Applying an Equity Lens to Tobacco-Control Policies and Their Uptake in Six Western-European Countries


ABSTRACT

We identified policies that may be effective in reducing smoking among socio-economically disadvantaged groups, and examined trends in their level of application between 1985 and 2000 in six western-European countries (Sweden, Finland, the United Kingdom, the Netherlands, Germany, and Spain). We located studies from literature searches in major databases, and acquired policy data from international data banks and questionnaires distributed to tobacco policy organisations/researchers. Advertising bans, smoking bans in workplaces, removing barriers to smoking cessation therapies, and increasing the cost of cigarettes have the potential to reduce socioeconomic inequalities in smoking. Between 1985 and 2000, tobacco control policies in most countries have become more targeted to decrease the smoking behaviour of low-socioeconomic groups. Despite this, many national tobacco-control strategies in western-European countries still fall short of a comprehensive policy approach to addressing smoking inequalities.

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INTRODUCTION

Over the last 40–50 years, smoking rates in developed countries have declined considerably. Estimates indicate that the overall prevalence of smoking among males and females has decreased by 30%–40% in some European countries during this period (1,2).

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Prior to the 1960s, there were few differences in the smoking habits of different socioeconomic groups in European countries (3). Then, smoking rates decreased, particularly among higher socioeconomic groups (2,4). This resulted in the gradual emergence of inequalities in smoking, with higher smoking prevalence among the less educated, those in manual occupations, and the economically disadvantaged (2,5,6). In 1958, approximately 50% of men and women in each socioeconomic group smoked in the UK. In 1992, only about 14% of professionals smoked, compared with 38% in unskilled manual occupations (7).

While a large body of research has examined socioeconomic inequalities in smoking prevalence, less attention has been directed towards identifying factors that may be effective for reducing them. Although there are several international overviews and comparisons of tobacco-control policies (8–10), none has specifically considered the extent to which policies in different countries have targeted smokers from lower socioeconomic backgrounds, and how such policies have changed over time.

This study aims to identify policies that have the potential to be effective in reducing smoking among socioeconomically disadvantaged groups. It also examines trends in their level of application between 1985 and 2000 in six western-European countries. This overview portrays how tobacco control strategies have evolved to target smoking inequalities, and identifies areas for subsequent improvement of existing policy.

M ETHODS

Literature Review

We located studies published in English and conducted from 1 January 1980 to 1 January 2004 through Medline and the Cochrane Library, using any of these words in the title: “smoking policy”, “smoking reduction”, “sale”, “health education”, “health promotion”, “marketing”, “mass media campaigns”, “TV advertising”, “smoking interventions”, “smoke-free policy”, “smoking ban”, “support”, “helpline”, “counselling”, “price”, and “tax” with “smoking prevalence”, “cigarette consumption”, “smoking”, or “tobacco”. We found 1,799 articles in Medline and four in the
Cochrane Library. We identified additional studies through reference lists. We included studies covering one or more of the following policies/policy areas: tobacco sales, anti-smoking education, tobacco advertising, smoking policies in the workplace, support for smoking cessation, and cigarette prices. We also included articles that discussed the practical implications of tobacco policy. We included both quantitative and qualitative studies.

**International Policy Overview**

In the international policy overview, we included policy areas shown in previous research to be effective for reducing overall population smoking prevalence. Thus we collected policy data for tobacco advertising, smoking policies in the workplace, support for smoking cessation, and cigarette prices in the international policy overview. We obtained policy data retrospectively for the years 1985, 1990, 1995, and 2000 from six countries: Sweden, Finland, United Kingdom, the Netherlands, Germany, and Spain. We obtained data for the international overview from a combination of international data banks (such as World Health Organisation country profiles for smoking, the World Bank Development Indicators database, and the British Tobacco Manufacturing Organisation cigarette price database) and from policy questionnaires sent to tobacco policy organisations/tobacco researchers in each country. To capture the scope of each of the policies examined in the international policy overview (shown in Table 1), we used the same characteristics as in the World Health Organisation country profiles for smoking. Scoring of the scope of each policy area is outlined below.

To capture the comprehensiveness of tobacco-advertising policy, full bans for the policy dimensions listed were scored “two”, partial bans were scored “one”, and a score of “zero” was given for no bans or voluntary agreements. We summed scores across 10 dimensions of tobacco advertising (listed in Table 1) to give a minimum score of zero and a maximum of 20 (full bans on all dimensions).

Indicators of the comprehensiveness of workplace smoking policy reflected whether legislation banned/restricted smoking in work and common areas. This question covered workplaces in the public and private sectors. We identified four levels of policy intensity: (1) no legislation on smoking in the workplace, (2) partial work-area ban
<table>
<thead>
<tr>
<th>Policy</th>
<th>Scope of policy</th>
<th>Data source</th>
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<tbody>
<tr>
<td>Tobacco advertising</td>
<td>Regulations on advertising/promotion in the following contexts:</td>
<td>Questionnaire</td>
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<td></td>
<td>● Television</td>
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<td>● Newspapers</td>
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<td>● Billboards, outdoor walls or posts</td>
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<td>● Point-of-sale advertising</td>
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<td>● Cinema broadcasts</td>
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<td></td>
<td>● Promotion (e.g. placement of products on TV shows and films)</td>
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<td></td>
<td>● Brand sharing (tobacco brand names on non-tobacco products e.g. fashion items)</td>
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<td></td>
<td>● Discounts and give-aways</td>
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<td>Smoking in the workplace</td>
<td>● Total ban on work and common areas</td>
<td>Questionnaire</td>
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<td>● Work-area ban and some restrictions in common areas</td>
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<td>● Partial work-area ban and partial (or no) common-area ban</td>
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<td>● Area or ban or restrictions not defined in legislation</td>
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<td></td>
<td>● No legislation on smoking in the workplace</td>
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<td>Telephone support lines</td>
<td>● The service was promoted by the mass media</td>
<td>Questionnaire</td>
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<td></td>
<td>● Service was free of cost</td>
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<td>Policy</td>
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<tr>
<td>Support line service</td>
<td>• Support line service was interactive rather than consisting of pre-recorded messages</td>
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<td></td>
<td>• Follow-up calls were made</td>
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<td>Smoking cessation</td>
<td>• Whether the following therapies were available and subsidised:</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>therapies</td>
<td>• Nicotine patches</td>
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<td>• Nicotine gum</td>
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<td>• Nicotine pastilles</td>
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<td>• Nicotine inhalers</td>
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<td>• Pharmacological treatments (e.g. bupropion)</td>
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<td>• Cognitive-behavioural treatments</td>
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<tr>
<td>Cigarette cost</td>
<td>Cost of 20 cigarettes of the most popular brand in each country, converted to British Pounds</td>
<td>World Bank</td>
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<td>World Health Organisation</td>
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<td>British Tobacco Manufacturing Organisation</td>
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and partial (or no) common-area ban, (3) work-area ban and some restrictions in common areas, and (4) total bans in both work and common areas. These levels were scored 0, 1, 2 and 3, respectively.

We obtained the sale price of a pack of 20 cigarettes for the most popular brand from the British Tobacco Manufacturing Organisation for each year between 1985 and 2000 and examined trends in the cost of cigarettes over the study period. We divided the sale price of a pack of 20 cigarettes of the most popular brand (in local currency) by the per-capita GDP (in local currency). Per-capita GDP served as a proxy for individual income in these analyses, permitting us to examine trends in the affordability of cigarettes relative to changes in income.

**Statistical Analyses**

We performed statistical analyses to determine the average annual change in the cost of cigarettes, and to examine whether these differed among countries. We used linear regressions in these analyses. The price/per capita GDP ratio was the outcome variable in these analyses and year was the independent variable. The $\beta$-coefficients and their 95% confidence intervals for the year terms were used to determine the significance of the annual trends for each country. To determine whether annual trends differed among countries, we combined price data from all countries and entered country, year, and an interaction term (year × country) as independent variables with the price/per capita GDP ratio as the dependent variable. We used the significance of the interaction term to determine whether annual trends differed between countries; and used their $\beta$-coefficients and 95% confidence intervals to ascertain which countries had significantly different annual trends.

**FINDINGS**

*Literature Review*

Policy on the sale of tobacco
Age restrictions have the potential to reduce smoking inequalities by preventing adolescents of disadvantaged backgrounds from gaining access to cigarettes. The literature suggests that age restrictions on tobacco purchase are effective only for delaying the uptake of
smoking among adolescents; they do not reduce smoking prevalence in adulthood (11–14). We found no studies that looked at whether age restrictions delay the uptake of tobacco consumption differentially by socioeconomic position (SEP). Field experiments suggest that these age restrictions are less likely to be enforced by shopkeepers in deprived neighbourhoods (15) and neighbourhoods around schools (16).

The socioeconomically disadvantaged may be more likely to purchase single cigarettes or to buy smaller packet sizes because they cost less (4,15). Therefore, regulating the size of cigarette packages sold may discourage smoking among this group. A comprehensive search of the literature found no study that examined changes in smoking prevalence or the consumption of cigarettes in relation to packet sizes. One study examined illegal sales of single cigarettes and showed that single cigarettes could be purchased from shopkeepers in approximately 50% of attempts, and more frequently in disadvantaged areas (15). This study was conducted only in one country a decade ago, so it may not be generalisable for other countries and for the present.

Anti-smoking education
School and mass media-based education strategies result in increased awareness of the risks of smoking, and have been shown to be effective in modifying attitudes and beliefs about smoking among children and adolescents (12,14). One study examined whether school and mass media education influences awareness, attitudes, and beliefs among adolescents at lower education levels (17). This study found a lower uptake of smoking among adolescents in lower education levels who had been exposed to the anti-smoking intervention, compared to those not exposed (17). Despite these promising findings, school-based smoking education may be limited in reaching the lowest educated groups, as these students may have left school by mid-adolescence, the most “risky” time for initiating smoking. Potential of school-based programmes to make a long-term influence among adolescents from low-socioeconomic backgrounds is unknown. Although research has shown that health education is effective in delaying the uptake of smoking, the evidence is not persuasive for reducing prevalence in adulthood (11) or delaying uptake – when used alone (not in combination with other strategies) (14,18).
Whitehead and Dahlgren (1991) reviewed the effectiveness of various education approaches among adults from different socio-economic backgrounds (19). Although success has been achieved with some segments of the population, education approaches used during the earlier part of the period may have been ineffective among adults from disadvantaged backgrounds (when used singly, not in combination with other interventions). Decreased effectiveness among this group may reflect the fact that disadvantaged adults are more difficult to reach, and are more resistant to changing their behaviour (5,20). Additionally, many campaigns in the past have used modes of delivery that have biased their effectiveness among disadvantaged groups. They used written materials, for example, despite lower literacy levels among disadvantaged adults. More recent health-education initiatives may have learnt from these past experiences.

**Tobacco advertising bans**

Tobacco marketing has differential effects by socioeconomic group. Bans on TV advertising have been effective for reducing smoking among adolescents (14) and inequalities in smoking, as disadvantaged groups report watching significantly more TV than those of higher SEP (21). Previous studies have not evaluated differential exposures to other media, such as radio, magazines, newspapers, point-of-sale advertising, and cinema broadcasts by SEP. Banning other forms of advertising, such as billboards, may also have the potential to reduce inequalities, as tobacco advertising billboards are more frequently placed in disadvantaged neighbourhoods (22). Some literature also suggests that the messages used in cigarette promotion are targeted specifically towards disadvantaged groups (e.g. advertisements depicting manual workers) (21).

**Smoking in the workplace**

Regulations on smoking in the workplace can reduce smoking-related disease by decreasing exposure to environmental tobacco smoke and discouraging smoking by conveying the idea that it is an unacceptable social habit (2,23). Many studies have shown that smoking policies in the workplace are effective in reducing smoking among workers (24–26). These studies have not considered whether smoking bans have equal impacts on smoking prevalence and
cigarette consumption among different socioeconomic groups. A European study found that, when workplace smoking policies were optional, they were more likely to be implemented in professional and white-collar workplaces than in manual workplaces (25).

Support for smoking cessation

Studies examining brief counselling interventions provided to all smokers attending general practitioners (GPs) have shown a reduction in population smoking prevalence of up to 5% (2,27). While effective, the effect is limited given the low educated, those in blue-collar workplaces, and the poor, are less likely to visit GPs for preventive-health reasons (2). Telephone “help lines” have been shown to be as successful as GP-based interventions, and are particularly effective for reaching low-socioeconomic groups (28–30). Studies have shown that callers in blue-collar occupations are more likely to decrease their cigarette consumption after contact is made with a “quit line” than their higher SEP counterparts (29,30). Quit lines are more effective among low SEP groups when counsellors make follow-up calls to monitor the progress of quitters (31). When the service is provided free of charge, quit lines have shown to be more successful in reaching smokers from disadvantaged backgrounds (2).

The price of nicotine replacement therapy (NRT) poses a barrier for low-socioeconomic groups (28,32,33). Provision of free (or subsidised) NRT to this group may overcome this barrier and achieve lower smoking prevalence among the socioeconomically disadvantaged (28). In a study where low-income women were provided nicotine patches without charge, significantly more women remained abstinent at 3 and 6 months than women having to pay for patches (28). Because smokers from low-socioeconomic backgrounds are less successful at quitting (34–36), these subsidies may be most effective if no limits are placed on the number of subsidised quit attempts. Additionally, the provision of free cognitive-behavioural therapy to smokers living in disadvantaged areas has been shown to be effective for quitting and decreasing cigarette consumption (37).

Cost of cigarettes

Relatively few studies have examined the influence of cigarette cost on smoking behaviour among different socioeconomic groups. One study in the UK showed that individuals in professional occupations
are less responsive to increases in the cost cigarettes compared to their more disadvantaged counterparts (7). In this study, those in white-collar occupations had a price elasticity of \(-0.5\) to \(-0.7\), whereas unskilled and manual workers showed greater price responsiveness, with elasticities of \(-0.9\) to \(-1.0\) (7,38). Studies examining price elasticities among different socioeconomic groups have not been replicated in countries outside the UK.

Other research has shown that costs also influence the nature of people’s smoking behaviour, and that this effect may be different between socioeconomic groups. A Dutch study has found that smokers (particularly those with lower SEP) are more likely to move to lower priced or self-rolled cigarettes when the cost of manufactured cigarettes increases (39). This may minimise the health benefits of increasing cigarette cost. Therefore, effective pricing policy involves increasing the cost of self-rolled tobacco and manufactured cigarettes at the same rate so that the population, and lower socioeconomic groups in particular, are less likely to switch from one type of cigarette to another.

**International Policy Overview**

*Tobacco-advertising policy*

The extent to which legislation regulating the promotion of tobacco products was in force at each time point is shown for each country in Figure 1. Tobacco advertising policies became more comprehensive from 1985 to 2000 in Sweden, Finland, United Kingdom, and the Netherlands. Policy intensity did not change in Spain and Germany. Results on the different dimensions of advertising (not presented) indicate that television and radio advertising were the most controlled media in all countries. The least restricted tended to be indirect methods of promotion, specifically point-of-sale advertising, sponsoring, brand sharing, discounts, and give-aways. Sweden and Finland reported the most comprehensive policies for tobacco advertising at all time points; tobacco advertising policies were least restrictive in the Netherlands and Germany.

*Smoking in the workplace*

The intensity of legislation on smoking in indoor workplaces over the same period is shown in Table 2. At all time points there were
workplace bans/restrictions on smoking in Sweden and Finland. The United Kingdom, the Netherlands, and Germany reported no workplace restrictions. In Spain, there were no workplace smoking restrictions before 1990, but later in the period there was a partial
work area ban (ban in health and educational workplaces) and some restrictions in common areas were implemented over the period. In Sweden, Finland, and Spain, legislation became more comprehensive over time.

**Support for smoking cessation**

Table 3 documents whether quit lines were provided in each country and the characteristics of the services provided. In most countries, national quit lines became available between 1995 and 2000. In the United Kingdom, they were available slightly earlier. The services were comprehensive in Sweden, the Netherlands, and Germany along with all strategies to encourage lower socioeconomic groups to utilise them.

We collected data on whether any of the smoking cessation therapies were subsidised, and if so, when. None were subsidised in Sweden, Finland, Germany, and Spain over the entire period (data not shown). Only the United Kingdom subsidised smoking cessation therapies, where authorities provided financial assistance for a limited range of quitting aids (i.e. nicotine patches, pharmacolo-

### Table 3: Availability and characteristics of quit lines, by country

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>Finland</th>
<th>UK</th>
<th>Netherlands</th>
<th>Germany</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was a telephone support line provided?</td>
<td>Y</td>
<td>NA</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>If so, at which time point was it available?</td>
<td>2000</td>
<td>—</td>
<td>1990</td>
<td>2000</td>
<td>2000</td>
<td>2000</td>
</tr>
<tr>
<td>The support line was promoted by the mass media</td>
<td>Y</td>
<td>NA</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Besides the cost of a local call, the call was free</td>
<td>Y</td>
<td>NA</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>NA</td>
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<tr>
<td>The support line service was interactive</td>
<td>Y</td>
<td>NA</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<tr>
<td>Follow-up calls were made to smokers</td>
<td>Y</td>
<td>NA</td>
<td>NA</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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Key: Y=yes; NA=no.
gical treatments, and cognitive-behavioural treatments) to individuals on low incomes. Spain also subsidised cognitive-behavioural treatments from 1990 onwards (no data shown).

**Cost of cigarettes**

Trends in the cost of cigarettes over the period are shown for each country in Figure 2. Costs increased significantly in most countries. $\beta$-coefficients and 95% confidence intervals of the year term in the models were greater than one. Germany was the only country where the cost of cigarettes did not rise (annual change in the price to per-capita GDP ratio is $2.35 \times 10^{-7}$ 95% CI $[-1.00 \times 10^{-6}, 1.47 \times 10^{-6}]$). General linear models showed that trends in the cost of cigarettes significantly differed between countries ($P$-value of cost $\times$ country interaction $<0.01$). Changes (increases) in cost were greatest in the UK and Spain, and were lowest in Finland (very small increases) and Germany (no changes). At all time points, the cost of cigarettes was markedly higher in Germany, the Netherlands, and the UK. Although we used population GDP as a proxy for income,
people under 25 years of age (an important target population for tobacco control policy) generally have an even lower disposable income than the population average because many are not employed.

**DISCUSSION**

The differential impact of tobacco control strategies on various socioeconomic groups has received little attention to date. A review of the literature revealed considerable potential to reduce smoking inequalities through tobacco control policies, especially those targeting tobacco advertising, smoking in workplaces, subsidised smoking cessation, and cigarette pricing. Our policy review indicated variability in the intensity of implementation of these measures. Despite considerable progress in tobacco control policies between 1985 and 2000 in the countries examined, the international policy overview demonstrated room for improvement in targeting of tobacco control policies to low-socioeconomic groups in most countries.

Some limitations of the study deserve note before discussing implications of the findings. The literature review included only studies written in English. We may have excluded information from non-English documents. However, when our international study team made an inventory of potentially relevant studies published in French, German, Dutch, Spanish, and Italian languages, they did not discover among those listed any relevant publications. By concentrating entirely on studies in the Medline and Cochrane databases, we may have excluded information published in the business, legal, and taxation literatures.

We collected no data about the enforcement of the policies, but discussion among members of the international research team suggested less enforcement of policies in southern Europe. In other words, the policy environment may not accurately reflect the situation in the real world, and the gap may be much larger in southern European countries. We examined trends in the cost of cigarettes in relation to per-capita GDP, but this simple comparison does not take into account a more complex reality. Taxation and income-redistribution schemes differ between the countries, and may confound this relationship. In several countries, new specifically targeted policies have been implemented after the period we
examined. The Netherlands adopted legislation banning smoking in the workplace in 2004.

We found restrictions on the advertising of tobacco products in some, but not all, countries. An encouraging finding was that most countries banned tobacco advertising on television and radio. This is an effective means for reducing smoking prevalence because both media reach large audiences, particularly disadvantaged groups (40). Tobacco advertising was least restricted (and showed little improvement over time) in Germany and the Netherlands, countries with higher population smoking prevalences than among Scandinavian countries (41–44). As the European Union has recently adopted laws to ban almost all forms of tobacco advertising across the entire region, further reductions in smoking inequalities may soon be achieved, particularly in Germany and the Netherlands.

Policy restricting smoking in workplaces is more comprehensive in some countries than others, most notable are the bans in Scandinavia. Germany and the Netherlands had fewest restrictions on workplace smoking, showed little improvement over time, and maintained higher smoking rates than the Scandinavian countries (41–44). Further reductions in smoking prevalence and inequalities in smoking are to be expected when Germany and the Netherlands adopt compulsory workplace smoking bans.

Affordability of cigarettes influences consumption levels. Thus, one of the most successful ways to reduce consumption, especially among disadvantaged groups (46), has been increasing the cost of tobacco products through taxation (9,45), Further cost increases in Finland and Germany could reduce smoking and inequalities in smoking. Such measures, however, may have unanticipated side effects. In the absence of effective and accessible smoking cessation services, cost increases may reduce funds for low-income groups to purchase the essentials of a healthy lifestyle (45–47). Rising prices have increased smuggling of cigarettes from countries where prices are lower. More comprehensive policies (in addition to increasing the cost of cigarettes), including national, social, and economic policies (which have an important influence on the position of disadvantaged groups) may be more effective for decreasing cigarette consumption among disadvantaged groups. Re-distributive welfare policies, for example, offer potential
to diminish income inequalities, and to aid disadvantaged groups (48).

As our findings parallel trends in smoking prevalence, our study could not distinguish whether these derived from policy alone, or from other social processes. Declines in smoking prevalence have been seen among poorly educated men in Sweden, Finland, the UK, the Netherlands, Germany, and Spain and poorly educated women in the UK (49), suggesting that policies targeting lower socioeconomic groups over time may have been effective in reaching disadvantaged men. An alternative explanation is that policy improvements may have first influenced higher socioeconomic groups, then disadvantaged groups may have adopted the quitting behaviours. That stable (or increasing) smoking prevalence has been seen among low-educated women in many European countries may suggest that policy improvements were less effective among poorly educated women. But these findings could also indicate that low-socioeconomic women lag behind men and higher socioeconomic groups are in their progression through the smoking epidemic. They have not yet adopted the quitting behaviour of men and their more advantaged counterparts, but may follow (50,51). In sum, trends of declining smoking among lower socioeconomic groups may not result directly from policy; rather, quitting behaviour may diffuse from high to low-socioeconomic groups.

The results of this study suggest that effectiveness of policies may be cumulative. We found declining education inequalities in smoking only in the UK (49). Compared to their more educated counterparts, poorly educated British men and women have greater annual declines in smoking (49). We found that the UK was most progressive in providing telephone quit lines, subsidising smoking cessation therapies, and increasing the cost of cigarettes. Simultaneous adoption of these policies may have led to greater declines among socioeconomically disadvantaged groups in the UK. It is also possible that the greater declines among low-socioeconomic groups in the UK derive specifically from powerful effects of price increases; the UK’s cigarette price increases were among the highest in the six countries examined.

Given that policies on tobacco advertising, smoking in the workplace, access to cessation therapies, and the cost of cigarettes have the potential to decrease smoking prevalence, and are especially
effective for targeting the behaviour of low-socioeconomic groups, this mixture of major and specifically targeted policies is recommended for inclusion in national tobacco control strategies. These strategies complement tobacco control measures that target smoking initiation among adolescence, including health publicity campaigns and school-based interventions. Each country in this study could extend its tobacco control policies to increase influence on smoking among lower socioeconomic groups. Periodic reviews of tobacco control policy across all European countries can ensure targeting of lower socioeconomic groups and inequalities in smoking between men and women.

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