



National Collaborating Centre
for Methods and Tools

Centre de collaboration nationale
des méthodes et outils

Webcast:

Part Two: Search

Hi, I'm Donna Ciliska, Scientific Director of the National Collaborating Centre for Methods and Tools and a Professor at McMaster University.

The National Collaborating Centre is funded by the Public Health Agency of Canada and located at McMaster in Hamilton.

This session is Part Two of Evidence-Informed Public Health where we're going to be talking about tricks for searching -- how to find the best available evidence in an efficient way.

The entire process, just to review, is to define the question, to conduct an efficient search, to critically appraise the information that you find and then put it together in a synthesis of what all of this information means as a total package; to adapt that to the local situation; implement the intervention with healthcare practitioners and policy makers; and then to evaluate what impact the implementation has had, both on practitioner change, policy change and then actual change in the community.



So this session is about searching and making your literature search most efficient.



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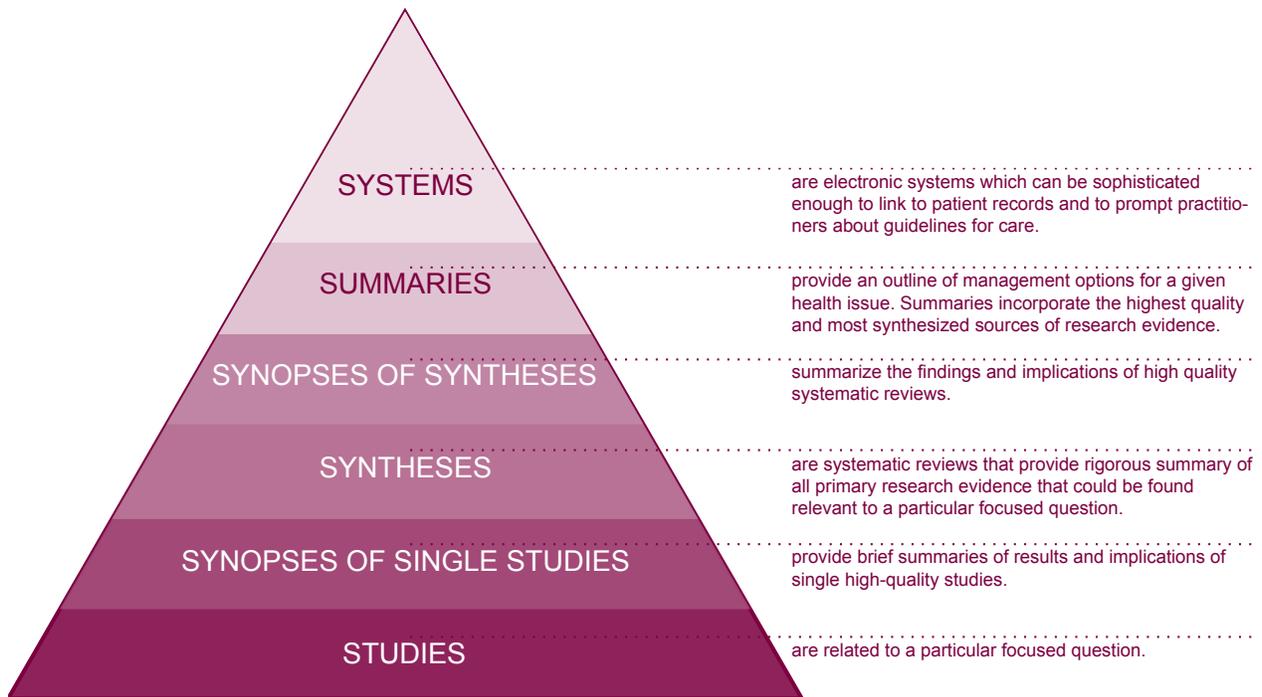
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This is a tool that Brian Haynes initially developed and then further developed with Alba DiCenso and Liz Bayley at McMaster University. This is a tool to help you efficiently search.



If you understand how the research is built up about a particular question, you can see it starts with individual studies at the bottom of the pyramid. Above that, we move into systematic reviews, where a systematic review is a process of putting together a number of studies that exists about a particular issue. Then, from there guidelines are developed based on a number of systematic reviews. So you can see that, as we move up in these levels, the evidence grows. Conversely, though, to do an efficient search you start at the top.

In public health we have no systems really that are available to us for searching. Systems do exist in primary care where there are automated office systems that require practitioners to do certain behaviours that are evidence-based, to order certain tests, to do particular examinations, but none of those exist in public health right now.

For summaries, we have guidelines like the Registered Nurses Association of Ontario or the National Guideline Clearinghouse.

For systematic reviews we have several options: in the Cochrane Collaboration; in searching through PubMed; and through a great resource we have in Canada called Health Evidence. For individual studies, we have PubMed. So now I'm going to go through some of these tools in a bit more depth.

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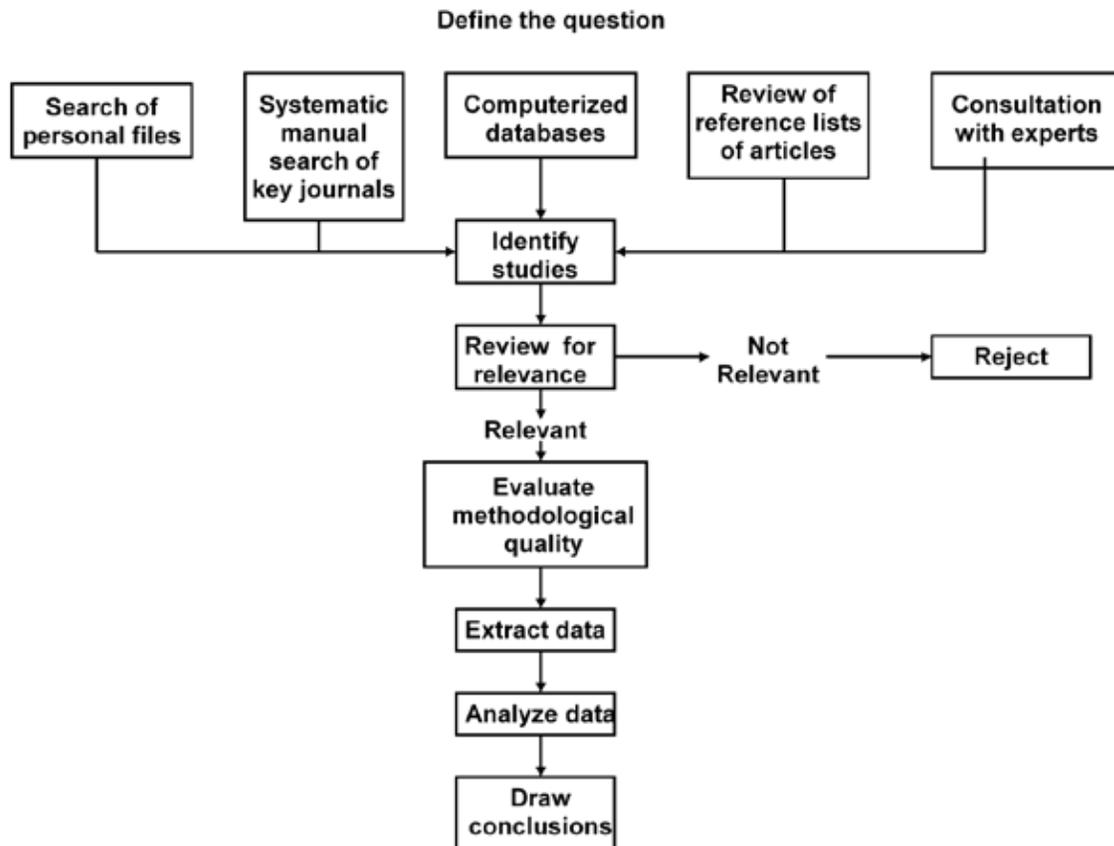
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Steps of a Systematic Overview



First of all, it's probably important that you understand what a systematic review is. A systematic review looks at a number of individual studies and builds up the results to find an answer in some synthesis.

The first part of a systematic review is being clear about the question, defining a clear question, and then doing a very thorough search to identify all of the studies. A thorough search re-requires that you look both for published and unpublished studies. There's an important publication bias that indicates that studies that find no difference between an intervention and the control, or studies where the control actually does better than the intervention, are less likely to be written and less likely to be published. That means that those results are not often included in systematic reviews unless you've looked for those unpublished studies.

So you need to do very broad, deep, wide search is done for published and unpublished studies about a particular topic, the question that you've chosen.

Then there's a process of going through all of the possible hits to make sure that they're actually relevant to this question. The relevance check is done independently by two people who meet to discuss any disagreements they have about whether or not a study is relevant or not to the question. If it is relevant, the

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goes onto two independent reviews of the quality of the study where again the two reviewers would meet for any disagreements.

Then two independent processes of data extraction where people take out what actually was the intervention, who did it, the theoretical basis, and the outcome, probably including the number of outcomes, and then some analysis of the data.

So this process is very rigorous. A systematic review is considered a type of research on its own. They usually take a number of people up to a year to do, so it's not a fast process and it's not an inexpensive process, but it's a very thorough process.

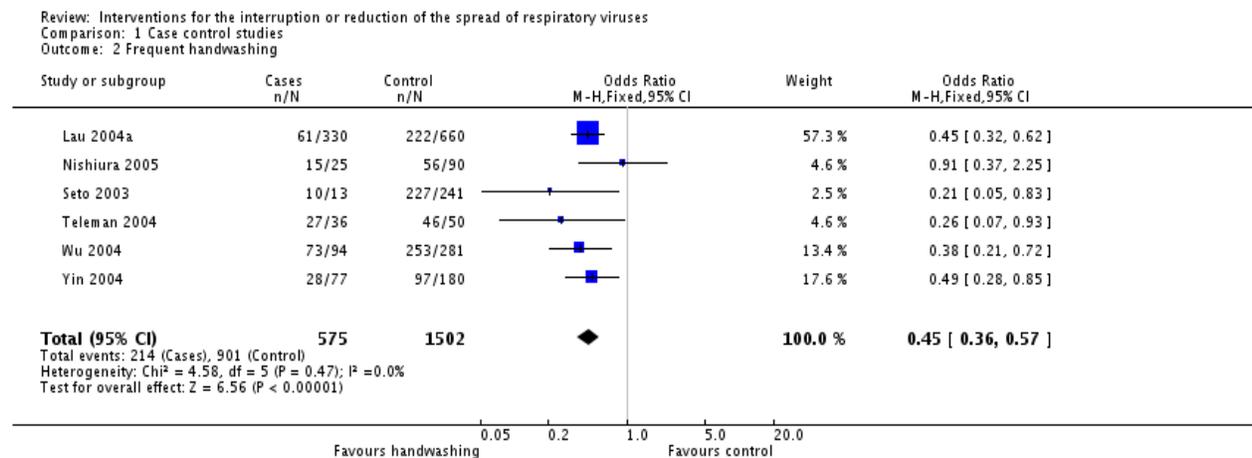
So the point is if you're looking for an answer about a particular question, if you can find a systematic review that's been done, it's going to save you a lot of time in looking for and doing the quality appraisal and synthesis of this information about the topic.

Sometimes systematic reviews are such that the outcomes can actually be put together statistically. If the outcomes are measured in the same way across studies they can be statistically combined to become a meta-analysis.

This good example looks at what difference it makes if people wash their hands ten times a day or more, versus less than ten times a day for this spread of respiratory viruses within an acute care situation. The meta-analysis is actually the diamond at the bottom of this graph (sometimes called a "blobagram"), the diamond at the bottom of the blobagram is the actual statistical combination of all of the results of the six studies that were included in this systematic review.

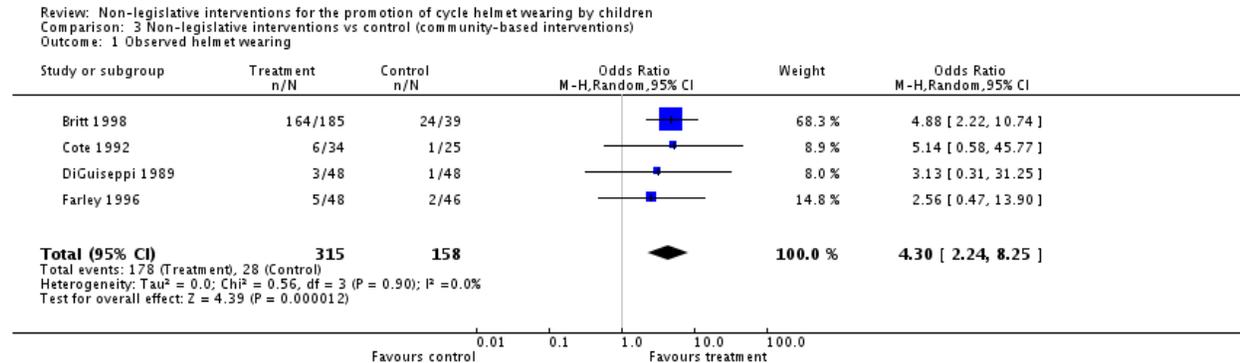
So all meta-analyses are the result of systematic reviews, but not all systematic reviews end in a meta-analysis.

So in this case, I can just give the interpretation of what difference does it make if you wash your hands ten times a day or more. The actual odds ratio is .45 so that means if you wash your hands more than ten times a day, you can reduce the spread of respiratory viruses by approximately one half, or a fifty percent reduction in the spread of respiratory viruses.



Just for one other quick example, in this meta-analysis, statistical results of four different studies were put together and the diamond shows you that result at the bottom.

This question was about what the difference it makes if we do interventions in the schools to get kids to wear bicycle helmets.



And you can see the odds ratio here is 4.3 which is a pretty dramatic increase in actual observed bicycle helmet use in children. People actually stood at the playgrounds and watched children as they arrived and left the playground and found that, if they did these interventions in the schools, they increased the use of bicycle helmets by almost four and half times.

So a meta-analysis gives you a very quick answer to your question and it's based on a large input of resources of people to look for all the studies, do the quality appraisals of the studies and do the data extraction of the studies to come up with a very clear answer for you.

Health Evidence is one of the best resources we have for public health in Canada. It's a registry of systematic reviews on the effectiveness of public health or health promotion interventions that are relevant to public health in Canada.

So if you find the answer to your question you know that it has already been assessed and has been determined to be relevant to public health in Canada.

Health Evidence provides you with an abstract and a quality assessment. Two people independently rate the quality of the systematic review and tell you whether on a scale of one to ten whether it's a low-, moderate- or high-quality systematic review.

So that saves the next step in the process of having to do the critical appraisal of the systematic review.

Health Evidence sometimes gives you summary statements. They don't have time to write summary statements for all two thousand systematic reviews that exists currently in this database, but they've tried to write summary statements for the ones they think are most important and are of highest quality, that will impact on public health in Canada.

Summaries are structured the same way we talked about in the previous session about defining the question, each question is structured in "PICO" format, so you know the population of interest, the intervention, the comparison and the outcome.

And they tell you the methodological strengths and weaknesses of the systematic review as well as the studies that are within the systematic review.

Then they give you implications for policy and practice, so the summary statement can give you in two or

three pages, the real nuggets of information of what's important from the systematic review for you to pay attention to in public health in Canada.

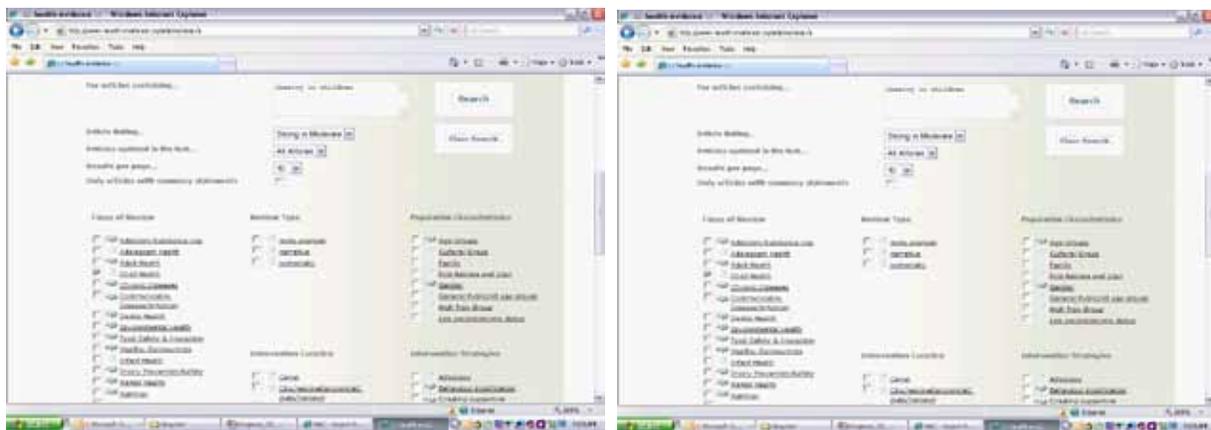
This is a quick look at the opening page of Health Evidence. You'll see the search boxes in the top right.

When you click on that button, you get a page that allows you to do free-text searching. I'm looking for the bicycle helmet interventions for children, so where it says "for articles containing," I've typed in helmet, and on the left I've clicked on child health to try to restrict this search for a systematic reviews to the age group that we're interested in.



And after I search on that I get this results page and you'll in see the results page the listing of the titles of the systematic reviews on the left, the authors, the date of the publication, and then the actual rating. In this case, I've chosen to show the results of the systematic reviews according to their ratings, starting with the ones that are strong.

You'll see, for the third review down, beside the rating, there's a little pdf icon. That icon shows you there is a synopsis available -- the two- or three-page summary for this systematic review.



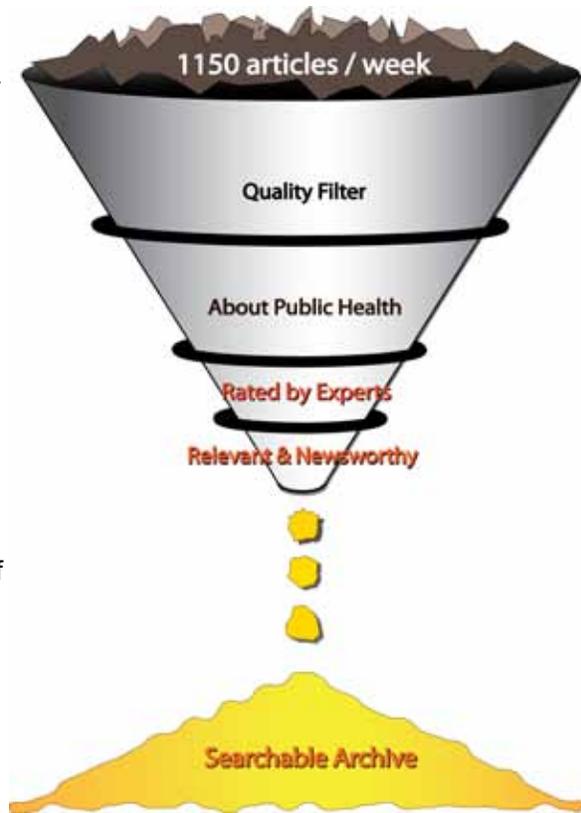
Another tool available to you is called "Public Health +." In contrast to Health Evidence which is all about systematic reviews, Public Health + includes both systematic reviews and primary studies. The advantage of this database is that all of the articles within this database have already been filtered for high quality. So when you look in this database you will only find the high-quality research, you won't find all of the research that exists about a particular problem. In this process, staff of the Health Information Research Unit actually read over a thousand articles per week with standard quality criteria.

Anything that passes their quality filter then goes on to be rated by experts in their areas of interest within public health, so it could be for example, in communicable disease, in health promotion. The experts rate each article for whether or not it's relevant to their practice, as well as whether or not it's newsworthy. In other words, if it's something that just reaffirms what we've known for a long time, it would be low on the newsworthy aspect, versus if it's something that's actually quite new and noteworthy for our practice.

Anything that passes the quality criteria and is then rated at least a four on a scale of one to seven for both relevance and newsworthiness goes into the searchable database for Public Health +.

So you end up with high quality, high relevance and high newsworthy articles, so really just the nuggets of what's important and what's new in public health.

This is updated on a weekly basis and you'll see on our website, you can have it sent directly to your email through an "RSS feed". So we are helping you keeping up with the best information in public health.



The screenshot shows the website for the National Collaborating Centre for Methods and Tools (NCCMT). The page is titled "Public Health +" and features a search bar and a list of search results. The first result is a randomized controlled trial on home injury hazard reduction.

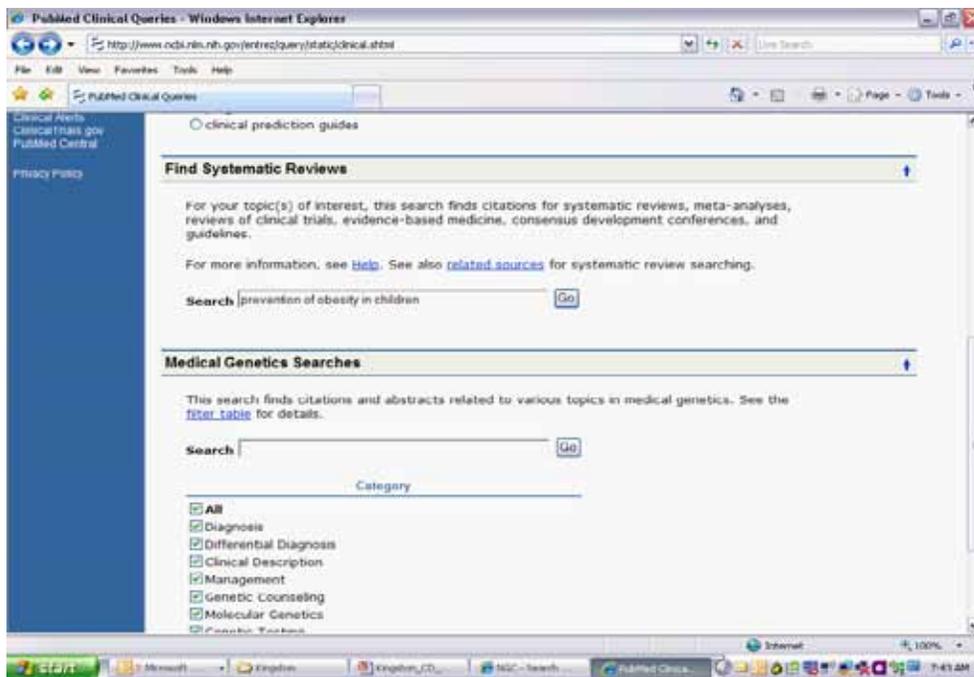
Results categorized by...	Showing 1 - 10:
All (883)	<p>A Randomized Controlled Trial of Home Injury Hazard Reduction: The HOME Injury Study. Source: Arch Pediatr Adolesc Med. 2011 Apr;165(4):339-45. Relevance Rating: 5 Newsworthiness Rating: 5</p>
	<p>Interventions for encouraging sexual behaviours intended to prevent cervical cancer.</p>

One other search strategy that will dramatically reduce the amount of time you spend searching, if you're not successful in finding a good systematic review in Health Evidence, if you're not successful in finding a high quality article within Public Health +, the next line would be to go to PubMed.

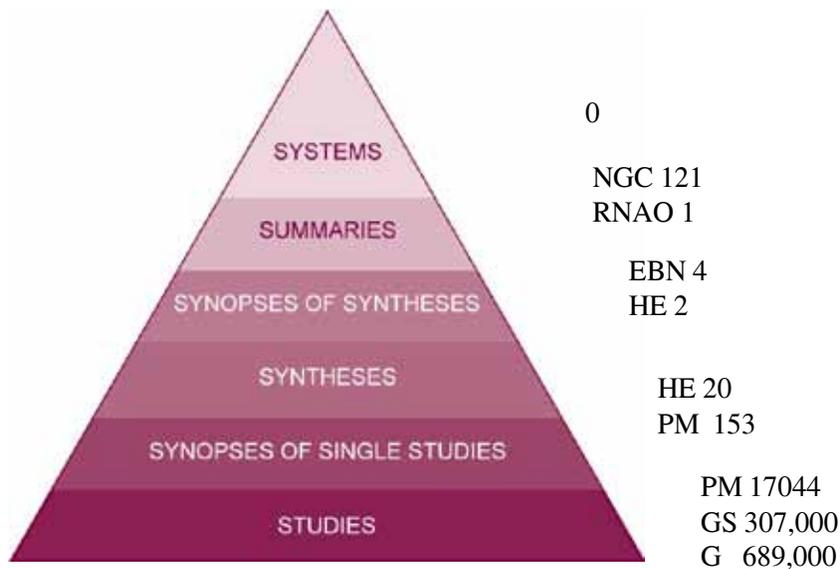


And PubMed is a free online database funded by the US government, actually for the rest of the world. PubMed has some built in filters, so rather than just searching broadly in public health and finding thousands of articles, you can go to this circled area called “clinical queries” to get some filters that are already built in that will help you find just the high quality information.

When you click on “clinical queries” you find this screen where you’ll find systematic reviews, unlike when you search on PubMed generally when you also get opinion pieces and non-systematic reviews.



This part of PubMed will actually help you find just the high-quality systematic reviews, for example, in the text search I put in obesity in children and got a limited number of high-quality reviews.



This diagram shows you how these tools can save you time. For every one of the searches on the pyramid, I used exactly the same words, I used obesity in children and I started at the bottom.

People often start searching in Google, but in Google when I put in obesity in children I got six hundred and eighty-nine thousand hits.

And some people will say “Well I only use Google Scholar and I got the best information that way,” but the same search using Google Scholar gave me three hundred and seven thousand hits – still way too much information for any practitioner to look at in a reasonable amount of time.

When I searched generally in PubMed, I got seventeen thousand forty-four hits – again, way too many.

Moving up the pyramid, when I went to the synthesis level, in Health Evidence I found twenty systematic reviews about obesity in children, so again, these would be a quality assessed and you can limit your search to find only the high-quality ones. Additionally, two of their twenty systematic reviews, also gave me the two- to three-page summary about what the systematic review was telling us, the implications for practice and policy.

When I used the “clinical queries” filter in PubMed, I found a hundred and fifty-three, still a large number.

Looking in the RNAO guidelines there was one guideline, and in the National Guideline Clearinghouse, a hundred and twenty-one guidelines.

So, from looking at this pyramid and the number of hits with the same search, you would probably go directly to Health Evidence. You would have found the best information in five minutes if you had used that strategy.

So those were some tips for efficient searching.

If you want to review other stages of the evidence informed public health process, you can go to the website for the National Collaborating Centre for Methods and Tools at www.nccmt.ca or, in French, www.ccnmo.ca.