

School-based interventions to prevent the uptake of smoking among children and young people: cost-effectiveness review - **Executive Summary**

Objectives:

This report is a cost-effectiveness review which complements three additional reports (effectiveness review, qualitative review and economic modelling report).

The four reports together form the evidence review which aims to address the two key questions defined in the NICE scope:

- Which school-based interventions, or combination of school-based interventions, are effective and cost-effective in preventing children and young people from taking up smoking?
- What factors aid the delivery of effective school-based interventions to prevent the uptake of smoking? What are the barriers to successful delivery?

This cost-effectiveness review specifically address the following question:

Are any school-based interventions more cost-effective than usual practice, minimal or no intervention, or other school-based interventions in preventing children and young people from taking up smoking?

Methods:

A systematic review of economic literature was undertaken. Major bibliographic databases including the Cochrane Library, York CRD database, MEDLINE, EMBASE ERIC, PsycINFO, ASSIA, HMIC were searched from inception to October 2008. This was supplemented by searches of selected websites.

Study selection was carried out using pre-determined criteria based on the scope issued by NICE. Economic evaluations that were conducted in OECD countries published in English from 1990 onwards and that assessed the cost-effectiveness of school-based interventions to prevent the uptake of smoking among children and young people were included. Data extraction and quality assessment was undertaken by one reviewer and checked by a second reviewer based on the *Methods for development of NICE public health guidance*.

Eight potentially relevant studies were identified and six were included in this review. Three articles analysed results from an experimental study while three modelled a hypothetical programme, although in one case an actual programme was used as an exemplar for estimating intervention costs. In all cases, the costs and benefits of the intervention were compared to controls which received usual education only. Two articles presented cost-effectiveness analyses (one from a health care provider perspective and another from a societal perspective), while four articles presented cost-benefit analyses. Studies were published between 2000 and 2008, although they used effectiveness data from the 1980s and 1990s. The three articles based on experimental studies all used interventions based partly or wholly on social influence models.

Synthesis was narrative and meta-analysis was not employed. The methodological quality of each study was rated using the Drummond checklist, and its applicability to the relevant population in the UK assessed. There was particular focus on whether sufficient economic evaluations exist to address issues of cost-effectiveness and, in existing models, how outcomes at the end of the intervention period or the last follow-up of an effectiveness study are used to estimate lifetime smoking and health-related outcomes.

Evidence statements are given below:

Cost effectiveness evidence statements

Excluding two studies that appear to be unrepresentative outliers, the cost of the intervention ranged from C\$67 (£30) to €75 (£60) per participant.

Indirect costs and benefits formed a large proportion of total costs and benefits in all studies conducted from a societal perspective.

Four articles represented the effect size in terms of reduction in smoking prevalence in the intervention group, ranging from 2.04% to 4.5%. Two articles represented the effect size in terms of reduction in smoking uptake in the intervention group, ranging from 16.8% until age 18 to 56% for 4 years.

The three cost-effectiveness analyses suggested that in the base case cost per QALY gained ranged from \$448 (£360) to €19,900 (£16,000). Two of them reported the cost per LY gained ranged from \$703 (£560) to €18,200 (£15,000). The wide range in these figures is largely due to the low estimate of intervention costs reported in the study with the lowest cost per LY/QALY gained.

All three cost-benefit analyses suggested that the modelled intervention would be of net benefit, with the benefit-cost ratio ranging from 2.0 to 15.4. However, the lower figure represents the ratio for a generic drug prevention programme and does not include indirect (productivity loss) costs of smoking, so is not directly comparable with the other two analyses.

Overall conclusions about net benefit or cost-effectiveness were robust to changes in single parameters except for the discount rate, time horizon, prevalence of smokers at baseline, effect size and duration of effect.

No conclusions could be drawn about the interaction between intensity of intervention, social determinants of health (age, sex, ethnicity and socio-economic status) and the cost-effectiveness of the modelled interventions.

Four studies found that the conclusions were robust to changes in the parameters governing costs and the health effects of smoking when varied using probabilistic sensitivity analysis, a technique in which the value of each parameter is sampled many times from a joint distribution representing the uncertainty in parameter values.

Conclusions:

All of the studies reviewed suggest that school-based smoking prevention programmes may be an efficient use of resources within the health care and education jurisdictions considered. However, the two studies that considered indirect benefits found that the majority of benefits accrued by such interventions were attributable to a reduction in productivity loss due to smoking-related morbidity and premature mortality. Hence it is not certain whether the conclusions of these studies are applicable to the UK where such considerations are not taken into account in the NICE reference case. Furthermore, most of the studies failed to take into account the deterioration of the effect of such interventions in the long-term, and hence may have overestimated the impact of school-based smoking prevention programmes.