Increasing tobacco taxes: a cheap tool to increase public health
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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.

CRD summary
The objective of the study was to estimate the cost-effectiveness of tobacco tax increases. The authors concluded that, from a health care perspective, a tax increase is a cost-effective intervention by means of which to increase public health. Overall, the methodology of the study was satisfactory, with both the methods and results being adequately reported. The authors’ conclusions appear appropriate given the scope of the analysis.

Type of economic evaluation
Cost-effectiveness analysis, cost-utility analysis

Study objective
The objective of the study was to estimate the cost-effectiveness of tobacco tax increases.

Interventions
The authors investigated the long-term effects of tobacco tax increases of 15%, which would result in a price increase of 10% in the Netherlands. This intervention was compared with the current practice scenario.

Location/setting
Netherlands/community.

Methods
Analytical approach:
The effects of a tax increase were translated into effects on smoking quit rates using price elasticity, which measures the impact of price increases on tobacco consumption. A dynamic population model, the RIVM chronic disease model (CDM), was then used to describe the morbidity and mortality of risk factors for chronic diseases including smoking (Hoogenveen et al. 1998, see ‘Other Publications of Related Interest’ below for bibliographic details). The time horizon of the analysis was 100 years. The authors reported that the perspective adopted in the economic analysis was that of the health care system. In sensitivity analyses, the authors also adopted a societal perspective.

Effectiveness data:
The effectiveness data were derived from previous studies and reports. Although the methods and sources used in the CDM have already been reported elsewhere, the authors provided a summary of the main effectiveness data used. The authors reported that CDM data were derived from general practitioner registrations, national registries, population surveys and observational studies. The main effectiveness estimates were the price elasticity of tobacco consumption and the impact of smoking on the incidence of 14 smoking-related chronic diseases.

Monetary benefit and utility valuations:
Quality-of-life information was derived using disability weights derived from the Dutch Burden of Disease Study.

Measure of benefit:
The measures of benefit were the life-years gained and the quality-adjusted life-years (QALYs) gained. Future benefits were discounted at an annual rate of 1.5% in accordance with Dutch standards.

Cost data:
The direct costs to the health care system included in the study were the costs of treating smoking-related illnesses and medical spending on additional life-years gained. The authors also evaluated costs from a societal perspective in the
sensitivity analyses, including administration costs and law enforcement costs to prevent tobacco smuggling and tax revenues from tobacco sales. Health care costs in the CDM model were derived from a Dutch cost of illness study. The price year was 2004. All costs were reported in euros (EUR). Since the costs were incurred during a 100-year time period, discounting was relevant and was performed using an annual rate of 4% in accordance with Dutch standards.

Analysis of uncertainty:
A series of one-way sensitivity analyses were performed. The parameters varied were the price elasticity of tobacco consumption, the time horizon of the analysis and the discount rate. In addition, the authors varied the perspective adopted by including the impact of tax revenues and administrative costs in the analysis.

Results
The total discounted QALYs gained by a tax increase were 17,000, 34,000 and 51,000 when assuming price elasticities of -0.1, -0.2 and -0.3, respectively.

The total discounted life-years gained by a tax increase were 21,000, 43,000 and 64,000 when assuming price elasticities of -0.1, -0.2 and -0.3, respectively.

The total discounted costs incurred were EUR 42,000,000, EUR 84,000,000 and EUR 127,000,000 when assuming price elasticities of -0.1, -0.2 and -0.3, respectively.

The additional cost per QALY gained was EUR 2,500 and the additional cost per life-year gained was EUR 2,000.

The results of the sensitivity analysis showed that the shorter the time horizon, the more cost-effective tax increases became. When the costs and outcomes were left undiscounted, the incremental cost-effectiveness ratios increased. The authors also reported that, if tax increases were to be included in the health care budget, these would outweigh the additional health care costs, with only 3% of additional taxes being required to compensate for additional health care costs.

Authors’ conclusions
The authors concluded that, from a health care perspective, a tax increase is a cost-effective intervention by means of which to increase public health.

CRD commentary
Interventions:
The main intervention investigation was well reported, although the authors did not provide any details of what the current scenario (i.e. the comparator) entailed.

Effectiveness/benefits:
The authors used a published model to investigate the impact of smoking cessation on health care outcomes. However, they gave a good summary of the sources used to identify data in the model, the main effectiveness measures used in the model, and how QALYs were calculated in an appendix at the end of their article.

Costs:
All the costs relevant to the health care perspective adopted in the main analysis appear to have been included. The source of the health care costs was appropriately reported. The authors adequately discounted costs, reported the perspective used in the analysis, and reported the price year. Furthermore, in sensitivity analyses, the authors examined the impact of using a wider perspective and including more cost categories.

Analysis and results:
The authors used a published model, adequate details of which were provided. Uncertainty in the model was investigated through one-way sensitivity analyses on certain parameters. However, only a limited number of parameters were varied. In addition, the use of probabilistic sensitivity analyses would have been a more thorough way to deal with model uncertainty. Overall, the study was well reported and the results were presented in detail. The authors acknowledged the limitations of their study.
Concluding remarks:
Overall, the methodology of the study was satisfactory, with both the methods and the results being adequately reported. The authors’ conclusions appear appropriate given the scope of the analysis.

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Bibliographic details

Other publications of related interest


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