

The case of the sugar-sweetened beverages tax

M Eykelenboom¹, SK Djojoseparto², MM van Stralen¹, MR Olthof¹, CM Renders¹,
MP Poelman³, CBM Kamphuis⁴, S Capacci⁵, IHM Steenhuis¹, on behalf of the PEN Consortium

¹Department of Health Sciences, Vrije Universiteit Amsterdam, and Amsterdam Public Health Research Institute, the Netherlands; ²Department of Human Geography and Spatial Planning, Utrecht University, the Netherlands; ³Chairgroup Consumption and Healthy Lifestyles, Department of Social Sciences, Wageningen University & Research, the Netherlands; ⁴Department of Interdisciplinary Social Science, Utrecht University, the Netherlands; ⁵Department of Statistical Sciences, University of Bologna, Italy.

What is already known on this topic

Priority of the problem: In European Union countries, it is estimated that 30-70% of the adult population are overweight of which 10-30% are obese¹. This is a major concern as overweight and obesity are associated with an increased risk of several non-communicable diseases including type 2 diabetes, cardiovascular diseases, musculoskeletal disorders and some types of cancer². Consumption of sugar-sweetened beverages (SSB) is an important modifiable risk factor for overweight and obesity³.

Benefits and harms: In real-world evaluation studies, the decrease in purchases and consumption of SSB seems proportional to the tax rate applied⁴. Modelling studies have demonstrated that if the tax rate is 20% or more, SSB taxes have the potential to reduce the prevalence and incidence of overweight and obesity, diabetes type 2, dental caries, and to reduce disability-adjusted life years⁵.

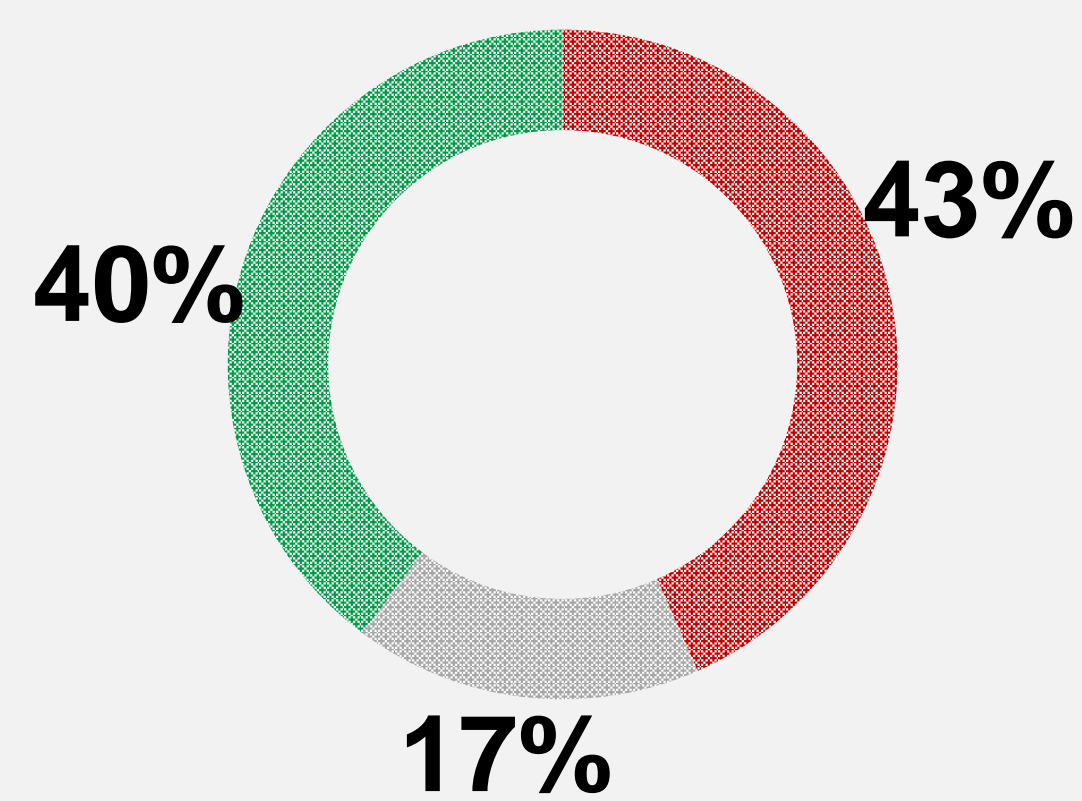
Acceptability: Acceptability is generally lower for government interventions perceived as intrusive⁶, such as an SSB tax.

Feasibility: Countries have experienced challenges in the introduction of an SSB tax due to opposition of the beverage industry and low political and public acceptability^{5,7}. Still, an SSB tax is regarded as the most feasible health-related food tax to implement⁸. Currently, SSB taxes have been implemented in over 40 countries worldwide⁹.

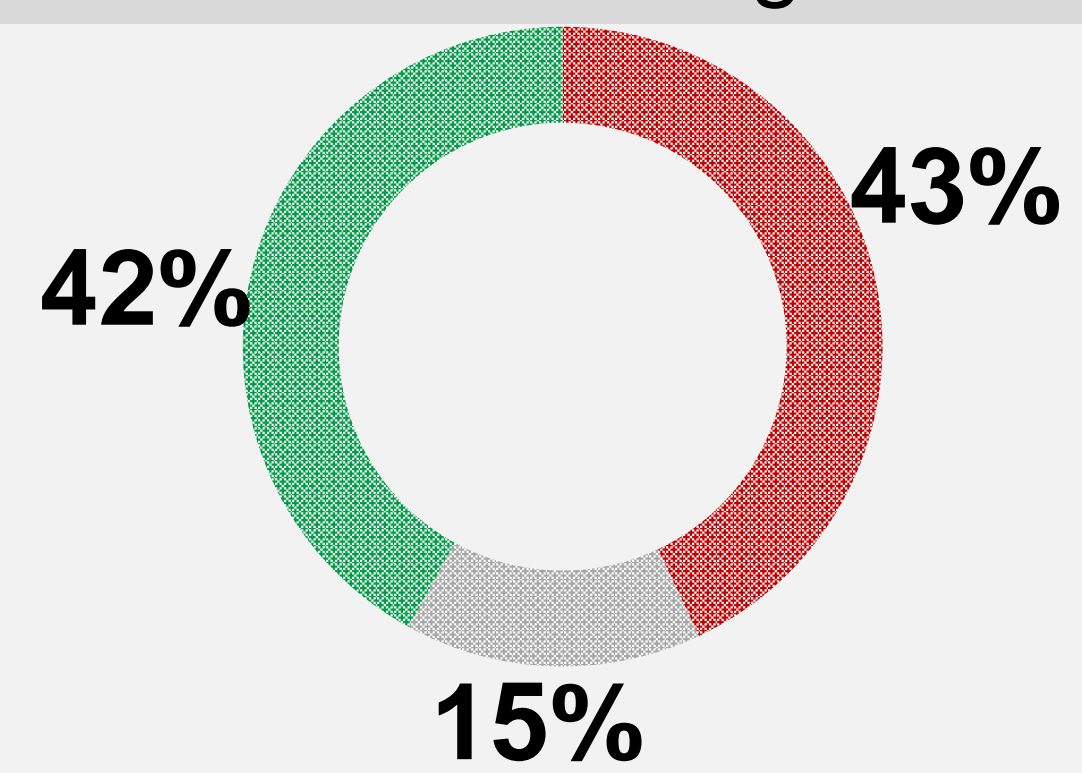
Equity: An SSB tax is regressive – i.e. the cost burden falls disproportionately on lower socioeconomic groups¹⁰. However, an SSB tax also seems to have progressive health effects – i.e. the health effects are more beneficial for lower socioeconomic groups, suggesting that an SSB may contribute to addressing health inequalities¹⁰.



An SSB tax in general:



An SSB tax as a strategy to reduce overweight:



An SSB tax if revenue is used for health initiatives:

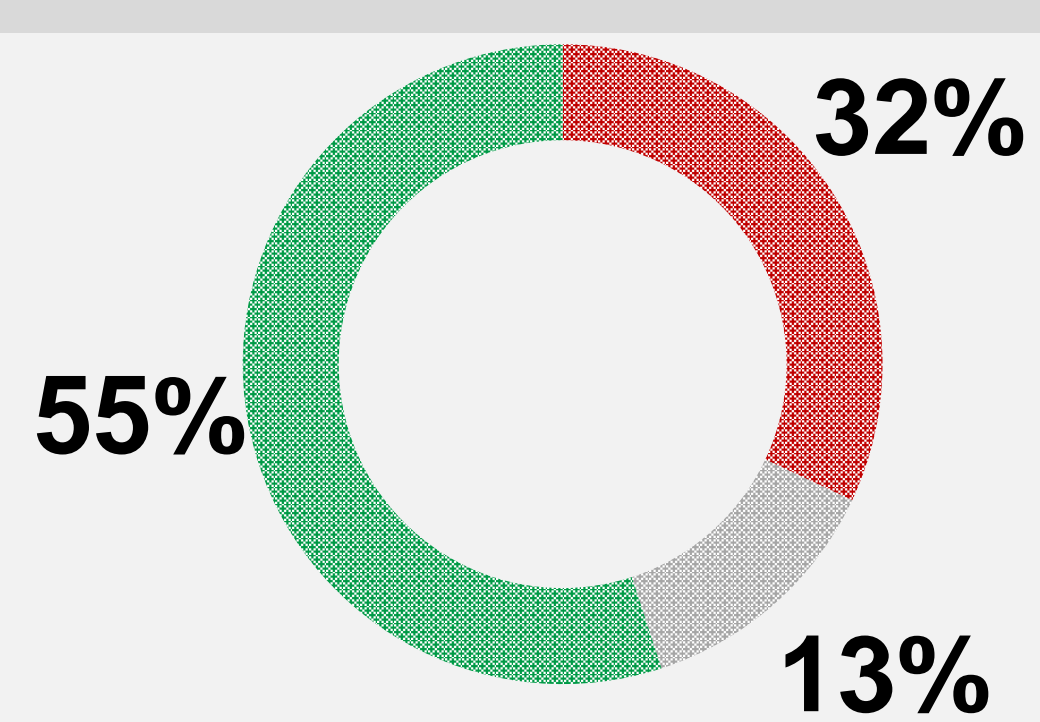


Fig 1. Public support for SSB tax in the Netherlands¹²

What our studies add

Acceptability: Five themes appear to have implications for the political and public acceptability of an SSB tax: (i) beliefs about effectiveness and cost-effectiveness, (ii) beliefs about appropriateness, (iii) beliefs about economic and socioeconomic benefit, (iv) beliefs about policy adoption and implementation, and (v) public mistrust of the industry, government and public health experts¹¹. Public acceptability of an SSB tax tends to be higher if revenue is used for health initiatives¹¹. In the Netherlands, the majority of the public (55%) supported an SSB tax if the revenue generated from the tax is used for health initiatives¹² (Figure 1). Participants with a low educational level, overweight, moderate or high SSB consumption and those with adolescents in their households reported lower levels of acceptability of an SSB tax¹².

Feasibility: Several challenges remain to be overcome to make the adoption of an SSB tax in the Netherlands feasible – e.g. considerable disagreement among stakeholders, an unfavourable political context and a strong lobby against an SSB tax¹³.

Equity: An SSB tax would have a larger impact on the budgets of lower socioeconomic groups¹⁴. However, an SSB tax could also have greater health benefits among lower socioeconomic groups and contribute to a reduction in socioeconomic inequalities in dietary intake and health¹⁴. To be effective and to prevent potential adverse health effects (e.g. compensation of lower SSB consumption with other unhealthy behaviours), additional interventions facilitating the reduction of SSB consumption in lower socioeconomic groups are recommended (e.g. decreasing the prices of healthy foods, investing the revenue of the tax in favour of lower socioeconomic groups)¹⁴.

Effectiveness: An SSB tax could be effective in reducing SSB purchases (based on an RCT using Virtual Supermarket software). The World Bank recommends that taxes on SSBs raise retail prices by at least 20% to reduce consumption⁵. The SSB tax introduced in Catalonia in May 2017 (corresponding to around 10% of the average price) proved to be effective in increasing prices (both CPIs and average price paid for drinks) but did not significantly affect drink purchases, according to our estimates using a quasi-experimental approach on data from the Spanish Household Budget Survey. More beneficial effects on consumer food purchases could be expected from a nutrient profiling tax based on Nutri-Score targeting a wider range of foods and beverages with a low nutritional quality.

Policy recommendations

1. Use the revenue generated from an SSB tax for health initiatives
2. Form advocacy coalitions to support the introduction of an SSB tax
3. When introducing a SSB tax, raise retail prices by at least 20% to reduce consumption
4. Look for opportunities to broaden the tax base
5. Couple an SSB tax to societal problems other than public health
6. Accompany the introduction of an SSB tax by other interventions to reduce SSB consumption in lower socioeconomic groups

Literature references

¹ WHO <http://www.euro.who.int/en/health-topics/noncommunicable-diseases/obesity/data-and-statistics> ² WHO <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight> ³ Malik et al. <https://pubmed.ncbi.nlm.nih.gov/23966427/> ⁴ Teng et al. <https://pubmed.ncbi.nlm.nih.gov/31218808/> ⁵ World Bank <https://openknowledge.worldbank.org/handle/10986/33969> ⁶ Diepeveen et al. <https://pubmed.ncbi.nlm.nih.gov/23947336/> ⁷ WHO <https://apps.who.int/iris/handle/10665/250131> ⁸ WHO <https://www.who.int/publications/i/item/9789241510066> ⁹ WCRF <https://policydatabase.wcrf.org/> ¹⁰ WHO <https://www.euro.who.int/en/publications/abstracts/using-price-policies-to-promote-healthier-diets-2015> ¹¹ Eykelenboom et al. <https://pubmed.ncbi.nlm.nih.gov/31484538/> ¹² Eykelenboom et al. <https://pubmed.ncbi.nlm.nih.gov/32495730/> ¹³ Eykelenboom et al. <https://pubmed.ncbi.nlm.nih.gov/34333638/> ¹⁴ Djojoseparto et al. <https://pubmed.ncbi.nlm.nih.gov/33292723/>

Additional Information: The case of the sugar-sweetened beverages tax

Existing literature on the political and public acceptability of an SSB tax

A mixed-method systematic review was conducted to synthesize existing literature on the political and public acceptability of an SSB tax¹. Synthesis of qualitative studies conducted in the US, Mexico, Australia, New Zealand, four Pacific countries, China, Israel, the UK, and fourteen European countries demonstrated that five themes appear to have implications for the political and public acceptability of an SSB tax: (i) beliefs about effectiveness and cost-effectiveness, (ii) beliefs about appropriateness, (iii) beliefs about economic and socioeconomic benefit, (iv) beliefs about policy adoption and implementation, and (v) public mistrust of the industry, government and public health experts. Synthesis of quantitative studies conducted in the US, Australia, the UK and France showed that 42% of the public supported an SSB tax, 39% of the public supported an SSB tax as a strategy to reduce overweight, and 66% of the public supported an SSB tax if revenue is used for health initiatives. Based on these findings, the review provided several recommendations to enhance the adoption and implementation of an SSB tax: (i) address inconsistencies between identified beliefs and scientific literature, (ii) use raised revenue for health initiatives, (iii) communicate transparently about the true purpose of the tax, and (iv) generate political priority for solutions to the challenges to policy adoption and implementation.

Public acceptability of an SSB tax and its associated factors in the Netherlands

The next step was to investigate public acceptability and its associated factors in the Netherlands. An online survey was conducted among a sample of 500 Dutch adults representative of the Dutch population for age, sex, educational level and location². Of the participants, 40% supported and 43% opposed an SSB tax in general. Moreover, 42% supported (43% opposed) an SSB tax as a strategy to reduce overweight, and 55% supported (32% opposed) an SSB tax if revenue is used for health initiatives. In line with the systematic review¹, these findings suggest that support for an SSB tax in the Netherlands tends to be higher if revenue is used for health initiatives. Participants with a low educational level, overweight, moderate or high SSB consumption and those with adolescents in their households reported lower levels of acceptability of an SSB tax than their counterparts. Moreover, beliefs about effectiveness and cost-effectiveness, appropriateness, socioeconomic and economic benefit, policy adoption and implementation and trust – that appeared to have implications for the acceptability of an SSB tax in previous qualitative studies – were also associated with public acceptability of an SSB tax in the Netherlands.

Stakeholder views on taxation of SSB and its adoption in the Netherlands

Semi-structured interviews were conducted to investigate Dutch stakeholder views on taxation of SSB and its adoption in the Netherlands³. Twenty-seven stakeholders from a diverse range of relevant sectors participated in the study – i.e. health and consumer organizations, health professional associations, trade associations, academia, advisory bodies, ministries and parliamentary parties. The findings of this study revealed considerable disagreement among stakeholders over the effectiveness, appropriateness and (socio)economic effects of an SSB tax. Perceived barriers to the adoption of an SSB tax in the Netherlands included an unfavourable political context, limited advocacy for an SSB tax, a strong lobby against an SSB tax, perceived public opposition, administrative load and difficulties in defining SSB. Perceived facilitators to its adoption included an increasing prevalence of overweight, disappointing results from voluntary industry actions (e.g., as agreed on in the National Prevention Agreement), a change of government, state budget deficits, a shift towards more public support for an SSB tax, international recommendations to implement an SSB tax and a solid legal basis. These findings suggest that several challenges remain to be overcome for the adoption of an SSB tax in the Netherlands.

Stakeholder views on the potential impact of a sugar-sweetened beverages tax on the budgets, dietary intake, and health of lower and higher socioeconomic groups in the Netherlands

Semi-structured interviews were conducted in 2019 with 27 participants from various stakeholder groups in the Netherlands (i.e. health and consumer organizations, health professional associations, trade associations, academia, advisory bodies, ministries and parliamentary parties).^{3,4} Participants from all stakeholder groups indicated that an SSB tax would have a larger impact on the budgets of lower socioeconomic groups. Participants from nearly all stakeholder groups (except trade associations) mentioned that an SSB tax could have greater health benefits among lower socioeconomic groups as these often have a higher SSB consumption and are more likely to be overweight or obese. Some participants mentioned that an SSB tax may have no or adverse health effects among lower socioeconomic groups (e.g. compensation of lower SSB consumption with other unhealthy behaviours). Some participants emphasised that an SSB tax should only be introduced when accompanied by other interventions (e.g. decreasing the prices of healthy foods), to make it easier for lower socioeconomic groups to lower their SSB consumption in response to an SSB tax, and to prevent adverse health effects. These findings suggest that an SSB Tax could contribute to a reduction in socioeconomic inequalities in dietary intake and health. However, additional interventions facilitating the reduction of SSB consumption in lower socioeconomic groups are recommended.

Additional Information: The case of the sugar-sweetened beverages tax

The effects of an SSB tax and a nutrient profiling tax on consumer food purchases in a Virtual Supermarket

Following analysis of the acceptability and feasibility of an SSB tax in the Netherlands, the effectiveness of an SSB tax was measured among Dutch adults being responsible for grocery shopping in their household. A randomized controlled trial was performed in a virtual supermarket setting with a control condition with regular food prices, an SSB tax condition and a nutrient profiling tax condition based on Nutri-Score.⁵ This study demonstrated that the SSB tax and the nutrient profiling tax decreased SSB purchases. Additionally, the nutrient profiling tax was effective in increasing the overall healthiness and decreasing the energy content of the total weekly food shopping basket. These findings suggest that a nutrient profiling tax targeting a wide range of foods and beverages with a low nutritional quality seems to have more beneficial effects on consumer food purchases than taxation of SSB alone.

The effects of a SSB tax on drink prices and purchases in Catalonia

The effect of the soda tax introduced in Catalonia in May 2017 was estimated using a quasi-experimental approach and data from the Spanish Household Budget Survey (HBS). The tax was imposed to SSBs depending on their sugar content and the maximum tax rate was set to 0.12 euros per litre for drinks with more than 8 grams of sugar per 100 milliliters (corresponding to around 10% of the average price). Thanks to the variation in the exposure to the tax among Spanish Autonomous communities, a difference-in-difference method was used to investigate the effect of the tax on prices and purchases. According to our estimates the tax led to a significant increase in the Consumer Price Index of non-alcoholic beverages (+6.2 points) and in the average price paid for potentially taxed drink categories (+10.6 cent for soft drinks). However, no significant change in purchases of soft drinks was found. This result is in line with the World Health Organization recommendation to impose taxes on SSBs that raise retail prices by at least 20% to reduce consumption.⁶

References

1. Eykelenboom M, van Stralen MM, Olthof MR, Schoonmade LJ, Steenhuis IHM, Renders CM. Political and public acceptability of a sugar-sweetened beverages tax: a mixed-method systematic review and meta-analysis. *Int J Behav Nutr Phys Act.* 2019; 16:78.
2. Eykelenboom M, van Stralen MM, Olthof MR, Renders CM, Steenhuis IH. Public acceptability of a sugar-sweetened beverage tax and its associated factors in the Netherlands. *Public Health Nutr.* 2021; 24:2354-64.
3. Eykelenboom M, Djojoseparto SK, van Stralen MM, Olthof MR, Renders CM, Poelman MP, et al. Stakeholder views on taxation of sugar-sweetened beverages and its adoption in the Netherlands. *Health Promot Int.* 2021.
4. Djojoseparto SK, Eykelenboom M, Poelman MP, van Stralen MM, Renders CM, Olthof MR, Steenhuis IHM, Kamphuis CBM; PEN Consortium. Stakeholder views on the potential impact of a sugar-sweetened beverages tax on the budgets, dietary intake, and health of lower and higher socioeconomic groups in the Netherlands. *Arch Public Health.* 2020 Nov 24;78(1):125.
5. Eykelenboom M, Olthof MR, van Stralen MM, Djojoseparto SK, Poelman MP, Kamphuis CB, Vellinga RE, Waterlander WE, Renders CM, Steenhuis IH; PEN Consortium. The effects of a sugar-sweetened beverage tax and a nutrient profiling tax based on Nutri-Score on consumer food purchases in a virtual supermarket: a randomised controlled trial. *Public Health Nutr.* 2021 Nov 3:1-13.
6. World Bank <https://openknowledge.worldbank.org/handle/10986/33969>.