

The global context for public health nutrition taxation

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Abstract

Objective: To assess critically the scope for public health nutrition taxation within the framework of the global tax reform agenda.

Design: Review of the tax policy literature for global policy priorities relevant to public health nutrition taxation; critical analysis of proposals for public health nutrition taxation judged against the global agenda for tax reform.

Setting: The global tax reform agenda shapes decisions of tax policy makers in all countries. By understanding this agenda, public health nutritionists can make feasible taxation proposals and thus improve the development, uptake and implementation of recommendations for nutrition-related taxation.

Results: The priorities of the global tax reform agenda relevant to public health nutrition taxation are streamlining of taxes, adoption of value-added tax (VAT), minimisation of excise taxes (except to correct for externalities) and removal of import taxes in line with trade liberalisation policies. Proposals consistent with the global tax reform agenda have included excise taxes, extension of VAT to currently exempted (unhealthy) foods and tariff reductions for healthy foods.

Conclusions: Proposals for public health nutrition taxation should (i) use existing types and rates of taxes where possible, (ii) use excise taxes that specifically address externalities, (iii) avoid differential VAT on foods and (iv) use import taxes in ways that comply with trade liberalisation priorities.

Keywords
Tax reform
Diet
Intervention
Policy

The growing global epidemic of diet-related chronic disease has provoked recommendations for the use of tax policy tools to create incentives for healthy food consumption^(1–3). Diets high in meat, processed foods (often high in salt, fat and/or sugar) and refined cereals, and low consumption of whole grains, fruits and vegetables are associated with increased risk of chronic diseases such as cancer, diabetes and CVD in both high- and low/middle-income countries^(4–6). High levels of consumption of foods such as soft drinks and fast foods are also associated with increased disease risk^(7,8).

Taxes and subsidies can change the price of healthier foods relative to unhealthy foods, and thus provide incentives for a better diet^(2,9). Such price changes would help to compensate for or decrease externalities† related to the high economic and social cost of diet-related chronic diseases by translating some of these future costs into a

higher price for unhealthy food^(10,11). They can also reinforce consumer education by drawing the attention of discerning shoppers to unhealthy foods⁽¹²⁾.

However, there has been limited implementation of recommendations for specific health-related food taxes⁽¹³⁾. Uptake and implementation of such taxes depend on several factors; one that is often overlooked by public health nutritionists is the importance of the type of tax proposed in determining the feasibility and acceptability of proposals made to tax policy makers⁽¹⁴⁾. The present study examines the types of taxes that could be used to change the relative prices of foods, and their feasibility from a policy perspective, taking special account of the global tax reform agenda.

Taxes are already applied at many points in the food supply chain – e.g. to agricultural inputs, transport of food, the companies that produce, process and market food and those who consume it (Fig. 1). While governments have applied health taxes to tobacco and alcohol, food is an essential commodity that is already taxed in complicated ways. These factors make the implementation of specific food taxes designed to improve diets difficult^(15,16). As the aim of public health nutrition intervention is to influence consumption (quantity and type)

† Externalities are unintended 'side effects' of decisions made by individuals, governments or companies, which affect others (see glossary). In this case, it is argued that the cost to individuals of consumption of unhealthy food does not reflect the full cost borne by the wider public from diet-related chronic diseases, in the form of public health-care costs, lost productivity, sick leave and the social and family costs of poor health.

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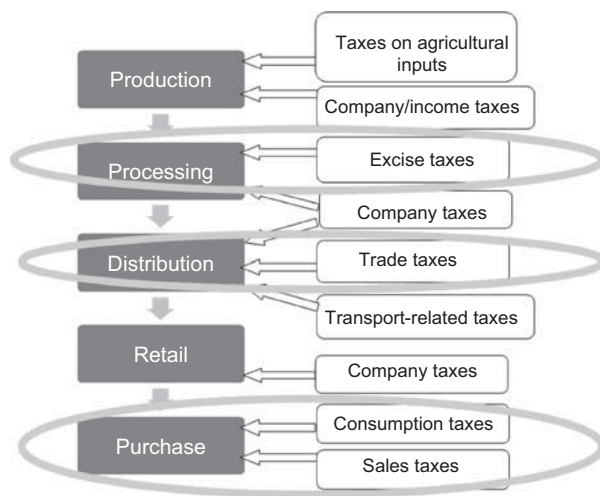


Fig. 1 Overview of the application of the taxation system to the food supply chain. Recommendations have focused on consumption, sales, trade and excise taxes as direct influences on the purchase price of specific foods (adapted from Hawkes⁽¹⁷⁾)

of healthy and unhealthy foods, recommendations have focused on consumption taxes as the most direct mechanism for influencing price. These include broad-based taxes (e.g. value-added tax (VAT) and sales tax), excise taxes and trade taxes, which are applied with a high degree of specificity (Box 1). In contrast, taxes on agricultural inputs, company taxes and transport-related taxes affect a wide range of products and services, and thus cannot be targeted to specific foods.

While tax policy varies widely among countries, there is consensus regarding several future directions. The present study summarises the global tax reform agenda, which guides tax policy makers at a national level in both developed and developing countries⁽¹⁸⁾, especially in relation to consumption taxes. Finally, it critically assesses recent recommendations for public health nutrition taxation in the peer-reviewed and popular literature, both of which inform policy. In doing so, the present study highlights factors that may have contributed to a widespread lack of implementation of such recommendations. By aligning proposals for taxation interventions to the agenda of tax policy makers, public health nutritionists can make more feasible taxation proposals and thus increase the likelihood of their adoption⁽¹⁹⁾.

Discussions about incentives for healthy eating have also included subsidies, such as tax exemptions, which fall under tax policy making (as 'tax expenditure'), and government expenditure in the form of fund transfers, administered by specific government departments (e.g. Agriculture). As the focus of the present study is on tax policy, we include only subsidies in the form of tax exemptions and do not analyse the scope for changes to 'fund transfer' subsidies, such as those related to agriculture. Reductions in such subsidies might well help correct prices and the availability of heavily subsidised

products. This occurred decades ago in Poland, where the reduction of subsidies to dairy and meat production, together with increased availability of vegetable oils and fruit, apparently contributed to rapid and substantial reductions in CVD mortality⁽²⁰⁾.

Method

We first summarised the priorities of the global tax reform agenda as they relate to consumption taxes. First, we performed a literature review using Business Source Premier, ProQuest, Google Scholar and International Monetary Fund (IMF) and World Bank websites, applying the terms 'global', 'tax', 'reform', 'agenda' and 'consumption'. We then examined reference lists from relevant articles. Based on this information, we highlighted the implications for nutrition-related consumption taxes. Second, we reviewed recommendations for, and examples of, public health nutrition taxation, from 2000 onwards, to identify the types of taxes recommended. Academic databases (Medline, ProQuest and Business Source Premier) and Google Scholar were searched using the terms 'tax', 'food', 'diet', 'nutrition', 'consumption', 'soft drink', 'obesity' and 'fat', and focused on proposed mechanisms for public health nutrition taxation. These proposals were critically assessed against the global tax reform agenda.

Findings

Overarching principles for tax policy makers in reforming taxation systems

Tax instruments (and the overall tax system itself) are assessed largely by reference to the criteria of simplicity, equity and efficiency⁽²¹⁾. 'Simplicity' relates to the ability of the revenue authority to administer a tax and the taxpayer to comply with the tax. In theory, the simpler the tax, the greater the certainty involved in its imposition, and, therefore, the greater the ease with which the tax can be administered and complied with.

'Equity' as an element of social justice and human rights has many definitions, but two varieties are of special relevance here: horizontal equity (an ethical principle that argues that persons here and now, occupying the same economic and social space, should be treated the same) and vertical equity (an argument that persons in a different social and economic context should be treated differently and, in particular, those with a greater capacity to pay should pay more tax to assist those who need affirmative support). A regressive tax is one that breaches vertical equity in that those with lower incomes pay proportionately more of their income as tax than those with higher incomes.

'Efficiency' requires that a tax should be neutral in the way that it affects economic behaviour (both in relation to consumer choices and productive processes). There is a loss

Box 1 Glossary of tax terms

Bound rates: Maximum rate of tariff allowed by the World Trade Organization (WTO) to any member state for imports from another member state.

Consumption tax: Charge levied by the state on consumption, expenditure, privilege or right, but not on income or property (e.g. customs duties levied on imports, excise duties on production, sales tax or value-added tax (VAT) at some stage in the production–distribution process). Also called indirect taxes; they are often regressive because they are not based on the ability-to-pay principle.

Discriminatory: Differences in two rates not explainable or justifiable by economic considerations such as costs.

Excise tax: Excise taxes consist of special taxes levied on specific kinds of goods, typically alcoholic beverages, tobacco and fuels; they may be imposed at any stage of production or distribution and are usually assessed by reference to the weight or strength or quantity of the product. Also called ‘excise duty’.

Externalities: Activities and conditions whose benefits and costs are not reflected in the market price of goods and services. The primary feature of externalities is that a decision by one set of parties affects others who did not have a choice and whose interests were not taken into account.

Import tariff: Duties or taxes levied on goods as they enter a country.

Progressive tax: Taxation that takes a larger percentage of a larger income and a smaller percentage of a smaller income, e.g. a tax on luxury cars.

Regressive tax: Taxation that takes a larger percentage of a smaller income and a smaller percentage of a larger income, e.g. a tax on the basic necessities (which form a larger percentage of the expenditure of the lower income population) is a regressive tax.

Sales tax: *Ad valorem* tax levied on sale of goods or services. Unlike a VAT (levied only on the net increase in price at every point a good or service moves from one seller to the next purchaser), sales tax is a cost and involves double taxation (tax on tax) because it is imposed on the gross price (seller’s net cost price + sales tax paid by the seller + seller’s profit) at each point of sale.

Subsidy: Economic benefit (such as a tax allowance or duty rebate) or financial aid (such as a cash grant or soft loan) provided by a government to (i) support a desirable activity, (ii) keep prices of staples low, (iii) maintain the income of the producers of critical or strategic products, (iv) maintain employment levels or (v) induce investment to reduce unemployment.

Tax: Compulsory monetary contribution to the state’s revenue, assessed and imposed by a government on the activities, enjoyment, expenditure, income, occupation, privilege, property, etc. of individuals and organisations.

Trade taxes: Taxes on goods crossing national borders, e.g. tariffs.

Value-added tax (VAT): Indirect tax on the domestic consumption of goods and services, except those that are zero-rated (such as food and essential drugs) or are otherwise exempt (such as exports). It is levied at each stage in the chain of production and distribution, but is borne by the end consumer. The goods and services tax (GST) is another example of a consumption tax.

Sources: <http://www.businessdictionary.com/> and <http://data.un.org/Glossary.aspx>

of efficiency if a tax encourages an individual to substitute goods and services that they value less for goods and services that they value more. The costs of administering and complying with a tax involve a loss of efficiency.

These overarching principles guide tax policy makers in both tax system reform and selecting appropriate instruments for taxation, and there are important relationships between these goals. For example, simplicity in the design of a tax can lead to lower administration and compliance costs and, therefore, greater efficiency.

The global tax reform agenda: an overview

The global tax reform agenda has changed the global economy fundamentally over the past 30 years. Barriers to cross-border flows of production (such as the removal of exchange controls to facilitate flows of capital) have been demolished and goods and services have moved more easily among nations. Multinational enterprises have emerged as truly global organisations responsive to tax differentials, and this in turn has created incentives for all countries to improve their tax systems to attract and

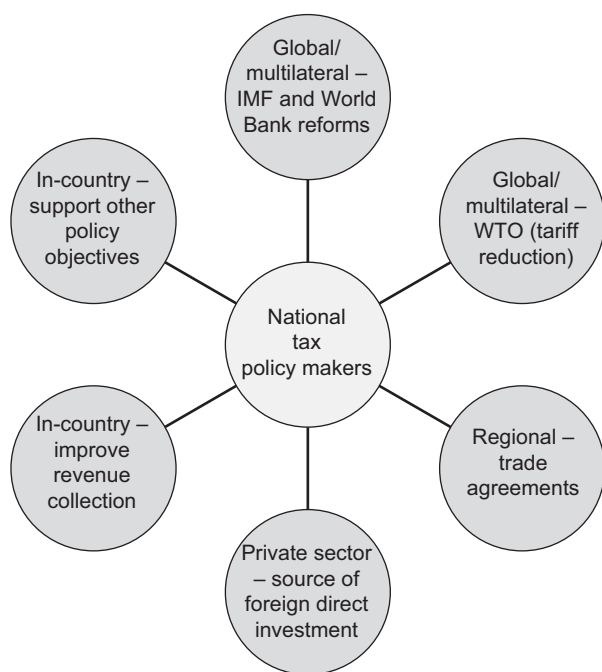


Fig. 2 Major influences on national tax policy makers

retain foreign investment. The World Trade Organization (WTO), IMF, World Bank and the Organization for Economic Cooperation and Development (OECD) have grown in power and authority. Many judge the new tax systems as more efficient than the old.

The global agenda for reform has not only informed development of tax systems to date but also continues to shape policy decisions, as tax systems are continually adjusted^(18,22–24) (Fig. 2). This section provides a brief overview of the emergence of the global tax reform agenda and its main priorities.

For low-income countries, the close of the colonial era and rise of international aid for development led to pressure for the reform of inefficient, inequitable tax systems plagued by administrative problems⁽²²⁾. In the 1980s, tax reform became part of IMF conditionalities, and the World Bank initiated research comparing the process and success of tax reform initiatives in various countries^(25,26). These agencies have played a major role in advising low-income countries to reform their tax systems to ensure that they are commensurate with administrative capacity.

At the same time, there was a growing adoption of consumption taxes – namely VAT – among OECD countries⁽²⁷⁾. The USA is the only OECD country to still use sales tax rather than VAT⁽²⁷⁾. Consumption taxes were adopted by the IMF and later by the World Bank as a key recommendation within their structural reform packages for low-income countries^(25,28). Consumption taxes are preferred because they have a lower administrative burden and – particularly when a flat rate tax is applied to a broad base – they are an efficient way to raise revenue^(29,30).

By the early 1990s, there was a remarkable global consensus, especially among international institutions, regarding tax reform, with the result that despite tax system differences between countries, the priorities and policy aims of tax policy makers have become similar⁽¹⁸⁾. Consumption taxes such as VAT or goods and services tax (GST) are now one of the main sources of revenue in most countries, replacing the existing, often *ad hoc* and highly complicated, taxation structures^(29,31). There have also been reductions in the use of trade-related taxes, as required by policies of trade liberalisation⁽³²⁾; import tariffs have declined in both developed and developing countries⁽²²⁾. ‘Tariff bands’ have come into favour, which are set rates for tariffs (e.g. 5%, 10% and 20%) that are often linked to planned rate reductions (e.g. after 5 years, the 20% band becomes 15%, 10% becomes 8%, etc.)⁽³²⁾. The work of the WTO, which was created in 1994, has served to reinforce this aspect of the tax reform agenda. In many low-income countries, the recent adoption of a VAT or GST has been closely associated with a reduction in trade tax revenue⁽³³⁾. While the VAT is imposed on both imports and domestic production, in many low-income countries it is largely collected at the border and therefore replaces lost trade tax revenue.

Excise taxes have been used less in many countries as the tax structure has been simplified and broad-based consumption taxes introduced. However, they remain an important component of tax systems as a tool for revenue raising and correcting for externalities^(34–36).

Thus, in summary, the global priorities for tax reform are to simplify administration, minimise distortions and maximise revenue. In relation to consumption taxes, the main agenda includes implementation of broad-based, flat rate general consumption taxes, the use of specific (usually excise) taxes only to correct for negative externalities, and reductions in import taxes in line with trade liberalisation (Table 1).

The global tax reform agenda: implications for nutrition-related consumption taxes

There is scope within the global tax reform agenda for changes to tax systems that help to achieve health and nutrition objectives. This is partly because tax systems are constantly changing due to ongoing reform^(23,30), and also because there is recognition by taxation specialists that the tax system plays a role in supporting other policy objectives^(36,37).

The general tax policy priorities described in the previous section suggest broad strategies that will make proposals for public health nutrition taxation interventions more feasible for tax policy makers to implement (Table 1). Public health nutritionists can contribute to simplifying tax administration by making proposals that are simple to implement and make use of existing tax policy mechanisms and tax rates. This minimises administrative costs because legislative and administrative processes for

Table 1 Implications of the global tax reform agenda for public health nutrition taxation

Global priorities for tax reform	Specific policy directions	Criteria to inform development of public health nutrition taxation interventions
General priorities		
Simplify administration	Reduce complexity of system	Use strategies to minimise administrative burden (e.g. employ existing policy tools) Consider unintended and differential impacts of tax
Maximise revenue	Streamline taxes	Avoid new exemptions or new types of taxes Use existing types and rates of taxes where possible
Minimise distortions	Progressive taxation	Explicitly consider regressivity Calculate revenue and suggest revenue-neutral options when proposing tax exemptions or subsidies
Consumption taxes		
General consumption taxes – broad base with minimal differential rates	Increasing adoption of VAT/GST Flat rate VAT	Avoid differential VAT rates Consider options to reduce exemptions (e.g. extend flat rate VAT to some food items)
Specific consumption (excise) taxes – use only to correct for externalities	Reduced use of luxury consumption taxes Minimal additional consumption taxes	Explain externality and estimate compensatory tax
Import taxes – reduce in line with trade liberalisation (they are discriminatory)	Tariff reductions, introduction of bound rates, tariffication (WTO)	Consider options for differential tariffs within bound rates Consider options to reduce tariffs on foods as tax exemption

VAT, value-added tax; GST, goods and services tax; WTO, World Trade Organization.

tax implementation and collection already exist, and established procedures and staff are in place for both the revenue authority and the taxpayer. In terms of maximising revenue, public health nutritionists can support the streamlining of taxes by not proposing new types of taxes or differential tax rates (e.g. special tax rates on certain foods). Again, a better option would be to examine the existing rates and types of taxes and utilise these for proposals. In doing so, it is important to reduce or limit distortions in the tax system. Further, proposals should explicitly describe the probable burden of the tax (including regressivity), as well as its benefits (i.e. reductions to the fiscal burden in the future through chronic disease prevention and additional revenue).

More specific policy directions for consumption taxes, tariffs and excise taxes are evident globally, and these also have implications for public health nutrition taxation (Table 1). The trend of general consumption taxes (sales tax and VAT) towards flat rate VAT has meant the replacement of a large number of different taxes on consumption, and limits the scope for applying widely varying rates of tax to different goods. However, it is not uncommon for VAT to have exemptions for essential foods⁽²⁷⁾, which could be extended to reduce the tax on healthy foods, or could be removed from unhealthy foods to increase taxes on these foods. The difficulty with this, though, is that it creates borders based on definitions of 'unhealthy' that have to be policed by the revenue authority and, from a taxpayer perspective, creates opportunities for tax evasion.

The use of specific consumption taxes (e.g. excise taxes) is decreasing as taxes are streamlined, but excise

taxes remain important for correcting externalities^(28,36). Proposals for excise taxes should explain the contribution of diet to poor health outcomes and clarify the role of the tax in influencing the consumption of specific foods or groups of foods, as well as raising revenue to compensate for the cost of diet-related chronic diseases^(11,19,38).

As a priority of both trade liberalisation and global tax reform, the reduction of trade taxes and introduction of bound rates and tariff bands mean that there is less scope to change tariff rates in response to public health nutrition priorities. Aligning proposed tariff changes with existing tariff bands and ensuring that they remain within bound rates makes administration and implementation easier, and is more likely to be acceptable. Alternatively, as a strategy for reducing the cost of healthy foods, the reduction or removal of tariffs supports trade liberalisation, and could be a more feasible way to reduce taxes than changes to VAT. Another result of trade liberalisation is that many governments in low-income countries are actively seeking new sources of revenue as income from tariffs declines. As such, there may be increasing scope for the proposal of new taxes (e.g. excise taxes) that benefit both finance and health⁽³³⁾.

Each country also has its own priorities for tax reform. In order to develop feasible proposals, public health nutritionists need to bear in mind the current national tax structure for food and national policy directions, as well as global policy priorities. For example, while global policy directions suggest against proposing changes to the VAT, if a country has a differentiated VAT then there may be a case for applying the highest VAT rate to unhealthy foods – using the existing tax bands but still

Table 2 Critical analysis of recommendations for use of public health nutrition taxation

Recommendation	Relationship to tax reform agenda	Assessment of political and administrative feasibility
Excise tax ^(38–40,58–61)	Permissible – to correct for externalities	Feasible if existing tax (i.e. if excise taxes are already in use) More likely if proposal explains externality and estimates compensatory tax
Extend VAT/GST to wider range of foods ^(16,62–64)	In line with revenue-maximising priorities	Feasible if some 'unhealthy' foods are currently exempt from VAT (reduces exemptions)
Increase VAT selectively ^(41,65)	Contrary to move towards flat VAT rates	Unlikely – adds to administrative burden, creates differential VAT; more feasible if tiered VAT already exists
Reduce VAT selectively ⁽⁴²⁾	Contrary to move towards flat VAT rates	Feasible if tiered VAT already exists More likely if reduction takes form of VAT exemption
Sales tax ^(13,43,66–68)	Many countries are replacing sales tax with VAT	Feasible if existing tax (i.e. if sales taxes are already in use) More likely if proposal aligns to existing rates of tax
Increase tariffs (e.g. on unhealthy foods) ⁽⁴⁴⁾	Contrary to trade liberalisation agenda	Feasible if non-discriminatory and within bound rates Use of existing tariff bands will improve feasibility and acceptability
Decrease tariffs (e.g. on healthy foods) ⁽¹⁹⁾	In line with WTO recommendations	Feasible – aligns to trade liberalisation agenda More likely if existing tariff bands are used
Revenue-neutral tax plus subsidy or tax reduction ^(42,47,69)	Adds administrative complexity	Unlikely – adds to administrative burden More likely if existing types and rates of taxes are used
Variable taxes based on price change required for dietary change ⁽⁴⁸⁾	Adds administrative complexity	Unlikely – adds to administrative burden More likely if existing types and rates of taxes are used

VAT, value-added tax; GST, goods and services tax; WTO, World Trade Organization.

increasing the tax. Ongoing, informed consultation with national tax policy makers is essential for the development of feasible proposals.

Critical assessment of recommendations for nutrition taxation

Public health nutritionists have recommended a variety of taxes to provide incentives for healthy diets and reduce the burden of chronic disease. This section presents a review of these recommendations and critically assesses the different types of proposals against the priorities of the global tax reform agenda (Table 2). Full details of the findings of the present study are provided in the Appendix.

One of the most common specific recommendations was for excise taxes, particularly on soft drinks as an easily identifiable commodity that adds little or no nutritional value to the diet while being associated with a higher disease risk^(38–40). Excise taxes are one of the most appropriate tools for public health nutrition because their use in correcting for externalities (the basis of public health nutrition taxation) is supported in the taxation literature. However, their feasibility will depend on whether a mechanism is in place for effective excise tax collection. Linking such taxes explicitly to health goals has also been found to improve public support⁽¹⁶⁾.

Several proposals for public health nutrition taxation have suggested changes to general consumption taxes, including increased VAT on soft drinks⁽⁴¹⁾, reduced VAT on healthy grain products⁽⁴²⁾ and increased sales tax on

soft drinks and snack foods^(13,43). However, the main point of introducing a VAT – and the reason for the trend towards flat rate VAT – is that through its broad base and single rate it is an efficient tax that is reasonably simple to administer. As a result, changes to VAT that lead to distortions and add administrative complexity are unlikely to be implemented.

As discussed above, the feasibility of tariff changes largely depends on whether they are consistent with the trade liberalisation agenda. Proposals for tariff increases that have been made in the Pacific (Welegtabit⁽⁴⁴⁾) are technically contrary to policies designed to reduce barriers to trade, such as the Pacific Island Countries Trade Agreement. However, if these increases are within bound rates and are non-discriminatory (see glossary), then they are feasible proposals to support public health nutrition priorities⁽⁴⁵⁾. In contrast, proposals to decrease tariffs on healthy foods⁽⁴⁶⁾ align with trade liberalisation priorities, and so are more feasible.

More complex proposals have included tax and subsidy packages that are revenue neutral^(42,47), and variable taxes based on the price change are required to reduce intake of unhealthy food to nutritional recommendations⁽⁴⁸⁾. These types of proposals are unlikely to be implemented, simply because of the associated administrative complexity. However, the feasibility of these proposals could be improved by using existing types of taxes and tax rates.

Several recommendations did not describe the specific tax used or proposed^(3,49–57). While this strategy allows tax policy makers to select the most appropriate tool for

taxation, it may reduce the likelihood of the proposal being adopted because it creates additional work for tax policy makers. While improving nutrition is a priority for health policy makers, the different priorities within finance may mean that little time is available to research and develop the details of such a proposal.

Discussion

Strategies to maximise acceptability of proposals

The implications of the global tax reform agenda for public health nutrition taxation centre on the types and rates of taxes used for intervention. First, there is little scope for use of types of taxes that are being phased out – e.g. many countries are phasing out retail sales tax with the introduction of a broad-based VAT and are reducing tariffs under trade liberalisation policies. Second, the introduction of new tax rates is contrary to the priorities of simplification and use of flat rate taxes. Public health nutritionists can improve the acceptability of their proposals for tax policy change by minimising the associated administrative burden (e.g. using existing types and rates of taxes). Excise taxes are also an appropriate mechanism for public health nutrition taxation, and proposals should clearly explain the health externality that is being corrected for. Understanding global priorities for tax reform can also highlight less obvious, more acceptable strategies that can help to achieve nutritional goals. For example, rather than proposing additional tax increases, it might be possible to remove VAT exemptions from unhealthy foods. Similarly, instead of proposing new exemptions to the VAT, tariffs on healthy foods could be reduced. Proposals should also describe the full impact of the tax, including considering the unintended and differential impacts of the tax, explicitly considering regressivity, calculating the revenue generated by the proposal and suggesting revenue-neutral options when proposing tax exemptions.

Future research, modelling and policy proposals for taxation should use potentially feasible scenarios that are consistent with the global tax reform agenda to improve the likelihood of serious consideration by tax policy makers. Proposals seen in the literature that aligned with global tax reform priorities included extending VAT to unhealthy foods that are currently exempted, decreasing tariffs on healthy foods and implementing excise taxes on specific foods to correct for externalities related to the burden of diet-related chronic disease. These proposals contribute to tax policy makers achieving their own priorities for reform, and also support population nutritional objectives. Ongoing, informed consultation with national tax policy makers will aid the development of feasible proposals. This should be supported by advocacy for (i) the significant personal, economic and social benefits of healthy eating and (ii) the benefits of a multi-dimensional approach, including taxation, to creating incentives to support healthy food choices.

The contribution of taxes to a multi-dimensional health promotion strategy might also include the use of revenue collected to support other initiatives, such as public education or social marketing of healthy foods^(38,62,70,71). This may improve public support for the taxes^(16,58), and also help to reduce regressivity (discussed below) as these initiatives may particularly benefit those with low incomes, who are often disproportionately affected by chronic disease⁽³⁸⁾. However, in terms of the global tax reform agenda, earmarking of revenue is likely to create additional administrative costs, and may reduce transparency and accountability since the tax revenue will not go through normal processes. It has also been suggested that diverting revenue may limit the sustainability of taxes, and that health promotion funds may be redirected as government priorities change⁽¹⁴⁾.

Taxes have been a critical component of strategies to reduce tobacco consumption and the associated burden of illness and death, and this experience has informed development of public health nutrition taxation recommendations to date⁽⁵⁶⁾. However, in contrast to food, tobacco products are non-nutritive and relatively homogeneous, and thus a fairly straightforward candidate for excise taxation. As a result, the most pertinent application may be the use of the Framework Convention on Tobacco Control as a model for global governance in reducing diet-related chronic disease. Provision of guidelines and legislative tools for adoption by national policy makers could assist countries seeking to implement multi-dimensional policy interventions.

Challenges for public health nutritionists

A significant challenge for public health nutritionists is to assist tax policy makers to define 'unhealthy' foods^(72–74). This will be important for tax administrators who have to monitor the border between healthy and unhealthy foods. As stated above, any borders created between taxed and untaxed goods increases the administrative and compliance costs of the tax. However, the definition of unhealthy foods is a contentious issue because of the essential nature of food, and the contribution of even the most 'unhealthy' food to basic nutrient requirements. It is, in fact, unhealthy diets that are related to disease, and the challenge presented is that of linking particular foods to an overall diet. Strategies employed to date have ranged from the identification of specific foods that are deemed 'high energy low nutrient value' foods (e.g. soft drinks), to more complicated calculations, usually taking into consideration fat, salt and sugar content. For example, researchers in the UK have used a 'nutrient-scoring profile' to identify a range of unhealthier foods for taxation^(62–64). A system such as traffic light labelling could contribute to both consumer education and identification of foods that would benefit from improved economic incentives reflecting the real costs of consumption⁽⁷⁵⁾. The implementation of a carbon tax or another form of environmental tax on food production and processing

may also result in similar health-related benefits, because of the high energy use associated with the production of livestock and highly processed food⁽⁷⁶⁾.

In selecting foods for taxation, public health nutritionists also need to balance the (un)healthfulness of the targeted food with consumers' likely response to its taxation, called 'price elasticity'. Where the aim of taxation is to decrease consumption, foods for which consumer demand is likely to decline in response to a price increase (price 'elastic' foods) may be more appropriate to target than those that are very inelastic. Food demand is often quite unresponsive to price changes ('inelastic'), particularly in higher-income countries. Andreyeva *et al.*⁽⁷⁷⁾ found that while food purchases in the USA were relatively price inelastic, there was variation between food products, with demand for soft drinks, juice, meats, fruit and cereals being relatively less inelastic. However, in lower-income countries, where people tend to spend a higher proportion of their income on food, demand for some, usually non-staple, foods and beverages can be very price elastic⁽⁷⁸⁾. However, there is relatively limited data on food price elasticities – further research in this area would help public health nutritionists to target food taxes more effectively.

Public health nutritionists also need to address the challenge presented by the potentially negative effect of taxation on the food industry, which has been cited as a barrier to policy implementation and sustainability^(68,70). Economic goals of government include the promotion of private sector growth as well as correcting for externalities, and one of the key aims of tax reform is to create an environment that does not discriminate unfairly against particular types of business or commodity. It has been shown that taxes on soft drinks can have negative effects on economic measures such as employment and growth of Gross Domestic Product^(59,79). However, these studies do not consider the health implications of soft drink consumption, and reinforce the need for public health nutritionists to provide tax policy makers with information on the personal, social and economic costs of poor diets.

Concerns have been raised in the literature and popular press about the fact that public health nutrition taxes are regressive, in that they will place a higher relative burden on those with lower incomes, who spend a higher proportion of their income on food^(15,16,68); in Mexico a tax on soft drinks was rejected by the Senate due to concerns over the effect on the poor⁽⁸⁰⁾. From a public health nutrition perspective, regressivity is a concern because of the negative effect of poverty on health overall⁽⁸¹⁾. However, the extent of regressivity created by public health nutrition taxation is not clear, and some studies have suggested that the poor may in fact benefit disproportionately from the health benefits resulting from economic incentives to improve diet^(16,62,69). In terms of the differential effects on consumption, Brownell *et al.*⁽⁵⁸⁾ point out that in the USA both the 15–20% drop in soft

drink consumption and any associated increase in expenditure that would most likely result from a small tax is relatively minor. Raising consumer awareness of the health, consumption and expenditure effects of proposed taxes, as well as the low-cost healthy alternatives available (namely water), may help to allay concerns regarding regressivity. In addition, complementing taxes on unhealthy food with subsidies for healthy foods could help to reduce the burden on those most affected by increases in food prices. Public health nutritionists should also be mindful that similar arguments have been made against special excise taxes on alcohol and tobacco, but for both of these the public health benefits across the population have outweighed the possibly uneven financial impacts.

Conclusion

Global priorities for tax reform shape the uptake and implementation of proposals for public health nutrition taxes. By understanding this agenda, public health nutritionists can support tax policy makers to use taxes to correct for externalities caused by diet-related chronic disease. Strategies to improve the feasibility and acceptability of proposals from the perspective of tax policy makers include (i) using existing types and rates of taxes where possible, (ii) using excise taxes that specifically address externalities, (iii) avoiding differential VAT on foods and (iv) using import taxes in ways that comply with trade liberalisation priorities.

Future research and modelling studies should consider the feasibility of scenarios for public health nutrition taxation in the light of the global agenda for tax reform. There is also a need for more research into the definition of 'unhealthy food' for the purposes of taxation, food price elasticities, the potential for environmental/carbon taxation to contribute to public health nutrition goals and the differential effects of public health nutrition taxation on the poor.

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References

1. World Health Organization (2008) *2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*. Geneva: WHO.

2. Powell LM & Chaloupka FJ (2009) Food prices and obesity: evidence and policy implications for taxes and subsidies. *Milbank Q* **87**, 229–257.
3. Magnusson R (2008) What's law got to do with it? Part 2: legal strategies for healthier nutrition and obesity prevention. *Aust N Z Health Policy* **5**, 11.
4. Popkin B (2002) An overview on the nutrition transition and its health implications: the Bellagio meeting. *Public Health Nutr* **5**, 93–103.
5. World Cancer Research Fund/American Institute for Cancer Research (2007) *Food, Nutrition, Physical Activity and the Prevention of Cancer: A Global Perspective*. Washington, DC: AICR.
6. World Health Organization (2003) *Diet, Nutrition and the Prevention of Chronic Diseases. Report of the Joint WHO/FAO Expert Consultation*. WHO Technical Report Series no. 916. WHO: Geneva.
7. Vartanian LR, Schwartz MB & Brownell KD (2007) Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health* **97**, 667–675.
8. Pereira M, Kartashov AI, Ebbeling CB *et al.* (2005) Fast-food habits, weight gain, and insulin resistance (the CARDIA study): 15-year prospective analysis. *Lancet* **365**, 36–42.
9. Thow AM, Jan S, Leeder S *et al.* (2010) The impact of fiscal policy interventions for diets, obesity and chronic disease: a systematic review. *Bull World Health Organ* (Epublication ahead of print version).
10. Cawley J (2004) An economic framework for understanding physical activity and eating behaviors. *Am J Prev Med* **27**, 117–125.
11. Finkelstein E, French S, Variyam JN *et al.* (2004) Pros and cons of proposed interventions to promote healthy eating. *Am J Prev Med* **27**, 163–171.
12. Cash SB & Lacanilao R (2008) *An Experimental Investigation of the Impact of Fat Taxes: Price Effects, Food Stigma, and Information Effects on Economic Instruments to Improve Dietary Health*. Edmonton, Canada: Department of Rural Economy, University of Alberta.
13. Chriqui JF, Eidson SS, Bates H *et al.* (2008) State sales tax rates for soft drinks and snacks sold through grocery stores and vending machines, 2007. *J Public Health Policy* **29**, 226–249.
14. Thow AM, Quested C, Juventin L *et al.* (2010) Soft drink taxes in the Pacific: lessons on implementation. *Health Promot Int* (In the Press).
15. Caraher M & Cowburn C (2005) Taxing food: implications for public health nutrition. *Public Health Nutr* **8**, 1242–1249.
16. Leicester A & Windmeijer F (2004) *The 'Fat Tax': Economic Incentives to Reduce Obesity. Briefing Note no. 49*. London: Institute for Fiscal Studies.
17. Hawkes C (2009) Identifying innovative interventions to promote healthy eating using consumption-oriented food supply chain analysis. *J Hunger Environ Nutr* **4**, 336–356.
18. Stewart M (2002) *Global Trajectories of Tax Reform: Mapping Tax Reform in Developing and Transition Countries*. Melbourne: The University of Melbourne Faculty of Law.
19. Nugent R & Knaul F (2006) Fiscal policies for health promotion and disease prevention. In *Disease Control Priorities in Developing Countries*, 2nd ed., pp. 211–223 [D Jamison, J Breman, A Measham *et al.*, editors]. Washington, DC: The World Bank and Oxford University Press.
20. Zatonski WA, McMichael AJ & Powles JW (1998) Ecological study of reasons for sharp decline in mortality from ischaemic heart disease in Poland since 1991. *BMJ* **316**, 1047–1051.
21. Taxation Review Committee (1975) *Full Report*, at paragraphs 3.6–3.28. Canberra: Australian Government Publishing Service.
22. Bahl R & Bird R (2008) Tax policy in developing countries: looking back – and forward. *Natl Tax J* **LXI**, 279–301.
23. Freebairn J (1997) Options and prospects for taxation reform. *Econ Rec* **73**, 373–386.
24. Garber HD (1988) The role of consumption taxes in tax reform around the world. *Natl Tax J* **41**, 357–364.
25. World Bank (1991) *Lessons of Tax Reform*. Washington, DC: World Bank.
26. Abed G (1998) *Fiscal Reforms in Low-Income Countries: Experience under IMF-Supported Programs*. Washington, DC: International Monetary Fund.
27. Organisation for Economic Co-operation and Development (2008) *Consumption Tax Trends 2008: VAT/GST and Excise Rates, Trends and Administration Issues*. Paris: OECD.
28. International Monetary Fund (1995) *Guidelines for Fiscal Adjustment. Pamphlet Series no. 49*. Washington, DC: IMF; available at <http://www.imf.org/external/pubs/ft/pam/pam49/pam49con.htm>
29. Cnossen S (1998) Global trends and issues in Value Added Taxation. *Int Tax Pub Finance* **5**, 399–428.
30. Gemmell N & Morrissey O (2005) Distribution and poverty impacts of tax structure reform in developing countries: how little we know. *Dev Policy Rev* **23**, 131–144.
31. Thirsk W (1991) *Lessons from Tax Reform: An Overview*. Washington, DC: World Bank.
32. World Trade Organization (2007) *Understanding the WTO*. Geneva: WTO.
33. Burns L (2007) VAT in the Pacific. In *GST in Retrospect and Prospect*, pp. 515–528 [R Krever and D White, editors]. New Zealand: Thomson Brookers.
34. Bolnick B & Haughton J (1998) *Tax policy in Sub-Saharan Africa: Examining the Role of Excise Taxation*. Boston, MA: Harvard Institute for International Development.
35. Cnossen S (2007) The role and rationale of excise duties in the ASEAN countries. In *Excise Taxation in Asia*, pp. 1–24 [SL Phua, editor]. Singapore: Centre for Commercial Law Studies, Faculty of Law, National University of Singapore.
36. Cnossen S (2005) Economics and politics of excise taxation. In *Theory and Practice of Excise Taxation: Smoking, Drinking, Gambling, Polluting, and Driving*, pp. 1–19 [S Cnossen, editor]. Oxford: Oxford University Press.
37. James S & Edwards A (2008) Developing tax policy in a complex and changing world. *Econ Anal Policy* **38**, 35–53.
38. Brownell KD & Frieden TR (2009) Ounces of prevention – the public policy case for taxes on sugared beverages. *N Engl J Med* **360**, 1805–1808.
39. Clarke D & McKenzie T (2007) *Legislative Interventions to Prevent and Decrease Obesity in Pacific Island Countries*. Auckland: Allen and Clarke, Policy and Regulatory Specialists Limited.
40. Bahl R, Bird R & Walker MB (2003) The uneasy case against discriminatory excise taxation: soft drink taxes in Ireland. *Public Financ Rev* **31**, 510–533.
41. Gustavsen G (2005) Public policies and the demand for carbonated soft drinks: a censored quantile regression approach. Presented at *XIIth Congress of the EAAE (European Association of Agricultural Economists), 'The Future of Rural Europe in the Global Agri-Food System'*, Copenhagen, Denmark, 24–27 August 2005.
42. Nordström J & Thunström L (2007) *The Impact of Tax Reforms Designed to Encourage a Healthier Grain Consumption*. Umeå: Umeå University.
43. Tefft N (2008) The effects of a soft drink tax on household expenditures. http://abacus.bates.edu/~ntefft/research/soft_drink_tax.pdf
44. Welegtabit S (2001) *Food Security Strategies for Vanuatu*. Bogor, Indonesia: The Regional Co-ordination Centre for Research and Development of Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific.

45. Thow AM (2009) Trade liberalisation and the nutrition transition: mapping the pathways for public health nutritionists. *Public Health Nutr* **12**, 2150–2158.
46. World Bank (2006) *Repositioning Nutrition as Central to Development: A Strategy for Large-Scale Action*. Washington, DC: The World Bank.
47. Jensen JD & Smed S (2007) Cost-effective design of economic instruments in nutrition policy. *Int J Behav Nutr Phys Act* **4**, 10.
48. Santarossa JM & Mainland DD (2003) Employing an environmental taxation mechanism to reduce fat intake. In *Health, Nutrition and Food Demand*, pp. 223–245 [WS Chern and K Rickertson, editors]. Oxford: CABI Publishing.
49. Boizot-Szantai C & Etile F (2005) *The Food Prices/Body Mass Index Relationship: Theory and Evidence from a Sample of French Adults*. France: Institut National de la Recherche Agronomique.
50. Laurance J (2009) Time for a fat tax? *Lancet* **373**, 1597.
51. Fantuzzi K (2008) Carbonated soft drink consumption: implications for obesity policy. PhD Thesis, University of Connecticut.
52. Gelbach JB, Klick J & Stratmann T (2007) *Cheap Donuts and Expensive Broccoli: The Effect of Relative Prices on Obesity*. Tuscon, AZ: University of Arizona; available at <http://ssrn.com/abstract=976484>
53. Schroeter C, Lusk J & Tyner W (2008) Determining the impact of food price and income changes on body weight. *J Health Econ* **27**, 45–68.
54. Chouinard H, Davis D, LaFrance JT *et al.* (2007) Fat taxes: big money for small change. *Forum Health Econ Policy* **10**(2).
55. Frazao E & Allshouse J (2003) Strategies for intervention: commentary and debate. *J Nutr* **133**, 844S–847S.
56. Gostin LO (2007) Law as a tool to facilitate healthier lifestyles and prevent obesity. *JAMA* **297**, 87–90.
57. Nestle M & Jacobson MF (2000) Halting the obesity epidemic: a public health policy approach. *Public Health Rep* **115**, 12–24.
58. Brownell KD, Farley T, Willett WC *et al.* (2009) The public health and economic benefits of taxing sugar-sweetened beverages. *N Engl J Med* **361**, 1599–1605.
59. Gabe T (2008) *Fiscal and Economic Impacts of Beverage Excise Taxes Imposed by Maine Public Law 629*. Orono, ME: School of Economics, University of Maine.
60. Kuchler F, Tegene A & Harris JM (2004) Taxing snack foods: what to expect for diet and tax revenues. *Agriculture Information Bulletin, United States Department of Agriculture* **747–08**, 1–11.
61. Kuchler F, Tegene A & Harris JM (2005) Taxing snack foods: manipulating diet quality or financing information programs. *Rev Agric Econ* **27**, 4–20.
62. Nnoaham K, Sacks G, Rayner M *et al.* (2009) Modelling income group differences in the health and economic impacts of targeted food taxes and subsidies. *Int J Epidemiol* **38**, 1324–1333.
63. Mytton O, Gray A, Rayner M *et al.* (2007) Could targeted food taxes improve health? *J Epidemiol Community Health* **61**, 689–694.
64. Marshall T (2000) Exploring a fiscal food policy: the case of diet and ischaemic heart disease. *BMJ* **320**, 301–305.
65. Allais O, Bertail P & Nichèle V (2008) The effects of a 'Fat Tax' on the nutrient intake of french households. <http://www.ivry.inra.fr/corela/members/allais.php>
66. Fletcher JM, Frisvold D & Tefft N (2010) Can soft drink taxes reduce population weight? *Contemp Econ Policy* **28**, 23–35.
67. Oaks B (2005) An Evaluation of the Snack Tax on the Obesity Rate of Maine. Texas State University Public Administration Program, Applied Research Projects. <http://ecommons.txstate.edu/cgi/viewcontent.cgi?article=1029&context=arp> (accessed July 2010).
68. Kim D & Kawachi I (2006) Food taxation and pricing strategies to 'thin out' the obesity epidemic. *Am J Prev Med* **30**, 430–437.
69. Smed S, Jensen JD & Denver S (2007) Socio-economic characteristics and the effect of taxation as a health policy instrument. *Food Policy* **32**, 624–639.
70. Jacobson MF & Brownell KD (2000) Small taxes on soft drinks and snack foods to promote health. *Am J Public Health* **90**, 854–857.
71. Wallerstein C (1997) Junk-food boost for health in Philippines. *Lancet* **351**, 734.
72. Cash S & Lacanilao RD (2007) Taxing food to improve health: economic evidence and arguments. *Agric Resour Econ Rev* **36**, 174–182.
73. Jones MW (2005) *The Streamlined Sales and Use Tax Agreement: A California Perspective*. Sacramento, CA: Government of the State of California.
74. Strnad J (2005) *Conceptualizing the 'Fat Tax': The Role of Food Taxes in Developed Economies*. John M. Olin Program in Law and Economics Working Paper no. 286. Palo Alto, CA: Stanford Law School.
75. UK Food Standards Agency (2009) Signposting. <http://www.food.gov.uk/foodlabelling/signposting/>
76. Haines A, Smith KR, Anderson D *et al.* (2007) Policies for accelerating access to clean energy, improving health, advancing development, and mitigating climate change. *Lancet* **370**, 1264–1281.
77. Andreyeva T, Long MW & Brownell KD (2010) The impact of food prices on consumption: a systematic review of research on the price elasticity of demand for food. *Am J Public Health* **100**, 216–222.
78. Seale J, Regmi A & Bernstein J (2003) *International Evidence on Food Consumption Patterns*. Washington, DC: USDA, Economic Research Service.
79. International Tax and Investment Centre & Oxford Economics (2008) *The Economic Benefits of the Reduction in Sales Tax on Soft Drinks in Egypt*. Oxford: ITIC & Oxford Economics; available at http://www.asiataxforum.org/index.php?option=com_docman&task=doc_view&gid=16
80. Hamm G (2006) Mexicans all shook up over soft drink tax plan. *Reuters AlertNet (Mexico City)*, 20 December.
81. Rose SM & Hatzenbuehler S (2009) Embodying social class: the link between poverty, income inequality and health. *Int Soc Work* **52**, 459–471.

Appendix

An overview of recommendations for public health nutrition taxation

Type of tax recommended/described	Study	Context	Country	Tax
Excise tax	Bahl <i>et al.</i> ⁽⁴⁰⁾	Study of soft drink demand	Ireland	Excise tax ↓ IR£0.37 → IR£0.29/gallon
Excise tax	Brownell and Frieden ⁽³⁸⁾	Small excise taxes on soft drinks	USA	Excise taxes on soft drinks
Excise tax	Brownell <i>et al.</i> ⁽⁵⁸⁾	Small excise taxes on soft drinks	USA	Excise taxes on soft drinks
Excise tax	Clarke and McKenzie ⁽³⁹⁾	Legislative interventions to improve food supply	Pacific Islands	Excise taxes on unhealthy foods
Excise tax	Gabe ⁽⁵⁹⁾	Soft drink consumption and economy	USA	Excise tax: \$0.42/gallon (bottled) and \$4.00/gallon (syrup) ~ 10 % tax
Excise tax	Kuchler <i>et al.</i> ^(60,61)	Snack food consumption and body weight	USA	Salty snack food excise taxes: 1cent/lb (0.4 %); 1 % and 20 %
Extend VAT/GST to a wider range of foods	Leicester and Windmeijer ⁽¹⁶⁾	Obesity prevention	UK	Examine a range of taxation options
Extend VAT/GST to a wider range of foods	Marshall ⁽⁶⁴⁾	Saturated fat consumption and heart disease risk	UK	Extend 17.5 % VAT to main sources of saturated fat
Extend VAT/GST to a wider range of foods	Mytton <i>et al.</i> ⁽⁶³⁾	Nutrient consumption and heart disease risk	UK	Extend 17.5 % VAT to unhealthy foods
Extend VAT/GST to a wider range of foods	Nnoaham <i>et al.</i> ⁽⁶²⁾	Nutrient consumption and CVD/cancer mortality	UK	Extend 17.5 % VAT to unhealthy foods
Increase VAT selectively	Allais <i>et al.</i> ⁽⁶⁵⁾	Complete food demand system	France	10 % VAT ↑ for cheese-butter products, sugar-fat products and/or ready meals
Increase VAT selectively	Gustavsen ⁽⁴¹⁾	Soft drink consumption	Norway	Double production tax + VAT (price ↑ 27 %) on soft drink
Reduce VAT selectively	Nordström and Thunström ⁽⁴²⁾	Nutrient consumption	Sweden	VAT reduction
Sales tax	Fletcher <i>et al.</i> ⁽⁶⁶⁾	State taxes and obesity	USA	State-level soft drink taxes (average 3 %)
Sales tax	Chriqui <i>et al.</i> ⁽¹³⁾	Analysis of state-level taxes on soft drinks and snacks	USA	State-level taxes
Sales tax	Oaks ⁽⁶⁷⁾	State snack tax and obesity	USA	State tax – 5.5 % on soft drinks and snacks
Sales tax	Tefft ⁽⁴³⁾	Soft drink expenditure	USA	State soft drink taxes
Sales tax	Kim and Kawachi ⁽⁶⁸⁾	State taxes and obesity	USA	State-level taxes on soft drink or snack foods
Decrease tariffs (e.g. on healthy foods)	Nugent and Knaul ⁽¹⁹⁾	Chronic disease prevention	Global	Reduce tariffs on healthy food
Increase tariffs (e.g. on unhealthy foods)	Welegtabit ⁽⁴⁴⁾	Improving nutrition and food security	Pacific	Increase tariffs on unhealthy foods
Revenue-neutral tax plus subsidy or tax reduction	Smed <i>et al.</i> ⁽⁶⁹⁾	Food and nutrient consumption	Denmark	Revenue-neutral combinations of taxes on unhealthy foods and subsidies for healthy foods
Revenue-neutral tax plus subsidy or tax reduction	Jensen and Smed ⁽⁴⁷⁾	Food and nutrient consumption	Denmark	Revenue-neutral combinations of taxes on unhealthy foods and subsidies for healthy foods
Variable taxes based on price change required	Santarossa and Mainland ⁽⁴⁸⁾	Nutrient consumption	Scotland	Variable rate based on moving nutrient consumption to recommendations
Not specified	Boizot-Szantai and Etile ⁽⁴⁹⁾	Improving healthy food consumption	France	Taxes on starchy foods to reduce consumption
Not specified	Chouinard <i>et al.</i> ⁽⁵⁴⁾	Dairy product demand	USA	10 % tax on dairy by fat content
Not specified	Fantuzzi ⁽⁵¹⁾	Soft drink consumption and body weight	USA	20 % <i>ad valorem</i> and 10 % per energy tax on soft drink
Not specified	Frazao and Allshouse ⁽⁵⁵⁾	Improving diet quality	USA	Small taxes on junk foods
Not specified	Gostin ⁽⁵⁶⁾	Obesity prevention	USA	Higher taxes on energy-dense, nutrient-poor foods
Not specified	Gelbach <i>et al.</i> ⁽⁵²⁾	Food consumption and body weight	USA	100 % tax on unhealthy foods
Not specified	Magnusson ⁽³⁾	Use of law for obesity prevention	Australia	Taxes to reduce consumption of unhealthy foods
Not specified	Nestle and Jacobson ⁽⁵⁷⁾	Obesity prevention	USA	Small taxes to fund prevention campaigns
Not specified	Schroeter <i>et al.</i> ⁽⁵³⁾	Body weight	USA	10 % tax on food away from home or soft drink
Not specified	Laurance ⁽⁵⁰⁾	Obesity prevention	Global	Tax on unhealthy foods

VAT, value-added tax.