Appendix A Sugar taxes around the world

Table 9 Sugar taxes around the world

Jurisdiction	Year implemented	Taxed products	Tax design	Source
Albania	2019	Beverages with more than 5g of sugar per 100ml	(10 leh per litre – around 8%)	Obesity Evidence Hub n.d.
Albany, California, U.S.	2017		Volumetric per ounce of beverage	Obesity Evidence Hub n.d.
Bahrain	2017	Aerated flavoured soft drinks, and concentrates, powders, gels or extracts, which will be made into an aerated drink	Excise tax – 100% tax on energy drinks, 50% tax on soft drinks	World Action on Salt, Sugar and Health n.d.
Barbados	2015	All sugar-sweetened beverages	10% excise tax	Obesity Evidence Hub n.d.
Belgium	2016	Beverages with added sugar, sweeteners or flavours	Specific (volumetric), flat rate (product type) 6.8133€/hl	World Health Organization. Regional Office for Europe 2022
Bermuda	2019	Sugar-sweetened beverages	75% on the customs value	Obesity Evidence Hub n.d.
Berkeley, California, U.S.[6]	2015	Sugar-sweetened beverages excluding milk-based	Volumetric excise tax (1 cent per ounce of beverage)	Obesity Evidence Hub n.d.
Boulder, Colorado, U.S.	2017	Sugar-sweetened beverages with at least 5 grams of caloric sweetener per 12 fluid ounces.	Volumetric excise tax (2 cent/ounce on drinks with > 5g caloric sweetener/12ounces)	Cawley et al. 2021
British Columbia, Canada	2021	Sugar-sweetened and artificially-sweetened beverages	Removal of exemption from provincial sales tax – 7% sales tax applied.	Government of British Columbia, Ministry of Finance (2021)

[6] The state of California decided in 2018 to ban cities from introducing any further taxes on SSBs until 2030 (Schmacker and Smed, 2020).

Jurisdiction	Year implemented	Taxed products	Tax design	Source
Brunei	2017	Beverages with more than 6 grams of sugar per 100 ml	$0.02 per litre (about 2%)	Obesity Evidence Hub n.d.
Catalonia, Spain	2016	Sugar-sweetened beverages	8 cent/litre on drinks with 5–8g sugar/100ml, 12 cent/litre on drinks with >8g sugar/100ml	Griffiths et al. 2019
Chile	2014	Sugar-sweetened beverages	Ad valorem 10% on drinks < 6.25g sugar/100ml, 18% on drinks > 6.25g of sugar/100ml	Griffiths et al. 2019
Cook County, Illinois, U.S. (includes Chicago)	2017, repealed same year	Sugar-sweetened and artificially-sweetened beverages, but excluding those purchased with food stamps and fruit drinks	The county passed a volumetric excise tax (1 cent per ounce) tax in November 2016. The county repealed it in October 2017.	(Urban Institute n.d.)
Cook Islands	2016	Sugar-sweetened beverages	$0.30 per litre (about 30%)	Obesity Evidence Hub n.d.
Denmark	1930s – increased in January 2012, decreased in July 2013, completely repealed in 2014.	soft drinks (at various times, other sugary products and also products high in fat have also been subject to taxes)	Per litre of beverage	Obesity Evidence Hub n.d. Schmacker and Smed, 2020
Domenica	2019	Sugar-sweetened beverages	$0.01 per gram of sugar content above 5 grams per serving	Obesity Evidence Hub n.d.
Estonia	2018	Sugar-sweetened beverages	€0.10 per litre (about 10%) on beverages with more than 5 grams of sugar per 100 ml	Obesity Evidence Hub n.d.
Fiji	2018	Sugar-sweetened beverages	$0.30 per litre (about 30%) on drinks with more than 6 grams of sugar per 100 ml	Obesity Evidence Hub n.d.
Finland	2011/2014	Sugar-sweetened beverages, fruit and vegetable juices	Volumetric specific excise tax 75 cents/kg or 7.5 cents/l for liquids, 75 cents/kg for solid ingredients of soft drinks	World Health Organization. Regional Office for Europe 2022
France	2012	Beverages with added sugar or sweeteners	Volumetric specific excise tax 7.16€/hl (around €0.075 per litre, or 7.5%) and an additional tax of €0.02 per	World Health Organization. Regional Office for Europe 2022

Jurisdiction	Year implemented	Taxed products	Tax design	Source
			gram of sugar content above 5 grams per serving since 2018	Obesity Evidence Hub n.d.
Hungary	2011	All foods and drinks with high sugar and/or salt content or artificially sweetened	Volumetric specific excise tax 5 forint/l for >8 g sugar/100 ml 250 forint/l for energy drinks	World Health Organization. Regional Office for Europe 2022 Obesity Evidence Hub n.d.
India	2017	Sugar-sweetened beverages	Higher GST (18%) on all SSBs	Obesity Evidence Hub n.d.
Indonesia	2020	Sugar-sweetened beverages	IDR200 per gram of sugar content above the threshold level for different categories of SSBs	Obesity Evidence Hub n.d.
Ireland	2018	Sweetened drinks containing more than 5g of sugar per 100ml	Volumetric-specific excise tax €0.20 per litre (about 6%)	Crosbie et al. 2022
Israel	2022 (repealed in 2023)	Sweetened beverages, concentrates and powders	NIS 1,00 per litre for beverages containing 5g or more of sugar per 100ml NIS 6,00/litre for concentrates and NIS 6,00/kilogram for powders, designed to produce a beverage containing 5g or more of sugar per 100ml	Israel Tax Authority 2021
Italy	2023	Sugar-sweetened and artificially sweetened soft drinks	€10 per hectolitre for the finished products, and 0.25 € per kilogram, for products designed to be used after dilution	Dosen 2022
Latvia	2018	Sugar-sweetened beverages	€0.075 per litre (about 7.5%) on drinks with more than 5 grams of sugar per 100 ml	Obesity Evidence Hub n.d.
Lithuania	2017	Sugar-sweetened beverages	€0.055 per litre (about 5.5%) on drinks with more than 5 grams of sugar per 100 ml	Obesity Evidence Hub n.d.
Maine	2003	Sugar-sweetened and artificially-sweetened beverages and snack foods	5.5% sales tax	Madsen 2020
Malaysia	2019	Sugar-sweetened and artificially-	RM0.40/litre (about 10%) on SSBs with more than 5g of sugar or sweeteners per 100 ml, or 7g per 100ml if milk-	Pakiam 2019

Jurisdiction	Year implemented	Taxed products	Tax design	Source
		sweetened beverages	based, 12g per 100ml if fruit/vegetable juice based	
Mauritius	2016	Sugar-sweetened beverages	MUR3 per gram of sugar content above the threshold level for different categories of SSBs	Obesity Evidence Hub n.d.
Mexico	2014	Sugar-sweetened beverages	Volumetric per litre of beverage MXN1 per litre (about 10%)	Griffiths et al. 2019
Morocco	2013	Sugar-sweetened and artificially-sweetened beverages	MAD0.70 per litre on soft and non-carbonated drinks with ≥5 g sugar per 100 mL, 0.6 MAD/L on energy drinks; MAD 0.15/L ($0.02) on nectars	Global Food Research Program 2020
Nauru	2007	Sugar-sweetened beverages	30% import duty on all products with added sugars	Global Food Research Program 2020
Newfound-land and Labrador, Canada	2021	Sugar-sweetened beverages	CDN$0.20 per litre, volumetric (per litre of beverage) levied on wholesalers and/or retailers[7]	Obesity Evidence Hub n.d.
Norway	2017, increased in 2018, repealed in 2020	Sugary drinks Sugar-sweetened and artificially-sweetened beverages	Volumetric, Per litre of beverage NOK3.34 per litre (about 34%) since 1922 additional tax of NOK4.75 per kilogram of sugar content above the threshold level for different categories of SSBs since 2018, but repealed in 2020	Øvrebø et al. 2020 Global Database on the Implementation of Nutrition Action (GINA) n.d.
Oakland, California, U.S.	2017	Sugar-sweetened beverages sold in fast food restaurants	Volumetric excise tax per ounce of beverage with ≥25 kilocalories/12 ounces.	Obesity Evidence Hub n.d.
Ohio, U.S.	1991	Sugar-sweetened and artificially-sweetened beverages	5% increase in sales tax	Obesity Evidence Hub n.d.
Peru	2018	Sugar-sweetened beverages	17% on drinks with more than 6 grams of sugar per 100 ml, and a tax of 25% on drinks with more than 8 grams of sugar per 100 ml	Obesity Evidence Hub n.d.

[7] The provincial Finance Department, has stated that the provincial government collects the tax at the wholesale level, but most retailers must "levy and collect the sugar-sweetened beverage tax from consumers and pay over the tax amount collected to the registered wholesaler, as per the wholesaler's invoice."

Jurisdiction	Year implemented	Taxed products	Tax design	Source
Philadelphia, U.S.	2017	Sugar-sweetened and artificially-sweetened beverages	Volumetric excise tax on distributors (1.5 cents per ounce of beverage)	Jones et al. 2019
Philippines	2018	Sugar-sweetened beverages	Volumetric PHP6 per litre (about 12%) on drinks with caloric sweeteners, and a tax of PHP12 per litre (about 24%) on drinks with high-fructose corn syrup	Saxena et al. 2019
Portugal	2017	Sugar-sweetened and artificially-sweetened beverages	Volumetric specific excise tax 8 cent/litre on drinks with < 8g sugar/100ml, 16 cent/litre on drinks with > 8g sugar/100ml	Gonçalves and Merenda 2022 Griffiths et al. 2019
Qatar	2019	Sugar-sweetened beverages	Ad valorem 100% on energy drinks and 50% on other SSBs	Koe 2019
Samoa	2017	Sugar-sweetened beverages	Volumetric tax on importers 52.5 sene/L (around 21%)	Teng et al. 2021
San Francisco, U.S.		Sugar-sweetened beverages, syrups, and powders	Volumetric excise tax (per ounce of beverage) of one cent per fluid ounce excise tax on the initial distribution within San Francisco	Treasurer & Tax Collector 2021
Saudi Arabia	2017	Sugar-sweetened beverages	Ad valorem 50% on all SSBs in addition to the 2018 VAT on all consumption goods	Jalloun and Qurban 2022
Seattle, Washington, U.S.	2018	Sugar-sweetened soda and some fruit drinks	Volumetric US 1.75 cents per ounce of beverage	City of Seattle 201)
Seychelles	2010	Sugar-sweetened beverages containing >5 g sugar/100 mL	Volumetric SCR4 per litre (about 40% or USD 0.22) per litre import tariff	Global Food Research Program 2020
South Africa	2018	Sugar-sweetened beverages	Specific excise tax per gram of sugar over 4g per 100ml ZAR0.021 (approx. 0.15 US cents) per gram of sugar content above 4 grams per 100 ml (about 11%) Revenue "soft-earmarked" for health promotion activities	Stacey et al. 2019 Global Database on the Implementation of Nutrition Action (GINA) 2018
Sri Lanka	2018	Sugar-sweetened beverages with	LKR 12/litre or 40 cents/gram of sugar content above the threshold level for different categories of SSBs	Institute of Policy Studies of Sri Lanka n.d.

Jurisdiction	Year implemented	Taxed products	Tax design	Source
		more than 4 g sugar per 100 ml		
Thailand	2017	Sugar-sweetened beverages	Tiered tax based on sugar content and product category, ranging from THB0.13 to THB1 per litre (about 1-10%)	Obesity Evidence Hub n.d.
Tonga	2013	Sugar-sweetened beverages	T$0.50/L	World Bank
United Arab Emirates	2017	Sweetened carbonated beverages and energy drinks	50% sales tax on carbonated beverages, 100% sales tax on energy drinks	Obesity Evidence Hub n.d.
United Kingdom	2018	Sugar-sweetened beverages excluding milk-based and beverages made by small producers	Volumetric excise tax tiered by sugar density (18p/litre on drinks with 5–8g sugar/100ml, 24p/litre on drinks with >8g sugar/100ml)	HM Revenue and Customs n.d.
Washington State, U.S.	2010, repealed same year	Sugar-sweetened and artificially-sweetened carbonated beverages	Volumetric excise tax (1/6 cent per ounce of beverage)	Griffiths et al. 2019
Vanuatu	2016	Sugar-sweetened beverages	VUV30 per litre (about 30%)	Obesity Evidence Hub n.d.

Source: NZIER

Appendix B Empirical methods for analysing real-world sugar tax impacts

Table 10 Empirical methods for analysing real-world sugar tax impacts

Method	Contexts	Strengths and limitations
Uncontrolled pre-post studies	The least statistically sophisticated method in included studies, and sometimes called before-and-after studies, these studies involve observing a single group of individuals before and after an intervention or policy change, and measuring the outcome variable at both time points. The analysis typically involves comparing the means or proportions of the outcome variable before and after the intervention or policy change. The pre-post approach is typically most convincing when it is applied to a narrow time window around the implementation of the tax; in this case, it is more plausible that changes in price and purchases are primarily driven by the tax and less appropriate for ascertaining the long term impacts of a tax.	The simplest way to evaluate changes that occur after the implementation of a tax is to compare prices and purchases before the tax is implemented with those after the tax is implemented. This assumes that in the absence of the tax, prices and purchases would have been identical to their levels prior to the introduction of the tax. This is unlikely to be true for many reasons; for example, seasonal variation in purchases, trends in how much people like soft drinks, or concern about the consequences of soft drinks for health are all likely to lead to changes in purchases, even if the tax was not introduced. In general, an uncontrolled pre-post study can offer robust insights into changes that occur after a tax is implemented, but cannot causally attribute those changes to the tax.
Difference-in-differences	Difference-in-differences (DiD) approaches are applied when one or several groups are exposed to an intervention or policy change and others are not. The DiD approach is based on demonstrating a stable and predictable difference between the groups in the pre-intervention period and a change or disruption in the difference in the post-intervention period. In the case of sugar taxes, the control group can be a country, a city, or a product that was not subject to the tax. In the US, where taxes have been introduced city- or state-wide as opposed to nationwide, the set of nearby areas without a tax provides a plausible set of control groups.	DiD assumes that the treatment and control groups would have followed the same trend without the intervention or policy change, which may not always be realistic. In a DiD study, the treatment and control groups may differ in important ways, which can introduce selection bias. In particular, when different countries are used for DiD groups, they are less likely to be culturally and politically similar than two nearby cities might be, making this approach most relevant in US studies of sugar taxes. However, one concern with using nearby geographical areas as a control group is that they may experience spillover effects. If residents of the taxed area decide to shop more in neighbouring untaxed areas, then this would lead to an increase in purchases in that area and therefore lead to the conclusion that the tax led purchases to fall by more than they actually did. One approach to deal with this challenge is to exclude areas immediately adjacent to the taxed area from the control group.
Controlled interrupted time series	Similar to DiD approaches, studies that use a controlled interrupted time series (CITS) approach study the changes in a population or variable of interest over time, including before and after the intervention or policy change occurs. The outcome variable is measured repeatedly before and after the intervention, and the interrupted time series analysis	CITS can often detect the immediate effects of an intervention or policy change by comparing the outcome variable before and after the intervention. In contrast, DiD may require a lag period before the treatment effect can be observed. Unlike before-an-after studies, CITS studies can control for pre-existing trends and

Method	Contexts	Strengths and limitations
	compares the trend of the outcome variable before and after the intervention to the control series which is usually a predicted counterfactual constructed from pre-intervention trends. CITS is different from DiD due to the focus being on the trend in the outcome variable compared with the control variable rather than on the difference between the two.	therefore allow for more robust analysis over a longer period of time. A key advantage of this technique over DiD techniques is that the requirement to identify a parallel trend does not apply here. A key disadvantage of this approach is the requirement for sufficient pre-intervention data to construct a predicted counterfactual. The quality of the trend analysis and the predicted counterfactual are reliant on good quality, complete data.
Other regression models, including mixed effects, time series prediction models and discontinuity methods	These methods represent various econometric modelling approaches where regression techniques are used to disaggregate changes in the outcome variable to the various potential contributors or causal variables. Commonly, predicted values for outcomes are generated based on the best fit model developed using pre-tax data. Actual data post-tax is then compared with predicted values to evaluate the predictive power of the model and provide certainty regarding its causal attribution.	These alternative regression-based approaches also offer the opportunity for well-controlled analysis and causal attribution. They are appropriate in any of the same situations where controlled-interrupted time series or DiD approaches may be used, but also where data on a control is not available while rich data on households, individuals, neighbourhoods and stores, and economic drivers may be available to a range of potential causal factors to be included in the model.

Source: NZIER