



## **Assessing the challenges of applying standard methods of economic evaluation to public health interventions**

- Good quality evidence on cost-effectiveness is essential if those commissioning public health services are to make informed decisions.
- Methods for assessing the cost-effectiveness of health care treatments and programmes have existed for several years and have been applied mainly to narrowly defined 'clinical' interventions, such as drugs.
- Evaluation of public health interventions raises methodological challenges, because these interventions generate very broad costs and benefits and are often directed at populations or communities rather than specific individuals.
- This methodology review of the literature aimed to identify the main challenges to the economic evaluation of public health interventions and to suggest how these might be addressed.
- Four main methodological challenges were identified: attributing outcomes to interventions to obtain unbiased estimates of effect; measuring and valuing outcomes to ascertain how much better the quality of life is in one health state compared to another; incorporating equity considerations; and identifying inter-sectoral costs and consequences to assess their impact on the health care sector and impacts on other sectors of the economy.
- Although economic evaluations have been applied in a wide range of public health areas, the current literature provides relatively few insights as to how to address these four methodological challenges.
- Despite the lack of insights provided by existing studies, this study makes a number of recommendations on ways by which the evidence on cost-effectiveness in public health could be improved and on potential areas for future research.

## Background

The second Wanless Report (Wanless, 2004) highlighted the need to consider the cost-effectiveness of public health interventions. The generation of good quality evidence on cost-effectiveness is essential if those commissioning services are to make informed decisions. Public health interventions comprise a wide range, from screening and immunizations through to the promotion of healthy eating, physical activity and well-being. The range of commissioners of such services is also quite broad, including practice based commissioners, primary care trusts, local authorities, PCT commissioning hubs and specialist commissioners. Therefore, the effective communication of cost-effectiveness evidence is of critical importance.

Methods for assessing the cost-effectiveness of health care treatments and programmes, known collectively as 'economic evaluations', have existed for several years. However, these have been applied mainly to more narrowly defined 'clinical' interventions, such as drugs, devices or medical procedures. In addition, the methods for the evaluation of screening and immunization programmes are fairly well developed.

The prime motivation for this project was the increasing recognition that the evaluation of many public health interventions raises additional methodological challenges, because these interventions generate very broad costs and benefits and are often directed at populations or communities rather than specific individuals. In addition, a particular feature of many public health interventions is a concern with health inequalities. Standard economic evaluation methods focus on efficiency (i.e. the maximization of health gain) rather than on equity (i.e. the distribution of health gain) and accordingly, the evaluation of public health interventions, needs to pay more attention to equity considerations.

This short report is based on a methodology review of the literature on the economic evaluation of public health interventions. The aim of the review was to identify the main methodological challenges and to suggest how these

might be addressed. The full version of this report is available to download at: [www.york.ac.uk/phrc/index.htm](http://www.york.ac.uk/phrc/index.htm)

## Methods

Existing reviews of the literature were considered in order to specify the main methodological challenges. A methodology review of empirical studies undertaken from 2000 to 2005 was then conducted, in order to identify whether they provided any useful insights in addressing these challenges. The empirical studies were identified using the NHS Economic Evaluation Database (NHS EED, [www.crd.york.ac.uk/crdweb](http://www.crd.york.ac.uk/crdweb)), which contains structured abstracts of economic evaluations and is based on a broad search of the relevant literature sources.

The methodologies used in the empirical studies were documented and interesting methodological approaches identified. These were then used by members of the team, in conjunction with the relevant theoretical literature, in formulating suggestions for how the methodological challenges might be addressed.

## Key findings

Four main methodological challenges were identified: attributing outcomes to interventions to obtain unbiased estimates of effect; measuring and valuing outcomes to ascertain how much better the quality of life is in one health state compared to another; incorporating equity considerations; and identifying inter-sectoral costs and consequences to assess their impact on the health care sector and impacts on other sectors of the economy.

In total, 1,264 NHS EED abstracts were identified through a search focusing on the public health areas mentioned in *Choosing Health*, England's public health strategy launched in 2004. The areas considered were accidents, alcohol, ante-natal and post-natal visiting, drug use, HIV/AIDS, low birth weight, obesity and physical activity, sexually transmitted infections, smoking, teenage pregnancy and youth suicide prevention. After screening the abstracts, in order to confirm that they were full economic

evaluations and to exclude those relating to screening and treatment interventions, 154 abstracts were retained for detailed review.

Although the review of existing empirical studies showed that economic evaluation had been applied in a wide range of public health areas, the current literature provided relatively few insights as to how to address the four methodological challenges. In particular, very few studies considered costs and consequences outside the health sector and the measures of outcome were normally confined to various measures of health gain. The majority of studies did not attempt to value the improvements in health, although 27% of studies valued health states, expressing the outcomes in quality-adjusted life-years (QALYs) or disability-adjusted life-years (DALYs).

Thirty-seven percent of studies were cost-effectiveness analyses (i.e. they measured outcomes in natural units such as 'cases prevented', and synthesised costs and outcomes) and 36% of studies were cost-consequence analyses (i.e. they included outcomes that were not synthesised with costs). Equity considerations were rarely mentioned and never addressed formally.

### **Conclusions**

Despite the lack of insights provided by existing studies, consideration of the theoretical and empirical literature suggests a number of ways forward, as detailed below. For fuller details the reader is referred to the main report.

## **Recommendations for improving the evidence on cost-effectiveness in public health**

### *1. Attribution of outcomes*

- Where randomised control trials (RCTs) cannot be undertaken, fill gaps in the evidence base through natural experiments data and non-experimental data.
- Where possible, conduct RCTs.
- Try to match the outcomes in trials with those available in long-term observational studies.
- Make more use of techniques to analyse non-experimental data including use of rigorous econometric methodology and Bayesian statistical methods.

### *2. Measuring and valuing outcomes*

- Promote debate about the theoretical and value propositions underlying the various forms of economic evaluation.
- Always perform a cost-consequences analysis, prior to proceeding to a valuation of outcomes.

### *3. Equity*

- Conduct pilot studies of health inequality impact assessment, such as providing factual information about how an intervention might change existing patterns of health inequality between different population groups, for selected public health interventions.
- Where the most cost-effective option is judged inequitable, calculate the opportunity cost of not selecting that option.

### *4. Inter-sectoral costs and consequences*

- Inter-sectoral impacts of interventions should be quantified (in a cost-consequences analysis). The need for budgetary transfers could be assessed.
- More consideration should be given to the impacts of public health interventions on the voluntary sector and private individual. For example, the impacts on the effectiveness of programmes and the need for incentives.
- An analysis should be conducted of costs and consequences by beneficiary group (i.e. defined by health status, socio-economic status, etc).

## Recommendations for future research

### 1. Attribution of outcomes

- In economic evaluations, synthesise all relevant data, both experimental and non-experimental. Conduct research into these methods.

### 2. Measuring and valuing outcomes

- Explore the practicalities of applying an inter-sectoral compensation test approach whereby there is an evaluation of the benefits net of costs which fall on different sectors of the economy (Claxton et al, 2006).
- Continue research on developing a more general measure of well-being.

### 3. Equity

- Undertake primary research on the effectiveness of interventions designed to tackle health inequality.
- Undertake further research on equity weighting, focussing on contexts relevant to public health, by explicitly valuing health inequality reduction (or other equity concerns) and by guiding the decision-maker about how much the total QALY sacrifice is worth making in order to reduce health inequality.

### 4. Inter-sectoral costs and consequences

- Should assess whether a general equilibrium approach would be more suitable for the evaluation of broad public health interventions. This approach would allow the analyst to capture the full range of costs and benefits occurring across different sectors of the economy.

## References

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