

# Issues raised in systematic reviews of complex multisectoral and community based interventions

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## Background

This is the first of a new series of Cochrane updates for the *Journal of Public Health*. It coincides with the registration of the new Public Health Review Group within the Cochrane Collaboration, anticipated for April 2008. This is an exciting development for both the public health sector and for the Cochrane Collaboration itself.<sup>1</sup> For the first time, there will be a group within the Collaboration whose focus is on population level interventions and in particular, a commitment to building the evidence base for the effectiveness of interventions to make an impact on equity and inequalities. These reviews and the evidence base itself are likely to be complex, sometimes without many studies at all, and composed of a variety of study designs and study methods, particularly given the need to address how, why, what and at what costs. Thus, we envisage that the overall work programme of this proposed Public Health Review Group to comprise:

- (i) *Systematic reviews* of population level interventions, focusing on building an evidence base of what will increase equity and reduce inequalities.
- (ii) *Strategies to build primary research and rigorous evaluations* of population level interventions (policy, programmes, legislation and community interventions).
- (iii) *Knowledge translation and exchange*.
- (iv) *Methodological developments* for research synthesis of public health research.
- (v) *Improvements in conducting and reporting primary research and rigorous evaluations*.<sup>2,3</sup>

We are looking forward to working closely with public health practitioners, professionals and researchers, to develop this update into a useful, relevant and readable contribution and value your feedback. Our initial plans are to provide a summary of two key evidence reviews published with each quarterly

update of *The Cochrane Library*. Issues of relevance to content, primary research, knowledge translation and research synthesis will be summarized for readers. Public health has been described as representing the totality of activities organized collectively by societies to promote people's health and to protect them from disease, and to do so in a way that promotes equity between different groups.<sup>4</sup> These activities 'occur in all sectors and will include the adoption of policies which support health. They will also ensure that social, physical, economic and natural environments promote health'.<sup>4</sup> There are many review groups within the Cochrane Collaboration that publish systematic reviews of public health interventions, and so the content will focus on public health users rather than the proposed new Public Health Review Group specifically.

The two reviews summarized below have interesting review methodological issues that are worth highlighting, in addition to the results that were found. [Please refer to *The Cochrane Library* ([www.thecochranelibrary.com](http://www.thecochranelibrary.com)) for the full text of reviews of interest].

## Review in highlight: Interventions for preventing injuries in the agricultural industry<sup>5</sup>

A Cochrane review of the effectiveness of interventions to reduce fatal and non-fatal occupational injuries among farmers and adolescents and children on farms was recently published. The interventions spanned a variety of public health strategies including engineering/technology, education/behaviour change (includes incentives), legislation/enforcement or multifaceted programs.

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This review highlighted several issues of relevance to those conducting public health reviews, including the dilemma of including multiple study designs to capture a rich body of evidence or limiting by strict design criteria, and the importance of including data to ascertain generalizability of findings.

The authors anticipated only a limited number of randomized controlled trials (RCTs) in this area due to the population level focus of most of the interventions under study (e.g. introduction of new regulations) and thus the initial protocol included a wide range of study designs, including RCTs, cluster RCTs, controlled trials and interrupted time series, as well as what the authors referred to as lower quality intervention studies including before–after studies without a control group, retrospective cohort studies and case-reference studies. However, the authors stated in the final review that the number of higher quality studies reduced the need to include these latter studies in the review. Should the inclusion criteria set out in the protocol remain constant through the review process, regardless of study yield, or does the discovery of a sufficient (definition?) number of ‘higher quality’ study designs justify excluding studies with designs considered inferior in quality? This certainly highlights the need to carefully consider what methods are acceptable and appropriate based on the question under review.

In extracting data from the studies, the authors collected information on three domains of equity: age, gender and ethnicity. They were also careful to extract data on setting or context. This provides important information when readers of the review assess the generalizability of the findings.

The authors concluded that:  
The selected studies provided no evidence that educational interventions are effective in decreasing injury rates among agricultural workers. Financial incentives could reduce injury rates. Legislation to ban pesticides could be effective. Legislation expanding the use of safety devices (ROPS) on new tractors was associated with a decrease in fatal injuries.<sup>5</sup>

### **Review in highlight: Mass media interventions for smoking cessation in adults<sup>6</sup>**

The authors of this review highlight a significant issue for most public health interventions, i.e. that large samples are required to detect relatively small effects on individual members of the target community, but they also note that even small changes may deliver significant benefits at the population level.

This review also illustrates the difficulty of extracting and interpreting study findings where there are inconsistencies of

key definitions in the primary studies. The review authors state that the findings were difficult to interpret when studies used different definitions of smoking, smokers and quit attempts. For example, the definitions of smoker, ex-smoker and quitter varied from study to study, making between-study comparisons difficult. This emphasizes a need to advocate for more consistent terminology and reporting of standard variables in studies to allow better syntheses, and thus more useful evidence generation and understanding.

This review provides an excellent example of how to extract and interpret process measures in a review. Process data that the authors looked for in this review included: descriptions of formative research, pilot studies and ongoing evaluation and modification of the intervention; media weight (reach, frequency and duration), campaign awareness/exposure; dose–response relationships (e.g. volume of calls to telephone helplines); maintenance of programmes after the interventions were completed and intervention costs. As expected, studies varied in whether these factors were reported, and the degree to which they were reported if indeed included. In synthesizing public health research, we contend that it is imperative to report on process indicators to ensure the review is extracting information on what really happened within the intervention, which components are actually working (or not), why they are and the resources and components needed to ensure the desired outcomes are achieved.

The authors of this review were also diligent in including the theoretical underpinnings of the interventions of each of the included studies, which really serves to increase the comprehension and generalizability of the results.

The authors concluded that:  
There is evidence that comprehensive tobacco control programmes which include mass media campaigns can be effective in changing smoking behaviour in adults, but the evidence comes from a heterogeneous group of studies of variable methodological quality. One state-wide tobacco control programme (Massachusetts) showed positive results up to eight years after the campaign, while another (California) showed positive results only during the period of adequate funding and implementation. Six of nine studies carried out in communities or regions showed some positive effects on smoking behaviour and at least one significant change in smoking prevalence (Sydney). The intensity and duration of mass media campaigns may influence effectiveness, but length of follow up and concurrent secular trends and events can make this difficult to quantify. No consistent relationship was observed between campaign effectiveness and age, education, ethnicity or gender.<sup>6</sup>

**New reviews and protocols of relevance to health promotion and public health from Issue 1, 2008 of *The Cochrane Library***



**Reviews**

Hand washing for preventing diarrhoea.  
Interventions for preventing injuries in the agricultural industry.  
Mass media interventions for smoking cessation in adults.  
Pharmaceutical policies: effects of cap and co-payment on rational drug use.  
Whole grain foods for the prevention of Type 2 diabetes mellitus.

**Protocols**

Folate supplementation in pregnancy.  
Opportunities provision for preventing youth gang involvement for children and young people (7–16 years).  
Risk scoring for the primary prevention of cardiovascular disease.  
Screening women for intimate partner violence in health-care settings.  
Strategies for communicating contraceptive effectiveness.  
Workplace interventions for preventing work disability.

## References

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- 2 Armstrong R, Waters E, Moore L *et al*. The reporting of public health intervention research: advancing TREND and CONSORT. *J Public Health* 2007;1–7. doi:10.1093/pubmed/fdm082. Advanced copy January.
- 3 Waters E, Priest N, Armstrong R *et al*. The role of a prospective Public Health Intervention Study Register in building public health evidence: proposal for content and use. *J Public Health* 2007;29(3):322–27. IF: 1.235.
- 4 Baum F. *The New Public Health, 2nd Edition*, Melbourne: Oxford University Press, 2002, p. 531.
- 5 Rautiainen RH, Lehtola MM, Day LM *et al*. Interventions for preventing injuries in the agricultural industry. *Cochrane Database Syst Rev* 2008 (Issue 1). Art. No.: CD006398. doi: 10.1002/14651858.CD006398.pub2.
- 6 Bala M, Strzeszynski L, Cahill K. Mass media interventions for smoking cessation in adults. *Cochrane Database Syst Rev* 2008 (Issue 1). Art. no. CD004704. doi: 10.1002/14651858.CD004704.pub2.