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Health Reform Monitor

Public health lessons from the French 2012 soda tax and insights on the modifications enacted in 2018[☆]

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ABSTRACT

In 2016, the World Health Organization officially recommended sugar-sweetened beverage (SSB) taxation as a strategy to reduce purchases, stimulate product reformulation and generate revenues for health-related programmes. Four years before, France had been one of the first countries to tax SSBs. However, the design of this tax was not considered optimal: its rate was flat, low, identical for SSBs and artificially-sweetened drinks containing no added sugars, and its initial public health justification was set aside in favour of budgetary concerns. In 2018, a new taxation scheme was enacted. Integrated in the Social Security Finance Bill, the tax on SSBs is now linearly indexed to the quantity of added sugars in the drink. In this article, we summarize the lessons learnt from the 2012 soda tax and offer insights on the potential public health benefits of the new tax enacted in 2018. A multidimensional framework aimed at gathering evidence about SSB taxation for public health drove our rationale so that we address: (1) the soda tax policy-change process; (2) its impact on price and purchases; (3) the consumer receptiveness to the tax and; (4) its legal framework. We also discuss the potential application of the tax to other foods/nutrients.

1. Introduction

In a context of increasing life expectancy and changing lifestyles, non-communicable diseases have become the leading causes of mortality and disability [1]. International public health authorities have repeatedly stressed the urgency of investing more in prevention given the nature of such diseases [2]. Food environments and dietary behaviours are one of the main drivers of non-communicable diseases [3].

Consumption of sugar-sweetened beverages (SSBs) is of particular concern and has been associated with a number of health problems such as tooth decay, weight gain, type 2 diabetes, cardiovascular diseases and cancer [4–8]. While the WHO recommends limiting daily energy intake from free sugars to less than 10% with additional health benefits to reducing it further below 5% [9], a daily consumption of one to two SSB portions may be enough to exceed this limit [10].

In order to promote a healthy diet, better results are achieved when

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combining interventions targeting individual behaviour with actions modifying consumer environments [11]. France has been quite proactive in this regard. The institutionalisation of the National programme for nutrition and health (PNNS), the ban on food and beverages vending machines in schools, compulsory health messages on food advertisements, improved food labelling through the Nutri-Score... are some of the "flagships" of nutrition policies implemented over the last 20 years [12,13]. In 2012, France also became one of the first countries to tax sodas. Since then, and despite the controversies surrounding the appropriateness of soda taxes for public health, this measure has come into force in more than fifty national, state or municipal jurisdictions [14] (see Fig. 1).

SSB taxation is now officially recommended by the WHO as a way of reducing purchases and generating revenue for health-related programmes [15]. Based on the literature and expert consultations, the WHO suggests that volumetric excise taxes, set according to the volume of a drink or the amount of an ingredient, are likely to be more effective than *ad valorem* taxes, in particular to avoid a shift to cheaper and eventually less healthy drinks [16]. Beverages generally targeted are characterised by the presence of added sugars. A minimum rate of 20% is recommended to influence consumer's behaviour and, when possible, variable rates according to the sugar content of the drink are likely to encourage manufacturers to modify their recipes [15,16].

In this regard, the soda tax enacted in France in 2012 was not optimal (see Table 1): its rate was flat and low and its scope was not based solely on a nutritional criterion (it also covered artificially-sweetened drinks). Moreover, its initial public health justification was set aside to respond to some budget-related considerations and a significant share of its proceeds was directed to the general budget [14]. However, the taxation scheme enacted in 2018 is better aligned with its public health objective (see Table 1). The tax, fully part of the Social Security Finance Bill, is now linearly indexed to the quantity of added sugars in the beverage [17].

In this article, we summarize the lessons learnt from the first soda tax implemented in France and offer insights on the potential public health benefits of the new tax as well as the questions it raises. Our rationale follows the interdisciplinary perspective of the SODA-TAX research consortium (2019–2023) on: (1) the policy process leading to the soda tax; (2) its impact on price and purchases; (3) the consumer receptiveness to the tax; (4) its legal framework. This outlook is driven by a

multidimensional approach aimed at gathering evidence about SSB taxation for public health [10], previous works of the authors and an updated review of the French and international literatures on the subject.

2. Socio-political processes underpinning the elaboration of soda taxation in France

An analysis of the policy process leading to the adoption of the 2012 soda tax highlighted a combination of contributing factors [14]. First, the on-going economic crisis forced the government to find new revenues without generating undue impact on consumers and economic operators. Second, the soft drinks industry, a prosperous industrial sector not perceived to be particularly anchored in the French territory (unlike e.g. the wine sector), may have been seen as a relevant target (among others), especially since soda taxation had already been contemplated (but to no avail) by past administrations. Third, the tax was championed by the Minister of budget who believed in the efficacy of food taxation to fight obesity. Fourth, since a majority of MPs primarily saw the soda tax as a revenue-generating instrument, the tax was extended to artificially-sweetened drinks and its proceeds partly earmarked for the farming sector to help producers facing high labour costs to compete with neighbouring countries.

Similar explanatory factors were reported in other jurisdictions. The congruence of health and budgetary problems also led to the justification of new food taxation e.g. in Denmark or the Pacific Islands [19,20]. *Policy entrepreneurs* [21] such as the French minister of budget were reported elsewhere e.g. in Mexico or Philadelphia [22,23], and so was the importance of a broad political consensus [18]. Over the last decade, results of the first real-world evaluations of soda taxes (e.g. in Mexico) helped in transitioning this policy instrument from a controversial and rarely adopted one to a WHO recommended strategy [16]. Today the challenge is no longer simply to get a soda tax passed, but to design it in such a way that it significantly impacts consumers' habits while nudging the industry towards reformulated recipes for their sodas, e.g. through tiered tax mechanisms like those in the United Kingdom or Portugal [24, 25].

However, as more countries are likely to adopt a soda tax or improve its design, many questions remain unanswered, such as the role played

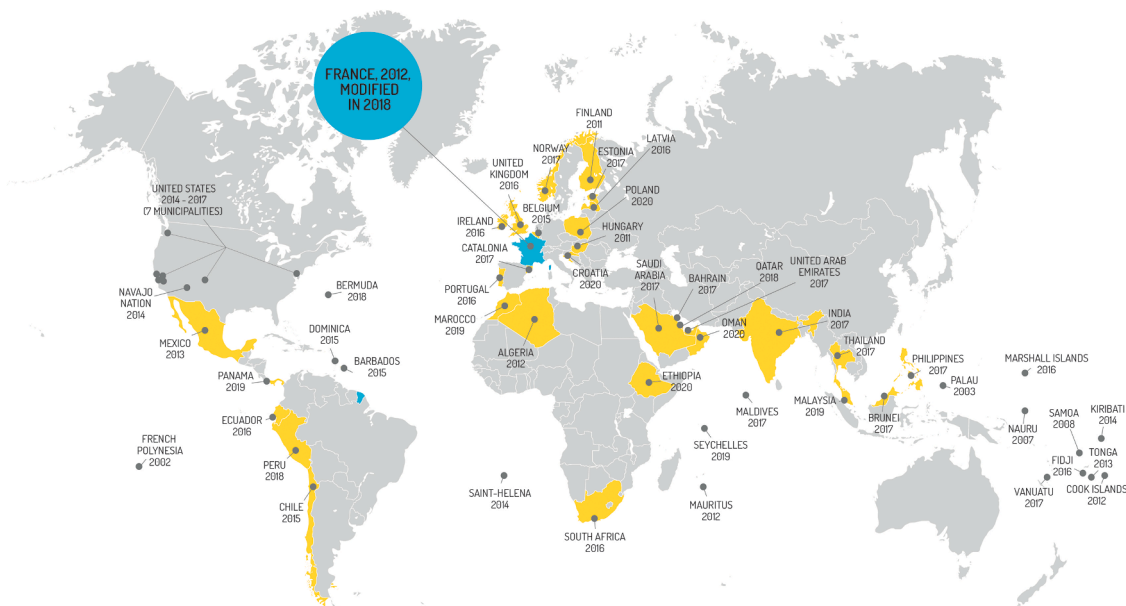


Fig. 1. Map of health-related taxes on non-alcoholic beverages adopted around the world (end of 2020)*.

* The soft drink taxes in Denmark and Cook County (Illinois, US) are not represented on the map as these taxes were respectively abolished in 2014 and repealed in 2017. Source: adapted and updated from [14].

Table 1
characteristics of soda taxes, as recommended internationally vs. enacted in France in 2012 and 2018.

	International recommendations ^a	French soda tax – 2012 ^b		French soda tax – 2018 ^c	
Scope	Behavioural effects most convincing for taxes on drinks with added sugars Relevance of including milk-based drinks, artificially-sweetened non-caloric drinks and 100% pure juices still uncertain and left for discussion	Beverages containing added sugars (carbonated beverages, fruit juices, fruit drinks and flavoured milks)	Artificially-sweetened beverages containing no added sugars	Beverages containing added sugars (carbonated beverages, fruit juices, fruit drinks and flavoured milks)	Artificially-sweetened beverages containing no added sugars
Rate	Eq. to a 10–20% price hike for behavioural effects on consumers If possible, rate based on specific nutrients of the product (e.g. on the sugar content for drinks with added sugars)	Flat rate: €0.076/litre =>eq. ≈ €0.02/can		Based on added sugars content: from €0.03/litre (if 5–15 g of added sugars / litre) to €0.24/litre (if 145–155 g of added sugars / litre) => eq. ≈ €0.05 / can of typical cola	Flat rate: €0.03/litre =>eq. ≈ €0.01/can of typical diet cola
Type	Volumetric excise tax	Volumetric excise tax		Volumetric excise tax	
Revenues earmarked for	Health care systems, the promotion of healthier diets and physical activity, the reduction of inequities (pre-affectation recommended)	Social security budget * (50%), general budget (50%)	General budget	Social security budget *	

^a adapted from WHO and WCRF [16,18].

^b adapted from [14].

^c adapted from [17].

* including public financing of health care and services.

by *policy learning* and *transnational policy transfer* processes [26,27]. In France, the elaboration of the new tax voted in 2017 recalls some of the circumstances of 2011, such as the legislative context (Social Security Finance Bill, voted on a yearly basis), the intervention of a *policy entrepreneur* (here the Social Affairs Committee of the National Assembly), a supportive government, and a much institution-centred public debate [28]. However, this new tax stands out for its strong *policy framing* towards youth health (no mention of generating new revenue for the State), its sophisticated design (rate indexed to the added sugar content in the drink) and the targeting of industry practices (rather than consumer behaviour) [29]. Indeed, an exploratory review of institutional documents since 2012 indicates that food taxes have continued to attract parliamentary interest, with the explicit aim of promoting public health (see, for example, reports submitted to the Senate in 2014 [30] and to the National Assembly in 2016 [31]). At the same time, the financial and health burden related to obesity and unhealthy eating in France has been highlighted by different institutions [30,32,33]. In 2016, the revised sugar guidelines published by the French National Agency for Food Safety also underlined the importance of limiting sugar intake based on scientific evidence associating sugar consumption (especially SSBs) with weight gain and its comorbidities [34]. Following the 2017 presidential election, the new general reporter of the Social Affairs Committee at the National Assembly (followed by the government and most political groups) mentioned these issues as a motivation for changing the soda tax. Several stakeholders also referred to WHO guidelines on the subject and to similar soda taxes adopted around the world to encourage product reformulation (e.g. in the UK) [35–37]. The beverage industry also appears to have been consulted on the issue and has shown some degree of openness to this change [35,38]. Further examination of this multi-year policy process in France would provide a valuable case study from which other jurisdictions could draw lessons to improve the implementation of this policy. It may also contribute to bolster the capacity of stakeholders in countering actions aimed to block its adoption or neutralize its impact on population health.

3. Impact of the French soda tax on prices, consumption and consumers' welfare

A large body of literature has documented the impacts of soft-drink taxation on prices and purchase behaviours. Ex-post evaluation studies find tax transmission rates at prices ranging from less than 50% for SSB taxes implemented in local US jurisdictions to more than 100% for taxes implemented in Chile, Denmark, Mexico or Portugal [39–48]. This

variability is explained by differences in tax design and market structures, and by heterogeneity in data, price measurement, and econometric designs. Such methodological differences explain that the three studies on the 2012 soda tax in France yielded transmission rates ranging from 40% to more than 100% [49–51].

Ex-post evaluations also show generally significant but small impacts on the consumption of beverages targeted by the tax [42,52–57]. For France, the 2012 tax reduced the consumption of SSBs by less than 5% on average [49,58]. Few ex-post studies have analysed in details the substitution behaviours that limit the effects of the tax on sugar intakes and thus its benefits for public health [57]. Consumer substitutions between product range, beverage categories and stores also complicate the definition of a valid control group for the quasi-experimental evaluation of national-level taxes. Some simulation studies show the importance of accounting for consumer substitutions towards untaxed sugary beverages such as pure fruit juices in France [58,59], or alcohols and sugary snacks in the UK [60,61].

On the supply side, companies, bottlers and distributors are strategically adapting to soda taxes. Work on British, Chilean and Portuguese cases has shown that a multi-rate tax indexed to the sugar content of beverages can encourage a reduction in the sugar content of new products, and the reformulation of certain varieties [62]. Nevertheless, the resulting impact on total sugar intake has yet to be evaluated in detail [63,64]. Reformulation efforts are likely to vary across firms depending on constraints of production cost and consumer attachment to beverage taste, but also on their brand portfolios, their competitive positions and their relations with distributors and bottlers [65]. Moreover, in the absence of consensus on the long-term effects of artificial sweeteners, the interest of reformulations replacing added sugars by artificial sugars remains debated.

Opponents of soft-drink taxes point out their regressivity, since they tend to generate higher welfare losses for low-income households. However, these households will also receive more of the corrective benefits of the tax if they consume more SSBs and if high-SSB consumers are relatively price-elastic [66,67]. The case of the French 2012 soda tax shows that the decline in consumption has been twice as large among low-income households as among high-income ones [58]. Income-related variations in welfare losses were small and were partly explained by residential selection, as modest households are more likely to be located in less competitive markets with higher pass-through rates [51]. In addition, these redistributive effects can be offset by transfers of tax revenues through, for instance, the funding of targeted health and prevention programmes.

As mentioned above, the 2018 redesign of the soda tax was thought out with the aim of encouraging companies to reduce the sugar content of their products. Recent analyses of the Soft Drink Industry Levy in the UK, a three-tiered tax, show that the 2016 announcement of its implementation in 2018 has prompted producers to reformulate their products, and is ultimately associated with lower sugar consumption from soft drinks [62,68,69]. However, unlike the three-tiered UK tax, the French one has sixteen tiers. This may either encourage gradual reformulations gently modifying consumer tastes or inhibit any effort by firms in the absence of clear target thresholds. When the 2018 reform was implemented, the business medias highlighted the heterogeneity of producers' strategies. Some producers had already started to focus on reformulations of their existing products, while others were more inclined to develop a portfolio of beverages perceived as 'healthy' (e.g. iced teas). Yet, some firms declared that they preferred to continue betting on the association between sugar and pleasure [70,71]. On the political side, government officials have claimed without substantial empirical evidence that the 2018 reform had a causal impact on the sugar content of products [72]. In this context, it would be worth documenting more completely the effects of the 2018 tax on the nutritional quality of the supply, and more specifically to disentangle the pre-existing trends in reformulation and innovations from the ex-post effect of the reform. It would also be important to identify the effects of these changes in the quality of supply on consumer prices, welfare and purchase behaviour, e.g. by replicating the methodology already used in an evaluation of the 2012 tax [51].

4. Receptiveness of French consumers to soda taxation

While support from independent health organizations [16,18] or even governmental bodies for the introduction of taxation on SSBs has increased over time, the opportunity of adopting such measures largely depends on their perceived acceptance by the general public. Surveys conducted in developed countries suggest that taxation is less accepted than other forms of regulation, such as front-of-pack labelling or marketing restrictions [73,74]. However, public perception and acceptance vary depending on the framing of the proposed taxation, and tend to increase when: 1) taxation of less healthy foods is proposed along with subsidies for healthier foods (e.g. fruits and vegetables), 2) when the revenue from the tax is targeted towards public health policies, or 3) when the taxation system is framed as a way to reduce obesity [73,75,76].

Also public acceptance and support for SSB taxation varies according to socio-economic status. A survey conducted in France among participants in the NutriNet-Santé cohort study investigated in depth perceptions around SSB taxation in 2012, a year after its implementation. It showed that overall support for the taxation of SSBs was on average at 48.5%, with higher rates of support being found when taxation was associated with a reduction in price of healthier foods or when revenue was stated as designed for the healthcare system (support increasing to 71.5% and 72.7%, respectively) [76]. One of the main determinants of SSB taxation acceptance appeared to be the educational level, with respondents with lower levels of education being less supportive of a taxation and more concerned on the injustice to the poor of such a policy [76].

Since its inception in 2012, awareness and acceptance of SSB taxation in France may have changed over time due to the continuous discussion on food taxation in the media or the framing of the new version of the tax. However, external factors may influence consumers' perceptions, in particular in the light of the current economic crisis. Finally, the interest for taxation of foodstuff having increased in recent years, the calls to include other types of foods, may concern consumers. Therefore, it appears worthwhile to investigate in depth the awareness, acceptance and perception of the soda tax, its changes over time and the potential of including other foods in a similar taxation scheme.

5. Legal framework of soda taxation in France

The adoption of an SSB tax – like any other fiscal measure pursuing public health objectives – must comply with international trade and European Union (EU) law rules [77–79]. If States retain a broad margin of discretion as to how they may tax goods, their freedom is subject to the principle of non-discrimination, which is enshrined in those rules. The law of the World Trade Organization (WTO) requires that the taxes imposed on imported products cannot exceed the taxes imposed on similar domestic products or products in competition [80]. The case law involving alcoholic drinks highlights the legal risks at stake: for example, the WTO Appellate Body decided that the measure that the Philippines had adopted on distilled beverages was discriminatory on the basis that it favoured domestic ingredients (cane sugar, coconut...) over imported ingredients while these ingredients were considered competitive or substitutable [81]. In the absence of common EU rules on the taxation of SSBs, taxes cannot directly or indirectly discriminate against imported products and exceed those applicable to similar domestic goods or goods in competition. Internal taxation must not be protectionist and has to be origin-neutral [82]. It is also necessary to ensure that the taxes directly or indirectly applicable to imported goods are not classified as State aids (e.g. Danish fat tax and meat and dairy products [83]).

The parliamentary debates that led to the adoption of the French 2012 soda tax specifically mentioned the relationship between economic freedoms and public health imperatives. However, in sharp contrast to what tends to happen in relation to the taxation of alcoholic beverages whose impact on the national wine industry gives rise to tensions [84], the adoption of the soda tax did not lead to a careful scrutiny of the potential discriminatory effects it could have between domestic and imported goods. In this respect, it is likely that food taxation measures based on nutrient profiling would have fewer risks of being discriminatory or protectionist, even though they apply to different food categories. Rather, in 2012, the legislature was more worried about the possibility that its soda tax legislation may be challenged as incompatible with the French Constitution. It is indeed essential to determine what is the real objective and justification of the tax to ensure that its payment is fair. In 2018, the public health objective of the soda tax is very clearly established as the price effect is such as to deter consumers from buying SSBs and therefore incentivise manufacturers to reformulate their products. In this respect, the 2018 soda tax based on sugar content is more clearly oriented toward public health objectives.

However, one of the arguments often put forward in favour of SSB taxes is absent from the French regulatory framework: namely, the objective to compensate for the collective costs resulting from the harmful consumption of free sugars. The specific earmarking of the soda tax revenue for the sickness branch of the Farmers' Social Security Scheme indicates that this new tax rather aims at filling a budget hole than covering the expenses related to the consumption of the SSBs in the general population. Another criticism relates to the complexity of its collection system (which combines several taxes on beverages) and the fact that its calculation relies exclusively on the taxpayer (here, the manufacturer or importer). A legal examination of these potential shortcomings would help better understand implementation challenges related to health-related food taxes.

6. Conclusions

This overview of the literature related to the French soda taxes highlights the interdependence of political, economic, health and legal issues in the making of this instrument (see table 2). On the one hand, the policy process leading to the adoption of the tax in 2012 was based on a weak public health rationale and tax design, and generated modest effects on SSB consumption. On the other hand, the tax was groundbreaking as it offered an opportunity to measure its impact on

Table 2

summary of lessons drawn from the 2012 soda tax and insights on the modifications enacted in 2018.

French soda tax – lessons from 2012	French soda tax – insights from 2018
<ul style="list-style-type: none"> • The tax was primarily designed and adopted as a revenue-generating instrument in a context of public deficit rather than as a public health measure. • The legislature made sure that the soda tax would not be challenged as incompatible with the Constitution but its rate was flat, low and identical for SSBs and artificially-sweetened drinks containing no added sugars. • The soda tax transmission rates onto prices ranged from 40% to more than 100% depending on the studies. The tax reduced the consumption of SSBs by less than 5% on average, with a decline in consumption twice as large among low-income households as among high-income ones. • 48.5% of the population globally supported the measure one year after its implementation, with higher rates of support when taxation was associated with a reduction in price of healthier foods or when its proceeds were stated as earmarked for the healthcare system. 	<ul style="list-style-type: none"> • The French public health context as well as international recommendations and experiences were mentioned as a motivation for changing the soda tax: it was primarily designed to make manufacturers reduce the sugar content in beverages and to promote youth health. • Taxes based on nutrient profiling are less likely to be deemed discriminatory or protectionist: the new soda tax, linearly indexed to the quantity of added sugars in the drink, is more clearly oriented toward a public health objective. • In 2018, the medias highlighted the heterogeneity of producers' strategies: some had already started reformulations; others were more inclined to develop a portfolio of 'healthy' beverages; others declared that they preferred to continue betting on the association between sugar and pleasure. • The acceptance of the soda tax may have changed over time due to the continuous discussion on food taxation or the framing of the new tax; recent external factors (e.g. economic crisis) may also influence consumers' perceptions.

consumption and its performance in terms of equity and social acceptability. In addition, and similarly to other European countries, its legal viability was not called into question. From there, an exploration of the policy process having led to the modification of the soda tax in 2018 suggests a progressive political turn to make it an explicit public health measure aimed at fostering a reduction in the sugar content of SSBs by the industry. Among other factors, this change builds on French and international evidence and guidelines about sugar consumption as well as on tax designs experimented in other countries. Despite preliminary positive effects detected on the French SSB market, the impact of the new tax on consumer behaviours and industry practices remains to be precisely evaluated. Such analysis could shed light on the relevance of the tax, contribute to the monitoring of its effects and eventually suggest adjustments, as the evaluation of the French soda tax is actually part of the 56 measures included in the fourth National programme for nutrition and health (PNNS 2019–2023).

As more and more soda taxes are being adopted around the world and their design is being refined in several jurisdictions [85], assessing under what conditions the soda tax could be extended to other foods/nutrients also appears necessary. Recently in France, parliamentary initiatives have proposed to extend the “soda tax model” to other foods based on sanitary, social and ecological considerations, and to earmark the tax proceeds for favouring access to healthier foods, e.g. fruits and vegetables [86–88]. Such proposals still face resistance, partially due to concerns regarding their feasibility and acceptability [89]. As suggested by the WHO [16], a nutrient profile model for designing and implementing fiscal policies may help overcome this challenge. In France, several institutions have suggested to work on this option building on the national Nutri-Score labelling system displayed by manufacturers on their products on a voluntary basis [33,86,90]. Nevertheless, an extension of the tax to other foods/nutrients would necessarily have to take into account the difficulties to collect the tax, the litigation risks as well as concerns for their acceptability. Indeed, a few years after the first health-related food taxes, in a context economically tense, marked by unforeseen sanitary threats (e.g. COVID-19) and raising ecological

concerns (e.g. climate change), it would be worth clarifying whether and under what conditions behavioural taxation remains an instrument gaining traction. Such a survey would provide important insights into the determinants of soda taxation acceptance and the potential for the inclusion of other foodstuff in future nutrition policies in France and elsewhere, with a specific focus on more vulnerable populations.

Declarations of Competing Interest

None.

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