The cost-effectiveness of the English smoking treatment services: evidence from practice

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of specialist smoking cessation services in England. This intervention was compared with no specialist smoking cessation services.

Type of intervention
Smoking cessation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients enrolled at 58 of the 92 specialist smoking cessation services in England in 2000/01.

Setting
The study setting was primary care. The economic study was carried out in England, UK.

Dates to which data relate
The effectiveness data were derived from studies and surveys published between 1998 and 2005. The price year was 2000/01.

Source of effectiveness data
The effectiveness data were derived from a review and synthesis of published data and surveys.

Modelling
The authors used an epidemiological model to estimate the cost-effectiveness of specialist smoking cessation services.

Outcomes assessed in the review
The outcomes assessed were:

the number of clients who accessed services and subsequently agreed a date for quitting smoking;

the number of clients receiving nicotine replacement therapy (NRT) and bupropion, and the number of clients reported to have quit at 4 weeks;

the background population cessation rate;
the proportion of patients who reported smoking cessation at 4 weeks who would relapse by 12 months;
the life-years gained (LYG) by stopping smoking at different ages for those quitting via smoking cessation services; and
the relapse rate among those smoking at 1 year and after a further 7 years.

**Study designs and other criteria for inclusion in the review**
Although the authors did not report the study designs included in the review, they provided appropriate details of the studies included. Data on the clients accessing smoking cessation services were derived from monitoring data supplied to the Department of Health (from smoking cessation services) on a quarterly basis. All other effectiveness data were derived from epidemiological studies conducted in the UK.

**Sources searched to identify primary studies**
Not reported.

**Criteria used to ensure the validity of primary studies**
Not reported.

**Methods used to judge relevance and validity, and for extracting data**
Not reported.

**Number of primary studies included**
Approximately 9 primary studies were included in the review. Data on the clients accessing smoking cessation services were derived from monitoring data supplied to the Department of Health (from smoking cessation services) on a quarterly basis. Other effectiveness data were derived from 8 epidemiological studies.

**Methods of combining primary studies**
The authors did not combine the results of the primary studies. The results from only one study were used to populate an individual model parameter.

**Investigation of differences between primary studies**
The authors investigated differences between the primary studies by comparing the differences in outcomes reported in them. The authors found differences in relapse rates of between 13.6% (that used in their model) and 30 to 40%, as well as differences in the LYG after quitting smoking. According to the authors, differences in life expectancy after smoking were attributed to the new findings of an epidemiological study, which found higher benefits after quitting smoking (Doll et al. 2004, see 'Other Publications of Related Interest' below for bibliographic details).

**Results of the review**
The background (i.e. unassisted) population smoking cessation rate was 2% per year.

The proportion of patients who reported smoking cessation at 4 weeks who would relapse by 12 months was 13.6%.

The LYG by stopping smoking at different ages for those quitting via smoking cessation services was 3.59 per quitter.

The relapse rate among those smoking at 1 year and after a further 7 years was 54%.
Measure of benefits used in the economic analysis
The health benefit measure used was the LYG. Future benefits were appropriately discounted at an annual rate of 3.5%.

Direct costs
The direct costs to the health and social care system were included in the analysis. These were the cost of providing specialist smoking cessation services and smoking-related health care costs. The costs of providing the smoking cessation services covered staff costs (calculated by multiplying the number of staff by the mean average wage), the space occupied by the services, the provision of computing facilities, and the provision of NRT and bupropion. Resource use for the cessation services were derived from the UK Department of Health Services. The costs of treating smoking-related diseases were derived from a published model (Orme et al. 2001, see 'Other Publications of Related Interest' below for bibliographic details). The costs were derived from routine published sources in the UK. Discounting was relevant, as the costs could be incurred over the future, and was appropriately performed at an annual rate of 3.5%, as recommended by UK guidelines. The authors reported the average costs per service provider as well as the median costs. The price year was 2000/01.

Statistical analysis of costs
The authors reported the mean costs per service together with their 95% confidence intervals (CIs). The authors provided no information on how the 95% CIs were calculated. They also performed regression analyses to investigate whether data from the surveys, in terms of the service configuration and interventions offered and area data on deprivation, could explain the differences in costs and cost-effectiveness between services.

Indirect Costs
The indirect costs were not included.

Currency
UK pounds sterling (£).

Sensitivity analysis
The authors undertook a series of one-way sensitivity analyses by varying:

- the annual salary figure for smoking cessation counsellors;
- the space allocated to cessation services;
- the proportion of patients receiving NRT or bupropion;
- the background cessation rates;
- the relapse rates;
- the LYG from smoking cessation; and
- the discount rate.

The authors also investigated best- and worst-case scenarios using the best and worst ranges used in the sensitivity analysis.

Estimated benefits used in the economic analysis
The mean number of LYG per smoking cessation service was 481.9 (95% CI: 397.5 to 566.2) after adjusting for longer-term relapse rates. The median number of LYG was 474.3.
Cost results
The total mean smoking cessation service costs were 254,400 (95% CI: 557.2 to 811.3). The median cost was 214,900.

The mean estimated health care costs saved by each service were 118,700 (95% CI: 98,000 to 139,400). The median savings were 109,000.

Synthesis of costs and benefits
The costs and benefits were combined using an incremental cost-effectiveness ratio (i.e. the additional cost per LYG). As the comparator was no smoking cessation service, the costs of the service (i.e. costs of providing the smoking cessation service only) and the net costs of the service (i.e. costs of the service minus the savings associated with health care costs) were divided by the number of LYG.

When only the smoking cessation service costs were included, the cost per LYG was 684.2 (95% CI: 557.2 to 811.3; median 544.2).

When both the costs of the service and the health care cost-savings were included, the cost per LYG was 437.7 (95% CI: 311.2 to 564.2; median 292.6).

The results of the sensitivity analysis showed that combining the most favourable assumptions reduced the net cost per LYG to 102 (95% CI: 70 to 135).

After combining the worst-case assumption, the net cost per LYG was 2,293 (95% CI: 536 to 4,050).

The results of the regression analysis showed that longer group behavioural sessions were associated with lower cost-effectiveness, whereas services offering shorter programmes of group behavioural support sessions had higher cost-effectiveness. A higher number of smokers setting quit dates and using NRT/bupropion also significantly increased the cost-effectiveness of smoking cessation services.

Authors' conclusions
In 2000/01, English smoking cessation services provided cost-effective services operating well below the threshold of 20,000 per quality-adjusted life-year used by the National Institute for Health and Clinical Excellence in the UK.

CRD COMMENTARY - Selection of comparators
Although no explicit justification was given for using no smoking cessation programmes as the comparator, it would appear to represent current practice in the authors' settings. You should decide if the comparator represents current practice in your own setting.

Validity of estimate of measure of effectiveness
The authors did not report that a systematic review of the literature was undertaken to identify relevant research and minimise bias. However, they used a combination of surveys from English smoking cessation services and recent long-term relapse rates and health gains for those who quit smoking. The authors also provided appropriate details of the studies included in the review and compared those used with other published sources, giving reasons for any differences between them. Appropriate sensitivity analyses were used for all effectiveness parameters and these took values reported in other studies, for which the results were not used in the base-case, into consideration.

Validity of estimate of measure of benefit
The estimation of benefits was modelled. However, the authors provided only limited details on how the different parameters were combined to provide the final measure of benefit.
Validity of estimate of costs
All costs relevant to the health care system perspective were included in the analysis. No major relevant costs appear to have been omitted. The costs and the quantities were not reported separately, which will limit the generalisability of the authors' results. The resource use data required for smoking cessation rates were derived from Department of Health surveys, which were then costed using unit costs derived from routine UK sources. The costs associated with treating smoking-related diseases were derived from a published model. Appropriate sensitivity analyses of the costs were performed. Since costs could be incurred in the future, discounting was necessary and was appropriately performed. The price year was reported, which will aid any possible future inflation exercises.

Other issues
The authors reported that other studies examining programmes to assist smokers in quitting also found low additional costs per LYG or quality-adjusted life-year gained. The issue of generalisability to other settings was addressed using sensitivity analyses and the fact that the authors used survey data from over 50 smoking cessation services in England. The authors did not present their results selectively and their results reflected the scope of the analysis. The authors reported a number of limitations to their study. First, the unit of analysis was the service and not the individual smoker. Second, the survey data were not subjected to the same rigour in data collection as would occur in a well-conducted research study. Finally, when the analysis took place, English smoking cessation services were generally new and at a relatively early stage.

Implications of the study
The authors reported that further research is required. This needs to investigate whether variations in costs and effects between services were inherent to services, or whether they could be explained more fully by smokers' characteristics and the uptake or delivery of cessation interventions within each service.

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Funded by the UK Department of Health's Policy Research Programme.

Bibliographic details

Other publications of related interest
Because readers are likely to encounter and assess individual publications, NHS EED abstracts reflect the original publication as it is written, as a stand-alone paper. Where NHS EED abstractors are able to identify positively that a publication is significantly linked to or informed by other publications, these will be referenced in the text of the abstract and their bibliographic details recorded here for information.


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