

Progress in the Pacific on sugar-sweetened beverage taxes: a systematic review of policy changes from 2000 to 2019

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Sugar-sweetened beverage (SSB) taxes are increasingly used by countries around the world to incentivise healthy beverage choices. Since 2000, several Pacific Island countries and territories (PICTs) have updated SSB tax policies, but information on many of these changes is not easily available and not always reported outside the region. A systematic characterisation of tax changes over time could underpin future evaluation studies and contribute to the monitoring of progress towards the adoption of best practice policy recommendations, such as is done by the Pacific Monitoring Alliance for NCD Action (MANA). A detailed understanding of tax design characteristics such as size, type and included beverages are particularly important for understanding the potential dietary and health effects of tax policies^{1,2} and if there are any policy gaps or regional patterns. The approach to SSB taxes in the Pacific is of interest given the region includes some of the highest rates of obesity and diabetes in the world;³⁻⁵ it has undergone rapid changes in nutrition with the increasing importation of processed food and dependency on trade;⁶ and there are a high proportion of low and middle-income countries (11 of 16).⁷ Findings are likely to be relevant to countries elsewhere particularly small island developing states.

Globalisation has led to rapid changes in many PICTs with increasing trade and increasing access to cheap high-density low-nutrient

Abstract

Objective: To systematically characterise sugar-sweetened beverage (SSB) tax policy changes in Pacific Island countries and territories (PICTs) from 2000 to 2019.

Methods: Medline, Google Scholar, Pacific Islands Legal Information Institute database, Factiva and news and government websites were systematically searched up to October 2019. Information was extracted on the date and SSB tax level change, tax type, included beverages, and earmarking; and checked for consistency with local experts.

Results: Three-quarters of PICTs had an SSB tax (n=16/21) and 11 of these were excise taxes that included both imported and locally produced beverages. The level of tax was over 20% in 14 jurisdictions. SSB tax was increased by more than 20 percentage points in eight PICTs. Most taxes were ad valorem or volumetric, three were earmarked and only two taxes targeted sugar-sweetened fruit juices. The majority of countries (14/21) had different tax rates for imported and locally produced beverages.

Conclusions: More than three-quarters of PICTs have SSB taxes. More than one-third increased these taxes since 2000 at an amount that is expected to reduce soft drink consumption.

Implications for public health: Despite high-quality tax design elements in some PICTs, SSB control policies could generally be strengthened to improve health benefits, e.g. by targeting all SSBs and earmarking revenue for health.

Key words: Pacific, excise, beverage, soft drink, sugar

processed foods from abroad that displace local traditional diets. There are high levels of SSB consumption in many PICTs,² with serious implications for oral health and the burden of NCDs. Several PICTs have a soft drink manufacturing industry, for example, Coca-Cola is manufactured in New Caledonia, Fiji and Samoa, and cheaper locally produced soft drinks are common across PICTs. Ministers of Health and Finance have declared a non-communicable disease (NCD) crisis, stated that

the financial costs of NCDs are unsustainable,⁸ and endorsed a 2014 regional Roadmap for addressing NCDs.⁹ Pacific MANA monitors Roadmap goals and in 2018 half of PICTs reported a 20% SSB excise, namely the Cook Islands, the Federated States of Micronesia (FSM), Fiji, Kiribati, Nauru, Niue, Samoa, Tonga, Vanuatu and Wallis and Futuna.¹⁰ A Pacific legislative framework on NCDs has been proposed to facilitate the implementation of Roadmap goals.^{11,12}

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Early Pacific SSB tax changes in Fiji, French Polynesia, Nauru and Samoa have been previously described with a focus on implementation lessons and the policy process.^{13,14} After the Nauru SSB tax, there was an increase in the range of available lower-sugar beverages and in Fiji the price of SSBs increased. In French Polynesia, SSBs became more expensive than bottled water.¹⁴ Furthermore, a recent World Bank evaluation of health-related taxes in Tonga found a low level of public awareness and that there was a partial shift following the tax to locally manufactured soft drinks and bottled water.¹⁵ This evaluation recommended applying excise taxes to both imported and locally produced products, monitoring to ensure annual increases in tax exceed inflation and rises in incomes, improving public communication about the tax, using the revenue to promote healthy lifestyles and support universal healthcare coverage, and strengthening a wider package of NCD prevention policies (not just tax) for example to make healthy food more available and affordable.¹⁵ However, the full scope of SSB tax policies in the region has not been examined in the literature and many tax changes have not been evaluated.

Given this background, the aim of this study was to: i) systematically identify SSB tax

changes that have been introduced by PICTs from 2000 to 2019; and ii) compare the design of SSB taxes by tax size, tax design (excise or tariff), tax type (e.g. ad valorem, volumetric or nutrient-specific), earmarking of revenue and included beverages (e.g. diet drinks, fruit juice, locally manufactured products).

Methods

Eligibility Criteria

A review of SSB taxes in the Pacific was conducted to identify legislation and other documents that gave information about SSB tax changes in a PICT in the period 2000 to 2019 to obtain a comprehensive insight into tax changes made during this period. SSB taxes were defined as any tax on SSBs or a subset of SSBs, as long as the level of that tax was greater than the tax on an equivalent bottle of water, in order to exclude broad-based tariffs. There were 21 Pacific Community jurisdictions included. Pitcairn was excluded due to its small size. No exclusions were made based on language. Eligibility criteria are outlined in Table 1.

Search strategy

A systematic search was applied in October 2019 using Medline, Google Scholar, Pacific Islands Legal Information Institute

database, Factiva, and Google web searches of news stories and government websites (See Supplementary File). Eligible study references and webpage links were followed up to identify other relevant records. Search terms comprised beverage, tax, and country domains, for example, a Google Scholar search was: ("sugar sweetened beverage" OR "sugar-sweetened beverage" OR sugary drink) AND (tax OR duty OR excise OR tariff) AND (Kiribati OR Micronesia OR Mariana OR "Marshall Islands" OR Palau OR Nauru OR Samoa OR Tonga OR "American Samoa"). Both English and French search terms were used, based on the common languages used in the Pacific. See Supplementary Material for further information.

Screening and extraction

All database findings were title screened by the author (AT) to identify records that would potentially meet the eligibility criteria. Full-text records were screened and reasons for exclusions were recorded. For each SSB tax change, information was extracted about the jurisdiction, date, included beverages, the tax rate for each included beverage and for water before and after the tax change, tax type (excise, tariff etc), tax design (ad valorem, volumetric etc), whether the tax applied to locally produced beverages, whether the revenue was earmarked and any other information on concurrent policies (such as food taxes), implementation challenges, and tax pass-through, etc, that may affect the taxes' impact. An excise tax was defined as a targeted tax (like tobacco or alcohol excise) on locally manufactured products, which may or may not include imported products. A tariff was defined as a duty or levy on imported goods. Ad valorem tax was defined as a tax assessed based on the value of a beverage; volumetric tax was that based on the volume; nutrient-specific tax (also called a nutrient-based, calorie-based, nutrition-focused or sugar tax) was based on beverage sugar content; and a tiered tax had a different level of tax according to set thresholds of beverage sugar concentration.

Eligible records with the highest quality information were used to characterise SSB tax change, with a prioritisation on enacted legislation, then peer-reviewed journal publications, government reports, other reports or meeting notes, news articles and other sources in this order. Google Translate has been found to be a viable tool for systematic reviews¹⁶ and was used to

Table 1: Eligibility criteria.

Inclusion criteria	Exclusion criteria
Tax from a national level jurisdiction that was one of the 21 PICTs eg, Pacific Community members (excluding Pitcairn, Australia, France, New Zealand and United States).	State level taxes (e.g. FSM) were not included due to the challenge of collecting data at the subnational level.
Tax on any SSBs such as sweetened beverages (Harmonised code [HS] 2202, which includes artificially sweetened beverages) and fruit juice (HS 2009).	Import tariffs on sweetened beverages that were the same size or smaller than import tariffs on bottled water (HS 2201) were excluded (all of which were import tariffs). This was to avoid broad-based import tariffs and consumption taxes that apply across food and beverages.
Tax was changed between 1 January 2000 and 31 October 2019 (particularly in sweetened beverage tax size).	Taxes on raw materials such as sugar and plastic bottles were outside the scope of this study. Bottle levies that included bottled water and did not specifically apply to SSBs, can be used to target plastic waste and were excluded.
Excise, import tariff or any other tax changes on either imported or locally manufactured beverages, regardless of the point of revenue collection.	Any consumption tax (eg, value added tax) or import tariffs that were applied to broad food types and not targeted specifically to sugary drinks were excluded.
Any policy type i.e. ad valorem, specific taxes including volumetric and nutrient-specific taxes, with and without tiers for sugar content. Ad valorem taxes are charged as a proportion of price. Specific taxes are charged according to volume or sugar content.	Subsidies on water or other healthy beverages were not eligible because it was difficult to identify a subsidy on healthier beverages from the legislation. Other health-related food taxes were outside the scope of this study.
Both SSB tax increases and decreases were eligible.	
Any rationale for tax changes (because motivation may be mixed or unclear).	
Any information source that provided novel information on SSB tax policies was eligible including legislation, tariff schedules, published literature, meeting reports, parliament and government statements, web pages, news stories and other grey literature to identify information on SSB taxes.	

Notes: Pacific Island Countries and Territories (PICTs). The Harmonised Code is a standardised system of coding to categorise import and export goods.

translate French web pages into English,¹⁶ particularly relevant for the French-speaking jurisdictions.

Extracted data were compared for consistency with SSB tax information from the MANA dashboard in 2018,¹⁰ key multilateral meeting papers and UN Comtrade import tariff data, where available.¹⁷ Key country experts from Customs, Finance and Health were also contacted to identify any further up-to-date SSB tax information and fill in any information gaps, particularly if there were inconsistencies between data sources. In Tonga and Cook Islands, face-to-face meetings with key health, customs/finance and statistics officials were held in 2018 to test the sensitivity of the search strategy.

Analysis of tax changes

In order to compare SSB tax levels and characterise SSB tax changes, each tax applied to sweetened beverages (HS 2202, main import category for SSBs) was converted into: a) US\$/L using official exchange rates in the year of the tax change;¹⁸ and b) ad valorem equivalent (AVE) percentages using the UN Comtrade import unit values in the year of the tax change (or adjacent years where numbers were small) as done elsewhere in trade databases.¹⁹ If there was a different tax for imported and manufactured beverages then the mean of these two was calculated. The sugar concentration of Coca-Cola (106g/L) was used to calculate the level of tax as required. In some cases, the timing of tax changes had to be estimated from the available data.

Results

Of the 4,488 records identified by the search strategy, 249 records were eligible and provided novel information for characterising SSB tax changes (see Supplementary Figure B for flow diagram).

Three-quarters of PICTs (n=16/21, 76%) had an SSB tax that met the study definition (Table 2). Five of these were jurisdictions with tariffs on imported beverages only and 11 were jurisdictions that had excise taxes on locally produced beverages. Four additional PICTs had import tariffs at the same rate as water, and Tokelau had introduced an import ban on carbonated soft drinks in 2012/13.²⁰ The level of tax was more than 50% of taxed beverage import value in seven jurisdictions, and more than 20% of import value in 14

Table 2: Sugar-sweetened beverage taxes in the Pacific.

Jurisdiction (n=21)	Level of tax	SSB tax			Import tariff the same as water
		Average level (% , 2018)	Local prod. & imports (eg, excise)	Local prod. only (eg, excise)	
Vanuatu	50vt/L excise and a 75% tariff	82%	45%		75%
Niue	80% tariff (imp)	80%			80%
Marshall Islands	US\$0.01666/oz	73%			73%
Tonga	15% (imp) or T\$0.05/L (prod) if sugar ≤5g/100ml <u>T\$1.50/L (imp) or T\$0.75/L (prod) if sugar >5g/100ml & ≤ 20g/100ml^a</u> T\$4/L (imp) or T\$1.50/L (prod) if sugar >20g/100ml	72%		48%	96%
American Samoa	US\$0.15/12oz	72%	72%		
Cook Islands	NZ\$9.37/kg sugar	56%	56%		
Fiji	F\$0.35/L prod tax & 32% or F\$2/L imp tariff whichever is greater	51%		15%	87%
New Caledonia	10%, 26% and 5% (imp)	41%			41%
Kiribati	40% of market wholesale value	40%	40%		
Nauru	30% of purchase price (imp)	30%			30%
Wallis and Futuna	30% tariff (imp)	30%			30%
French Polynesia	<5g sugar/100ml: 0 CFP/L 5 to 9.99g sugar/100ml: 20 CFP/L <u>10 to 29.99g sugar/100ml: 30 (imp) or 40 (prod) CFP/L^a</u> 30 to 39.99g sugar/100ml: 45 (imp) or 60 (prod) CFP/L 40g+ sugar/100ml+: 60 (imp) or 85 (prod) CFP/L	30%		34%	25%
Tuvalu	10% excise and a 33% tariff (imp)	27%	10%		33%
Samoa	52.5 sene/L	21%	21%		
Northern Mariana Islands	US\$0.005 per fl oz	19%	19%		
Guam	US\$0.005 per 8 fl.oz.	3%	3%		
Micronesia	Same import tariff as water				25%
Palau	Same import tariff as water				25%
Papua New Guinea	Same import tariff as water				15%
Solomon Islands	Same import tariff as water				10%
Tokelau	Import ban on carbonated soft drinks				
Count		16	11	9	4

Notes:

imp, imports; prod, local production.

a: The underlined tax was the one used to calculate the tax levels in this table based on the sugar content of a typical regular soft drink.

Taxes displayed are ad valorem taxes or ad valorem equivalents calculated from the level of tax as a percentage of 2018 import unit values in UN Comtrade data. The standard soft drink sugar concentration of 10.6g/100ml was used to calculate level of tax if required.

Wherever there was a different tax on local and imported goods the total SSB tax size was calculated as the average of the two, but if there was only a tariff the value of this tax is given as the average (assuming low rates of local production, which was not the case in all jurisdictions eg, New Caledonia).

Table 3-1 Eligible sugar-sweetened beverage tax changes identified in Pacific Island countries and territories, 2000-2019.

Jurisdiction	Date of change	Tax type	Tax design	Origin ^d	Tax rate (HS 2202)	SSB tax level ^b		Included beverages ^f	Comments	
						AVE	US\$/L current			
American Samoa	1-Jun-01	Excise	Volumetric	All	US\$0.15/1.2oz	98%	\$0.42	-	Sweetened beverages, soft drink syrup	Excludes freight, insurance & shipping expenses (ie, FOB) Excludes items imported by the US Government. There were no duties on imports after 1967. Split invoicing practice was revoked in Sep 2009. Cf. value.
Cook Islands	13-Aug-08	Tariff	Ad valorem	Imports	Increased from 40% to 60%	60%	\$0.30	20%	Sweetened beverages	
	31-Jul-12	Tariff	Ad valorem	Imports	75%	75%	\$0.62	15%	Sweetened beverages	
	1-Aug-13	Tariff	Ad valorem	Imports	77%	77%	\$0.84	2%	Sweetened beverages	
	1-Jul-14	Excise	Nutrient-specific	All	NZ\$9.37/kg sugar to replace the import tariff	66%	\$0.82	-11%	Sweetened beverages (if contain sugar)	Delay in implementation on locally-produced soft drinks. Other broad tax changes may have increased disposable income. Imports from PICTA countries were on a decreasing schedule of preferential excise rates & were free by 2017 (but these made up a small proportion of imports).
Fiji	1-Jan-06	Excise	Volumetric	Local prod.	Changed from 10% to F\$0.05/L	4%	\$0.03	-6%	Carbonated soft drinks	Fiji is Revenue and Customs Authority proposed the tax in order to compensate for losses due to trade liberalisation. ¹² Described as a 'production tax'.
	3-Nov-06	Excise	Volumetric	Local prod.	F\$0.03/L	2%	\$0.02	-2%	Carbonated soft drinks	Excise reduced in 2007 (unsure of exact date) due to soft drink industry lobbying. ¹³ Excise was replaced by a 3% fiscal import duty on sugar which was not included in this analysis (raw product). Tariff on water introduced at 20c/L from 1-Jul-08 (previously free) but then reversed immediately.
	1-Jan-10	Excise	Volumetric	Local prod.	F\$0.05/L	2%	\$0.03	1%	Carbonated soft drinks	Other policy changes in 2012/13 reduced import duty on most fruits, vegetables & legumes, & excise also removed
	20-Nov-15	Excise	Volumetric	Local prod.	F\$0.10/L	4%	\$0.05	2%	Sweetened beverages	
	22-Jun-16	Excise	Volumetric	Local prod.	Increase from F\$0.10/L to F\$0.30/L	11%	\$0.14	8%	Sweetened beverages	5c/L health levy also reportedly introduced in 2016, unclear if/how this is related to this prod. tax change. Rationale: there were budget deficits after Cyclone Winston
	30-Jun-17	Excise	Volumetric	Local prod.	F\$0.35/L	13%	\$0.17	2%	Sweetened beverages	
	24-Jul-18	Tariff	Volumetric	Imports	Fiscal 32% or F\$2.00/L whichever is greater	87%	\$0.96	55%	Carbonated/sweetened beverages	The tax increase aims to protect children from obesity & lifelong poor health (WCFR 2019). The fiscal tariff on water remained at 32%.
French Polynesia	1-Jan-02	Tariff	Volumetric	Imports	60 CFP/L	82%	\$0.47	81%	SSBs (excl. flav. water, fruit juice, flav. milk; ie also excl. ASBs and soya)	Imports from EU countries excluded from the tax (France accounts for 50% of food products ¹⁴). Tax called 'preventive consumption tax' and replaced a 1% local development tariff. There was active involvement of health policy makers. Sweets & ice cream also included in the tax.
	1-Jan-02	Excise	Volumetric	Local prod.	42 CFP/L	58%	\$0.33	58%	SSBs (excl. flav. water, fruit juice, flav. Milk; ie also excl. ASBs and soya)	Described as a 'Production tax' Since 2006 funds went to the general government budget, with 80% of funds earmarked to the Ministry of Health's general budget ¹⁵
	1-Jan-20	Excise (imports)	Tiered volumetric	Imports	0 to 4.99g/100ml: 0 CFP/L 5 to 9.99g/100ml: 20 CFP/L 10 to 29.99g/100ml: 30 CFP/L ^c 30 to 39.99g/100ml: 45 CFP/L 40g/100ml+: 60 CFP/L	28%	\$0.29	-28%	Sweetened beverages, fruit juice and syrups, flavoured milk	'Consumption tax for prevention' Included other sweet unhealthy foods (eg sweets, chocolate, biscuits)
	1-Jan-20	Excise	Tiered volumetric	Local prod.	0 to 4.99g/100ml: 0 CFP/L 5 to 9.99g/100ml: 20 CFP/L 10 to 29.99g/100ml: 40 CFP/L ^c 30 to 39.99g/100ml: 60 CFP/L 40g/100ml+: 85 CFP/L	38%	\$0.39	-2%	Sweetened beverages, fruit juice and syrups	Described as a 'Consumption tax for prevention' Included other sweet unhealthy foods (eg sweets, chocolate, biscuits)
Kiribati	1-Apr-14	Excise	Ad valorem	All	A 70% tariff was replaced with a 40% excise	40%	\$0.37	-30% ^a	Sweetened beverages	Changed from FOB tariff to fair market wholesale value excise: this is likely to have increased the size of the excise so the tax change reported here is likely to be smaller.
Marshall Islands	pre-20-Aug-08	Tariff	Volumetric	Imports	0.01666/oz	66%	\$0.56	-	Sugar-sweetened carbonated soft drinks (ie, excl. ASBs)	
Federated States of Micronesia	pre-2001 to 1-Apr-2007	Tariff	Ad valorem	Imports	25%	25%	\$0.13	-	Soft drinks, beverage preparations, other (from 1 Jan 2005 25%+ fruit juice excl.)	The tax was 4% on all other imports such as water, however on 1 Apr 2007 the tariff on water was increased to 25% the same as soft drinks, and so this tax was no longer eligible for this study. Note: subnational taxes used in FSM are not presented as these were out of scope.
Nauru	1-Jul-07	Tariff	Ad valorem	Imports	Increase from 5% to 30%	30%	\$0.26	25%	Non-alcoholic beverages (excl. water, ASBs, soymilk, unflavoured milk)	'Levy' or 'customs and excise duty' collected at the port with other import duties as a proportion of purchase price The tax also included other sugar-containing food products Primarily as a health promoting measure but also financial reasons ¹⁷
New Caledonia	1-Jan-17	Tariff	Ad valorem	Imports	Tariff (DD) 10% General import tax (TGI) 2.6% Basic import tax (TBI) 5%	41%	\$0.47	29%	Sweetened beverages (ie, excl. soymilk)	Previously tariff on water was greater than soft drinks but now 0% for all these tariffs. European products were exempt from tariff (DD).

Table 3 cont.: Eligible sugar-sweetened beverage tax changes identified in Pacific Island countries and territories, 2000-2019.

Jurisdiction	Date of change	Tax type	Tax design	Origin ^d	Tax rate (HS 2202)	SSB tax level ^e		SSB tax change		Included beverages ^f	Comments
						AVE	US\$/L	current	current		
Niue	1-Jan-09	Tariff	Ad valorem	Imports	Possible reduction from 35% to 25%	25%	\$0.44	-	-	Sweetened beverages	Introduction of consumption tax & changes to income tax, phasing out import duties in accordance with the PICTA agreement & replacing import duties with excise duties.
	unknown	Tariff	Ad valorem	Imports	60%	60%	\$1.43	35%	\$0.84	Sweetened beverages	
	1-Jul-16	Tariff	Ad valorem	Imports	80%	80%	\$1.73	20%	\$0.43	Sweetened beverages (excl. flav. water & flav. milk)	
Palau	Sep-03 to 10-Jan-18	Tariff	Volumetric	Imports	\$0.28175/L (\$0.10/12fl.oz.)	32%	\$0.28	-	-	Carbonated soft drinks	This tariff was replaced on 10 Jan 2018 with a 25% tariff which was the same rate of water and thus no longer eligible for this study.
Papua New Guinea	1-Jan-07 to 1-Jan-08	Tariff	Ad valorem	Imports	Increased from 15% to 25%	25%	\$0.30	10%	\$0.12	Sweetened beverages	Increased tariff intended for a six-month period only. On 1 Jan 2008 this tariff was returned to 15% and thus was the same as the tariff on water and was no longer an eligible SSB tax for this study.
	1-Jul-06	Excise	Volumetric	All	Increased from 33 to 36 sene/L	21%	\$0.13	2%	\$0.01	Sweetened beverages	Very small difference between sweetened drinks & water which remained with a 33sene/L excise
	1-Jul-08	Excise	Volumetric	All	40 sene/L	15%	\$0.15	1%	\$0.02	Sweetened beverages	Primarily revenue raising but also some health aims. ³⁵ All excise taxes were increased by the Ministry of Finance in response to a budget deficit. ³⁵
	2012	Excise	Volumetric	All	44 sene/L	22%	\$0.19	2%	\$0.02	Sweetened beverages	
	2015	Excise	Volumetric	All	47 sene/L	17%	\$0.18	1%	\$0.01	Sweetened beverages	
	1-Jul-16	Excise	Volumetric	All	51 sene/L	24%	\$0.20	2%	\$0.02	Sweetened beverages	Sugar syrups & other unhealthy foods included in the excise at 8% level
	2018	Excise	Volumetric	All	52.5 sene/L	21%	\$0.20	1%	\$0.01	Sweetened beverages	
Tonga	13-Aug-13	Excise	Volumetric	No	Increased from 15% tariff to T\$0.50/L	22%	\$0.28	7%	\$0.09	Sweetened beverages	Import tariffs removed
	1-Jul-16	Excise	Volumetric	Imports	T\$1.00/L	68%	\$0.45	34%	\$0.23	Sweetened beverages	Several fatty & sugary food taxes were also introduced.
	27-Jun-17	Excise	Tiered volumetric	All	T\$1.50/L if sugar > 5g/100ml & ≤ 20g/100ml, T\$4/L if > 20g/100ml and 15% tariff if ≤ 5g/100ml	80%	\$0.68	27%	\$0.23	Sweetened beverages, fruit juice & sachet drinks (if contain sugar)	Delay in local producers paying this tax. Several fatty & sugary food taxes were also introduced.
	5-Jul-18	Excise (imports)	Tiered volumetric	Imports	T\$1.50/L if sugar > 5g/100ml & ≤ 20g/100ml; T\$4/L if > 20g/100ml and 15% tariff if ≤ 5g/100ml	96%	\$0.67	0%	\$-	Sweetened beverages, fruit juice & sachet drinks (if contain sugar)	This change halved the tax on locally-produced products
		Excise	Tiered volumetric	Local prod.	T\$0.75/L if sugar content > 5g/100ml but not > 20g/100ml; and T\$0.05 if ≤ 5g/100ml	48%	\$0.34	-48%	-\$0.34	As above	
Tuvalu	2009/10	Tariff	Ad valorem	Imports	Changed from 50% to 33%	33%	\$0.51	-4% ^b	-\$0.06 ^b	Sweetened beverages	Changed from FOB to CIF which increased the level of the tariffs, because the later includes insurance & freight eg. in 2008 50% FOB was effectively from 37% CIF. (FOB value \$142,427 & CIF value \$192,453, 1.35 times more). This is accounted for in the AVE/US\$ change calculations
	2009/10	Excise	Ad valorem	All	Introduction of a 10% excise	10%	\$0.15	10%	\$0.15	Soft drinks	Comprehensive tax reforms introduced simultaneously affecting income tax, consumption tax, and a broad reduction in duties on imports from PICTA partners.
	2009/10	Combined				43%	\$0.66	6%	\$0.09		
Vanuatu	1-Jan-02	Tariff	Volumetric	Imports	Increased from 100 to 107 Vt/L	157%	\$0.77	10%	\$0.05	Sweetened beverages	Juice had tariff change from 35% to 40% on 1 Jan 2003
	1-Jan-12	Tariff	Ad valorem	Imports	80% to 75%	75%	\$0.71	-5%	-\$0.05	Sweetened beverages	
	1-Jan-15	Excise	Volumetric	All	50v/L (in addition to the tariff)	33%	\$0.46	33%	\$0.46	Sweetened beverages	Some reports that this tax came into effect on 9 Feb 2015.
	1-Jan-15	Combined				108%	\$1.49				
Wallis and Futuna	1-Jan-16	Tariff	Ad valorem	Imports	Increased from 10% to 20%	20%	\$0.13	10%	\$0.07	Sweetened beverages	In addition a bottle tax was introduced across healthy & unhealthy beverages. There were also different taxes for example in the entry fee (IE) between water (14%) & sweetened beverages (28%) & these applied to broad categories of products (irrespective of origin). Products from the EU & associated territories were exempt. Shops reported no change in price.
	1-Aug-17	Tariff	Ad valorem	Imports	30%	30%	\$0.26	10%	\$0.09	Sweetened beverages (excl. juice and milk)	In addition a bottle tax was introduced across healthy & unhealthy beverages. There were also different taxes for example in the entry fee (IE) between water (14%) & sweetened beverages (28%) & these applied to broad categories of products (irrespective of origin). Products from the EU & associated territories were exempt. Shops reported no change in price.

Notes: prod. production; HS 2202, the harmonised system code for sweetened beverages trade category; AVE, ad valorem equivalent; PICTA, Pacific Islands Comprehensive Trade Agreement; CIF (cost, insurance, freight) value, the product value and the cost of insurance and freight of importing that product; FOB (free on board), the product value at point of export ie. without shipping costs; ASBs, artificially sweetened beverages

a: The Kiribati tax change calculation does not account for the change in how the tax was applied.

b: The Tuvalu tax change calculation for AVE/US\$ accounts for the change from FOB to CIF valuation. This increased the level of the tariffs, because the later includes insurance & freight. In 2008, the 50% FOB was effectively a 37% CIF. (calculated from FOB value \$142,427 & CIF value \$192,453, a relative difference of 1.35 times).

c: The AVE and US\$ calculations for the French Polynesia and Tonga taxes used the tax rates for a standard soft drink sugar concentration of 106g/L.

d: Origin specifies whether the tax applied solely to imported beverages, locally produced beverages, or all origins ie. imported and locally produced beverages. Excise as it is referred to in this table includes taxes that applied solely to local production, and those that were applied to imported and locally produced beverages, usually, at the same rates (but if rates were different the excise is reported in two adjacent rows).

e: Conversion between tax levels and ad valorem equivalent (AVE) percentages were calculated from the import value per litre from the UN Comtrade database, and official World Bank exchange rates for the year of the tax change.

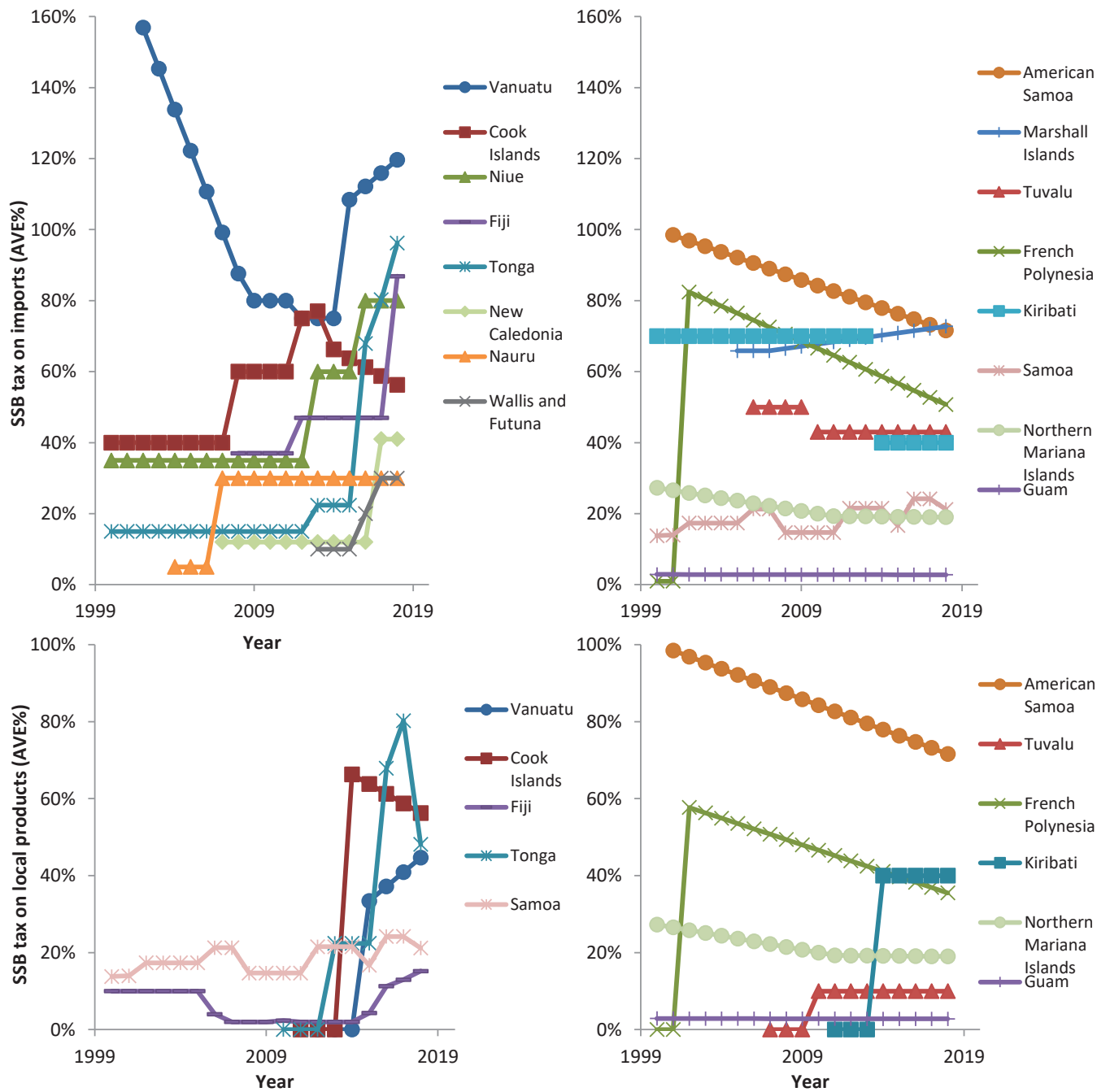
f: Sweetened beverages comprise soft drinks (including ASBs), fruit drinks (excluding juice HS 2008) and flavoured (flav.) milk whether or not they include a caloric sweetener, and are commonly identified by the Harmonised system (HS) trade code of 2202. Sweetened beverages exclude dairy milk and fruit juice unless otherwise specified. Fruit juice was commonly identified by HS 2009 which includes juices with and without sugar. Beverage preparations normally include syrups for soft drink preparation, cordial concentrates and powdered sachet drinks, and may be identified using trade codes HS 17.01.99, 17.02 and 21.06.90.

jurisdictions (2018 estimates). The highest tax level was 82% in Vanuatu and the lowest was 3% in Guam. In two-thirds of countries (10/16) there were different tax rates for imported and locally produced beverages, which generally favoured local producers with less tax. Early SSB import tariffs in Vanuatu (157% in 2002) and Samoa (112% in 1998) were larger than current SSB taxes.

Figure 1 illustrates the trends in SSB taxes over time in jurisdictions with SSB taxes. Eight PICTs have increased SSB tax by 20% or more (of import value; Cook Islands, Fiji, French Polynesia, Nauru, New Caledonia, Niue, Tonga, and Vanuatu), see Table 3; and three PICTs decreased SSB taxes by 20% or more (Kiribati [may be less as changed from FOB to CIF], French Polynesia and Tonga).

Federated States of Micronesia and Solomon Islands also decreased tariffs by more than 20% on sweetened beverages and water (not presented in Figure 1 as no current eligible SSB tax). There were further large declines in tax due to inflation (increasing import values) in American Samoa (excise) and Vanuatu (tariff, although timing unknown), and smaller declines in the Cook Islands, French Polynesia

Figure 1: Changes in SSB tax on imported (above) and locally-produced (below) sweetened beverages in the Pacific by jurisdiction, 2000-2018.



Notes: Generally jurisdictions with the largest tax increases are presented on the left with some exclusions to aid presentation. These are SSB taxes applied to imported sweetened beverages (Harmonised code 2202), and include ad valorem tariffs, or other tax types as a proportion of import unit values. The dates of some tax changes were estimated due to incomplete information: Fiji 2015, Niue 2013, Samoa 2000, Tuvalu 2010 and Vanuatu 2009. Some taxes were changed from FOB value (excludes insurance and freight) to CIF value (cost, insurance and freight included) which would have elevated their level (eg, 1.35 times greater in Tuvalu), so the change in valuation is indicated by a break in the line in the figure above. This was the case for Kiribati in 2014 and Tuvalu in 2010. Trends in the ad valorem equivalent rate of stable volumetric taxes were approximated from the AVE at the beginning and the end of the period (which is expected to change due to change in import values). The SSB tax in French Polynesia increased in 2002, and although not shown on this timeline, changes in 2020 have substantially reduced the level of SSB tax.

and the Northern Mariana Islands. In Samoa, regular adjustments to the volumetric rate have maintained the value of the SSB tax since 2000 as a proportion of import price. SSB tax increases were more likely to be applied to imported SSBs and at a greater level for these products than for locally produced SSBs, e.g. in Fiji a large tax increase in 2018 only applied to imported carbonated sweetened beverages, not local production. In some cases, a proportion of imported beverages were exempt, e.g. those from the EU to New Caledonia.

Table 3 describes the characteristics of SSB tax changes by jurisdiction. Ad valorem taxes were commonly used particularly historically, and volumetric taxes were also common. In 2014, the Cook Islands adopted a nutrient-based tax applied to sugar content.²¹ In 2017, Tonga²² (and French Polynesia²³ in 2020) applied higher volumetric SSB taxes to beverages that exceeded set sugar concentration thresholds.

Sweetened beverages (HS 2202) were the most common category targeted by SSB taxes, but included beverages varied. The recent changes to Tonga and French Polynesia taxes also expanded SSB taxes to include fruit juice (HS 2009, with or without added sugar of sweeteners) according to thresholds of sugar content. At least one additional type of drink preparation (e.g. cordial, powdered sachet) was included in SSB taxes in American Samoa, French Polynesia, FSM and Tonga. Five jurisdictions (i.e. the Cook Islands, French Polynesia, Marshall Islands, Nauru and Tonga) excluded artificially sweetened beverages from the SSB tax, but other jurisdictions did not distinguish between calorie- and non-calorie-sweetened beverages.

Legislated earmarking of SSB tax revenue was identified in three jurisdictions. Money was assigned to education in American Samoa and the Marshall Islands. In French Polynesia, the 2002 SSB tax revenue was earmarked to public health programmes (for prevention), education, youth and culture, sport, family and road safety; and the 2020 SSB tax was earmarked for exclusive use on health promotion campaigns.

There were at least three jurisdictions with examples of proposed SSB tax bills that did not progress (See Supplementary File).²⁴ SSB taxes were introduced as part of a wider tax on unhealthy foods in French Polynesia, Nauru and Tonga.

Discussion

Findings

Three-quarters of the 21 PICTs had an SSB tax in 2019, and 11 of 16 had taxes (excise and tariffs) on both imported and locally produced beverages. The proportion of jurisdictions (11/21) with excise taxes in the Pacific was similar to the Caribbean (6/13), but SSB excises are reported to be slightly more common in Latin America (15/19).²⁵ The level of SSB taxes was greater than 50% (of import value) in seven Pacific jurisdictions, greater than 20% in 14 jurisdictions and less than 20% in two jurisdictions. SSB taxes were widely used in the Pacific, and the taxes tended to be levied at relatively high rates, for example, several taxes were similar to one of the largest SSB taxes internationally – the 50% carbonated drinks and 100% energy drink taxes in Saudi Arabia and UAE.²⁶ Changes in SSB taxes are particularly important for potential health gains. Eight PICTs increased SSB taxes by more than 20 percentage points and three PICTs decreased SSB taxes by this amount. The size of tax increases was as large as in Berkeley (US) and Philadelphia (US), and larger than in jurisdictions such as Mexico, France, Catalonia, and Chile.²⁷ Many of the Pacific tax increases were likely to have met the WHO recommendation to raise retail prices by 20% to optimise potential health improvement,²⁸ for example, the Tonga excise.¹⁵ SSB tax decreases were mainly due to the lack of SSB tax adjustment for inflation or shifts away from import tariff-based systems to excise tax-based systems in response to trade liberalisation commitments.^{29,30}

The widespread use of SSB taxes in the Pacific may have been facilitated by the cost-effectiveness³¹ of this policy for obesity prevention. Greater political support is possible with the joint benefits of revenue collection and health improvement, and this is likely to be particularly pertinent in resource-poor regions such as in the Pacific where governments often have difficulties with raising revenue and there is a high burden of NCDs. This is more relevant with the negative economic effects of the COVID-19 pandemic on many PICTs, particularly those dependent on tourism. Five of the Pacific tax increases were implemented after the Pacific NCD Roadmap was published in 2014, in which health and finance ministers outlined an agreed pathway to address NCDs including the use of SSB taxes.⁹ The regional commitment to SSB taxation has

continued³²⁻³⁴ and been supported, for example, by the Pacific Community and the WHO. Regional leadership, multilateral support and an increasing international precedent for SSB taxes,²⁶ are likely to have facilitated effective policy implementation in PICTs, as previously identified.³⁵

US Affiliated Pacific Islands were less likely to have SSB taxes, as were the two largest low-income countries, Papua New Guinea and the Solomon Islands. This contrasts with French affiliated PICTs, which all had SSB taxes, and suggests the ongoing influence of historical and political bilateral relationships. There was no obvious pattern whereby jurisdictions with large beverage manufacturing industries (e.g. Fiji, Samoa, New Caledonia and French Polynesia) or more trade commitments had lower levels of SSB tax. For example, World Trade Organization members included countries with and without SSB taxes (Fiji, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu). There was also no clear pattern of SSB taxes by country income. The majority of jurisdictions, however, had lower tax rates for locally produced beverages than imported beverages, which increases the risk of substitution to these typically cheaper locally produced beverages. Such policies may also not be consistent with some trade commitments.

As seen in the Caribbean and Latin America, the design of many SSB taxes in the Pacific has not been optimised to reduce SSB consumption and there is an opportunity for further design improvements to achieve health goals.²⁵ Most SSB taxes were ad valorem or volumetric tax designs. Ad valorem designs are likely to be less effective than volumetric designs,³⁶ and both are likely to be less effective than SSB taxes applied directly on beverage sugar content,^{1,37} such as the nutrient-based taxes in the Cook Islands, Tonga and French Polynesia. These nutrient-based designs discourage a simple shift to cheaper drinks or larger volumes that is possible with ad valorem taxes and may provide stronger incentives for local beverage reformulation³⁸ and importation of lower sugar beverages.

Few SSB taxes were earmarked and only one PICT invested the tax revenue into health.^{13,39} A focus on tax and lack of investment of revenue back into health is concerning for equity, particularly if low-income households are paying a larger proportion of their income on SSB taxes⁴⁰ and there are few other obesity prevention policies and low levels of health

system funding. Earmarking enables policy makers to improve health benefits, public acceptability and address inequalities.³⁸

Many SSB taxes targeted a narrow set of SSB types, for example, soft drinks alone, as seen in the Caribbean and Latin America.²⁵ Tonga²² and French Polynesia²³ both included sugar-sweetened fruit juice, which is likely to reduce the risk of tax erosion from substitution to this beverage. Three PICTs included taxes on unhealthy foods similar to what has been done in Mexico.⁴¹

Strengths and limitations

This study provides an up-to-date systematic review of SSB tax legislative changes in the Pacific drawing on a wide range of databases, regional networks and other sources. It is strengthened by an analysis of tax changes over time. Although a thorough search was carried out, some information gaps remain. For example, additional legislative and tariff schedule documents were identified on the two field visits but may be missing for other settings. The legislated tax rate was extracted, but the level of tax may be discounted for products from trade partners with special agreements or products imported for government purposes. Revenue collection might be a better measure of SSB tax implementation if these data were readily available. There was also some variation in quality and inconsistencies between data sources. Missing or incorrect information about either the old or new SSB tax policies may have led to errors in SSB tax descriptions. We did not formally extract information on built-in increases over time, sunset provisions or referendums in the tax legislation, although none of these was noted.

Regarding the analysis, shelf prices would have been preferable for estimating the level of SSB tax but only import values were available. The latter tends to overestimate the size of an SSB tax as a percentage of shelf prices. Changes in how the tax is calculated in Tuvalu and Kiribati mean that the new levels of tax are likely to be closer to the old tax rate than the differences illustrated in Figure 1. Also, when calculating overall tax rates (Table 1) we could not take into account variation in the market share of locally produced and imported products by jurisdiction, and an equal market share was assumed. This may overestimate the average SSB tax (e.g. Fiji, where more beverages are locally produced) or underestimate the average SSB tax (e.g. Tonga, where more beverages are imported)

depending on which beverages were more commonly consumed. PICTs with SSB import tariffs alone were assumed to have no local production, which could overestimate the tax where there was local production (e.g. New Caledonia).

Potential policy implications

To improve potential health benefits such as oral health and NCD prevention, SSB taxes should include a broad range of sugar-containing beverages (e.g. such as fruit juices), levy tax on sugar content, invest revenue in the health system and obesity prevention, equalise tax rates for locally produced and imported products,¹⁵ ensure implementation of revenue collection on all products (including if they are locally produced, purchased by government, or imported from a preferential trading partner), legislate automatic adjustments for inflation (and consider adjustments for changes in income⁴²), and adopt a comprehensive package of nutritional prevention policies,⁴³ such as those monitored by Pacific MANA. These include reducing salt consumption and trans-fats, restriction of marketing of unhealthy beverages to children, compulsory health food policies in schools and food-based dietary guidelines policies.⁴⁴ Suboptimal health-promoting tax designs suggest there may also be a greater role for regional and international agencies (e.g. Pacific Community, World Bank, WHO) in offering advice and support on tax design and in tax policy evaluation. Improved collaboration between health-related tax experts from health and finance sectors may also improve effective policy design and implementation.³⁵ Finally, ongoing monitoring and transparency of existing SSB tax reviews and evaluations are important for making ongoing design changes for health improvement. These recommendations are relevant to all jurisdictions for optimising SSB taxes for health.

Conclusions

More than three-quarters of PICTs have SSB taxes, and more than one-third increased these taxes since 2000 at an amount that is expected to reduce soft drink consumption and therefore benefit public health. Despite many high-quality tax design elements in some PICTs, SSB control policies could generally be strengthened to improve health benefits in this region, for example, by

including all SSBs whether or not they were imported or manufactured and investing revenue into the health system and obesity prevention.

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Ethics approval

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Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary File 1: Further background, search strategy, further results and discussion.

Supplementary File 2: Data extraction.