

The Sugar Tax Implementation

Alessandra Faraudello, Federica Costelli
University of Eastern Piedmont, Novara, Italy

In Italy, Law No. 160 of 27 December 2019, also known as the Budget Law 2020 (paragraphs 661-676) introduced the Sugar tax. Subsequently, Law No. 178 of 30 December 2020 (Budget Law 2021) brought some changes such as the effective date of the Sugar tax and administrative penalties. This tax should have become effective on 1 January 2021 but was deferred until 1 January 2023. In addition to the regulatory dimension, this contribution aims first to introduce the growing trend of sugar consumption and then to analyse the issue of the sugar tax, first in Italy and later in Europe. Finally, an attempt will also be made to highlight the effects of this application.

Keywords: sugar tax in Italy, sugar tax in Europe, sugar consumption, economic impacts

Introduction

Global sugar consumption in 2020 exceeded 171 million tonnes (Organization for Economic Cooperation and Development/Food and Agriculture Organization of the United Nations [OECD/FAO], 2021a). The main consumer countries are India, the EU, China, Brazil, the US, Indonesia, Russia, Pakistan, Mexico, and Egypt (OECD/FAO, 2021a).

The main variables influencing sugar consumption are (International Sugar Organization [ISO], n.d.):

- Population growth.
- Per capita income.
- The price of sugar and sweeteners used as sugar substitutes.
- The political decisions of each Country.

According to an FAO study, global sugar consumption is expected to increase by 1.4 per cent per year to 196 million tonnes in 2030. During the forecast period 2021-2030, per capita consumption is expected to increase, but this varies from Country to Country and region to region (OECD/FAO, 2021b).

Alessandra Faraudello, Ph.D., assistant professor, Department of Business and Economic Studies, University of Eastern Piedmont, Novara, Italy.

Federica Costelli, research fellow, Department of Business and Economic Studies, University of Eastern Piedmont, Novara, Italy.

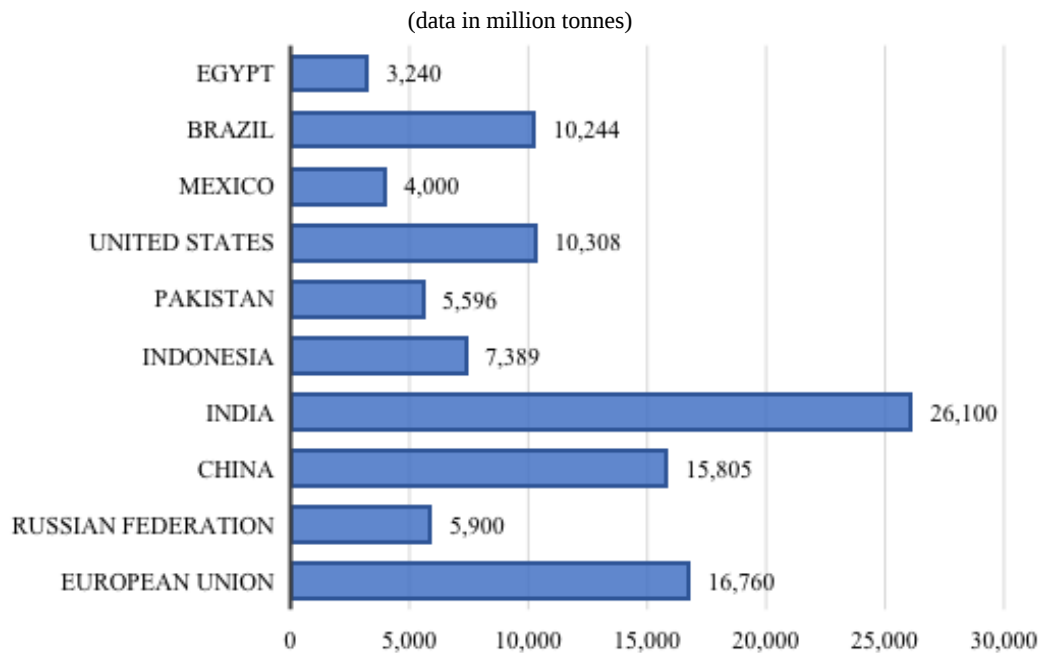


Figure 1. World sugar consumption in the main countries in 2020 (Source: OECD/FAO (2021a), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>).

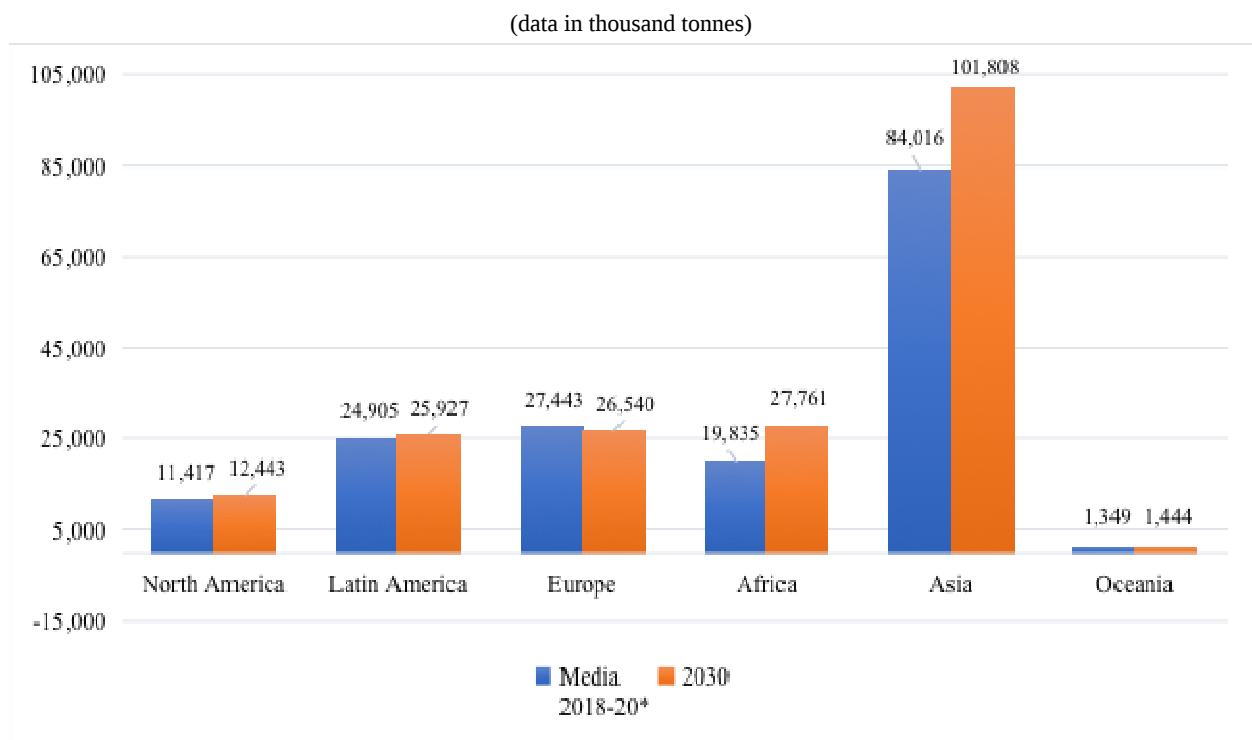


Figure 2. Sugar consumption in the main country aggregates (Source: OECD/FAO, OECD-FAO Agricultural Outlook 2021-2030, <https://doi.org/10.1787/19428846-en>).

From the analysis of the above figure, the increase in sugar consumption, as estimated by the FAO study, will happen in all countries, except for Europe where there will be a slight decrease.

Furthermore, the FAO expects an increase in global consumption in developing countries such as Asia and Africa, the increase per capita consumption over the next ten years in Asia will be 1.1%, while in Africa it will be 0.8%. The study also forecasts a reduction in sugar consumption in all developed countries as they are more sensitive to the negative health effects of excessive sugar intake. Many countries have already implemented a tax on sugary products to try to reduce their consumption, and many companies in reaction have already changed the recipe of their products by decreasing the amount of sugar in them. According to an FAO projection, countries such as Mexico, Australia, New Zealand, Canada, and Western Europe will reduce their sugar intake over the next decade (OECD/FAO, 2021b).

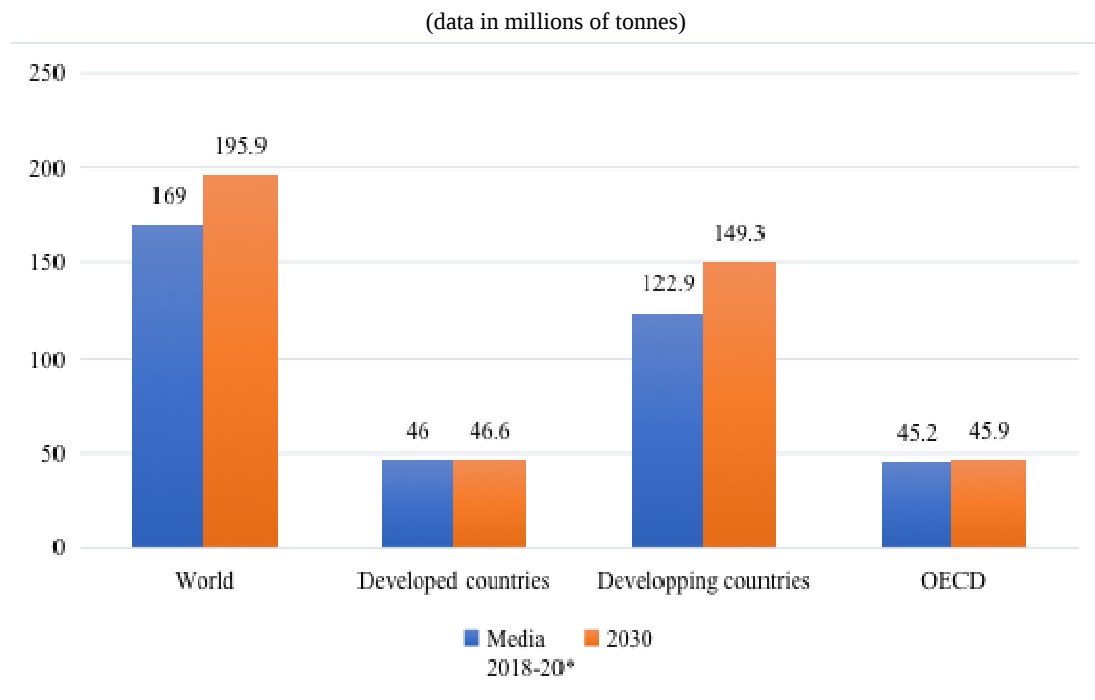


Figure 3. World sugar consumption in 2018-2020 and forecast for 2030 (Source: OECD/FAO, OECD-FAO Agricultural Outlook 2021-2030, <https://doi.org/10.1787/19428846-en>).

Sugar Intake and Health Effects

Excessive intake of sugars in drinks and sweets causes serious health problems. The sweet taste of foods and drinks comes from both natural and artificial substances. The former refers to simple carbohydrates or sugars, while the latter are associated with molecules of a different chemical nature (Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione [INRAN], 2003).

In the daily diet, the main sources of sugar are foods and drinks. In fact, sucrose, the common sugar, is present in both honey and ripe fruit, which also contain glucose and fructose, while milk contains lactose. Our body absorbs and metabolises sugars in a very simple way. The consumption of sugars, especially if taken alone, causes an increase in glycaemia in a very short time, which then returns to the initial value within a certain time frame. This mechanism of raising glycaemia values is what responds in cases of physical and mental tiredness or in moments of hypoglycaemia. This is particularly disadvantageous for individuals who have difficulty using glucose at the cellular level such as diabetics (INRAN, 2003). In a balanced diet, the intake of simple sugars should not exceed 15% of the total energy intake (Consiglio per la ricerca in agricoltura

e l'analisi dell'economia agraria [CREA], 2018), while for the intake of free sugars, the WHO, suggests not exceeding 10% of the total energy (World Health Organization [WHO], 2015). "The most recent international recommendations suggest reducing the consumption of free sugars, i.e. those added to food and beverages, both in packaged and home-prepared products, and reducing the consumption of sugar also found in honey, syrups and fruit juices" (CREA, 2018, pp. 92-93).

Excessive sugar consumption can lead to an unbalanced diet and/or excessive caloric intake that can favour the onset of dental caries, obesity, diabetes mellitus, and cardiovascular disease. Although the correlations (high sugar consumption and the occurrence of disease) are not always direct, body weight and sugar intake patterns are indications of the appearance of disease (CREA, 2018).

According to surveys conducted by the Istituto Superiore di Sanità in the three-year period 2017-2020, in Italy, 10.8% of the adult population is obese and 31.6% is overweight, while for school-age children, in 2019, 9.4% and 20.4% are obese and overweight, respectively. These surveys show that adults who are obese or overweight are between 50 and 69 years old, have a low education, many economic difficulties, and live predominantly in the South or on the Italian islands¹.

This represents an important issue both for the health of the entire population and for the management of these diseases for the National Health Service.

This problem is not only present in our Country, but the World Health Organisation (WHO) and the Organisation for Economic Cooperation and Development (OECD) consider it a "global pandemic", i.e. present worldwide (Epicentro, n.d.). This phenomenon is not only more present in industrialised countries, but is also spreading to developing countries, as the graph below shows (WHO & Centers for Disease Control and Prevention, 2004).

Obesity and overweight are increasing in European countries, and depending on the Country, 25%-70% of adults are overweight, while 5%-30% are obese (Epicentro, n.d.).

According to the report *The Heavy Burden of Obesity: The Economics of Prevention* by the OECD, 8.4% of the health system's budget costs are related to the treatment of overweight-related diseases. Particularly the latter is "responsible for 71% of the costs of treatment for diabetes, 23% of the costs of treatment for cardiovascular diseases and 9% of the costs of treatment for cancer" (Epicentro, 2019, <https://www.epicentro.iss.it/obesita/oecd-heavy-burden-obesity-2019>). According to the OECD report in Italy, 9 per cent of health expenditure is due to overweight, this reduces GDP by 2.8 per cent and to cover these costs each citizen pays 289 euro more in taxes each year (Epicentro, 2019).

¹ Dati di sorveglianza Passi per gli adulti <https://www.epicentro.iss.it/passi/dati/sovrappeso>.

PASSI (Progressi delle Aziende Sanitarie per la Salute in Italia) is a public health surveillance system that operates on the Behavioural Risk Factor Surveillance model, adopted in many countries, in order to collect information on the Italian adult population (aged 18-69) to create prevention guidelines for non-communicable chronic diseases (including overweight and obesity). It is an internal NHS tool for sending information to ASLs and Regions, <https://www.epicentro.iss.it/passi/>.

Dati di sorveglianza OKkio alla salute per i bambini <https://www.epicentro.iss.it/okkioallasalute/indagine-2019-dati>. OKkio alla SALUTE is also a Public Health surveillance system with the aim of monitoring the situation of overweight, obesity, and risk factors among primary school children (ages 6-10), in order to propose initiatives aimed at improving the living and health conditions of this population under analysis. The analysis sample is that of children in the third grade of primary school (ages 8-9) as their nutritional situation is little affected by puberty and as their degree of cognitive development allows them to answer the questions in the questionnaires proposed to them accurately, <https://www.epicentro.iss.it/okkioallasalute/la-sorveglianza>.

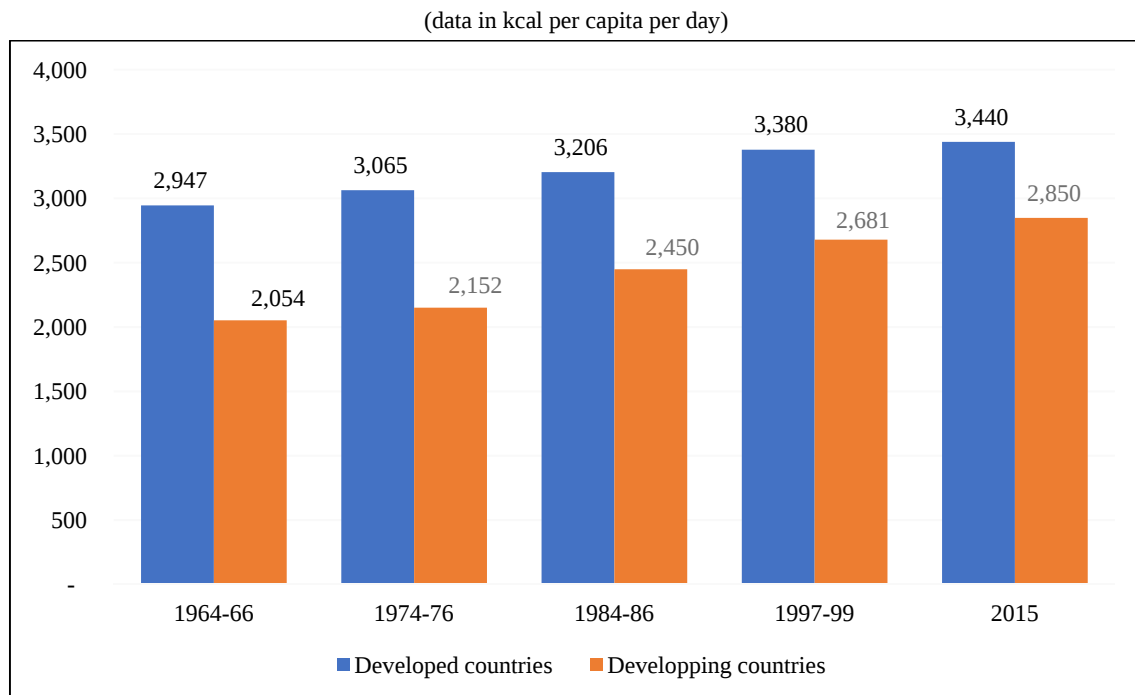


Figure 4. Trend in calorie consumption over time from 1964-1999 and projections to 2015 (Source: World Health Organization & Centers for Disease Control and Prevention, *The Atlas of Heart Disease and Stroke*, 2004).

In an unhealthy diet, sugary drinks are the main source of sugar. People who habitually consume this type of drink usually have an unhealthy lifestyle and underestimate the intake of other healthier foods such as fruit, vegetables, and milk. The social and economic context in which we live influences eating habits. In fact, all people who consume sugary drinks assiduously are the poor. In any case, as the consumption of these drinks increases, so does the risk of metabolic diseases (CREA, 2018). The WHO argues that only a specially created tax on these drinks would lead to a reduction in consumption, especially if there is a subsequent increase in the price of soft drinks of at least 20% (WHO, 2015b).

Sugar Tax in Italy

Italy, with Law No. 160 of 27 December 2019 (Article 1 Paragraph 661), also known as Budget Law 2020 (paras. 661-676), provided for the introduction of the Sugar tax, as a taxation to encourage companies operating in this sector to change their recipes by reducing the amount of sugar present in them and to discourage the consumption of sweetened soft drinks for an improvement in quality of life and public health (Eurispes, 2020).

Article 1 Paragraph 661 of Law No. 160 of 27 December 2019 specifies that sweetened beverages are defined as all products classified in CN code 2009 and 2202 of the Combined Nomenclature of the European Union, after dilution and packaged for sale with the addition of sweeteners, with an alcohol content of 1.2 per cent by volume or less. Sweeteners are all substances, both synthetic and natural, that give a sweet taste to beverages.

In particular, “fruit juices (including grape must) or vegetable juices, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter” are classified in CN code 2009 (Camera di Commercio di Torino, n.d.), while “Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavoured, and other non-alcoholic beverages, not

including fruit or vegetable juices of heading 2009” are covered by CN heading 2202 (Camera di Commercio di Torino, n.d.).

Article 1 Paragraph 666 of Law No. 160 of 27 December 2019 indicates the areas in which Sugar tax does not apply. In particular, it does not apply to sweetened beverages sold by the Italian manufacturer whether they are to be exported or consumed in EU Member States. Furthermore, sugar-sweetened beverages containing sweeteners in an amount not exceeding 25 grams per litre for finished products and 125 grams per kilogram for products destined to be diluted are exempted.

Law No. 178 of 30 December 2020 (Article 1 Paragraph 1086 Letter (c)), known also as Budget Law 2021, changed the ambit of exemption of the Sugar tax. In particular, the tax does not apply to sweetened beverages sold by the subjects referred to in Paragraph 664 Letter (a) of Law No. 160 of 27 December 2019.

The tax is due at the time of supply by the domestic manufacturer or, if different, by the domestic packaging agent, to consumers in the territory of the State, or to resellers. For products coming from EU countries, the tax is due at the moment of receipt of the sweetened beverages by the purchaser and, finally, at the moment of import into Italian territory from non-EU countries. This is indicated by Article 1 Paragraph 663 of Law No. 160 of 27 December 2019.

The taxable persons are the domestic manufacturer or the domestic packaging agent and the purchaser of sweetened beverages from EU countries. The importer of sweetened beverages from non-EU countries also must pay sugar tax, as referred to in Article 1 Paragraph 664 of Law No. 160 of 27 December 2019.

Among the changes brought about by the Budget Law 2021 is also the one concerning taxable persons. In particular, according to Article 1 Paragraph 1086 Letter (b) of Law No. 178 of 30 December 2020, the domestic manufacturer or the domestic packaging operator and the Italian resident or non-resident person “on behalf of which the sweetened beverages are obtained by the manufacturer or the operator of the packaging plant” (Article 1 Paragraph 1086 Letter (b) of Law No. 178 of 30 December 2020) are liable to pay the tax.

Article 1 Paragraph 665 of Law No. 160 of 27 December 2019 specifies that the amount of the tax is EUR 10 per hectolitre for finished products and EUR 0.25 per kilogram for products intended to be diluted. According to Article 1 Paragraph 671 of Law No. 160 of 27 December 2019 the Customs Agency is responsible for carrying out tax assessment, verification, and control activities; assisted by the Finance Police, it has the power to enter production, packaging, or storage facilities in order to obtain information useful for ascertaining the correct application of the provisions contained in Articles 661-676.

The penalties, with the Budget Law 2021, have been reduced as follows: in the event of non-payment of the tax there is an administrative penalty of double to five times the amount due, however not less than EUR 250. In the event of late payment, there is an administrative penalty of 25 per cent of the tax due, however not less than EUR 150. Finally, for the late submission of the declaration and for any other violation there is an administrative sanction ranging from 250 euros to 2,500 euros. These are specified in Article 1, Paragraph 1086 Letter (d) of Law No. 178 of 30 December 2020.

With the Decree of 15 October 2020, the Ministry of Economy and Finance published a table showing, for each substance that imparts a sweet taste to beverages, the indication of the conventional sweetening power and the equivalence of one gram of sucrose with the corresponding amount of the above-mentioned sweetening substances.

The entry into force of the Sugar tax was subject to three extensions: the first to 1 January 2021 with the Relaunch Decree (Decree-Law No. 34 of 19 May 2020, Art. 133), the second to January 2022 with the Budget

Law 2021, and the third to 1 January 2023 with the Budget Law 2022 (Article 1 Paragraph 11 Letter (b) of Law No. 234 of 30 December 2021).

The entry into force was postponed due to the current COVID-19 pandemic in order not to further burden food businesses already affected by the economic crisis caused by the pandemic.

The Effects of the Sugar Tax on Businesses and the Opinions of Trade Associations

According to a study conducted by Nomisma² (“The soft drinks sector in Italy in the post covid era”), commissioned by Assobibe³, the introduction of the Sugar tax will cause a 28% increase in taxation with a consequent penalisation of consumption and a fallout on a sector already heavily damaged by the pandemic (Regione Piemonte, 2021). This could result in a loss of EUR 180 million annually and on the employment side, an estimated 5,000 workers are at risk (Regione Piemonte, 2021). Particular attention is given to SMEs, which account for about 64% of the total companies in the sector, and which are at risk of making losses and a negative operating result with major repercussions on the balance of the sector (Associazione Italiana Industria BEVENDE ALCOLICHE [ASSIOBE], n.d.). Major trade associations such as Assobibe and Confagricoltura are against the introduction of the sugar tax as they do not consider it effective in reducing the incidence of diseases such as obesity and diabetes; rather, they propose investments in food education projects aimed at young students (ASSIOBE, n.d.).

Some Mentions of Sugar Tax in Europe and the World

Sugar tax is already in force today in about 50 Countries worldwide (Allcott, Lockwood, & Taubinsky, 2019).

Table 1

Sugar Tax in the World

Europe	Western Pacific	Africa, Eastern Mediterranean, and South-East Asia	America
Estonia (2018)	Philippines (2018)	Morocco (2019)	Colombia (2019)
Ireland (2018)	Brunei (2017)	South Africa (2018)	Bermuda (2018)
United Kingdom (2018)	Vanuatu (2015)	Bahrain (2017)	Peru (2018)
Portugal (2017)	Kiribati (2014)	India (2017)	Barbados (2015)
Belgium (2016)	Cook Islands (2013)	Maldives (2017)	Dominica (2015)
France (2012)	Tonga (2013)	Sri Lanka (2017)	Chile (2014)
Hungary (2011)	Fiji (2007)	Saudi Arabia (2017)	Mexico (2014)
Latvia (2004)	Nauru (2007)	Thailand (2017)	USA (8 località)
Norway (1981)	Palau (2003)	United Arab Emirates (2017)	Panama (2019)
Finland (1940)	French Polynesia (2002)	Saint Helena (2014)	Equador (2016)
Poland (2021)	Samoa (1984)	Mauritius (2013)	British Columbia, Canada (2021)
Spain (2021)		Seychelles (2019)	Newfoundland and Labrador, Canada (2022)
Island of man (2019)		Qatar (2019)	
Italy (2023)		Oman (2019)	
		Malaysia (2019)	

Source: Allcott et al. (2019).

² Nomisma is a company specialising in consultancy and market research, operating in particular sectors of the economy thanks to “the implementation of observatories that photograph the dimensions and trends of the main market segments” as stated on their official website: <https://www.nomisma.it/chi-siamo/>.

³ Assobibe is a Confindustria trade association of soft drink producers.

Many countries have adopted it to address both the problem of excessive sugar consumption and to limit the problems it causes to public health.

This policy is in accordance with WHO guidelines, which limit sugar intake to 10% of total daily calories (WHO, 2015a).

In 2021, three countries have adopted it, two of them in Europe: Poland and Isle of Man, and one in Canada. Many other countries in the World have introduced it, already in years before 2021, such as France (2012), Portugal (2017), Mexico (2014), Belgium (2016), and many others (Allcott et al., 2019).

Some examples considered most significant are given below.

Great Britain

In Great Britain, the so-called soft drinks industry levy came into force on 6 April 2018, i.e. the tax on drinks exceeding a certain sugar limit (HM Treasury, 2018), of which fruit juices and milk-based drinks are exempt (HM Revenue & Customs, 2018). In particular, the levy is around EUR 0.20 per litre (18 pence/litre) for drinks with a sugar content between 5 and 8 grams of sugar per 100 millilitres. The levy increases to about EUR 0.27 per litre (24 pence/litre) for all drinks with a sugar content exceeding 8 grams per 100 millilitres (HM Revenue & Customs, 2018). The entry into force of the sugar tax had been announced two years earlier and many companies reformulated their recipes before the arrival of this tax, with a reduction of 45,000 tonnes of sugar per year (HM Treasury, 2018).

France

In France, the Sugar tax was introduced in 2012 (Institute for Fiscal Studies [IFS], 2019). It was modified in 2018 and further in 2022. The levy is based on the content of added sugars: from 3.12 €/hl to 24.39 €/hl for drinks with an amount of added sugars from less than 1 kg/hl to 15 kg/hl. This levy affects drinks falling under CN codes 2009 (fruit and vegetable juices) and CN 2022 (mineral and aerated waters with added sugar or other sweeteners) (Entreprendre.Service-Public.fr, 2022).

Norway

Norway already introduced a sugar tax in 1922 (World Economic Forum, 2018). It was increased in 2018 and again in 2022. The sugar tax in 2022 amounts to NOK 8.60 per kilogram (about 0.83 €/kg). It does not apply to lactose, honey, 100 per cent maple syrup, and sugar for diabetics (The Norwegian Tax Administration, 2022). Furthermore, if introduced as an ingredient in another product, the latter will be exempt, e.g. sugar in commercial soft drinks will make the latter exempt. In Norway, there was a tax on soft drinks, but it was repealed on 1 July 2021 (The Norwegian Tax Administration, 2021).

Denmark

In Denmark, this tax came into force in 1930 at \$0.25 per litre. In 2011 it was changed: for drinks with more than 0.5 grams of sugar per 100 millilitres, the levy was \$0.12 per litre. In 2014, the tax was further modified with an increase in the levy: for beverages with less than 0.5 grams of sugar per 100 millilitres, the tax amounts to \$0.45 per litre (Goiana-da-Silva et al., 2020). This tax was abrogated as it was considered ineffective and an obstacle to business opportunities (W. M. K. Allen & K. J. Allen, 2020).

Studies About the Effects of Sugar Tax

Among the many studies on the effects of the Sugar tax, two examples will be given, both from the United States of America.

The study “A Salient Sugar Tax Decreases Sugary Drink Buying” (Donnelly, Guge, Howell, & John, 2021) investigates how ways of communicating the presence of the sugar tax can influence consumers’ purchasing choices and consequently a decrease in the consumption of these drinks. This study was conducted in shops at the University of San Francisco.

Consumers, generally, are against the payment of taxes, especially those affecting hedonic products such as alcohol and tobacco. In some States, these taxes have met with opposition from consumers and industry. Emblematic was the case of Cook County, Illinois, which abrogated the Sugar tax just after implementing it. It is probably for this reason that governors try to highlight the benefits of such taxes. Some experts have attributed the success of the SSB tax to Philadelphia for allocating its revenues to the pre-K education plan.

This study also tests whether the addition of the tax recipient could influence the purchases of drinks affected by the Sugar tax.

The study was conducted in two markets at the University of San Francisco (with 29,586 students) in 2018, the year in which the \$0.01/ounce sugar tax on SSBs came into effect.

Three conditions (control, tax-salient, and recipient-salient) were tested in which the price tags for the drinks were changed, in particular three tags on which different information were shown:

- In the “control” condition, the SSB tags indicated only the price of the drink (including the tax);
- In the “tax-salient” condition, in addition to the price of the SSB, the label indicated “includes the San Francisco sugary drinks tax” (the exact amount of the tax was not indicated);
- In the “recipient-salient” condition, the tag carried the price of the SSB and an indication of the recipient of the tax.

Some comparisons were also made with the 2016 and 2017 pre-tax data.

Table 2

SSB Purchases During the Study and Before the Study

	2018 (Study period)		2017 (Pre-tax)		2016 (Pre-tax)	
	Total drinks bought	SSBs bought (% of total)	Total drinks bought	SSBs bought (% of total)	Total drinks bought	SSBs bought (% of total)
Baseline	13.752	6.549 (47.6%)	15.392	7.466 (48.5%)	13.468	6.524 (48.4%)
Control	15.188	7.136 (47.0%)	17.144	8.444 (49.3%)	14.973	7.351 (49.1%)
Tax-salient	16.073	7.263 (45.2%)	14.537	7.346 (50.5%)	14.992	7.438 (49.6%)
Recipient-salient	14.852	6.615 (44.5%)	16.435	8.312 (50.6%)	13.937	6.999 (50.2%)

Source: Donnelly, Guge, Howell, and John (2021).

The baseline situation is before the study, in fact the two markets within the university did not display us drink prices.

In this situation, the introduction of the tax did not affect SSB purchases significantly compared to pre-tax years, just as the introduction of price tags (Control) did not particularly affect SSB purchases in 2018, while the introduction of the price tag (including tax) in 2018 led to a decrease in the consumption of sugar-sweetened beverages compared to the years 2016 and 2017. The addition of the words “include SF Sugar Tax” (Tax-salient) in 2018 reduced the purchase of SSBs compared to the “Control” and Baseline situation, i.e., compared to the situation where only the price tag was shown and compared to the situation where there was no price tag. Also comparing the “tax-salient” condition over time, it is possible to see the reduction in the

consumption of these beverages after the introduction of the tax and after the indication on the price tag of the presence of the tax compared to the years 2016 and 2017.

Finally, disclosing the recipient of the tax has further reduced the consumption of beverages subject to the Sugar tax, both in comparison to previous conditions and over time.

So, informing the consumer of the presence of the tax and the recipient contributes to reducing the consumption of these sugary drinks, thanks to the contribution of retailers who have published this information on their product labels.

A further study is the one on the non-pecuniary effects of sugar tax, in particular, we refer to the article “Non-pecuniary effects of sugar-sweetened beverage policies” (Ahn & Lusk, 2020). The purpose of this study is to investigate the non-pecuniary effects of implementing a tax on sugar-sweetened beverages. These effects can be both informative, i.e. consumers only discover the true salubrity of a certain food after the introduction of this tax, as well as the effects can also refer to the reactivity of the consumer who might react “against” the policy manoeuvre itself.

The aim of this study is to test the non-pecuniary effects after the introduction of the sugar tax on sugary drinks (SSB Tax Experiment) and after a limitation of the size of the sugary drink itself (SSB Size Ban Experiment).

Choice experiments (choice experiment: CE) were carried out; participants had to choose between five drinks (soda, diet soda, water, sparkling water, and aromatic sparkling water) which one they preferred (an additional option “none” was added to the five choices). Prices ranged from \$1.5 to \$2.25 depending on the drink.

The experiments were carried out in October 2016, in which only the SSB Tax Experiment was performed, and in August 2019, in which both the SSB Tax Experiment and the SSB Size Ban Experiment were performed.

Two choice experiments were carried out for the SSB Tax Experiment: a pre-tax experiment in which the base prices were \$1.25 and \$2.25, and one after the introduction of the tax with a price increase of \$0.02/ounce on soda (so prices increased to \$1.65 and \$2.65). The participants were divided into three groups. One group was given no information about the inclusion of the sugar tax and was simply asked to choose a drink (20oz) according to the different prices. The second group was informed of the imposition of the tax, so they were asked to choose a drink knowing of the presence of the Sugar tax, but keeping in mind that diet soda, water, sparkling water, and flavoured sparkling water were not affected by the tax. Finally, the third group was told that the price increase was justified by an increase in the cost of beets and sugar cane due to the drought, but to keep in mind that diet soda, water, sparkling water, and flavoured sparkling water were not affected by the tax.

Table 3

Comparison of SSB Purchases in the Pre- and Post-tax Periods in the SSB Tax Experiment

	2016 SSB Tax Experiment		2019 SSB Tax Experiment		
	No information	Tax information	No information	Tax information	Drought information
Pre-tax	30.32%	30.85%	21.09%	24.32%	21.06%
Post-tax	23.39%	25.37%	15.82%	17.41%	14.69%
Difference	-6.93%	-5.47%	-5.27%	-6.91%	-6.36%

Source: Ahn and Lusk (2020).

Based on the results of the experiment on the introduction of the Sugar tax, it emerged that in 2016, after the implementation of the tax, it was the group without the information on the presence of the tax that reduced Soda consumption more (-6.93%) than the group that was influenced by the presence of the tax information (-5.47%). While in 2019, when the experiment was repeated, it was the group that had the information of the presence of the tax that reduced the purchase of Soda more (-6.91%), after the implementation of the Sugar tax, than the group with no information on the tax (-5.27%). As well as it is always the group with the tax information that reduced their soda consumption more (-6.91%) than the group that was aware of the price increase due to the drought (-6.36%).

In this study, the market shares of the beverages in the choice experiments were also investigated.

Table 4

Simulated Market Shares in Groups With and Without Tax Information (Year 2016)

Choice option	Pre-tax	Post-tax	Difference
No information group			
Soda	24.74%	21.20%	-3.54%
Diet soda	14.90%	15.63%	0.73%
Water	24.75%	25.78%	1.03%
Sparkling water	16.55%	17.17%	0.62%
Flavored sparkling water	10.23%	11.10%	0.87%
None	8.83%	9.13%	0.30%
Tax information group			
Soda	30.06%	31.55%	1.49%
Diet soda	8.00%	7.37%	-0.63%
Water	25.07%	23.35%	-1.72%
Sparkling water	11.98%	12.32%	0.34%
Flavored sparkling water	19.89%	19.80%	-0.09%
None	5.00%	5.60%	0.60%

Source: Ahn and Lusk (2020).

In 2016, the group without information about the presence of the tax reduced Soda consumption by 3.54%, while the group that was aware of the presence of the tax even increased Soda consumption by 1.49%.

In the group without information, the market shares of water, sparkling water, and flavoured sparkling water increased, while vice versa the market share of water decreased in the group with tax information.

The increase in Soda's market share after being informed of a price increase following the introduction of the tax suggests a strong reactivity effect as also suggested by Just and Hanks' model (Ahn & Lusk, 2020). According to these authors, consumers are emotionally attached to the consumer goods they purchase more, so the introduction of this type of policy could lead buyers to double their purchases of goods restricted by a tax/policy.

While in 2019, following the repeat of the experiment, it was the group that was aware of the Sugar tax that reduced its purchase of Soda more (-1.92%) than the group that was not aware of the tax (-0.33%). On the other hand, it was the group that was aware of the increase in the price of Soda due to the drought that reduced Soda purchases more (-3.11%) than the group that was aware of the Sugar tax (-2.13%).

For the SSB Size Ban Experiment, two CEs were conducted: one pre size limitation where the drinks were 20 ounces and one after the reduction of the drink size to 16 ounces. The participants were divided into three

groups. One group was not given any information on size reduction and was simply asked to choose a drink based on price and size, considering that the largest drink was 20 ounces, and the smallest was 16 ounces. A second group was provided with information about the size reduction due to a policy banning the sale of Soda larger than 16 ounces. So, they were asked to choose a drink, but to keep in mind that diet soda, water, sparkling water, and flavoured sparkling water were not affected by the policy and that the largest Soda size was 20 ounces and the smallest was 16. Finally, the third group was told that the decrease in size was due to a shortage of plastic so the beverage manufacturers had to reduce the size of their drinks. They were also asked to choose a drink, but diet soda, water, sparkling water, and flavoured sparkling water were not affected by this decision.

Table 5

Simulated Market Shares in Groups With and Without Tax Information (Year 2019)

Choice option	Pre-tax	Post-tax	Difference
No information group			
Soda	13.66%	13.33%	-0.33%
Diet soda	7.94%	7.69%	-0.25%
Water	36.88%	36.25%	-0.63%
Sparkling water	12.11%	11.05%	-1.06%
Flavored sparkling water	15.98%	16.38%	0.40%
None	13.42%	15.30%	1.88%
Tax information group			
Soda	21.87%	19.95%	-1.92%
Diet soda	13.18%	12.89%	-0.29%
Water	27.97%	28.21%	0.24%
Sparkling water	12.03%	12.03%	0.00%
Flavored sparkling water	14.00%	13.17%	-0.83%
None	10.95%	13.74%	2.79%

Source: Ahn and Lusk (2020).

Table 6

Simulated Market Shares of Each Beverage in Drought Information Group Versus Tax Information Group (Year 2019)

Choice option	Pre-tax	Post-tax	Difference
No information group			
Soda	21.72%	18.61%	-3.11%
Diet soda	7.36%	8.42%	1.06%
Water	32.64%	34.14%	1.50%
Sparkling water	9.59%	10.01%	0.42%
Flavored sparkling water	14.29%	13.74%	-0.55%
None	14.40%	15.09%	0.69%
Tax information group			
Soda	18.43%	16.30%	-2.13%
Diet soda	13.21%	13.35%	0.14%
Water	34.26%	34.17%	-0.09%
Sparkling water	9.74%	9.09%	-0.65%
Flavored sparkling water	11.56%	11.36%	-0.20%
None	12.80%	15.73%	2.93%

Source: Ahn and Lusk (2020).

Table 7

Comparison of SSB Purchases in the Pre- and Post-tax Period in the SSB Size Ban Experiment

2019 SSB Size Ban Experiment			
	No information	Size ban information	Lastic shortage information
Pre-tax	22.12%	20.27%	21.02%
Post-tax	18.26%	14.52%	13.57%
Difference	-3.85%	-5.75%	-7.45%

Source: Ahn and Lusk (2020).

The group that was aware of the policy banning the sale of Soda larger than 16 ounces reduced Soda consumption more (-5.75%) than those who were not aware of it (-3.85%), but less than those who knew that because of the plastic shortage, Soda producers were forced to reduce the size (7.45%). It seems that the issue of plastics influenced consumers more than the policy on drink sizes.

Table 8

Simulated Market Share in Groups Without Information and With Size Ban Information (Year 2019)

Choice option	Pre-size change	Post-size change	Difference
No information group			
Soda	24.44%	21.93%	-2.51%
Diet soda	10.20%	10.41%	0.21%
Water	38.57%	38.61%	0.04%
Sparkling water	7.09%	7.20%	0.11%
Flavored sparkling water	8.92%	10.13%	1.21%
None	10.77%	11.72%	0.95%
Tax information group			
Soda	19.59%	16.08%	-3.51%
Diet soda	26.54%	26.60%	0.06%
Water	20.51%	20.44%	-0.07%
Sparkling water	10.54%	11.17%	0.63%
Flavored sparkling water	12.04%	13.10%	1.06%
None	10.77%	12.61%	1.84%

Source: Ahn and Lusk (2020).

In line with the above, market share analyses of beverages in the EC are reported. As can be seen in the tables above, the group that had information on the size ban reduced Soda consumption more (-3.51%) than the group that did not know about it (-2.51%), but less than the group with information on plastic, which reduced Soda purchases to -7.72%.

In conclusion, it can be said that in 2016 there were clear non-pecuniary effects, in line with Just and Hanks' thinking, while in 2019 these effects were present to a lower degree. The authors of this survey claim that in 2019, respondents may have already moved on from their initial reactions related to the soda tax; therefore, in 2019, as it was already widely discussed, respondents were most influenced by information and price effects.

Table 9

Simulated Market Shares Between the Group With Size Ban Information and the Group With Plastic Shortage Information (Year 2019)

Choice option	Pre-size change	Post-size change	Difference
Plastic shortage information group			
Soda	24.64%	16.92%	-7.72%
Diet soda	8.14%	8.85%	0.71%
Water	28.29%	29.02%	0.73%
Sparkling water	8.86%	9.54%	0.68%
Flavored sparkling water	15.74%	17.00%	1.26%
None	14.33%	18.66%	4.33%
Size ban information group			
Soda	29.22%	21.58%	-7.64%
Diet soda	10.87%	11.65%	0.78%
Water	28.17%	29.27%	1.10%
Sparkling water	12.27%	13.76%	1.49%
Flavored sparkling water	7.88%	9.39%	1.51%
None	11.60%	14.34%	2.74%

Source: Ahn and Lusk (2020).

Conclusions

The sugar tax was planned to induce companies producing sweetened beverages to change their composition by reducing the amount of sugar present and thus to try to change the misbehaviour of some consumers of these beverages. As previously indicated, excessive sugar consumption, especially in children and young people, can lead to serious damage to health, so that the WHO has suggested a sugar intake of no more than 10% of total calories per day (WHO, 2015a).

The main effects of this tax are as follows:

- Reducing the amount of sugar in beverages, as has happened for example in Great Britain and France.
- Changing the tax by increasing the tax levy, France and Norway are examples of this.
- The reduction in state revenues expected as a result of the change in the recipe for sugar-sweetened drinks.
- Reducing the consumption of sweetened drinks, as in France.

A negative consequence of the Sugar tax was recorded in Denmark as it negatively affected the Country's economy and employment as people moved to another Country without the Sugar tax for supplies.

In Italy, the effects of this tax will only be seen in future years as it has not yet come into force. To date, there are only a few predictions from trade associations.

In Italy, the sugar tax used as a tax lever should not be a means to hit unhealthy products, but rather a way to incentivise the evolution towards healthier products, since food education alone may not be a sufficient measure to tackle the health problems caused by obesity and malnutrition.

References

- Ahn, S., & Lusk, J. L. (2020). Non-pecuniary effects of sugar-sweetened beverage policies. *American Journal Agricultural Economics*, 103(1), 53-69. Retrieved from <https://doi.org/10.1111/ajae.12134>
- Allcott, H., Lockwood, B. B., & Taubinsky, D. (2019). Should we tax sugar-sweetened beverages? An overview of theory and evidence. *Journal of Economic Perspectives*, 33(3), 202-227. doi:10.1257/jep.33.3.202

- Allen, W. M. K., & Allen, K. J. (2020). Should Australia tax sugar-sweetened beverages? *Journal of Paediatrics and Child Health*, 56, 8-15. doi:10.1111/jpc.14666
- Associazione Italiana Industria Bevande Alcoliche. (2021). *Sugar tax incoerente rispetto ai messaggi di crescita proposti dal governo. Filiera delle bevande e PMI a rischio*. Retrieved from <http://www.assobibe.it/sugar-tax-incoerente-rispetto-ai-messaggi-di-crescita-proposti-dal-governo-filiera-delle-bevande-e-pmi-a-rischio/>
- Camera di commercio di Torino. (n.d.). *1.1 Classificazione delle bevande alcoliche*. Retrieved from <https://www.to.camcom.it/book/export/html/17206>
- Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria. (2018). *Linee guida per una sana alimentazione*. Roma: Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria.
- Donnelly, G. E., Guge, P. M., Howell, R. T., & John, L. K. (2021). A salient sugar tax decreases sugary drink buying. *Psychological Science*, 32(11), 830-1841. doi:10.1177/09567976211017022
- Entreprendre.Service-Public.fr. (2022). *Taxation des boissons*. Retrieved from <https://entreprendre.service-public.fr/vosdroits/F32101>
- Epicentro Istituto Superiore di Sanità. (2019). *Dall'Ocse i dati sull'impatto dell'eccesso ponderale sui bilanci nazionali*. Retrieved from <https://www.epicentro.iss.it/obesita/oecd-heavy-burden-obesity-2019>
- Epicentro Istituto Superiore di Sanità. (n.d.). *Dossier Alimentazione Guadagnare salute*. Retrieved from https://www.epicentro.iss.it/guadagnare-salute/formazione/materiali/GS_alimentazione.pdf
- Eurispes. (2020, October 23). Sugar tax, Italia ancora lontana dall'obiettivo. *Eurispes*. Retrieved from <https://www.leurispes.it/sugar-tax-italia-ancora-lontana-dalloobiettivo/>
- Goiana-da-Silva, F., Cruz-e-Silva, D., Bartlett, O., Vasconcelos, J., Morais Nunes, A., Ashrafian, H., ... Darzi, A. (2020). The ethics of taxing sugar-sweetened beverages to improve public health. *Frontiers in Public Health*, 8(110), 1-8. doi:https://doi.org/10.3389/fpubh.2020.00110
- HM Revenue & Customs. (2018). *Check if your drink is liable for the soft drinks industry levy. Find out which drinks are liable for the soft drinks industry levy, and how much you may need to pay*. Retrieved from <https://www.gov.uk/guidance/check-if-your-drink-is-liable-for-the-soft-drinks-industry-levy>
- HM Treasury. (2018). *Soft drinks industry levy comes into effect. The "sugar tax" will help to reduce sugar in soft drinks and tackle childhood obesity*. Retrieved from <https://www.gov.uk/government/news/soft-drinks-industry-levy-comes-into-effect>
- Institute for Fiscal Studies. (2019). *The evidence on the effects of soft drink taxes*. Retrieved from <https://ifs.org.uk/publications/14382>
- International Sugar Organization. (n.d.). *About sugar*. Retrieved from <https://www.isosugar.org/sugarsector/sugar>
- Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione. (2003). *Linee guida per una sana alimentazione italiana*. Retrieved from <https://www.aiabumbria.com/userfiles/files/3%20LINEE%20GUIDA%20INRAN.pdf>
- Legge n. 160 del 27 dicembre 2019.
- Legge n. 178 del 30 dicembre 2020.
- Legge n. 234 del 30 dicembre 2021.
- Ministry of Economy and Finance. (2020). Ministerial decree (15 ottobre 2020) Imposta sul consumo delle bevande edulcorate. Ministry of Economy and Finance (20A05722) (GU Serie Generale n.260 del 20-10-2020).
- Organization for Economic Co-operation and Development & Food and Agriculture Organization of the United Nations. (2021a). *OECD-FAO agricultural outlook (edition 2021)*. Retrieved from <http://dx.doi.org/10.1787/agr-outl-data-en>
- Organization for Economic Co-operation and Development & Food and Agriculture Organization of the United Nations. (2021b). *OECD-FAO agricultural outlook 2021-2030*. Retrieved from <https://doi.org/10.1787/19428846-en>
- Regione Piemonte. (2021). *Il Piemonte contro le tasse su plastica e zucchero*. Retrieved from <https://www.regione.piemonte.it/web/pinforma/notizie/piemonte-contro-tasse-plastica-zucchero>
- The Norwegian Tax Administration. (2021). *Excise duty on non-alcoholic beverages*. Retrieved from <https://www.skatteetaten.no/en/business-and-organisation/vat-and-duties/excise-duties/about-the-excise-duties/excise-duty-on-non-alcoholic-beverages/>
- The Norwegian Tax Administration. (2022). *Sugar tax*. Retrieved from <https://www.skatteetaten.no/en/business-and-organisation/vat-and-duties/excise-duties/about-the-excise-duties/sugar/>
- World Economic Forum. (2018). *Will a sugar tax help reduce obesity?* Retrieved from <https://www.weforum.org/agenda/2018/03/will-a-sugar-tax-help-reduce-obesity/>

- World Health Organization & Centers for Disease Control and Prevention. (2004). *The atlas of heart disease and stroke*. Geneva: WHO.
- World Health Organization. (2015a). *Information note about intake of sugars recommended in the WHO guideline for adults and children*. Geneva: WHO.
- World Health Organization. (2015b). *Fiscal policies for diet and prevention of noncommunicable diseases*. Geneva: WHO.