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Sugar-sweetened beverage tax in Pacific Island countries and territories: A discussion paper

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Prepared by Andrea McDonald

for the Public Health Division, Secretariat of the Pacific Community

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Executive summary

Background

A non-communicable disease (NCD) crisis in the Pacific has been widely acknowledged given that the region accounts for some of the highest rates of obesity and diabetes in the world. As well as the health impact, there are significant economic and financial implications for Pacific Island countries and territories (PICTs). The evidence of health damage from sugar-sweetened beverage (SSB) consumption is compelling.¹ SSB consumption is known to cause dental disease, an increased risk of unhealthy weight gain, type 2 diabetes, metabolic syndrome, gout, and many other health conditions. SSBs are defined as beverages with added caloric sweeteners such as sugar and include soft drinks, fruit drinks, sachet mixes, cordials, energy and sports drinks, flavoured milks and cold teas or coffees (New Zealand Beverage Guidance Panel, 2014).

There is high level of commitment in the Pacific to address the NCD crisis and consider SSB taxes as part of the solution. Economic and Health Ministers are committed to ‘considering policies that reduce consumption of local and imported food and drink products that are high in sugar, salt and fat content and directly linked to obesity, diabetes, heart disease and other NCDs in the Pacific through targeted preventative measures, taxes and better regulation’.² Taxation on SSBs is an important first step because these beverages are high in sugar, often have no nutritional value, and there is clear evidence of their detriment to health.

This paper discusses how an SSB tax could be developed in PICTs in order to optimise health gains. The features of an SSB tax that impact on health are discussed. Recommendations are founded on an analysis of the Pacific context, including evidence on SSB consumption and a review of SSB tax policies that have already been adopted.

Pacific context

Context influences the effectiveness of policies when addressing SSB consumption. Taxation is likely to provide health gains only where there are high levels of SSB consumption by people who are at high risk of obesity, diabetes and other related conditions.³

There is evidence of high levels of SSB consumption in the majority of PICTs (16/20, no data for PNG and Pitcairn) with particularly strong evidence of this in the Cook Islands, Niue, Palau, French Polynesia and Tonga (Table 4). School health surveys, household income and expenditure surveys (HIES) and trade data have been used to evaluate SSB consumption.⁴ SSBs account for varying amounts of the food budget (1–9%) in PICT household expenditure surveys (Table 2). Many youths in the region consume SSBs every day, but the proportion varies between countries. In school health surveys⁵ 77% of Niue students reported regular consumption of soft drinks whereas this was only 22% for Kiribati students.

The contribution of SSB consumption to the obesity epidemic is a recent phenomenon related to globalisation of the food supply. Trade data from 2000 to 2010 demonstrate increased soft drink consumption in Fiji, Guam and Tonga.⁶ Processed foods from every corner of the globe, such as SSBs, are available in the Pacific region. In 2013, 99 million litres of soft drink was imported into PICTs at a value of USD 105 million at an average cost of USD 1.06 a litre.⁷ Soft-drink exporters to the Pacific were led by Malaysia, Singapore, European Union, United States and New Zealand; these are listed in order of their export volumes (Table 3). Asian countries have become significant exporters of soft drinks to the Pacific and account for two-thirds of exports to the region (Table 5).

Implemented policies

SSBs taxes have already been adopted in 12/22 PICTs (Table 6, no data for Pitcairn) and are applied at an average level of USD 0.15 for a 355 mL can of soft drink. The Cook Islands has adopted the highest level of SSB tax applied at the rate of NZD 9.80 per kg of sugar (USD 0.30 on a 355 mL can). Eight PICTs have adopted excise taxes (American Samoa, Cook Islands, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, French Polynesia, Kiribati, Tonga and Samoa), and four PICTs use import tariffs (Republic of the Marshall Islands, Nauru, Palau and Vanuatu). In addition, Tokelau has an import ban on soft drinks, which has resulted in a dramatic reduction in soft-drink imports as it was implemented (and a small increase in imported juice).⁸ In Palau, community campaigns and water-only policies in schools have been associated with reductions in regular soft drink consumption reported by grade 9–12 students. Carbonated soft drinks were the most commonly taxed beverage in PICTs.

Developing a sugary drink tax

1. Communicate a clear health goal

An SSB tax with a clearly defined goal to improve health and address NCDs will maximise the health impact of the policy and improve its acceptability to the public. SSB taxes that are introduced as solely revenue raising measures are unlikely to achieve substantial health gains. Industry may actively and aggressively oppose SSB taxation to protect their profits. Political leadership and communication is vital to explain the links between SSBs and the NCD crisis to the public before tax is increased.⁹ Many PICTs do not currently have local production facilities or a strong industry presence; this makes it important to act promptly before any local production can be established.

2. Characteristics:

A. Excise tax

Among the potential tax measures that could be developed, excise tax is a good option for taxing SSBs in PICTs. An excise tax can be applied by using the existing model for taxing tobacco and alcohol. Excise tax can be differentially applied to SSBs, which would enable their price to be increased relative to the price of other goods and services. Import tariffs have been used extensively in the past; however, many countries are now moving to other forms of taxation that are in line with trade agreements that limit their use.

B. Tax on volume or sugar content

A specific tax is assessed on SSB volume or nutrient content (\$1 per litre, \$10 per kg sugar) and has been found to be more effective than taxing on value (*ad valorem* tax on 30% of price). Specific taxes require a plan for adjustments to keep up with inflation over time.

C. Tax a broad range of beverages

Carbonated soft drinks are the first priority for SSB taxation. However, taxing a broad range of beverages will maximise health gains and reduce the likelihood that consumers will simply switch to unhealthy beverages, such as fruit drinks. Consideration in choosing which SSBs to tax include the following: evidence of health harms (e.g. dental caries from diet drinks), a drink's nutrient value, ease of implementing the tax, and whether a drink is commonly consumed and public support.

D. Adequate tax rate

A higher tax level is likely to have a greater impact on SSB consumption and improve the likelihood of health gains. Tax in the 30% range is suggested for a measurable impact on population health.¹⁰ The consumption of soft drinks is particularly sensitive (elastic) to changes in price compared with some other food groups.¹¹ There is clear evidence of an association between SSB price and consumption. Price elasticity for SSBs is generally around -1, equivalent to a 30% reduction for a 30% increase in price (elasticities were -1.30, -1.21 and -0.79 in three meta-analyses). The effect of SSB tax on weight loss may be small but children, adolescents, high consumers and low-income groups are generally more sensitive to price and are more likely to benefit from SSB taxes. Encouraging healthy drink choices in children is likely to create patterns of behaviour that persist into their adult lives.

3. Revenue and investment

An SSB tax is important for health and the tax revenue could make an important contribution to the government budget. The expected revenue from an SSB tax can be estimated from household trade data and expenditure surveys. A proportion of the revenue from SSB tax may be set aside for health, thus extending likely health gains and encouraging greater public support.

4. Affordable alternatives

The cheaper the cost of healthy beverage alternatives – compared with SSBs – the more likely it is that an SSB tax will be effective. There are several Pacific examples where the cost of bottled water is more expensive than soft drinks. Unless this is reversed, the health impact of an SSB tax may be limited. The availability and affordability of healthy alternatives such as safe drinking water that is pleasant to drink, bottled water and milk should be considered. It is reassuring that the PICTs with the greatest rates of SSB consumption and obesity tend to have good coverage of safe drinking water but it is also important that the water tastes good.

5. Monitor the impact

The impact of SSB taxes should be monitored to make any necessary improvements. SSB consumption can be tracked with health surveys, household expenditure surveys, trade data, revenue generation and the price and availability of SSBs and healthy alternatives. Reduction in consumption may occur early; however, the impact of reduced energy intake on BMI is likely to cumulate and take longer to be measurable.

Debates and myths

Some may claim that an SSB tax is unfair on the poor because the cost of the tax corresponds to a greater proportion of incomes for a low-income household. The health benefits are, however, greater for low-income people, high consumers of SSBs and children, because these groups are more sensitive to price changes. Low-income groups and high consumers also have higher levels of risk factors for NCDs and stand to benefit more from consumption that shifts away from unhealthy foods. Financial regressivity is largely outweighed by progressive health benefits.

It is contested that the SSB tax will have a minimal impact on weight loss because consumers will simply switch to buying beverages and products with similar levels of sugar, or other products with salt and fat. Consumers are more likely to switch to another beverage than select a food product. Switching to more affordable SSBs can be discouraged by placing an excise tax on a broad range of SSBs by taxing on volume (or sugar content), rather than price, and ensuring healthy alternative beverages are available and more affordable than SSBs.

It is argued that an SSB tax is bad for jobs and businesses. Producers, importers and grocers may be affected if there are reductions in demand for their products; however, the increased demand for alternative beverages also creates business opportunities. Reports of job losses in Hungary after an SSB tax could not be distinguished from external factors such as the financial crisis.¹² In terms of economic impact, the productivity and health costs of not addressing NCDs may well be far greater in the long-term.

Opponents may doubt whether producers, importers and retailers will pass the tax on to consumers of SSBs. In Europe there was evidence of over-shifting for SSB taxes, where the consumers were charged more than the cost of the tax. However, in a competitive environment the costs may not be completely passed on, such as in Nauru where a 30% import levy was introduced. Increasing importation of cheaper SSBs from Asia to Nauru reduced the impact of the SSB tax; however, a proportion of the expected price increase still appeared to be passed on to consumers.

Policy makers may have concerns about public opposition to tax increases. Public opinion is often mixed. In Fiji industry opposition led to the removal of a domestic SSB excise tax in 2007 only to be reintroduced in 2008 and there have been subsequent changes since.¹³ Many countries have maintained an excise tax

despite industry pressure. In Samoa importers and manufacturers were more accepting and supportive once the link between soft drinks and health was clearly communicated. As the public becomes more aware of the burden of NCDs and the need to address it they are more likely to be supportive of measures such as an SSB tax. Public support may be improved when the health benefits are emphasised and revenue is invested in health.¹⁰

Conclusion

An SSB tax is a useful policy option to improve health and raise revenue – particularly for the majority of PICTs with high rates of SSB consumption and obesity. The tax should be part of a broader package of policy measures that when used together are more likely to reduce consumption and address the NCD crisis in the Pacific.¹⁴ Half of PICTs (12/21, no data for Pitcairn) have already adopted SSB taxes with various designs. Our discussion outlines how SSB tax policy can be adopted and developed in line with the evidence to achieve the desired health gains and revenue. The impact of an SSB tax policy on health depends on a clear health purpose, using an excise tax, taxing on volume or sugar content, taxing a broad category of SSBs, choosing an adequate tax level, preferably in the 30%+ range, ensuring healthy alternative beverages are available and affordable, investing revenue back into health and monitoring the impact of the SSB tax. The arguments put forward by opponents of SSB taxation can largely be addressed with careful policy design and monitoring of policy effectiveness.



1. Introduction

1.1 Background

This paper presents a summary of evidence-based options to address sugar-sweetened beverage (SSB) consumption in the Pacific region with a particular focus on taxation. A summary of the evidence and how it applies in the Pacific provides a tool for Pacific Island Countries and Territories (PICTs) to build and develop SSB tax policies. Our recommendations are founded on an analysis of SSB consumption in the Pacific and a review of SSB tax policies that have already been adopted by PICTs.

Definitions

SSBs are beverages that contain a caloric sweetener such as sugar. The main categories of SSBs include soft drinks or fizzy drinks, fruit drinks, sachet mixes, cordials, energy or sports drinks, flavoured milks, and cold teas or coffees (New Zealand Beverage Guidance Panel, 2014). An SSB tax is defined as a tax specifically targeted to SSBs rather than a tax more broadly applied to a range of food and drink products (e.g. value added tax – VAT).

Non-communicable disease

It is widely acknowledged that the Pacific has a non-communicable disease (NCD) crisis. There is no doubt that the Pacific has high rates of unhealthy weight gain, obesity and type 2 diabetes. The top ten countries in the world for overweight and obesity rates are in the Pacific. Pacific Island Forum leaders acknowledge that ‘NCDs already undermine social and economic development in the Pacific, and are financially unsustainable. NCDs impose increasingly large, yet often preventable financial costs on national budgets and the economy more broadly.’²

Sugar-sweetened beverages

SSBs are a particular problem. There is compelling evidence that SSBs are harmful to health.¹ SSB consumption is known to cause dental disease^{15,16,13} and dental caries are the most common NCD.¹⁸ SSBs increase the risk of unhealthy weight gain, obesity, metabolic syndrome, gout, type 2 diabetes and many other health conditions. The impact of SSB consumption on health is discussed in more detail below in section 4.2.

Meta-analyses have shown a clear association of a high intake of soft drink with increased energy intake and body weight.^{19,20} A positive correlation between SSB consumption and weight gain is shown in cross-sectional studies, long-term follow-up cohort studies,¹⁵ experimental and intervention studies. The larger

effect found in experimental compared to observational studies¹⁹ strengthens the likelihood of causation between soft drink consumption and weight gain.

SSBs are an important potential contributory factor to the high levels of type 2 diabetes in low- and middle-income countries. One large study found that individuals drinking 1–2 SSB servings a day had a 26% greater risk of developing type 2 diabetes than those drinking less than one a month.¹⁶ In a meta-analysis of 310,819 participants and 15,043 cases of diabetes, there was a 26% greater risk of diabetes for the highest versus the lowest consumers of SSBs. An increase in SSB consumption of one drink per day was associated with a 15% increase in the risk of developing diabetes.¹⁶ The overall risk of developing metabolic syndrome was 20% greater for the highest consumers of SSBs than the lowest consumers.¹⁶

First step

Addressing SSBs is an important first step. They are inexpensive, abundant and have little nutritive value. SSBs are high in calories, low in satiety, and are heavily marketed – especially to children by the frequent use of celebrities, sports stars and cartoon characters. Soft drink intake has been associated with lower intakes of milk, calcium and other nutrients.¹⁹ Importation of SSBs displaces sales of fresh local products, drains scarce foreign exchange reserves and creates shipping costs for import and re-export of cans.⁹ It is imperative that the Pacific addresses high risk foods, such as SSBs, given the rates of diabetes and obesity that are among the highest in the world.⁹

Most countries tax food and drinks through a range of different mechanisms including import tariffs and sales taxes. An SSB tax is specific. SSB tax is the additional tax applied to SSBs that is over and above the tax level applied to a broad range of food and drinks. For example, SSB tax is the additional level of tax on soft drinks that is over and above the tax applied to bottled water.

SSB tax is a subcategory of a broader food tax solution. This paper does not discuss sugar tax per se (or fat and salt tax) but instead focuses on taxes applied to SSBs as these drinks are an important contributor to sugar consumption and this tax is an important first step in food taxation. The WHO draft guideline on sugars recommends that sugar intake should be limited to less than 10% of dietary intake.¹⁸ SSBs are the largest source of added sugar in the US diet, where 84% of adolescents and 63% of adults consume SSBs on any given day.²¹

Food tax is also just one part of a broader strategy for addressing NCDs, which may also include nutrition guidelines for schools, marketing restrictions for children and public awareness campaigns, as discussed below. Nutrition solutions for the NCD crisis lie in policies that create supportive environments where high-sugar foods are less affordable, acceptable and available, and healthier alternatives are accessible.²²

High-level support

There is both global¹³ and regional interest in SSB tax as a strategy to reduce consumption and raise revenue. There is also high-level support from PICTs for considering taxes to address the NCD crisis and the burden of obesity and diabetes. After the July 2013 Forum Economic Ministers' Meeting (FEMM) in Nuku'alofa, the ministers requested a roadmap for strengthening NCD prevention and control in the Pacific region. The NCD Roadmap was presented to the economic ministers in the Solomon Islands in July 2014 at the Joint Forum Economic and Pacific Health Ministers Meeting. Finance and health ministers then committed to the development of country-specific roadmaps. PICTs signed up to a list of commitments that address NCDs. One specific action was to 'consider policies that reduce consumption of local and imported food and drink products that are high in sugar, salt and fat content and directly linked to obesity, diabetes, heart disease and other NCDs in the Pacific through targeted preventative measures, taxes and better regulation' (Joint Forum Economic and Pacific Health Ministers, 2014). Another example of high-level regional support was the 2011 United States Affiliated Pacific Island Countries (USAPIC) commitment to implementing policies that reduce sugar consumption²³ such as increasing SSB tax on soft drinks and juices (or drinks containing less than 50% fruit juice).

Governments around the world have implemented SSB taxes to reduce obesity and improve health in countries such as Brazil, Chile, France, Hungary, Mexico, Taiwan, Thailand³ as well as several countries in the Pacific. Lessons from these contexts were considered when analysing the policy options for the Pacific.

Opportunities going forward

Managing the NCD crisis is an opportunity for the Pacific region to work collaboratively, act early and show strong leadership. The NCD crisis is important for many sectors, especially for the ministries of health, finance and trade.

1.2 Package of policy options

SSB taxes are one part of a package of complementary measures for reducing SSB consumption but will not fix the problem if they are acting alone. SSB tax is much more likely to reduce consumption if it is part of a broader package of policy measures.^{14,22} Other policy options include banning SSB importation, restrictions on selling SSBs at schools, marketing restrictions (particularly marketing to children) and public awareness campaigns. These policy options are briefly considered here for their impact on health, cost, ease of implementation and impact on other sectors (Table 1).






Fiscal taxes or subsidies, health information and communication strategies, and restrictions on marketing of unhealthy foods to children have all been recommended as cost-effective for developing countries.²⁴ Substantial health gains as a result of these policies may be largely or entirely paid for through future reductions in health care expenditure.

There are also many other strategies for addressing SSB consumption such as those that have been tried in the Pacific.²³ These strategies align with the different facets of the Ottawa Charter.²⁵ The policies discussed in Table 1 are about developing public-health policy (e.g. SSB taxation, restricting SSB sales in schools, advertising restrictions). Other health-promotion strategies²⁵ include creating supportive environments (e.g. school policies in Palau, workplaces, church nutrition guidelines), strengthening community action (utilising existing community resources, e.g. local councils in Tokelau), developing personal skills (education and public awareness campaigns) and reorientating health services (including nutrition advice in routine care and adopting hospital nutritional guidelines). Action can be taken by governments and many other groups²⁶ such as community groups, schools and early childhood education communities, health professionals and hospitals, industry and non-governmental organisations (NGOs).

SSB tax

SSB taxation is an example of a policy that aims to increase the price of SSBs relative to more healthy alternative options.²⁷ Taxation may be popular because of the potential for revenue generation and it is more cost-effective than other options. The design of an SSB tax should be considered to best achieve policy goals such as health benefits as put forward in this discussion paper.

Table 1: Summary assessment of policy options that aim to reduce SSB consumption.

	Effectiveness (reducing consumption and improving health) (incl. timeframe)	Cost	Ease of implementation	Impact on other sectors
SSB tax 	<p>Moderate</p> <p>Reduces consumption. Some weight loss likely if tax is great enough.</p>	<p>Nil – revenue raising</p> <p>But consider operational and monitoring costs.</p>	<p>Moderate</p> <p>Uses existing tax structures. Likely to be a strong industry lobby.</p>	<p>Possible economic impact on importers, producers, retailers.</p> <p>e.g. spending on soft drinks is as high as 6% of food budget in Palau.</p>
SSB import ban e.g. Tokelau 	<p>High</p> <p>Community led and very effective in Tokelau at reducing soft-drink imports. Small increase in fruit juice imports. Illicit trade possible.</p>	<p>Low</p> <p>Possible reduction in import revenues. Policing illicit trade may become costly.</p>	<p>Difficult</p> <p>Only be possible in small island communities. May be difficult to enforce and politically unacceptable. Also requires import dependence. May not fit with trade commitments.</p>	<p>Possible economic impact on importers, retailers. Likely to reduce health costs in the long-term.</p> <p>e.g. dental caries, diabetes rates, dialysis.</p>
Restrict SSBs sales and consumption in schools (e.g. national policy) 	<p>Moderate (students only)</p> <p>Effective in Boston²⁸ and Palau²⁹ at reducing total consumption among students.</p> <p>To be effective requires access to drinking water and combination of the policy with health education (resources often available within countries).</p>	<p>Low</p> <p>Implementation costs up front then just asking staff to enforce.</p>	<p>Moderate</p> <p>Issues with implementation and then enforcing this policy.</p> <p>Relies on individual schools. Pacific experience suggests that many schools do not implement central imposed bans. However, primary schools may be able to lock gates.</p>	<p>Children may simply spend more time outside the school grounds, which may cause safety issues.</p> <p>May be substituted by sales outside the school gate making it less effective, unless ban extends to area surrounding the school or children are already restricted to school grounds.</p>
Restriction of SSB marketing to children³⁰ 	<p>Low-moderate</p> <p>May be long-term gains if restrictions are enforced.</p>	<p>Low</p> <p>Implementation costs up front and then cost of enforcement.</p>	<p>Very difficult due to industry opposition and also issues with cross-border advertising.</p> <p>Issues with implementation and then enforcing this policy.</p>	<p>Limitation of sports sponsorship to schools and clubs.</p>
Public awareness campaign e.g. Tonga: 	<p>Low</p> <p>Is likely to complement other strategies. Evaluation is critical to assess effectiveness.</p>	<p>Moderate</p>	<p>Moderate</p> <p>Health-promotion capacity required.</p>	

Tokelau went a step further than taxing SSBs and instead banned the import of sugar-sweetened carbonated soft drinks.⁸ Tokelau is a small island state with 1,200 persons. The initiative was taken by local councils that stopped importing sugar-sweetened drinks after being shown the trade data on soft-drink imports and their health impacts. The availability of fruit juices has increased but perhaps because these are expensive they have not completely replaced soft-drink imports. As a result there are more local stores selling bottled water. There has been a substantial reduction in aluminium can waste. In social gatherings there has been a total shift from serving carbonated beverages to water and coconut water. The financial impact is unclear but does not seem to be noticeable (personal communication, Ministry of Health, 2014). There are some reports of beverage smuggling.⁸ Other similar small island states dependent on importation of soft drinks may be able to consider this option but it is unlikely to be consistent with trade agreements.

School settings

Much attention has been given to school settings when promoting healthy beverage choices. Evidence shows that banning soft drink sales in schools can be effective at reducing the total consumption among students in Boston (USA),²⁸ Palau²⁹ and elsewhere.³¹ A review of youth studies found that limiting SSB availability in school has been associated with reduced consumption, particularly when vending machines and snack bars were targeted.^{29,4} However, a recent paper from the US shows that the policy reduced availability but it did not show any evidence of reducing overall consumption among students, where there were background trends of increasing consumption.³²

Marketing restrictions

Food advertising and other forms of marketing food to children are widespread across the world.³³ An example of an advertising and marketing restriction is to limit television advertising to children. Food promotions directly affect children's preferences, purchase behaviour, consumption patterns and diet-related health.³⁴ Television advertising of soft drink is associated with increased consumption of soft drinks among elementary school children.³⁵ Advertising restrictions may be cost-effective public-health interventions.³⁶ The World Health Organization (WHO) recommends policies on food-marketing communications to reduce the impact of marketing on children.³⁰

Public awareness

Public awareness campaigns are a social-marketing strategy that aims to help individuals develop personal skills to support healthy beverage choices and discourage unhealthy choices. There is little evidence of their effectiveness in reducing SSB consumption but they may be useful in combination with other policy options. Health education and health-promotion initiatives have been used throughout the Pacific.³⁷ The OPIC study (Obesity Prevention in Communities)³⁸ intervention was implemented through secondary schools and associated communities in Fiji and Tonga in order to lower SSB consumption (along with other changes to diet) but was largely unsuccessful.³⁹

1.3 Aim

The Secretariat of the Pacific Community (SPC) aims to facilitate action on sugar-sweetened beverages (SSBs) in PICTs to address the burden of NCDs and their health and financial costs. SPC is a multilateral, multidisciplinary organisation that serves development in 22 PICTs. Solutions for NCDs are multi-sectoral and require input from finance and health ministers.

The health impact of SSB tax depends on many factors. The objectives of this discussion paper are as follows:

1. To discuss how SSB taxation could be applied in PICTs to maximise desired health gains as well as raising revenue; and
2. To take into account the Pacific context, including data on SSB consumption and SSB tax policies that have already been adopted.



2. Context and consumption

The impact of SSB taxes – that are implemented to achieve desired health gains – is dependent on context. SSB taxes are only likely to be demonstrably effective where there are high levels of SSB consumption by people who are at high risk of obesity, diabetes and other SSB related conditions.³ Figure 2 and Figure 3 below show the geographical distribution of SSB consumption, obesity and diabetes. These outcomes are largely driven by globalisation, trade and the implications of this for the local food environment.^{40,41} The political environment influences the choices of solutions for addressing SSB consumption.

2.1 Consumption

When considering SSB tax policy options, it is important to understand the level of SSB consumption. Data on SSB consumption are useful for informing SSB tax policy and for monitoring the effectiveness of an SSB tax. Many health surveys measure overweight and obese persons in a population, but consumption and nutrition data are more difficult to obtain in the Pacific region. There are three key forms of SSB consumption data publically available (Table 11) namely health surveys (majority were school health surveys), household income and expenditure surveys and trade data (soft-drink imports). These all can be used to estimate national levels of soft drink consumption. Industry sales data and country tax revenues may also be obtainable in some instances although we did not have access to these indicators.

Household expenditure

Table 2 demonstrates the varying economic significance of SSBs and mineral water as a proportion of spending on household food budgets in various PICTs. Palau appears to spend the greatest proportion of the household food budget on soft drinks (6.2%). Marshall Islands (4.1%) and French Polynesia (3.4%) were also high. More analysis is required to look at the volume of SSBs purchased by households in these studies; however, the expenditure data are likely to be an indication of consumption – albeit influenced by differences between countries and the price of soft drinks relative to the rest of the food budget.

Table 2: Mean household expenditure on beverages as a proportion of the household food budget (excluding alcohol and spending away from home) from Household Income and Expenditure Surveys 2000–2010, where beverage category data was available.

	Year of HIES	All beverages (non-alcoholic)	Soft drinks	Other sweetened drinks	Fruit juice	Flavoured milk	Mineral water
French Polynesia	2000/2001	11.0%	3.4%	3.5%	2.4%	-	1.7%
Palau	2006	9.9%	6.2%	-	-	-	-
New Caledonia	2008	7.9%	3.5%	0.5%	1.9%	-	1.9%
Marshall Islands	2002	7.3%	4.1%	0.3%	1.8%	-	1.1%
Cook Islands	2005/2006	4.9%	2.6%	0.1%	0.9%	0.5%	0.7%
Tuvalu (Funafuti)	2004/2005	2.3%	2.0%	0.1%	0.1%	0.1%	0.1%
Vanuatu	2010	1.4%	0.5%	0.6%	-	0.1%	0.2%
Wallis and Futuna	2005/2006	9.3%	-	-	-	-	-
Samoa	2008	6.2%	-	-	-	-	-
Micronesia (FSM)	2005	5.9%	-	-	-	-	-
Nauru	2006	1.6%	-	-	-	-	-
New Zealand (ref)	2013	3.5%	1.7%	0.6%	1.2%	-	<0.1%

Note: SSB tax may have been increased since the time of these figures (e.g. French Polynesia, Cook Islands and Nauru).

Soft-drink imports

In 2013, 99 million litres of soft drink at a value of USD 105 million was imported into PICTs, at an average cost of USD 1.06 per litre. Across the Pacific region where there is a population of 10.6 million, an average of 9.4 litres of soft drink per person was imported; this does not account for local production within countries. Soft-drink exporters to the Pacific were led by Malaysia, Singapore, European Union, United States and New Zealand; these are listed in order of export volumes (Table 3). Asian countries have become significant exporters of soft drinks to the Pacific accounting for two-thirds of soft-drink exports (Table 3). Soft drink trade was analysed from the World Integrated Trade Solution (WITS), UN Comtrade data⁷ using the 2012 Harmonised System (HS) category 22.02 of soft drinks, to determine export values and volumes to the 22 PICTs, from any one of the 160 countries that the database covers. Any potentially missing trade data would underestimate the figures that are presented here.



Table 3: Largest soft-drink exporters to Pacific Island Countries and Territories, by trade volume and value for Harmonised System 22.02 category, in 2013.

Exporter	Trade volume (Litres 000)	Trade volume (% total)	Trade value (USD 000)
Malaysia	27,849	28%	30,656
Singapore	26,180	26%	26,073
Asia – not specified	10,622	11%	7,022
European Union	8,508	9%	9,633
United States	7,765	8%	5,199
France	6,386	6%	7,604
New Zealand	3,876	4%	5,327
Indonesia	1,666	2%	1,929
Netherlands	1,163	1%	1,055
Brunei Darussalam	1,095	1%	896
Fiji	644	1%	5,335
Total	98,848	100%	105,141

Synthesis

Approach

Each PICT was given an assessment on whether soft drink consumption appeared to be ‘very high’, ‘high’ or ‘moderate’ based on the available data (Table 4 and Figure 1). The key at the bottom of Table 4 specifies the thresholds selected in order to characterise each category of consumption.

Categories of consumption were selected to align with indicators and account for the distribution of the data (Figure 1). There were no existing published categories for ‘very high’ and ‘high’ consumption.

For this reason, we selected thresholds of consumption to align across the different consumption indicators based on the following:

- Adult health survey data, trade data and energy intake thresholds were aligned by approximating that daily consumers on average drink two 350 mL soft drinks that are equivalent to 140 calories each (the calories in a can of coke), and non-daily consumers drink no soft drinks. For example if 30% of adults consume soft drinks daily, 700 mL a day in 30% of the population is the equivalent of 210 mL a day per person in the whole population. This is the same as 77 L over a year (rounded to 80 L). 210 mL per person per day averages to approximately 84 calories, which is 3.7% of an average person’s 2250 calorie energy requirement (rounded to 4%).
- Allowance was made for the greater levels of consumption observed among adolescents (11–18yo), which we approximated as 50% greater consumption than the total adult population.
- HIES expenditure was aligned with energy intake thresholds by assigning the cost per calorie of soft drinks to be 25% less than the cost per calorie of the rest of diet, based on a study in Europe where the cost per calorie of soft drinks was 27% less than the cost per calorie of a low energy density diet (but similar to a high energy density diet).⁴² This was done because energy dense foods such as soft drinks are often a cheap form of calories compared to more healthy foods.^{43,44}

- We limited the analysis to soft drinks because they were the SSBs for which we had best data. We approximated soft drink consumption from the SSB consumption question in the sole contributing STEPS survey.

Category labels were selected based on nutritional recommendations that soft drink consumption should be limited and is an 'extra' in the diet e.g. consume less than once a week. Any proportion of the population consuming soft drinks daily should probably not be considered low consumption so we termed the lowest consumption category as 'moderate'. The 'contribution to energy intake' thresholds are consistent with WHO guidelines that less than 5% of energy intake should be free sugars – and soft drinks are just one contributor to free sugars, which are likely to make up less than 40% free sugar intake. In this way anything above 2% energy intake might be considered high.

Findings

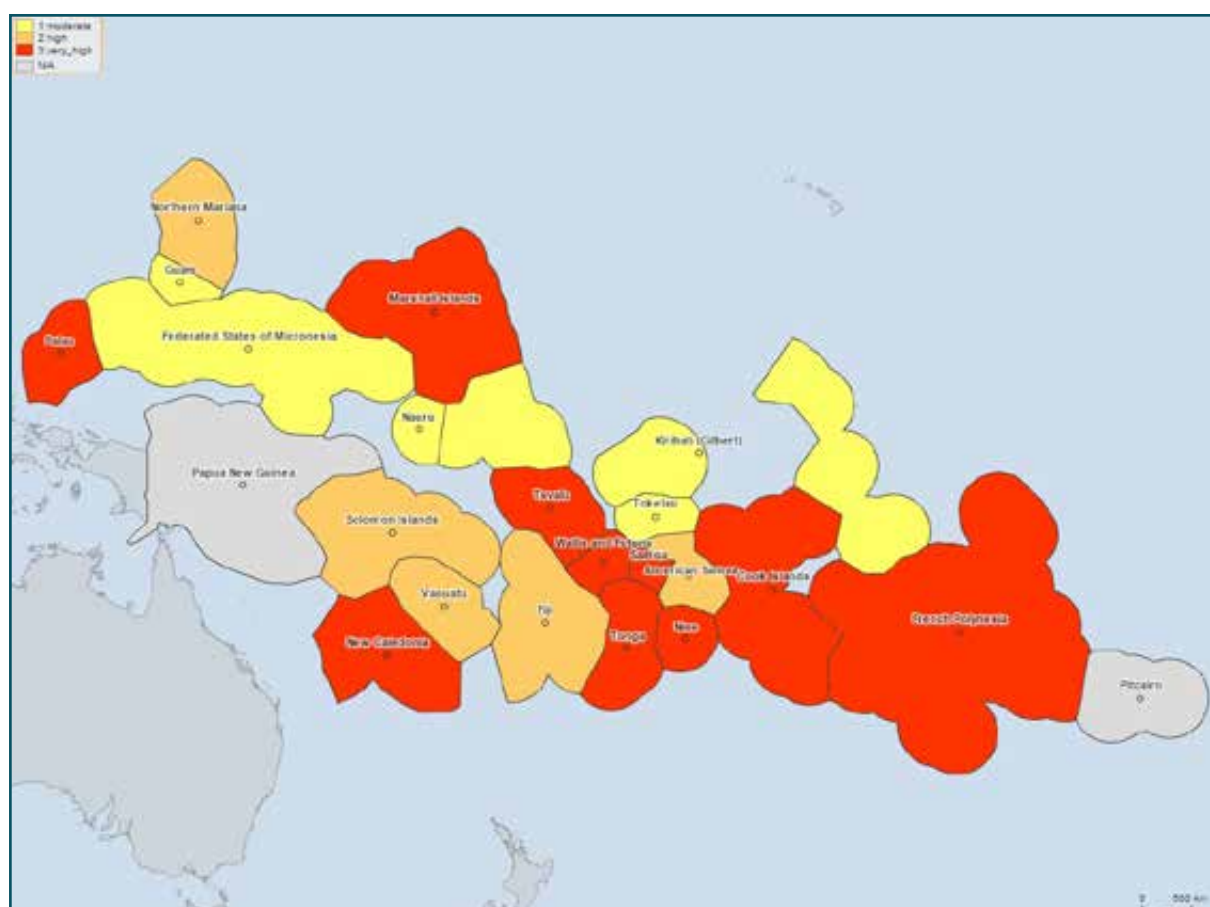
At least one indicator of SSB consumption was available for 20 PICTs, excluding only Papua New Guinea and Pitcairn Islands. The lack of data for Papua New Guinea is concerning given that the country accounts for a large proportion of the Pacific's regional population. There were many sources of data that had been collected but not analysed until now for their application to SSB consumption (to our knowledge), including the majority of household expenditure surveys and export trade data (UN Comtrade, WITS). Most of the consumption indicators were up-to-date within the last ten years.

There was evidence of high SSB consumption levels in the majority of PICTs (16/20, no data for PNG or Pitcairn) throughout the three sub-regions: Polynesia (8/9), Micronesia (4/7) and Melanesia (4/4). PICTs with evidence of very high SSB consumption were largely from Polynesia (7/9) but also Micronesia (3/7) and Melanesia (1/4). In many cases the level of soft drink consumption in Pacific populations was comparable with high-income countries.⁴ FSM, Kiribati, Nauru and Tokelau were examples of countries that each had more than one measure of SSB consumption and indicated only the lowest levels of SSB consumption (moderate).

Overweight (Figure 2) and prevalence of diabetes (Figure 3) are a significant problem in the majority of PICTs. There is some evidence of a particular concentration of obesity and diabetes in the Polynesian and Micronesian sub-regions. This is not dissimilar from the pattern of SSB consumption that is also greatest in Polynesia.

In many cases there were limited data points for comparing changes over time. However, between 2000 and 2010 there was evidence of increases in soft-drink importation in Tonga (2000–2010), Guam (2001–2009) and in Fiji (1997–2008), where trade data showed a doubling in estimated litres consumed per person.⁶ There was also some recent evidence of decreased SSB consumption associated with public-health action. A decreasing trend can be seen among youths who reported regular soft drink consumption in Palau (2007–2011).²⁹ This may have been influenced by 'water-only campaigns' in schools (personal communication with Palau NCD coordinator). In Tokelau there was a significant decline in soft-drink imports for the period 2008–2012⁸ after the introduction of an import ban on carbonated soft drinks.

National estimates overlook the difference in consumption of SSBs between population groups in a country. Consumption may vary by age, gender, ethnicity and socioeconomic status. For example, in American Samoa, 6–17 year-old youths consumed SSBs more than adults aged 45 years or more.⁴⁵ In neighbouring Samoa⁴⁵ 18–44 year-olds were greatest consumers.⁴⁵ Gender variation is more pronounced in some school health surveys than others.⁵ In Kiribati 26% of 13–15 years-old girls reported daily consumption of soft drinks compared to 18% of boys.⁵ Slightly more girls in the Cook Islands reported daily SSB consumption than boys (64% vs. 60%).⁵ Adolescent consumption varied by ethnicity in Guam and the prevalence of obesity mirrored this trend.⁴⁶ US adolescents, black children, low income, low parental education and low-socioeconomic status groups in Guam have higher rates of SSB consumption.⁴⁷



Definition of the categories for the assessment of soft drink consumption	HEALTH SURVEY 11-18 year-olds consuming soft drinks daily %	HEALTH SURVEY Adults consuming soft drinks daily %	NUTRITION SURVEY Contribution of soft drinks to total energy intake %	EXPENDITURE SURVEY Proportion food & drink expenditure spent on soft drinks %	TRADE DATA Net importation (and production) of soft drinks L/person
Moderate	<23	<15	<2	<1.5	<40
High	23-45	15-30	2-4	1.5-3	40-80
Very High	>45	>30	>4	>3	>80

Figure 1: National indicators of soft drink consumption in Pacific Island Countries and Territories, 1995-2014.

Note: where a country had more than one indicator (see the key) they were classified to the highest consumption category for which there was evidence. There was no available data for Papua New Guinea and Pitcairn.

Table 4: Snapshot of soft drink and SSB consumption indicators in the Pacific region, 1995–2014.

Country	School health surveys Percentage of adolescents who consume soft drinks daily		Nutrition surveys Soft drinks as a percentage of total energy intake		National household income and expenditure surveys ⁴⁸ Expenditure on soft drinks as a percentage of the household food budget		Trade data ^{4,7} Net importation of soft drinks (as supplied by countries) per capita, adjusted for tourist stays	
Melanesia								
Fiji	*33% OPIC (13–18yo) ⁴⁹	2005/06	2% National Nutrition Survey ⁵⁰	2004	HIES - SSBs not in report	2002/03 & 2012/13 (not yet released)	Fiji Bureau of Statistics estimates consumption – increased over time [from 15 to 33 L/ person]	1997-2008
New Caledonia			Planning a nutrition survey	2014	3.5% HIES – separate report for beverage expenditure	2007/08	Insitut de la statistique trade but no production data.	1995-2014
							WITS exports [32+ L/person]	2013
Papua New Guinea					HIES - SSBs not in report	2009/10	WITS exports [7+ L/person]	2013
Solomon Islands	45% GSHS (13–15yo)	2011			HIES - SSBs not in report	2004/05 & 2012/13 (not yet released)	WITS exports [3+ L/person]	2013
Vanuatu	38% GSHS (13–15yo)	2011			0.5% two HIES –expenditure by beverage types in 2010 report	2006 & 2010	WITS exports [5+ L/person]	2013
Micronesia								
Federated States of Micronesia					<5.9% HIES – total beverage expenditure	2005 & 2012/13 (not yet released)	Division of Statistics produced a report (currency value only)	2000-2007
							Pak 2014 Imports [34 L/person]	2012
							WITS exports [18 L/person]	2013
Guam	22, 19, 19% YRBSS - improved (grade 9-12)	2007, 2011, 2013			HIES- SSBs not in report	2005 & 2013 WITS exports [51+ L/ person]	Bureau of Statistics publish 4d trade data in some quarters (value only)	2011-2014
	*53% Leon Guerrero 2002 ⁴⁶ (11–15yo)	1999					2013	
Kiribati	22% GSHS (13–15yo)	2011			HIES - SSBs not in report	2006 2014/15	Pak 2014 Imports [1 L/person]	2012
							WITS exports [2 L/person]	2013
Marshall Islands					4.1% HIES – expenditure by beverage types	2002	WITS exports [21 L/person]	2013
Northern Mariana					HIES - SSBs not in report	2005	Pak 2014 Imports [44 L/person]	2012
							WITS exports [27 L/person]	2013

(Table 4 continued)

Country	School health surveys Percentage of adolescents who consume soft drinks daily		Nutrition surveys Soft drinks as a percentage of total energy intake	National household income and expenditure surveys ⁵³ Expenditure on soft drinks as a percentage of the household food budget		Trade data ^{4,7} Net importation of soft drinks (as supplied by countries) per capita, adjusted for tourist stays	
Nauru				<1.6% HIES – total beverage expenditure	2006 & 2012/13 (not yet released)	WITS exports [34 L/person]	2013
Palau	38, 35, 26% YRBSS – improved (grades 9–12)	2007, 2009, 2013		6.2% HIES – total beverage expenditure	2006 & 2012/13 (not yet released)	Pak 2014 Imports [110 L/person] WITS exports [94 L/person]	2012 2013
Polynesia							
American Samoa	35, 34% YRBSS ²⁹ (grades 9–12)	2007, 2011		HIES - SSBs not in report	2005	WITS exports [9 L/person]	2013
Cook Islands	62% GSHS (13–15yo) ⁵	2011		2.6% HIES – expenditure by beverage types	2004/05 (& next 2014/15)	Pak 2014 ⁴ Imports [71+L/person] WITS exports [103+L/person]	2011 2013
Niue	77% GSHS (13–15yo)	2010		HIES - SSBs not in report	2002	Pak 2014 Imports [51 L/person] WITS exports [72 L/person]	2012 2013
French Polynesia			25% STEPS (18+yo) ⁵⁶	3.4% HIES – expenditure by beverage types	2000/01 (& next 2014/15)	Government estimates of consumption are available [90 L/person] WITS exports [37+ L/person]	2012 2013
Tokelau						Rush 2012 shipping manifest analysis ⁸ [Decreased from 43 to 17 L/person] WITS exports [8 L/person]	2008–2012 2013
Tonga	57% GSHS (13–15yo)	2010		Two HIES - SSBs not in reports	2001/02 & 2009	Department of Statistics trade data (currency value only) Pak 2014 Imports [31+ L/person]	2008–2013 2011
	*24% OPIC (13–18yo) ⁴⁹	2005/06					
	33% HBLPY (11–16yo) ⁵²	2000					
Tuvalu	52% GSHS (13–15yo)	2013		2.0% two HIES - expenditure by beverage types in 2004 report	2004 & 2010	Pak 2014 Imports [8 L/person] WITS exports [6 L/person]	2011 2013
Wallis and Futuna				<9.3% HIES – total beverage expenditure	2005/06	WITS exports [55 L/person]	2013
Samoa	54% GSHS (13–15yo)	2011		<6.2% two HIES – total beverage expenditure in 2008 report	2002, 2008 & 2012/13 (not yet released)	WITS exports [15+ L/person]	2013

KEY	HEALTH SURVEY 11–18 year-olds who consume soft drinks daily %	HEALTH SURVEY Adults who consume soft drinks daily %	NUTRITION SURVEY Contribution of soft drinks to total energy intake %	EXPENDITURE SURVEY Soft drinks as a proportion of household spending on food %	TRADE DATA Net importation (and production) of soft drinks L/ person
Moderate	<23	<15	<2	<1.5	<40
High	23–45	15–30	2–4	1.5–3	40–80
Very high	>45	>30	>4	>3	>80

Note: *not nationally representative.

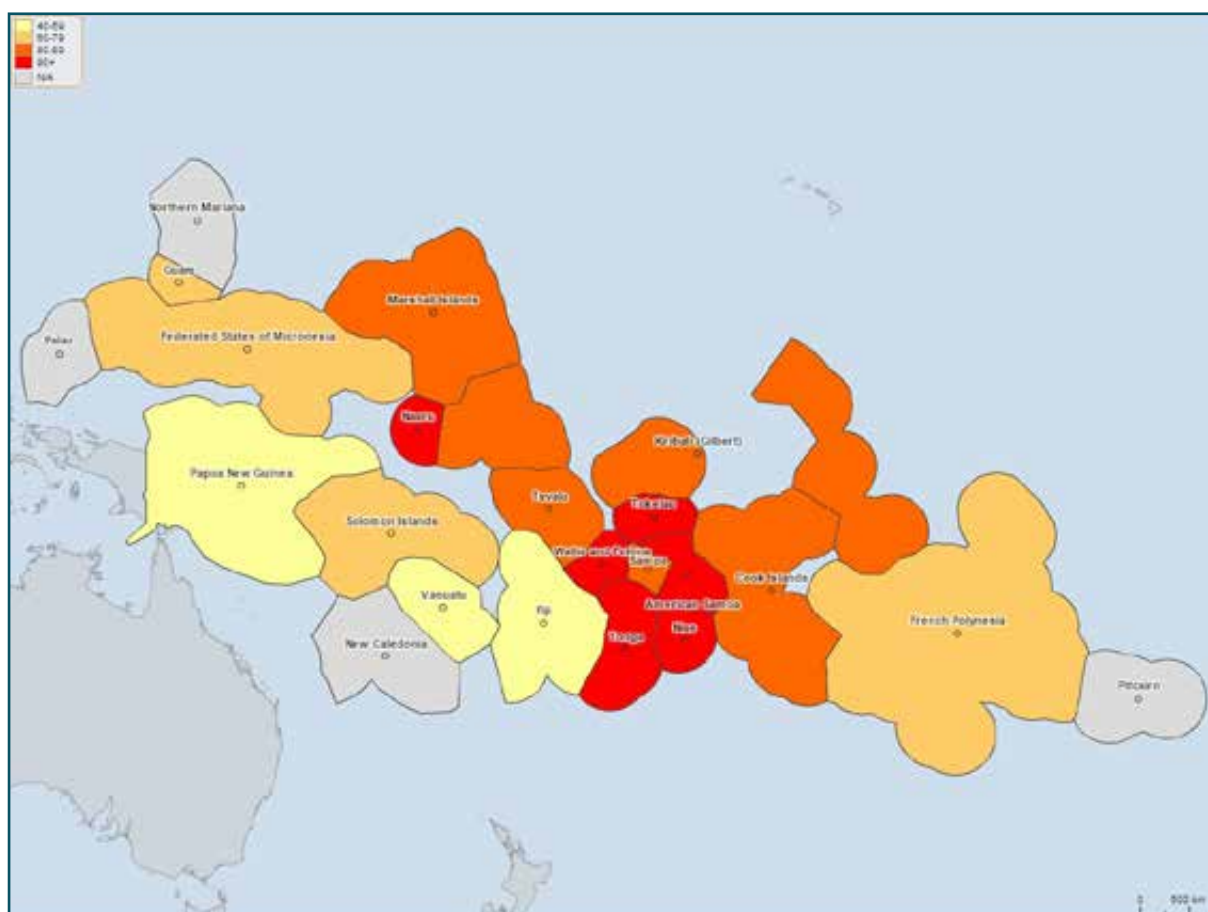


Figure 2: Prevalence of overweight: percentage of adults with a BMI >25.0 in the Pacific Island Countries and Territories, 2002–2013^{53,54,55}

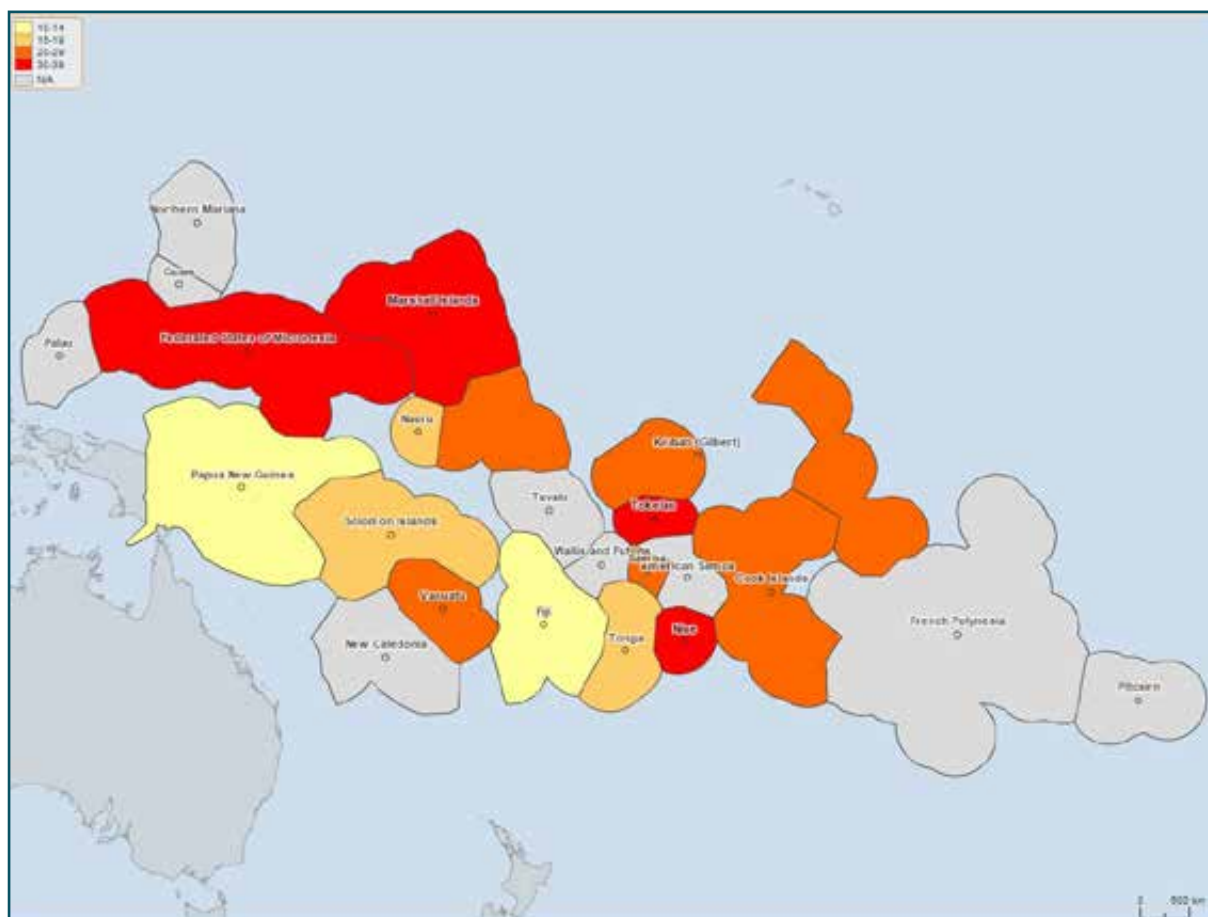


Figure 3: Prevalence of adult diabetes, 2002–2011⁵³

2.2 Food environment

The local food system should be understood before attempting to modify it to improve health.⁵⁶ Processed foods (such as SSBs) are available in the Pacific from every corner of the globe and at least 54 countries of origin have been identified.⁵⁷ A huge variety of soft drinks are available, such as in New Caledonia where 83 varieties have been identified.⁵⁷ The number of products in New Caledonia and the other countries studied (Fiji, Guam, Nauru and Samoa) were >200 juices, 150 juice drinks, 140 soft drinks and 100 cordials.⁵⁷ Coconuts and other fruit may be freely growing but remain difficult to buy, whereas imported soft drinks are conveniently available throughout the region.

High levels of SSB consumption in the Pacific are related to high availability and variety, low prices, heavy marketing and limited access to safe drinking water that is pleasant to drink.⁵⁸ A study in Fiji found extensive sponsorship of school and sports events by beverage companies where 88–98% of sampled school children were able to identify a sports event sponsored by the food or drink industry and around half of the children incorrectly named an SSB when asked to indicate a healthy drink that they had seen advertised.⁵⁹ A brief review of online news media in the Pacific region demonstrates how SSBs are associated with feasts and celebrations, prizes for sporting achievements and gifts.

Access to safe drinking water is essential as a healthy alternative to SSBs. A lack of safe drinking water may encourage greater SSB consumption. About half of PICTs have high rates (>90% households) of safe drinking water access,^{60,53} however, anecdotal reports suggest tap water may be unpleasant to taste, which could be related to mineral content or treatment processes. Urban areas generally have better access to safe drinking water than rural areas.⁶⁰ It is reassuring that PICTs with the highest rates of SSB consumption tend to be the most developed with good access to safe drinking water.

2.3 Political environment

Every PICT has a different political and legal landscape that influences the extent of SSB consumption and what can be done to address it. Trade links, availability of SSBs, authority structure, and a country's available resources are important. Table 5 highlights the variations in population size, gross domestic product, urbanisation, trade agreements and trade links.

Trade has a significant influence on which taxes are put in place to address SSB consumption. PICTs that have recently signed trade agreements may be in the process of reducing import tariffs, including specific taxes on SSBs. The high-profile experience of Samoa banning imports of turkey tails and then seeking to join the World Trade Organization (WTO)⁶¹ illustrates the influence of trade on public-health policies. Imports of SSBs from within the region are low (1% in 2013⁷). However, lower import tax required under Pacific Island Countries Trade Agreement (PICTA) may encourage more SSB imports from within the region and reduce the health benefits of SSB import tariffs.⁶¹ Negotiations are ongoing for PICTA to be superseded by the Pacific Agreement on Closer Economic Relations (PACER-plus), which additionally includes Australia and New Zealand. Some researchers say that regional trade agreements carry less protection to public health than more traditional trade agreements because of 'inherent power imbalances'.⁹ The influence of trade agreements on the type of SSB tax that is selected is discussed below in section 4.2.

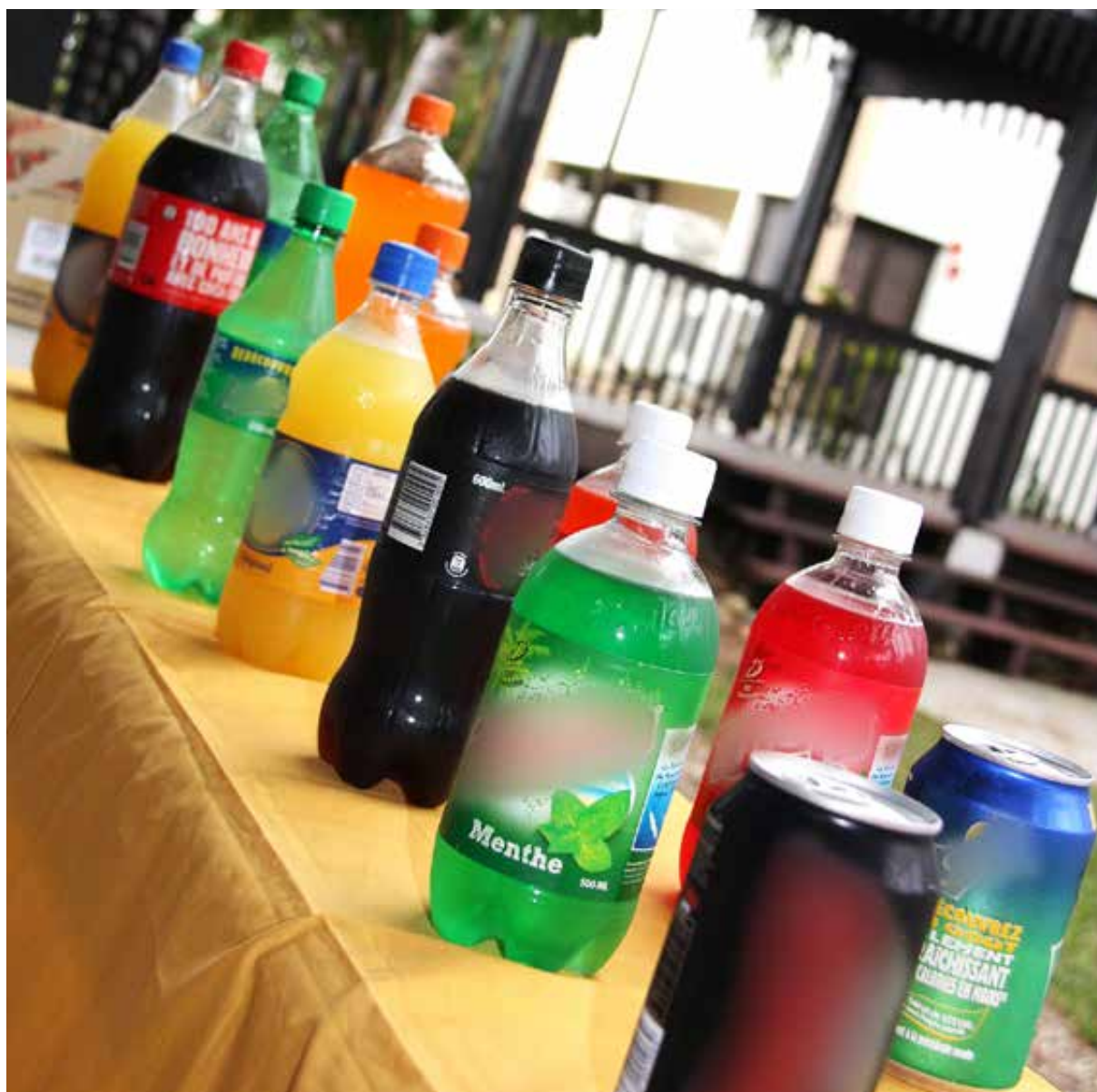


Table 5: Demographic and trade data for Pacific Island Countries and Territories relevant to addressing SSB taxation.

Countries	Mid-year population estimate (PRISM ⁶ 2013)	GDP per capita USD (PRISM ⁶ 2005–2012)	Urban population (%) ⁶	Largest trading partners for soft-drink imports (litres, 2013) ⁷	Trade agreements	Local manufacture of soft drinks	Ethnicities
Melanesia							
Papua New Guinea	7,398,500	18,437	13	Malaysia, Singapore	MSG, WTO, PICTA, SPARTECA	Yes	Papuan, Austronesian, Chinese, Australian
Fiji	859,200	3,639	51	NZ	WTO, MSG, PICTA, SPARTECA	Yes	54% iTaukei, 38% Indo Fijian
Solomon Islands	610,800	1,676	20	Malaysia, Singapore	WTO, PICTA, SPARTECA	Yes	95% Melanesian, 3% Polynesian
Vanuatu	264,700	3,099	24	Singapore, Fiji	WTO, MSG, PICTA, SPARTECA	Yes	99% ni-Vanuatu
Nouvelle-Calédonie	259,000	36,405	67	EU, France	EU, PTOMA, Cotonou agreement	Yes	40% Kanak, 29% European, 9% Wallis and Futuna
Micronesia							
Guam	174,900	25,420	94	Asia ns, Japan	US	Yes	37% Chamorro, 26% Filipino, 11% Pacific,
Kiribati	108,800	1,651	54	Singapore, Indonesia	PICTA, SPARTECA	-	99% Micronesian
Federated States of Micronesia (FSM)	103,000	3,031	22	USA	PICTA, SPARTECA	-	49% Chuukese, 24.2% Pohnpeian
Northern Mariana Islands (CNMI)	55,600	11,622	90	Asia ns, Japan	US	-	Chamorro
Republic of Marshall Islands (RMI)	54,200	3,158	74	USA	PICTA, SPARTECA	-	92% Marshallese
Palau	17,800	10,314	77	Singapore, USA	PICTA	-	70% Palauan, 15% Filipino, 5% Chinese
Nauru	10,500	8,379	100	Singapore, Australia	PICTA, SPARTECA	-	58% Nauruan, PI 26%, European 8%
Polynesia							
Polynésie française	261,400	26,667	51	EU, France	EU	Yes	67% Polynesian, 12% European
Samoa	187,400	3,680	20	USA	WTO, PICTA, SPARTECA	Yes	93% Samoan, 7% Euronesian
Tonga	103,300	4,557	23	Malaysia, USA	WTO, PICTA, SPARTECA	Yes	98% Polynesian
American Samoa	56,500	9,333	50	NZ, Fiji	US	-	91% Native Samoan
Cook Islands	15,200	17,565	74	NZ	PICTA, SPARTECA	Yes	88% Cook Islander
Wallis & Futuna	12,100	12,324	-	China, France	EU	-	68% Wallis, 32% Futuna (Polynesian)
Tuvalu	10,900	3,407	47	Fiji, Singapore	PICTA, SPARTECA	-	96% Polynesian
Niue	1,500	15,807	-	NZ	PICTA, SPARTECA	-	
Tokelau	1,200	-	-	Samoa		-	Tokelauan - Polynesian
Pitcairn	60	3,385	-	NZ		-	British, Polynesian, Chilean

Note: MSG = Melanesian Spearhead Group (excludes 22.02 soft drinks from the agreement)
WTO = World Trade Organization
PICTA = Pacific Island Countries Trade Agreement will be succeeded by PACER plus
SPARTECA = South Pacific Regional Trade and Economic Cooperation Agreement



3. Sugary drink tax policies in the Pacific

Several governments in the Pacific region have already introduced SSB taxes⁶¹; however, the current situation is unclear given the dynamic nature of taxation policies. An update on SSB tax policies in the Pacific region is pertinent given the rapid pace of change, the significant regional and international interest, a paucity of empirical data on the impact of SSB tax and the progress that has already been made in the Pacific. Recognition should be given to the countries that have taken action and have honoured their commitment to address the NCD crisis.

Food taxation is not a new thing. In most countries taxes are applied to all goods including food products. In a typical PICT every item of food has some tax applied to it, although some foods may be exempt through price control lists such as zero rated staple foods in Fiji. In countries that have never adopted SSB taxes, the level of tax on SSBs is similar to the level of tax on other food and drinks. SSB tax is defined here as the additional tax applied to SSBs that is over and above the tax level applied to a broad range of food and drinks (e.g. the tax on SSBs that is additional to the tax on bottled water).

3.1 Policy review

A review of SSB tax policies in the Pacific was carried out. Key articles in the academic literature were examined, relevant government legislation and news websites were explored, and NCD coordinators in PICTs were contacted to ask for policy information. The policy review was current as of September 2014 and describes the status of SSB policies in 21 PICTs. Academics who had published on SSBs helped to identify the key literature on SSB tax policies and reviewed the results of the discussion paper for any known discrepancies. The Google search engine was used with terms incorporating the name of each PICT: 'tax' or 'import tariff', and a 'soft drink' or 'soda' term. Government websites, legislation or media reports about SSBs were explored. NCD coordinators in 19 ministries of health were emailed using SPC's list of country contacts. We asked NCD coordinators about the current SSB policies in place, their effectiveness, any unintended effects, as well as what the willingness is for change and who makes the decision about SSB tax. Reminders were sent out by email. By using these methods, every attempt was made to ensure policy data

were accurate; however, inconsistencies, changes over time and limited online access to policy information made it difficult to eliminate all potential sources of error. Most PICTs change and update their tariff schedule annually and in some cases twice a year.

3.2 Findings

As of September 2014, there was evidence that SSB taxes have been adopted in twelve out of twenty-one PICTs (Figure 4 and Table 6). Eight PICTs had adopted excise taxes (American Samoa, Cook Islands, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, French Polynesia, Kiribati, Tonga and Samoa), and four PICTs use import tariffs (Republic of the Marshall Islands, Nauru, Palau and Vanuatu). In addition, Tokelau has introduced a complete import ban on carbonated soft drinks.⁸ The most commonly taxed beverage was carbonated soft drink; however, sweetened fruit juices were also taxed, for example, in the Commonwealth of the Northern Mariana Islands.

The majority of the soft-drink taxes appeared to include non-caloric sweetened soft drinks such as diet coke. Several taxes are specifically applied to HS 22.02, which includes non-caloric sweetened soft drinks. In the Cook Islands and French Polynesia, however, non-sugar-sweetened drinks were excluded from the excise tax. The market portion of diet soft drinks is unknown and may be limited in the countries that have adopted SSB taxes.

The pattern of SSB tax adoption was greatest in the Micronesian (average 10c a can) sub-region followed by Polynesia (average 9c on a can). Of the five PICTs in the Melanesian sub-region, only Vanuatu has an SSB tax. The low SSB tax (average 3c a can) in Melanesian PICTs may be related to the lack of evidence of high SSB consumption. This may be because little evidence has been collected. Melanesian countries all produce soft drinks locally and tend to have larger populations and a greater number of trade agreements than the other sub-regions. Although there are relatively lower rates of diabetes and obesity in Melanesia the prevalence is still concerning.

Although there was no apparent association between a high level of soft drink consumption and presence of SSB tax in Table 7, the level of SSB tax tended to be greater with evidence of greater levels of SSB consumption. PICTs that have recently increased SSB tax (Cook Islands and Tonga) tended to be countries with evidence of high levels of SSB consumption. Countries that have had SSB tax over a long timeframe tended to register more moderate levels of SSB consumption (CNMI, FSM, Kiribati and Vanuatu).

There is preliminary evidence about the effects of some of the SSB tax policies although in many cases the impact of the tax policies is only described anecdotally and has not been formally evaluated.⁶¹ After the introduction of SSB taxes in Nauru, an increased range of available lower-sugar beverages was noted and there was an increased cost of SSBs in Fiji. In French Polynesia, SSBs changed to become more expensive than water.⁶¹ After the ban in Tokelau, there was a dramatic reduction in carbonated soft-drink imports and a small increase in imported juice.⁸ In Palau, community campaigns and water-only policies in schools (NCD coordinator, personal communication, 2014) have been associated with reductions in regular soft drink consumption reported by grade 9–12 students.

Table 6: Sugar-sweetened beverage taxation policies in Pacific Island countries and territories in 2014.

Country	Year of adoption	Import tariff rate	Excise tax rate	Tax on a 355 mL can of coke*	SSBs taxed
Melanesia					
Fiji ¹³	2011	No specific tariff – 32% import duty applied to beverages whether or not they are sweetened e.g. bottled water	No specific tax – 15% excise tax applied to beverages whether or not they are sweetened e.g. bottled water	-	Soft drinks and juice, whether or not sweetened, excludes sweetened milk
Nouvelle-Calédonie ^{62,63}	-	No specific tariff: but customs duty of 5% for fruit juice, 10% for soft drinks. The A3 (highest rate) taxes flavoured waters and juices, confectionary products.	No	-	-
Papua New Guinea ⁶⁴	-	No specific tariff: 12.5% tariff on imported soft drinks, 15% fruit juice (will both be 10% from 1/1/15)	No	-	Waters containing added sugar, fruit juice (no tariff on sweetened milk drinks, yoghurt drinks, syrups)
Solomon Islands ⁶⁵	-	No specific import tariff: 10% import tariff on all beverages.	No	-	-
Vanuatu ⁶⁶	1988	75% import duty, compared to 30% on unsweetened waters. However, on a reducing schedule of import tariffs on SSBs under PICTA, e.g. from one of supply sources Fiji.	No (Excise tax of 20vt/kg on syrups only)	Singapore: 17c (depends on import price) Fiji: 0c	HS 22.02 – sugar or otherwise sweetened or flavoured beverages (cf. 30% on non-sweetened waters, 20% on fruit juice)
Micronesia					
Federated States of Micronesia (FSM) ⁶⁷	Dec 2004	25% import duty specific to SSBs. This is a national tax.	Two of four states also have their own additional SSB excise tax. ⁶⁸ Yap state: \$0.10 per 12 fl. oz. \$0.15 per container of more than 12 fl. oz. Kosrae state: \$0.02 per 12 fl. oz plus \$0.01 per each additional oz.	6c (depends on price) Yap: + 10c Kosrae: + 2c	Import tax: soft drinks, drink mixes, drink preparations, coffee, tea and non-alcoholic beverages, excluding 25+% fruit juice (which is taxed at 12%) Excise tax: soft drinks/soda
Guam	-	-	No excise.	-	-
Kiribati ⁶⁹	2014 (decrease)	In April 2014 a 70% import duty specific to soft drinks was reduced to 0% (and replaced by VAT & excise)	40% excise duty since April 2014	15c (depends on price)	Soft drinks HS 22.02 (i.e. sweetened waters)
Republic Marshall Islands (RMI) ⁷⁰	2004–2005	\$0.01666 per 1 ounce, 20c on a can (7% of the cost of a \$2.75 can ³¹)	No	20c	Carbonated beverages
Northern Mariana Islands (CNMI) ⁷¹	1995	-	0.5 cents (\$0.005) per fluid ounce excise tax (+5c for a beverage container)	11c	SSBs excluding: milk, 100% juices, water
Nauru ¹	July 2007	30% special import sugar levy. Removed a levy on bottled water.	No	11c (depends on price)	Carbonated soft drinks, cordials, flavoured milks and drink mixes (also sugar and confectionary)
Palau ⁶⁸	-	\$0.10 per 12 fl. oz. (355mL), \$0.15 per container of more than 12 fl. oz (Bottled water [if not distilled] is also specifically taxed at 25% <i>ad valorem</i>)	No	10c	Carbonated soft drinks

(Table 6 continued)

Country	Year of adoption	Import tariff rate	Excise tax rate	Tax on a 355 mL can of coke*	SSBs taxed
Polynesia					
American Samoa ⁷²	June 2001	15c per 12 ounces or fraction thereof (US \$0.42/L)	15c per 12 ounces or fraction thereof (US \$0.42/L)	15c	Soft drinks, non-alcoholic beverage, or syrup for use in preparation of soft drinks
Cook Islands ^{61,73,74}	April 2014	Previously: There was previously a 77% import levy on carbonated soft drinks but less for PICTA countries.	NZD 9.80/kg of sugar content in soft drinks introduced on April 1 st 2014, replacing import levy. ⁷⁴	30c (USD and allowing for 39g sugar in a can)	Soft drinks (HS code 22.02)
Niue	Apr 2009	No specific import tax: all import taxes are gradually being reduced to zero	No	-	-
Polynésie française ¹³	2002	60 CFP/L import tax	40 CFP/L excise tax	15c (locally produced)	Sugar-sweetened drinks – (also confectionary and ice-cream) Excise: HS 21.06 – syrups, 22.02 – but excludes drinks with no sugar, flavoured milk and beverages containing fruit juices Imports: HS 21.06, 22.02, 04.02.99
Tokelau ⁸	2009	Soft drink ban – In 2008 soft-drink importation was calculated at 43 L/person/year and presented to each Taupulega (Council of Elders) following the 2009 NCD Meeting. Since then, one atoll has banned soft drinks and the other two followed.		-	Soft drinks (fruit juice is allowed to be imported)
Tonga ⁷⁵	Aug 2013	No specific tariffs, average import tariff of 10% on food and beverages	1 Pa'anga/L excise duty up from a 15% duty before (5% of the cost of a 7.75 T\$ can ⁷⁶)	18c	Carbonated drinks (also lard and dripping)
Tuvalu	-	No	No	-	-
Wallis & Futuna	-	There are no specific charges for soft drinks. Most import tax 3%.	No	-	-
Samoa ¹³	2008	0.30 T/L excise on imports	0.40 T/L excise on local production (3% of the cost of a 4.53T can ³)	6c (locally produced)	Soft drinks

Note: No specific tax means that the rate of taxation for SSBs was no greater than that of other categories of food or drink.

*SSB tax is the extra tax level in addition to tax applied to other foods and drinks. Ad valorem taxes were calculated based on the average import price of 355 mL of soft drink to the Pacific (USD 0.38).⁷

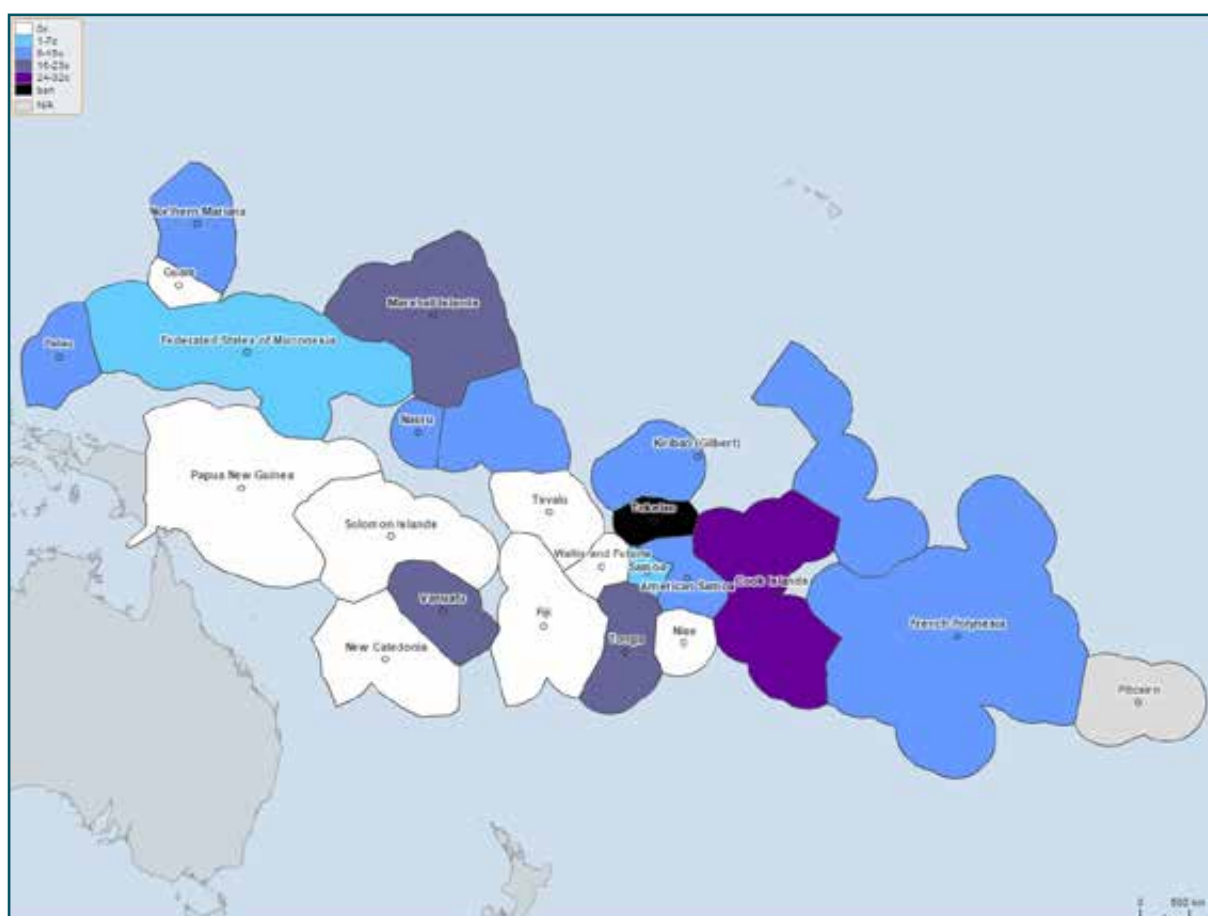


Figure 4: Typical level of sugar-sweetened beverage tax (USD) on a 355 mL can of coke in Pacific Island Countries and Territories, over and above tax levels applied to other foods and drinks, 2014.

Note: Ad valorem taxes in Nauru, FSM, and Kiribati are calculated based on a US\$1 price for a can of coke. Tokelau has an import ban on carbonated soft drinks but no soft-drink tax.

Table 7: Sugar-sweetened beverage taxes by level of SSB consumption in Pacific Island Countries and Territories, specifying the average level of SSB tax on a can of soft drink where tax has been adopted, 2014.

Level of soft drink consumption	Excise tax and year adopted	Import tax only and year adopted	No specific SSB tax
Very high (Mean SSB tax: USD 0.17)	French Polynesia 2002 Samoa 2008 Tonga 2013 Cook Islands 2014	Palau RMI 2005 (no local production)	New Caledonia Niue Tuvalu Wallis & Futuna
High (Mean SSB tax: USD 0.14)	American Samoa 2001 CNMI 1994	Vanuatu 1988 (exclusions for some trading partners, local production not taxed)	Fiji Solomon Islands
Moderate (Mean SSB tax: USD 0.11)	FSM 2004 Kiribati 2014	Nauru 2007 (no local production)	Tokelau 2009 (ban) Guam
Unknown			Papua New Guinea



4. Developing a sugary drink tax

Careful design of an SSB tax can maximise its desired impact on health and SSB consumption. Among the various ways that an SSB tax may be designed, evidence suggests that the health gains may be optimised by:⁷⁷

1. Purpose: making the health goal clear and communicating it
2. Characteristics:
 - i. choosing an excise tax
 - ii. taxing on beverage volume or sugar content
 - iii. taxing a broad range of SSBs
 - iv. setting an adequate tax rate preferably 30%+
3. Investing revenue in health
4. Ensuring other healthy beverages (such as tap water, bottled water) are more affordable than SSBs
5. Monitoring enforcement and the health impact over time to make any necessary adjustments

Nauru for health¹³

In 2007, the Government of Nauru adopted a 30% import tax on sugar, confectionery, carbonated soft drinks, cordials, flavoured milks and drink mixes. The tax covers the whole market for these foods because none of them are locally produced. At the same time a levy on bottled water was removed. The tax was prompted by the Minister for Health and its expressed purpose was to 'discourage excessive consumption of sugar.' The tax method selected in Nauru was similar to the pre-existing taxes on alcohol and tobacco. In 18 months, the policy had resulted in price increases for SSBs¹³ and a greater variety of sugar-free beverages.⁸⁵ Increased competition from cheaper Asian beverages reduced the impact of the tax on SSB price.^{13,85}

Text box 1: Nauru introduces SSB tax for health gains

These design features are discussed in more detail in the sections that follow. Calculations are also given for the expected revenue from a 20% (or equivalent) soft drink or SSB tax.

Successful implementation of an SSB tax in the Pacific relies on selecting design features that will align with government priorities (e.g. trade commitments), engage other sectors in the proposing and developing of cross-sectoral policies, broadly justify policy initiatives, build on excise tax policies already used and use a clear enforcement mechanism.⁸⁴ Potential side effects from an SSB tax should be considered prior to implementation and might be predicted by carrying out a health or social impact assessment.⁸⁵

4.1 Communicate a clear health goal

The aim and rationale of a tax policy will direct its design and how effective it will be at achieving the desired health gains. For maximal success, it is important that an SSB tax is clearly justified in terms of its contribution to health.¹³

There are many benefits from taxing SSBs:^{9,80}

1. Reduced consumption of SSBs (economic disincentive to consumers, while possibly increasing their incentive to select a healthier, cheaper replacement)
2. Increased government revenue, which may or may not be used to offset rising NCD health costs and fund other health initiatives
3. Reinforced public-health messages that the product is unhealthy or of low nutritional quality that sends a strong message to consumers and the industry that consumption of SSBs is harmful
4. Signs of commitment to development partners that the government is willing to address NCDs
5. Correction of the true economic cost to society of SSBs, including the economic burden and social costs of NCDs (externalities).

Tax rates are generally higher with a greater health impact in countries where there is a clear and explicit goal of health promotion. This is the case in Nauru where an import tax of 30% on high-sugar drinks was introduced (see text box).¹³ SSB taxes that are introduced primarily to raise government revenue frequently result in lower taxes and no real health impact. Fiji introduced a small domestic excise tax on soft drinks of 5c/L in 2006/2007 to raise revenue (for health) and pass on the true costs to consumers.¹³ The impact on consumption and health was limited and the tax was soon removed after industry lobbying.

Industry may actively and aggressively oppose SSB taxation to protect their profits. Political leadership and communication are vital in order to explain the links between SSBs and the NCD crisis before a tax is increased.⁹ SSB tax proposals should clearly explain that the tax is a correction for health externalities such as NCDs, which are linked to SSB consumption.⁸¹ Many PICTs do not currently have local production facilities or a strong industry presence, which makes it important to act promptly before these facilities are established.

1. **Recommendation:** Clearly explain that the goal of the SSB tax policy is to reduce SSB consumption. SSB tax corrects for the external costs of SSBs including NCDs (externalities). Political leadership and communication are vital to explain the links between SSBs and health before tax is increased.

4.2 Characteristics

A. Excise tax

Health impact is influenced by the type of tax that is selected and how it is enforced. In PICTs, there are currently at least three different types of SSB taxes – import tariffs, excise tax and VAT (Text box 2). The evidence from tobacco taxation^{82,83} suggests that excise tax is the most appropriate method for reducing tobacco consumption. Excise tax has similarly been recommended as an appropriate mechanism for nutrition taxation⁸¹ such as SSB taxes. This is largely because excise taxes are applied equally to both imports and local production, and because excise can be differentially applied, which enables the price of SSBs to be raised relative to the price of other products and services. In producing countries, an import tariff is too narrow because locally produced SSBs are not taxed.

Types of SSB taxation

Term	Definition
Import tax/tariff	Tax placed on the importation of beverages.
Excise tax/duty	Tax placed on the manufacture, sale, use, or distribution of beverages.
Value added tax (VAT)	Consumption tax that is placed on the value added to goods (and services), such as beverages, at each stage in the production–distribution–retail chain.
<i>Ad valorem</i> tax	Tax levied as a percentage of a beverage's value (e.g. 30% of the price).
Specific tax	Tax levied on beverage volume (\$1 per litre) [volumetric tax], or perhaps sugar content (5 cents per teaspoon of sugar) [nutrition-based tax].

Text box 2: Summary of different types of SSB taxation⁷⁷

Excise taxes consist of special taxes placed on specific kinds of goods at any stage of production or distribution, typically alcoholic beverages, tobacco and fuels.¹³ Excise taxes vary greatly depending on what beverages are taxed and how the tax is assessed.⁷⁷ Excise tax can be applied anywhere along the food supply chain from production or importation to retail. It may be more effective to recover tax from producers and importers given the smaller number of players, and this will almost certainly be passed on to consumers.⁸⁴ The same structures and processes used for taxing alcohol and tobacco can be used to introduce and enforce SSB tax. A clear enforcement mechanism is vital. Building and developing an existing set-up for excise tax on tobacco is a laudable approach.

These are the advantages of using excise tax as a mechanism for taxing SSBs:⁷⁷

- Excise tax comprehensively applies to both local production and imports. This is important where SSBs are produced locally for local consumption. Excise tax can be designed to be consistent with trade agreements whereas import tariffs may be accused of discriminating against foreign producers by applying higher tax rates to foreign goods.
- It is the existing taxation mechanism for alcohol and tobacco taxation in most PICTs. Using the same model for SSBs will help to enable successful policy implementation by minimising administrative costs.¹³
- Excise tax is easier to collect if acquired earlier in the distribution process when there are fewer entities to collect taxes from. For example, it may be collected at the importation and production stage of the distribution process. This lowers administrative costs and decreases the likelihood of tax evasion.

- An excise tax can be levied on volume, sugar content (specific tax) or on value (ad valorem).
- The cost of the tax is expected to be incorporated into the price that the consumer views when deciding what to purchase, because the additional costs of the tax are passed on to the retailer.⁸⁵

2A. Recommendation: Excise tax on SSBs is a good option because it is non-discriminatory between imported and locally produced goods, implementation can be modelled on tobacco excise and the tax can be collected early in the SSB distribution process for efficiency and better enforcement.

Import tax

Import tariffs are the other main type of SSB tax used by PICTs. An import tariff may have a similar impact as excise, when a country is fully reliant on importation for SSB consumption and there is no local production. Import tariffs are, however, frequently subject to trade agreements. The level of the tariff on SSBs may vary depending on where the SSBs are imported from, according to the trade agreements in place.

When forming a new trade agreement with another country, the negotiation will include setting maximum permissible import tariffs. In WTO negotiations the maximum allowable level of import tariffs may be 70%+ for some countries while in PICTs they may be as low as 15%. Furthermore, it is usually possible to exclude certain products from the agreements (MSG, PICTA) or say that some products should be allowed a higher tariff or a longer time to reduce that tariff. This is usually used to benefit local industry but may also be used to exclude categories of SSBs in order to maintain a country's ability to apply import tariffs to these products.

Import duties have traditionally provided a major source of revenue in the Pacific region. More recently, import duties have been progressively reduced and removed to meet trade commitments.⁸² Countries are replacing lost revenue with other domestic taxes such as excise tax, and/or VAT, sales, or goods and services taxes.¹³ Health-related taxes are unlikely to be a problem if import duties are not greater than what has been agreed as the upper limit, taxes are applied equally to domestic and imported products⁷⁹ and there is a health justification.¹³ For example, Samoa is signatory to the WTO and introduced an import tariff on SSBs in 2008. The government justified the policy with an aim to improve health and ensured that both import and domestic excise duties were the same rate.¹³

Value added tax

VAT is an example of a sales tax. It is a broad-based tax placed on the value added to a range of products and services, including beverages, at each stage in the production-distribution-retail chain. Governments collect VAT by a system of partial payments at each stage in the chain. There is usually a flat tax rate, but some jurisdictions may exclude fresh fruit and vegetables from VAT. Although this is one way of creating a price differential between SSBs and more healthy alternatives, no country has applied a greater level of VAT to SSBs⁷⁷ because of the broad-based nature of this tax. Complex tax structures are difficult to administer, and undermine effectiveness by creating greater opportunities for tax avoidance and tax evasion.⁸²

B. Specific tax

In addition to the types of tax discussed, the method by which an SSB tax is applied and calculated influences the expected health gains. An SSB tax can be applied as an *ad valorem* tax (e.g. 30% of the price) or a *specific* tax which is commonly applied to the volume of the beverage ('volumetric', e.g. \$1 per litre) or the nutrient content of the beverage ('nutrition-based', e.g. \$10 per kg of sugar). The choice of application method influences the tax's effectiveness and ease of implementation (Table 8).

Specific taxes, such as taxes based on volume or nutrient content, have some advantages over *ad valorem* taxes that are applied to value (Text box 3).

1. Tax based on the volume of a beverage has been found to be more effective than tax based on beverage price.^{86,83} Evidence from an Australian modelling study based on purchasing data shows that a 20c/L tax had 50% greater impact on consumption than a 20% flat rate sales tax.⁸⁶ Volumetric tax resulted in 50% greater weight loss than the tax based on value (0.41 kg vs. 0.29 kg per person). In studies of tobacco, specific taxes (such as on volume) led to greater increases in consumer prices than taxes based on product value.⁸³
2. Similarly, evidence from modelling studies has shown nutrition-based taxes, such as a taxes on sugar, have a greater impact on nutrition than value-based taxes of the same level.⁸⁷
3. Specific tax is likely to be more effective at reducing sales on bulk purchases of soft drinks than a tax that is based on value. A tax that is based on price might lead to bulk buying whereas a tax that is based on volume is generally more effective in switching purchasing from unhealthy foods.⁹
4. Specific tax is less likely to encourage consumers to switch to less expensive brands because it avoids increasing the gap in prices between high- and low-priced brands.⁸² Furthermore, the additional cost of the SSB tax will not decrease with decreases in the product price as would be the case with a tax that is based on value. The volumetric tax may be easier to implement than the nutrition-based tax per kg of sugar. This is because beverage volume is generally identifiable and frequently recorded.
5. The volumetric tax may be easier to implement than the nutrition-based tax per kg of sugar. This is because beverage volume is generally identifiable and frequently recorded.
6. Specific excise taxes may be easier to administer than a tax that is based on value, as was the case with tobacco.⁸² This limits the opportunities for tax avoidance and evasion.⁸²
7. Revenue is also more likely to be stable with tax that is applied to soft drink volume or sugar content.⁸³

A specific tax in the Cook Islands⁷⁴

On the 1st of April 2014 the Cook Islands government introduced a tax on soft drinks with high-sugar content, switching from an *ad valorem* tariff (one based on the price of the good) on to a specific tax (one based on the quantity of sugar in the soft drink). The tax was switched from being applied only to imported products to all products consumed in the Cook Islands. Specific taxes make the aims of the taxation policy clear by targeting the specific content in a product – in this case, sugar. The new tax is applied at the rate of NZ \$9.80 per kg of sugar content in soft drinks. This works out to be NZ \$0.38 for a can of coke.

Text box 3: Nutrient-based tax on soft drinks

Specific taxes require adjustment to keep up with inflation and maintain their impact over time. The tax can be designed to automatically adjust in line with inflation to avoid reductions in the real value of the SSB tax. This was done with the 2012 Cook Islands SSB tax; however, several other PICTs have not made a plan for this.

Table 8: Comparison of possible types of excise tax on SSBs that could be used in the Pacific region

Type of tax application	Health impact	Administrative costs	Issues
Specific: nutrition-based (\$10 per kg of sugar) <i>e.g. Cook Islands 2014 [but limited just to SSBs]</i>	+++	\$\$\$ Requires maintenance of a list of sugar content for brands sold based on their nutrition labels	* Requires adjustment to keep pace with inflation
Specific: volumetric (\$1 per litre) <i>e.g. American Samoa, CNMI, French Polynesia, Samoa, Tonga</i>	+++	\$\$ Depends on current system	* Requires adjustment to keep pace with inflation
Ad valorem (value based) (30% of the price) <i>e.g. FSM, Kiribati, Nauru</i>	+	\$ Depends on current system	** May lead to bulk buying Encourages purchase of lower price brands
Flat tax (e.g. 30% tax if >3g sugar per 100 mL) ⁸⁴ <i>No Pacific example</i>	++ Uncertain	\$\$\$ Limited by the quality of nutrition information	** Impact of small PICTs on reformulation is limited Does not promote zero calorie beverages

Note: symbols demonstrate the relative extent of the health impact, costs, and issues respectively

The implementation of a nutrition-based tax (or a flat tax) requires a list of sugar content of the different SSB brands in order to categorise products to different levels of tax that is based on their sugar content. This could be created by a ministry of health from nutrition labels and maintained on an annual basis. It could be a requirement that imported or locally produced products are labelled or charged the maximum level of tax if the product is not reliably labelled. The Danish tax on saturated fat is an example of a nutrition-based tax. In France the law made it difficult to introduce a nutrition-based tax and this influenced the decision to introduce a category-based tax.¹²

2B. Recommendation: A specific tax (e.g. \$1 per litre or \$10 per kg of sugar content) is likely to be more effective than an ad valorem tax (e.g. 30% of price). A specific tax policy should incorporate adjustments for inflation over time to maintain its health effect.

C. Tax a broad range of beverages

A broad range of SSBs should be taxed to maximise the health impact and reduce the likelihood that consumers will simply switch to untaxed SSBs with similar health consequences. As with tobacco excise taxation, comparable tax increases on all SSB products maximises the public-health impact of increased tax by minimising opportunities for substitution.⁸²

SSBs are defined as beverages that contain a caloric sweetener such as sugar. SSBs include soft drinks, sweetened juices, fruit drinks, sachet mixes, cordials, energy or sports drinks, flavoured milks, cold teas or coffees (New Zealand Beverage Guidance Panel, 2014). SSBs of many kinds are linked to obesity, diabetes and other health conditions. Two beverages categories that lie outside the SSB definition are also considered here – 100% unsweetened fruit juices and diet soft drinks.

Soft drinks and energy drinks

The most commonly consumed SSBs are carbonated soft drinks. In recent times there has been evidence of increasing consumption of ‘non-traditional’ SSBs such as sports or energy drinks (at least in other regions).⁴⁷ Energy drinks are additionally concerning given the very high levels of caffeine in many of these products and that little has been done to mitigate their public-health impact.⁸⁸

Fruit juice

100% fruit juice without added sugar/sweetener falls outside the SSB definition but may also have some harmful health effects. In contrast to most SSBs, pure fruit juices provide additional nutritional value beyond energy.⁸⁹ They may be more satiating than soft drinks, particularly fresh juices with some fibre content.⁸⁹ Evidence for the link between consumption of fruit juice and obesity is conflicting and if anything it appears to be weaker than the link between soft drinks and weight gain.⁹⁰ Soft drinks and fruit juices contain similar amounts of sugar and energy and therefore theoretically have the same potential for promoting weight gain.⁹⁰ It has been found that sucrose, high-fructose corn syrup or fruit-juice concentrates all result in similar metabolic effects (Hu and Malik, 2010). Soft drinks and fruit juice also have similar erosive potential on teeth from their sugar and acid content.

Fruit juice is within the remit of the recent WHO draft guidelines on sugar intake.¹⁸ The guidelines strongly recommend that free sugars should not exceed 10% of total energy intake. ‘Free sugars’ include not only added sugars but sugars naturally present in fruit juices and fruit concentrates. ‘Free sugars’ do not include sugars from milk and intrinsic sugar that is incorporated in the structure of intact fruit and vegetables, because there is no evidence that intrinsic sugars are harmful.¹⁸

Diet drinks

Artificially sweetened soft drinks (e.g. diet coke, pepsi max) fall outside the definition of SSBs because they are not sugar-sweetened. Artificially sweetened soft drinks are generally not believed to contribute to the obesity epidemic.⁹¹ Substitution of soft drinks with artificially sweetened alternatives is associated with weight loss in randomised controlled trials.⁹² There are concerns, however, that an SSB tax that excludes artificially sweetened soft drinks may result in their increased consumption which may turn out to be harmful in other ways. Diet soft drinks are promoted as a healthy alternative and have been approved for use in many countries. However, they retain some of the components of SSBs that have been associated with ill health consequences such as high levels of acidity, which may contribute to dental erosion.⁸⁹ Diet cola drinks retain caffeine, which has been linked to central nervous system disturbances (especially in children and adolescents), loss of bone mass and even death in some instances.⁸⁹ Artificial sweeteners undergo rigorous toxicology tests for approval. The Food and Drug Administration (FDA) has approved the use of five artificial sweeteners including aspartame, Acesulfame-K, saccharin, sucralose and neotame.⁹³ Stevia has also been approved for use in many constituencies. Expected and unexpected health impacts from an increase in the consumption of artificially sweetened beverages may be avoided if incentives are offered to encourage consumption of water and other healthy beverage alternatives.

Considerations

The definition of SSBs selected for taxation often takes into account several factors in addition to the presence of caloric sweetener. It is prudent to consider the following:

- Other harmful effects: As described, acid content and caffeine have also been associated with health harms such as dental caries.
- Nutrient value: Some SSBs have greater nutrient value such as milk drinks, freshly squeezed fruit juice or >50/70% fruit juices; conversely many SSBs have no substantive nutrition value (e.g. soft drinks). Consideration of nutrition value is particularly relevant for PICTs with high rates of undernourishment or nutrient deficiencies.

- **Public support:** (e.g. extent of obesity epidemic, industry response) Some SSBs may be produced locally or significantly contribute to local employment. Alternatives to SSBs may help to bridge any gap created by increased SSB taxes.
- **Implementation:** Choosing a practical method for identifying formal taxation (e.g. working with the Harmonised System [HS] codes [including unique country codes where necessary]). SSBs sold in the informal economy may be difficult to tax.
- **Most commonly consumed SSBs:** There will be little public-health impact without including the most commonly consumed SSBs (by people at greatest risk of obesity) in the taxation policy. This does not preclude consideration of SSBs that may increase or are increasing in popularity and consumption.
- **Relative price:** The current price differential between SSB categories may influence the selection of categories. For example, it may be that fruit juice is already twice as expensive as soft drink, making soft drink a greater priority for taxation.

Harmonised System in French Polynesia

In 2002 French Polynesia adopted an import tax on soft drinks called the 'consumption tax for prevention' and an excise tax called a production tax, as part of a raft of taxation measures on food and beverages. The import tax is applied at the rate of FCP 60/L and the excise or production tax is applied at the rate of FCP 40/L. The import tax was applied to particular categories of the Harmonised System (HS): soft drinks (HS 22.02), syrups (HS 21.06) and sweetened milk drinks (HS 04.02.99). The production tax was applied to soft drinks and syrups using the HS code 22.02 and then specifying exclusions such as flavoured mineral water with or without sugar, other flavoured drinks without sugar, other non-carbonated beverages containing fruit juice or fruit puree, beverage made of chocolate or flavoured milk.⁹⁴

Text box 4: Harmonised System (HS)

Sugar-sweetened carbonated soft drinks are often selected for SSB taxation perhaps because of their high rates of consumption, low nutrient value, low price and ease of identification for taxing. In the US, carbonated sodas were the most commonly taxed and had the greatest sales tax rates (35 states). About half as many (16 states) also taxed >50% on fruit juice and 100% fruit juice (14 states).⁷⁷

Soft drinks may be singled out in the Pacific because local alternatives exist in the form of water, fruit juices and coconut water, which circumvent concerns about the generally regressive nature of food taxes.¹³ Fruit juices have often been excluded from Pacific SSB taxes.⁹⁴ The United States Affiliated Pacific Island Countries (USAPIC), however, has recently made a commitment to implement policies that reduce sugar consumption.²³ Proposals for SSB tax include increasing the soft-drink tax and including any juices or drinks containing less than 50% fruit juice.

The HS codes can be used to help categorise SSBs that are to be taxed. Many HS codes may include SSBs (Text box 4).

2C. Recommendation: An SSB tax should tax soft drinks as the first priority. Inclusion of a broad range of SSBs (possibly also diet soft drinks and fruit juice) will maximise the health impact and reduce the likelihood that consumers will simply switch to other unhealthy beverages. Selection of beverage categories for taxation may be informed by evidence of health harms, nutrient value, public support, ease of implementation and which beverages are commonly consumed.

D. Adequate tax rate

It is generally considered that the level of an SSB tax should be a minimum of 20%, and preferably 30% or greater, to have a recognisable impact on population health.¹⁰ An example may be a \$1 per litre excise tax that works out to be \$0.35 for a 350 mL can of soft drink that would perhaps normally costs \$1. The impact of different levels of SSB tax on health is available from natural experiments, simulation studies and controlled experiments. Indirect evidence is available from the tobacco and alcohol literature. There is strong evidence that SSB tax reduces SSB consumption^{95,96} a new focus seems to be put on taxing foods that are perceived as being associated with obesity (eg, sugar-sweetened beverages and foods high in fat, sugar, and salt content and leads to moderate weight reductions. The larger the tax and increase in SSB price, especially relative to other healthier beverage options, the larger the impact on consumption, obesity, health, health care costs and revenue generation.^{97,98,81}

Reduced consumption

There is strong evidence from both country experience and simulation modelling that SSB tax reduces SSB consumption.^{95,96}

Much can be learned from the introduction of SSB tax in other parts of the world. Empirical evidence from Mexico's introduction of a soda tax shows a 6.4% reduction in soft drink sales during the first half of 2014, compared with the same period of 2013. Half of the participants in an August 2014 health survey reported they had lowered their consumption of sugary drinks compared with the year before.⁹⁹ It may be difficult to distinguish the contribution of the SSB tax to reduced consumption from other factors that may also have contributed to the observed changes. A study of soft drinks taxation in Ireland, that was put in place during the 1980s, found an 11% decrease in consumption for each 10% increase in price.¹⁰ In Hungary, industry data suggested a drop in sales after adoption of an SSB tax in 2011 from 117 million litres sold in the last quarter of 2011 to 69 million litres in the first quarter of 2012. This was partly attributable to the general economic crisis, the possibility of the stockpiling of goods before tax introduction and a degree of tax evasion in the first few months.¹² In France, a growth in soft drink sales was reversed and there was a 0.03% decline in sales after the introduction of an excise tax.¹²

The impact of SSB tax on consumption can also be estimated using a measure called price elasticity. Price elasticity is the percentage change in quantity of SSBs bought or consumed in response to a 1% change in the price of the product.⁹⁷ Simulation studies model how SSB prices affect consumer demand for SSBs (price elasticity) and consumer demand for other beverages (cross-price elasticity). This method is relatively new and its quality relies on the quality of the dietary, health and economic data that are used.¹⁰ Elasticities are based on small weekly fluctuations in price and often do not capture compensatory behaviour that may increase or decrease energy intake.¹⁰ The strength of modelling is that it presents the available evidence in a meaningful way. For example, cross-price elasticities can be used to identify potential unintended effects from SSB tax.

Reviews combining results from empirical and simulation studies find elasticities close to -1, which equates to 30% reduced consumption for every 30% increase in the price. Several systematic reviews of studies that combined their elasticity data, found statistically significant reductions in SSB and soft drink consumption (Table 9). For every 1% increase in SSB price, meta-analyses predict 0.79,¹⁰¹ 1.21⁹⁷ and 1.30%⁹⁵ reductions in consumption. For a 1% increase in soft drinks price, meta-analyses predict 0.86,⁹⁷ 0.93,¹⁰² and 1.00%¹⁰¹ reductions in consumption. Soft drink elasticity results have also been published in more recent simulation studies from Australia (0.63%), New Zealand (1.27%) and the United States (1.04%).

While the majority of the elasticity studies are from high-income contexts,⁸¹ evidence from Brazil and Mexico is consistent with high-income country results.⁹⁵ Low-income countries may have even greater price elasticity and greater reductions in consumption with the introduction of taxation. The impact of price on tobacco use in low- and middle-income countries indicates that demand for tobacco products is at least as responsive, and often more responsive, in low- and middle-income countries.⁸² In the absence of Pacific simulation studies on the price elasticity of SSBs, the use of international systematic review results is appropriate. More research is needed to assess elasticity in low- and middle-income countries and countries in the Pacific region, in particular to measure and predict the health impact of SSB taxation.

Harmonized commodity description and coding system – categories that may include SSBs

22 02 10	Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavoured containing added sugar
22 02 90	Other 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 vegetables juices of heading 20.09
21 06 10	Protein: concentrates and textured protein substances
17 02 30	Glucose and glucose syrup, not containing fructose or containing in the dry state less than 20% by weight of fructose
17 02 40	Glucose and glucose syrup, containing in the dry state at least 20% but less than 50% by weight of fructose, excluding invert
17 02 50	Chemically pure fructose
17 02 60	Other fructose and fructose syrup, containing in the dry state more than 50% by weight of fructose, excluding invert sugar
17 02 90	Other, including invert sugar and other sugar and sugar syrup blends containing in the dry state 50% by weight of fructose
04 02 29	Dairy produce: milk and cream, containing added sugar or other sweetening matter, other than in powder, granules or other solid forms, fat content exceeding 1.5%
04 02 99	Dairy produce; milk and cream, containing added sugar or other sweetening matter, other than in powder, granules or other solid forms
09 01	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion.
09 02	Tea, whether or not flavoured
20 09 11	Juice: orange, frozen, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter
20 09 12	Juice: orange, not frozen, of a Brix value not exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 19	Juice: orange, not frozen, of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 21	Juice: grapefruit (including pomelo), of a Brix value not exceeding 20, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter
20 09 29	Juice: grapefruit (including pomelo), of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 31	Juice: of single citrus fruit (excluding orange or grapefruit), of a Brix value not exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 39	Juice: of single citrus fruit (excluding orange or grapefruit), of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 41	Juice: pineapple, of a Brix value not exceeding 20, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter
20 09 49	Juice: pineapple, of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 50	Juice: tomato, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 61	Juice: grape, of a Brix value not exceeding 30, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter
20 09 69	Juice: grape, of a Brix value exceeding 30, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 71	Juice: apple, of a Brix value not exceeding 20, unfermented, (not containing added spirit), whether or not containing added sugar or other sweetening matter
20 09 79	Juice: apple, of a Brix value exceeding 20, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 80	Juice: of any single fruit or vegetable n.e.c. in heading no. 2009, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter
20 09 90	Juices: mixtures, unfermented, not containing added spirit, whether or not containing added sugar or other sweetening matter

Text box 5: The Harmonised System (HS) codes can be used to identify categories likely to account for SSBs in 2007/2012 versions¹⁰⁰

Heterogeneity

Elasticity results are generally presented for whole populations and do not reflect differences between groups within a country. We know that consumption rates vary between population groups – as does price elasticity.¹⁰³ Children, adolescents and low-income populations are generally more sensitive to price.⁹⁷ Overweight individuals and high consumers are also more sensitive to increases in price. Increasing the price of SSBs is likely to result in greater consumption reduction among low-income groups and high consumers. Not only are poorer households most responsive to price changes, but they also face higher levels of risk factors for NCDs and stand to benefit more from shifting consumption away from unhealthy foods and drinks.⁹ SSB tax is likely to be an effective way of encouraging healthy drink choices in children that develop into positive behavioural patterns that persist into their adult lives.¹⁰⁴

Table 9: Price elasticity estimates from meta-analyses of both empirical studies and simulation studies.

Context	Definition of taxed beverages	Number of contributing study estimates	Pooled summary elasticity estimate	Range (95% C.I.)	Expected reduction in consumption from a 20% price increase
SSBs reviews					
US (x6), Mexico, Brazil, France (2000–2013) ⁹⁵	Soft drinks, sugary drinks, non-alcoholic drinks, soda, sweet drinks, beverage, fruit drinks, sport drinks, cold drinks and carbonated SSBs (excluding full cream milk, low-fat milk, skim milk, water, tea and coffee)	9	-1.30	-1.09 to -1.51	26%
US only (2007–2012) ⁹⁷	SSBs, regular carbonated soft drinks, sports drinks, fruit drinks	12	-1.21	-0.71 to -3.87	24%
US only (1938–2007) ¹⁰¹	Soft drinks (including diet), carbonated soft drinks, juice and soft drinks, soda, soda and fruit aides, non-alcoholic beverages, other beverages and beverages	14	-0.79	-0.33 to -1.24	16%
Soft drink reviews and some locally relevant more recent simulation studies					
US only (2007–2012) ⁹⁷	Soft drinks (including diet) (bottled water in one study)	4	-0.86	-0.41 to -1.86	17%
US, Norway (1990–2011) ¹⁰²	Carbonated soft drinks (including diet)	4	-0.93	-0.06 to -2.43	19%
US only (1938–2007) ¹⁰¹	Soft drinks (including diet), carbonated soft drinks, soda, and soda or fruit aides	7	-1.00	-	20%

Weight changes

There is good evidence that reducing SSB consumption leads to weight loss, and reduction in the prevalence of obesity and obesity-related diseases.¹ The impact of SSB tax on weight loss may be small.^{105,96,106} Small average reductions in weight loss across the whole population may, however, equate to a substantial public-health impact. Small changes at the population level may have a large impact on the health of individuals – particularly those most likely to reduce soft drink consumption.

In the US, an increase of one percentage point in soft-drink tax-levels led to a statistically significant average decrease in body mass index (BMI) of 0.003 points among adults, with greater reductions for low-income and Hispanic groups.¹⁰⁵ For a 30% tax increase this equates to a 90g average weight loss per person.

There is strong evidence that greater soft drink consumption leads to greater body weight. Several meta-analyses have shown statistically significant relationships of high soft drink intake with increased energy intake or body weight.^{19,20} The Malik¹⁰⁷ meta-analysis shows a positive association of greater SSB consumption with weight gain and obesity in both children and adults. BMI increased by 0.07 (95% C.I.: 0.01 to 0.12) for each additional daily 12 ounce serving of SSB over the duration specified in each study.¹⁰⁷ Several randomised, controlled trials have demonstrated that substituting SSBs with artificially sweetened equivalents was associated with weight loss, even with both groups blinded to what they were drinking.¹⁰⁸

A selection of simulation studies has also looked at how price changes in SSBs may impact on obesity and other health outcomes. A UK study estimated that a 20% SSB tax might reduce the number of obese adults by around 1.3% and the number of overweight adults by 0.9%.¹⁰⁹ A systematic review combined three simulation studies to give a combined estimate for the reduction in caloric intake of -0.02% (-0.01%, -0.04%) for each 1% price increase in carbonated soft drinks.¹⁰² Small reductions in energy intake may contribute to important weight reductions over time.

Heterogeneity

The greatest weight loss is likely to be seen in high consumers, low-income households and children.

Weight changes in children and adolescents are likely to be greater given their greater price sensitivity, high levels of SSB consumption and compelling evidence of the link between SSB consumption and childhood obesity. Weight reduction as a result of SSB tax is likely to be greater for heavy purchasers of SSBs in low-income households. A recent simulation study estimates a weight reduction of 3.2kg for heavy purchasers in low-income households with a 20c per litre volumetric tax, compared with 0.41kg per capita weight reduction in the whole population.⁸⁶

2D. Recommendation: A higher tax level is likely to have a greater impact on SSB consumption and improve the likelihood of measurable health benefits. SSB tax is likely to have a greater health benefit for children, high consumers and low-income groups who are more sensitive to changes in price.

4.3 Revenue and investment

One benefit of SSB taxation is generation of revenue. Estimated revenue collection has been modelled in some high-income countries using household expenditure data.^{11,110} In the Marshall Islands¹¹¹ and Cook Islands⁷⁴ revenue from proposed tax levels was estimated using current tax revenue and trade data. For a selection of PICTs, we estimated potential revenue from soft drink or SSB taxes by adopting the same methodology used elsewhere.¹¹⁰ PICTs were included if soft drink expenditure was available from a Household Income and Expenditure Survey (HIES). Expenditure surveys have been done by 20/22 PICTs and are repeated at regular intervals. Not all reports, however, provide detailed expenditure by individual categories of SSBs.

Government revenue was estimated for the scenarios where tax is introduced (or increased) for soft drinks or for a wider category of SSBs. The level of the tax introduced (or the level of increase) was selected to be 20% of the soft drink's retail value. Revenue was calculated using the average annual household expenditure on soft drinks, multiplied by the number of households present in the most recent available census. Adjustment was made for reduced consumption as a result of the price increase, by using price elasticities of -1.0 and -0.9, which are consistent with soft drink and SSB meta-analysis results, respectively

(Table 9). Diet beverages (and other non-SSBs) were excluded from revenue estimates that used the diet beverages proportion of soft drinks sold in New Zealand in the annual supermarket surveys (17%).¹¹² This may be a conservative estimate for the Pacific as, for example, the figure was less than 10% in Mexico.⁹⁹ The broader SSB tax applied the 20% tax to fruit juice, flavoured milk and other beverages (not mineral water), along with soft drinks.

Table 10: Estimated revenue in local currency expected from a 20% tax on soft drinks and a broader SSB tax adjusted for reduced demand and exclusion of expenditure on non-SSBs.

	HIES year	Local currency	Expected revenue from a 20% soft-drink tax		Expected revenue from a 20% SSB tax	
			Local currency	\$US	Local currency	\$US
Cook Islands	2005/2006	NZD	170,062	142,852	277,128	232,787
Marshall Islands	2002	USD	300,155	300,155	470,903	470,903
New Caledonia	2008	CFP	231,508,646	2,546,595	403,403,816	4,437,442
French Polynesia	2000/2001	CFP	176,408,978	1,940,499	492,976,328	5,422,740
Palau	2006	USD	106,969	106,969	-	-
Tuvalu	2004/2005	AUD	21,067	19,593	24,824	23,087
Vanuatu	2010	Vatu	13,544,512	148,990	33,925,616	373,182
New Zealand (ref)	2013	NZD	41,744,352	35,065,256	84,478,794	70,962,187

Table 10 presents the revenue estimates. The differences in revenue between countries are largely driven by the number of households and beverages expenditure reported in the HIES surveys. Our estimates are similar and if anything more conservative than revenue takes that are posted in the Cook Islands,⁷⁴ Marshall Islands¹¹¹ and French Polynesia,¹³ even after accounting for the different tax rates applied. Our figures may be conservative given the frequently historical nature of the HIES surveys and census figures used here, and the contribution of tourism and other non-household expenditure on soft drinks that we have not accounted for here.

The revenue raised from French Polynesia taxes on SSBs (excluding fruit juices), beer, confectionary and icecream was CFP 1.5 billion in 2005¹³ or 0.9% of the government's annual budget, compared with our estimate of CFP 493 million for the broad SSB category. Import tax currently collected in the Marshall Islands is USD 931,769 based on a \$0.20 tax per 12 ounce of soft drink, which equates to revenue worth 70% of the total value of imported carbonated soft drinks.¹¹¹ In the Cook Islands, under the previous 77% import tariff, NZD 1,229,599 was collected in 2012 from imported sugar-sweetened soft drinks.⁷⁴ Our estimates are much smaller than these figures, perhaps due to differences in the level of taxation that was assessed. It should be noted, however, that the retail and import value of a soft drink may markedly differ. The 20% retail tax assessed here (e.g. 20c on a \$1 can of soft drink) may equate to a much greater proportion of soft-drink import value (e.g. 20c on a can imported at the cost of 33c is equivalent to a 61% import tariff).

In addition to the immediate revenue gains, SSB tax is likely to produce long-term savings on health costs. A UK study modelled a 20% tax on SSBs and found that most of the reduction in obesity and overweight was among those aged less than 30 years old, indicating that savings in health costs may occur sometime in the future.¹⁰⁹ There are also significant gains to be made in economic productivity.

Investing revenue

The health impact of an SSB tax may be increased further by channelling the revenue made from the tax into healthcare. The earmarking of taxes for health may improve public support of an SSB tax. In French Polynesia initial SSB tax funds were completely channelled into a health prevention fund. More recently, when the majority of the tax revenue was directed to the general budget,^{13,61} the SSB tax gained widespread support from government ministers because it funded activities and benefited several ministries such as public health, education, youth and culture, sport, family and road safety. In the Cook Islands, it is proposed to commit NZD 200,000 of the revenue raised from the new 2014 public-health tax to nutrition and NCD education in order to reduce the future burden of treating people in the health system who suffer from NCDs.⁷⁴ It may not always be politically feasible to allocate additional revenue to health interventions.⁹ The use of funds for general revenue may provide additional incentive for the agencies that collect the tax because the revenue contributes to their budget.¹³

3. **Recommendation: Governments may choose to allocate a proportion of SSB tax to address NCDs. This may improve the health impact and public support. Revenue from SSB can make a substantial contribution to the government budget.**

4.4 Affordable alternatives

Greater health gains from an SSB tax can be achieved by maximising the availability and affordability of alternative healthy beverages. The most robust studies of food taxation have shown that taxes are more effective when placed on non-core foods and beverages (such as soft drinks) for which there are close untaxed substitutes.¹¹³ Ensuring availability of healthy alternative beverages includes the provision of safe palatable drinking water, such as putting water fountains in schools, and reducing tax on non-sweetened beverages such as bottled water, as is done in Nauru (Text box 1). Ensuring the affordability of alternative healthy beverages is another way that revenue from SSB tax might be invested.

Demand for alternative beverages tends to increase as a result of increases in soft drink prices. This is modelled by examining cross-price elasticities. A 1% increase in the price of soft drinks has been associated with increased demand for milk (0.13%) and fruit juices (0.39%), and decreased demand for diet soft drinks (-0.42%).⁹⁵ Other studies have shown an increased demand for diet soft drinks (0.16%) with the same 1% increase in regular soft drink price.⁸⁶

Greater demand for alternative beverages relies on the availability of these beverages. SSB price increases are more likely to be effective if there are more affordable healthy alternatives. Shortly after Denmark introduced a 'fat tax' in 2011 it was noted that the desired health outcome could only be achieved if a healthier substitute was affordable or cheaper, such as low fat spread instead of butter.¹¹⁴ It is crucial to consider the relative price and availability of alternatives,⁵⁸ such as bottled water. There are many examples in the Pacific where bottled water is more expensive than soft drinks including Nauru, Fiji and Samoa, before an SSB tax was implemented.⁷⁸

All PICTs should consider access to drinking water that is safe and pleasant to drink before designing an SSB tax²⁷. This includes water taps and water fountains in schools and public places; and promotion of water as a healthy beverage alternative. The affordability of water affects the relative price of SSBs. In some countries households have to pay for water in bulk and arrange its delivery to the house. Affordability and access to safe palatable drinking water in the Pacific should be maintained and improved.

4. **Recommendation: An SSB tax is likely to be more effective when healthy beverage alternatives are available and cheaper than SSBs. Measures include ensuring access to safe palatable drinking water and reducing tax on healthy beverages such as bottled water.**

4.5 Monitor the impact

A system to monitor the consumption of SSBs and healthy alternative beverages enables policy makers to adjust the SSB tax to achieve greater health gains. Evaluation of changes to SSB consumption also contributes more broadly to the regional and global evidence base. A monitoring system may include SSB tax revenue data and use of health surveys, household expenditure surveys or trade data. The SSB environment could be monitored by assessing the availability of SSBs and healthy alternatives for purchase, their prices and how this changes over time. Reduction in consumption may occur early after SSB tax introduction; however, the impact of reduced energy intake on BMI is likely to be cumulative over time and is not likely to be measurable for several months.

The strength and breadth of data available for monitoring SSB policies varies between PICTs. Different indicators have different strengths and limitations (Table 11). Nationally representative surveys are important sources of self-reported SSB consumption, particular in school surveys. Another method of monitoring soft drink consumption is via the Household Income and Expenditure Surveys (HIES). The majority of PICTs (20/22) already collect household expenditure and this data could be analysed to assess the volumes of SSBs purchased; however, the frequency of these surveys is often limited. A cost-effective way of tracking the volume of soft drink consumption and other SSBs may be through repeated HIES. Expenditure on SSB types, healthy beverage alternatives and food products could be monitored to investigate any evidence of a substitution effect. Trade data can also be used to estimate SSB consumption,⁴ but this relies on being able to obtain SSB import volumes from countries (including production and exports if these are relevant) or use international export data to estimate consumption per population (L/person) as demonstrated here.

- 5. Recommendation: Set up a system to monitor the effectiveness of the SSB tax and make any necessary improvements. Important indicators to monitor include revenue generation; price and availability of SSBs and healthy alternative beverages; and SSB consumption from health surveys, household expenditure surveys and trade data.**

Additional recommendations

1. More health survey data on adults is required. This could be collected by adding an SSB question into the STEPS, DHS and other population surveys.
2. Health surveys, household surveys and trade data provide nationally representative estimates for soft drink consumption and all could be extended to measure consumption of other SSBs as well.
3. Often PICTs have collected household expenditure data and trade data but further analysis and publication is required to measure soft drink and SSB consumption.

Table 11: Strengths and limitations of sugar-sweetened beverage consumption data in the Pacific region.

	Strengths	Limitations
National school and other health surveys <i>GSHS, YRBSS, nutrition surveys</i>	Self-reported consumption Can analyse consumption by individual factors such as age and gender Standardised questions are repeated in subsequent surveys to look at trends over time and comparisons between countries	Validity of the questions may vary between GSHS, YRBSS, STEPS surveys because each uses a different question Majority of data is from school surveys of 13–18yos only Questions in the past have focused on soft drinks and excluded other SSBs Sometimes there may be an extended timeframe between repeat surveys
Household income and expenditure surveys	Ability to analyse consumption by household factors such as income Already routinely conducted in the majority of PICTs Data is available on cost and volume of SSBs purchased and therefore the impact of cost can be assessed Multiple week diary of expenditure captures rigorous data	Require the dataset and country permission for more detailed analysis as usually only publically report in currency value rather than by volume Uncertain quality of volume data May underestimate consumption outside the household, e.g. tourists May be a long timeframe between repeat surveys
Trade data <i>Imports, exports and production</i>	Historical data is available and useful for understanding time trends Already routinely collected and can be accessed through countries or international databases (UN Comtrade) Import and export data can be mirrored for validation	Country level data only Data may be more complete for currency value rather than by volume Potential undercounting by customs departments or in the reporting to international databases Importations may vary quite a lot year to year e.g. stock piling



5. Debates and myths

Some analysts are sceptical about the impact of an SSB tax on health.⁹ This section will identify some of the main arguments from opponents and consider the alternative perspectives on these issues. Many of these issues highlight the importance of SSB tax policy development in the domains we have put forward above in this discussion paper. Further research and careful monitoring of the outcomes from SSB tax policies will enable policy makers to improve policy settings with the aim of maximising health gains and generating revenue. Arguments against SSB tax, such as the impact on the poor and on business, are similar to those made against tobacco tax, which have all largely been proven to be ‘misleading, overstated or false’.⁸³

Myth: SSB tax unfairly disadvantages the poor

SSB tax may be financially regressive with low-income groups paying a greater proportion of their income on an SSB tax than the high-income groups.⁹¹ The evidence for financial regressivity, however, is inconclusive and if present at all the level may be relatively small.⁸⁶ Any extra cost to the poor is substantially outweighed by additional health gains for this group. Low-income groups and high consumers get the greatest health benefits from an SSB tax because they are more likely to reduce consumption and the health gains are greater because of the higher risk that low-socioeconomic groups have of acquiring many SSB-related diseases.⁹ Any regressive nature of an SSB tax could be further offset by using the revenue gained from SSB taxes to provide health-promotion programmes targeted to low-income groups⁸¹ such as subsidies on fresh fruit and vegetables, cooking lessons using local produce, or education campaigns. SSBs provide no nutritional benefit, and safe drinking water is generally readily available at little or no cost.¹¹⁵

Myth: Consumers will just switch to other unhealthy food and drink

It is contended that consumers, who are discouraged from buying SSBs by a tax, may instead buy other beverages with similar levels of sugar, or other food products. In this way the impact of SSB tax on energy intake and obesity may be low.¹¹⁶ An example of a beverage switch is if a consumer substituted a taxed soft drink with an untaxed sweetened fruit juice. In Tokelau, after a ban on soft drinks, there was a small

increase in fruit juice importation but this was only a small proportion of the original import volumes of soft drinks that were consumed. Cross-price elasticity studies also show small increases in the consumption of other SSBs (particularly fruit juice) with increase in the price of soft drinks.⁹⁵ The switch to other SSBs may be avoided by incorporating all SSBs – including sweetened fruit juice – into the SSB tax policy.

Alternatively, consumers may simply switch to cheaper brands of the same product (that are also taxed) and not lower their consumption of sugar.¹¹⁷ A volumetric or nutrition-based tax may help to discourage this by ensuring the absolute cost of the tax per litre/sugar content is comparable across different brands and on bulk purchases of cheap SSBs.

The substitution effect from SSBs to other food groups is less likely for beverages because consumers tend to substitute like-for-like by selecting another beverage, particularly when healthy alternative beverages are available and affordable. More evidence will help to further understand consumer choices in different contexts.

Myth: SSB tax is bad for jobs and business

It is warned that SSB tax will cause job losses and be bad for local business. Producers, importers and grocers will be affected by SSB tax where there is reduction in demand for their products; however, the same groups may benefit from a switch in demand to the healthy alternatives that they also sell. A shift of demand to healthy beverage options creates an opportunity for local producers and retailers of non-SSB drinks such as bottled water. SSBs have varying significance to the local food economy in the Pacific region, which is reflected in the different amounts of the food budget spent on SSBs (1–9%) in PICTs (Table 2).

Any negative economic impact attributable to SSB tax is difficult to measure and may be small. Limited economic impact has been identified in Tokelau since a total ban on imports was made (personal correspondence, Ministry of Health). Industry in Fiji claimed that an excise tax eroded their profit in a highly competitive environment. In small island countries claims by producers that the tax will affect their business and cause them to shed jobs can be a significant obstacle to tax implementation. If those industries fail to offer healthier beverage alternatives then they may be adversely affected, but they should take the lead of companies elsewhere and offer sugar-free options (including bottled water). Conversely, importers and manufacturers in Samoa were more accepting and sometimes supportive of the tax.¹³ In France, Denmark and Hungary, negative impacts on food businesses were only reported in Hungary and in that context job losses were difficult to distinguish from the effects of the economic crisis.¹² Coca-Cola Enterprises briefly suspended plans for the expansion of its bottling facility in Bouches-du-Rhône on announcement of the SSB tax in France, but this decision was reversed.¹² Food producers and retailers have argued that they face administrative costs due to the tax.¹² These costs can be minimised by applying an excise tax higher up in the supply chain (e.g. on imports and producers). A strategy used in the Cook Islands to give the market time to adjust and reduce the impact on jobs was to gradually introduce tobacco tax.⁹

A recent study has modelled the net economic impact of an SSB tax on jobs showing that it may be positive at a state- or country-wide level. Macroeconomic simulation modelling for Illinois and California illustrate declines in employment within the beverage industry, but found that these were offset by new employment in non-beverage industry and government sectors.¹¹⁸

Furthermore, the economic cost of not doing anything about NCDs is substantial. The impact of NCDs on productivity⁷⁹ may outweigh the short-term cost to jobs and business from an SSB tax. NCDs are having a growing impact on the local economy, business productivity and future sustainability across the sector. More research is needed about the impact on jobs, monetary savings to the health sector, implementation costs and government revenue.⁹⁵

Myth: SSB tax will not be passed on to consumers

It is argued that producers and retailers may not pass the SSB tax on to consumers. Evidence from alcohol and tobacco sales shows that the price may increase by more than the tax levied. This is called over-shifting⁸³ and was evident for the majority of SSB taxes introduced in Europe.^{117,12} The response of suppliers and shops to the tax increases depends on the degree of competition in the industry. High competition may see some of the SSB tax absorbed by suppliers and shops (under-shifting).⁹

In Nauru, an upsurge of cheaper products from Asia was a major factor that limited price increases. A price increase of 30% was expected and the retail price of a 375 mL can of soft drink increased only by 20%. Bottled water remained more expensive than soft drink; however, locally desalinated drinking water was significantly cheaper, and was sold and delivered to households by tanker trucks.^{13,61} It is reassuring that even in the scenario of increasing competition, two-thirds of the SSB tax was passed to consumers. Taxing on volume rather than value is preferable because it ensures that cheaper soft drinks are taxed the same amount as more expensive drinks and the difference in price between them does not increase. The introduction of cheaper soft-drink imports adds more weight to the importance of SSB tax to account for the negative externalities of overweight and NCDs.

Myth: The public oppose increased tax on SSBs

There may be concern about public opposition to an SSB tax. Public opinion has been mixed in the Pacific and elsewhere. In Fiji, industry opposition led to the removal of a domestic SSB excise tax, but in Samoa importers and manufacturers were more accepting and supportive once the link between soft drinks and health was communicated clearly.¹³

Public reaction to food taxes was mixed in Denmark, France and Hungary. In Denmark the tax on saturated fats was repealed due to political opposition from farmers, producers and consumers, and recognition that citizens were crossing the border to Germany to purchase products. Although generally unpopular, initial observations of public reaction in France suggest that people generally accept that soft drinks are not a healthy option so they do not question the tax.¹²

Public support is likely to be greater when the health benefits are emphasised and revenue is used for health.¹⁰ In 2010, Cancer Council Victoria found very strong support for taxes on unhealthy food and beverages in a national telephone survey, particularly if the funds were used to subsidise healthy foods with 69% of participants in favour of a tax on soft drinks to reduce the cost of healthy food (Obesity Coalition Australia).

Political leadership and communication is vital to explain the links between SSBs and the NCD crisis before tax is increased.⁹ Taxation should be backed up with clear health messages to maximise the incentive and price signal about the importance of reducing SSB consumption for health.⁹

6. Summary of recommendations

1. Communicate a clear health goal

Clearly explain that the goal of the SSB tax policy is to reduce SSB consumption. SSB tax corrects for the external costs of SSBs including NCDs (externalities). Political leadership and communication are vital to explain the links between SSBs and health before tax is increased.

2. Characteristics

A. Excise tax

Excise tax on SSBs is a good option because it is non-discriminatory between imported and locally produced goods, implementation can be modelled on tobacco excise and the tax can be collected early in the SSB distribution process for efficiency and better enforcement.

B. Tax on volume or sugar content

A *specific* tax (e.g. \$1 per litre or \$10 per kg of sugar content) is likely to be more effective than an *ad valorem* tax (e.g. 30% of price). A specific tax policy should incorporate adjustments for inflation over time to maintain its health effect.

C. Tax a broad range of SSBs

An SSB tax should tax soft drinks as the first priority. Inclusion of a broad range of SSBs (possibly also diet soft drinks and fruit juice) will maximise the health impact and reduce the likelihood that consumers will simply switch to other unhealthy beverages. Selection of beverage categories for taxation may be informed by evidence of health harms, nutrient value, public support, ease of implementation and which beverages are commonly consumed.

D. Adequate tax rate

A higher tax level is likely to have a greater impact on SSB consumption and improve the likelihood of measurable health benefits. SSB tax is likely to have a greater health benefit for children, high consumers and low-income groups who are more sensitive to changes in price.

3. Revenue and investment

Governments may choose to allocate a proportion of SSB tax to address NCDs. This may improve the health impact and public support. Revenue from SSB can make a substantial contribution to the government budget.

4. Affordable alternatives

An SSB tax is likely to be more effective when healthy beverage alternatives are available and cheaper than SSBs. Measures include ensuring access to safe palatable drinking water and reducing tax on healthy beverages such as bottled water.

5. Monitor the impact

Set up a system to monitor the effectiveness of the SSB tax and make any necessary improvements. Important indicators to monitor include revenue generation; price and availability of SSBs and healthy alternative beverages; and SSB consumption from health surveys, household expenditure surveys and trade data.

7. Conclusion

The Pacific region accounts for some of the highest rates of obesity and diabetes in the world. There is a high level of support for addressing the NCD crisis. There was evidence of high levels of soft drink consumption in the majority of PICTs (16/20, no data available for PNG or Pitcairn) and throughout the sub-regions, with a particular concentration in Polynesia. SSB tax is a useful policy option and is particularly important for improving health in PICTs with high rates of SSB consumption and obesity. Half of PICTs (12/21, no data available for Pitcairn) have already adopted an SSB tax from a range of different designs. SSB tax is one tool among a broader package of policy measures that are more likely to reduce consumption and address the NCD crisis in the Pacific when they are used together.

Our discussion outlines recommendations for how SSB tax policies across the Pacific can be introduced and further developed to maximise potential health gains. Policy settings to optimise health include adoption of a clear health goal, using an excise tax, taxing on beverage volume or sugar content, using an adequate tax rate, ensuring availability and affordability of healthy alternative beverages, and taxing a broad range of SSBs. Potential revenue from SSB tax can be estimated from trade data and household expenditure surveys (as demonstrated here). Monitoring policy effectiveness is crucial for policy makers to make adjustments that optimise health gains over time and share the lessons learned with the wider community. The arguments put forward by opponents of SSB taxation can largely be addressed with careful policy design and ongoing monitoring of the policy's impact.



Resources

Other SSB tax policy briefs for reference

Rudd Report. *Sugar-sweetened beverage taxes: An updated policy brief*.¹¹⁹ This discussion paper includes arguments for and against SSB excise taxes.

The role of health related food duties in the UK.¹⁴ – National heart forum 2012.

UK heart forum report for Public Health England¹²⁰. *Six potential areas for action to reduce sugar consumption*. Produce and import less, use less, sell less, market less, recommend less and eat less.

SSB tax policy brief from the New Zealand Beverage Guidance Panel^{26,121}

Applying lessons from tobacco to SSBs

Many aspects from the WHO technical manual on tobacco taxation are relevant to SSB tax.⁸³ This discussion document corresponds with many of the areas in the WHO technical manual.

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