

# What Is the Role of Regulation in the Management and Prevention of Obesity?

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**Abstract** This review article discusses recent literature on the role of regulation in the management and prevention of obesity. Specifically, the article examines regulation in five domains: product, price, promotion, places, and people. Examples of each type of regulation are described and recent research findings examining the impact of these regulatory tools are summarized. While various levels of government in different countries are trying regulation-based approaches to promote healthier behaviors, some measures, including menu labeling, ‘fat taxes’, and restrictions on food and beverage marketing and access, have had limited impacts. Moreover, many studies that attempt to measure the effects of regulatory approaches do not collect data on body weight, thus the impact of regulations on obesity over time is often not studied. The complexity of factors that influence diet and activity demands multi-factorial interventions; examining current efforts will help inform continuing policy decisions about regulation-based approaches to manage and prevent obesity.

**Keywords** Obesity · Law · Regulation · Management · Prevention · Food and beverages · Taxation · Marketing · Menu labeling · Nutrition labels · Advertising restrictions · Food industry · Self-regulation · Quick service restaurants · School food · Penalties and rewards

## Introduction

This review article discusses recent literature on the role of regulation in the management and prevention of obesity. The

dramatic global increase in the prevalence of obesity and related health conditions over the past three decades has directed policy attention to regulatory tools to address this public health problem. This article focuses on government use of legal authority to enact regulatory measures, but comments briefly on voluntary self-regulation by industry. While dietary intake and physical activity are both important considerations in obesity, this article addresses regulatory tools concerning foods and beverages. Specifically, the article examines regulation in five domains: product, price, promotion, places, and people. Examples of each type of regulation are described and recent research findings examining the impact of these regulatory tools are summarized.

## Regulatory Tools

### Product Regulation

Direct product regulation includes restrictions on the ingredient and nutrient content of foods. No one specific food component causes obesity, but habitual overconsumption of products high in fats, sugars and salt has cumulative adverse impacts on human health. With the exception of restrictions on trans fats content in foods, there are as yet few examples of legal restrictions on single ingredients in food products implemented as part of obesity and chronic disease control measures.

Medical evidence about the harms of consuming trans fats, even in small quantities [1], prompted the enactment of legal limits on permissible trans fat content in several jurisdictions, including several European countries and some cities and states/provinces in the U.S. and Canada [2]. The food industry has also taken voluntary steps to reformulate products to lower trans fat content, in some cases to comply with government-recommended standards and governmental monitoring [3].

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Salt and sugar content in food is also under growing scrutiny. High salt intake is associated with hypertension and certain cardiovascular diseases. Some argue for regulatory controls on the permissible level of added salt in foods; for example, the American Heart Association argues the U.S. Food and Drug Administration should remove salt from the list of additives generally recognized as safe [4]. In regard to sugar, “[a] growing body of epidemiological and mechanistic evidence argues that excessive sugar consumption affects human health beyond simply adding calories. Importantly, sugar induces all the diseases associated with metabolic syndrome” [5, p. 28], including hypertension and diabetes [6]. An emerging discourse focusing on the potentially addictive properties of ‘junk’ foods [7] may build public support for more regulation of the food industry.

Product regulation also includes rules about packaging, including mandatory requirements that products bear nutrition labels in a standardized format disclosing calorie and nutrition information. Disclosure of information about products is viewed as less coercive than restricting the actual ingredient composition of products [8]. Use of labels is associated with a healthier diet and a recent systematic review concludes that “[t]he evidence to date indicates that nutrition labels on pre-packaged foods are a cost-effective population-level intervention with considerable reach” [9•, p. 1502]. Governments continue to consider options for simplified label formats, including warning labels on foods high in fat, sugar or salt, to help make labels accessible for populations that currently report low use, including persons with lower literacy skills.

### Price Regulation

Tax measures to manipulate food and beverage prices are also a key regulatory mechanism to influence consumption patterns. Assuming consumers are sensitive to price, higher prices on less healthy food products should deter purchases and lower prices on healthier items like fresh vegetables and fruits should encourage purchases. A majority of U.S. states [10] and some European countries have taxes of varying amounts levied against high-calorie foods and beverages. A 2013 systematic review analyzed “recent U.S. studies on the price elasticity of demand for sugar-sweetened beverages (SSBs), fast food, and fruits and vegetables, as well as the direct associations of prices/taxes with body weight outcomes” [11•]. The authors found that higher prices for fast foods and lower prices for vegetables and fruits were associated with lower body weight in some groups, specifically, adolescents and lower-income adults and children. Existing taxes on SSBs in the U.S., which are relatively low, were found to have little influence on body weight. Tax increases may help reduce consumption, but would face opposition from industry and consumers who condemn heavy taxation as excessive government interference in the marketplace.

Consumers may change their behavior in ways that undermine the effectiveness of taxes. For instance, consumers may replace taxed products (e.g., soda pop) with equally caloric products that are not taxed (e.g., flavored milk beverages) [12]. In Denmark, consumers avoided the government’s controversial tax on products high in saturated fats by cross-border shopping in Germany and Sweden [13]. The government rescinded the tax after only a year because of adverse economic impacts on food producers and sellers and also abandoned plans for a sugar tax [13]. Regulatory measures must be analyzed carefully to identify possible ways in which they may encourage undesired or counterproductive behaviors. Smaller scale or time limited pilot projects may be useful to test the impacts of new regulations prior to wide-scale adoption.

Proponents of food and beverage taxes point out that the revenue generated by higher taxation may be allocated to other obesity control initiatives; thus taxes can have benefits beyond influencing individual consumer behavior. For instance, a national penny-per-ounce tax on SSBs in the U.S. is estimated to raise around \$13 billion annually [10]. Moreover, taxes levied against manufacturers may encourage them to reformulate products to reduce the tax burden calculated on fat or sugar content. Some analysts contend the global giants in the beverage industry can continue to earn profits while reformulating products to reduce calorie content [14].

### Promotion Regulation

Promotion of foods and beverages takes various forms, including: television advertisements; online and social media marketing through company websites and Facebook pages; product placement on television, films, and video games; and licensing of characters, such as a food company paying to use an image of Harry Potter on its cereal boxes. Calls for marketing restrictions have focused especially on advertising aimed at children since they lack experience in distinguishing commercial and non-commercial messages and in critically judging advertisements [15].

Much of the concern about children’s exposure to ‘junk food’ advertising has focused on television ads, particularly as very young children are increasingly exposed to TV and videos [16]. An international study of food advertising in 13 countries across five continents revealed that the majority of ads (67 %) in all countries were for food with poor nutritional profiles, with fast food meals, chocolate products, and confectionary items at the top of the list [17]. Exposure to TV advertising is associated with childhood and adolescent overweight and obesity. An analysis of six Western countries concluded that the contribution of TV food ads to childhood obesity is as high as 40 % in the U.S., almost 30 % in Australia and almost 20 % in Great Britain, Sweden and the Netherlands [18].

A recent review of 59 countries found that nearly one-third has adopted legislation or formal policies, including approval of industry self-regulation guidelines, that aim to control marketing to children [19]. While this indicates a growing willingness for governments to regulate in this area, it is noted that some policy statements are vaguely worded and not amenable to enforcement and assessment of impact.

Other shortcomings of current TV advertising regulations have been described. First, advertising restrictions, such as those implemented in the UK since 2006, apply only to children's programming. Young people who watch channels not covered by the regulations see ads that promote foods high in fat, sugar and salt. A critical study of the UK regulations found that only a small percentage of junk food ads on UK television would even be caught by the regulatory standards [20]. Second, ad restrictions do not cover television channels broadcast from outside the jurisdiction. For instance, childhood obesity rates have risen in Sweden over the past 20 years, even after advertising restrictions took effect [21]. Swedish children are exposed to food and beverage ads broadcast on satellite TV channels and, like their peers in many other countries, have become more sedentary. Additionally, companies use other screen media, including 'adver-games' on websites, to promote their products to children, thus marketing restrictions should look beyond traditional media [22].

The food and beverage industry in some countries has committed to self-regulatory pledges to reduce certain promotional activities aimed at children. Three main criticisms of industry self-regulation have emerged: first, many industry codes apply only to marketing to children under age 12; second, there are unclear standards for what counts as a 'healthy' food; and, third, ambiguous commitments mean that companies may apply them in a relatively self-serving way [23]. Several analyses have found only weak compliance with voluntary advertising codes. One study that examined advertising between 2003 and 2007 found that ads for sugary drinks had, indeed, decreased, but the number of fast food ads had increased [24]. A Spanish study found that almost half of TV ads in Spain directed at children did not comply with an industry-developed code [25]. Interestingly, companies that agreed to the voluntary code of conduct were almost as likely to violate it as companies that had not signed on. In contrast, food and beverage companies that agreed to follow an advertising code in Australia reduced the number of ads for unhealthy foods directed at kids, but the drawback in that country is that relatively few companies signed on to the voluntary code [26]. As a result, the majority of foods ads are still for unhealthy products and health promotion researchers in Australia have argued that industry self-regulatory promises sound responsible until one scrutinizes the fine print and finds the permissive loopholes [27].

Overall, industry self-regulation has a mixed record of success and a recent review argues that "industry stakeholders

have many untapped opportunities to advance progress by collectively promoting ... healthy food, beverages, and meals; substantially strengthening self-regulatory programs; supporting clear, truthful, and non-misleading product labeling and health claims; engaging in public-private partnerships; and funding independent evaluations of collective efforts" [28, p. 329].

While food and beverage marketing to children is pervasive and implicated in obesity, some observers contend that the emphasis on regulating marketing is flawed as it promotes nutritionism, "the reductionist paradigm by which our culture evaluates food, based solely in terms of nutrient composition" [29, p. 192]. A perverse outcome is that marketing regulations may allow industry to promote highly processed foods to children that meet nutrient profiles (e.g., Froot Loops cereal with reduced sugar); critics argue the emphasis should instead be on encouraging a diet rich in whole, unprocessed foods.

### Place Regulation

Place-based regulation may restrict the location where certain food service establishments may conduct business. Regulations may also seek to control the food environment in locations such as schools and daycares, health care facilities, recreation centers, and public service venues. The objectives are to protect certain populations, such as children and the socio-economically deprived, from unhealthy environments and to set examples for more nutritious eating.

Quick service restaurant chains are places that are subject to increasing regulation, including restrictions about where these establishments may be located, and the information they must provide to their customers. Some local government regulations control the location and number of fast food chains. For example, in 2008, the City of Los Angeles adopted a one-year ban on new fast food restaurants in South L.A., a neighborhood with a high incidence of obesity and a heavy concentration of fast food outlets [30]. A U.S. study that examined 15 years of data "found some support for policies targeting fast food restaurants. Specifically, [the analysis adds] to scarce longitudinal evidence that greater availability of chain fast food restaurants may promote greater fast food consumption in low-income groups" [31].

Chain food service establishments in some jurisdictions are required to post calorie and nutrient information at the point of sale, a strategy referred to as menu labeling. In 2010, the U.S. federal government enacted legislation mandating national chain restaurants (those with 20 or more locations) to display calorie information. Menu labeling is based on the premise that providing nutrition information at the point of sale will enable consumers to make healthier eating decisions. Studies of consumer behavior indicate, however, that menu labels do not have a significant impact on what many people buy and eat. A 2011 systematic review of studies on the impact of

menu labeling assessed them to be of varying methodological quality and reported that the majority of studies did not find a statistically significant reduction in calories purchased due to menu labels [32]. Health-conscious consumers, including those who state they are on a diet to lose weight, may be more likely to use menu label information to select lower-calorie options [33]. Menu labels may be more effective if they are combined with information about recommended daily energy intake (e.g., “Most adults need about 2000 calories per day”) or accompanied by visual cues about the relative healthfulness of menu items (e.g., a traffic light symbol system with red, amber and green circles next to high, moderate and low calorie items, respectively) [34].

Even if menu labels do not have a major impact on consumer behavior, they may have a benefit of inducing businesses to reformulate their products to reduce caloric content and also to offer healthier options lower in calories, fat and salt. Some companies have taken steps in this direction. For example, Starbucks has moved to using 2 % milk instead of whole milk in its beverages and has introduced a selection of small-portion food items. A study of menu offerings in Seattle-area restaurants found “modest improvements” in energy and nutrient content of meals following the introduction of mandatory menu labeling – but on the whole, levels are still excessive [35].

As most children attend school, the school environment can play a significant role in influencing children’s diet and other health behaviors. Regulation of foods available in schools includes rules on the nutritional content of food served as part of school meals and restrictions on the sale of foods in vending machines and as part of fundraising [36]. A challenge in this area is that national or state laws may require school boards to develop nutrition policies, but the law may be silent on specific standards that must be met. Thus, policies may vary in their content and strength, with corresponding variability in their impact on school food environments [37]. Bans on the sale of certain products (e.g., potato chips) have, not surprisingly, resulted in a drop in sales of those products, but sales of other less healthy foods not covered by a ban (e.g., ice cream) have been noted to increase [38]. Thus, it is unclear if bans promote an overall improved dietary intake and, to date, school-based interventions to improve children’s nutrition have generally not been shown to improve body composition [39]. Coupling regulations to control the school food environment with nutrition education strategies may improve the impact [39].

Other examples of regulatory initiatives to improve food environments focus on places like health care facilities and public service venues. In British Columbia, Canada, food service establishments doing business in health care facilities must comply with mandatory menu labeling rules [40]. In the U.S., many hospitals have agreed to follow voluntary guidelines to improve food environments; however, a criticism of industry pledges is that they do not “preclude hospitals from engaging or continuing in contracts with retail food chains ... or require

them to remove all high-fat, high-sodium or sugary foods and beverages” [41]. Some local governments have adopted regulations that restrict the sale of certain foods or beverages in public sector venues. In 2011, the mayor of Boston “issued an executive order requiring City departments ... to phase out the sale, advertising, and promotion of sugary beverages on City-owned property” [42]. In 2012, the mayor of New York City proposed a ban on the sale of large (i.e., 16 ounces or greater) sugar-sweetened beverages in food service establishments throughout the city, including restaurants, cinemas and sports venues. Some fast food chains in the city sell sugary beverages as large as 64 fluid ounces, containing 54 teaspoons of sugar and 780 calories [43]. The American Beverage Association filed a lawsuit challenging the City’s legal authority to enact the ban and a March 2013 court ruling struck down the restrictions [44]. Further judicial appeals are likely.

### People Regulation

Many of the foregoing domains of regulation are all indirectly concerned with influencing the behavior of individuals, for example, by manipulating prices to change purchasing behavior, providing information about food products through labeling, or restricting access to less nutritious foods and beverages in some environments. More directive regulation by governments in personal choices about diet and physical activity is generally opposed as excessive interference in citizens’ private lives. Reflecting on the role of government in matters of public health, the legal scholar Jethro Brown noted a century ago: “it is one thing to insist that a man shall have his house connected with a system of deep drainage; it is quite another thing to insist that he shall practise calisthenics or that he shall go to bed at a reasonable hour” [45, p. 207]. This quotation highlights a tension between regulating self- and other-regarding behavior. How one disposes of waste clearly impacts others in a community, while how one chooses to eat or exercise is arguably of less direct relevance to third parties. Of course, the counter argument is that the costs of obesity have major socio-economic impacts, particularly in regard to health care expenditures and lost productivity. Nonetheless, some contemporary analysts caution that “[i]n the private realm of diet and exercise, the state should assert itself gently” [46, p. 1353].

An extreme example of direct state regulation in the area of obesity occurs when child protection officials intervene in families where parents fail to comply with medical advice to help a severely obese child lose weight [47]. American commentators argue that “[i]n severe instances of childhood obesity, removal from the home may be justifiable from a legal standpoint because of imminent health risks and the parents’ chronic failure to address medical problems” [48, p. 207]. Counseling, nutrition education, and other social supports may assist a family and the authors emphasize that “government can reduce the need for such interventions through investments in the social

infrastructure and policies to improve diet and promote physical activity among children” [48, p. 207].

In regard to adults, some governments use penalty or reward programs, often tied to health insurance or benefits, to attempt to regulate individuals’ behaviors. For example, the State of Arizona proposed a \$50 annual levy on Medicaid recipients who are obese and do not comply with medically-supervised weight loss [49] and some employers have threatened to reduce employees’ pay if they do not lose weight or meet other health targets [50]. Penalties of this nature have attracted substantial criticism on the grounds that they discriminate against and stigmatize obese persons. Reward-based incentive schemes may provide more defensible options for shifting individual health behaviors. Indeed, health insurers in some countries, including Germany and South Africa, offer financial rewards to insured members who engage in healthy lifestyle behaviors; in some cases, these incentive programs are legally mandated [50].

## Conclusion

Governments in many jurisdictions are experimenting with regulation as a tool to control rising rates of obesity and related chronic health conditions. Some regulatory interventions show promise in this regard, but ongoing evaluation is necessary. Some of the recent systematic reviews discussed in this article point out shortcomings in existing studies. Most notably, many regulatory interventions are not evaluated for their impact on body mass outcomes, thus it is unclear whether the measures actually meet their ostensible broad objective of reducing the burden of obesity. Unintended negative impacts of regulation must also be monitored and governments must be willing to amend regulations to take into account their real-world impact.

It is now well-accepted that the contemporary public health problem of obesity arises from a complex interplay of personal, environmental, economic and socio-cultural factors. This complexity implies that multi-factorial responses are necessary and the types of regulatory measures discussed here are a set of tools applicable across different domains – products, price, promotion, places and people – to attempt to bring about health-promoting changes.

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## Compliance with Ethics Guidelines

**Conflict of Interest** Nola M. Ries declares that she has no conflict of interest.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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