The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studi...
The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies

Luc Louis Hagenaars a, *, Patrick Paulus Theodoor Jeurissen a, Niek Sieds Klazinga b

a Celsius Academy for Sustainable Healthcare, Radboud University Medical Centre, Nijmegen, the Netherlands
b Department of Social Medicine, Academic Medical Centre, Amsterdam, the Netherlands

ABSTRACT

Taxation of energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs) is increasingly of interest as a novel public health and fiscal policy instrument. However, academic interest in policy determinants has remained limited. We address this paucity by comparing the policy content and policy context of EDF/SSB taxes witnessed in 13 case studies, of which we assume the tax is sufficiently high to induce behavioural change.

The observational and non-randomized studies published on our case studies seem to indicate that the EDF/SSB taxes under investigation generally had the desired effects on prices and consumption of targeted products. The revenue collection of EDF/SSB taxes is minimal yet significant. Administrative practicalities in tax levying are important, possibly explaining why a drift towards solely taxing SSBs can be noted, as these can be demarcated more easily, with levies seemingly increasing in more recent case studies.

Despite the growing body of evidence suggesting that EDF/SSB taxes have the potential to improve health, fiscal needs more often seem to lay their policy foundation rather than public health advocacy. A remarkable amount of conservative/liberal governments have adopted these taxes, although in many cases revenues are earmarked for benefits compensating regressive income effects. Governments voice diverse policy rationales, ranging from explicitly describing the tax as a public health instrument, to solely explicating revenue raising.

© 2017 Elsevier B.V. All rights reserved.

1. Introduction

Over the past few years there has been significant growth in political, public and academic interest in the taxation of energy-dense foods (EDF) and sugar-sweetened beverages (SSB). A growing body of evidence suggests that such fiscal measures have the potential to improve population health [1–4]. Taxation has already been proven effective convincingly for tobacco and alcohol [5]. The additional revenues of these taxes may further increase their attractiveness for policymakers. Not only can this be useful in times of budgetary deficiencies, it can also broaden the financing model of health systems. Currently most countries are highly reliant on income taxes, which is a barrier for employability because increasing the marginal tax rate means increasing personnel costs. The reuse of taxes on unhealthy commodities in the fiscal domain of health can contribute to decreasing income tax dependency [6].

More important is that a tax on EDFs and SSBs can correct for the negative externalities associated to excess consumption of these products, by increasing their prices to their true social costs. It is probable that a case for such a Pigovian tax can be made given the relatively low prices of most EDFs and SSBs and their impact on health and associated medical costs, but it should be noted that quantification of all externalities is still in its infancy. The case for SSBs may be stronger since their inflation-adjusted price has gone down over the past decades whereas prices of fruits and vegetables have gone up [7,8].

Profound policy barriers exist for the uptake of EDF and SSB taxation. Apart from the fact that consumption taxation is regressive [5], which can cause political debate on its own, food taxes also lend themselves to considerable ethical scrutiny, as they touch the base of the debate where protection of the public becomes restriction of personal freedom [9]. Public support for EDF/SSB taxes there-

* Corresponding author at: Maretakstraat 109, 2563 HM, The Hague, the Netherlands.

E-mail addresses: luchagenaars@gmail.com, luc.hagenaars@radboudumc.nl (L.L. Hagenaars), patrick.jeurissen@radboudumc.nl (P.P.T. Jeurissen), n.s.klazinga@amc.uva.nl (N.S. Klazinga).

http://dx.doi.org/10.1016/j.healthpol.2017.06.011
0168-8510/© 2017 Elsevier B.V. All rights reserved.
fore depends on the normative discussion whether a government should only use arguments of health promotion (promoting healthy behaviour) or also of health protection (protecting the population against health dangers) to legitimize the prevention of obesity and diseases related to excess consumption of EDFs/SSBs. In addition, normative preferences also influence whether people find the nature of the intervention appropriate. Since EDF/SSB taxes are a form of collective prevention, they may be found inappropriate as they also affect people who are not at risk for developing obesity or related diseases. Furthermore, these taxes interfere with the interests of the food and soda industry, who exert strong lobby efforts for policies in favour of their interests and are accused to ‘puzzle’ lay people’s nutritional literacy [10]. The food industry contributes to framing obesity as merely a matter of personal responsibility in addition to portraying a lack of physical activity as the primary cause; hence framing strategies that aim to decrease public acceptance for policy measures such as EDF/SSB taxes by stating they infringe on personal freedom and choice [10,11]. Another complication concerns the difficulty to robustly identify the health effects of EDF/SSB taxes. There exist many confounding factors such as substitution to other foods, and external reasons for price fluctuation and dietary behaviour.

Furthermore, health effects may only be visible after several years or even decades. Available evidence comes mainly from modelling studies which do take substitution effects into account, or observational studies of separate episodes of the causal chain linking an EDF/SSB tax to health outcomes [12]. Put simple, a case for such taxes can be made as the available evidence does point to effectiveness, but this evidence is less clear-cut as compared to tobacco and alcohol where addiction components are publicly accepted. A final complexity is that demand for most foods is not very elastic, which means that industry and retailers can shift relatively large parts of price increases onto consumers without enduring large consumption decreases. A meta-analyses conducted by Green, Cornelsen [13] for instance ranges the elasticity of foods in high-income countries from $-0.36$ to $-0.61$, with low- and middle income countries having higher price elasticity. Consumers seem more responsive to SSBs, with price elasticity estimates of soft drinks in the USA for instance ranging between $-0.79$ [14] and $-0.86$ [15]. Because of relatively inelastic demand experts argue that price increases should be tangible in order to generate meaningful behavioural effects. A sales tax of 20% or an excise of 1 cent per ounce for SSBs are mentioned [16]. However, in the world of policy, compromises must be made. Such high levies and price increases may prove unrealistic in many policy settings, as policy making not only develops on the basis of puzzling (that is using evidence-based strategies) but also on powering (that is influencing people, in particular to control resources) [17].

1.1. Study objectives

Taxation of unhealthy EDFs and SSBs has potential both as a public health tool but also in the light of health systems’ financial sustainability. Yet profound barriers disable its uptake. In the academic literature, attention has mostly been focussed on whether EDF/SSB taxes work, with little or no attention being paid to the policy determinants. We address this paucity of research by providing an overview of patterns observed in the policy content and policy context of 13 case studies. To our knowledge, this is the first study that investigates the policy comparatively from such a wide perspective.

2. Methods

In order to present an overview of patterns observed in the policy content and policy context of EDF/SSB taxes on the basis of systematically collected data, we first identified case studies of which we assume the tax has potential to meaningfully impact dietary behaviour using a purposeful sampling strategy. We therefore only included cases where the level of taxation is relatively high. We then identified a number of possible policy determinants on the basis of the policy analysis models of Walt and Gilson [18] and Leichter [19], key publications related to EDF/SSB taxation, and research group discussions. Subsequently these variables were filled for all cases using scientific literature, government publications where applicable, and grey literature where necessary. We finally consulted experts on individual case studies to validate our information.

2.1. Inclusion rationale

In many countries value added taxes or fiscal import duties apply to standard foods and drinks, but only in few countries unhealthy foods encounter additional taxation. Where unhealthy foods are targeted specifically, levies are often too low to expect meaningful dietary effects since EDFs are relatively price inelastic [1]. In this study we include a number of cases of which we assume that the fiscal policy under investigation has sufficient potential to improve diets, by only including cases that are widely recognized internationally for having tax levies that may according to economic theory be high enough to meaningfully impact dietary behaviour. A World Health Organisation (WHO) European Region paper [20] on the use of price policies to promote healthy diets served as a starting point for our purposeful sampling. It identifies four principal cases where the WHO assumes the tax has the specific objective to influence diet, and where the tax is high enough to acknowledge the potential for dietary effects even though the primary purpose is raising revenue. These are the tax on saturated fats in Denmark, the tax on sweets, ice cream and soft drinks in Finland, the public health product tax in Hungary, and the tax on sugar- and artificially sweetened beverages in France. Other widely recognized cases concern the soft drink taxes levied in four Pacific countries (Fiji, Samoa, Nauru, French Polynesia) [21], the SSB tax of Berkeley, California [22], and the tax on sodas and snacks in Mexico [23]. In addition, the recently announced SSB tax in the UK (due for implementation in 2018) is included as the proposed levy is relatively high and the policy is subject to intense public and political scrutiny [24]. The same goes for the tax on sugar- and artificially sweetened beverages of Philadelphia (implemented in 2017) [25]. We finally included the South African SSB tax (due for implementation in 2017) because it was announced explicitly as an instrument to tackle South Africa’s obesity crisis while the proposed levy is relatively high [26,27]. In total 13 case studies were included.

2.2. Conceptual framework: exploring the policy determinants of EDF/SSB taxes

We use elements of Walt and Gilson’s [18] health policy analysis triangle as a framework to categorize policy elements. The health policy triangle is a highly simplified representation of policy reality, where a policy’s context, content and process interact with each other as well as actors involved. We primarily focus on content and context variables. A systematic, comprehensive description of policy processes and the role of actors involved requires thorough investigation of individual cases and empirical data collection, which is outside the scope of this comparative analysis. Fig. 1 emphasizes how we use this model.

We classify context and content elements of EDF/SSB taxes according to the categorization presented in Table 1. Our choice of variables was guided on the basis of key publications including references [5,8–11,16,20–23,28–30], as well as research group discussions. To our knowledge no such framework for compari-

Please cite this article in press as: Hagenauers LL, et al. The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies. Health Policy (2017), http://dx.doi.org/10.1016/j.healthpol.2017.06.011
son hitherto exists. Our approach should therefore be seen as a first attempt to systematically explore the policy determinants of EDF/SSB taxes.

Elements describing the policy content (defined here as the substance of a policy which details its constituent parts) constitute the policies’ general and technical characteristics, and the policy impact. Under general characteristics we describe 1) targeted commodities, 2) current status, and 3) the government’s stated rationale at the point of introduction. Under technical characteristics we 1) describe tax rates and mechanisms, and 2) whether revenues are earmarked. Under impact we describe 1) the (expected) revenue collected by the tax and how this compares to total tax revenue, 2) price pass-through to consumers and 3) consumption change of the targeted commodities, 4) substitution effects and 5) effects on health outcomes.

We used the categorization method of Leichter [19] for context variables (defined here as systemic factors that may have an effect on the eventual policy content), which identifies situational, structural, cultural and exogenous factors. Situational factors encompass the relevance of the tax in the light of the broader fiscal situation. This is important because taxation policy is mostly dealt with in Ministries of Finance, where fiscal effects are central on the agenda, not necessarily public health [6,21]. The prevailing way of framing the issue is another vital situational element, because framing strategies can influence popular support in lifestyle-related policies [28]. Under this variable we describe elements of the policy process, however we do not assume this makes our process analysis complete. The final situational factor concerns the composition of the government adopting the policy.

Under structural factors we include obesity rates, to analyse the severity of the problem. We do so by comparing obesity rates for adults and children internationally and, where applicable, nationally. (Inter)national comparison is also used to investigate levels of socio-economic inequality. This is important because consumption taxes have regressive income effects, which receives considerable political attention. The share of goods and services taxation as part of total tax revenues is also included, as it indicates taxation traditions. Cultural factors constitute the room for lobbyists to influence policy, and general public support for health promotion policies. With these variables we address population perception. Under exogenous or international variables we explore the chance whether cases may have set a precedent. We assume that a case is most likely to do so if it receives considerable political, public and media attention nationally and globally, while in such cases industry will likely deploy strong efforts to block the policy [11]. The ease of buying the taxed product across the border is explored as well, because this influences the effectiveness of an EDF/SSB tax. Finally, the role of international trade agreements promoting free trade is analysed as this can influence policy content [21,31,32].

### 2.3. Data collection methodology

The identified variables are presented in Table 1. For policy content, government documents (using mostly budget announcements) form the primary sources of information for both general and technical characteristics as well as the revenue collection variable of policy impact. OECD revenue statistics [33] (excluding the Pacific cases, Berkeley and Philadelphia) describe the share of the tax in total government revenues. When a language barrier did not allow us to look into government documents, scientific and sometimes grey literature was used.

For policy impact, excluding revenue collection, peer-reviewed studies evaluating real world effects on price change, consumer behaviour and health outcomes formed primary sources of information. If peer-reviewed studies were not available, we used grey literature: a report of the Banque de France [34], WHO [20], and casual monitoring in the Pacific countries [21].

---

**Table 1** Choice of variables.

<table>
<thead>
<tr>
<th>Policy Content</th>
<th>General characteristics</th>
<th>Situational</th>
<th>Structural</th>
<th>Cultural</th>
<th>International/exogenous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What commodity/nutrient</td>
<td>Relevance to governmental fiscal priorities</td>
<td>Obesity among adults &amp; overweight among children</td>
<td>Room for lobbyists to influence policy</td>
<td>Possibility of avoiding tax by cross-border shopping</td>
</tr>
<tr>
<td></td>
<td>When first levied</td>
<td>Prevaling way of framing the problem</td>
<td>Level of socioeconomic inequality (GINI-coefficient)</td>
<td>(using the corruption perception index of Transparency International)</td>
<td>Possibility of precedent effects</td>
</tr>
<tr>
<td></td>
<td>Current status and history of major adaptations</td>
<td>Composition of executive government implementing the policy</td>
<td></td>
<td>Public support for healthy lifestyle promotion policy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stated government rationale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tax mechanism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tax rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are revenues earmarked?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Expected) revenue, absolute &amp; as a share of total tax revenue</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Price pass-through to consumers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumption change of targeted commodity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Substitution to other commodities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Health outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Fig. 1. Health Policy Analysis Triangle, adapted from original of Walt and Gilson [18]. Full circles refer to elements of the policy cases that we analysed systematically; dashed circles refer to elements of the policy cases of which we only describe highlights readily available in the literature.
For policy context, a number of variables allowed us to use (inter)nationally comparable quantitative indicators. We use WHO data [35] to compare obesity rates among adults for all nations included, and Centres for Disease Control and Prevention data for the US cities of Berkeley and Philadelphia [36,37]. For children’s obesity rates, we used OECD data [38] to compare nations. Levels of income inequality, expressed by GINI-coefficient, were compared internationally using World Bank data [39], with Bloomberg data for Berkeley and Philadelphia [40]. OECD data allowed us to compare the actual share of goods and services taxation in total tax revenue [33].

We used the corruption perceptions index of Transparency International [41] as an indicator of the influence of lobbyists in politics, and the tobacco [42] and alcohol [43] control scales as indicators how far European countries’ health promotion policies reach [44]. For non-European cases these scales hold no data.

Situational and exogenous/international variables did not allow for the use of quantitative indicators: short elaborations were written on the basis of publications in scientific journals [21,29,31,34,45–49], WHO reports [20,50], two academic books [11,22], government budget speeches in which the tax was announced [24,28,51,52], and transcripts, videos, or government press releases of City Council/Parliament meetings during which the issue was debated [53–55]. Reports of the Banque de France [34], National Heart Forum [56], KPMG [57], and two newspaper article [58,59] were used to fill information gaps for France, South Africa, and Philadelphia.

Data sources, indicators used, and mapping techniques are described in further detail in appendices 1 and 2.

2.4. Expert consultation

Given that interpretation of qualitative data can be prone to researcher interpretation bias, we consulted experts on individual case studies. This served as a factual check of the accuracy and completeness of our information. Experts were found for Denmark, Finland, France, Hungary and the United Kingdom using the OECD network of health committee delegates. The health committee implements OECD’s work on health and consists of policymakers of national ministries of health. The lead author of the study of Thow, Quested [21] took up this role for the Pacific cases, and those of the studies of Falbe, Thompson [60] and Cawley and Frisvold [61] for Berkeley. For Philadelphia local policymakers were consulted, and for South Africa we used the open round of the government for receiving commentary on its SSB tax. We did not succeed in consulting an expert for Mexico. A list of consulted experts can be found in Appendix C in supplementary material.

3. Results

The complete results are presented in appendices 1 and 2 in supplementary material. We here point out common patterns observed in the policy content and policy context of EDF/SSB taxes by describing the differences and similarities witnessed in the 13 case studies.

3.1. Policy content

Of all unhealthy foods, the taxation of SSBs seems most appropriate and realistic from a policymaking perspective, as evidenced by a drift of the most recent cases towards solely taxing SSBs. All taxes now target SSBs, with the exception of Denmark’s fat tax that has only been in place for one year. In Finland, Hungary, Nauru, French Polynesia, and Mexico also specific foods such as sweets, ice cream, snacks, condiments and confectionery were taxed, with Hungary having the widest scope of products. Finland has slimmed down its scope by only letting SSBs remain as from 2017. France and Philadelphia are peculiar cases; here artificially sweetened beverages are subject to the same tax as SSBs, whereas original policy proposals only included SSBs.

At the point of writing, most taxes were very recently introduced, while they were about to be introduced in the UK (2018) and South Africa (2017). Only Finland has had a very long tradition of taxing unhealthy foods, with a first ‘sweets tax’ in 1926. The Pacific cases also have a somewhat longer food tax history, with Samoa implementing its first soft drinks tax in 1984 while the others were implemented after 2002. All other cases implemented their taxes after 2011; taxing EDF/SSBs can be seen as a relatively new policy instrument.

In some cases, changes were applied after implementation. Denmark’s fat tax was quickly abolished, whereas in Finland additional foods were added to the scope of the tax from 1926 to 2000, before sweets and ice cream were removed, added back, and removed again in 2000, 2010 and 2017 respectively.

Official stated rationales of governments differ, with many but not all explicitly referring to it as a health promotion measure. The governments of Denmark, Hungary, Nauru, French Polynesia, Berkeley, Mexico, the UK, and South Africa officially announced the policy as a health promotion measure. On the other hand, the governments of Finland, France, Fiji, Samoa and Philadelphia more prominently or solely mention revenue raising as the central aim.

Of all tax mechanisms used, most often there is an excise duty that targets a specific product, with inclusion based on composition. Only in Denmark the nutrient itself (saturated fats) was targeted, which seems to have contributed to its abolishment due to administrative complexities. In the other cases, a specific tax rate applies to – for instance – SSBs exceeding a certain amount of sugar per litre, or regardless of how much sugar they contain. Crucial seems to be the accurate demarcation of product categories and practicability in administering tax levying.

The level of taxation is difficult to compare because currencies, the level of competition, and purchasing powers differ. Tax levels should therefore ideally be adjusted for purchasing power, but this was outside the scope of our study. The products subject to taxation themselves differ as well, as does their base line tax rate. Still, we can say that some cases exert a stronger tax pressure than others. Some of the Pacific cases, as well as Berkeley and especially Philadelphia with their SSB taxes of $0.01 and $0.015 per ounce respectively bear relatively high tax levels. France has a relatively low tax level with a rate of €0.11 per 1.5L.

It is interesting that some recent cases (Berkeley, Philadelphia, UK, and South Africa) portray relatively high levies. A momentum may have been set for SSB taxes encouraging policymakers to use relatively high levies as they draw upon the experience of earlier attempts.

Cases also differ when it comes to the earmarking of the raised revenues. Taxes are not earmarked in Denmark, Finland, Fiji, Samoa, Nauru, Berkeley, South Africa, and Mexico; French Polynesia, Philadelphia, and the UK do specifically earmark revenues for community, health promotion or educational programmes; Hungary and France earmark part of the revenues for healthcare. It should be noted that a fine line exists with implicitly earmarking revenues. Mexico stipulates that it plans to use SSB/EDF revenues for portable water in public schools in low income areas and South Africa plans to use revenues for health promotion, yet both countries do not explicitly earmark. The same goes for Berkeley: an SSB panel of experts which makes recommendations how the City should fund programmes to reduce SSB consumption, was announced in the same Ordinance as the SSB tax. Revenues are not explicitly linked to this panel, because the SSB tax would then have required a supermajority in the referendum deciding upon its faith according to Californian tax law [62].

Please cite this article in press as: Hagenaaars LL, et al. The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies. Health Policy (2017), http://dx.doi.org/10.1016/j.healthpol.2017.06.011
The revenues raised by the taxes as a share of total tax revenue constitutes less than 1% in all cases, except for Berkeley (4%) and Philadelphia (1.17%). Of the most populated countries (excluding the Pacific countries), Mexico raises most revenues at around 0.38% of total tax revenue. Taxation of EDFs and SSBs therefore probably only forms a small part of larger taxation reforms that aim to decrease income tax rates. Compared with public health expenses, the financial flows are substantial. In the case of Mexico, expected revenues of 12 billion pesos per year make up for around 37% of total spending on preventive care [63].

We found studies investigating the extent to which the EDF/SSB taxes were passed on to consumers through higher shelf prices for the cases of France, Fiji, Nauru, Mexico and Berkeley. Close to all of the tax was passed onto consumers in France and Mexico [34,64]. Fiji and Nauru showed lower but still significant price pass-through [21]. In Berkeley one study, conducted in low income neighbourhoods, found similarly high price pass-through effects [65]. A study looking into retail outlet data of supermarkets and gasoline stations concludes that the tax was fully passed through [66]. However, a study which collected data on a wider scope of drink sizes as well as in more neighbourhoods, came to a lower overall pass-through estimate of 43.1% [61]. Retailers may be more likely to dampen the price effects of taxes by spreading costs to other products or by reducing margins on the targeted products if nearby retailers fall under a jurisdiction without such a tax, such as in the cases of Berkeley and Philadelphia.

Consumption effects were investigated in a number of cases. Evaluations of the Danish case show mixed results on dietary effects; with one study concluding that fats consumption increased by 10–15% [67], whereas a study based on retail outlet data found a 0.9% decrease [68]. Both studies used a non-experimental design and econometric analyses to investigate retail outlet data, making it difficult to robustly disentangle the tax’ impact from other reasons of price changes or aggregate consumption shocks. A study enduring similar limitations investigated the Hungarian public health product tax, and found that sales of included products decreased by 27%, while also observing product reformulation. This study also discovered desirable substitution effects: processed foods consumption decreased by 3.4% while it increased by 1.1% for unprocessed food, with poorer households being more responsive. Bíró [45] therefore concludes that population diet has improved as a result of the public health product tax. A recent WHO impact assessment shows that consumption of the taxed products has decreased as well in the long term, while this study also found that health literacy has improved following the introduction of the public health product tax [69]. In France, an SSB sales drop of 3.3% has been noted, but we found no methodological details of this finding [56]. In Mexico two observational studies were conducted which adjusted for macro-economic variables and pre-existing trends. These found that the monthly sales volume of taxed beverages decreased by 6.1% [70] and 5.1% [71] on average after policy introduction. Moreover, these reductions were considerably higher in lower socioeconomic groups with 9% [70] and 10.2% [71] on average. A larger effect was found in Berkeley. A study with a non-randomized design that examined pre- and posttax changes in SSB consumption in low income areas found a 21% decrease in Berkeley, compared to a 4% increase in the comparison cities of Oakland and San Francisco that did not implement an SSB tax [60]. A study with a similar observational design that did not solely investigate low-income areas concludes that the tax was passed through mostly, but not uniformly, to consumers. Sales of SSBs fell by 9.6%, compared to an increase in sales of 6.9% in comparison cities whereas sales of untaxed beverages in Berkeley rose by 3.5% [72].

Real world evidence on the effects of the policies in terms of health outcomes remains scarce and therefore was not included. This relates to the fact that many confounding factors hinder such analyses, making the bulk of these studies reliant on modelling.

Thus, the available observational and non-randomized studies that evaluated the impact of the taxes in our 13 case studies seem to indicate that consumers did seem to change their behaviour: the consumption of targeted products decreases, and this effects seems larger among lower socioeconomic groups. Also of interest is the observed change in food supply, an often overseen effect of EDF/SSB taxation. Less is known about substitution effects, although Bíró [45] hints that these may be beneficial if taxes are well designed. It remains difficult to pinpoint precisely the effects on health outcomes due to the scarcity of real world evidence.

3.2. Policy context

An enabling situational factor seems to be the fiscal need for extra revenue. In both Denmark and South Africa the tax formed part of a larger revision of the taxation system with the specific aim of expanding the scope of revenue sources, in an effort to decrease income taxes. Budgetary deficits also create fiscal need, like the recent economic crisis (Hungary), downturns in foreign trade (due to World War II and Finnish independence) or import tariff reductions following trade liberalization (Fiji and Samoa). Also in French Polynesia, Berkeley and Mexico extra resources were required, whereas in Philadelphia extra revenue was necessary for certain community and educational programmes held as policy priorities of the Mayor. For France and the UK no direct fiscal need was found, but there may have been an indirect fiscal need given that both cases studies were under pressure to reduce their budget deficit in the aftermath of the financial crisis.

The way in which the policies were framed differs, although similarities also exist. Industry consistently points to a lack of evidence on the effectiveness of EDF/SSB taxes and therefore seems to pressure governments to not adopt them in the first place, but if they pursue to refer to it as a normal taxation instrument instead of a health protection measure. The latter occurred in France, where Coca-Cola threatened to suspend domestic expansion (which meant a loss of potential jobs) if the policy was labelled a public health policy [56].

In other cases the government forcefully described their tax as a public health tool while specifically naming and shaming food or soda industry as the culprit of the obesity/non-communicable diseases epidemic. This happened in Berkeley, the UK, and to some extent Mexico and South Africa. In Berkeley a broad coalition of community groups expressed a consistent message in their ‘Berkeley versus BigSoda’ campaign that preceded the policy’s referendum. Their message referred to the ‘soda industry’s inappropriate behaviour’; parallels were drawn with the tobacco industry. Opponents of the tax mainly focussed on ‘confusing exemptions’ of the tax, and accusations that City Council only aimed to raise revenue, instead of using the (more effective) argumentation that it restricts personal freedom [11,73]. In the UK, celebrity chef Jamie Oliver was in the centre of the debate as an SSB tax advocate, Oliver consistently accused food industry to ‘damage children’s health’ and advocated for a tax as a matter of ‘parental responsibility of the government for children’s health’. UK government framing follows similar logic, as the tax is named the ‘soft drinks industry levy’ and the government mentions the tax will incentivize industry to reformulate their products by reducing sugar amounts. The earmarking of any upcoming revenues for community school programmes also follows the frame used by Oliver.

Several other cases use a mix of describing the tax as a public health tool as well as a source of revenue, with some cases specifically describing how these revenues enable popular policies. The tax is thus not universally described as a public health instrument. This may be explained because industry has strong lobbying capaci-
ity and the means to commence law suits [11]. However, research shows that exposure to strategies used by the food industry to manipulate food choices can generate criticism towards the food and soda industry, and hence support for public policy measures. Ortiz et al. [28] have for instance proven this by exposing people to strategies how the industry develops foods that exploit the biological need for energy (e.g. inclusion of salt and sugar in bread or milk), and uses advertisement and cognitive biases (e.g. increased portion sizes) to stimulate overconsumption. In the cases where the government described the tax specifically as a public health tool, it may have only been able to do so because prominent voices in the public debate emphasized these strategies of the food/soda industry. In cases where the government did not describe the tax as a public health tool, such voices were probably much less present.

The increasing trend of public-private partnerships may also explain why some governments did not describe the tax as a health protection measure. It remains unclear whether (the threat of) these taxes work constructively, or destructively for such partnerships.

A striking finding is that the government implementing the tax in most cases consists of liberal or conservative parties. In more comparable cases such as Denmark, Finland, France and the UK, parties with a centre/right position in the national political spectrum held executive power. Only Fiji, South Africa, Berkeley and Philadelphia had a left-wing party in power. This finding is notable, because the common view is that health policies in general, and lifestyle policies in specific, are more often urged by left-wing parties [44,74]. A logical rationale from a left-wing perspective could be that EDF/SSB tax urges industry to ‘behave better’. However, EDF/SSB taxes can also be explained with a more right-wing rationale: the individual is ‘to blame’ for societal costs associated to unhealthy food choices, which supports Pigovian taxation as well. In addition, regressive income effects are of less a concern and lowering income taxes may be of transcending importance for the right.

We also observe patterns in the structural factors for our 13 cases, yet we cannot say these are decisive factors due to the small sample size. Obesity rates are higher than global average in all cases. Especially the Pacific countries, Mexico, Philadelphia, the UK, the US and South Africa stand out. Berkeley is peculiar as the obesity rate of Alameda County (in which Berkeley resides) is only 20%, compared to 28.9% USA average.

Given that EDF/SSB taxes are regressive, it is interesting to note that the Gini coefficient is relatively high in most cases (meaning that incomes are relatively unequal).

The same goes for reliance on excise taxes: its share in total revenue is only below OECD average in France and Mexico. Finance departments may have more experience with excise tax technologies and the demarcation of product groups if governments are relatively dependent on such taxes, which can aid the implementation of an EDF/SSB tax.

Of cultural elements, room for lobbyists as measured by the corruption perceptions index does not appear to influence the policy. The tobacco and alcohol control scales show that the European countries with an EDF/SSB tax also exert relatively big health promotion efforts for tobacco and alcohol. The UK came out on top of the tobacco control scale; France and Finland are amongst the highest-ranking countries in both scales; Denmark and Hungary are in the middle range for both rankings. No data was collected for the non-European cases, but Berkeley for instance has relatively high public support for health promotion efforts as it is known for national leadership in policies such as smoking bans [11].

The precedent that may have been set by our cases differs. The Pacific countries represent very small markets where global media attention is limited, so industry opposition of large multinational was negligible. The UK, Berkeley and Philadelphia were under bright global media headlines so the stakes for industry were much bigger. The SSB taxes have nevertheless been approved in these cases, so they may have set a policy precedent. Still, situational factors remain vital for the origination of an SSB tax. The Danish fat tax also carried with it the burden of a precedent since it was the first in its kind, which impeded the policy.

The influence of cross-border trade is difficult to measure, but is likely of limited concern in large countries like Mexico and South Africa, and isolated countries such as the Pacific islands and to some extent the UK. It is more of an issue in cases where border crossing requires little effort, like Berkeley and Philadelphia. Still, it remains questionable if this is really a matter of concern since EDFs and especially SSBs are cheap. Buying these products is often a matter of everyday grocery shopping routine, which may be different in products such as cigarettes. Inhabitants also have to make travel expenses to shop across the border. Nevertheless, the cross-border argument can be important in the public debate. In Denmark it was part of the opposition strategy to discourage the tax by virtue of endangering Danish jobs [31]. This claim was not substantiated by rigorous empirical evidence, however [5].

Trade agreements are also important, but they do not necessarily disable EDFs/SSBs taxes as long as products are demarcated adequately, and product inclusion is solely based on composition and not on its (geographic) origin. EU trade agreements for instance forced the Danish fat tax to also include milk and meat, which was not part of the original proposal because these are produced extensively in Denmark. In Finland EU agreements led to the abolishment of the sweets and ice cream tax, as Finland excluded certain domestic products. From these experiences and our content analysis it seems that policymakers run into less demarcation issues when designing an SSB tax compared to an EDF tax.

4. Discussion

Our analysis of 13 case studies on EDF/SSB tax policy content and context determinants has some limitations. First, it requires a systematic literature review to evaluate the effectiveness of EDF/SSB taxes in general. This was out of scope for our explorative study design that primarily focuses on identifying policy patterns in 13 case studies. The impact elements of our policy content analysis therefore are limited with respect to external validity. The number of observational and non-randomized studies that we included to evaluate the effectiveness of the EDF/SSB taxes under investigation also do not cover all 13 cases.

A second limitation concerns the limited depth of the analyses of policy processes and the behaviour of stakeholders involved. For policy analysis these elements are vital, we focussed on generic policy processes though to enhance international comparability [75]. Systematic investigation and comparison of policy processes including stakeholder analysis is recommended to further understand the issue.

A third limitation concerns the lack of an overview of other obesity policies of governments. This is covered to a certain extent by the variables ‘prevailing way of framing the problem’ and ‘healthy lifestyle promotion policy’, but it remains difficult to (inter)nationally compare the multitude of obesity policies of governments.

We nevertheless believe the current study pinpoints an interesting development in public health policy, first of all because the more robust observational and non-randomized studies that were available on our 13 case studies [34,45,60,61,64,65,68–70,72,76] seem to indicate that the taxation had the desired effects on prices and consumption of targeted products. Less is known about substitution effects, but the Hungary case shows that substitution to healthier products and product reformulation can occur as well [45].
The proper design of an EDF/SSB tax remains important. Policymakers seem hesitant to include a wide scope of products, possibly because of difficulties in defining sharp boundaries and administering tax levying. This may explain the recent drift towards solely taxing SSBs. Policymakers’ confidence seems to grow, since in the most recent cases (Berkeley, UK, Philadelphia) relatively high levies apply to SSBs, which in all probability makes these policies more effective than earlier attempts.

This suggests that SSB taxes are useful new instruments for the public health policy toolbox. However our context analysis shows that these policies do not principally envelop following public health advocacy. Fiscal needs quite often form their foundation instead.

The fact that fiscal needs dominate may explain one of our more striking findings: a conservative or liberal government implemented the EDF/SSB tax in most cases, contradicting the view that health taxes are a left-wing preference only. This view may have its origin in the question whether an EDF/SSB tax provides public protection or restricts personal freedom. Opponents also argue that they are ineffective, hurt small businesses, and cause job losses [11,22]. All of these elements ‘skew’ the policy to the left. However, other rationales are also at play, such as closing budget loopholes. The revenues raised are often used for benefits that compensate for regressive income effects, either by explicitly earmarking revenues for certain benefits or by doing so more implicitly. This may be important for possible left–wing support.

Left and right-wing political rationales can be used in specific framing strategies: either the industry (left) or individual (right) can be blamed for any negative externalities that follow unhealthy food consumption, although in practice governments seem hesitant to describe the behaviour of the industry and even more so the individual as the reason for their EDF/SSB tax.

It remains somewhat puzzling how EDF/SSB taxation relates to another trend in public health policy: public-private partnerships. The threat of a tax can work as a lever to make self-regulation work as it provides incentives for industry to engage in product reformulation [77]. In such scenario the instrument may be supportive for productive public–private partnerships. Yet in the 13 cases that we describe, the threat has turned into reality as the policy is already in place or announced, suggesting that self-regulation was considered insufficient. The question remains whether the instrument jeopardized public-private partnerships in these cases.

5. Conclusions

This study is in our knowledge the first attempt to investigate patterns in the policy content and policy context of taxing unhealthy foods and beverages, using a cross-country comparative methodology with a wide scope of included variables. We recommend scholars to enhance this methodology by adding the comparison of policy process and stakeholder behaviour.

Our study shows how this new policy instrument follows diverse policy rationales. This implies that it can be embraced by diverse ideologies. However, administrative practicalities remain important, which might explain why we note a drift towards solely taxing SSBs as these can be demarcated more easily compared to EDFs. Policy experiences with SSB taxes seem successful, because the observational and non-randomized studies that were available on our cases seem to indicate that the SSB tax generally had the desired effects on prices and consumption. This may also explain why we note an upward drift of SSB levies in recent cases. In SSB taxes the ‘puzzling’ phase seems to be clear, but there still are issues on ‘powering’. In EDF taxes both ‘powering’ and ‘puzzling’ remain substantial tasks for policymakers. We therefore conclude by advising policymakers to aim for an SSB tax initially if a window of opportunity for a food or beverage tax arises.

Conflict of interest

All authors declare that they have no conflict of interest.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgements

We thank the case-specific experts who validated our information for individual cases. This not only served as a useful fact-check but also enhanced our understanding of the policy dynamics of individual cases.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.healthpol.2017.06.011.

References


Please cite this article in press as: Hagenaa Ll, et al. The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies. Health Policy (2017), http://dx.doi.org/10.1016/j.healthpol.2017.06.011.
[29] Stafford N. Denmark cancels fat tax and shelves sugar tax because of threat of job losses. BMJ 2012;2012:
[37] CDC. Nutrition, Physical Activity and Obesity: Data, Trends and Maps. Atlanta, GA: Centers for Disease Control and Prevention (CDC); 2015.

[57] KOMAG. Taxing your sweet tooth. Effective nudge or economic burden? May 2016.
[59] Zillman C. Coca-Cola zero is rebranding itself in the UK as Britain adopts a sugar tax. Fortune 2016 April:20.
[70] Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study. BMJ 2016;352:b6704.

Please cite this article in press as: Hagenaars LL, et al. The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies. Health Policy (2017), http://dx.doi.org/10.1016/j.healthpol.2017.06.011