a href="http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=177">http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=177</a></li> </ul>
	<p>PHRED Effective Public Health Practice Project</p> <ul style="list-style-type: none"> <li>• <a href="http://www.phred-redsp.on.ca/">http://www.phred-redsp.on.ca/</a> <a href="http://oldhamilton.ca/.phcs/ephpp/Reviews-Portal.asp">http://oldhamilton.ca/.phcs/ephpp/Reviews-Portal.asp</a></li> </ul> <p style="text-align: center;"><b>Recommended for conduct of systematic reviews</b></p>	
	<p>Campbell Collaboration C2-SPECTR Database</p> <ul style="list-style-type: none"> <li>• <a href="http://www.campbellcollaboration.org/">www.campbellcollaboration.org/</a></li> </ul>	
<p><b>Health Services Research</b></p> <ul style="list-style-type: none"> <li>• What is the cost-effectiveness?</li> <li>• Cost-benefit?</li> <li>• Cost-utility?</li> </ul>	<p>Critical Appraisal Skills Programme (CASP) (UK):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/">http://www.sph.nhs.uk/what-we-do/public-health-workforce/resources/critical-appraisals-skills-programme/</a></li> </ul> <p style="text-align: center;"><b>Recommended</b></p>	<p>Economic evaluation studies:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sph.nhs.uk/sph-files/Economic%20Evaluations%2010%20Questions.pdf">http://www.sph.nhs.uk/sph-files/Economic%20Evaluations%2010%20Questions.pdf</a></li> </ul>
	<p>National Health Services Economic Database</p>	<p><a href="http://www.crd.york.ac.uk/crdweb/">http://www.crd.york.ac.uk/crdweb/</a></p>

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	<p>The Guide to Community Preventive Services.</p> <p>The Task Force on Community Preventive Services (US):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.thecommunityguide.org/library/book/index.html">http://www.thecommunityguide.org/library/book/index.html</a></li> </ul>	<p>Chapter 11 “Understanding and Using the Economic Evidence” (tool):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.thecommunityguide.org/library/economics.pdf">http://www.thecommunityguide.org/library/economics.pdf</a></li> </ul>
<p><b>Clinical Practice Guidelines</b></p> <ul style="list-style-type: none"> <li>• What is the best intervention/management of ....? (considers the best evidence, context and expert opinion)</li> </ul>	<p>Scottish Intercollegiate Guidelines Network (SIGN):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.sign.ac.uk/">http://www.sign.ac.uk/</a></li> </ul>	<p>SIGN 50: A Guideline Developers’ Handbook:</p> <ul style="list-style-type: none"> <li>• <a href="http://sign.ac.uk/guidelines/fulltext/50/index.html">http://sign.ac.uk/guidelines/fulltext/50/index.html</a></li> </ul>
	<p>AGREE II (Appraisal of Guidelines Research and Evaluation) Collaboration</p> <ul style="list-style-type: none"> <li>• <a href="http://www.agreetrust.org/home/">http://www.agreetrust.org/home/</a></li> </ul> <p><b>Recommended</b></p>	<p>Critical appraisal tool for Guidelines – AGREE II Tool</p> <ul style="list-style-type: none"> <li>• <a href="http://www.agreetrust.org/resource-centre/agree-ii/">http://www.agreetrust.org/resource-centre/agree-ii/</a></li> </ul>
	<p>National Institutes for Health and Clinical Excellence</p> <ul style="list-style-type: none"> <li>• <a href="http://www.nice.org.uk/">http://www.nice.org.uk/</a></li> </ul>	
<p><b>Overviews of Critical Appraisal Methods/ Tools/Processes</b></p> <ul style="list-style-type: none"> <li>• What is the level of evidence?</li> </ul>	<p>The NIHR Health Technology Assessment Programme (NHS)</p> <ul style="list-style-type: none"> <li>• <a href="http://www.hta.ac.uk/1117">http://www.hta.ac.uk/1117</a></li> </ul> <p>Article: Evaluating non-randomised intervention studies</p> <p>Deeks J.J., Dinnes J., D’Amico R., Sowden A.J., Sakarovitch C., Song F., et al. (2003). Evaluating non-randomised intervention studies. <i>Health Technology Assess.</i> 7(27).</p> <p>Article link:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.hta.ac.uk/fullmono/mon727.pdf">http://www.hta.ac.uk/fullmono/mon727.pdf</a></li> </ul>	

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	<p>BioMed Central Systems article on grading the quality of evidence and the strength of recommendations II: Pilot study of a new system:</p> <p>Article link:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.biomedcentral.com/content/pdf/1472-6963-5-25.pdf">http://www.biomedcentral.com/content/pdf/1472-6963-5-25.pdf</a></li> </ul>	
	<p>Agency for Healthcare Research and Quality (AHRQ) (US):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.ahrq.gov/">http://www.ahrq.gov/</a></li> </ul>	
	<p>The Guide to Community Preventive Services:</p> <p>The Task Force on Community Preventive Services (US):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.thecommunityguide.org/library/book/index.html">http://www.thecommunityguide.org/library/book/index.html</a></li> </ul>	<p>Chapter 10 “Methods Used for Reviewing Evidence and Linking Evidence to Recommendations” (tool):</p> <ul style="list-style-type: none"> <li>• <a href="http://www.thecommunityguide.org/methods/methods.pdf">http://www.thecommunityguide.org/methods/methods.pdf</a></li> </ul>
	<p>The Canadian Task Force on Preventive Health Care:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.ctfphc.org/">http://www.ctfphc.org/</a></li> </ul>	