Obesity and Public Health Policy: Lessons from Tobacco Control

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About this Report

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Executive Summary

Obesity is a significant global public health problem with no known long term effective strategies to address it. In England, while obesity prevalence rates have trebled over the last two decades, during the same period smoking prevalence rates have declined significantly. The objective of this paper is to draw lessons from international tobacco control efforts that can be applied to tackling obesity in England.

The successes in tobacco control have primarily been a result of public policy measure to combat the problem and similar approaches can be used against obesity. The approaches have included Information and Communication Strategies, Community-based Programs, Regulatory and Legislative Efforts, Economic Approaches and Medical Interventions and Management all within a comprehensive framework. The paper outlines these strategies, what is known about their effectiveness (and the factors influencing effectiveness) and how they could be used to combat obesity.

The provision of information to individuals is critical to promoting healthy behaviours. Mass media campaigns have been found to be effective in decreasing smoking prevalence rates particularly when they are adequately funded and combined with other polices. In particular, social marketing campaigns have been found to be effective and similar types of campaigns in which multiple themes about obesity are targeted to specific demographic groups to raise awareness and improve knowledge can be used.

The communities in which individuals learn, work and live can and *do* have a significant impact on health behaviours. Accordingly, school, workplace and community-based programs have been used as part of comprehensive anti-tobacco programs. Overall evidence on the effectiveness of the tobacco control school-based programmes has been mixed. The school environment provides opportunities to give children a foundation for healthy eating behaviours. The government has recently taken positive steps to provide school environments that are supportive of healthy eating behaviour for example by mandating nutritional standards for school lunches.

Among the regulatory and legislative measures that have been used in tobacco control are advertising and promotional bans, regulation of label contents on tobacco products and minimal cigarette pack sizes. Overall, mixed results have been found regarding the effectiveness of tobacco advertising restrictions. However, in order to maximize effectiveness, advertising bans must be comprehensive and not limited to one medium as manufacturers are likely to use alternative media outlets to circumvent a ban in a specific medium. With regards to obesity, food advertising has a particularly significant effect on children; their preferences, purchasing behaviours and consumption patterns. While government has made positive steps in restricting the advertisement of junk food on television to children more needs to be done.

Taxation has been the single most effective public policy tool used against tobacco. Cigarette pricing as a policy tool has been effective because the price demand elasticity (i.e. how much the demand for cigarettes responds to changes in price) can be significant. Although the evidence of food price elasticity is limited, there is, however, evidence to suggest that policy-related economic instruments can influence food consumption.

The healthcare system plays an important role in both the prevention and treatment of diseases. The availability of nicotine replacement therapy (NRT) and the provision of brief advice by healthcare professionals, together with other environmental approaches discussed above, have contributed to declines in smoking prevalence rates. Professional advice to overweight and obese patients on living healthier lifestyles, drug therapy and bariatric surgery can make important contributions in combating obesity.

In summary, efforts to date to address obesity have not led to population declines in prevalence rates and tobacco control which has been a major public health success offers valuable lessons, albeit, with caveats. However, implementing the public policies that have been outlined above to address obesity

will be challenging as clear differences exist between tobacco and obesity. Food (the excessive intake of which leads to obesity), unlike tobacco, is necessary for life and extreme caution has to be taken regarding the implementation of policies such as taxation of food products to discourage the consumption of unhealthy diets.

Contents

Chapter 1: Introduction

Globally, chronic diseases are the leading causes of both mortality and morbidity with the most significant modifiable risk factors being tobacco use, unhealthy diets and excessive energy intake and physical inactivity[1]. In the UK, smoking is the single greatest cause of preventable illness and early death with more than 120,000 people dying each year. Encouragingly, over the last 35 years, there have been substantial declines in the proportion of adults who smoke[2]. In 1974, for example, 51 percent of men and 41 percent of women aged 16 and over reported they were regular cigarette smokers but by the beginning of this decade, these proportions had fallen to 28 percent and 26 percent respectively.[3]

As smoking prevalence rates have declined, there have been alarming increases in the levels of obesity throughout the UK. Prevalence rates in England have trebled since the 1980s[4] and are forecast to increase. In 2003, 22 percent of men and 23 percent of women were obese and these figures are projected to increase to 33 percent and 28 percent respectively by 2010 if current trends persist[5]. In stark contrast to the significant declines in tobacco use in high income countries, no country has been able to stem or reverse population obesity prevalence levels. However, given that obesity is a more 'recent' epidemic, this is not entirely unexpected. In addition, the strategies which have been predominantly used to date against obesity have been individual-based which, though effective in the short-term, are ineffectual in the long-run[6].

While it is acknowledged that individuals are ultimately responsible for their health behaviours, it must also be recognized that personal choices are always made in the context of a larger environment. Accordingly, an important complement to individual-based anti- obesity programs is a multifaceted public health policy approach[6]. Public health policies are required to help address the many behavioural, socio-cultural and environmental factors that promote excess caloric intake and discourage physical activity in what have been termed 'toxic' or 'obesogenic' environments[7,8*]. Environments which are conducive to providing opportunities and support to help individuals develop healthier behaviours are needed and the UK government now recognizes this[9].

The objective of this paper is to draw lessons from international tobacco control efforts that can be applied to tackling obesity in England. While there are important differences between the main causes of obesity and smoking, there are particularly similar social and environmental factors which influence both, thus allowing us to draw these lessons. In learning from the successes of tobacco control, it is hoped that measures can be taken that will lead to population-level declines in obesity and ultimately lead to improved population health.

The successes in tobacco control have primarily been a result of governments implementing policy measures to combat the problem and similar approaches can be used against obesity[10,11*,12,13]. Successful tobacco control public policy comprehensive frameworks have included:

- **Information and Communication Strategies**
- **Community-based Programs**
- **Regulatory and Legislative Efforts**
- **Economic Approaches**
- **Medical Interventions and Management**

Having monitoring and evaluation frameworks in place and disseminating information on the effectiveness of programs has also been critical to success. Here we outline the above strategies, what is known about their effectiveness (and the factors influencing effectiveness) and how they could be used to combat obesity. While it is necessary for energy intake to be decreased and/or energy expenditure to be increased in order for the prevalence rates of obesity to decline, the focus of this paper is on policies that could lead to decreasing energy consumption although similar policies, albeit modified, could be applied to promote increased energy expenditure.

* Indicates an annotated reference

Chapter 2: Public Policy Options for Obesity - Learning from Tobacco Control

In this chapter, the various public policy options (Information and Communication Strategies, Community-based Programs, Regulatory and Legislative Efforts, Economic Approaches, Medical Interventions and Management) that have been used for tobacco control are outlined. Furthermore, what is known about their effectiveness and factors influencing effectiveness is discussed as well as how these options could be used in as a part of a comprehensive framework to combat obesity.

2.1. Information and Communication Strategies

The provision of information to individuals is critical to promoting healthy behaviours. This can be undertaken in a number of ways including: providing information in educational settings, information on product labels, brief advice by healthcare professionals and using various forms of media to disseminate information. Mass media (radio, TV, billboards, etc) in particular, have played an important role in tobacco control by directly reaching a large number of individuals with messages on prevention, cessation and the dangers of second hand smoke. There are low expectations that mass media campaigns on their own can lead to behaviour change. Therefore, mass media campaigns have primarily been aimed at raising awareness, providing knowledge and changing attitudes, with the aim of contributing to potential behaviour change[14]*.

Evidence on Effectiveness and Factors Influencing Effectiveness

Using a computer simulation model, it has been estimated that 'quit rates' can be increased by as much as 40 percent (the effect is measured relative to initial smoking rates) as a result of media campaigns that target smoking cessation and that media campaigns can lead to as much as a 7 percent annual decrease on smoking prevalence rates when they are adequately funded and combined with other polices [15]. Declines in prevalence rates on the order of 1.2 -1.5 percent and greater have been attributed to single campaigns.[16] The effectiveness of mass media campaigns is influenced by a number of factors some of which are summarized in Box 1.

Box 1: Effective anti- tobacco media campaigns[17,18]:

- are comprehensive from a media standpoint: featuring multiple messages, executions and media vehicles
- are synergistic in that they work together with other parts of the overall tobacco control programs to create stronger results.
- introduce persuasive new risk information to smokers and non-smokers.
- provide resources and helpful information about how to quit.
- introduce a variety of ads over time to constantly attract and engage different kinds of smokers.
- maintain strong media presence for extended periods of time, continuously reminding individuals not to begin smoking, to quit smoking and to remain tobacco free.
- work within an overall strategy that seeks to de-normalize smoking by using multiple media channels to reach consumers with messages about why and how to quit smoking and engaging non-smokers as well.

Application to Obesity

In England, mass media campaigns to educate and raise public awareness on obesity related issues such as what constitutes a healthy diet, dietary recommendations and ideal body weights are sorely needed as knowledge about these issues has been found to be poor. For example, in a survey conducted by Hansbro *et al*[19] to assess the public's knowledge of what constitutes a healthy diet, only 16 percent of respondents mentioned as many as three out of four of the core recommendations (to eat more fruit, vegetables and salad; to cut down on fat; to eat more fibre; to eat more starchy carbohydrate) put forward by the Department of Health[20]. Furthermore, a cross-sectional survey of adults in England assessing knowledge of current dietary recommendations, sources of nutrients, healthy food choices and diet–disease links found serious gaps in knowledge and there was evidence of much confusion over the relationship between diet and disease[21].

If individuals fail to recognize that they are overweight or obese, any information programs linking overweight and obesity with health risks might fail to induce diet and lifestyle changes. This is especially relevant in England as perceptions of excess body weight, particularly of parents towards their overweight and obese children, have been found to be poor. In one study, only 1.9 percent and 17.1 percent of parents of overweight and obese children respectively, identified their children as such[22]. Another study supports these findings with only a quarter of parents of overweight children identifying their children as overweight[23]*. In this same study, 33 percent of mothers (57 percent of fathers) of obese children viewed their child's weight as being 'just right' and among the overweight parents 40 percent and 45 percent of overweight mothers and fathers, respectively, judged their own weight as being 'about right'. Males, individuals from ethnic minority groups and those from lower socio-economic classes are most likely to under-assess their weight status[24,25].

There is great need for informational and educational strategies to be used in efforts to overcome some of the knowledge and awareness gaps that have been identified regarding obesity. With regards to media campaigns, evidence from tobacco control has shown that successful campaigns that use a 'social marketing approach' can be effective in providing knowledge and changing attitudes. Social marketing uses concepts from commercial marketing to design and implement programs aimed at bringing about behaviour change that would benefit individuals and society. Realizing its potential benefits, the government commissioned independent reviews which have found that there is scope for social marketing to improve the impact and effectiveness of public health programs and interventions including obesity[26,27]*. What is now needed is to implement social marketing based public health campaigns in which multiple themes about obesity are targeted to specific demographic groups to raise awareness and improve knowledge, as has been proposed in the national obesity strategy document[28].

2.2 Community Programs

The communities in which individuals learn, work and live can and do have a significant impact on health behaviours. Accordingly, school, workplace and community-based programs have been used as part of comprehensive anti-tobacco programs. The school environment provides a 'captive audience' of students and a forum for communicating with a large number of young people. In addition to promoting comprehensive smoking bans in public places, work places have provided employers with opportunities to promote and support the participation of employees in smoking cessation programs. Wide-ranging community-based programs which have included voluntary organizations, places of worship and entertainment venues among others have been used as part of comprehensive community-based strategies for tobacco control[29].

2.2.1. School-based Programs

Evidence on Effectiveness and Factors Influencing Effectiveness

Overall evidence on the effectiveness of the tobacco control school-based programmes has been mixed[30]. While some studies have reported marked decreases in prevalence rates of smoking, other studies have been unable to show any long term positive benefits[31]. The effectiveness of programs is influenced by a variety of factors and some of the strategies which have been found to positively influence the outcomes of school-based programs are outlined in Box 2 below:

Box 2 : School-based strategies that are effective in preventing tobacco use among youth[32]

- Develop and enforce a school policy on tobacco use.
- Provide instruction about the short- and long-term negative physiologic and social consequences. of tobacco use, social influences on tobacco use, peer norms regarding tobacco use, and refusal skills.
- Provide tobacco-use prevention education in nursery through year 11; this instruction should be especially intensive in early secondary school years and should be reinforced at older ages.
- Provide program-specific training for teachers.
- Involve parents or families in support of school-based programs to prevent tobacco use
- Support cessation efforts among students and all school staff who use tobacco.
- Assess the tobacco-use prevention program at regular intervals.

Application to Obesity

The school environment provides opportunities to give children a foundation for healthy eating behaviours. In schools, young people can be taught about nutrition, receive lessons in cooking nutritious meals and receive healthy meals. The government has recently taken positive steps to provide school environments that are supportive of healthy eating behaviours. Nutritional standards for school lunches have been mandated. Furthermore, confectionary, savoury snacks (except nuts and seeds without added sugar or salt) and other junk food such as soft drinks can no longer be sold in vending machines[33*,34*].

2.2.2. Workplace and Community-based Programs

Evidence on Effectiveness and Factors Influencing Effectiveness

When offered in the workplace, proven smoking cessation methods such as group therapy, individual counselling and nicotine replacement therapy (NRT), are equally effective compared to being offered in other settings[35]. However, other elements such as social and environmental support, competitions and incentives, do not show clear benefits promoting smoking cessation at work[33]. Evidence from systematic reviews evaluating the effectiveness of community-based programs to prevent smoking in young people has found they can be effective while the community interventions to reduce smoking among adults have been found to be largely ineffective especially among heavier smokers[36,37].

Application to Obesity

In the workplace, obesity among employees should be of particular concern to employers and they can take steps to ensure that work environments support healthy eating as obesity can have negative financial impacts on businesses. A study in the United States found that obese workers filed twice the number of workers' compensation claims, had seven times higher medical costs from those claims, and had 13 times more lost work days due to work injury/illness than non-obese employees[38]. Employers can provide support for their employees to maintain a healthy lifestyle by providing healthier food choices in staff cafeterias and vending machines and through other organizational polices that encourage healthy lifestyles.

At the community level, voluntary organizations, community groups, local retailers and local health commissioners can all be involved in efforts to support various schemes such as courses for improving cooking skills for adults and promoting the sales of fruit and vegetables of local farmers through local retail outlets[39].

2.3 Regulatory and Legislative Strategies

Regulatory and legislative strategies have been used as part of comprehensive tobacco control programs. Among measures used have been tobacco advertising and promotional bans, regulation of label contents on tobacco products and minimal cigarette pack sizes.

2.3.1 Advertising

Tobacco advertising has been found to increase consumption by encouraging smokers to smoke more, reducing smokers' motivation to quit and encouraging former smokers to resume[40]. There is particular concern about the impact of advertising on youth. A number of studies have found cigarette advertising is effective in getting children's attention[41,42]. In addition to advertising through conventional channels such as television, radio and newspapers, tobacco companies advertised through sponsorship and promotional events until comprehensive bans were enacted through the Tobacco Advertising and Promotion Act of 2002[43].

Evidence on Effectiveness and Factors Influencing Effectiveness

Overall, mixed results have been found regarding the effectiveness of tobacco advertising restrictions[44]. Nevertheless, there is strong evidence that limiting advertising and banning sponsorship of tobacco company events has been effective particularly among children. Among adolescents, aggressive counter-industry media campaigns which highlight industry deceptive practices lead to negative attitudes toward the industry and result in reduced smoking intentions and behaviour[45]. In order to maximize effectiveness, advertising bans must be comprehensive and not limited to one medium as manufacturers are likely to use alternate media outlets to circumvent a ban in a specific medium.

Application to Obesity

Food advertising has a particularly significant effect on children; their preferences, purchasing behaviours and consumption patterns. This effect has been found to be independent of other factors and to operate both at a brand and category level[46]. In general, high energy but nutritionally deficient foods (junk food) account for a disproportionately large percentage of all food advertising, whilst advertising for healthier options is significantly lower. This disproportionate advertising encourages and reinforces the consumption of unhealthy diets by children. Furthermore, it undermines the efforts to encourage healthy eating. Therefore, making it mandatory for food and beverage industries to responsibly market their products (especially to children) should be an integral part of food policy by government.

The government has made positive steps in restricting the advertisement of junk food on television[47]. However, while advertisements for food and drink products high in fat, salt and sugar are no longer permitted in or around programmes made for children (including pre-school children), these efforts have been criticized as not being stringent enough as some of the programmes most popular with children are escaping the food advertising restrictions because of the relatively large adult audiences also watching[48]. Furthermore, the advertising restrictions have only been in one medium; television. As evidence on the effectiveness of advertising restrictions towards children in tobacco control shows, in order to be effective, restrictions against junk food advertising need to be more comprehensive and to target all media and other promotional outlets.

2.3.2 Product Labelling and Package Size

Governments may require product manufactures to provide information about a product on its package and to regulate the quantity of product sold in a package. With regard to tobacco products, health warning labels on packages are required and these provide smokers with universal access to information on the risks of smoking. Additionally, there are regulations on cigarette package sizes and cigarettes cannot be sold individually which makes them less accessible, especially to young people.

Evidence on Effectiveness and Factors Influencing Effectiveness

There is considerable variation on health warning packages among countries. They range from graphic depictions of disease on Canadian packages to obscure text warnings in the United States[49]. Results of the impact of health warnings on tobacco use have been mixed, with some studies finding limited short term or no effects on use and others finding a decrease in tobacco sales following the introduction of warning labels and increased quit attempts [50,51,52]. Evidence on effectiveness suggests the impact may depend on the type of warnings. Warnings that are graphic, larger, and more comprehensive in content are more effective in communicating the health risks of smoking and have been found to increase quit attempts[53].

Application to Obesity

Further regulations to make it easier for consumers to make healthier food and meal choices could be undertaken on the two types of information available on food products: nutrition labels and health claims. While labelling provides consumers with information about the nutritional properties of food, health claims provide information to the consumer about the nutritional and health advantages of particular foods and nutrients and also serve as a marketing technique employed by food and beverage companies[54]. There has been recent EU regulation to limit health claims and foods which, for example, claim to be "low in salt" or "light". Foods with these types of claims will have to meet standardised definitions agreed by the EU[55]. Furthermore, foods making such claims will be mandated to make it clear on the same label if they are also high in fat or sugar[56]. This is particularly important as there is evidence that many consumers are confused by food and health claims[57].

Although nutrition labelling on packaged food in the England is mandatory, how this information is presented is voluntary. While research findings reveal consumers find the 'traffic light'[†] front of pack labelling system developed by the Food Standards Agency to be 'user friendly', some food manufactures use an alternative based on the percentage in each food of an individual's Guideline Daily Amount (GDA) of a nutrient[58,59]. The GDA system has been criticised as research has found nearly half of adults lack the numeracy skills to use percentages correctly in the context of measures and observations.[60] Although independent evaluation on the impact of the traffic light system on consumer purchasing behaviour is being undertaken, there is anecdotal evidence the system is positively influencing the purchasing of healthier foods[61]. Nutritional labelling information should be presented uniformly making it easier for consumers to make healthier purchasing decisions and government has not ruled out the possibility of using legislative tools to ensure the food and drink industry comply.

Information about the nutritional content of food should extend beyond that of packaged food to meals served in restaurants as individuals are increasingly eating meals prepared outside the home. This is particularly important as portion sizes have significantly increased in the last 30 years not only at fast-food restaurants, but also at conventional restaurants leading to greater food consumption[62,63,64]. The government should work with the restaurant industry to encourage it to regulate portion sizes and to provide nutritional information on menus on food that is served as has been proposed in the obesity strategy[28].

[†] The traffic light colours indicate if food has high (red), medium (amber) or low (green) amounts of fat, saturated fat, sugars and salt per 100g of the food.

2.4 Economic Approaches

Taxation has been the single most effective public policy tool used against tobacco[65]. Taxes account for a significant proportion of the price of cigarettes. In the UK, for example, about 80 per cent of the price of a pack of 20 premium brand cigarettes is tax[66]. Increased tobacco taxes prevent not only smoking initiation, but also motivate smoking cessation and lead to the reduction in the number of cigarettes smoked.

Evidence on Effectiveness and Factors Influencing Effectiveness

Cigarette pricing as a policy tool has been effective because the price demand elasticity (i.e. how much the demand for cigarettes responds to changes in price) can be significant especially among adolescents, individuals from low socio-economic classes and women. Studies have shown that a price rise of 10 percent would be expected to reduce the demand for tobacco products by about 4 percent in adults in high income countries and 6 percent in children[67,68]. In order to maximize the effectiveness of taxation of tobacco products, increases in taxes have to be consistently and significantly higher than general inflation. Furthermore, efforts have to be made to counter tobacco smuggling as this can undermine the sales of highly taxed tobacco products.

Application to Obesity

Although the evidence of food price elasticity is limited, there is, however, evidence to suggest that policy-related economic instruments can influence food consumption[69]*. Economic strategies that could be used could act both as incentives (to purchase healthier foods) and disincentives (to discourage the purchasing of junk food)[70]. Incentives could involve removing sales taxes on healthy foods, subsidizing healthy foods and subsidizing transportation of health foods in remote regions. Taxation on unhealthy foods could discourage unhealthy eating.

2.5 Clinical Interventions and Management

The healthcare system plays an important role in both the prevention and treatment of diseases. The availability of nicotine replacement therapy (NRT) and the provision of brief advice by healthcare professionals, together with other environmental approaches discussed above, have contributed to declines in the smoking prevalence rates.

Evidence on Effectiveness and Factors Influencing Effectiveness

Health care professionals, especially physicians, are the primary source of information about healthy behaviours for many individuals. Evidence from a systematic review reveals that the provision of brief simple advice by physicians about quitting smoking increases the likelihood that a smoker will successfully quit and remain a non-smoker a year later[71]. While there is insufficient evidence to determine whether use of aids or providing follow-up support after offering the advice increases the quit rates any further, quit rates may increase as a result of the provision of more intensive advice.

All forms of NRT (chewing gum, patches for the skin, nose spray, inhalers, and tablets) can help people quit smoking and almost double long term success rates[72]. There is no evidence that one form of NRT is better than any other. The effectiveness of NRT appears to be largely independent of the intensity of additional support provided to the smoker. Although beneficial in facilitating the likelihood of quitting, the provision of more intense levels of support is not essential to the success of NRT[70]. In addition to NRT, other pharmacological interventions can be used to aid smokers to quit. For example, nicotine receptor partial agonists (varenicline and cytosine) can help individuals stop smoking. While

varenicline can increase the odds of successful long-term smoking cessation approximately threefold compared with pharmacologically unassisted quit attempts, the evidence regarding the effectiveness of cytisine is at present inconclusive[73]*. Rimonabant, a cannabinoid type 1 receptor antagonist is also effective in increasing quit rates[74]*. It may also moderate the weight gain that is usually associated with smoking cessation in the long term.

Application to Obesity

Professional advice to overweight and obese patients on living healthier lifestyles, drug therapy and bariatric surgery make important contributions in addressing obesity. Although brief advice by healthcare professionals to patients is a cost-effective means of disease prevention, research evidence shows there is scope for more involvement of the primary care team with regards to obesity. In one study, less than one in five of the obese and one in 20 of the overweight adults recalled having received weight control advice from a health professional[75].

Mandating that healthcare professionals learn about the behavioural risks of obesity and that they give advice to overweight and obese patients about health promoting behaviours has the potential to contribute significantly to fighting obesity. Drug therapy and surgery are being used particularly with individuals who have tried but failed to lose weight by other means. For example, rimonabant has been found to produce modest weight loss (5% after one year) among adults with overweight or obesity although rigorous studies examining its efficacy and safety of are required to fully evaluate the benefit risk ratio of this drug[76]. Studies evaluating the long-term efficacy of orlistat and sibutramine have found both drugs to be modestly effective in promoting weight loss[77]. While surgery leads to weight loss in morbid obesity, it is not clear which surgical procedure (gastric bypass, gastroplasty, adjustable gastric banding, etc) is the safest and most effective[78]. Although surgery and pharmacotherapy are essential in addressing obesity (especially in the morbidly obese), it should be noted they are unlikely to be the mainstay of a public policy to combating obesity.

Table 1: Measures to reduce tobacco use and their potential application

Measure	Effect on Tobacco Use	Potential Applicability to Weight and Diet Outcomes
Information and Communication Strategies	Strong evidence exists that quit rates can be increased as a result of media campaigns that target smoking cessation. Media campaigns can lead to as much as a 7 percent annual decrease on smoking prevalence rates when they are adequately funded and combined with other polices (14)	There is potential for social marketing based media campaigns to be used to raise awareness and improve knowledge about factors that are relevant to obesity such as what constitutes a healthy diet and the relationship between diet and disease. This may translate into behaviour change.
Community Programs		
a. School-based Programs	Overall evidence on the effectiveness of the tobacco control school-based programmes has been mixed with some studies finding school-based programs influence intentions to quit and others finding no long-term impact (30).	Policies promoting healthy school environments have been recently implemented and their effectiveness is still to be evaluated (33,34). However, there is likely to be little impact on overall diet and weight outcomes if there is no additional support to promote healthy eating outside the school environment.
b. Workplace and Community-based Programs	Community-based programs to prevent smoking in young people have been found to be effective while the community interventions to reduce smoking among adults have been found to be largely ineffective especially among heavier smokers (36, 37). Some workplace programs can be effective in reducing smoking rates (35).	Community-based programs involving various organizations such as voluntary groups and local retailers to promote healthy eating could be used. The effectiveness would depend on the uptake by community members. Employers can assist employees in maintaining healthy lifestyles by providing healthier food choices in staff cafeterias and vending machines and through other organizational polices that encourage healthy lifestyles
Regulatory and Legislative Efforts		
a. Advertising Bans	Empirical evidence shows the adoption of partial advertising bans has little or no effect on smoking. However, comprehensive advertising bans covering all media and all forms of direct and indirect advertising can reduce tobacco consumption by more than 5 percent (79).	Television advertising restrictions on programming for children have been recently implemented (47). The impact of advertising bans in tackling obesity is likely to be greater if comprehensive bans that include other media are put in place. However, whether widespread comprehensive bans can be implemented is very questionable as this may be seen to be impinging on the rights of commercial speech.
b. Product Labelling and Package Size	Evidence on the effectiveness of tobacco warning labels suggests the impact may depend on the type of warnings. Warnings that are graphic, larger and more comprehensive in content are more effective in communicating the health risks of smoking and have been found to increase quit attempts (52).	Anecdotal evidence suggests the new 'traffic light' food labeling system can positively influence the purchase of healthier foods (67). Therefore, this is a promising mechanism which can be used by consumers to make healthier food choices. Importantly, the provision of nutrition information on restaurant menu items could also be useful in promoting healthy food consumption. However, as restaurant menus may change frequently, there may be difficulties in providing accurate information.
Economic Approaches (Taxation)	Strong evidence exists which shows that increasing prices of tobacco products is effective in reducing smoking. A price rise of 10 percent would be expected to reduce the demand for tobacco products by about 4 percent in adults in high income countries and 6 percent in children (66,67).	Price incentives such as reducing the price of healthy foods in vending machine foods and cafeterias could have a positive impact in the adoption of healthy diets. Taxation of junk food could also be used in efforts to promote health diets. However, difficulties in implementation may arise not only because of the regressive nature of such as a tax, but also because of practical questions such as which foods to tax and how much to tax.
Medical Interventions and Management	The provision of brief medical advice on smoking cessation by doctors is a highly cost effective way of reducing smoking (69). Treatments in the form of behaviour support (including telephone help lines) and pharmacotherapies are also effective in reducing smoking rates (72-74).	Physicians and other healthcare providers can give advice to overweight and obese patients on how they can lose weight and live healthier lifestyles as well as provide them with information on where they can access additional support. Surgical interventions have been shown to be effective in the treatment of the morbidly obese (78) and long-term pharmacotherapy (orlistat and sibutramine) appears modest (77). However, surgical and pharmacotherapeutic options are unlikely to be viewed as the mainstay of public policy.

Chapter 3: Conclusion

Obesity in England is a serious problem with not only significant health (physical and mental) but also economic consequences and evidence suggests that prevalence rates will continue to rise if current trends persist. Efforts to date to address obesity have not led to declines in prevalence rates and tobacco control which has been a major public health success offers valuable lessons, albeit, with caveats (Table 1).

The successes of tobacco control can be attributed to persistent efforts by advocates calling for comprehensive and complementary policies to curb tobacco use and having these polices evaluated for their effectiveness. Additionally, changing public attitudes towards smoking as evidence has emerged about the dangers of second hand smoke has also been critical in ensuring that anti-tobacco public policies are accepted and promoted.

Implementing the public policies that have been outlined above to address obesity will be challenging as clear differences exist between tobacco and obesity. Food (the excessive intake of which leads to obesity), unlike tobacco is necessary for life and extreme caution has to be taken regarding the implementation of policies such as taxation of food products to discourage the consumption of unhealthy diets. Furthermore, while the dangers of tobacco, particularly of second hand smoke, have led to public support for anti-tobacco policies, no such similar feature exists for the impact of obesity. Therefore, in the current social and political climate, some of the policies that have been proposed are unlikely to receive public support.

Prevailing general public attitudes do not recognize the significant impact the physical environment has on rising obesity levels. Although genetics can play a role in causing obesity, the general consensus is that the rapid rise in population obesity levels over the past 30 years is predominantly a result of changes in social and environmental factors.

These changes include technological innovations which have led to reduced food prices and more sedentary work environments, changing sociodemographic factors such as increased female labour force participation and increased urbanization. As a result, we now live in ‘obesogenic’ environments which promote increased caloric intake while at the same time they reduce opportunities and requirements for energy expenditure. However, outside of public health and policy circles, obesity is still largely viewed as a consequence of behaviours by individuals and changing attitudes will take time.

The complexity of the causes and drivers of obesity underscore the need for multiple stakeholders working synergistically to address the problem. Thus, although the role government could play in promoting healthy environment has been the focus of this paper, it is critical for families, communities, the food industry and other stakeholders to take active roles. While for example, the government has made efforts to provide healthy school environments, there is likely to be no impact in the reduction of childhood obesity levels if parents are not actively involved in promoting healthier lifestyles for their children at home or if the communities in which they live do not provide opportunities for physical activities. Accordingly, urban planners need to design communities which support physical activities such as pedestrian walkways, cycle paths and playgrounds. Successfully reversing obesity trends will require the adoption of healthier lifestyles by individuals within environments that are supportive of these lifestyles.

Finally, the effectiveness of policies and programs needs to be monitored and evaluated and findings disseminated as there is very limited evidence on long-term effective measures to tackle obesity. As a multi-faceted approach is required to address obesity, so are multi-disciplinary efforts evaluating the effectiveness of programs needed. A combination of methodologies have to be applied and the gold standard for evaluating the effectiveness of programs that is, randomized controlled trials, may have to take a less prominent role, and other evaluation methodologies which take place in the broader context of communities in which individuals live may have to take more prominent positions.

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