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TAX ON SUGAR SWEETENED BEVERAGES IN SPAIN

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ABSTRACT

This article provides a critical review about the challenges that taxes on sugary drinks as an instrument of health policy must face to reverse the trend of the current epidemics of obesity. We analyzed the experiences of the leading countries, particularly Mexico, and reflect on the counterweight exerted by the industry against obesity policies, and on the power of lobbyists. Those tax policies for public health have to overcome the enormous strength of the industry, which is exerted in several-science and research, brand reputation, influence on regulators-levels. We suggest that a specific tax on sugary drinks has enough potential to reduce noncommunicable diseases and risk -diabetes mellitus, hypertriglyceridemia, lipoproteins, LDL, blood pressure- via reduced consumption thanks to the high price elasticity of those drinks. Furthermore, the effects are amplified even in the medium term, once established new habits to healthier eating. These taxes could encourage business innovation without inflicting costs of lost jobs and contribute to reducing the social gradient in obesity.

Keywords: Public Policy, Overweight, Obesity, Beverages, Hyperglycemia, Hypertriglyceridemia, Cholesterol, LDL, Hypertension, Diabetes Mellitus Type 2, Taxes, Spain

RESUMEN

El impuesto sobre bebidas azucaradas en España

Este artículo aporta una revisión crítica acerca de los retos a los que se enfrentan los impuestos sobre las bebidas azucaradas como instrumento de políticas de salud, para revertir la tendencia epidémica de la obesidad. Se valoran las experiencias de los países más significados, en particular México, y se reflexiona sobre el contrapeso que ejerce la industria a las políticas antiobesidad y el poder de los *lobbies*. Esas políticas impositivas en pro de la salud pública han de sobreponerse a la enorme fuerza de la industria, que es ejercida en varios niveles –ciencia e investigación, reputación de marca, influencia en reguladores–. Se sugiere que un impuesto específico sobre bebidas azucaradas tiene bastante potencial para reducir enfermedades no transmisibles y riesgos –diabetes mellitus, hipertrigliceridemia, lipoproteínas de baja densidad, hipetensión diastólica–, a través de la reducción del consumo, al ser alta la elasticidad del precio de estas bebidas. Además, los efectos incluso se amplifican a medio plazo, una vez establecidos nuevos hábitos de consumo más saludable. Los impuestos podrían fomentar la innovación empresarial sin infligir costes de pérdida de empleos y contribuirían a reducir el gradiente social de la obesidad.

Palabras clave: Políticas públicas, Sobrepeso, Obesidad, Bebidas, Hipertrigliceridemia, Colesterol LDL, Hipertensión, Diabetes mellitus tipo 2, Impuestos, España.

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THE PROBLEM

Noncommunicable diseases (NCD) and obesity are major threats to global health. Every year, NCD provoke 36 million deaths, almost two-thirds of the global total. Obesity (defined as body mass index, BMI, >30 kg/m^2) and overweight (BMI 25-30 kg/m2) is a risk factor for NCD, and the prevalence of obesity in the world has doubled since 1980. Currently, 600 million people are obese and 1,900 million are overweight [(1)].

Among the adult population (25-64 years) in Spain, the estimated prevalence of overweight is 39.3% (95% confidence interval [95% CI], 35.7-42.9%); that of general obesity is 21.6% (95% CI, 19.0-24.2%) among the total population, 22.8% (95% CI, 20.6-25.0%) among men and 20.5% (95% CI, 18.5-22.5%) among women, and these values rise with age. The prevalence of abdominal obesity is estimated at 33.4% (95% CI, 31.1-35.7%), and is higher among women (43.3%; 95% CI, 41.1-45.8%) than among men (23.3%; 95% CI, 20.9-25.5%), and this, too, increases with age[(2)].

This paper characterises obesity, highlighting its nature and the role played by sugar-sweetened beverages (SSB) in its aetiology and in that of cardiometabolic disease. We then consider the taxation of SSB – possibly the most effective measure that can be taken to address the excessive consumption of SSB – and discuss what is known about its impact on health, innovation, inequality and employment. Finally, we analyse scientific and other issues that arise in fighting for public health against vested interests. Special emphasis is given to discussing the situation in Mexico, where this issue is of crucial importance. Finally, we briefly review the arguments presented and the conclusions drawn.

ON OBESITY

Much is known about the effects of the obesity epidemic, but considerably less about its causes. Indeed, there does not appear to exist any single, dominant component[(3)], but rather a variety of factors that each contribute something. Various economic variables may also be relevant, according to the population group being considered.

The results of several randomised controlled trials (setting aside industry-sponsored studies) have led to the generally accepted conclusion that humans do not reduce their food intake when calorie-rich beverages are added to the diet[(4)]. Hence, decreasing the consumption of SSB can lower both the BMI of the population and the incidence of many metabolic and cardiovascular diseases.

On the other side of the coin, the consequences of obesity are clear: fewer and lower-quality job opportunities, lower wages (especially for women)[(5)] and higher costs of health care (especially those arising from morbid obesity, BMI>35). These negative outcomes on society justify government intervention. However, it is more difficult to justify intervention merely to counteract irrational behaviour, except perhaps to defend children's wellbeing.

Studies of economic and financial initiatives taken to prevent or treat obesity, such as requiring the provision of nutritional information on food and menus, imposing taxes on high-calorie, low-quality foods, or offering financial incentives for weight loss, have shown that they achieve very little effect[(6)].

Just as there is no single cause of obesity, nor will a magic solution to the problem be found. Instead, a wide range of policies must be deployed to achieve any substantial reduction in the prevalence of obesity. And much remains to be discovered about how taxes and financial incentives can change patterns of human behaviour.

Obesity is the third largest burden of disease with which humanity inflicts itself, after smoking, armed violence and war[(7)]. However, many studies have confirmed the limitations of partial solutions. Thus, reversing the

obesity epidemic does not necessarily mean we must eliminate all of its contributory factors; indeed, some of them, such as technological change or giving up smoking, can be considered globally beneficial.

Nor will isolated or one-size-fits-all measures suffice: only many-faceted interventions by national and local governments, businesses, the media, educators, etc., targeted at specific groups within society will achieve real results, and then only after much trial and error and further research. Trial and error is necessary because the practical implementation of policies cannot wait for the 'science of obesity' to be definitively established, as human behaviour is sometimes rational and often impulsive, and the underlying social norms are complex and subtle.

Primary prevention and a focus on health and education are necessary ingredients of all effective policies in this respect. Prevention is essential because 75% of the long-term growth of obesity is described by the rightward shift of the BMI distribution, and only 25% by greater right-skewness[8].

Health and education issues must be addressed in all policies because one of the strongest research findings from studies of health services is that more education is associated with better health, greater employability, higher wages, more political effectiveness, higher participation in volunteer activities and greater trust in other members of society.

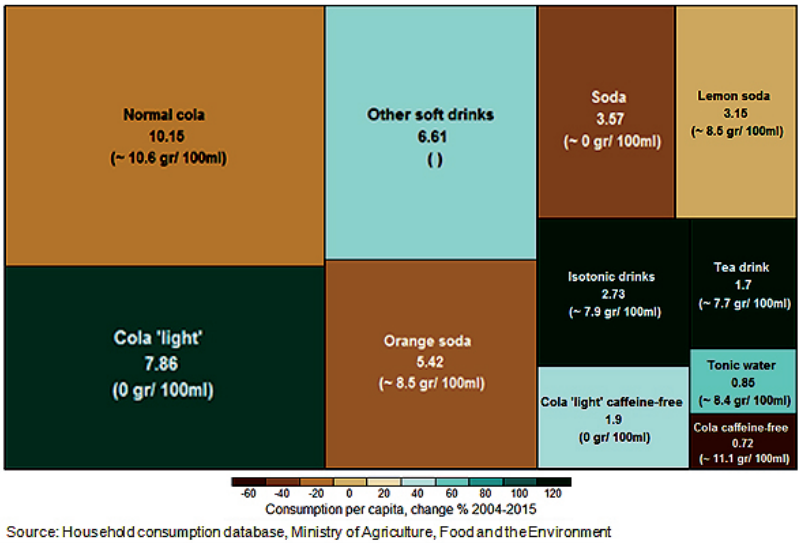
Studies of the relation between education and obesity have obtained mixed results. Indeed, some have observed no association at all between education and obesity, although this may be because average values conceal very significant differences, of opposite signs, among subgroups. According to Cutler *et al*[9], the association between education and obesity differs considerably between countries, which suggests that it will also vary between regions and cultures. Above all, it suggests that in seeking to prevent and treat obesity, very careful account should be taken of a country's circumstances: its rules and standards, public safety, the degree of inequality, etc. Quite possibly there are no 'universal laws of obesity', as political and economic institutions undoubtedly play a highly significant role in its distribution. The social world differs from the physical one because it is man-made (and thus malleable), and it is out of the question to create a 1:1 scale map of the world, as is described in the short story by Borges, *On exactitude in science*. Simplification is necessary.

A recent study conducted in Spain[10] estimated the obesity gradient according to income, social class and education, as reflected in the indicator of relative inequality in BMI distribution, using unconditional quantile regression. This study concluded that education is the factor of inequality that has the greatest impact, above household income or social class. The outstanding importance of education in Spain is something that distinguishes it from other countries.

ON SUGAR-SWEETENED BEVERAGES

An estimated 184,000 annual deaths worldwide are attributable to the consumption of SSB: 133,000 (95% CI: 126,000 - 139,000) from diabetes mellitus, 45,000 (95% CI: 26,000 - 61,000) from cardiovascular disease and 6,450 (95% CI: 4,300 – 8,600) from cancer. Five per cent of SSB-related deaths occur in low-income countries, 70.9% in middle-income countries and 24.1% in high-income countries. The proportion of mortality attributable to SSB ranges from <1% in the Japanese population aged over 65 years to >30% in Mexicans aged under 45 years. Mexico has the highest absolute mortality (405 deaths per million adults) and proportional mortality (12.1% of all deaths) due to SSB[11]. In Spain, the corresponding figures are 30 (95% CI: 23 - 27) deaths per million adults and 0.6% (95% CI: 0.5 - 0.8) of all deaths. In this country, the home consumption of carbonated and sugared drinks in 2015, according to the household consumption panel of the

Figure 1
Per-capita consumption (litres) of carbonated and sugared drinks in 2015: approximate sugar content (gr/100ml)



Source: Household consumption database, Ministry of Agriculture, Food and the Environment

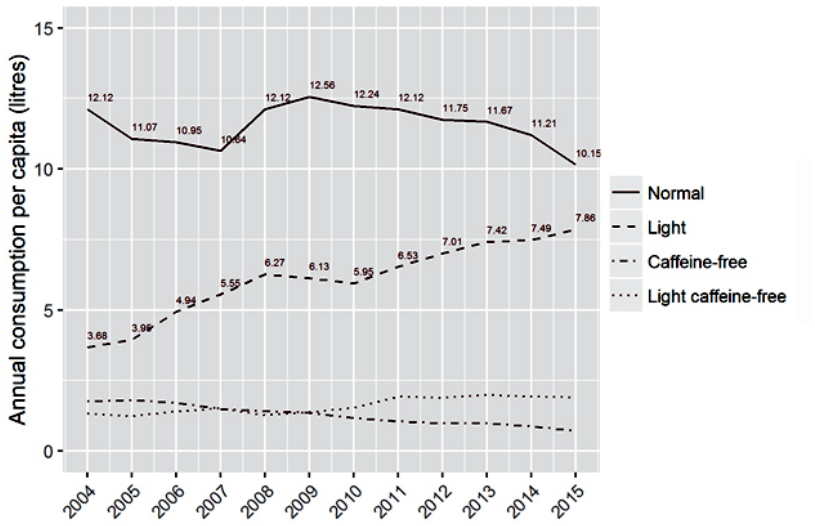
Ministry of Agriculture, Food and the Environment, based on a sample of 6,200 households, was 44.6 litres per person per year (an increase of 6.7% on the 41.8 litres recorded in 2004). 46.2% of this total corresponds to cola carbonates (figure 1). In the last decade, nevertheless, the consumption of soft drinks with added sugar has been steadily replaced by that of 'light' alternatives, the per-capita consumption of which has more than doubled since 2004 (figure 2).

Sugar, particularly in the form of added ingredients, not only contributes to overweight and obesity but also damages health directly. Harm is caused by the potent biological effects of SSB, which are almost irresistible due to mechanisms (some of which are not immediate) such as brain rewards, glucose-insulin responses, de novo hepatic lipogenesis and adipocyte function. Nevertheless, real progress has been made in identifying and understanding best practices to reduce the burden of disease produced by diet-associated cardiometabolic disease[12].

In February 2015, the US Government Dietary Guidelines Advisory Committee recommended that Americans should limit their consumption of added sugar to no more than 10% of daily calorie intake. In 2014, the Food and Drug Administration proposed that food manufacturers should indicate on the labels of their products the quantity of added sugar[13].

SSB provide no nutritional benefit and have very clear costs for public health and for the individuals who consume them. In a new study, funded by the National Institutes of Health, scientists designed a clinical trial in which foods with added sugar were removed from the diet of a group of obese young people (aged 9-18 years) who presented one or more symptoms of metabolic syndrome, to be replaced by other, starchy carbohydrates, whilst maintaining the former level of calorie intake. After 10 days, the children showed dramatic health improvements, despite losing little or no weight. On average, their LDL cholesterol decreased by ten points, their diastolic blood pressure by five points, and triglycerides concentration, a contributor to

Figure 2
Evolution of household consumption of cola carbonates: 2004-201



Source: Household consumption database, Ministry of Agriculture, Food and the Environment

heart disease, by 33 points. Blood sugar and fasting insulin levels – indicators of the risk of diabetes – also improved significantly[14].

Not all calories are equal, and those derived from sugar are especially likely to contribute to type 2 diabetes and other metabolic diseases, which are increasing in children. In consequence, just excluding added sugar from the diet would improve a child's metabolic health within 10 days.

TAXATION, POSSIBLY THE MOST EFFECTIVE LEVER

The purpose of imposing taxes on products such as tobacco, alcohol and SSB is to mitigate the negative effects of their consumption, not only among those who consume them but also among society at large: in other words, to address the negative externalities affecting health and social care that are borne collectively[15,16].

Taxes can be based on the value (*ad valorem*) or on the quantity (*excise*) of a product. The latter type are more suitable for tobacco, alcohol and SSB because the legislator's aim is not to promote the consumption of lower-priced alternatives but to reduce the overall quantities consumed. Moreover, such taxes are not manipulable by vendors, who might otherwise lower prices strategically and thus reduce the tax burden. They are borne directly by the manufacturer, who is thus encouraged to innovate and create less harmful products. Moreover, specific quantity-based taxes payable by the manufacturer might be complemented by a tax on the retail price as a direct signal to the consumer, thus discouraging manoeuvres by manufacturers and distributors such as the use of larger unit sizes or redistributing the tax among different products.

It is of vital importance to know how demand for a product will vary in response to tax changes. This price elasticity of demand can be either positive or negative, although a negative sign is more likely. It is interpreted as follows: when elasticity is between 0 and -1, demand is said to be inelastic (a price increase of 10% is followed by a decrease in

consumption of less than 10%). This may be good news for the tax authorities but less good in terms of public health. Values greater than -1 (in absolute numbers) are considered elastic; a price increase of 10% results in a decrease of more than 10% in the quantities consumed. This outcome is worse for the Treasury, which will obtain lower tax receipts, but better for public health, as consumption of the product that produces harmful externalities will decrease disproportionately.

A tax on SSB could be fiscally neutral if the revenues thus obtained were employed in subsidising healthier substitutes, such as water, or in preventing childhood obesity.

The price elasticity of demand can be estimated using time series or cross-sectional analysis, incorporating appropriate control variables such as purchasing power and the consumption of complementary and/or substitute goods. For this purpose, different models can be used: some are conventional and others assume the existence of addiction, either rational or myopic.

According to the Lancet Commission on Investing in Health[17], imposing heavy taxes on tobacco is the most important measure available to countries around the world to reduce NCDs. The same point has been made by the World Health Organization[18]. Similarly, reliable global scientific research has confirmed the healthcare effectiveness of taxing alcohol. For SSB, scientific evidence is only now appearing because experience of such taxation is more recent. In all three cases, these taxes should form part of a package of public policies that include restrictions on advertising, legislation to introduce mandatory labelling information and the promotion of healthy environments.

To date, few countries have introduced special taxes on SSB. A meta-analysis conducted of data from three countries that have done so – France, Mexico and Brazil – reported a decline in consumption and, according to some articles, reduced overweight and obesity[19]. The estimated price elasticity was -1.3 (95% CI -1.1 to -1.5). This high elasticity is explained by the existence of almost perfect untaxed substitutes, i.e. the same carbonated drink in a 'light' or sugar-free version. Compared to the elasticity of the other two health damaging products – tobacco and alcohol – SSB seem very reactive to price, and therefore taxing these products is a more powerful lever in health policies.

A very recent study[20] estimated a price elasticity of -1.2 for SSB in Ecuador, rising to -1.5 among the poorest 40% of the population. It may seem regressive to impose tax burdens on this area of the population, but in countries such as Ecuador, where a large proportion of healthcare expenditure is made directly by the population, reducing the sales of these harmful products will not only benefit consumers' health but also their economy. Epidemiological and economic models calculated for other developing countries, such as India, have concluded that a tax of around 20% on SSB could reduce both obesity and type 2 diabetes[21].

Given the still-limited real-world application of special taxes on SSB, most studies of this question have used simulations with estimates of price elasticity. These studies have consistently found that fiscal policies can reduce the consumption of SSB and generate revenue. Two such studies[22,23], conducted in the USA, demonstrated the cost-effectiveness of this intervention. However, other estimates for the USA, where already two-thirds of the States apply some kind of specific taxation to SSB, are more pessimistic, reporting that although these taxes do reduce the BMI of the population, the change is minimal[24].

In this context, the situation in Mexico is of great interest, because this country applies special taxes to SSB, to apparently good effect, and has introduced health policies with very significant implications (as we discuss further, below).

The first democratically elected president of Mexico, Vicente Fox, had been president of Coca-Cola Mexico and head of the multinational's operations throughout Latin America. Mexico has the second highest rate of overweight and obesity among OECD countries and by far the world's highest rate of deaths caused by the consumption of SSB. Coca-Cola controls 73% of the soft drinks market in Mexico (only 42% in the USA), which has the world's highest rate of soft drink consumption per capita (163 litres per year). In January 2014, a special tax of approximately one peso per litre was imposed on carbonated drinks, representing an increase of 10% in the retail price.

An observational study[25] was performed to determine the effect produced, after one year, of a new tax on SSB. This study was conducted from January 2012 to December 2014, with a Nielsen panel of 6,252 households which provided 205,112 observations in 53 cities with more than 50,000 inhabitants. This study used a differences-in-differences method, with fixed effects, adjusting for the variables that can affect SSB consumption, to determine whether consumption patterns changed after the introduction of the new tax. The variables used in this analysis included demographic information on household types and socioeconomic status. The expected consumption volume (ml/person/day) of taxed and untaxed beverages in 2014, the period studied after introduction of the tax, was compared with the counterfactual volume that would have been consumed in the absence of this tax, on the basis of previously observed consumption patterns.

The following findings were reported: purchases of taxed beverages decreased by an average of 6% and did so at an increasing rate, to 12% by December 2014. All three socioeconomic groups (low, medium and high) reduced their purchases of taxed drinks, but the reductions were greater among the households with a lower socioeconomic level, with an annual average decrease of 9% and a decrease of 17% in December 2014. The sales of untaxed drinks rose by 4%, and also in relation to the counterfactual, driven mainly by increased purchases of bottled water.

In view of the above considerations, it can be concluded that long-term monitoring of SSB purchases, of possible substitutions and of the health implications, is required. Foreseeably, purchases of taxed SSB will continue to fall, as has happened with tobacco and alcohol, other products that respond to a habit-forming process, one that can change abruptly when a shock occurs, such as a significant price increase.

IMPACT OF SSB TAX AND REGULATORY CHANGES ON INNOVATION, INEQUALITY AND EMPLOYMENT

Sugar is not only present in SSB, fruit juices and sweets; it can be found in thousands of everyday products. Sugar consumption in moderation poses few problems for most people, but excess consumption can provoke metabolic problems apart from weight gain, and this is especially so with SSB. The physiological response to SSB is well established: any fructose ingested goes directly to the liver, where it forms triglycerides. A rapid increase in triglycerides levels in the bloodstream, together with reduced HDL cholesterol, means there is an increased risk of cardiovascular disease[26]. This is yet another reason for considering the taxation of SSB.

It is worth reiterating that special taxes on the manufacturers of SSB encourage them to innovate towards less harmful products. Interestingly, well-designed regulation does not weaken the competitiveness of companies, but strengthens it. Highly regulated industries, such as pharmaceuticals, have developed new skills and are world leaders, particularly in countries with stricter requirements of efficacy, safety and quality than in others, like Spain, where product authorisation, for decades, operated under a much

laxer system. Good regulation reinforces a company's 'immune system' and makes it better prepared to compete in the world. This could be the case, in the future, of the powerful Spanish food industry. However, among multinationals, such as the SSB sector listed in Standard & Poor's 500, regulation should extend well beyond the health impact of their products, as the industry's concentration and control of markets severely limits the necessary competition. The situation is not a new one: the large companies that emerged from the second industrial revolution, especially in the chemical and electrical sectors, underwent unprecedented levels of concentration. These developments were countered by government action to maintain and protect competition. Today, however, the problem is much more complex, as the companies involved are not only multinational but elusive in their legal forms and geographic location.

Obesity and overweight have a steep social gradient in Spain, as regards education, income and employment, a gradient that persists over time and is significantly higher for women and girls than for men and boys[27]. According to the European Health Interview Survey of Spain 2014, only 5.3% of university-educated women are obese, in contrast to 30% of those who have not completed primary education[28]. Today, obesity is both cause and effect of socioeconomic inequalities, and so policies combating obesity will ultimately benefit both health and equality. Any risk of regressivity of a tax on SSB will depend on the price elasticity of low and high income households. According to the 2015 Household Budget Survey, households with the highest incomes (>€5,000 per month) spend 4.8 times more than those with monthly incomes of less than €500. However, the gradient of their specific spending on soft drinks is only half that (2.4). If the price elasticity of low-income households were greater than -1 (in absolute values), spending would decrease following tax changes, and SSB consumption would be replaced by water or soft drinks without added sugar. If the new tax were accompanied by a 'nudging' campaign to modify preferences, which a priori should not be too difficult, there should be no serious side effects regarding equality.

It is no easy matter to lose weight, and the obese should not be blamed for their condition, in view of the social, genetic and environmental determinants of their lifestyle. As nutrition habits are (slightly) reversible through taxes and other measures, it is logical to suppose that this impact would be all the stronger if tax revenues were employed to subsidise healthy substitutes for SSB, such as water, or to prevent childhood obesity.

New taxes on SSB need not affect employment, either, as they should not provoke any change in the range of products consumed.

PUBLIC HEALTH: PITTING RATIONALITY AGAINST VESTED INTERESTS. LESSONS FROM MEXICO

Rationality in the field of public health, and in general many policies that promote social welfare, does not reside solely in evidence and in arguments. In many cases, it must fight vested interests. The SBB industry, which is highly concentrated, fights back to prevent or at least to alleviate taxation. And it does so on various fronts: in the world of science, in that of recognition and reputation (the protection of trademarks, corporate social responsibility, communication, spin, advertising, etc.) and by lobbying politicians and regulators.

In science

Industry-sponsored research (for example, into tobacco or pharmaceutical products) almost invariably produces results that confirm their benefits, or innocuousness, even when independent researchers draw opposite conclusions[29]. A comparison of the strategies used by the tobacco, pharmaceutical, lead and vinyl chloride industries, as well as in

those in which silicosis is provoked (such as mining or smelting), observed very similar patterns of behaviour and specific strategies employed to manipulate the research effort and its outcomes[30]: These included: 1) funding and publishing studies that contribute to their interests; 2) suppressing unfavourable research findings; 3) directly communicating favourable results to decision makers. Lawyers and executives of these five industries have sought to challenge government regulations and protect their industries against litigation, and in doing so have created another industry, that of the production and dissemination of research findings that benefit the paymaster.

Regarding the impact of research sponsored by the sugar industry, little was known until recently, when a bibliographic review showed that as long ago as the 1960s, when evidence first appeared of a relationship between sugar intake and cardiovascular disease, the Sugar Research Foundation paid three Harvard scientists to push this aspect into the background and to draw attention to saturated fats[31]. They did so in two papers published in 1967 in the NEJM, at a time when there was no obligation to acknowledge funding sources. Years later, one of these three scientists was appointed head of the Department of Nutrition at the US Ministry of Agriculture, and he wrote the first draft of what would become the Federal dietary recommendations.

In 2013 it was reported that systematic reviews financed by the industry (Coca-Cola, PepsiCo and industry organisations) about the impact of SSB and its relation with obesity, were five times more likely not to find an association between SSB and obesity than independent studies[32]. In 2015, moreover, it happened again: Coca-Cola provided millions of dollars of funding to researchers to proclaim a scientific solution to obesity based on taking more exercise, and paying less attention to calorie intake[33]. Once again, the company sought to raise a smokescreen, as the tobacco industry has been doing for decades, and to divert public attention from the question of sugar intake. Even today, despite actions that have been undertaken to combat SSB, the increased cardiovascular risk from consumption of these beverages is not consistently affirmed.

Brand recognition and reputation

The SSB industry employs sophisticated marketing strategies and philanthropy to deflect criticism, to increase brand awareness and to generate loyalty, in almost every corner of the world. Not surprisingly, the marketing campaigns and scientific messages of Coca-Cola and PepsiCo focus on sustainability, exercise, personal responsibility, balancing calories, hydration and living a "healthy and active life", thus diverting attention from obesity and diabetes.

The industry also cloaks itself with the mantle of corporate social responsibility. Despite the view that 'the proper business of business is business', in order to protect shareholders the interests of all stakeholders (including customers, suppliers, local authorities and the general public) must be addressed. Therefore, preserving the company's reputation requires taking account not only of the financial dimension of its behaviour but also the social and environmental issues involved. Partnerships must be established. To take some examples regarding Coca-Cola: this company worked jointly with Greenpeace to ensure that new vending machines and refrigerators would be free of hydrofluorocarbon emissions in 2015; and it worked with the World Wide Fund to ensure healthy, resistant sources of fresh water in the Mesoamerican basins of Mexico, Belize, Guatemala and Honduras and in the basin of the Yangtze river in China. Credit should be given for the pressure exerted by organisations such as Oxfam, with its initiative 'Behind the Brands', to channel public pressure to make the producers of world-famous brands more accountable.

Another important question is that of how far public health policy should go in public-private partnerships. Recently published data on the funding provided to 96 associations, mainly in the fields of medicine and public health, by Coca-Cola and PepsiCo[34], from 2011 to 2015, as part of a corporate marketing drive to torpedo improvements in public health that did not interest these companies, remind us of the conclusions reached in the study by Hernández-Aguado and Zaragoza[35]. According to these authors, public-private research partnerships seem to arouse more enthusiasm than is justified by the effectiveness and safety of such collaborations, and recommended public authorities not to enter into such agreements with producers of goods or services that are harmful to health. In Spain, the Nutrition, Physical Activity and Obesity Prevention (NAOS[36], Spanish initials) strategy is an example of self-regulation by the food industry, an exercise of corporate social responsibility in a country where the 'revolving door' phenomenon between government and industry is commonplace. It is always wise to consider whether the partner company supplies products and services that are beneficial or harmful to health.

Influencing policymakers and regulators

To head off taxes on SBB, and to constrain regulation in general, diverse arguments have been put forward ("What matters is the balance between calorie intake and energy expenditure"; "It doesn't matter where the calories come from", etc.), and the products are associated with healthy images (for example, through the sponsorship of sporting events, even of the Olympics). As observed by Marion Nestle[37], the author of Soda Politics, the industry has co-opted supporters from a variety of stakeholders: elected politicians, activists against hunger, minority groups, schools, and even, as described above, scientists and nutrition organisations.

To conclude this examination of industry resistance, let us mention what may be the most important of all: what really matters is not so much the financial power of multinationals but the fact that both Coca-Cola and PepsiCo project an aura of prestige, as beacons of a culture that the USA has exported throughout the world. Their global brands are iconic and much esteemed.

The issue for the industry is its image, not its taxes: these costs can be spread amongst different products and formats, and marketing takes full advantage of our stupidity [according to at least two Nobel prize winners [38]]. The companies will continue to issue their half-truths ["What matters is total calorie intake"; "Exercise protects against obesity and diabetes"…] while muting the message that diet is vastly more significant. They will finance scientific associations and aid for diabetics, sponsor major sports events and act with great 'corporate social responsibility' ... just as the tobacco industry did, previously.

LESSONS FROM MEXICO

In Mexico, science, action and awareness came together. Juan Rivera (the founder of the nutrition research group at the National Institute of Public Health) was the health scientist and Alejandro Calvillo (philosopher and founder of Consumer Power), the activist. Their success was greatly assisted by the contribution of a third character, the philanthropist Michael Bloomberg (who, like Calvillo, embodied action and awareness), who contributed ten million dollars in 2012. Bloomberg, as mayor of New York, had seen how judges, supported by Hispanic groups and the NAACP (to which Coca-Cola contributed funding), among others, overturned the municipal ban on serving SSB in containers larger than 16 fluid ounces. The way in which Rivera, Calvillo and Bloomberg engineered the introduction of special taxes on SSB in Mexico will be followed with interest around the world, both in the few places where similar taxes have already been introduced (France, Chile and Denmark, although later abolished in the latter) and where attempts have failed or where no attempts have yet been made[39].

RECAP

A specific tax on SSB is feasible in Spain, and could underpin other measures already being applied, both within the NAOS strategy and outside it, such as healthy eating programmes in schools and promoting other ways of distributing fresh foods, for example via farmers' markets, which shorten the supply chain, lower prices and provide an appealing leisure-time option for families. Reducing the consumption of SSB would produce immediate health benefits, and since price elasticity in this area seems to be high, a specific tax of 10-20% on the retail price could very significantly reduce the bodyweight of many children and adults. Children and teenagers are the main consumers of SSB in Spain. According to the 2014 European Health Interview Survey[28], in Spain 30.3% of young people aged under 25 consume one or more soft drinks daily or almost every day (more than four times a week), in contrast to 5.9% of those aged over 50. Moreover, Spain has a higher proportion of overweight children than all other countries in its area[40]. Therefore, such a tax would have a major impact on children and young people, with consequent long-term benefits.

This change would affect equality in two opposite directions. On the one hand, in view of the steep social gradient in obesity in Spain and the fact that low-income consumers are more elastic to price changes, the tax would be very effective among this population and the gradient would be reduced accordingly. However, the other consequence could be negative, especially if elasticity is lower than estimated. If this were so, poor families would have to give up the consumption of other goods in order to continue purchasing SSB. This problem, which is very serious in the case of tobacco (adult smokers have almost no price elasticity) does not seem, however, very likely in the case of soft drinks, as the price elasticities we consider are greater than one.

One advantage of a tax on SSB is the simplicity of its design, compared to other taxes aimed at reducing obesity. In the latter case, various questions must be answered. Should we tax the nutrient or the food? According to the calorie content or the quantity of specific harmful components such as trans fats? This added complexity is one of the reasons adduced by opponents of the tax on fats (butter, milk, cheese, pizza, meat, oil and processed foods with over 2.3% saturated fat) in Denmark, which was introduced in 2011 and abolished a year later[41].

Although feasible and desirable, a tax on SSB would have to overcome major obstacles, and in particular the pressure of powerful industrial lobbies, which infiltrate scientific journals and public committees. The more articles such as this that are published, the sooner such healthcare policies may be put into practice.

The challenge for the SSB industry is to avoid becoming the manufacturers of the 'liquid cigarette'. The challenge for healthcare scientists, meanwhile, is to ally their science with 'Calvillos and Bloombergs' (i.e., action and awareness). An inability to reverse the trend towards increasing obesity would not be the result of weak individual will but rather the failure of social will to confront vested interests, when and where appropriate.

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