

A population search filter for hard-to-reach populations increased search efficiency for a systematic review

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Abstract

Objectives: This article discusses how hard-to-reach population groups were conceptualized into a search filter. The objectives of this article were to (1) discuss how the authors designed a multistranded population search filter and (2) retrospectively test the effectiveness of the search filter in capturing all relevant populations (eg, homeless people, immigrants, substance misusers) in a public health systematic review.

Study Design and Setting: Systematic and retrospective analysis via a case study. Retrospective analysis of the search filter was conducted by comparing the MEDLINE search results retrieved without using the search filter against those retrieved with the search filter. A total of 5,465 additional results from the unfiltered search were screened to the same criteria as the filtered search.

Results: No additional populations were identified in the unfiltered sample. The search filter reduced the volume of MEDLINE hits to screen by 64%, with no impact on inclusion of populations.

Conclusions: The results demonstrate the effectiveness of the filter in capturing all relevant UK populations for the review. This suggests that well-planned search filters can be written for reviews that analyze imprecisely defined population groups. This filter could be used in topic areas of associated comorbidities, for rapid clinical searches, or for investigating hard-to-reach populations. © 2014 Elsevier Inc. All rights reserved.

Keywords: Tuberculosis; Equity; Disadvantaged; Vulnerable; Hard to reach; Search filter; Systematic review methodology; Literature searching; Information retrieval; Information science

1. Introduction

This case study originated in a systematic review of qualitative evidence on the barriers to tuberculosis screening [2]. The review's purpose was to inform guidance on identifying and managing tuberculosis among hard-to-reach groups [3], which presented some challenges to the review team. Chiefly, how should a population group, which, by its very nature, is hard to define, be turned into a concept that could be sensitively reviewed and, at the same time, not become so broad, as to become diffuse?

This article will explore how the review team responded to this challenge, explaining why and how a

multistranded population search filter was constructed. The article will also demonstrate how this filter has been tested and validated, as well as analyzing its strengths and weaknesses.

The population search filter (available in [Appendix](#) at www.jclinepi.com) discussed in this article can be used either

- in the form presented here (eg, as a filter for rapid clinical enquires on hard-to-reach populations) or in analogous topic areas (such as other infectious diseases associated with similar populations); or
- as a basis for further research, in which the remit of the search requires a detailed analysis of the population groups discussed here.

The review discussed in this article was commissioned by the UK's National Institute for Health and Care Excellence (NICE) to inform the development of public health guidance in England [3]. The searches, data extraction,

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What is new?**Key findings**

- The development of a hard-to-reach population search filter tested by an MEDLINE case study.

What is known?

- Search filters can be used to improve the specificity of literature searches [1];
- The use of search filters is not common in searching for community-based interventions or in public health reviews; and
- There are presently no search filters for hard-to-reach populations.

This article adds:

- A case study—tested, population search filter for hard-to-reach groups; and
- Detail on a successful approach to writing an effective, multistranded, population search filter.

and other methods used to compile the review were conducted according to the second edition of the NICE public health methods manual [4].

2. Background*2.1. Definition: what does hard to reach mean?*

The definition of “hard to reach” was modified during the review process as the evidence was searched, quality appraised, and synthesized. The completed review [2] used a more detailed definition than the original scope setting out the parameters of the review [5], reflecting the iterative nature of the process and the work that this search filter engendered. The published NICE guidance defined the hard-to-reach population in the United Kingdom as

“adults, young people and children from any ethnic background, regardless of migration status. They are ‘hard-to-reach’ if their social circumstances, language, culture or lifestyle (or those of their parents or carers) make it difficult to: recognise the clinical onset of TB; access diagnostic and treatment services; self-administer treatment; or attend regular appointments for clinical follow-up”. “The main groups considered in this guidance were people who are homeless, substance misusers, prisoners and vulnerable migrants” [3].

Given that the review did not start from a precise definition of the population [5], the search strategy had to reflect the diversity of meanings attached to hard to reach and

recognize that the population under review could be described as underserved, or hidden, difficult to locate, and difficult to engage with and treat. These distinctions are important because they each have implications for the ways in which services are organized and delivered.

2.2. Definition: what are search filters?

Search filters form part of a search strategy, and they are designed to retrieve specific types of results, often those reporting on a certain study type or outcome [1]. Search filters are commonly used for locating reports of randomized controlled trials (RCTs), where the concept of an RCT is well understood and a shared definition is held by those involved in the process [1]. There are certain characteristics that always make up an RCT, and a search filter can be designed to capture these essential and static components such as the fact that the trial has to be randomized and controlled. This method of information retrieval requires the author to identify their article as an RCT, the database producer to index it as an RCT, and the searcher to know how to identify an RCT. The key is to match these three stages in the process, and when the concepts are well understood, this can be done with high levels of accuracy [1,6].

The issue in reviewing population-level interventions such as tuberculosis screening is that the naming of, and characteristics associated with, the search terms are frequently changing. It is difficult for the literature searcher to translate fluid and difficult-to-define concepts into the strict controlled vocabulary of a database and to conceptualize definitions, which are ever changing. For example, the phrase “community-based interventions,” although a popular phrase in the epidemiologic literature, does not have a universally agreed or single point of understanding, and so it does not match any Medical Subject Headings (MeSH) in MEDLINE or the controlled indexing vocabulary of other databases. The literature searcher has to use a variety of free-text terms and indexing vocabulary to capture all potential interpretations of this idea. Furthermore, evidence relating to “community-based interventions” could be drawn from a range of disciplines, including psychology, education, and sociology [7], with each one using its own terminology and sources of information [8]. It is because of these points that search filters are not commonly used in public health reviews, particularly when a priori definitions of concepts do not exist [9].

2.3. The structure of this article

This article will now break into two parts. Section 3 details why this population filter was required and how a multistranded population search filter was written. Section 4 records an evaluation of the filter’s effectiveness and covers the methods used to test the filter and the results found. In Section 5, the article analyzes the strengths and limitations of the filter.

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