



Impact of price on the smoking behaviour of young people

- Smoking is a significant contributor to preventable illness and premature death. It has also been shown to be a major contributor to social inequalities in health.
- Deterring non-smokers starting to smoke and encouraging young smokers to quit is a serious public health issue that has long term consequences in terms of future health gains and associated costs to the NHS and the wider economy.
- Many different interventions have been proposed, developed, evaluated and implemented to deter smoking among young people.
- This systematic review of 45 studies represents the most comprehensive review to date examining the impact of price on cigarette smoking in young people aged 25 years or under.
- The existing evidence, albeit methodologically limited, suggests that price is an effective instrument in modifying the smoking behaviour of young people, though the size of effect is less clear.
- Increases in price appear to reduce smoking participation and prevalence, as well as the level of smoking. Increased price also appears to lead to reductions in smoking initiation and increases in quit rates.
- Price should be viewed as a legitimate instrument to be used alongside other policies aimed at reducing cigarette consumption among young people.

Background

Smoking has been identified as the single greatest cause of preventable illness and premature death in the UK accounting for 87,000 deaths a year in England alone. It is also a major contributor to health inequalities, being disproportionately concentrated in socio-economically disadvantaged groups.

While the prevalence of smoking in Britain declined substantially in the 1970s and early 1980s, the rate of decline continued more slowly until the early 1990s. More recently smoking prevalence has resumed a slow decline and in 2006 it was estimated that around 22% of the adult population smoked. This is against a backdrop of sustained increases in the real price of cigarettes, averaging over 5% annually since the early 1990s.

Youth and young adulthood (aged 25 or less) represent critical stages in the development of smoking habits that directly affects health in later years. Deterring non-smokers from taking up smoking and encouraging smokers to quit within this age group will have huge benefits in terms of future health gains and the associated reduction in costs to the NHS and wider economy. A range of interventions have been proposed, developed, evaluated and implemented to deter smoking among young people.

This summary report is based on a systematic review which examined the impact of price on cigarette smoking in young people aged 25 years or under. Where data allowed, the specific focus was on estimated price elasticity effects (this provides a measure of the percentage change in smoking outcome for a 1% change in price).

Methods

A systematic review was conducted. Full details of methods are on the PHRC website (www.york.ac.uk/phrc/papers.htm).

Eligible studies were those assessing the impact of price on smoking behaviour in young people aged 25 years or under: either by focusing on young people or by presenting the data separately for young people and adults.

Due to differences between studies in terms of sources of data, outcomes and modelling methods, formal meta-analysis was considered inappropriate and a narrative synthesis was undertaken. The studies were grouped according to whether they used longitudinal, repeated cross-sectional or cross-sectional data and within these groupings described in relation to the type of controls they employed, in particular policy variables such as restrictions of sales to young people, and indoor air regulations. Where available the differential impact of price by sub-groups and evidence on the impact of cross-border purchasing of cigarettes on price elasticity estimates were also assessed.

Smoking outcomes were categorised into participation, prevalence, levels of smoking, smoking initiation and smoking cessation. A distinction between smoking participation and smoking prevalence was made as the former refers to individual-level analyses of the probability of smoking, and the latter to aggregate state or country-level analyses of the proportion of smokers.

Key findings

A total of 45 studies met the inclusion criteria. The literature was dominated by studies from the USA, with only one study based in the UK. Thirty-four studies were specific to young people and 11 studies included adults and young people but reported findings separately. The vast majority of studies were econometric analyses of survey data; therefore the evidence base is derived almost exclusively from the secondary analysis of observational data. In the absence of experimental evidence, the attribution of outcomes to policy instruments is sensitive both to the quality and reliability of the survey data and the empirical approach to modelling. Differences across studies in both the use and interrogation of data mean that some caution is warranted when interpreting the findings.

Details about the surveys and price or tax data that formed the basis of analyses were rarely described in detail. Further, the representativeness, with respect to all young people, of many of the surveys was questionable. The lack of detailed reporting limits the generalisability of the findings to a national population of young people.

Thirty-three studies reported estimated price effects as an elasticity. Overall, the results of the review suggest that price is an effective instrument in reducing cigarette smoking among young people. However, differences in the estimated size of this effect across studies and for each outcome were found. This is perhaps not surprising given the wide variability in the sources of data used, and empirical techniques employed and possible real differences in effects.

Smoking participation

While there is fairly consistent evidence across studies of a negative effect of price on smoking participation, the magnitude of this effect is less clear. Better quality evidence from longitudinal studies suggests a 10% increase in price is associated with between a 1.1% and 2.4% decrease in smoking participation. Evidence from repeated cross-sectional studies suggests a more elastic response, implying a decrease of between 1.3% and 7.7% for a 10% increase in price. There was little evidence to suggest a difference in price response by age of young person, while results across gender suggest males are more responsive to price than females. Evidence from two studies suggests that black ethnic groups are more price responsive than whites.

Smoking prevalence

Limited evidence was found on the price elasticity of smoking prevalence. All three studies suggested that price had a negative impact on smoking. Evidence from the strongest study suggests a modest response to price for school-aged children, implying a 10% increase in price is associated with between a 1.3% and 2.4% decrease in smoking prevalence.

Level of smoking

There is consistent evidence across the majority of studies of a negative effect of price on the quantity of cigarettes smoked by smokers. The single longitudinal study suggests a 10% increase in price is associated with a 7.3% decrease in the quantity of cigarettes smoked. Evidence from five repeated cross-sectional studies suggests a more inelastic effect implying up to a 6% decrease in quantity smoked for a 10% increase in price (range: 6% to 0.2%). Studies based on surveys of older rather than younger young people suggest a greater response to price for the former. Evidence from two studies suggests that

price may have a greater impact on males than on females. Two studies provide evidence to suggest that white ethnic groups are responsive to price but black ethnic groups are not. There was some evidence to suggest that cross-border shopping reduced the price responsiveness of young people.

Moreover, price was also found to be negatively related to the total quantity of cigarettes smoked which takes into account both the effect of price on participation and on the level of smoking by smokers. Better quality evidence from the single longitudinal study suggests a 10% increase in price is associated with a 8.4% decrease in the total quantity of cigarettes smoked. Evidence from the five repeated cross-sectional studies suggests a more inelastic effect implying between a 3.3% and 6.5% decrease in quantity smoked for a 10% increase in price. There was some evidence to suggest that this price response is greater for older rather than younger young people and that males are more responsive than females. Conflicting evidence on the price responsiveness across ethnic group was found. Mixed evidence of the effect of cross-border purchasing of cigarettes on the price responsiveness of young people was found.

Smoking initiation

Overall, the evidence suggests that price is effective in deterring young people from starting to smoke. Three of the four longitudinal studies using more than two waves of data reported an elastic response to price implying a 10% increase in price is associated with between a 6.5% and 9% decrease in smoking initiation. A single longitudinal study which included controls for state level anti-smoking sentiment found a lower response to price, suggesting a reduction of 1% in smoking initiation for a 10% price increase.

Smoking cessation

Based on the two available longitudinal studies, price appears to be effective in encouraging young people to quit smoking but has a more moderate effect in encouraging sustained smoking cessation among young people.

Implications for policy

The review findings raise questions about the high price responsiveness of young people frequently assumed in the literature.

Price potentially acts to reduce cigarette consumption through three mechanisms. First, a higher price might reduce cigarette initiation and hence prevent individuals from starting to smoke. Secondly, a higher price might induce smokers to attempt quitting which is likely to translate into increased cessation rates and thirdly, price might influence the level of consumption by encouraging smokers to reduce their daily intake. The findings of this review lend some support to these assertions, in that overall, smoking initiation, quantity smoked and quit attempts, appear to be responsive to price, albeit at different levels of effect. Whilst smoking participation also appears to be responsive to price, the overall effect appears to be lower than the commonly cited USA consensus elasticity estimate of around -7%.

Although some ambiguity remains over the magnitude of effects, the results of this systematic review suggest that price is likely to be effective in reducing cigarette smoking among young people. This has important implications for informing cigarette taxation policy if such policies are to be aimed at curtailing the future public health burden of smoking and the associated costs placed on the NHS.

Taxation should be viewed as a legitimate instrument to be used alongside other policies aimed at reducing cigarette consumption. Evidence on the responsiveness to price across social groups is lacking, and further research is required to inform future Government targets aimed at reducing the social distribution of smoking.

Implications for research

Current evidence on the effect of price is dominated by studies undertaken in the USA; only one study was identified from the UK. Similarly, evidence on the impact of cross-border purchases of cigarettes was limited to the USA and the extent to which this evidence is transferable to the UK population, where the relative cost of cigarettes is greater and smuggling is a significant problem, is not clear, and is an important area for future research. The majority of price data were derived from the US Tax Burden on Tobacco, often using a weighted average price across all sales of cigarettes measured at state level. It is questionable whether an average across all sales is the most relevant price to apply to studies of young people who tend to be more brand-conscious than older smokers.

Limited evidence on the price elasticity of smoking by socio-economic or demographic group was found. Consideration of the effects on groups from different socio-economic backgrounds should be a priority area for future research, as an aid to understanding the social patterning of smoking among young people and the effectiveness of price in reducing inequalities in smoking behaviours.

The evidence included in this review was limited by a lack of detailed reporting; a problem commonly found in much medical research. No guidelines or checklists currently exist for either the reporting or quality assessment of econometric studies and their development remains a priority for the future.

Details of the research team

Nigel Rice,¹ Christine Godfrey,² Russell Slack,³ Amanda Sowden,³ Gillian Worthy²

1. Centre for Health Economics, University of York; 2. Department of Health Sciences, University of York; 3. Centre for Reviews and Dissemination, University of York.

Address for Correspondence

Nigel Rice. Centre for Health Economics, University of York, Heslington, York, YO10 5DD.
Email address: nr5@york.ac.uk

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