What lessons can be learned from tobacco control for combating the growing prevalence of obesity?

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Background

Tobacco smoking kills more people than almost any other avoidable cause, but in the UK this situation is improving and has been for about 35 years. The current annual death toll in the UK is probably around 90 000, of whom about 30 000 are under the age of 70 years (Fig. 1). This figure will continue to fall fairly steeply for another 5 years as we benefit from the decline in smoking prevalence that began in the 1970s and only flattened off in the mid-1990s (1). Cigarette smoking prevalence is currently estimated at 25% (2) and in the past 5 years has declined on average at an estimated 0.4% per year (3).

While smoking remains one of the leading avoidable causes of premature death in the UK, it may seem odd to seek to draw lessons for another behavioural condition that for the time being at least kills fewer people – obesity. However, lessons can probably be learned from both the similarities between the two areas and their differences.

To reduce the population burden of obesity, obviously there is a need to get people who are becoming, or are already, obese to consume fewer calories or increase energy expenditure, or both. This review focuses on finding ways of decreasing energy consumption, but similar discussions could be undertaken on interventions to increase energy expenditure (typically by being more physically active).

Sources of similarity and difference between smoking and over-eating

One source of similarities and differences lies in the motivations underlying these activities. In both cases, intrinsic motivation such as enjoyment of the activity and needs met by the activity must be pitted against extrinsic motives arising from health concerns and social and financial costs (5). In the case of smoking, the 'needs' dominate and are largely derived from dependence which declines and in some cases disappears after a sufficiently long period of abstinence (5). In the case of over-eating, appetite and enjoyment of food are obviously enduring motives that for many people persist at levels above that conducive to energy balance.

The second point of comparison is in how far the public, the media and therefore Government will tolerate what may be regarded as manipulative or coercive measures to control a behaviour. Behaviour change interventions targeted at those engaging in the behaviour vary in how far they involve education, persuasion, facilitation or more coercive methods (Table 1). Until very recently, there has been little evidence of public desire to see coercive measures either in the case of smoking or over-eating. The situation is changing somewhat with smoking, but there is probably little public appetite at present for coercion to prevent over-

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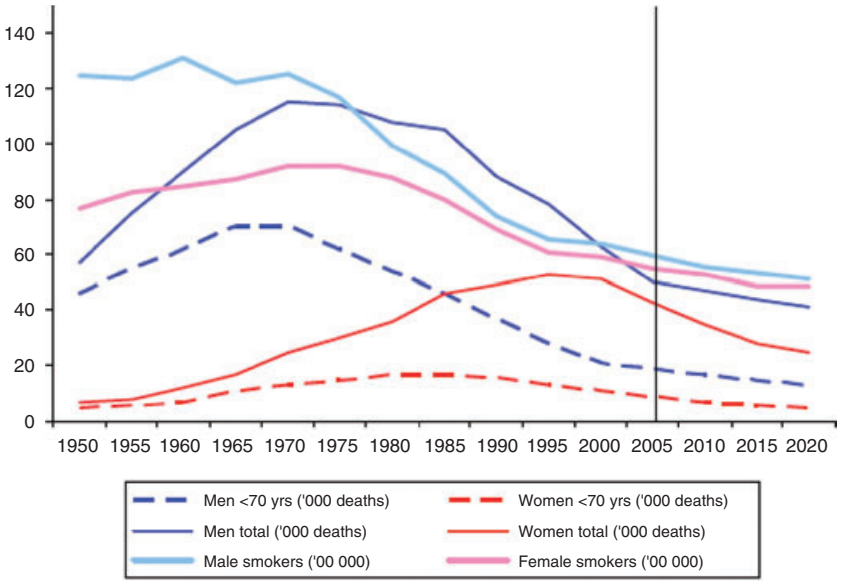

Figure 1 Trends in numbers of smokers and smoking-related deaths in the UK 1950–2020. Mortality data to 2000 are drawn from Peto and Lopez (4). Figures on numbers of smokers are drawn from ONS and Tobacco Advisory Council estimates of smoking prevalence combined with population trends (http://www.oheschools.org/ohech6pg2.html and http://www.optimumpopulation.org/opt.more.ukpoptable.html to calculate the number of adults aged 16 and over).

Table 1 The EPICURE taxonomy of approaches to achieving behaviour change (6)

Education	Increasing knowledge and understanding about the behaviour and its effects
Persuasion	Actively attempting to shape attitudes and behaviour through argument, imagery, etc.
Inducements	Making the desired behaviour more attractive, e.g. through financial incentives, social approval or other rewards
Coercion	Making the undesired behaviour less attractive, e.g. through increased financial cost, punishment or social disapproval
Upskilling	Providing training or instruction on how to achieve the desired behaviour or avoid the undesired behaviour
Regulating access	Restricting opportunities to engage in the undesired behaviour or making the desired behaviour more accessible
Empowerment	Making it easier to engage in the desired behaviour or refrain from engaging in the undesired behaviour, e.g. through medications or psychological support to control desires and impulses

eating, especially given that food, unlike smoking, is essential to life.

In addition to the approached outlined in Table 1 are measures designed to combat or limit the activities of those who are actively promoting the unhealthy behaviour, usually for commercial gain: the 'supply side' of the supply–demand equation. This could involve creating incentives and disincentives to suppliers, or, more commonly, restricting their advertising and marketing activities.

Interventions to reduce smoking prevalence

The motivations underpinning smoking may be undermined in a number of ways.

Most smokers enjoy smoking and believe that it serves a number of useful purposes: helping with stress, keeping weight down, social bonding and so on (7,8). It may be possible to persuade smokers to place less value on these features of smoking or, in the case of stress relief, to counter their misconceptions.

Nicotine as delivered by cigarettes is addictive: it changes the brain so that smokers experience powerful desires and urges to smoke which undermine and overwhelm their resolve not to (9). This may be addressed to some degree with treatments (see below).

Smoking appears to become an important part of many smokers' identity (for example, see Chen *et al.* (10)). It may be possible to undermine the attractiveness of this identity.

Even though people recognize that smoking kills, the causal connection between smoking and premature death is not simple: there is a reasonable chance for many smokers that they will 'get away with it' – suffering only minor health problems. This probably reduces the motivation to try to stop smoking (8). A major element of public campaigns is to make the adverse consequences of smoking more 'real' and immediate.

Stopping can always be put off to another day. Many smokers cite 'not the right time' as a reason for not attempting to stop (11). It may be possible to use media campaigns or interventions from health professionals to inject an urgency into the attempt to change.

Against this are motivations that stop people from smoking or encourage them to try to stop (12):

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• concern over the health effects of smoking. As noted above, these can potentially be enhanced by education and persuasion.

• the financial cost of smoking. Even behaviours that involve a strong addictive component are clearly responsive to price (13,14);

• concern over social disapproval of smoking. This has clearly been important in limiting smoking prevalence in women in developing countries and could be a powerful force in the West;

• dislike of the self-image of being a smoker. Some smokers appear to have internalized the negative image of being a smoker and it may be possible to use public campaigns and media advocacy to strengthen this process (12);

• concern over the harm smoking causes to others. Some smokers are concerned about directly affecting the health and comfort of non-smokers and the emotional damage that would be caused to those close to them if they were to die, and it may be possible to work on this;

• inconvenience and discomfort associated with smoking restrictions. Making it more difficult to find somewhere to smoke and limiting the times when people can smoke may motivate some smokers to stop entirely.

Smoking prevalence will be high in a society where cigarette smoking is regarded as normal or attractive, cigarettes are easy to get hold of, smoking is permitted in most places, the cost of smoking is not prohibitive, there is relatively little active concern among young and middle-aged people about reaching old age and there are few salient reminders about the adverse effects of smoking. As long as governments allow ready access to cigarettes, reducing smoking prevalence will be a matter of changing the balance of motivational forces so that for more of the time being a non-smoker becomes a greater priority and smoking becomes a lesser one.

The UK Government's strategy for reducing smoking prevalence has involved a number of measures (15). The clearest evidence for benefit relates to tax increases (16–20) but greater public awareness of the health effects of smoking in the 1970s coincided with a substantial reduction in prevalence that occurred at that time and arguably played a role. Other than that, there is little direct evidence that other measures have played a significant role, although it is possible that they have (Table 2).

It is worth considering why these measures have not had more of an effect to date, in the light of the balance of motivational forces operating on smokers and the level of coercion that governments are willing to exercise. Governments have arguably not engaged in sufficiently intensive and prolonged mass media campaigns on the threat posed by smoking to well-being and health. The emphasis has been primarily on providing information and creating modest levels of concern rather than creating high and persistent levels of worry about the effects of smoking. Neither have they engaged in campaigns to stigmatise smoking. Cost, distaste for negative messages and concerns about public acceptability may have contributed to this.

Governments have not put the price of cigarettes out of the reach of even the poorest members of the community. This may be partly because there would be a political price to pay for too steep an increase in the tax on cigarettes, partly because smuggling has become a serious problem only a small part of which arises from discrepancies between the UK price and the price in other European Union countries, and partly out of concern that poor smokers who fail to stop would be driven further into poverty.

Governments have not adopted policies that prevent young people getting access to cigarettes. They could do more, for example, by making it a criminal offence to sell or give cigarettes to a minor. It may be that costs and

Table 2 Measures to reduce smoking prevalence in the UK and their effects

Measure	Effect on prevalence
Tax increases	The clearest direct evidence for an effect based on time-series analyses, but cigarettes are now expensive compared with other countries and prices are no longer being put up ahead of inflation (6)
Public information campaigns and media advocacy	Probably reduced prevalence in the 1970s when information on health risks was relatively new, but there has been no clear evidence of an effect on prevalence in the past decade
Restricting where people can smoke	Not clear whether it has had an effect in the UK to date, but evidence from Ireland suggests that it might when complete bans on indoor smoking in public areas come into force (21)
Prohibiting sales of cigarettes to minors	Not clear whether this has had an effect
Banning advertising and promotion of tobacco products	No clear evidence of an effect to date since a comprehensive ban was introduced in 2003
Increasing access to cessation aids	No clear effect from population prevalence surveys, but the effect would be likely to be small in percentage terms and would require much larger surveys to be detected (22)
Requiring cigarettes to carry health warnings	No evidence of an effect on prevalence to date, but pictorial warnings being proposed for 2007 may have some impact (23)

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difficulties in enforcement have conditioned their thinking on this.

Governments have not marketed the National Health Service (NHS) 'stop smoking' services sufficiently to get more than a small minority of smokers to attend (1,11). The reason for this may relate to the complex relationship between the Department of Health and the NHS, in which the powers of the Department to issue guidance are limited and the only way to ensure that local healthcare trusts prioritise an activity is to set targets.

Lessons for reducing over-eating

So what can this tell us about how to reduce over-eating? As with smoking, unless we are willing to restrict the supply, it comes down to working on the motivation of consumers. The more people are motivated to eat foods with a high-calorie content and the less they are motivated to exercise restraint, the more they will over-eat (24). As with smoking, governments could in theory introduce policies that would dramatically alter this balance. For example, it could introduce rationing. However, draconian action of this kind would be considered disproportionate and politically unacceptable. Therefore, it has to try to be creative in finding acceptable ways to limit motivation to engage in patterns of eating that lead to excessive calorie intake, or encourage, persuade and help people to reduce their calorie intake.

Providing information about how to avoid over-eating

This is a point of difference from smoking. The activity of not smoking is trivially easy to accomplish if the balance of motivational forces goes in that direction. Avoiding over-eating presents a non-trivial challenge because a relatively small daily energy imbalance can lead to obesity if sustained over a number of years. Despite the many types of diet that have been promoted over the years, there may be little public awareness of basic information such as the number of calories required for energy balance, how to estimate the calorie content of one's own diet and number of calories involved in gaining or losing 1 kg of fat. If this is the case, increasing knowledge could be a useful approach. This merits further investigation.

Increasing concern about the adverse effects of over-eating

Before the Royal College of Physicians (RCP) reports in the 1970s, there was a general sense that smoking was harmful. However, the harms were not widely promulgated and arguably did not impinge a great deal on the public consciousness. Looking at the trend in prevalence suggests that these reports and the publicity surrounding them were influential in accelerating the decline in smoking prevalence in the UK. The current situation in the UK with regard to over-eating is probably similar to the pre-RCP report situation for smoking. Therefore, there may be scope for reducing over-eating through a similar exercise which sets out very clearly the health costs and raises their profile.

Providing treatment for over-eating

Psychological and pharmacological 'treatments' to aid smoking cessation are cost-effective life-saving interventions for those who use them. It is not clear how far treatment for over-eating would have the same benefit. This is partly because of modest long-term effects on weight (25–27) and it is partly because it is not clear exactly how far losing weight improves longevity, although it does reduce morbidity (28). But, equally importantly, unless very large numbers of 'over-eaters' come forward for treatment, its effect at the population level will be very small, as is the case with smoking. Treatment (including psychological support) to combat over-eating should probably be considered something that the NHS provides for individuals who have a need for it and want it, but this should not be the mainstay of the public health policy.

Increasing the price of particular kinds of foods

Palatable foods that have a high energy density may promote over-eating (29). The experience from smoking shows that price is a very important lever of change and would be likely to have an effect in this situation. The situation with regard to food is more complex and it is not clear that a practicable method of doing this could be found. However, this is an area that would merit investigation.

Restricting the availability of certain types of food or opportunities to eat

There has been little attempt to restrict *availability* of cigarettes but *smoking* restrictions have probably had an impact on prevalence in countries where they have been applied. It is difficult to imagine how one could restrict the availability of foods or particular kinds of food except in institutions such as schools. Similarly, it is difficult to imagine a situation where governments would restrict eating opportunities. However, it may be worth exploring shaping social norms to restrict eating times and occasions.

Restricting the supply of particular kinds of foods to children

It is difficult to estimate how much of an effect this would have. It is not clear how far externally imposed restraints

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on over-eating in children would translate into voluntary restraint in adulthood. It is worth noting that the epidemic of obesity began in adults before it reached children and arguably the former has helped drive the latter.

Regulating the marketing of foods

Marketing has powerful effects in shaping our thoughts and desires. It has not been shown conclusively that banning the promotion of cigarettes reduces smoking once smoking has become established as part of a culture, but it could reduce the extent to which smoking becomes prevalent in a culture. A ban on the marketing of more energy-dense foods is an option, but it is difficult to predict whether it would have a significant impact at this stage. However, it would be worth investigating the impact of food promotion that encourages people to over-eat to determine whether there should be restrictions on that kind of advertising.

Reducing the social acceptability of over-eating or eating too much of particular kinds of food

Social norms are extremely powerful determinants of behaviour. They set the boundaries of acceptability (30). It seems likely that changes in social norms have played a role in reducing smoking prevalence and they could do the same for over-eating. It is important to note that obesity is already largely stigmatized and there would be little point in focusing on this. As with all the other proposed interventions, it is patterns of food intake that lead to over-eating that would need to be the target. This is an area that merits investigation.

Conclusion

An analysis of two factors may be instructive in discerning lessons for combating over-eating from efforts to combat smoking:

- the balance of motivation to engage in the activity vs. motivation to exercise restraint;
- the extent to which governments are willing or able to use what might be regarded as manipulative or coercive measures to address the problem, rather than relying on education, persuasion or facilitation.

It has been argued that the situation with regard to over-eating may be broadly similar to the situation in the pre-1970s with smoking. If that is the case, there may be scope to make a significant impact through providing better information and campaigns designed to change norms and raise public concerns about patterns of behaviour that lead to over-eating. However, even if that is successful, it is unlikely that the problem will be adequately addressed without more coercive measures directed either at consumers or suppliers, or both. This will only become feasible if observable patterns of over-eating come to be viewed by the public as illegitimate, thus meriting tough action to control them. This would probably require a significant shift from the current situation (31).

Conflict of Interest Statement

The author undertakes research and consultancy for manufacturers of smoking cessation medications.

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