In 2001, the Surgeon General’s “Call to Action to Prevent and Decrease Overweight and Obesity” identified obesity as a key public health priority for the United States. Obesity rates were higher than ever, with 61% of adults nationwide overweight or obese. In the intervening years, several administrations have declared a commitment to deal with the problem, and the food industry has issued numerous pledges for change, yet the prevalence of overweight and obesity has risen further, to 68%. Children have been particularly affected; >19% of school-aged children were obese in 2007 to 2008 compared with just 6% in the late 1970s. Disease rates join high healthcare costs, so everyone is affected personally, economically, or both.

A wide range of government policies and programs have been implemented, including the development of national clinical guidelines, nutrition labeling on packaged foods, education and social marketing efforts, and more recently, calorie labeling on restaurant menus and federal efforts to increase access and financing for fresh fruits and vegetables. However, most of these efforts focus on clinical and educational factors or on community interventions and, until recently, have rarely addressed environmental drivers of overweight or obese. In the intervening years, several administrations have declared a commitment to deal with the problem, and the food industry has issued numerous pledges for change, yet the prevalence of overweight and obesity has risen further, to 68%. Children have been particularly affected; >19% of school-aged children were obese in 2007 to 2008 compared with just 6% in the late 1970s. Disease rates join high healthcare costs, so everyone is affected personally, economically, or both.

Optimal and Suboptimal Defaults

Evidence from behavioral economics has demonstrated that humans are heavily influenced by default conditions in their environment. Defaults can be conceptualized as conditions to which people are exposed in day-to-day life that affect particular aspects of their behavior and health. For example, polluted air and water create negative defaults that damage health. Progress comes through removing the toxic agents, not by accepting them and urging people to react differently (eg, wear masks or boil water).

One remarkable example of defaults comes from research on organ donation rates. A study of European countries compared rates in countries where individuals are not donors by default but can opt to become donors (similar to the US approach) with rates in countries where individuals are donors by default but can opt out. Individuals have the same choices in both circumstances, but organ donation enrollment rates average 15% in countries with the opt-in defaults and 98% in countries where the default is reversed (see Figure 1). This is a stunning difference. Even with unlimited funds to educate and implore the population to become organ donors, the 98% enrollment that is found in countries where donation is simply the default could never be reached.

Evidence suggests that defaults in the food environment also influence behavior, especially in terms of selection and consumption of food. This has been demonstrated in laboratory and field studies manipulating the availability, appearance, sizing, and serving of food. It has also been demonstrated in schools, where changes to the food environment such as the elimination of unhealthy a la carte and vending machine foods have been shown to change the diet of students. There are also broad environmental defaults that affect the entire population such as prices of foods, food marketing, and the widespread availability of unhealthy foods. As it stands now, the food environment creates a set of defaults that contribute to obesity, in the United States and elsewhere.

Recent cost-effectiveness analyses of obesity treatment and prevention strategies suggest that policy interventions to change these defaults are the swiftest and most cost-effective way of creating change. The Assessing Cost-Effectiveness (ACE) studies of obesity and of noncommunicable disease prevention identified the 3 most cost-effective policy interventions as a tax on unhealthy foods and beverages, a front-of-pack “traffic light” nutrition labeling system, and a reduction of marketing of unhealthy foods and beverages to children. Recent reports from the Organization for Economic Cooperation and Development also support the idea that regulatory and fiscal policy could reduce obesity by improving defaults for the whole population.

The role of defaults in obesity prevention is presented visually in Figure 2, which is adapted from Swinburn and colleagues’ recent article in The Lancet. Although individual behavioral factors (on the right half of the figure) affect energy imbalance, these behaviors are shaped by environmental and systemic drivers that shape “default” consumption and activity patterns. The triangle along the bottom of the figure represents the hypothesis that policy interventions to change environmental and systemic defaults will have the greatest population effect on obesity but will also be the most politically difficult to implement.
Using the framework presented in Figure 2, this article describes the evidence that harmful dietary defaults are a key contributor to obesity and discusses 2 policy interventions that show promise for reducing obesity on a population level: restricting marketing of unhealthy food and beverages to children and taxing unhealthy products (in this case, sugary drinks). Although there is growing evidence that these interventions may have a positive impact on diet and weight gain in the population, their implementation has met considerable resistance from the food industry.

Environmental Contributors to Obesity
The environment has a marked impact on dietary choices and physical activity. It is estimated that people make >200 food-related decisions each day (eg, when to eat, how much to serve themselves, whether to finish the amount served) but recall making <10% of those decisions.19 This leaves the majority of people’s dietary choices vulnerable to default conditions around them, which may be influenced by the marketing, sizing, convenience, appearance, and pricing of foods and beverages, to name a few relevant factors. The following describes features of today’s food environment that nudge or even blatantly push people to consume more food.

Food Environment
A growing body of literature documents the impact of the availability of foods high in sugar, fat, sodium, and calories on diet and body weight.20–24 A longitudinal study of adults found that those who live closer to fast food restaurants consume fast food more frequently than others.25 Children

Figure 1. Effective consent rates by country. Explicit (opt-in, gold) and presumed (opt-out, blue) consent. Reprinted from Johnson and Goldstein19 with permission from the publisher. Copyright © 2003, American Association for the Advancement of Science.

Figure 2. Framework to categorize causes of obesity and corresponding policy responses. Adapted from Swinburn et al7 with permission from the publisher. Copyright © 2012, Elsevier.
whose schools serve more unhealthy foods or provide vending machines with unhealthy foods tend to be heavier than children whose schools do not permit such practices. Similarly, adolescents who attend schools near fast food restaurants are more likely to be obese. These studies suggest that proximity to unhealthy food may be a driver of weight.

Economic features of the food environment also contribute to obesity. The cost per calorie of healthy foods exceeds the costs of energy-dense (and often nutrient-poor) foods. In the past 30 years, this cost disparity has increased; between 1985 and 2000, the prices of healthy foods like fruits and vegetables, fish, and dairy products increased at more than twice the rate of the prices of sugar and sweets, fats and oils, and carbonated beverages (Figure 3). The disparity in costs of healthy and unhealthy food may be exacerbated by the US Department of Agriculture’s focus on scaling up (and subsidizing) production of commodity crops such as corn and soybeans and the relative neglect of fruit and vegetable production.

Another troubling phenomenon is the growth of portion sizes. For children alone, the average portions of soft drinks, pizza, and Mexican foods increased by 34, 140, and 139 calories, respectively, between 1977 and 2006. Sodas, sold originally in 6.5-oz bottles, are now typically sold in 20-ounce containers, triple their original size. Experimental studies indicate that portion size directly influences consumption and that nearly all consumers will eat more when given larger portions, often without realizing it. Growing portion sizes have accompanied increasing eating occasions (i.e., snacking) to lead to substantial rises in calorie intake: US adults consumed >500 more calories per day in 2006 than in 1977.

The impact of growing portions is exacerbated by increased eating away from home. In 2008, Americans spent 49% of their food budget on food away from home compared with 33% in 1970. On average, each meal eaten outside the home increases that day’s consumption by 134 calories and decreases diet quality by reducing fruit, vegetable, and whole grain consumption and increasing saturated fat and added sugar. This shift has occurred for children also; between 1977 and 2006, children increased their caloric intake away from home by 255 calories per day and decreased intake at home by only 76 calories per day.

Another powerful force influencing diet today is food marketing. It is estimated that children view 5500 food advertisements per year, with 95% of those advertising restaurant and fast food, sugared cereals, sugary drinks, and other unhealthy foods. Harris and colleagues found that the average preschool child sees >1000 advertisements per year for fast food alone. These advertisements work; children’s preferences for foods and their requests to parents for those foods increase with exposure to food marketing. Exposure to advertising also increases children’s consumption of the advertised foods, often subconsciously. Coca-Cola spent $758 million on US advertising in 2010; McDonalds spent $1.3 billion, and Burger King spent $392 million. In contrast, the budget for the development and promotion of the US Department of Agriculture’s “My Plate” food guide released in 2011 is $2 million per year.

A Note on Physical Activity
At the same time that the food environment has pushed Americans to consume more energy, physical activity levels have remained low. The Surgeon General recommends 30 minutes of moderate activity 5 days a week, yet >33% of Americans report being completely sedentary. As with poor diet, low rates of physical activity can also be traced, at least in part, to social and economic causes. More people have sedentary jobs; it has been estimated that work-related energy...
obesity prevention without major shifts in caloric intake. At the same time, many schools are cutting funding for physical education; 36% of surveyed kindergarten through 12th grade physical education teachers said that their budgets had been cut between 2006 and 2009.

Although low rates of physical activity are a major public health concern in their own right, growing evidence suggests that food intake is a more important contributor to obesity than sedentary behavior. For example, Swinburn and colleagues found that energy intake increased by about 500 cal/d for US adults and 350 cal/d for children between the 1970s and the 2000s, a change of much greater magnitude than any documented shifts in physical activity levels. Large amounts of increased physical activity (≥2 hours per person per day) would be required to compensate for this increase. There is no doubt that physical activity is an important public health priority, but it is unlikely to be an effective tool for obesity prevention without major shifts in caloric intake.

The US Policy Response to Obesity

Clinical and Behavioral Approaches

US policymakers have implemented a wide range of policies and programs to respond to obesity that began in the 1990s and increased after the Surgeon General’s Call to Action in 2001. The majority have addressed clinical, behavioral, or educational issues, with less attention paid to environmental factors. For example, the “Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults” were developed by the National Heart, Lung and Blood Institute in 1998. These guidelines drew on reviews of the scientific literature to develop “principles of safe and effective weight loss” and are intended to be used by health practitioners who work with obese and overweight patients. The report by nature focuses almost entirely on therapies for weight loss in individuals, including dietary changes, exercise, pharmacotherapy, and surgery.

Another government program to address obesity is the Weight-Control Information Network, established in 1994 as a service of the National Institute of Diabetes and Digestive and Kidney Diseases. Although the clinical guidelines of the National Heart, Lung and Blood Institute are intended for a medical audience, the mission of Weight-Control Information Network is to provide evidence-based information about obesity and weight control to the general public and the media.

Other government policies have moved beyond the collation of clinical information to more proactive social marketing approaches that aim to motivate the population to change their diet and exercise habits. The HealthierUS Initiative launched by President George Bush in 2002 encouraged the American public to exercise daily and to eat a nutritious diet, primarily by promoting the “President’s Challenge” to engage in an active lifestyle. The initiative also revamped the President’s Council on Physical Fitness and Sports (now the Council on Fitness, Sports and Nutrition) to “expand national interest in and awareness of” exercise and sports. Other programs include the US Department of Agriculture’s “Team Nutrition” program, a comprehensive, hands-on educational program in which students practice making food choices and differentiating between healthy and unhealthy foods. This program and other social marketing projects such as the “Five a Day for Better Health” fruit and vegetable campaign borrow persuasive techniques developed for commercial marketing to augment the appeal of healthy behaviors and increase consumers’ self-efficacy about making healthy choices.

Recent Shifts in Approach

Although clinical guidelines, educational programs, and social marketing campaigns are important, they do not address the environmental causes of the obesity epidemic and rely on individuals to prevail over a most challenging environment. Swinburn and colleagues describe these types of policies as counteractions, i.e., policies that react to environmental drivers of obesity without changing them directly. For example, educating children about the risks of consuming sugary drinks and entrenching them to consume healthier beverages like low-fat milk is certainly important. However, children leave the classroom or the doctor’s office only to confront a world where sugary drinks are cheaper and more ubiquitous than milk and where beverage marketing confronts them in movies, on the Internet, and even in schools, increasingly with branding techniques targeted at the limbic, or emotional, part of the brain. The intention of the policy to improve defaults is to make healthy choices easier.

Some recent policies indicate a shift toward the defaults approach described above. Federal legislation in 2009 allocated $183 million for Safe Routes to School, a project that promotes active transport to schools by building bike lanes, trails, and sidewalks. The Let’s Move! campaign launched by First Lady Michelle Obama in 2010 includes efforts to improve food environments in schools, to increase opportunities for physical activity, and to augment both the affordability and accessibility of healthy foods. The Healthy Food Financing Initiative announced in 2010 also aims to increase access to healthy foods by attracting supermarkets to areas currently lacking them. The Healthy, Hunger-Free Kids Act of 2010 gave the US Department of Agriculture the authority to regulate the availability and quality of foods sold to children in schools. Federal menu-labeling legislation was passed in 2010 as part of the Patient Protection and Affordable Care Act. Assessing the effectiveness of these changes is a challenge; methods to measure environmental changes and to connect them to individual behavior and/or population health are still in development. Evidence suggests that policy to improve safe routes to school may increase walking or bicycle travel, but this change has not been connected to changes in body weight. Evaluations of menu labeling interventions have had mixed results; although it is not clear that menu labeling has a marked impact on the amount of calories ordered, there is some evidence that consumers may consume less later in the day.

These initiatives represent important shifts in the US policy approach to obesity, yet many of the most powerful defaults in the food environment such as marketing of unhealthy foods to youth and the prominent availability of sugary drinks have yet to be changed.
A fundamental reality must be recognized and addressed explicitly. Although promotion of healthy foods through food access programs is valuable, growing evidence suggests that reducing consumption of unhealthy foods may be at least as important. A study that followed up adults for 20 years found that the primary determinants of weight gain were consumption of unhealthy foods such as potato chips, French fries, sugary drinks, and meats. Consumption of fruits and vegetables was associated with less weight gain, but the impact was much smaller than that of the unhealthy foods.64 Similarly, proximity to supermarkets, which are presumed to have more healthy foods, has less influence on diet than proximity to unhealthy foods.25 It is not clear that simply promoting access and consumption of healthy foods (without discouraging consumption of unhealthy foods) will address obesity.

**Two Potentially Powerful Policies**

A great deal of work is occurring on obesity prevention policies, including nutrition policies in schools, policies to encourage consumption of water in lieu of sugared beverages, changes in zoning laws to change the food landscape, and programs to improve the built environment. Here, we discuss 2 areas that have been identified as strategies6,15–18 for cost-effective population-level change: taxes on sugary drinks and restrictions on marketing to children.

**Taxes on Sugary Drinks**

Fiscal interventions like taxes can be a powerful tool to improve the economic landscape of the food environment.65 Beverages with added sugar are a prime candidate for taxation; they constitute >10% of caloric intake nationwide and provide little or no nutritional value.66 Consumption of these beverages is associated with weight gain and a variety of other health conditions, including diabetes mellitus, hypertension, and metabolic syndrome.67–72

A penny-per-ounce excise tax on sugary drinks would effectively raise the shelf price of sugary drinks by ≈20%.65 A number of studies have modeled the effect of such a tax, predicting a 14% to 20% reduction in the consumption of taxed beverages.73–79 The ultimate effect on body weight will depend on the degree to which people substitute other high-calorie beverages such as juice and whole milk. Estimates of substitution are mixed. Fletcher and colleagues78 found that children and adolescents substitute juice and whole milk to offset caloric reductions from sugar-sweetened beverages, whereas Smith and colleagues24 found much smaller increases in consumption in other categories. However, reducing consumption of sugary drinks has metabolic benefits in its own right, and the policy is likely to have a public health effect even if a substantial portion of the calories are offset by increases in other categories.69,80,81 An analysis of food prices and health outcomes in the Coronary Artery Risk Development in Young Adults (CARDIA) study found that increases in soda prices were associated with lower caloric intake, lower body weight, and reduced insulin resistance.82 The revenue generated by a tax would be substantial (eg, $790 million for New York State in 201283) and could be earmarked for further obesity prevention efforts.84

**Reducing Food and Beverage Marketing to Children**

Reducing the harmful effects of youth-targeted food and beverage marketing has been identified as a policy priority.41,90 Governments in some other countries have already taken action on this issue.91 In the United States, the only restrictions are the self-regulatory standards that food companies established in 2007 through the Children’s Food and Beverage Advertising Initiative (CFBAI). The CFBAI commits companies to reduce or eliminate the marketing of unhealthy food to children <12 years of age. Unfortunately, vague definitions of “advertising primarily directed at children” and “healthier food” have allowed CFBAI companies to continue to market unhealthy products to children, especially with Web-based advertising, including product-themed online games, banner ads, and marketing on social media sites like Facebook and Twitter.43,92,93 A number of studies have documented continuing pervasive practices of marketing to children despite these pledges.43,57,93–95

Taxes on sugary drinks have been gaining interest across the nation. They were considered as a measure at the federal level to fund healthcare reform in 2009 and were proposed in 11 states and 2 major cities in the 2009 to 2010 legislative cycle.85 In each case, these proposals met massive resistance from the beverage industry through its trade association, the American Beverage Association. This industry typically spent about $1 million on lobbying Congress each year but increased lobbying expenditure to $19 million when beverage taxes were considered at the federal level in 2009 (see Figure 4).85 Since then, the American Beverage Association has also spent heavily in states considering sugary drink taxes, spending $13 million and $14 million on lobbying in the states of New York and Washington, respectively.86,87 Antitax campaigns have also been waged by industry-funded front groups such as Americans Against Food Taxes that position themselves as grassroots consumer organizations, reminiscent of tobacco industry front groups made to look like grassroots groups of smokers.9

Although the industry has so far been successful in fending off sugary drink taxes, policymakers are increasingly considering them to promote public health and to close budget gaps.88,89

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**Figure 4.** The American Beverage Association (ABA) federal lobbying expenditures, 2000 to 2010. The ABA stepped up federal lobbying when a sugary drink tax was considered in 2009 (Lobbying Disclosure Act Data [cited February 15, 2011]; http://opweb.senate.gov).
The US government has taken some steps to address this issue. In 2009, Congress established an Interagency Working Group on Food Marketed to Children that included representatives of the Federal Trade Commission, Food and Drug Administration, Centers for Disease Control and Prevention, and US Department of Agriculture, with the mandate to develop recommendations for nutritional quality standards for food marketed to children. A proposed set of voluntary standards, which held that all foods marketed to youths 2 to 17 years of age should contribute to a healthy diet and have minimal levels of saturated and trans fat, added sugar, and sodium, was released for comment in April 2011. Major trade associations for the food industry, the Grocery Manufacturers of America and the National Restaurant Association, and a number of food companies released statements criticizing the proposal. The CFBAI also objected and presented revised pledges as an alternative approach. Industry associations and food companies spent millions of dollars lobbying on the issue, and the revised standards released by the Federal Trade Commission in October 2011 were substantially weakened, applying only to children ≤12 of age. Reuters called the Federal Trade Commission’s weakening of the marketing standards a partial victory for the food industry.

Although CFBAI made some improvements to the rigor and consistency of its marketing pledges in July 2011, they do not apply to teens and continue to permit extensive marketing and branding on programs and Web sites that have many child viewers but are not technically child targeted (such as American Idol or even www.luckycharms.com). Furthermore, 25% of food marketing to children continues to come from non-CFBAI companies, such as Dr Pepper/Snapple. It is also worth noting that CFBAI announced these changes only after the far more rigorous (although voluntary) standards of the Interagency Working Group on Food Marketed to Children were being considered. Industry self-regulation could be a positive force but is likely to be beneficial only in the presence of a serious threat of government regulation.

Conclusions

It is likely that reducing obesity will require policy changes that improve the food and physical activity defaults for all Americans, not just targeted individuals. Some environmental policies such as physical activity promotion and efforts to improve access to healthy foods are unlikely to meet resistance. However, recent experience suggests that implementing some of the policies with the greatest potential benefit to public health will be politically difficult.

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