World Health Organization
European Region

Policy brief on the association between sugar-sweetened beverage consumption and childhood overweight and obesity

Abstract

Childhood overweight and obesity represent a significant global health challenge. Alongside the rising prevalence of this issue is sugar-sweetened beverage (SSB) consumption, a key contributor to excessive caloric intake and poor diet quality. This policy brief emphasizes the multi-faceted health consequences of childhood obesity, including an increased risk of noncommunicable diseases (NCDs) and associated socioeconomic burdens. Evidence-based interventions, such as SSB taxation, have been identified as cost- effective strategies to reduce SSB consumption and promote public health.

The implementation of school food policies, public food procurement initiatives, and taxation measures are highlighted as critical components of a comprehensive approach to creating healthier food environments. These measures not only target SSB consumption but also address broader dietary patterns and health behaviors. Despite opposition from beverage industries, SSB taxation has demonstrated effectiveness in influencing purchasing behaviors and generating revenue for health promotion

The policy brief advocates for robust surveillance systems to monitor childhood obesity trends, strategic policy planning, and the integration of SSB taxation within broader health frameworks. Collective action across sectors is essential to combat childhood obesity, reduce health inequities, and achieve global health targets aligned with the Sustainable Development Goals.

Keywords

SUGAR-SWEETENED BEVERAGES; PEDIATRIC OBESITY; NONCOMMUNICABLE DISEASES; TAXES; HEALTH PROMOTION; NUTRITION POLICY; PUBLIC HEALTH

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Acknowledgements

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Key messages

- Sugar-sweetened beverage (SSB) consumption contributes to an increasing global prevalence of childhood overweight and obesity, which represents one of the major predisposing factors for various noncommunicable diseases (NCDs), which, in turn, contributes to an increased global burden of disease and financial burden for families, health-care systems, and the global economy.

- Public food procurement and service policies for healthy diets, including school food and nutrition policies, are associated with lower SSB consumption and some of the cost-effective policy options for promoting public health.

- SSB taxation exemplifies a promising policy tool for reducing SSB consumption.

- Beverage industries implement powerful strategies to oppose SSB taxation, but their arguments against SSB taxation are not supported by evidence.

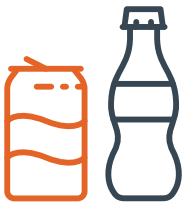
- Reliable and accessible surveillance data on country-level prevalence of overweight and obesity among children and their SSB consumption should be leveraged for policy planning, implementation, evaluation, and revision. One example is data collected from the WHO European Child Obesity Surveillance Initiative (COSI).

Overweight and obesity among children

Overweight and obesity are defined as an abnormal or excessive accumulation of body fat that may impair one's health *(1)*. Body mass index (BMI), calculated as weight in kilograms divided by height in metres squared, is commonly used to classify overweight and obesity. For children under the age of five, overweight and obesity are defined as weight-for-height greater than two and three standard deviations, respectively, above the WHO Child Growth Standards median (i.e. for a girl with a height of 120 cm, overweight is equivalent to weighing 28 kg and obesity is equivalent to weighing 31 kg *(2)*. For children between 5–19 years-old, overweight and obesity are defined as BMI-for-age greater than one and two standard deviations, respectively, above the WHO Growth Reference median (i.e. for a 19-year-old, overweight is equivalent to BMI 25 kg/m^2 and obesity is equivalent to BMI 30 kg/m^2) *(2)*.

Among children and adolescents in the WHO European Region, 8% of those younger than five years of age, over 30% of 7–9-year-olds, and approximately 25% of 10–19-year-olds are living with overweight or obesity *(2)*. Globally, obesity has quadrupled among children and adolescents 5–19 years of age since 1990 *(3)*. This growing trend of overweight and obesity prevalence has been observed not just among developed countries, but in developing countries where malnutrition and underweight remain a major concern *(4,5)*. While underweight has declined due to an epidemiologic transition from high infectious disease to NCDs prevalence *(6)*, a combined prevalence of underweight and obesity increased following a rise in obesity in most countries since 1990 *(7).* This is characterized by a double burden shift from underweight-dominance to obesity-dominance, which reflects an economic and technological change and the ensuing nutrition transition *(7)*, described as an increased availability of and accessibility to cheap, energy-dense foods.

This growing trend of overweight and obesity is especially unsettling given the rising burden of NCDs. From 1990 to 2010, NCDs contributed to a quarter of the increase in health loss, quantified as global disability-adjusted life years *(8)*. In 2010, NCDs accounted for over half of all global health loss *(8).* In 2019, NCDs were responsible for almost 75% of all deaths worldwide *(9).* If the trend continues, the share of deaths caused by NCDs is projected to reach about 86% in 2048, representing 77 million annual deaths – an almost 90% increase in absolute numbers over 2019 *(9)*.

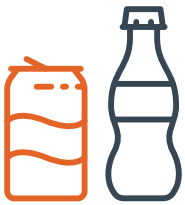


SSBs as a contributor to childhood overweight and obesity

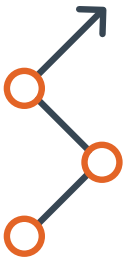
Causes of obesity are complex and multifactorial. A common view from an ecological perspective suggests that a child's weight status is determined by their personal characteristics and individual risk factors, which in turn are nested within the family context incorporated within the wider community and social context *(10)*. In other words, the development of obesity is determined by the intricate interplay among the hereditary, metabolic, mental, behavioural, environmental, cultural and socioeconomic factors across each level of the ecological model *(11)*. Increased BMI has often been found to be associated with a combination of modifiable risk factors of physical inactivity, excess caloric intake, and poor diet quality *(4,12)*. Alongside the growing rates of overweight and obesity is an increase in the consumption of free sugar, which contributes to the overall energy density of diets and promotes a positive energy balance *(13,14)*. Indeed, across the Region, children's free sugar intake is over 10% of their daily energy intake, exceeding the WHO's recommended cut-off to reduce free sugar intake below this level *(15)*. Among the leading sources of free sugar, SSBs are a major contributor *(15)*. Using standardized procedures for iterative data collection from nationally representative samples of children, the fifth round of data collection recently conducted by the WHO European COSI, found that almost a quarter of children 6–9 years-old consumed soft drinks on more than three days a week *(16).*

SSBs encompass a broad range of beverages, including carbonated or non-carbonated soft drinks, juices and nectars, flavoured milks and other sweetened dairy drinkable products, sweetened plant-based milk substitutes, vitamin waters, energy drinks, and sweetened tea- and coffee-based drinks, syrups and concentrates *(17)*. In addition to being more quickly absorbed by the liver *(18)*, energy consumed in the form of liquid results in less complete compensation at subsequent meals compared to energy consumed in the form of solids, due to the low satiety of liquid foods *(13)*. In other words, SSB consumption results in added calories that individuals do not compensate for by reducing solid food consumption, therefore the total calorie intake increases.

In terms of research-based evidence, attention should be paid to the role of sponsorship or conflicts of interest with the beverage industry on biased conclusions, such as higher chances of reporting no positive association between SSB consumption and weight gain *(19)*. Additionally, food and beverage industries often push for a greater emphasis on physical activity, for instance, through sponsorship of scientific conferences and



deliberation on topics to present *(20)*, rather than reducing the consumption of their beverage products as the solution to obesity and NCDs *(20–23)*. In reality, liquid calories are difficult to offset through exercise, and weight reduction is found to be more effective with diet than exercise *(24,25)*. That said, a positive association between SSB consumption and childhood obesity is supported by systematic reviews on well-conducted prospective cohort studies and randomized controlled trials with low risk of bias assessments *(26–28)*. Likewise, based on the available evidence of no benefits from SSB consumption and an evaluation against the harms, WHO strongly recommends that infants and young children 6–23 months of age should not consume SSBs *(29)*.



Consequences of childhood overweight and obesity

Childhood obesity represents one of the major predisposing factors for various NCDs, such as hypertension, cardiovascular diseases, diabetes, cancers, and kidney diseases *(6,30–32)*. In addition, childhood obesity is associated with an increased risk of mental health problems, such as depression and anxiety *(4,30)*, as well as wider societal impacts, such as stigma and discrimination *(31)*. Among the most common NCDs worldwide, dental caries share many common risk factors with childhood obesity, such as free sugar consumption *(33)*. In this view, pediatric dentists are thought to be uniquely positioned to engage with interprofessional teams to promote positive dietary changes in children to decrease SSB consumption and prevent and reduce the risk of childhood obesity *(34–37)*, for example, through dietary education in a dental setting *(34,35)*.

Because children living with overweight and obesity are likely to stay obese into adulthood with an associated elevated risk of developing NCDs *(38)*, the ramifications of childhood obesity contribute not only to a global burden of disease, but also to an increase in financial burden for families, health-care systems, and the global economy. This is manifested through both direct medical costs and indirect costs, such as income lost from decreased productivity or absenteeism *(5,30,32)*. Currently in the Region, overweight and obesity are estimated to affect almost 60% of adults *(2)*. Projections made by the World Obesity Federation suggested that global levels of overweight and obesity from 2020 to 2035 will continue to rise, especially among children and adolescents, in parallel to a rising economic impact *(39)*.

WHO actions

In this context, the WHO *Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition* sets a global target for 2025 of no increase in childhood overweight *(40)*. The target was extended to 2030 to decrease the global childhood overweight prevalence to a level less than 3% – a goal aligned to the Sustainable Development Goal 2.2 call for the elimination of all forms of malnutrition *(41)*. Meanwhile, the WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2030 sets targets to achieve a one-third relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases by 2030, and calls for a halt in the rise of diabetes and obesity – all targets aligned to those for NCDs included in the 2030 Agenda for Sustainable Development *(42)*. Nevertheless, to date, all Member States have a projected increasing trend of obesity, and few have managed to have an obesity plateau at the current levels *(43)*. The latest WHO data (to be published in autumn) suggest that France and Spain are seeing it plateau finally.

Policy options to reduce SSB consumption

Globally, the affordability of the most-sold brand of the most-sold type of SSB (i.e. carbonated SSBs) has increased in the last three decades, and the off-trade consumption of soft drinks has increased by 21.2% in the last 15 years *(44)*. While an intervention, such as home-based parental modelling *(45,46)* helps to reduce SSB consumption by encouraging dietary behavioural change, such a practice often focuses on individual culpability, increases the effort on the part of the actors who receive the information, and overlooks the current marketing landscape that shapes choice environments and constrains the individuals' ability to make genuinely free and informed health choices *(47)*. In this sense, policies that limit SSB availability and accessibility are required to modify the obesogenic environment and to make the population's default decisions healthier *(47)*.

According to the WHO Global Database on the Implementation of Food and Nutrition Action (GIFNA), 21.7% of the world's population lives in countries with mandatory measures towards sugars reduction, such as mandatory reformulation to reduce sugars in food, mandatory declaration of total and/or added sugars on all prepackaged food, or mandatory marketing restrictions that include sugars *(48)*.

Schools, where foods and beverages are served and sold daily and have a large population reach, are long recognized as ideal venues for instituting healthy food choices. A large number of countries implement school food and nutrition policies for healthy diets *(49)*, such as banning SSBs from school cafeterias *(50)* or improving the placement of healthier beverages in school cafeterias *(51)*, offering healthier beverages in vending machines *(51)*, or improving access to drinking water in schools *(51)*, which often limit or prohibit the consumption of SSBs and are associated with lower SSB consumption among students *(52–55)*. Despite challenges in ensuring policy enforcement and school compliance *(56)*, these policies represent a great opportunity for countries to send a message to the public about the negative impact of SSB consumption and to limit SSB consumption in schools while normalizing healthier consumption behaviours *(57)*. According to the WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2030 (WHO Global NCD Action Plan), public food procurement and service policies for healthy diets, such as the ones outlined above, as well as policies implemented at additional public settings, such as childcare centers, hospitals,

and government offices, are most cost-effective and feasible for implementation by countries at any income level (i.e. the best buys for a health-promoting environment) *(58)*.

Given the success in other public health issues, such as tobacco control, taxation as a fiscal policy has received increasing attention and is considered a promising tool to discourage SSB consumption by influencing purchasing behaviours through price increases. Indeed, SSBs are one of the most commonly taxed unhealthy food and beverage products *(59)*. To date, 59.1% of the world's population is covered by national level SSB taxes (*59*). SSB taxes are not always as strong as they could be – for example, they may not: include 100% fruit juices in the excise tax base *(44,60,61)*; encourage reduced sugars content (e.g. a uniform tax rate is applied across all beverages of the same type regardless of sugar concentration) *(44,61,62)*; or constitute a significant price share *(44)*. SSB taxation is good value for money and represents a cost-effective policy action, according to the WHO Global NCD Action Plan *(58)*. Based on the level of certainty of evidence and various contextual factors, such as resource implications, equity and human rights, and acceptability and feasibility, WHO published a new guideline to strongly recommend the implementation of policy to tax SSBs to promote healthy diets *(63)*.

In addition to raising the price of SSBs to reduce consumption via decreased affordability, taxing SSBs sends a strong message to the public regarding the health risks associated with SSB consumption and signifies recognition by the government of the serious health outcomes *(17,64)*. Moreover, SSB taxation has the potential to generate revenues to earmark for other health promotion initiatives. These include, for example, subsidizing fruits and vegetables and fresh and potable water in formats of food vouchers, price discounts or public distribution systems; investing in healthy school meals, age-congruent physical activities, and urban development that promotes active mobility *(17,60,64,65)*. In the meantime, revenues from SSB taxation could fund nutrition-related, high-quality health research to provide solid scientific evidence for decision-making. Raising revenues for health initiatives not only transforms the environment to one that further promotes healthier foods and beverage choices but also improves public acceptability of and support for SSB taxation *(66)*.

Challenges in the promotion of SSB taxation

A major barrier to the implementation of effective SSB taxes comes from the strong pushback from industry representatives, which tends to shift from outright opposition to various attempts to weaken the policy or delay its introduction following the announcement *(67)*. Yet, claims for most anti-tax interferences are countered by the evidence. One key argument from the industries is that SSB taxation is not evidence-based, but as addressed above, a significant amount of evidence supports the association between SSB consumption and negative health outcomes, such as childhood overweight and obesity. Meanwhile, industries try to divert attention towards alternative interventions, such as education campaigns and physical activity. However, such initiatives should be considered complementary to tax policies, rather than substitutes *(17)*. Another common argument is the "questionable" benefit of SSB taxation as reflected by the less conclusive effect on weight outcomes. Nonetheless, the time lag between the implementation of SSB taxation policy and any health effect at a population level needs to be recognized. While SSB taxation policy needs to be in place for several years to reveal changes in weight *(17,68)*, levels of sugar consumption could be assessed in the short term. At the same time, the lack of strong evidence may be impacted by the relatively small variations in tax rates that were applied to a limited set of SSBs *(31,68)*. Given that most food products tend to have a relatively low price elasticity of demand (i.e. a smaller reduction in consumption than the proportionate increase in price), and that the predicted changes in consumption may not be achieved due to a smaller price increase at the point of purchase resulting from an incomplete pass-through of taxes across retailers, it is sensible for governments to impose high enough SSB taxes to induce practical purchase and consumption changes, and an overall improvement on health *(68,69)*. Globally, SSB excise taxes are quite low in most countries and only represent 6.6% of the population-weighted average retail price (at purchasing power parity) for 330 ml of an internationally comparable brand of SSB *(44)*.

Besides focusing on questioning the public health benefits of SSB taxation, industries also stress the expanding "negative effects" of SSB taxation, such as the harmful effect on employment opportunities and the disproportionate financial burden on lower-income groups *(61,67)*. While job loss claimed by the industries can be justified by an offset of job creation in sectors other than the SSB-related sectors *(61,67)*, lower-income groups do tend to bear proportionately higher costs from any consumption taxes *(70)*. Yet, the greatest regressivity potential occurs when taxes target entire food groups containing core items,

such as dairy products, rather than specific non-core food items like SSBs. In addition, the responsiveness to the targeted SSB taxes stemming from the higher price sensitivity among the low socioeconomic groups may lead to more pronounced beneficial health effects from the reduction in SSB consumption and improvements in diets, such as substituting their regular SSB purchases with healthier alternatives, such as water *(60,61,69,71)*. Furthermore, SSB taxes have a potential redistributive effect, with a net transfer of taxes collected from higher-income populations to programmes targeted towards lower-income populations, suggesting a progressivity that contributes to reducing health inequities *(70)*.

Finally, it should be noted that, while SSB taxation compares favourably with other complementary measures in terms of cost-effectiveness and impact on high-risk groups, SSB taxation is made more effective when it is implemented as part of a comprehensive policy package *(17)*, which may include the public food procurement and service policies at schools, nutrition labelling, the restriction of harmful marketing of food and beverages, and reformulation towards lower levels of salt, sugars and harmful fats *(17).* To achieve multiplicative beneficial health effects, it is critical to review the status of those complementary measures before incorporating the SSB taxation to reflect on how the SSB taxation would fit with the existing policies *(17)*. Addressing obesity will require a comprehensive approach to create healthier food and a physical activity environment as well as to strengthen access to obesity management services a part of universal health coverage.

Recommended actions

- Governments should support effective surveillance systems for nutrition status, dietary intake and diseases to utilize reliable, valid and accessible data from evidence-based research for decision-making.
- Governments should invest in building the capacity of health-care practitioners and public health professionals to provide and expand stigma-free treatment that would benefit children living with overweight and obesity. Oral health professionals should participate in an interprofessional effort to address SSB consumption and promote positive dietary habits for improved weight management.
- WHO publications note that Governments should implement tax on SSBs *(60)*. SSB taxation represent a triple-win policy for governments as they can reduce long-term health-care costs, generate additional tax revenues, and reduce health inequities. It is a recommended policy option to prevent and control NCDs and childhood overweight and obesity *(17)*.
- Governments should design the SSB tax with a tax level high enough and broad enough to cover all SSBs, to trigger sufficiently high changes in prices to alter the affordability of the taxed products and induce changes in SSB consumption. A uniform definition of SSBs, such as the one provided by the WHO, should be applied.
- Governments should refer to the WHO guideline on the use of non-sugar sweeteners (NSS) to avoid incentivizing undesirable substitutions – free sugars intake should be reduced without the use of NSS, as simply replacing free sugars with NSS means that the overall quality of diet is largely unaffected, and the potential undesirable effects of using NSS carry a greater weight when assessing against the desirable effects *(72)*.
- Governments should incorporate public food procurement and service policies, such as school food and nutrition policies, SSB taxation, and targeted subsidies for healthy foods, into the full comprehensive policy package for reducing sugars intake, which also includes food reformulation, marketing restrictions, and front-of-package labelling. SSB taxation is more effective when it is implemented as part of a comprehensive policy package.
- Governments should monitor and evaluate the health initiatives as well as identify and engage key stakeholders, such as those within and external to the government *(73)*, to facilitate a collective, cross-sectoral effort to address barriers and challenges in combating the childhood obesity epidemic.

Recommended readings

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Incentives and disincentives for reducing sugar in manufactured foods: an exploratory supply chain analysis: a set of insights for Member States in the context of the WHO European Food and Nutrition Action Plan 2015–2020. Copenhagen: WHO Regional Office for Europe; 2017 (https://iris.who.int/handle/10665/345828, accessed 20 August 2024).

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