Evidence-based public health practice: improving the quality and quantity of the evidence

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Summary
Evidence-based practice in public health has moved from being a complex cousin of evidence-based medicine to a field that is seeking to establish how evidence-based principles can apply to public health approaches. The Cochrane Collaboration Health Promotion and Public Health field offers public health practitioners the opportunity to be involved in these developments, and/or to employ the array of relevant systematic reviews in their practice.

Keywords: health promotion, public health, Cochrane Collaboration, systematic reviews

Introduction
The basis for public health decision-making and the contribution of evidence to this process appear to be very highly fraught, which is not surprising as even the concept of ‘evidence’ itself is a contested issue. There are many reasons why those in public health question the use of various methods of securing evidence to guide policy and practice, and some are raised here. The type and methods for systematic reviews to inform public health decision-making have also been the subject of debate. This paper aims to articulate the rationale for how public health could benefit from the development of more rigorous methods to conduct and evaluate relevant research, and how the Cochrane Collaboration Health Promotion and Public Health Field is seeking to participate in this endeavour.

Public health and the evidence-based movement
There are many conceivable reasons why some in public health may be reluctant to wholeheartedly embrace the evidence-based movement. First, the evidence-based movement has been promoted vigorously in medicine and medical clinical practice, where the environment, practice and relative straightforwardness of treatments mean that researchers are accustomed to the use of a randomized controlled trial (RCT) to answer the question of effectiveness. Notwithstanding the practical and philosophical challenges to the uptake of evidence-based medicine, the fact that RCTs are commonly used to answer clinical questions ensures that there is some acceptance, at least, of the research methods employed to answer questions of effectiveness and that there is a large number of RCTs of clinical questions.

Second, the significant increase in systematic reviews of effectiveness in medicine, with a focus on RCTs, has resulted in proportionally many more reviews relevant to the needs of clinical practitioners and clinical questions in comparison with relatively few available for public health decision-making.

Third, despite the ideals of researchers, much of public health decision-making and health promotion practice is based on the notion of plausibility, politics and timeliness. Nevertheless, evaluations of programmes such as Scared Straight1 and Bike Education2 are examples of the emerging evidence of evaluations where the results did not turn out as expected, or rather where public health and health promotion interventions produced more harm than good; hence the calls for more comprehensive and strenuous evaluations, and for systematic reviews of the public health research literature. Many researchers also argue that public health interventions apply to such a large number of people and such a large proportion of the population that even a small individual effect may result in aggregate harm.3

Fourth, the evidence literature will only be as good as the conduct of the primary studies. As a result, the application of rigorous methods to public health and health promotion practice needs serious and well-funded attention. Rather than suggesting that public health and health promotion (or any other specialty) deserves special treatment and different ‘evidence’, we...
need to focus on ensuring that the relevant questions are answered and evaluated with the most appropriate, corresponding research methods. For example, it is feasible for experimental studies, with units of analysis relevant to the context (e.g. community, schools, well care clinics, geographical areas, cities, sports clubs, etc.) to be properly designed and employed to adequately answer public health practitioners’ questions of effectiveness. Similarly, there are many questions related to the effectiveness of a particular strategy that require concurrent and integrated methods (e.g. qualitative research that focuses on questions of process and participants’ perspectives). Fortunately, the focus on the use of hierarchies of evidence is now moving towards dimensions of evidence and a range of research matrices have been proposed to assist practitioners.

Systematic reviews in public health

The systematic review is a method of locating, appraising and synthesizing evidence. The high-profile use of reviews as a cornerstone of evidence-based medicine has, however, led to several misconceptions about their purpose and methods. Principally, these misconceptions centre around the sole use of RCTs, adoption of the biomedical model and the necessity for statistical synthesis. Petticrew provided a framework and rationale to dispel these myths. He argued that systematic reviews are not a panacea; however, they often identify the need for primary studies and are an efficient method of identifying which research is lacking. In addition, they can prevent unnecessary primary studies being carried out, particularly if a quantitative or qualitative summary suggests the effectiveness of an intervention after pooling common primary study.

The complexity of the public health environment and its impact on evidence

The public health environment for research and policy is complex. Interventions involve humans and communities, and thus public policy invariably must reflect the complexities that this brings. Practitioners also develop experience and modify their behaviour according to the needs of the subject and their experience in the field. As such, conducting research in geopolitical contexts, with changing populations, is complex and necessarily requires attention to sophisticated research methods.

Cochrane’s contribution to the public health evidence base

The Cochrane Collaboration’s commitment to the production of high-quality, regularly updated, systematic reviews on the effectiveness of health interventions is, by now, reasonably well known in the United Kingdom, although less so in other parts of the world (www.cochrane.org). The Health Promotion and Public Health Field of the Collaboration (www.vichealth.vic.gov.au/cochrane) is aiming to improve the quality and quantity of systematic reviews, for there to be a solid foundation of evidence relevant to core public health questions. To achieve this, the Field is employing a number of strategies. First, it is identifying and communicating with public health and health promotion practitioners to: (1) identify global priorities for the most pressing questions that require review; (2) develop a useful set of principles or modus operandi for systematic reviews and primary research in public health and health promotion; (3) bolster the support to reviewers and the review groups of the Collaboration to ensure that reviews are conducted, supported and reviewed by those with expertise in public health; (4) advocate the funding and conduct of reviews that are deemed necessary, if not vital, to public health decision-making. Second, it is working within the Collaboration to ensure that these public health principles, questions and appropriate methods are employed in systematic reviews of relevant public health topics.

How should systematic reviews be constructed to meet the needs of public health practitioners?

Sheldon et al.’s prerequisites for a reliable systematic review include the importance of appropriate and consistent criteria for the inclusion or exclusion of research studies, and the need to use sound judgment about comparing results between studies and pooling results. It seems crucial that, for practitioners and policy-makers to embrace and use systematic reviews effectively, there are a range of additional factors to consider: (1) the theoretical framework employed; (2) the extent to which the intervention was carried out as intended (process data); (3) the geopolitical context or environment in which the intervention was conducted (context data); (4) the extent to which the outcomes were appropriate to the evaluation of the intervention; (5) the cost effectiveness of the intervention.

This is where public health practitioners and researchers can continue to develop a comprehensive model for evaluating and synthesizing evidence of intervention effectiveness. It is also where the tussles between quantitative and qualitative research techniques need to evolve into the training of public health practitioners to ensure proficiency across all research methods, thus ensuring that interventions are evaluated using the best combination of methods. Indeed, it will be necessary for practitioners to be well skilled in multiple methods if they are to try and disentangle the relationship between outcomes and the various conditions (such as staff experience or a favourable political climate).

Specifically, process evaluation is necessary to identify whether a programme or intervention was delivered as intended and efficiently, to ensure that an unsuccessful outcome was not more a matter of how the programme was implemented than anything inherently wrong in the programme itself. As Nutbeam contended, ‘evidence of effectiveness [in health promotion] will come from interventions that have a reasonable chance of success’. Process evaluation has been incorporated into Cochrane reviews previously.
The need to include information about the context of an intervention is also essential to render the content of a systematic review useful to those with an interest in implementing a similar intervention. Context identifies the situation in which interventions have been delivered. Raphael contended that ‘decision making in health promotion should draw upon local evidence even when conclusions from the health promotion literature are available’.13 A good systematic review should allow the reader to assess the information contained in the review to identify the components that could be applied (or not) to the circumstances as noted from the local situation.

What’s next

The Field is seeking public health practitioners and researchers to be involved in these methodological and ideological debates concerning systematic reviews in public health, and encourages individuals to become involved in the associated activities of the Field. The Field has developed a database of ‘contributors’ who are interested in becoming involved in some way, or receiving information about the Field’s activities, and of other initiatives in the area of evidence-based public health and health promotion. Some tasks are time-limiting, needing the skills and expertise of individuals or organizations for discrete projects, whereas others extend over longer periods of time. The majority of these latter tasks are undertaken by the administrators of the Field. We urge those interested in this area to stay in touch, and if you are interested in any particular aspects (developing global research priority questions, methodological challenges of public health intervention design and evaluation, thinking about undertaking a review or applying for bursary monies, training graduates and undergraduates in public health, taking an authorship role in disseminating the activities of the Field) ‘contributors’ will be canvassed first.

What’s new in the Cochrane Library?

The Field is particularly committed to disseminating information on reviews that are applicable to the needs of practitioners in health promotion and public health more broadly. This list is updated on a regular basis on the Field’s website (www.vichealth.vic.gov.au/cochrane). Recently published relevant public health reviews in the Cochrane Library include:

- interventions for preventing eating disorders in children and adolescents;
- group-based parenting programmes for improving the mental health of 0–3-year-old children;
- exercise to improve self esteem in children and young people;
- home-based post-discharge parental support to prevent morbidity in preterm infants;
- advice on low-fat diets for obesity;
- ‘Scared Straight’ and other prison tour programmes for preventing juvenile delinquency;
- face-washing promotion for preventing active trachoma.

The Journal of Public Health Medicine in collaboration with the Cochrane Health Promotion and Public Health Field will provide an update on methods and content of systematic reviews every 6 months. The Field welcomes any requests or input from interested persons or organizations; for further information, contact Field Administrator jdoyle@vichealth.vic.gov.au or access the website: www.vichealth.vic.gov.au/cochrane.

References

1. Petrosino A, Turpin-Petrosino C, Finckenauer JO. Well-meaning programs can have harmful effects! Lessons from experiments of programs such as Scared Straight. Crime Delinquency 2000; 46: 354-379.

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