

Collaborating to plan efficient public health guideline evidence reviews: understanding which sources retrieve evidence

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Abstract

The National Institute for Health and Care Excellence (NICE) produces public health guidelines. Information specialists collaborate with technical analysts to perform systematic searches for evidence reviews (ERs). Public health ERs require searches from multiple disciplines across a range of sources leading to high volumes of results. The purpose of the project was to provide evidence to support the choice of sources for new topics. It aimed to retrospectively analyse a sample of NICE public health ERs by examining which sources retrieved publications. Medical databases found the highest proportion of publications, but smaller subject focussed databases and search techniques also contributed. These findings justify use of a range of sources for public health reviews and help the planning of ERs.

Key words: public health; databases, bibliographic; evidence-based practice; information storage and retrieval.

Introduction

The National Institute for Health and Care Excellence (NICE) is an independent organisation based in England that produces a range of guidelines. NICE public health guidelines aim to promote healthy living and prevent ill health.

Information specialists (IS) have a key role in both the scoping and development of all new guidance at NICE. They collaborate closely with technical analysts and advisers to perform systematic searches for the evidence reviews that support the recommendations for NICE guidance.

The search process for any topic is lengthy. It starts with searches for guidance (from NICE and other organisations) and systematic reviews on the topic in question. This helps the analysts to gain an insight into what is already published on the topic and to discover what the gaps in evidence are.

During the guideline development phase the IS develops a strategy in MEDLINE which is run and translated into other databases e.g. Embase and Cochrane Library. Additional search techniques may be used to find further results. The process includes writing the search protocol and keeping records of methods and search dates to aid the transparency.

Public Health evidence reviews

Public health topics can be more challenging to search than clinical topics. There are a number of reasons for this but key factors are the type of evidence needed to answer these questions and the volume of results that can be found.

The evidence for public health guidelines may be found in medical databases like MEDLINE and Embase. However, searches may also need to be undertaken in databases with a different disciplinary focus. For example, a recent NICE guideline “Alcohol intervention in secondary and further education NG135” required searches in education focussed databases as well as medical. There may also be useful evidence in websites or unpublished reports. Locating this evidence requires additional searching.

Searching itself can contribute to the large volume of results because the terminology used to describe public health interventions is complex. The concepts can be difficult to define. For example, a search on a behaviour change technique would require search terms covering behaviour change as a term with various iterations as well as terms covering the behaviour that was being changed, for example stopping smoking.

For clinical topics, it is often appropriate to limit

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searches by study type to reduce the number of results. For example, if the research question is answerable by randomised controlled trials (RCTs) this would be a suitable study limit. However, for public health guidelines, it may not be possible to limit results in this way. RCTs may not be the most or only appropriate study type to find the evidence, meaning that other study types should be included.

Consequently, the volume of results for public health topics is usually high. This results in more time needed for searching additional sources, uploading results and de-duplicating results.

With this challenge in mind, NICE began an investigation into where the evidence came from for a sample of NICE public health guidelines. The aim of the project was to discover if databases and search techniques used in public health topics were essential for identifying all the included publications in the evidence reviews.

Methods

The project was initiated in 2016 and covered ten guidelines in total (Figure 1). Most of the guidelines had more than one evidence review which resulted in analyses of 29 evidence reviews.

Drugs misuse prevention (DMP) (2)	Community pharmacy (4)
Transport related air pollution (TRAP) (3)	HIV (3)
Sexual health (SH)	Physical activity & environment
Stop smoking interventions & services (SSIS)	Workplace health
Suicide Prevention (SP) (9)	Flu vaccination (4)

Fig. 1. Project topics (number of reviews in brackets)

Search summary table

Bethel and Rogers (1) presented their search summary table at the Cochrane Colloquium in 2016 and this was adapted to the requirements of the NICE project. Table 1

Included references - list each one on a new row	Database searches (June 2015)						Supplementary searches	
	Embase	HMIC	Medline	MIP	Psy-cINFO	SPP	Call for Evidence	Websites
Add a column (in alphabetical order) for each database or source that was used. Delete any columns that are not required.								
1. Adedimeji, Adebola A., Asibon, Aba, O'Connor, Gerard, Carson, Richard, Cowan, Ethan, McKinley, Philip, Leider, Jason, Mallon, Patrick, Calderon, Yvette, Increasing HIV testing among African immigrants in Ireland: challenges and opportunities, Journal of immigrant and minority health / Center for Minority Public Health, 17, 89-95, 2015				X	X			
2. Dowson, Lucy, Kober, Catherine, Perry, Nicky, Fisher, Martin, Richardson, Daniel, Why some MSM present late for HIV testing: a qualitative analysis, AIDS care, 24, 204-209, 2011	X		X		X			X
3. Glew, Simon, Pollard, Alex, Hughes, Leila, Llewellyn, Carrie, Public attitudes towards opt-out testing for HIV in primary care: a qualitative study, The British journal of general practice : the journal of the Royal College of General Practitioners, 64, e60-6,	X		X	X				

Table 1. Adapted version of Search Summary Table developed by information specialists at Exeter University.

illustrates an example of the search summary table used to collect data from each search. For each search, an un-deduplicated Endnote Library was retained. The publications included in the evidence reviews were found and inserted into the table. The un-deduplicated Endnote library was searched to check which database or source had found each included publication. The unique sources for each review were established by checking which included publications had been retrieved by a single source.

Results

Which sources retrieved publications included in the evidence review?

Which databases did we need? Across the reviews, 28 databases were used (Figure 2). Seven of the 28 databases are routinely searched for all public health reviews. These are CDSR, CENTRAL, DARE, Embase, MEDLINE, MiP and SPP.

AMED	Econlit	MEDLINE
ASSIA	EconPapers	MEDLINE in Process (MiP)
BNI	Embase	PsycINFO
CINAHL	EPPI Bibliomap	Social Care Online
Cochrane CDSR	EPPI Doppher	Social Welfare
Cochrane CENTRAL	EPPI Trophi	Sociological Abstracts
Cochrane Dare	ERIC	Social Policy & Practice (SPP)
Cochrane HTA	Greenfile	Transport
Cochrane NHS EED	Health Evidence	
Community Pharmacy Future	HMIC	

Fig. 2. Twenty-eight databases used in the guidelines

MEDLINE, Embase, CDSR and PsycINFO (when searched) found over two thirds of the included publications in many reviews. In some cases the figure was much higher. For example, Embase found 86% of included publications for SH. However, for some reviews it was the smaller, subject focussed databases that found a large percentage of the included publications. For example, for TRAP (Evidence review 1) Greenfile found 52% of included publications. Five databases did not retrieve any included publications at all. These were Cochrane HTA, Community Pharmacy Future, Health Evidence, Social Welfare and Sociological Abstracts.

What other search techniques did we need? Across the reviews, eight techniques were applied (Figure 3). In-

cluded publications were found this way for some reviews. SP (Evidence Review 1) found 91% of included publications via citation searching. DMP (Evidence Review 1) found 31% of included publications from citation searching and 60% from reference harvesting. However, for some reviews, no included publications or very few, were found by using additional techniques. For example, handsearching did not produce any included publications for any review.

Analyst Actions	Handsearching
Call for Evidence	Reference Harvesting
Citation searching	Websites - search
Contact Exports	Websites - browse

Fig. 3. Techniques used in the 10 evidence reviews

Which included publications were retrieved by a single source?

Databases. Sixteen of the 28 databases found at least one included publication that was not found anywhere else. Medical databases (CDSR, MEDLINE, Embase) accounted for high proportions of unique included publications for some reviews. For example, CDSR found 81% of unique included publications for SSIS and MEDLINE found 67% of unique included publications for SP (Evidence Review 8). Smaller databases also found included publications that were not found anywhere else. SPP found the only unique included publication for SP (Evidence Review 2).

Search techniques. Five of the eight techniques used retrieved unique included publications. The highest proportion was in DMP (Evidence Review 1), where 83% of the unique included publications were due to one of these techniques. This included 50% from reference harvesting and 33% from citation searching. This was followed by SP (Evidence Review 7) where 25% were found from citation searching. Website searching led to a unique included publication seven of the 28 times that it was used.

Reflections

The results illustrate that both commonly searched medical databases and smaller subject-focused databases have a place in public health search strategies. Additional search techniques can also provide included publications for some topics. Five databases did not contribute any included publications and so it

would be possible to reduce the sources for individual topics without losing relevant publications. However, the knowledge of which sources find relevant results and which don't only comes after searching and screening are complete. Therefore, given the range of topic areas within the public health discipline, dropping any one source globally could compromise future guidelines. The results suggest that NICE is justified in using a wide range of sources to support public health guidelines. A benefit of the work was the development of a robust methodology that can be applied in other settings. For example, the methods used in the project were applied to recent work undertaken for COVID-19 guidance and used to pinpoint which sources were finding useful evidence.

Developments: database selection

The project results have helped NICE to make decisions about which sources to search for future topics and to supply data for scoping searches. For example, the project findings from HIV and SH were used by an IS for a new topic "Reducing sexually transmitted infections" to define which sources to search. The IS looked at which sources had returned included publications for HIV and SH and, after performing some tests, was able to make the decision not to search the databases that had not previously been productive. There was a large body of evidence for this topic so being able to use the project findings to pinpoint which resources were most useful made it possible to focus the search.

Study	Coding	Discovery Method	Manually added?	Added after main search	De-duplicate group?	No. of duplicates	Date of search
Lee, PH; Wu, DM; Lai, HR; Chu, NF; The impacts of a school-wide no smoking strategy and classroom-based smoking prevention curriculum on the smoking behavior of junior high school students; Addictive behaviors; 2007; vol. 32 (no. 10); 2099-2107	Include	CENTRAL (PsycINFO)	N	N	Y	1	14/01/21
Effects of a life-skills-based prevention program on self-esteem and risk behaviors in adolescents: a pilot study; BMC psychology; 2019; vol. 7 (no. 1); 82	Include	CENTRAL	N	N	N		14/01/21
Vidrine, DJ; Arduino, RC; Gritz, ER; Impact of a cell phone intervention on mediating mechanisms of smoking cessation in individuals living with HIV/AIDS; Nicotine & tobacco research; 2006; vol. 8(suppl1); S103-8	Include	CENTRAL (Medline; PsycINFO)	N	N	Y	2	14/01/21
Moshhammer, H.; Neuberger, M.; Long term success of short smoking cessation seminars supported by occupational health care; Addictive Behaviors; 2007; vol. 32 (no. 7); 1486-1493	Include	Embase (Web of Science; PsycINFO)	N	N	Y	3	14/01/21
Sapir, T.; Moreo, K.; Carter, J.D.; Greene, L.; Patel, B.; Higgins, P.D.R.; Continuing Medical Education Improves Gastroenterologists' Compliance with Inflammatory Bowel Disease Quality Measures; Digestive Diseases and Sciences; 2016; vol. 61 (no. 7); 1862-1869	Include	Embase	N	N	N		14/01/21
Jung, M.E.; Fitzgeorge, L.; Prapavessis, H.; Faulkner, G.; Maddison, R.; The getting physical on cigarettes trial: Rationale and methods; Mental Health and Physical Activity; 2010; vol. 3 (no. 1); 35-44	Include	Embase (CENTRAL; PsycINFO)	N	N	Y	2	14/01/21
Strauss, S.M.; Jensen, A.E.; Bennett, K.; Skursky, N.; Sherman, S.E.; Schwartz, M.D.; Clinicians' panel management self-efficacy to support their patients' smoking cessation and hypertension control needs; Translational Behavioral Medicine; 2015; vol. 5 (no. 1); 68-76	Include	Embase (CENTRAL; PsycINFO)	N	N	Y	2	14/01/21
Han, M.K.; Martinez, C.H.; Au, D.H.; Bourbeau, J.; Boyd, C.M.; Branson, R.; Criner, G.J.; Kalhan, R.; Kallstrom, T.J.; King, A.; Krishnan, J.A.; Lareau, S.C.; Lee, T.A.; Lindell, K.; Mannino, D.M.; Martinez, F.J.; Meldrum, C.; Press, V.G.; Thomashow, B.; Tycon, L.; Sullivan, J.L.; Walsh, J.; Wilson, K.C.; Wright, J.; Yawn, B.; Zueger, P.M.; Bhatt, S.P.; Dransfield, M.T.; Meeting the challenge of COPD care delivery in the USA: A multiprovider perspective; The Lancet Respiratory Medicine; 2016; vol. 4 (no. 6); 473-526	Include	Embase	N	N	N		14/01/21
Kahl, K.G.; Winter, L.; Schweiger, U.; The third wave of cognitive behavioural therapies: What is new and what is effective? Current Opinion in Psychiatry; 2012; vol. 25 (no. 6); 522-528	Include	Embase	N	N	N		14/01/21
Schumann, A.; Stein, J.A.; Ullman, J.B.; John, U.; Rumpf, H.-J.; Meyer, C.; Patterns and Predictors of Change in a Smoking Intervention Study: Latent Growth Analysis of a Multivariate Outcome Model; Health Psychology; 2008; vol. 27 (no. 3(suppl)); 233-s242	Include	Embase (Medline; CENTRAL; PsycINFO)	N	N	Y	3	14/01/21
Free, C.; Phillips, G.; Galli, L.; Watson, L.; Felix, L.; Edwards, P.; Pat V.; Haines, A.; The Effectiveness of Mobile-Health Technology-Based Health Behaviour Change or Disease Management Interventions for Health Care Consumers: A Systematic Review; PLoS Medicine; 2013; vol. 10 (no. 1); e1001362	Include	Embase	N	N	N		14/01/21
Oka, Roberta K; Katapodi, Maria C; Lim, Jessica W; Bacchetti, Peter; Froelicher, Erika Sivarajan; Quantifying smoking cessation outcomes: from The Women's Initiative for Nonsmoking Study (X): methodological implications.; Nursing research; 2006; vol. 55 (no. 4); 292-7	Include	Medline (CENTRAL; PsycINFO)	N	N	Y	3	14/01/21

Fig. 4. EPPI Reviewer included studies report.

The project methodology has also been useful for searches for publications to inform the decision to update a guideline and the evidence reviews that inform the update of guidelines. This is because it helps to target which sources should be searched. For example, sources could be dropped if they have been unproductive in the original search.

Collaboration

Information specialists collaborated with two internal teams during the project. Public health analysts had been aware of the project since its inception as it would directly affect their work. The protocols for new or update topics can be evidence based, as the IS can review which sources were useful for similar topics and use this information in discussions with analysts about choosing the right sources to search. For example, website searching can be time consuming but ISs have been able to demonstrate when it has been able to provide evidence that would not have been found anywhere else.

This information also helps to plan resources for the development of a new or updated guideline. Knowing which sources are likely to yield useful results and factoring in the time needed to develop a strategy, search and then sift helps to plan a realistic timescale.

The project illustrated the benefits of continually evaluating which sources are most useful. However, the original data collection method via Excel spreadsheet could be time consuming. As a manual process, mistakes were more likely to occur due to spelling discrepancies or other manual errors. Consequently, ISs collaborated with the Digital, Information and Technology (DIT) team at NICE to develop the functionality to support the continued surveillance of sources by automating the process. Since the project was initiated, NICE has moved from using Endnote to EPPI Reviewer for evidence management. The DIT team has made it possible to view an automatically generated report that includes some of the features of the search

summary table (*Figure 4*).

Conclusions

Research into which sources found included results in a list of ten public health guidelines found that most sources are useful for finding included publications. For some topics, smaller, more focussed databases and search techniques retrieved included publications that were not found elsewhere. The results indicate that NICE information specialists have been making the right decisions about which sources to search. Additionally, the results have been useful in planning searches for new and update topics. They also aid collaboration with the Public Health team by offering evidence to support decisions. Collaboration with the DIT team resulted in an automated method to collect data for this beneficial methodology.

The next stage in this work is to devise and report on scenarios that describe in more detail the implications of this research.

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