Evidence-based public health: Cochrane update
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Background
Tasks required of public health practitioners vary enormously. They include, but are not limited to research, advocacy, policy development, provision and management of health services, prioritization of interventions and programmes, responding to health alerts and concerns, intersectoral engagement and community development initiatives. How can an evidence-based approach assist, given the complexity of the decisions, the time pressures, and the political processes involved with the allocation of public funds?

This paper aims to highlight aspects of evidence essential to public health decision making, the skills required to improve public health practice and the practical assistance available.

What aspects of evidence are crucial to public health decision making?
The evidence base for public health decision making is necessarily complex because of the structural and behavioural changes required for population health improvements. Although a range of study designs are required to answer the sheer breadth of public health decisions, where intervention-related decisions are being considered it is clear that evidence beyond the traditional evidence-based medicine hierarchy is essential.\(^1\)\(^,\)\(^2\) Not only is information required on the effectiveness of complex interventions\(^3\) but also data describing processes, context, meanings and costs.\(^1\) Irrespective of the intervention these will vary from setting to setting, and from country to country.

The more recent emphasis in public health on inequalities and the influence of social determinants on health outcomes highlights awkward questions about who has benefited most from public health and health promotion activities,\(^4\) as evidence has emerged of interventions that have widened health inequalities as a result of health promotion campaigns.\(^5\) Correspondingly, this has highlighted the need to ensure that evaluations are powered to collect information on population subgroups.

These emphases necessarily place great demands on those conducting and publishing research and those who have to understand the research, as well as the amount of funding required to mount sophisticated and complex studies. Equally importantly, it requires the development of high-quality, reliable and updated information systems and resources to assist public health practitioners who seek this information. Although systematic reviews have become the cornerstone in evidence-based medicine, not everybody accepts that systematic reviews are necessary or desirable, and as one moves further away from the clinical applications of systematic reviews cynicism about their utility grows. Although Petticrew has argued that many of these common criticisms are fallacious,\(^2\) evidence-based resources for public health practitioners, including systematic reviews, need to include aspects of evidence important to public health decision making.

The momentum adopted within evidence-based clinical medicine and the resultant products available to practitioners or clinicians have outstripped those of the public health field. Public health practitioners in Norway still report that their most frequently used information sources were legal literature (63 per cent used this source often), reference books (34 per cent) and colleagues (26 per cent).\(^6\) Research-based literature was rarely used; only 6 per cent reported using this information source often. The practitioners did not have simple access to libraries and very few of them undertook literature searching. When reading scientific literature, they evaluated the quality of this material primarily through their own experiences as opposed to looking at the methods or statistical analysis used. In-depth interviews with 25 health promotion specialists working in the National Health Service in England revealed that many relied on collecting literature in an ad hoc fashion to keep up to date, instead of adopting more systematic processes of evaluating the evidence.\(^7\)

What processes are required for evidence-based public health practice and what skills are required?
The processes for evidence-based public health decision making are not unlike those adopted in other disciplines: defining the question, finding the most comprehensive information, appraising the evidence and using the evidence. This process can be

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applied regardless of the question and the appropriate study design. Specifically, critical appraisal allows the practitioner to bring judgement to the research in a structured way: Are the results valid? What are the results? Will they help me? Evidence-based public health practice requires a process of change that addresses the present information-seeking behaviours and critical appraisal skills of practitioners to ensure best use of research-based information. To allow these skills to be developed the public health practitioner requires access to appropriate education programmes; recognition of the long-term personal and organizational commitment to the approach; and access to trained personnel to assist with analysis, process improvement, evidence dissemination and evaluation. Public health leadership in this evolution is critical – each element of the process needs to meet the needs and contexts of those involved in public health decision making.

How and where can public health practitioners locate useful evidence?

A number of services are available to public health practitioners, responsive to local regional needs in some countries (e.g. the Public Health Observatory in the United Kingdom) or to international audiences (e.g. CDC, Cochrane etc.). Specifically, examples of resources within each of the categories are detailed below.

Education and training

Several groups are putting together resources for public health practitioners and decision makers to guide them through appraising the evidence for public health. For example, the National Public Health Partnership in Australia has developed A schema for evaluating evidence on public health interventions and is planning an education and dissemination strategy to assist users in its application.

Professional support networks

There are also numerous electronic discussion lists that are useful for public health practitioners wishing to pose questions relating to finding, evaluating and using the available evidence. For example, Evidence-based healthcare (http://groups.yahoo.com/group/ebhc) is used for online debates and discussion among clinical and public health practitioners, for those undertaking research and those seeking evidence-based answers to practical questions.

Information access

Several planned programmes of systematic review research work by various international initiatives are accessible electronically: systematic reviews by the Cochrane Collaboration (www.cochrane.org/cochrane/revabstr/mainindex.htm); Effect-}

ive Public Health Practice Project (www.city.hamilton.on.ca/ sphs/ephpp); Guide to Community Preventive Services (www. thecommunityguide.org); HDA Effectiveness reviews (www. hda-online.org.uk/evidence/eb2000/corehtml); the EPPICentre (http://eppi.ioe.ac.uk); and the NHS R&D HTA Programme (www2.york.ac.uk/inst/crd).

What difference will it make?

The main value in seeking an evidence-based approach is to minimize investment of efforts and funds in areas of public health where there is clear, incontrovertible evidence of no effect, or evidence of harm, or of poor cost-effectiveness. Evidence-based approaches also highlight areas where the evidence may be less than reliable, requiring further assessment before expenditure of large funds, or community participation in an effort where the benefits are unclear. Similarly, where a decision requires an understanding of what the community perceptions are, the extent of the problem, the risk and protective factors, and the types of interventions that are likely to be effective, a range of evidence will be required.

Irrespective of the evidence base, it is clear that evidence will only ever form one component of the public health decision-making process. What is effective needs to be considered in a broader decision-making process, which includes political values around what is seen as appropriate as well as effective interventions.

Concluding comments

Public health interventions can have a significant effect on the health and wellbeing of individuals and populations. However, we need to assume that every intervention under the banner of public health will not necessarily be effective, and in some instances may in fact be harmful to some individuals and some populations. This requires public health practitioners to incorporate searching and using best evidence in decision-making processes. It also requires leadership in public health to ensure that evidence-based training and resources are accessible, appropriate and easy to incorporate into busy work environments. Examples of these are occurring internationally but require a more systematic approach to minimize overlap.

What’s new in the Cochrane Library?

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 and as summarized by the Cochrane Consumer Network (www.cochraneconsumer.com) include the following.

New Cochrane reviews: Issue 3 and 4, 2002

Community interventions for reducing smoking among adults

No strong evidence that coordinated, multi-dimensional community programmes to try and lower adult smoking rates in that community are effective.
Exercise for preventing and treating osteoporosis in postmenopausal women
Role of exercise in preventing bone loss in postmenopausal women remains unclear.

Fluoride varnishes for preventing dental caries in children and adolescents
Fluoride varnishes applied professionally 2–4 times a year would substantially reduce tooth decay in children.

Interventions targeted at women to encourage the uptake of cervical screening
Educational materials might be able to increase the number of women who have Pap smears (to identify early signs of cervical cancer), but more research is needed.

Iodized salt for preventing iodine deficiency disorders
Iodized salt supplementation improves iodine status in children, but more research is needed to see if this affects child development or reduces deaths.

Primary prevention for alcohol misuse in young people
Some programmes to prevent alcohol misuse in young people do not appear to help, but culturally focused skills and the Strengthening Families Programme might reduce drinking.

Vitamin A supplementation for reducing the risk of mother-to-child transmission of HIV infection
Evidence so far does not show reduction in the risk of a baby contracting HIV from his or her mother from vitamin A supplementation during pregnancy, but more trials are under way.

Cervical cap versus diaphragm for contraception
Diaphragm and Prentif cap are effective in preventing pregnancies, but women using the Prentif cap are more likely to have abnormal cell changes in the cervix.

Community animal health services for improving household wealth and health status of low-income farmers
There is no strong evidence that community animal health services improve the health or economic status of farmers in low-income countries.

Interventions aimed at improving immunization rates
Immunization rates increased through use of patient reminder/recall systems.

School-based programmes for preventing smoking
Education alone will not prevent children taking up smoking, and social influence interventions may have only short-term effects.

Vitamin A supplementation during pregnancy
Vitamin A supplementation for pregnant women in areas where deficiency is common can reduce night-blindness, but more research is needed on other possible health benefits.

Updated Cochrane reviews: Issue 3 and 4, 2002

Education for contraceptive use by women after childbirth
Not enough evidence on education about contraception and family planning for women who have just given birth, or when such education would be most valuable.

Group behaviour therapy programmes for smoking cessation
Attending group smoking cessation programmes helps smokers to quit.

Self-help interventions for smoking cessation
Providing smokers with materials to support quit attempts is of limited benefit unless the materials take into account each smoker’s individual characteristics.

Individual behavioural counselling for smoking cessation
Individual counselling can help smokers quit.

Group-based parent-training programmes for improving emotional and behavioural adjustment in 0–3-year-old children
Parenting programmes for parents of infants and toddlers can improve some emotional and behavioural adjustment and sleep patterns, although it is not clear whether improvements are maintained over time.

References
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8 Guyatt GH, Sackett DL, Cook DJ, et al. Users’ guides to the medical literature, II. How to use an article about therapy or prevention. A. Are the results of the study valid? JAMA 1993; 270: 2598–2601.