A TAXING ISSUE?

The Tax System and Healthier Lifestyles in Wales

GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

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LIST OF ABBREVIATIONS

CVD	Cardiovascular disease
DALYs	Disability-adjusted life years
EASR	European age-standardised rate
GHG	Greenhouse Gas
IHD	Ischaemic heart disease
NCDs	Non-communicable diseases
NDNS RP	National Diet and Nutrition Survey Rolling Programme
PHPT	Public Health Product Tax
QALYs	Quality Adjusted Life Years
SACN	Scientific Advisory Committee on Nutrition
SES	Socio-economic Status
SFA	Saturated fatty acids
SSB	Sugar-sweetened beverages
TFA	Trans fatty acids
UN SDGs	United Nations Sustainable Development Goals
VAT	Value Added Tax
WHO	World Health Organization
WRA	Welsh Revenue Authority
YLL	Years of life lost

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EXECUTIVE SUMMARY

This report has two main aims:

1 To increase knowledge and understanding of the range of taxation options available to promote health and influence change in unhealthy behaviours.

2 To provide Welsh policy makers with current health evidence related to these options, detailing why fiscal measures are a mechanism for improving health.

REMIT AND SCOPE

The report focuses on contemporary population health concerns related to diets where taxation has been considered or implemented elsewhere, and/or is a viable innovation within the Welsh context.

Excluded from the scope of this report are topic areas where taxation and other fiscal policy approaches are already in place by UK Government (for example, on alcohol and tobacco) and environmental-related taxation.

Novel fiscal approaches to addressing the impacts of health-harming commodities have had positive outcomes:

- At the immediate outset of the Hungarian Public Health Product Tax (PHPT), the consumption of products within the scope of the tax did not change significantly, and increased in the case of pre-packaged sweets. With time, since the introduction of the tax in 2011, the policy measures introduced in Hungary have resulted in successes such as:
  - reduced consumption of the products party to the tax, for example pre-packaged sweets and salty snacks, with greater change seen amongst overweight and obese adults;
  - the reduction or removal of particular unhealthy ingredients in food products;
  - consumers substituting taxed products for healthier options, with fresh fruit and vegetables acting as substitutes in 82-86% of cases. Some consumers resorted to substituting with products such as home-made sweets or home-made salty snacks;
  - Higher prices were cited as the main reason for changes in consumption of salty snacks by 81% of people in 2012, and by 56% in 2014.
- The introduction of a tax in Mexico similarly demonstrated changes in purchasing behaviour.
  - Comparing purchases prior to, and over, the first year of the tax, researchers found a reduction of -25g per capita per month of purchases of taxed foods in 2014.
  - Stratified by socio-economic status (SES), lower SES households purchased on average 10.2% fewer taxed foods than expected, with medium SES households purchasing 5.8% fewer taxed foods than expected.
  - Purchasing of cereal-based sweets showed a decline in purchase of 5.2% beyond the expected decline following the introduction of the tax. Purchases of salty snacks showed the biggest decline (-6.3% 'beyond expected').
  - After two years, a reduction in the volume of taxed food purchases (1607g, per capita, per month, compared to 1798g prior to the tax) were also observed.
  - The unhealthiest group (those who purchased more of the taxed products, and less of untaxed products – purchasing nearly 40% of taxed products) showed the largest relative decline in their purchases of taxed foods (-12.3%)

- Fiscal policies aimed at reducing consumption of some health-harming commodities are relatively novel. As such, evidence on their impact – on health, on consumption and on the wider economy – is still emerging. Nevertheless, the long history of taxation on alcohol and tobacco has demonstrated clear impact on consumption levels and health outcomes, indicating that fiscal policies have potential for changing behaviour. We cannot, however, assume that the observed impacts on one product group will be directly transferable to other product groups.

Taxation alone is unlikely to be a solution in itself to public health concerns – a range of interventions need to be in place.

NOURISHING stands for:
- **N**utrition label standards and regulations on the use of claims and implied claims on food
- **O**ffer healthy food and set standards in public institutions and other specific settings
- **U**se economic tools to address food affordability and purchase incentives
- **R**estrict food advertising and other forms of commercial promotion
- **I**mprove nutritional quality of the whole food supply
- **S**et incentives and rules to create a healthy retail and food service environment
- **H**arness supply chain and actions across sectors to ensure coherence with health
- **I**nform people about food and nutrition through public awareness
- **N**utrition advice and counselling in healthcare settings
- **G**ive nutrition education and skills.

- In the Hungarian example, the product tax was complemented by a strengthened regulatory framework, which, for example, prohibited the food industry from releasing a food product containing more than 2% of trans fats within its total fat content. Policy makers should look to the NOURISHING framework for examples of a broad range of policy options, ranging from regulation to information campaigns. Taxation interventions should be supported with subsidies for healthier options – this would help to negate any regressive effects of taxation on those of a lower SES, and guide consumers towards healthier consumption. This is particularly pertinent in relation to food taxes. In the Stay Well in Wales survey, which asked the Welsh population for their views on a range of public health matters, over 8 in 10 (82%) agreed that healthy foods should cost a bit less and unhealthy foods a bit more – only 6% disagreed.
- In relation to dietary-related taxation and subsidies, the balance of evidence supports Niebylski et al.'s assertion that 'maximum success [is] achieved when food taxes/subsidies are at least 10-15% and used together.' The evaluation of the Hungarian PHPT recommended that, as a next step, consideration should also be given to introducing price subsidies for healthy food products, such as fruits and vegetables.

It is important to learn from the lessons of policy development and implementation to date if policy-makers are to consider introducing a new tax aimed at improving health.

- If taxing specific products or ingredients, policy makers should engage with experts on the topic prior to developing the policy, to ensure that the right nutrients/ingredients/products are targeted by the proposed tax.
- Consideration of the absolute amount that those with lower income would pay after the introduction of a tax is essential. It is important to note that the World Health Organization considers that the potential health gains from food taxes 'may be progressive and contribute to reducing health inequalities' and cites evidence which indicates that 'higher price sensitivity among low socioeconomic groups means that they may be more responsive to the tax and more likely to reduce their consumption as a result.'
- Any new tax should be introduced with a mid – to long-term commitment to keep it in place, so that the impact of the tax can be properly evaluated. Evaluation should be embedded from the start, with sufficient resource allocated to undertake the evaluation effectively.
- If considering the introduction of a new tax, efforts to explore any unintended consequences must be undertaken in the early planning stages. This should include balanced consideration of the potential impacts outside of the health sector, for example on industry, employment, the wider economy, and other relevant aspects of public life. As such, we strongly recommend a Health Impact Assessment approach from the outset.

WHAT DO WE KNOW ABOUT TAXATION FOR HEALTHIER LIFESTYLES?

In most countries, taxes linked to health-harming commodities have been introduced with the aim of influencing specific choices people make, in order to promote healthy behaviours and reduce any detrimental impacts on health. The most common global examples of this are tobacco and alcohol taxation, which have existed for many years.

In the case of alcohol, taxes have been shown to be effective at reducing alcohol-related harms, and the effects of alcohol pricing strategies tend to be observed over the long term, rather than the short term.

An emerging development in the last decade is the introduction of sugar-sweetened beverage taxation in numerous countries. Where levels of soft drink consumption and obesity prevalence are high, the introduction of a 'sugar tax' for beverages may be effective at reducing consumption and obesity prevalence.

WHAT ARE THE EVIDENCE GAPS?

In the existing international examples of novel food taxes in the 21st Century, whilst data on consumption has highlighted reduced levels of purchasing of taxed products, there is still only limited evidence of direct health impacts, at least impacts that can be explicitly linked to the introduction of a tax. We know that health-related taxation with a long history (tobacco and alcohol) have had demonstrable impacts, however it is not clear that these effects are directly transferable to other products due to differences in price elasticities and consumer demand. Any future tax proposal needs to commence with a clear understanding of the current baseline for the purchasing and consumption level of the product(s) to be taxed, and the current baseline for the health impact that the tax is aiming to address. This can only aid decision making and ongoing evaluation and monitoring of the implemented tax.

SUMMARY CONCLUSION

There can be no greater example of the need for well-designed, well-planned policy making than in the potential introduction of health taxes, especially in the example of diet-related taxes; we all eat and drink, and very few of us would be unaffected by some of the policy measures discussed in this paper.

Evidence of impacts on purchasing behaviour, the consumption of health-harming products, increased purchase and consumption of healthier options have been noted in international examples of implementation, notably in Hungary and Mexico.

There are policy lessons to be learned from the design and implementation of such taxes. Numerous examples in this report demonstrate that whilst fiscal approaches to reduce health-harming behaviours are well intentioned, some have been flawed in their execution. To reduce the chances of this, policy-makers need to have clear baseline figures of the health outcome(s) targeted by the proposed tax and associated consumption levels of the tax-targeted product/ service prior to introducing a tax to ensure effective evaluation. Furthermore, policy-makers need to be committed to implementing the tax over the mid- to long-term to be able to observe and record any positive health outcomes – it is unlikely that significant health impacts will be observed in the short-medium term. Engaging with stakeholders from the outset of the proposal, through a Health Impact Assessment approach, can increase the likelihood of support, and the aims of the proposed tax should be clear and consistent – with the envisaged health benefits emphasised – to enhance the chances of widespread consumer support for the policy.

SECTION

01

INTRODUCTION

The increasing burden of non-communicable diseases (NCDs) in Wales is of great concern to the population, to the health service and to government. In disability-adjusted life years (DALYs), cardiovascular disease (CVD) (157,091 DALYs), cancer (171,380 DALYs) and respiratory diseases (47,855 DALYs) account for a great proportion of disease burden in Wales, and are similarly leading causes of years of life lost (YLL) (CVD 130,315 YLL; cancer 164,150 YLL, respiratory disease 31,479 YLL). (1) The topics considered in this report are leading contributory factors to the increasing burden of NCDs in Wales. New approaches to address and respond to the problem of NCDs must be considered in all policy arenas, one of which being fiscal policy.

NCDs linked to health behaviours are key preventable causes of morbidity and mortality globally. The latest edition of the World Health Organization's Global Status Report on Non-Communicable Diseases, published in 2014 identified global targets to achieve:

- a 30% relative reduction in the mean population intake of salt/sodium;
- a 30% relative reduction in the prevalence of current tobacco use in those aged 15 years and above;
- 'halt' the rise in diabetes and obesity; and
- a 25% relative reduction in overall mortality from cardiovascular diseases (CVD), cancer, diabetes or chronic respiratory diseases. (2)

Fiscal measures could play a part in reaching these targets.

Tobacco and alcohol products have a long history of being taxed, initially as a form of revenue generation for the state. Governments have, in recent years, recognised the potential health and societal benefits arising from the taxing of unhealthy products, with new ideas on other products that could potentially be taxed with a view to improving population health. Aside from the health improvement potential of taxing unhealthy products i.e. reducing the consumer demand for unhealthy options, through emerging and innovative taxation policy options, it has been argued that new and sustainable revenue streams to support health service funding may emerge.

Wales, as part of the United Kingdom, has a commitment to meet the United Nations Sustainable Development Goals (UN SDGs). (3) Within SDG 3, which aims to ensure healthy lives and promote well-being for all at all ages, target 3.4 aims to 'by 2030, reduce by one third premature mortality from NCDs'. Similarly, at a national level, the Well-being of Future Generations (Wales) Act 2015 (4) aims to develop a society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood. In attempting this, Welsh statutory agencies will monitor and address several indicators, including 'the proportion of people with fewer than two healthy lifestyle behaviours'. (5) Fiscal measures such as taxation may present an opportunity to contribute to the reduction of NCDs.

This report has two main aims:

1. To increase knowledge and understanding of the range of taxation options available to promote health and influence change in unhealthy behaviours, by appraising contemporary literature and international implementation, and contextualise opportunities to develop public policy in Wales in relation to the priority areas identified.
2. To inform policy makers about the current health evidence related to these options, detailing why fiscal measures are a mechanism for improving health.

REMIT AND SCOPE

The report focuses on contemporary population health concerns related to diets where taxation has been considered or implemented elsewhere, and/or is a viable innovation within the Welsh context.

Excluded from the scope of this report are topic areas where taxation and other fiscal policy approaches are already in place by UK Government (for example, alcohol and tobacco) and environmental-related taxation.

TAXATION IN WALES

The Wales Act 2014 (6) and Wales Act 2017 (7) devolved taxation and borrowing powers to the Welsh Government and National Assembly for Wales, and the Tax Collection and Management (Wales) Act 2016 (8) provides the Welsh ministers with the powers to collect and manage fully-devolved Welsh taxes. Along with providing specific powers over stamp duty land tax, landfill tax and the partial devolution of income tax, the Wales Act 2014 gave Wales the power to create new taxes in areas of devolved responsibility.

The Tax Collection and Management (Wales) Act 2016 led to the creation of the Welsh Revenue Authority (WRA), the body tasked with the collection and management of devolved taxes. The WRA will provide information, advice and assistance to the Welsh Ministers relating to devolved taxes, provide information and assistance relating to devolved taxes to devolved taxpayers, their agents and other persons, act to resolve complaints and disputes relating to devolved taxes, and will promote compliance with the law relating to devolved taxes, whilst also protecting against tax evasion and tax avoidance in relation to devolved taxes. (9)

The Welsh Government's Tax Policy Report (10) and Tax Policy Framework (11) provide further guidance on the proposed work plan for taxation in Wales, with the Tax Policy Report highlighting progress to date towards the actions outlined within the work plan. The Tax Policy Framework outlines the goal of Welsh taxes, in line with existing Welsh Government policy objectives, stating that Welsh taxes should:

- Raise revenue to fund public services as fairly as possible;
- Deliver Welsh Government policy objectives, in particular supporting jobs and growth;
- Be clear, stable and simple;
- Be developed through collaboration and involvement;
- Contribute directly to the Wellbeing of Future Generations Act goal of creating a more equal Wales.

Furthermore, the Tax Policy Framework states that 'each tax should have a defined purpose and be flexibly designed to link together where appropriate, in particular in the context of the wider UK and international tax system.' (11)

A six phase process for developing new taxes in Wales has been released. (12) The phases are:

- Identify an issue affecting Wales where tax is a possible lever
- Assess information and talk to interested people and organisations (this will continue throughout the process)
- Secure the transfer of the necessary powers from the UK Parliament to the National Assembly, involving agreement between them
- Design the new tax, including collection and administration arrangements, and issue a public consultation
- Legislate for the new tax in the National Assembly
- Develop guidance for tax payers and introduce the tax.

Aside from Welsh Government, other organisations in Wales have published reports on the new taxation powers.

The Bevan Foundation's Tax for Good report provides a background context to devolved taxation in Wales, along with some consideration of novel taxes and levies that the Bevan Foundation proposes for Wales to consider implementing, in the spheres of 'Economy and Employment', 'Health and Wellbeing' and 'Environment'. Their proposals are aimed at improving individual outcomes and raising revenue for public spending. The report also provides a checklist for new taxes, to help identify how well proposals for new taxes comply with relevant existing and future legislation.

The Wales Centre for Public Policy have published The Welsh Tax Base. Risks and Opportunities after Fiscal Devolution. This report aims to measure the tax base in Wales, and highlights the potential positives and pitfalls of amending the newly devolved taxes, considering the impact of things such as the ageing population on income tax receipts and the fact that there are fewer high-earning individuals residing in Wales compared to the rest of the UK. Whilst not looking specifically at consumption taxes, it does provide some valuable insights, such as the authors highlighting the 'modest' revenue streams from new taxes. (13)

In relation to the potential for individual or corporate behaviour change, the Wales Centre for Public Policy authors state that 'policymakers and the wider political community should consider the extent to which tax policy should itself be used to achieve wider policy goals, or whether tax policy should be primarily designed to maximise revenue over the medium to long-term, to provide more resources for the Welsh budget to tackle priorities through the expenditure side.' They also consider that 'creating too many tax incentives in the design of a tax may increase the overall complexity of the system and work against maximising potential revenue yields'. (13)

OUR APPROACH

This report considers the potential role of taxation to improve population health and influence an individual's choices and behaviours. Through a review of the contemporary international literature regarding examples of taxation as a mechanism to improve health and/or prevent ill-health, the report provides evidence and case studies exploring the potential for application of health-specific taxation within Wales, weighing up the benefits and disadvantages, and providing lessons from policy implementation.

This report complements a recent publication by Public Health England reviewing the evidence surrounding fiscal and pricing policies to improve health.(14,15) Building on the policy lessons identified by Public Health England, our report focuses on appraising taxation options and identifying how policy can be best implemented if a decision is made to proceed with the introduction of any future fiscal measures to improve health.

In work to support the development of the draft Wales obesity strategy, Public Health Wales undertook a review of evidence to support the evidence for effective action on obesogenic environments. Part of this work looked at price manipulation as an intervention for the food and drink environment. (16) That report complements this current report in relation to dietary-related topics.

We look at taxation as an option alongside other policy tools through the NOURISHING framework introduced by the World Cancer Research Fund for interventions to address diet-related concerns. (17) NOURISHING stands for:

- **N**utrition label standards and regulations on the use of claims and implied claims on food
- **O**ffer healthy food and set standards in public institutions and other specific settings
- **U**se economic tools to address food affordability and purchase incentives
- **R**estrict food advertising and other forms of commercial promotion
- **I**mprove nutritional quality of the whole food supply
- **S**et incentives and rules to create a healthy retail and food service environment
- **H**arness supply chain and actions across sectors to ensure coherence with health
- **I**nform people about food and nutrition through public awareness
- **N**utrition advice and counselling in healthcare settings
- **G**ive nutrition education and skills.

In non-diet related examples, we adapt this model where relevant and feasible.

A similar model, MPOWER, was introduced by World Health Organization as 6 tools to implement tobacco control. (18) In the tobacco control context, MPOWER stands for:

- **M**onitor tobacco use and prevention policies
- **P**rotect people from tobacco smoke
- **O**ffer help to quit tobacco
- **W**arn about the dangers of tobacco
- **E**nforce bans on tobacco advertising, promotion and sponsorship
- **R**aise taxes on tobacco.

This model has proven to be effective in appraising tobacco control intervention options, and it is hoped that our application of the NOURISHING model to consider alternative policy options alongside fiscal interventions will help to provide a narrative to aid policy development. We are also mindful of the content of this report, particularly on diet-related topics, in the context of Brexit. Public Health Wales' Brexit Health Impact Assessment highlights the potential of disruption to food supplies, food imports and the risk of increased food prices in the short term in any Brexit scenario. (19) The findings and recommendations of this report assumes no direct impacts of Brexit, but the reader should be mindful of any potential repercussions of the UK's actual exit from the EU and the impact that this may have. For example, should food prices rise significantly, policy-makers may be mindful to refrain from applying new fiscal measures, and should zero tariffs be applied to food imports, thus reducing the cost of products compared to current pricing, the need for a fiscal intervention to reduce consumption may increase.

SEARCH STRATEGY

In order to identify relevant papers, reports and other evidence to inform this report, the authors searched Pubmed, OVID, and Google Scholar. Grey literature was sourced primarily through deep Google searches, and appraised according to the AACODS protocol (20). Other publications were sourced through bibliographic mining of the papers identified through the search strategy.

From these searches, studies and reports were considered for inclusion if they considered the intersectionality of a given health topic and taxation, were published within the last 10 years, in the English language and in a context relevant to Wales. A PICO (Participants, Interventions, Comparators, Outcomes) approach to appraising the studies is outlined Table 1 below - based upon earlier work by McGill et al. (21) in the field of healthy eating - though given the novel nature of this report, this was considered as a 'best case' scenario; other publications not meeting each of the PICO inclusion criteria were still considered on their merits.

	Inclusion	Exclusion
Participants	Humans from high or middle income countries, of any age/gender.	Specific sub-sections of population were excluded (as any proposed taxation will be on whole-population level).
Interventions	Publications that consider either a hypothetical or introduced form of taxation to address a specific, individual unhealthy behaviour, at a national or sub-national level.	Publications considering only alcohol, tobacco, or sugar-sweetened beverage taxation.
Comparators	Where possible, a comparison of pre- and post- introduction of a tax designed to address unhealthy behaviours. (Comparators not considered an essential pre-requisite for this report).	For general budget
Outcomes	Any demonstrable improvement in health/health behaviours following taxation intervention.	

Table 1 – PICO approach (adapted from McGill et al. (2015))

The 'cut-off' date for content to be reviewed was 31st January 2019, therefore any publications/articles released after this date are not reflected upon in this report. The approach to each search can be found in Appendix 1.

SECTION

02

WHY CONSIDER TAXATION?

BRIEF LESSONS FOR POLICY DEVELOPMENT

There are two principal reasons why a government may want to look to fiscal measures in relation to health improvement – firstly, in an effort to influence a change in health-harming behaviours, and secondly to raise additional revenues for the state; these additional revenues could be allocated to health improvement initiatives or other health care services.

Introducing a form of taxation should change the price of a product or service that has a health-harming influence, with the aim to restrict or reduce the use of the product or service by consumers, and therefore theoretically improve their health (or reduce the risk of initiating a health-harming habit). A taxation applied on purchases would impact all consumers, making this a population-level intervention, though its level of impact at an individual level would depend on the socio-economic status of the citizens. Taxation applied directly on producers (such as the Soft Drinks Industry Levy) can also result in product reformulation, as has been seen in the recipe amendments for some soft drinks prior to the Soft Drinks Industry Levy in the UK in 2018, but these taxes can also be passed on to consumers, referred to as 'pass-through'.

A detailed review of evidence aimed at informing policy development, including a summary of important considerations for the design of price policies has been published by the World Health Organization Regional Office for Europe, Using price policies to promote healthier diets. (22) Although the publication focuses on nutrition, the policy lessons and theoretical concepts are equally applicable to any form of Pigouvian tax (a tax which aims to address perceived or known negative social outcomes of a product's price).

EQUITY CONCERNS

Examples to date of the implementation of fiscal measures applied to unhealthy products have applied a flat rate of tax to a product or service, meaning that lower earners are more impacted than those in higher income brackets. Given that many of the examples in this report look at potential food taxes, we must remember that people of lower socio-economic status tend to spend more of their disposable income on food than those in higher income groups, and will therefore be more impacted by any price increases through taxation. (22)

Sassi et al. consider the equity impacts associated with price policies to promote healthy behaviours (23) and note that low-income households might be subject to an 'unfair financial burden' from fiscal policies, including taxation, as a share of all household consumption. Importantly however, it is also noted that low-income consumers enjoy greater health benefits resulting from these fiscal measures. Sassi et al. conclude that any adverse effects could be mitigated by a 'pro-poor' use of the tax revenues generated, or through other adjustments to the wider tax system.

Even though those of lower socio-economic status are likely to be disproportionately impacted by new taxes on products or services, they are also the group expected to benefit more from the health improvement expected from the introduction of said taxes. We know from Kantar World Panel Data[1], which has provided insights into consumer behaviour in relation to food purchasing in Wales, that low income households in Wales buy less healthy food, including items higher in sugar, saturated fat, and sodium. Generally, the Kantar World Panel Data shows that Welsh shopping baskets have a higher level of calories, saturated fats, sugar, and salt than the rest of Great Britain. Examples from modelling studies related to fiscal measures within the nutrition field have demonstrated the potential for health improvement amongst this group. (24,25)

[1] Kantar World Panel Data for Wales provided as part of the Welsh Government Food Division Data Contract

Linked to concerns around inequities, attitudes towards potential taxation vary according to demography. A 2015 British Social Attitudes survey, commissioned by Public Health England, looked at attitudes to obesity. (26) Over 2000 respondents considered 40 questions in relation to obesity, including questions exploring attitudes towards specific actions designed to discourage consumption of unhealthy foods and drinks (Table 2). This showed that over half of the respondents were in favour of a tax on sugary drinks, with just under half in favour of a tax on fatty foods.

		In Favour	Neither in favour nor against	Against	*Weighted base*	*Unweighted base*
Ban sugar drink ads	%	58	19	22	*2179*	*2188*
Tax sugary drinks	%	58	13	29	*2179*	*2188*
Ban fat food ads	%	53	22	25	*2179*	*2188*
Cut snack size	%	49	23	28	*2179*	*2188*
Tax fatty foods	%	45	19	36	*2179*	*2188*

Table 2 – Views of the British public on potential actions to discourage consumption of unhealthy foods and drinks. Reproduced from Curtice, J. 2016. Attitudes to obesity. Findings from the 2015 British Social Attitudes survey. London: NatCen Social Research, p16

However, attitudes were shown to vary between social groups. Women were 'slightly more likely than men to support most of these measures, with just the taxation of fatty foods being a possible exception', and those 'with a child in the household are also a little keener on the taxation of fatty foods and the reduction of snack size'. Educational attainment was also linked with being more in favour of regulatory actions (Table 3).

	Sex		Highest qualification		Age Group	
% in favour of action	**Male**	**Female**	**Degree**	**None**	**18-34**	**55 and over**
Ban sugar drink ads	53	62	63	55	52	62
Tax sugary drinks	55	60	68	47	51	60
Ban fat food ads	50	57	58	52	52	58
Cut snack size	44	54	56	44	46	48
Tax fatty foods	44	46	55	36	44	45
Weighted base	1094	1085	528	394	625	810
Unweighted base	992	1196	511	466	465	983

Table 3 – Attitudes towards actions designed to discourage consumption of unhealthy foods and drinks, by sex, highest educational qualification, and age group. Reproduced from Curtice, J. 2016. Attitudes to obesity. Findings from the 2015 British Social Attitudes survey. London: NatCen Social Research, p17

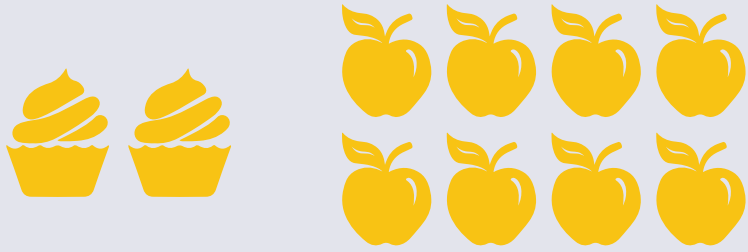
The 2018 Stay Well in Wales survey asked the Welsh population for their views on a range of public health matters. In this study, over 8 in 10 (82%) agreed that healthy foods should cost a bit less and unhealthy foods a bit more – only 6% disagreed. Amongst the other findings from this study relevant to this report, younger respondents ranked the option 'people being unable to afford healthy choices' as a higher contributor to poor health and well-being than older respondents. This was also one of the top ten concerns for female respondents. Respondents were also presented with four groups of potential spending areas – 'helping people to eat healthier' ranked as the top priority from the four options, with no differences in responses noted according to gender, age or deprivation. (27)

AN EXISTING EVIDENCE BASE FOR HEALTH-RELATED TAXATION?

The most obvious examples of where fiscal measures such as taxation have had a positive impact on unhealthy habits can be found in the levies applied to tobacco and alcohol. These products have an extensive history of taxation globally, with a great level of academic analysis undertaken on both products demonstrating the power of price increase upon consumption. (28,29)

The successes of fiscal measures to restrict the purchasing and consumption of tobacco and alcohol has led scholars and practitioners to consider the application of taxes in other spheres of public health. This is a relatively recent development, and as such the evidence of the impact of taxation on changing unhealthy diets is limited but slowly emerging. In the case of fiscal measures to reduce the consumption of sugar-sweetened beverages (SSB) – which is not considered in detail in this report, some association between decreased consumption of SSB linked to increased taxation on the products has been noted. A 2012 review by Powell et al. highlighted higher fast-food prices being associated with lower weight outcomes, particularly amongst adolescents, but the link between soda [SSB] taxation and weight outcomes was not made, which the authors argued was due to relatively low state-level sales taxes. (30) Jou and Techakehakij considered factors influencing the effectiveness of SSB taxation on obesity reduction. They found that SSB taxation may be more effective in countries where the prevalence of obesity and SSB consumption are both high, though in settings where the baseline tax rate is already high, consumption patterns and the prevalence of obesity may be less likely to change. (31) Other scholars have considered the implementation of taxation alongside subsidies on healthier products. (32,33)

8 IN 10 (82%)



Proportion of the Welsh population surveyed for the Stay Well in Wales study who agreed that healthy foods should cost a bit less and unhealthy foods a bit more – only 6% disagreed.

Other types of research evidence produced for the consideration of dietary-related taxes include modelling studies; observations based upon consumption, purchasing or sales data; policy analysis; surveys; and real-world case studies. A summary of their advantages and limitations is presented in Table 4 below.

Research Method	Advantages of method	Limitations of method	Research method featured in (example)
Modelling Study	Provides links between economic theory, policy design and anticipated health outcomes Can predict impact of fiscal measures before committing to policy shift	Can be limited by quality of necessary data e.g. dietary, health or economic information Question over how accurate modelling is once in real-world implementation	Mytton et al. (34)
Use of consumption, purchase or sales data	Provides verifiable insight into consumer behaviour Can highlight unexpected impacts on policy e.g. product substitution	Risk of assuming population-level changes Can lack qualitative examination (e.g. causality behind changes in data) May not capture data on all relevant/defined products	Colchero et al. (35)
Policy analysis	Should be lots of decision-making evidence in public domain (minutes, transcripts, evidence sessions etc.)	Access can be restricted to information not in public domain Unlikely to gain in-depth insight into reasons for policy failure	Bødker et al. (36)
Consumer Surveys re: purchasing/ consumption behaviour	Can capture large number of respondents	Self-reported Unlikely to be cross-referenced with actual sales/price data	Thow et al. (37) Sharma et al. (38)
Real-world (empirical) case studies	Verifiable 'lived experience'	Few real-world examples in this field to date International examples may not be directly transferable to local context	Bahl et al. (39)
Experimental choice studies / RCTs	Can demonstrate shifts in consumption behaviour Demonstrates the direct effect of taxes	Limited to specific settings Can't demonstrate impact on overall consumption Can't be used to predict sustainable changes in behaviour	Epstein et al. (40)
Cross-sectional /longitudinal studies	Can demonstrate lasting trends	Needs time commitment to undertake study	Powell et al. (41)

Table 4 – Types of Research Method

USE OF REVENUES

There are a range of international examples of the revenues from fiscal interventions such as sugar taxes being reinvested in health promoting efforts. Some are highlighted in Table 5 below:

Country	Fiscal Intervention	Use of Revenues
Fiji	Sugar tax, including sugar syrups	General budget
French Polynesia	Sugar tax, including confectionary and ice cream, and alcohol	2002-2006 – a preventative health fund 2006 – 80% allocated to general budget, earmarked for health
France	Soda tax	For general budget
Mexico	Sugary drink tax	Funding programmes addressing malnutrition, obesity and 'obesity-related chronic diseases', and access to drinking water. (Though it's reported that funds are currently added to general budget)
St Vincent and the Grenadines	VAT of 15% on brown sugar	Financing initiatives to treat diabetes
USA – Berkeley, California	Sugary drink tax	City's general fund to fund community health and nutrition programmes

Table 5 – Use of revenues from fiscal interventions. Source: World Cancer Research Fund (17)

SECTION

03

ABOUT TAXATION

KEY TERMINOLOGY AND CONCEPTS

In this section of the report, we highlight the key terminology and concepts involved in taxation which feature throughout the existing evidence base and this report, to provide basic definitions and explanations.

Identifying opportunities to improve population health or influence health-harming behaviours through the taxation system is one element; how taxes are to be collected also needs to be considered. Here we summarise the mechanisms used in collecting revenue through taxation and the terminology involved.

PRICE ELASTICITY OF DEMAND

This is, in percentage terms, the amount that consumption will change if the price of a product/service increases by 1%. The higher the elasticity of demand, the greater the reduction in consumption when price increases. The lower the elasticity, the lesser the reduction in consumption.

Another term in use to explain this is 'own price elasticity of demand'. Green et al. provide a succinct explanation of food price elasticity - 'own price elasticity of demand is usually negative, because demand almost always decreases as prices increase. However, the magnitude of the elasticity may be larger or smaller depending on the availability and closeness of substitute foods, necessity of the food, the proportion of budget spent on it, and the time period.' (42)

REGRESSIVE TAXATION

Regressive taxation occurs when those poorer pay a higher percentage of their available income in tax than the rich. This is of particular relevance in any introduced 'flat' tax, where all people pay the same percentage tax regardless of their socioeconomic status – many of the taxation options considered in this report would be examples of a flat tax. Nevertheless, the World Health Organization considers that the potential health gains from food taxes 'may be progressive and contribute to reducing health inequalities' and cite evidence which indicates that 'higher price sensitivity among low socioeconomic groups means that they may be more responsive to the tax and more likely to reduce their consumption as a result.' (22) In this regard, there are clear links with price elasticity of demand and the potential reduction in consumption.

SUBSTITUTION

Substitution refers to the risk of a tax leading to consumers switching from the taxed product/service to an untaxed alternative. In many cases, this could involve switching one harmful product for another. (43) This also links with cross-elasticity of demand, with the substituted good increasing in demand as the price of the taxed product increases (a positive cross-price elasticity for the substitute).

PASS-THROUGH

Pass-through explains the translation of a tax change to consumer prices. This can occur when excise taxes are applied upon producers, who then raise the retail price of their product to compensate for the additional tax burden on themselves. (44–46)

TAX MECHANISMS

Table 6 below (22) explains the most common tax mechanisms in use worldwide.

Tax Mechanism	Description	Strengths	Weaknesses	Source
Ad-quantum excise	A set amount of tax is charged on a given quantity of the product (for example, £1 per kg or £1 per unit) or per specific ingredients.	Potentially predictable revenue stream. Increases all product prices by a fixed amount.	Inflation can reduce impact without regular adjustment. Changes in product characteristics (such as package size or composition) can reduce impact (more so for unit as opposed to tax per kg of the product or ingredient).	Yurekli, 2000 and OECD (47,48)
Ad-valorem excise	A tax levied on the sale of goods or services, determined as a percentage of the gross value or cost of the product at point of sale (for example, 30% of the price paid by consumers).	Automatically adjusts for inflation. Reduces industry profit margin on subsequent price increases.	Less predictable revenue stream. Generates large price differentials between cheap and expensive products.	Yurekli, 2000 (47)
Value-added tax	Tax on each stage of production that adds value to a product or process, with reimbursement of taxes paid to previous suppliers in the chain.	Efficient as it only taxes the value added and avoids cascade effects.	Generally applied at a fixed rate for all goods, therefore lacking opportunities to generate relative price changes between goods and change behaviour.	WHO, 2012

Table 6 – Summary of tax mechanisms. (Source: WHO)

TERMINOLOGY

The way taxes are described has a bearing on how they are accepted by politicians, industry bodies and the public at large. Landon and Graff, in their exploration of food duties, highlight the various references to 'fat taxes', 'sin taxes', 'health-related food taxes', 'duties' and 'levies'. They also emphasise the importance of communication messages regarding potential taxes that promote the purpose and benefits of introducing such a tax. (49)

SECTION

04

TAXATION OPPORTUNITIES BY TOPIC

In this section, a range of topics are considered: fat, salt, sugar (non-beverage), and red and processed meats. The health evidence base and Welsh policy context for each are considered, along with international examples of fiscal measures introduced to improve health or reduce consumption.

These topics have clear links to some of the major NCDs affecting quality of life in Wales, and provide an emerging international evidence base, looking at approaches through a policy, health, and economic lens. We know from Kantar World Panel Data , which has provided insights into consumer behaviour in relation to food purchasing in Wales, that low-income households in Wales buy less healthy food. This includes items higher in sugar, saturates and sodium. Generally, the Kantar World Panel Data shows that Welsh shopping baskets have a higher level of calories, saturates, sugar and salt than the rest of Great Britain.

FATS

In this section, we consider saturated and trans fats within diets.

[2] Kantar World Panel Data for Wales provided as part of the Welsh Government Food Division Data Contract

SUMMARY OF HEALTH RATIONALE

Fats in the diet are constituted from a range of different types of fatty acids, the most concerning of which for obesity rates being trans fatty acids (TFA) and saturated fatty acids (SFA). The excessive intake of saturated fats and trans fats i.e. greater than 10% of total energy intake, has a clear causal link with overweight and obesity in children and adults, as well as being connected to the development of other NCDs. A key source of both saturated and trans fats are energy-dense foods (otherwise known as 'junk food'), though products such as butter, margarine, cooking oils and other dairy products are also major contributors to a high-fat diet. Whilst intake of trans fats from labelled products is below the recommended maximum levels in the UK, data on the trans fats within unlabelled products (e.g. takeaway items) is unavailable, therefore we cannot be complacent.

The latest edition of the WHO's 'Global Status Report on Non-Communicable Diseases', published in 2014, includes a target to halt the rise in diabetes and obesity. It states that 'worldwide, the prevalence of obesity has nearly doubled since 1980' and calls for 'multisectoral action that simultaneously addresses different sectors that contribute to the production, distribution and marketing of food', and highlights a 'best buy' to replace trans fats with unsaturated fats. (2)

The WHO Regional Office for Europe's 2016 'Action Plan for the Prevention and Control of Noncommunicable Diseases in the WHO European Region' has a goal to reformulate food products to replace trans fats and saturated fats with unsaturated fats. (50)

The effects of saturated fats and trans fats have been subject to two extensive systematic reviews, published in 2016. (51,52) These reviews highlight the health impacts from excessive intake of both saturated and trans fats, with assessments of the potential impact of modifying intake levels.

In relation to the effects of saturated fat, the systematic review aimed to appraise the effects of modified levels of saturated fat intake. When compared with a mixture of carbohydrates, an increased intake of lauric, myristic or palmitic acids was shown to raise cholesterol levels, whilst increases in stearic acid did not having a demonstrable impact on cholesterol. Only lauric acid alone acted to reduce total cholesterol. (51)

In the systematic review into the effects of trans-fatty acid intake, the aim was to assess the effect of modifying the intake of trans fats on blood lipid and lipoprotein levels through swapping trans fatty acids with monounsaturated fats, polyunsaturated fats, saturated fats or carbohydrates. This found a significant decrease in total cholesterol when industrial trans fats, ruminant trans fats and total trans fats were replaced with an equivalent level of monounsaturated fats and/or polyunsaturated fats. Replacing them with equivalent levels of carbohydrates showed a decrease in total cholesterol compared with industrials trans fats, but increase compared with ruminant trans fats. (52)

WALES

OVERWEIGHT AND OBESITY

In Wales, according to the National Survey for Wales 2016-17, 59% of adults are overweight or obese (23% are obese), and rates of adult overweight or obesity increase with the level of deprivation. (53) Having a high body-mass index is the third highest risk factor for disability-adjusted life years (DALYs) in Wales. (1)

Whilst overweight and obesity cannot be attributed exclusively to a high-fat diet, such a diet is in no doubt a major contributory factor.

CARDIOVASCULAR DISEASE (CVD)

The Public Health Wales Observatory, using Global Health Data Exchange (IHME) data, has highlighted that CVD is the second leading cause of DALYs in Wales, with 157,091 life years impacted according to 2016 analysis. This has dropped compared to figures from 1990. Furthermore, the same report highlights 26,775 years lived with CVD-related disability and 130,315 years of life lost in Wales. (1)

Whilst CVD cannot be attributed exclusively to a high-fat diet, such a diet could be a contributory factor.

DIABETES

In Wales, the prevalence of adults being treated for diabetes has risen, from 5% in 2003/04 to 7% in 2015. (1) Wales has the highest prevalence of diabetes in the UK. There are currently more than 191,000 people living with diabetes in Wales, and whilst this will include those with type 1 diabetes, around 90% of this number will have type 2 diabetes. (54) From the Public Health Wales Observatory's work on the Global Burden of Disease study, diabetes – along with urogenital, blood, and endocrine diseases – accounts for 38,094 DALYs in Wales according to 2016 figures. (1)

Whilst diabetes cannot be attributed exclusively to a high-fat diet, such a diet could be a contributory factor.

HIGH TOTAL CHOLESTEROL

In Wales, high total cholesterol is cited as a substantial risk factor for disability-adjusted life years, being the fifth highest risk factor according to 2016 figures, with 43,626 DALYs in all people of all ages. (1) Whilst cholesterol levels cannot be attributed exclusively to a high-fat diet, such a diet could be a contributory factor.

FOOD PURCHASING BEHAVIOUR IN WALES

Kantar World Panel Data[3] has provided insights into consumer behaviour in relation to food purchasing in Wales. Kantar is a market research company, which provides data and insight into shoppers' behaviour. The data is self-reported and relates mostly to purchases rather than consumption. Participants are rewarded for taking part.

In relation to fat and saturates, there has been a 0.5% reduction in the fat content of the average Welsh food shop, and a 1.2% increase in saturates over the last 4 years. Both of these figures compare favourably with the UK as a whole, which has seen over 2% increase in fat content of the average food shop, and around 3% increase in saturates.

[3] Kantar World Panel Data for Wales provided as part of the Welsh Government Food Division Data Contract

INTERNATIONAL APPROACHES

DENMARK

The Policy Dimension

The Danish Fat Tax was proposed in January 2011 by the Liberal-Conservative government of the day. The stated intention of the tax was to promote better eating habits and improve health, although some scholars have disputed this, highlighting reasons why this was primarily motivated by a need to raise new revenue for the state to help finance a cut in income tax (36,55,56). It was abolished 15 months after its introduction; an overview of the political developments in relation to the Danish fat tax is provided in Figure 1.

The origins of the fat tax in Denmark came through a 'Commission of Prevention' (CoP), established in 2008, which was tasked with making recommendations for preventative action regarding health issues. The Commission reported in April 2009, with 52 recommendations, including the recommendation to introduce a tax on saturated fat in both dairy and vegetable fats. According to Bødker et al.'s commentary, 'the CoP estimated that a tax of DKK 20 (approx. USD 3.7) per kilo of saturated fat would generate an annual tax revenue of DKK 1 billion (approx. USD 184 million) and increase the population's life expectancy by 5.5 days.' (36)

The fat tax was proposed by the Danish Government in February 2009, with the tax to be on saturated fat in dairy (excluding milk) and oils. The taxation rate was set at DKK 25 (approx. USD 4.6) excluding 25% value added tax (VAT). Following amendments imposed by the EU Commission's rules on state aid, meat was included within the second draft of the bill, with a standard taxation rate for each animal proposed. The inclusion of meat as a taxable product led the Danish government to reduce the proposed overall fat tax rate to DKK 13, from DKK 25, due to the estimated revenues that adding meat would generate. A consultation on the revised bill followed in October 2010, and Bødker et al. (36) categorized the themes of the consultation responses as follows:

- **'Threatening lawsuits'**
  Industry bodies suggested that the proposed tax was in violation of EU customs, state aid, and discriminatory internal taxation laws.

- **'Predicting welfare losses'**
  Suggestion that it would increase inflation and cross-border trade into Germany.

- **'Casting doubt on evidence'**
  Some industry bodies argued that there was no association between saturated fat and obesity.

- **'Diverting focus'**
  including suggesting other tax models, such as collecting at retail rather than production level, or replacing fat tax with a packaging tax, or a discount in tax for companies reducing fat in their products).

- **'Requesting postponement'**
  Needing more time to implement the proposed tax or waiting until EU mandatory nutrition labelling regulations came into force.

The fat tax, with some amendments following the consultation period, was passed into law on 17th March 2011, with 96% of parliamentary votes in favour.

Nevertheless, 15 months later the tax was abolished. Criticisms of the tax (36), included:

- Using standard rates for taxing meat led to lean cuts being taxed at the same level as fattier cuts. On similar lines, the tax paid per product did not necessarily reflect the amount of saturated fat in the product, making the 'health benefits' argument negligible in some cases.
- The tax was paid on the amount of fat used in production, rather than the actual fat remaining in the final product – so for example, if a pastry producer's product only contained 25% of the fat used in production, they were still taxed at 100% of the fat used in production.
- Increasing social inequality was a concern.
- Complicated design of the tax, rendering it difficult for companies to calculate how much they owed.

Furthermore, the authors criticised the tax as being less about public health and more about revenue raising, as indicated by the fact that:

- The tax was processed and overseen by the Fiscal Affairs Committee, within the Danish Ministry of Taxation, not the Health Committee.
- The adjustments in the taxation rate during the Bill drafting and consultation stages was in order to gain a specific tax revenue, rather than achieve a level of health improvement.
- The tax was designed to minimise the administrative burden on industry – hence why the tax rate was the same regardless of the saturated fat content of the product, for example.

An article in the BMJ highlighted opposition from companies who complained that the tax was 'a bureaucratic nightmare' – and the Tax Ministry itself highlighted the criticisms of 'increasing prices for consumers, increasing companies administrative costs, and putting Danish jobs at risk' in its statement announcing the repeal of the tax. (57)

The fat tax was abolished on 1st January 2013, following a vote taken in the Danish Parliament in December 2012.

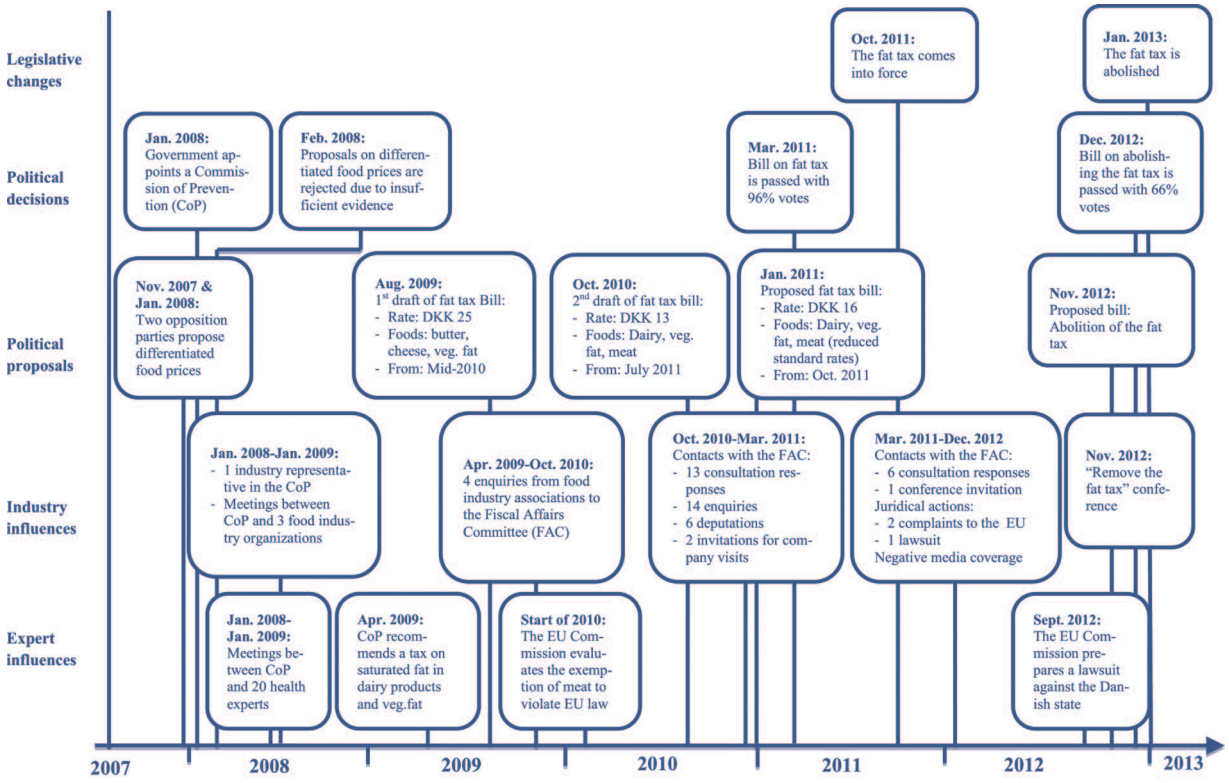


Figure 1 – 'Political Timeline' graphic from Bødker et al (2015) (36)

THE HEALTH IMPACTS

The fat tax was abolished before any formal evaluation of health impacts was conducted. Mette Wier, Executive Director of the Danish Institute of Governmental Research told the BMJ that the decision to repeal the fat tax was made too quickly: "The best thing to do would have been to evaluate the long term effects after a few years, and then decide." (57)

Bødker et al. considered the Danish tax 'poorly designed in terms of facilitating reduction in the consumption of saturated fat and, hence, benefiting public health', though noted that towards the end of the tax's existence evidence of consumption levels was starting to emerge. (36) This evidence was noted in Smed et al. (56), who provided the first study aimed at evaluating the health impact of the tax. They investigated the impact of the tax on consumption of saturated fat, unsaturated fat, fruit, vegetables, and fibre, through the use of a risk assessment model. They estimated the effects of the consumption levels on NCDs and mortality, with their estimates showing:

- A 4% reduction in saturated fat intake, with increases in vegetable consumption, by 7.9% on average, and fibre by 3.7%;
- Salt intake, however, increased for most individuals;
- An inferred reduction in mortality of 123 lives saved annually.

The Smed et al. paper (56) looked at observed purchase data, taking into account substitution possibilities. As this was a natural experiment, there was not a control group, and therefore the scholars couldn't be entirely sure that any observed changes in diet were due to the fat tax.

Bødker et al. published a paper looking at the effect on consumption patterns and the risk of ischaemic heart disease (IHD). (58) In this study, the authors investigated retail outlet data for 12 foodstuff categories which had been targeted by the fat tax, looking at whether the sales of the products had decreased during the period when the fat tax was implemented. To ascertain any changes in IHD, using two different methods, they modelled the effect of changes in intake of monounsaturated, polyunsaturated and saturated fats, and changes too on serum cholesterol by dietary cholesterol. They found that the total sales decreased by 0.9%, whilst their two methods of assessing changes in IHD noted marginal changes in IHD risk.

The Bødker et al. study (58) in part argues for governments to implement higher taxation rates for food taxes as a means of increasing the health impact, though they acknowledge the risk of this exacerbating economic inequalities. A possible solution, cited in other papers (32), would be to combine taxation with subsidies on healthier options, which Bødker et al. suggest could address the regressive effects of the tax.

HUNGARY

The Policy Dimension

In September 2011, the Hungarian Government introduced a 'Public Health Product Tax' (PHPT). The Government aimed to use the revenues from this tax directly for health improvement policies and to increase the wages of healthcare workers. They wanted to "reduce the consumption of food products that are not useful from a public health point of view and to promote a healthy diet." Prime Minister Viktor Orban was reported as saying "those who live unhealthily have to contribute more to support the health system." (59) The policy was designed collaboratively by the Ministry of Health and the Ministry of Finance, supported by WHO. (60)

The tax is collected at point of sale from consumers purchasing a product within the tax's scope, and is also collected from those selling a taxable food product in Hungary for the first time. The tax is per unit of product sold, measured in kilograms or litres. (60) Examples of taxable products can be seen in Table 7, along with taxation rate.

Taxable products	Taxable if	Tax Rate		Gross price of a taxable item, August 2014*
		Since Sept 2011	Since Sept 2011	
Juice concentrate	Sugar > 8g/100ml and fruit <25%	0	200 HUF/l	"YO" raspberry flavoured concentrate: 1427 HUF/l
Other juice	Sugar > 8g/100ml and fruit <25%, since January 2012: if milk <50%	5 HUF/l	7 HUF/l	"SIÓ" lemon-lime juice: 279 HUF/l
Energy drink, year 2011	Sugar > 8g/100ml or caffeine >10mg/100ml	250 HUF/l	–	"Red Bull" energy drink: 1756 HUF/l
Energy drink since 2012	Methylxanthine > 1mg/100ml or taurin >100mg/100ml (sugar content not relevant)	–	250 HUF/l (since 2013: 40 HUF/l if no taurin, but methylxanthine > 15mg/100ml)	
Pre-packed sweets without cocoa	Sugar > 25g/100g	100 HUF/kg	130 HUF/kg	"Gyõri" layered biscuits with lemon: 1644 HUF/kg
Pre-packed sweets with cocoa	Sugar > 40g/100g and cocoa < 40g/100g, since January 2012: if milk < 50%	100 HUF/kg	130 HUF/kg	"Americana" milky bar with cocoa: 1680 HUF/kg
Sugared cocoa powder	Sugar > 40g/100g	100 HUF/kg	70 HUF/kg	"Nesquik" cocoa powder: 2245 HUF/kg
Salty snack (exception since January 2012: bakery product with salt <2g/100g)	Salt > 1g/100g	200 HUF/kg	250 HUF/kg	"Chio" salted peanuts: 1860 HUF/kg
Condiments, instant soup (exceptions: ketchup, mustard, ready to eat soup, infant formula)	Salt > 5g/100g	200 HUF/kg	250 HUF/kg	"Vegeta" condiment: 1899 HUF/kg
Aromatised beer	Sugar > 5g/100ml	0	20 HUF/l	"Soproni" lime-mint radler: 398 HUF/l
Alcoholic refresher	Sugar > 5g/100ml	0	20 HUF/l	"Bacardi" breezer: 1996 HUF/l
Jam	Sugar > 35g/100g	0	500 HUF/kg	"EKO" apricot jam: 1656 HUF/kg

Table 7 – Junk food tax rates and indicative prices of the taxable products, Hungary. Reproduced from Bíró (61)

*The prices are based on the Hungarian Tesco online store as of 14th August 2014.

Within the scope of the PHPT were eight different product groups, including sugar-sweetened cocoa powder, energy drinks, condiments, fruit jams, flavoured beer and alcoholic beverages, salty snacks, soft drinks and syrups. (59) Prior to the introduction of the tax, analysis of food product content was conducted in laboratories, to identify unhealthy foods and quantify the levels of salt, sugar and other unhealthy ingredients contained within. Combined with existing knowledge on levels of consumption, this information influenced the legislation's development and provided baseline data for future monitoring and evaluation. (60)

Bíró noted that the introduction of the tax was followed by complementary regulations. The first of these, introduced in February 2014, prohibited the food industry from releasing a food product that contained more than 2% of trans fat within total fat content. This was followed in January 2015 by regulations restricting the supply of certain products within public canteens – for example, high fat meat and soft drinks with sugar are prohibited, and salt and sugar are not available on canteen tables. (61)

The WHO Regional Office for Europe reported that over the first four years of the tax, consumption of the taxed products had decreased and food manufacturers had 'reduced or eliminated unhealthy ingredients in their products'. Over US$200 million had been generated in tax revenue over the same four year period. (60) The revenues from this tax have gone directly to the country's 'public health insurance fund', contributing 1% of the fund's income. (61)

EVALUATIONS

A 2015 assessment of the PHPT's impact was published by the WHO Regional Office for Europe. (62) Based upon a sub-sample of the 2014 Hungarian National Diet and Nutritional Status Survey, this found that:

- Most consumers (59-73%) reduced – and maintained a reduction of – consumption of the taxed products;
- Health literacy had improved amongst consumers, with people reducing consumption because they had learnt that it was unhealthy, rather than because of the financial impact of the tax;
- Those who substituted a taxed product for something else mostly chose healthier alternatives – fresh fruit and vegetables were cited as substitutions in 82-86% cases;
- Overweight and obese adults were 1.8–2.7 times more likely to change their consumption than adults who were underweight or of normal weight (independently of sex and age);
- With regard to different product groups, overweight and obese adults were even more likely (1.5–4.3 times) to reduce their consumption than adults who were underweight or of normal weight;
- Socioeconomic status (SES) had an impact on changes in consumption – assuming educational level correlates with income level, price changes were clearly effective, with a higher proportion of adults with a lower level of education choosing cheaper products compared with those with higher education, and only 0-20% of people with lower levels of education reporting reducing consumption because they had learnt that the product was unhealthy.

The evaluators concluded that the PHPT had achieved its public health goals, and for next steps, recommended that consideration should also be given to introducing price subsidies for healthy food products, such as fruits and vegetables, as well as raising the tax level on certain products, with the additional revenue being used for public health projects and nutrition-related interventions.

THE HEALTH IMPACTS

Direct health improvement has not been measured, with much of the focus on a reduction in consumption and purchasing behaviour, where health impacts can only be assumed.

CRITICISMS

Bíró noted that the main arguments that food producers have made against the food tax include:

- The fact that home-made snacks are exempt from the tax;
- Food producers having to substitute natural ingredients with artificial (e.g. sweeteners instead of sugar);
- Financial and job losses within the food industry.

Also, the notes from a meeting of the UK National Heart Forum in 2012 highlighted that 'extra purchases and stockpiling of goods ahead of the introduction of the tax also meant that the exact impact of the tax is difficult to measure.' (49)

MEXICO

The Policy Dimension

The 2006 'National Survey on Health & Nutrition' highlighted the burden of overweight and obesity in Mexico. This insight was followed by programmes to increase health promotion messaging, changes to school meals and industry self-regulation between 2007 and 2009. A National Agreement on Food Health was published in 2010, which included guidelines on the sale and consumption of food and drink in schools, which came into force in 2012.

As of 2012, the prevalence rate of obesity and overweight among adults in Mexico was 71 percent (32 percent being obese and 39 percent overweight). About 40 percent of adult women and 27 percent of men were obese. In response to concerns regarding overweight and obesity, the Mexican Government launched a National Strategy for the Prevention and Control of Overweight, Obesity and Diabetes. One pillar of this strategy focussed on 'Regulatory Policy', featuring the development of fiscal policies 'to reduce consumption of sugar sweetened beverages and high-calorie foods.' (63)

In January 2014, an 8% tax on 'nonessential' foods was enacted in Mexico. Passed in October 2013, the legislation saw tax applied to foods with energy density greater than 275kcal/100g, which included cakes, pastries, frozen desserts, and salty savoury products. Simultaneously, a 1 peso per litre tax on sugar-sweetened beverages was introduced. The law defined 'nonessential' foods in the following categories: chips and snacks, candies and sweets, chocolate, puddings, peanut and hazelnut butters, ice cream and ice pops, and cereal-based products with substantial added sugar. (37, 38) The non-essential food tax implemented in Mexico collected a gross revenue of 29.6 billion MXN pesos (~ US$2 billion) during 2014 and 2015. (39)

The taxes were part of a comprehensive policy approach to reducing obesity, including health promotion campaigns, increased access to healthcare services and strengthened regulations on product labelling and marketing. Analysis by the World Bank showed that the taxes were designed 'to avoid, as much as possible, the substitution of consumption of the taxed goods for other unhealthy foods and beverages not subject to taxation.' (63)

More extensive analysis of the policy approach undertaken in Mexico can be found in the World Bank's analysis. (63)

EVALUATIONS

Batis et al. (64) provided a first-year evaluation of the impact of the tax. Their study aimed to examine changes in the volume of taxed and untaxed packaged food purchases according to SES. By looking at a dataset that tracks household food purchases over time, the authors analysed the volume of purchases of taxed and untaxed foods from January 2012 to December 2014, they found a change of -25g per capita per month in the mean volume of purchases of taxed foods in 2014. Stratified by SES, lower SES households purchased on average 10.2% less taxed foods than expected, with medium SES households purchasing 5.8% less taxed foods than expected. There was no change observed in the purchasing habits of high SES households. The authors concluded that, compared to what would have been purchased had pre-tax trends continued, household purchases of the foods covered by the tax declined more than expected in the first year of the tax being introduced. Purchases of salty snacks showed the biggest decline (-6.3% 'beyond expected'), followed by 'cereal-based sweets' (-5.2% 'beyond expected'). Untaxed foods showed no change in the volume purchased.

Batis et al. consider that the first year results show that a 'relatively modest tax' contributes to a substantial decline in purchases of affected products. However, the authors also highlight the complexity in how the tax was based on defining specific food products to be taxed, though they note that this approach proved more successful than the Danish example, as it focused on processed foods rather than specific ingredients.

Limitations of the evaluation include its sample being comprised of urban households, so there is no observed impact on rural households. The model used also assumes that pre-tax trends in consumption would have continued. Furthermore, there is an assumption that it was the tax that impacted purchasing habits – the impact of other measures, such as health promotion campaigns, is not measured in this study.

Taillie et al. performed an evaluation after two years of the tax's implementation. (65) The focus of their work was to ascertain any differences between households who purchase high volumes of taxed products, compared to those households that purchased less of the taxed products. Their study compared purchasing behaviour in both groups before the tax, and over the first two years of the tax being introduced. Using longitudinal data on household purchases, they analysed the mean volume of taxed and untaxed food purchases during 2012-2013. Overall, they found a reduction in the volume of food purchases (1607g, per capita, per month, compared to 1798g prior to the tax), and the rate of reduction in the percentage of taxed foods purchased increased in the second year of the tax's implementation. As highlighted in the Batis et al. study, Taillie et al. consider whether it was the result of the tax alone, or whether other interventions, such as a public health campaign regarding obesity and diabetes, led to this behaviour change. In the population group considered healthiest (those who purchased less of the taxed products, and more untaxed products) no change in the purchase of taxed foods was observed, indicating that a tax does not affect their purchasing habits. However, the unhealthiest group (those who purchased more of the taxed products, and less of untaxed products – purchasing nearly 40% of taxed products) showed the largest relative decline in their purchases of taxed foods (-12.3%).

Taillie et al. also cite other work (35,66) which highlighted that there was some variability in pricing between urban and rural areas, suggesting that the tax may not have impacted all households equally.

Limitations of this evaluation include the fact that only packaged products were captured within the dataset. This means that the purchasing habits of loose products – such as fruit and vegetables – could have increased. Out-of-home purchasing was also not captured, so restaurant meals were not considered within the dataset.

THE HEALTH IMPACTS

These taxes were introduced as part of an effort to prevent further increase in the rates of obesity and diabetes in the Mexican population, which stood at a prevalence of over 33% overweight and obese for children, and 70% for adults. In 2006, the prevalence of type 2 diabetes in adults was 14.4%. (64) The Pan American Health Organization conducted analysis of the trends in consumption, and impact of, ultra-processed food and drink products in Latin America, which showed that in 2013, Mexico was the fourth-highest of 80 countries for annual retail sales per capita of ultra-processed food and drink (behind the United States, Canada and Germany). (67) Furthermore, a paper looking at the findings of the 2012 Mexican National Health and Nutrition Survey explored the dietary energy intake of Mexicans showed that the intake of foods high in saturated fats and/or added sugar – foods now largely captured within the scope of Mexico's tax - contributed 16% of the average person's total energy intake. Fruit and vegetables contributed only 5.7%. (68)

Whilst Batis et al. looked at the impact of the tax on purchasing habits, their work did not explore the health impacts of the tax – in fact, they specifically called for further research to explore how the changing trend in consumption is linked to changes in the nutritional content of diets. (64)

As with the Batis evaluation, Taillie et al. (65) were also unable to observe the impact on health directly, as again this evaluation was focused on purchasing behaviour.

ABANDONED PROPOSALS – IN BRIEF

ROMANIA

Policy Proposition

In 2010, the Romanian Health Ministry proposed a new levy on foods with high fat (and sugar) content. This was in response to figures that showed that half of the population were overweight and a doubling of the obesity rates among children aged between 3-9 years, to 3.5%. The levy would have been applied directly to producers and importers.

Romania's proposal would have seen more savoury snacks included within the scope of the levy than in other international examples, including foods high in grease and additives, though critics highlighted some of the products excluded from the scope of the tax, for example kebabs and pizza, both popular food items in the country. If the bill had gone through, a list of 'guilty' products (those to be taxed) would have been submitted to the government, and then put to a Parliamentary vote.

Food producers in Romania criticised the proposal, stating that the population eat unhealthy products because they are economically poor, and therefore taxing the food they eat will exacerbate the financial insecurity of the poorest. (69,70) In addition, the head of Romania's Food Industry Federation predicted that there would be 36,000 job losses. (59)

The proposal was dropped prior to being taken to Parliament, with Ministers concerned over the financial implications for an already poor population that spends less than €300 per month on food. (59)

WELSH/UK POLICY CONTEXT

In 2012, in an interview conducted shortly after the launch of the Public Health Green Paper, Wales' then Chief Medical Officer, Dr Ruth Hussey, stated that lowering the price of fresh fruit and vegetables would be more effective than taxing foods high in fat and salt. Dr Hussey highlighted the end of the Danish tax and the economic situation as reasons to be wary of taxation as a policy option: "Given the economic situation something that makes healthier food more affordable might be a more positive move rather than a tax. It's not something that I would advocate as a simple solution and it would need discussion." (71)

The Welsh Government is currently undertaking a public consultation on its draft obesity strategy. In work to support the development of the draft Wales obesity strategy, Healthy Weight: Healthy Wales. In this consultation document, Welsh Government state that, in relation to supporting Welsh business to reformulate and to develop healthier food choices, 'we will consider additional measures if necessary, including the use of further taxation powers in Wales, if the scale and pace of change by industry is not sufficient.' (72)

Public Health Wales has also recently undertaken a review of evidence to support the evidence for effective action on obesogenic environments. Part of this work looked at price manipulation as an intervention for the food and drink environment. (24)

NOURISHING DATABASE EXAMPLES

Aside from the use of economic tools to address over-consumption of fat, the World Cancer Research Fund's NOURISHING database (17) highlights the following examples of other policy options:

MANDATORY STANDARDS FOR FOOD AVAILABLE IN SCHOOLS

AUSTRALIA

In Australia, six states and territories have implemented mandatory standards, based upon either the national voluntary guidelines or nutrient and food criteria as defined by the state: Australian Capital Territory (2015), New South Wales (2011), Northern Territory (2009), Queensland (2007), South Australia (2008), and Western Australia (2014). All of these states and territories identify "red category" food, which is either completely banned in schools or heavily restricted (e.g. offered no more than one or two times per term).

FINLAND

Finnish National Nutritional Council's guidelines for schools provide guidance on specific food products for use in schools, for example cheese products with a fat content of at most 17% and a maximum salt content of 1.2% should be selected.

MANDATORY REMOVAL OF TRANS FATS IN FOOD PRODUCTS

ARGENTINA

In 2010, the Argentine Food Code was amended to set limits on trans fat permitted in food. In accordance with these regulations, trans fat content must not exceed 2% of total vegetable fats in oils and margarines, and 5% of total fat in all other food.

AUSTRIA

In 2009, a ministerial regulation was passed in Austria setting a limit on trans fats of 2g per 100g of a food item. If a food product is composed of various ingredients, the limit of trans fats is 4g per 100g if the total fat content of the product is less than 20%, and 10g per 100g if the total fat content of the food product does not exceed 3%. The regulation is not applicable to trans fats of animal origin.

CAMPAIGNS

AUSTRALIA

In June 2012, the Department of Health of Western Australia initiated the public health campaign LiveLighter. In 2014, it extended to Victoria and the Australian Capital Territory and in 2015 to the Northern Territory. LiveLighter uses a website, social media, advocacy, and provocative radio, print and TV advertisements to encourage people to eat healthily and be physically active to maintain a healthy weight. The website provides free resources such as recipes, a meal and activity planner, and a BMI, sugary drink and risk calculator. The campaign is ongoing, and an evaluation is available. (73)

ENGLAND

Change4Life is a campaign to promote healthy eating and physical activity. This includes tools to advise consumers on reducing the levels of fat in diets, providing healthy recipes, and information on local services. (74)

COMMENTARY AND CONCLUSIONS

HEALTH IMPACTS

It is clear that the literature regarding health impacts of any form of fat tax is limited at present, due largely to the relatively recent introduction of such schemes globally, and the lack of evaluation in some examples.

POLICY DESIGN

From the Danish example, there is strong evidence regarding the approach to policy implementation, with less evidence on the health benefits, due in part to its short-lived existence. The limited health impact analysis published about the fat tax (56) suggested that the tax had an impact in reducing saturated, and other, fat intake, whilst also contributing to an increase in vegetable, fruit and fibre consumption – but the risk of substitution was also noted.

It was clear that some authors considered the fat tax as more of a revenue raising intervention than anything aimed primarily at improving health (41–43), and their evidence for this perception is strong, despite the public description of the tax as being to 'promote better eating habits and thereby strengthen the health of the population'. (75) Furthermore, the Danish example provides an insight into how industry associations may respond to any attempt at introducing a fat tax.

EQUITY CONSIDERATIONS

According to Bødker et al. (36) the Danish Commission of Prevention suggested that the risks of increasing social inequality through the fat tax could have been avoided had a reduced tax on fruit and vegetables been introduced simultaneously. Should a fat tax be introduced elsewhere, it would surely help to abate widening inequalities by using some, or all, of the proceeds to introduce a subsidy on healthier options. Depending upon how such a system is designed, this could help to address concerns around the potential for exacerbating inequities – though there is yet to be a 'real world' example of this operating in practice.

TARGETING SPECIFIC PRODUCTS

Questions over what products would be taxed or subsidised, in what quantities, and at what rate, would inevitably provoke debate which would have to be justified on a case-by-case basis, perhaps complicating matters. Lessons from the Danish experience show that applying a blanket tax rate to a sub-group of products – in that case meat – led to perversities in the system, through taxing lean cuts of meat at the same level as fattier cuts. Similarly, criticisms of the Romanian proposals highlighted the products that weren't included within the scope of the suggested tax. In any future fat tax implementation, the rate of taxation could be considered on a 'per product' basis, rather than a standard rate of tax, to avoid such issues.

In the Mexican example, a unique characteristic compared to others in this analysis is in the defining of 'nonessential' foods. As Batis et al. state 'If only selected unhealthy foods are taxed, individuals can substitute with other unhealthy untaxed foods; on the other hand, if the tax categorization is too broad, many relatively healthy products will also be affected, increasing the cost of food without the public health benefit.' (64) The authors state that on the whole this tax successfully targeted unhealthy foods through focus on processed foods, but it did lead to some anomalies and complication – an example cited was that most ice creams remained untaxed, whilst nuts were taxed, and '"Tostadas" (fried corn tortilla) and "totopos" (corn tortilla chips) are only considered non-essential if salt, chili pepper, spices or condiments are added after the corn flour has been baked, fried or dehydrated'. In addition, further clarification on what food products were within the scope of 'nonessential' was issued during 2014, representing about 2.3% of all products. (76)

Hungary's introduction of their 'public health product tax' has clear food product groups within its scope, and was followed by complementary regulations, all with a clear aim at improving nutrition ahead of revenue raising (and with the revenue raised going towards health budgets). This appears to be the best international implementation to date of any kind of food tax – yet as with the other international examples, health improvement evidence is lacking. Improved nutritional literacy has been noted, however.

SUMMARY RECOMMENDATIONS

From all of the cited literature in this section, to maximise the health benefits from any potential fat tax implementation, policy design lessons regarding a fat tax can be summarised as follows:

- Any scheme would benefit from links to a 'health food subsidy', to reduce the potential negative impacts on those of lower socio-economic status and the risk of substituting high-fat products with cheaper unhealthy options e.g. high-salt products.
- A fat tax should have the primary aim to improve health, not state revenues, with oversight of outcomes and evaluation planning by a health agency.
- A fat tax should be introduced concurrently with complementary regulations and campaigns, to maximise the potential health benefits.
- Following the Hungarian example, baseline information should be collected on the taxed product's formulation and purchasing levels prior to implementation of any tax. This will aid successful evaluation of the policy.
- Revenues from a fat tax should at large be directed towards nutrition-related interventions/public health campaigns.

SALT

Globally, as of 2010, 1.7 million annual deaths from cardiovascular causes had been attributed to excess salt intake. (6)

SUMMARY OF HEALTH RATIONALE

Sodium is an essential nutrient in people's diets, however the average person in the UK consumes more than the daily required amount, primarily through added salts. Alongside the well-established link between excess salt consumption and conditions such as high blood pressure and cardiovascular disease, there is growing evidence that health conditions such as osteoporosis and kidney disease are in part linked to a high-salt diet. (77)

The risks of developing hypertension and cardiovascular disease (CVD) are greatly increased through high consumption of salt. Salt constitutes the most common source of sodium in our diets. Globally, as of 2010, 1.7 million annual deaths from cardiovascular causes had been attributed to excess salt intake. (2) Reducing sodium intake in adults is shown to reduce blood pressure, with lower sodium intake also associated with reduced risk of stroke and fatal coronary heart disease. Most people would benefit from reducing sodium intake. (78)

High blood pressure is common in the UK. A 2003 report from the Scientific Advisory Committee on Nutrition called for a reduction in the population average intake of salt to 6g per day for adults and a reduction in the salt content of processed food and drinks. (79)

The latest edition of the World Health Organization (WHO) Global Status Report on Non-Communicable Diseases, published in 2014, issued a global target to achieve a 30% relative reduction in the mean population intake of salt/sodium. WHO recommend a salt intake of no more than 5g daily for adults, to reduce the risk of coronary heart disease and stroke, as well as reducing blood pressure. The Report also calls for countries to consider 'fiscal tools to encourage the production and consumption of foods with reduced sodium content'. (2)

Processed foods constitute a major source of salt within our diets. The WHO Regional Office for Europe's 2016 Action Plan for the Prevention and Control of Noncommunicable Diseases in the WHO European Region has goals to reformulate food products, including the reduction of salt content, and to reduce salt intake in diets generally, in line with WHO guidance. (50)

In Wales, the National Diet and Nutrition Survey Rolling Programme (NDNS RP) estimates salt intake from urinary sodium excretion. In the results from years 2 to 5 of the programme (2009/10 – 2012/13), the mean estimated salt intake was 7.8g/day for children aged 11 to 18 years, 29% greater than the Scientific Advisory Committee on Nutrition (SACN) recommendation of a population average of no more than 6g/day. For adults aged 19-64 years, the mean estimated salt intake was 8.4g/day, 41% greater than the SACN recommendation of a population average of no more than 6g/day; 9.7g/day for men aged 19 to 64 years and 7.3g/day for women aged 19 to 64 years. Mean estimated salt intake was 7.1g/day for adults aged 65 years and over, 18% greater than the SACN recommendation of a population average of no more than 6g/day. Therefore, in all age groups, consumption of salt in Wales appears to be considerably higher than the recommended intake. (80)

In May 2017, the Faculty of Public Health published a position statement on salt. (81) In their statement, the Faculty propose policy options for advocates to lobby for, such as salt reduction in school food, adoption of the FSA's food labelling and improved access to fresh fruit and vegetables. The options proposed by the Faculty do not include fiscal measures.

FOOD PURCHASING BEHAVIOUR IN WALES

The latest World Panel Data for Wales highlighted a drop of 6.4% in the sodium content of take home shopping in Wales between 2011 and 2015, with the decrease being greater than for Great Britain as a whole. Furthermore, 2016 World Panel data shows that 85% of salt purchase in Wales is derived through "hidden" salt in items such as bakery products, dairy products, and chilled convenience foods. (82,83)

SUMMARY OF STUDIES

Systematic reviews have considered modelling studies looking at the impact of a tax on salt. In the Niebylski et al review (84), a modelling study from 2005 by Kuchler et al. was reviewed. (85) This study modelled the effect of a 1%, 10% and 20% tax rates on crisps and salty snacks on energy intake in the US, finding the impact on quality of diet to be 'small, and negligible at the lower tax rates'.

Smith-Spangler undertook a modelling study of a high sodium tax rate (40%), looking at the effects on US adults aged 40-85. This model showed a potential to decrease lifetime population sodium intake by 6% and save $22.4 billion, as well as increase Quality Adjusted Life Years (QALYs) by 1.3 million. The author acknowledged that the demand for salty foods was 'relatively unresponsive to prices', hence the 40% tax rate applied in the model – again, the author stated that this level was 'neither realistic nor necessarily advantageous'. (86)

Mhurchu et al. modelled the effects of health-related taxes and subsidies on mortality in New Zealand. This was in the form of an econometric-epidemiologic modelling study. In their model, the authors proposed a 20% tax on the total cost of major food contributors to sodium intake – examples listed include bread and breakfast cereals; prepared, preserved and processed meats; and takeaway foods and beverages. From running the model, the authors found that a 20% tax on 'major dietary sources of sodium' would result in a 7% reduction in daily energy purchase (170kcal) and 2,000 deaths prevented or postponed (DPP). (87)

Nghiem et al. modelled the health and economic impacts of eight different dietary salt reduction interventions. (88) As with the above study, this consisted of epidemiological modelling in New Zealand adults aged 35 years and over, with cost-utility analysis also performed. In their scenario, the authors modelled an excise tax on salt which was to increase annually until a level of salt intake of 5.9g salt per day was achieved. The authors predicted that a tax along these lines would gain more QALYs than other interventions, such as food labelling changes or mass media campaigns.

INTERNATIONAL APPROACHES

HUNGARY

Policy Context

The Hungarian Public Health Tax includes products high in salt within its scope. The policy background to the tax is covered in detail in the 'Fat' chapter of this report. In relation to salt specifically, a variable tax rate is applied, and products within its scope include salty snacks with more than 1g salt per 100g, condiments with more than 5g salt per 100g and flavourings with more than 15g salt per 100g.

In 2014, the second full year of the Product Tax's implementation, 78% of Hungarian adults consumed powdered soups and salty condiments, and 71% consumed salty snacks. The WHO Europe assessment of the impact of the tax showed that, by 2015, salty snacks and salty condiments had contributed 16% and 14% respectively of the Public Health Product Tax's total revenues. (62)

IMPACTS

As with the fat aspect of the Hungarian tax, changes in consumption have been noted in salty products. 16% of people who brought salty snacks changed their consumption, while 11% of people purchasing powdered soup and salty condiments changed their consumption. In the case of salty snacks, those who changed consumption tended to consume less rather than substitute to other types of products – 86% changing to fresh fruit and vegetables – but 65% resorted to home-made salty snacks, and only one-third used non-salty snacks. Consumers of salty condiments tended to either consume less or buy different brands, with 33% of consumers resorting to home-made soups instead and 39% changing to products with reduced salt content. (62)

The WHO Europe assessment also highlighted that those with higher BMI were the consumers who most changed their consumption of salty snacks and condiments. Furthermore, amongst all consumers, higher prices were cited as the main reason for changing consumption of salty snacks by 81% of people in 2012, and by 56% in 2014. Half of consumers of salty snacks had learnt that the products were unhealthy by 2014. (62)

MEXICO

The Policy Dimension

The policy background to the Mexican tax is covered in detail in the 'Fat' chapter of this report.

In relation to salt, the 'salty snacks' category of the tax captures food products such as potato crisps, 'tortilla' crisps, ready-to-eat and microwave popcorn, crackers, peanuts and seeds (as highlighted in the Commentary and Conclusion of the Fat chapter of this report, the classification of products party to the tax is complex and subjective).
In a first-year evaluation of the tax, purchases of salty snacks showed the biggest decline (-6.3% 'beyond expected'). Across all analysed categories, households of lower socio-economic status (SES) were most responsive to the tax, with higher SES households making no significant changes in purchasing behaviour. (64)

PORTUGAL

Portugal proposed a tax on foods high in salt as part of its 2018 budget proposal. This proposal would see a levy of €0.80 (approx. £0.71) per kg applied to products with a salt content of 1g or more per 100g. This was proposed 'in the pursuit of health promotion and disease prevention', and is forecast to generate €30m (approx. £27m) in 2018. (89) The budget was passed on 27th November 2017. (90)

WELSH/UK POLICY CONTEXT

Public Health England (PHE) oversee a salt reduction programme, which aims to encourage food producers to reformulate their products to reduce salt content. The latest report on progress towards this was published in 2017. (91) The 2017 targets cover 76 specific food groups that PHE have identified as being the major contributors to most people's salt intake – examples include setting a target of no more than 1.63g salt or 650mg sodium in ham and other cured meats, 1.13g salt or 450mg sodium in bread and rolls, and 1.0g salt or 400mg sodium in breakfast cereals.

NOURISHING DATABASE EXAMPLES

Aside from the use of economic tools to address over-consumption of fat, the World Cancer Research Fund's NOURISHING database (17) highlights the following examples of other policy options:

MANDATORY LIMITS ON LEVEL OF SALT IN FOOD PRODUCTS

ARGENTINA

In 2013, the Argentine government adopted a law on mandatory maximum levels of sodium permitted in meat products and their derivatives, breads and starchy products, soups, seasoning mixes and tinned food. The law also applies to salt levels in restaurant food. Producers and importers may be fined up to 1m pesos, 10m pesos for repeat infringements and may even be shut down for up to five years.

GREECE

Since 1971, mandatory maximum levels of salt have been in place for bread, tomato juice and tomato concentrates.

COMMENTARY AND CONCLUSIONS

There is a dearth of 'real world' examples of an implemented tax to primarily address sodium intake.

From the Hungarian example, we can note an appropriate definition of 'excessive' salt content, with salty snacks with more than 1g salt per 100g, condiments with more than 5g salt per 100g and flavourings with more than 15g salt per 100g falling within the scope of the legislation. With these levels of salt having what the WHO Regional Office for Europe see as an 'unequivocally negative impact on public health' (60) it would be appropriate to follow these measures if implementing a similar tax in Wales.

The Hungarian example also demonstrates clear shifts in consumption, and increased population knowledge about the health impacts of salt. Nevertheless, it is perhaps still too early to consider whether there has been any lasting changes, and thus demonstrable improvement in health outcomes.

In Mexico, purchase data showed that the 'salty snacks' category products had the biggest decline in purchasing after the implementation of their tax. However, as in the case of Hungary, any correlating effect on health outcomes is yet to be observed.

Salt is a cheap product, and therefore demand is fairly unresponsive to minor price fluctuations. As such a substantial taxation rate would be required to affect any kind of change – Smith-Spangler indicated that a 40% tax would be required. (86)

As in other examples within this report, a tax alone would be unlikely to lead to a sufficient shift in population health outcomes related to salt intake. Product reformulation, national campaigns and regulatory approaches should all be considered as a comprehensive package of interventions – a range of international examples are highlighted in the WHO Global Status Report on NCDs. (2)

SUGAR (NON-BEVERAGE)

Many countries, including the UK, have sought to halt the contribution of a high sugar diet to negative health outcomes through the introduction of 'sugar taxes' which have focused on soft drinks. In this chapter, we explore the opportunities for fiscal policies to address high sugar intake from other dietary sources, such as confectionary, sugar syrups chocolate, biscuits and cakes.

SUMMARY OF HEALTH RATIONALE

Excess sugar intake is a major contributor to increasing diabetes and obesity rates. As we have highlighted in other chapters of this report, being overweight or obese increases the risk of a wide range of chronic diseases, principally type 2 diabetes, hypertension, cardiovascular disease including stroke, as well as some types of cancer.

In Wales, the prevalence of adults being treated for diabetes has risen, from 5% in 2003/04 to 7% in 2015. (1) Wales has the highest prevalence of diabetes in the UK. There are currently more than 191,000 people living with diabetes in Wales, and around 90% will have type 2 diabetes. (54)

Globally, obesity has more than doubled since 1980, with 11% of men and 15% of women aged 18 years and older obese as of 2014, and the global prevalence of diabetes was estimated to be 9% in 2014. (2) Two thirds (66%) of male adults in Wales are overweight or obese, with 54% of female adults overweight or obese – the proportion of adults who are overweight or obese increases according to deprivation level. (92) Reduced intake of dietary sugars is associated with a decrease in body weight and conversely increased dietary sugar intake is associated with weight increase. (93)

SUMMARY OF STUDIES

Smith et al. recently published an analysis of British food purchasing data to consider whether sweet snacks are more sensitive to price increases than sugar-sweetened beverages (SSBs). This was in response to the lack of published consideration of the potential impact of taxation on such products (in comparison to the many studies regarding sugar-sweetened beverages). The authors looked at a sample of 36,000 British households through Kantar World Panel data on household expenditure, and aggregated the data according to particular food categories. They found that chocolate and confectionary, cakes and biscuits 'have similar price sensitivity as SSBs, across all income groups' and unlike in the case of SSBs, 'price increases in these categories are also likely to prompt reductions in the purchase of other sweet snacks and SSBs, which magnify the overall impact.' They conclude that greater health gains may be found in policies increasing the price of these products compared to similar price increases of SSBs. (94)

FOOD PURCHASING BEHAVIOUR IN WALES

Kantar World Panel Data[4] has provided insights into consumer behaviour in relation to food purchasing in Wales.

The latest World Panel Data for Wales highlighted that packet sugar was the highest contributor of take home sugars in Wales in 2015 (11.8% of all take home sugars). Confectionery was the second highest (10.2%), with biscuits (6.6%) and cakes and pastries (5.1%) also noted. Soft drinks were the third highest contributor, representing 8.7% of all take home sugars in Wales.

Concerns over sugar intake amongst consumers has increased year-on-year, rising from 54% of consumers stating that they restrict how much sugary food they eat in 2012 to 62.5% in 2016. Furthermore, 29% of panel respondents stated that they were 'very concerned' about sugar consumption in Wales. (82,83)

[4] Kantar World Panel Data for Wales provided as part of the Welsh Government Food Division Data Contract

INTERNATIONAL APPROACHES

HUNGARY

Policy Context

The Hungarian Public Health Product Tax includes products high in sugar content within its scope. The policy background to the tax is covered in detail in the 'Fat' chapter of this report, and is therefore not repeated here. In relation to products containing sugar specifically, a variable tax rate is applied, with:

- Pre-packaged sugar-sweetened products taxed at 130 forints (approx. £0.36) per kg;
- 'Sugared cocoa powder' where sugar content is greater than 40g per 100g taxed at 70 forints (approx. £0.19) per kg (interestingly this was reduced to this level in 2012, from the introductory rate of 100 forints (approx. £0.28) per kg in September 2011);
- Jams with sugar content greater than 35g per 100g taxed at 500 forints (approx. £1.39) per kg. These were not within the original scope of the tax, with the tax introduced from January 2012;

- Juice concentrate with sugar content greater than 8g per 100ml and fruit content less than 25% taxed at 200 forints (approx. £0.55) per litre. This was not within the original scope of the tax, with the tax introduced from January 2012;

- Other juices with sugar content greater than 8g per 100ml and fruit content less than 25% taxed at 5 forints (approx. £0.014) per litre from September 2011; since January 2012, milk drinks with milk content of less than 50% were also captured within the scope, and the tax increased to 7 forints (approx. £0.019) per litre;

In 2014, the second full year of the Product Tax's implementation, 84% of Hungarian adults consumed pre-packaged sweets, an increase from 68% in 2012. The WHO Europe assessment of the impact of the tax showed that in 2014, the tax on pre-packaged sweets contributed 49% of the realised tax revenue, with 3.2% of revenue coming from syrups, 0.1% from fruit jam, and 1.4% from sugar-sweetened cocoa powder. (62)

IMPACTS

As with the fat aspect of the Hungarian tax, changes in consumption have been noted in sugary products. 14% of people who brought pre-packaged sweets changed their consumption. In the case of pre-packaged sweets, of those who did reduce consumption, they tended to consume less or buy a different brand. The price increase was cited as a reason for decreasing consumption by 81% of people in 2012, reducing to 66% in 2014. (62)

The WHO Europe assessment also noted that the association between a person's weight and changes in consumption was significant in relation to pre-packaged sweets, with 25% of overweight and 21% of obese people changing their consumption of this product category. Substitution effects were noted, with 95% of people substituting pre-packaged sweets for home-made sweets, 82% substituting to fresh fruit and vegetables, 41% to flavoured milk products and 16% to non-packaged sweets. (62)

MEXICO

The policy background to the Mexican tax is covered in detail in the 'Fat' chapter of this report, and is therefore not repeated here.

Batis et al.'s first-year evaluation of the Mexican tax did not provide analysis of the purchase data related to the chocolate, candies, and sweet bread categories of food covered by the tax. However, analysis of the purchasing of cereal-based sweets showed a decline in purchase of -5.2% beyond the expected decline post-tax implementation. Across all analysed categories, households of lower socio-economic status (SES) were most responsive to the tax, with higher SES households making no significant changes in purchasing behaviour. (64)

FINLAND

Policy Context

Finland imposed excise taxes on non-alcoholic drinks and confectionery for most of the 20th century. This was implemented for revenue-raising purposes. The measure has had a tumultuous 21st century, with it being cancelled in 2000, reinstated in 2011, and mostly cancelled again in 2017 (the tax on candy and ice cream was removed on 1 January 2017).

In 2014, the tax rate was €0.95 (approx. £0.85) per kg by weight for confectionery and ice cream, €0.22 (approx. £0.20) per litre for beverages with more than 0.5% sugar and €0.11 (approx. £0.10) per litre for other non-alcoholic beverages.

An excise tax remains levied on non-alcoholic beverages, excluding milk, non-dairy milks, and ice cubes. Producers with an annual production volume of less than 50,000 litres are exempted from the tax. (17)

One of the reasons for the abolition of the confectionary aspect of the tax in 2017 was that it was considered to fail EU state aid rules, as by targeting specific products, it was not neutral e.g. chocolate and candies were targeted by the tax, but biscuits and mousses were not. Sebastian Hielm, Director of Food Safety at the Ministry of Agriculture and Forestry in Finland was quoted as saying that the result of specific products being targeted by the tax was '…an increase in new biscuit products which had a higher sugar content, resembling candy more and more.' (95)

At the time of writing, no formal evaluation of the Finnish experience in recent years is available. In a 2015 'Head to Head' article in the BMJ, ministerial adviser to the Ministry of Social Affairs and Health in Finland, Sirpa Sarlio-Lähteenkorva, highlighted the challenges of introducing a comprehensive sugar tax for added sugars, such as the administrative burden and implications for international trade. (96)

NORWAY

Policy Context

Norway has had a general sugar tax in place since 1981. Alongside non-alcoholic sugary drinks, the tax covers chocolate, sugar, and sugar products. As of 2017, chocolate and sugar products are taxed at NOK 20.19 (£1.88) per kg, with sugar taxed at NOK 7.81 (£0.73) per kg. (97)

Alongside this, a 'Chocolate Tax' was originally introduced in 1922 to 'boost state income', and critics in 2007 pointed out that the regulations around this meant that 'some products with high chocolate content can escape the tax by being inside an item rather than covering it, or by covering a slightly lower percentage of an item's surface' and it was also applied to 'chewing gum and sugar-free pastilles and drops, but not to many chocolate covered biscuits'. (98)

January 2018 saw the sugar tax rate increase by 83% for 'chocolate and sugar products' and 42% for 'concentrate (syrup)' drinks. (99)

OTHER NATIONS

Some smaller nations - the characteristics of which are not directly transferrable to the Welsh context - have introduced taxes on products containing high sugar content, as cited in the NOURISHING framework (97):

- **Dominica** introduced a 10% excise tax in 2015 for foods and drinks, with the foods including sweets, candy, and chocolate bars. The revenues contribute to a health promotion campaign 'Get Healthy'.
- **Fiji** has had a 10% tax on sugar syrups since 2007.
- **French Polynesia** has introduced an import tax on confectionary and a tax on ice cream, alongside taxes on drinks, since 2002. The proceeds of the tax went towards preventative health between 2002 and 2006, and from 2006 80% of the revenues went towards the general budget, though still intended for health spending.

WELSH/UK POLICY CONTEXT

Wales is party to some of the alternative policy actions taken by the UK Government in relation to sugar reduction targeted at the food production industry.

Public Health England oversee a sugar reduction programme which aims for all aspects of the food industry in the UK to, by 2020, reduce the level of sugar in 'categories that contribute most to the intakes of children up to 18 years' by 20%. These categories include breakfast cereals, yoghurts and fromage frais, confectionary, and biscuits. The food industry was challenged to meet a 5% reduction in the first year of this programme, which was largely not met (breakfast cereals, sweet spreads and sauces and yoghurts and fromage frais were noted as meeting or exceeding the 5% target). A report on progress towards these targets was published in May 2018. This showed that there have been reductions in sugar levels in 5 out of the 8 food categories, with a 2% reduction in total sugar per 100g of retailers own brand and manufacturer branded products. (100) The campaigning group Action for Sugar have recently called for a 'Confectionary levy', based upon the Soft Drinks Industry Levy, aimed at reformulating products 'not on sugar content, but on energy density'. (101)

COMMENTARY AND CONCLUSIONS

Sugar-product taxation has been in place for a number of years in some countries, and are emerging in other countries. As with other topics within this report, there have been different approaches to taxing sugar, with differing levels of taxation and different products being targeted.
One important finding from Hungary is the proportion of adults consuming pre-packaged sweets in Hungary increased following the introduction of their Public Health Product Tax in September 2011, from 68% in 2012 to 84% in 2014. If the tax was intended to change general consumer behaviour, it is clear that in this food category this had an unintended impact two years into the tax, however there was a noted shift in consumption of pre-packaged sweets amongst overweight and obese people observed in 2014 (25% and 21% respectively). It will be interesting to observe levels of consumption in more recent years to ascertain whether this is an emerging trend.

With the devolution settlement as it stands to date, and with Wales being party to the UK Government's Soft Drink Industry Levy, it remains to be seen what form of additional sugar tax Wales could introduce. That said, as the UK Government's sugar tax very specifically about soft drinks, there may well be scope for Welsh Government to introduce a non-beverage sugar tax. Other policy approaches – such as restricting the promotion and sale of high-sugar goods in public institutions and settings, or enhancing public information campaigns promoting low-sugar diets – may be a more feasible action for Welsh Government officials to consider in the short-term.

RED AND PROCESSED MEAT

In this chapter, we use the definitions for red and processed meats provided by Bouvard et al.'s article in The Lancet: "Red meat refers to unprocessed mammalian muscle meat—for example, beef, veal, pork, lamb, mutton, horse, or goat meat—including minced or frozen meat; it is usually consumed cooked. Processed meat refers to meat that has been transformed through salting, curing, fermentation, smoking, or other processes to enhance flavour or improve preservation. Most processed meats contain pork or beef, but might also contain other red meats, poultry, offal (eg, liver), or meat byproducts such as blood." (102)

SUMMARY OF HEALTH RATIONALE

Whilst meat consumption is seen as having some nutritional value, the consumption of meat is high in the United Kingdom - average per capita UK meat consumption is reportedly twice the global average. (103)

In 2015, the International Agency for Research on Cancer (IARC) classified processed meat as carcinogenic to humans based on evidence of links between consumption of the product and colorectal cancer. Red meat was considered 'probably carcinogenic to humans', owing to limited evidence that consumption causes cancer, observed mainly for colorectal cancer but with associations noted for pancreatic and prostate cancers. (102,104,105)

If we consider health in its broadest sense, there are also arguments to be made about excess meat production and its impact on the environment. The Food Ethics Council highlight that 'farming animals accounts for around 15% of global greenhouse gas emissions.' (106) Intensive farming is also linked to increasing levels of antibiotic resistance, with the WHO issuing guidelines recommending a reduction in antibiotic use in food-producing animals to help maintain the effectiveness of antibiotics. (107)

SUMMARY OF STUDIES

There have been very few studies which hypothecate a taxation on meat of any kind; in this section we highlight two which have looked at meat products specifically. Other studies have looked at meat as part of a range of products taxed, and where the direct effects of tax on meat are not extractable from the general findings, these have not been included.

Springmann et al. looked into emissions pricing of food commodities in an article for Nature Climate Change published in 2017. (108) In this paper, the authors considered a range of taxation scenarios, applied globally and in each region of the world, and appraised the agricultural and health impacts, alongside potential emissions reductions. By quantifying Greenhouse Gas (GHG) emissions linked to food production, the authors considered a tax rate for each relevant food product according to their estimated 'social cost of carbon' – this led to a global average GHG tax of $2.8 per kg for beef, $1.3 per kg for lamb, and $0.3 per kg for pork and poultry. This model showed increased food prices and reduced consumption for meat products, and the authors noted that by 2020, globally there would be a total of 124,000 (Confidence Interval 123,500 – 125,000) avoided deaths due to reduced red meat consumption – it was also noted that two-thirds of total emissions reductions globally were due to reduced consumption of beef.

Springmann et al. delivered a modelling study on optimal tax levels and associated health impacts of taxation on red and processed meats in 2018. (109). This study considered the health-related costs associated with red and processed meat consumption, highlighting that under 'optimal taxation' prices of processed meat would increase by 25% on average, with a 16% decrease in consumption. A 9% decrease in deaths attributable to red and processed meat consumption would be observed globally, along with a 14% decrease in attributable health costs globally. The greatest reductions were observed in high and middle-income countries.

A summary of a conference paper by Thiele et al., presented by Schoenbach, quantified the potential health impacts of a processed meat tax. (110) In the simulation, the authors modelled four possible tax schemes with associated price elasticities calculated, then considered potential changes in health outcomes including ischemic heart disease, diabetes and colorectal cancer, along with life expectancy 25 years into the future. They found a range of 39,000 less cases of the three conditions under a 4% tax to 423,000 less cases under a 33.3% tax. Life expectancy was expected to increase by half a week under a 4% tax and by a month under a 33.3% tax.

Säll published a study which simulates a meat tax in Sweden. (111) In this paper, the author considers the potential impact of tax on meat in Sweden, aimed at addressing environmental concerns rather than health impacts. Säll investigates the effects of the hypothetical tax on beef, pork, and chicken.

INTERNATIONAL APPROACHES

DENMARK

The Danish Fat Tax includes meat products within its scope. The policy background to the tax is covered in detail in the 'Fat' chapter of this report, and is therefore not repeated here.

In relation to meat, the initial report which led to the development of the tax discouraged the inclusion of meat as 'it was considered infeasible for food corporations.' A draft of the fat tax bill was reported to the EU Commission, which judged that by excluding meat from the tax's scope, EU laws on state aid were broken. To address this, the Danish Government proposed a standard taxation rate for each animal. Including meat within the scope of the tax, with its anticipated additional revenues, led the proposed fat tax rate to be lowered from DKK 25 to DKK 13 (approx. £2.99 - £1.55). By the 2011 reading of the Bill, the Fiscal Affairs Committee reduced the taxation rate for six out of ten meat types. (36) The tax was to be paid based upon the weight of saturated fat in foods with over 2.3g per 100g.

Meat Product	Standard rate (g/100g)	Real fat content (g/100g)	Current price (€)	Price change (unified tax) €	%	price change (differentiated tax) €	%
Minced beef (9%-15%)	5.2	9%-15%	4.46	0.09	1.95	0.13	2.88
Tenderloin	5.2	2.7	12.44	0.09	0.70	0.03	0.23
Minced pork (9%-15%)	6.5	9%-15%	2.68	0.1	3.91	0.13	4.80
Cumberland sausage	6.5	6.7	3.55	0.1	2.94	0.07	2.02
Cutlet	6.5	4.14	4.20	0.1	2.5	0.04	1.06
Chicken	2.5	3.3	2.68	0.03	1.11	0.04	1.32
Chicken breast	2.5	1	5.59	0.03	1.95	0.01	0.19

Table 8 – Tax rates and price changes for meat under the fat tax law (all cuts are evaluated in 500g packs) Source: Smed, S. 2012. Financial penalties on foods: the fat tax in Denmark (112)

Smed highlighted the price changes for meat under the fat tax (above). (112)

In a 2016 paper, Jensen et al investigated the effects of the tax specifically on meat and dairy products – for meat, they focused on three types of minced beef products: those with ≤ 7% fat; those between 7-11% fat; and those ≥12% fat. Using data from a large supermarket chain covering January 2010 – October 2012, they found that the tax had an 'insignificant or small negative effect' on the price of low/medium fat products, and a 13-16% price rise for high-fat products such as minced beef. Substitution effects were also noted. They concluded that a 4-6% reduction in saturated fat intake from minced beef was probable. (113)

HUNGARY

The Hungarian Public Health Product Tax includes meat products within its scope. The policy background to the tax is covered in detail in the 'Fat' chapter of this report, and is therefore not repeated here.

In relation to meat products specifically, the Product Tax was followed by additional regulations, one of which prohibited the provision and promotion of high fat meats in public canteens. (61)

POLICY PROPOSALS

GERMANY

The Federal Environmental Agency in Germany published a report looking into what they classed as 'environmentally harmful subsidies' in 2017. (114) With VAT on food in Germany standing at 7%, the report authors argue that animal foods, including meat, be taxed at the higher 19% VAT rate to address concerns over the impact of agriculture on climate change, with the additional funds used for making vegetables and public transport cheaper. (115) The proposal was rebuffed by the Federal Environment Minister and Agriculture Minister. (116)

WELSH/UK POLICY CONTEXT

Wales is home to a large livestock industry, with over 200,000 non-dairy cows, 10,000,000 sheep and lambs, and 24,500 pigs. (117) The meat industry in Wales has an annual turnover of over £1 billion and supports around 50,000 jobs. (118) Cattle and sheep farms had an average income of £22,900 in 2016/2017. (119) Policy in Wales is aimed at growing the food and farming industry, though the current food and industry action plan does not include actions relating to farming and food production on farms. (120)

A Welsh Red Meat Levy is in place, paid by both producer and slaughterer/exporter. As of April 2018, the total levy per head is £5.67 for cattle, £1.30 for pigs and £0.87 for sheep. (121)

Meat Promotion Wales is the industry-led organisation responsible for the development, promotion, and marketing of Welsh red meat. It undertakes research and aims to strengthen export opportunities for the industry. (122)

COMMENTARY AND CONCLUSIONS

Studies regarding a theoretical tax on meat have tended to revolve around environmental concerns rather than health impacts, with the envisaged tax targeted at reducing greenhouse gas emissions. Springmann et al.'s recent study, looking at the associated health impacts, is a welcome addition to the literature and provides interesting considerations, pertinent for high and middle income countries. (109) The study adopts cost-of-illness estimates for conditions such as coronary heart disease, stroke, and cancer into its model. The authors acknowledge a number of caveats and assumptions, though these are reasonable. The unknowns of possible substitution effects to other products is also highlighted.

In the Danish example, one of the common criticisms of the tax was that lean cuts of meat were taxed at the same rate as fattier cuts. (36) This highlights the importance in careful design of a tax, for if the goal is to reduce the excess consumption of fat, then variable tax rates for different cuts of meat seems the only viable option. From the 2016 paper from Jensen et al. (113), a reduction of saturated fat intake from minced beef products was noted, though the authors point out that because the average Dane's saturated fat intake exceeds the recommended limit by 40%, the tax has had limited impacts. It should be pointed out that Jensen et al.'s analysis was limited to one group of supermarkets, one meat product and one year of tax implementation, so long-run effects were not observed.

The proceedings from a Food Ethics Council Business Forum seminar on the concept of a meat tax provides insights into current industry thinking about the potential of a tax on meat. Some argued that the threat of a meat tax alone would be influential in changing product formulation and ingredients, as has been observed prior to the introduction of the Soft Drink Industry Levy. The concluding comments show a lack of appetite for a meat tax, but if there was to be one, it would have to be part of a wide-ranging approach. (103)

SECTION

05

INCENTIVISATION THROUGH TAXATION

In the previous section, we looked at the potential for introducing taxes on unhealthy products and services to provide a disincentive to purchasing and using the products and services. An alternative – or in some instances, complementary – approach could be to use the tax system to incentivise greater uptake of healthier alternatives. Methods for the delivery of tax incentives could be through:

- VAT reductions on specific items/services;
- Tax Credits;
- Subsidies.

Owing to the restrictions of the devolution settlement, much of this is not within Wales' powers. In relation to subsidies, much of the current evidence comes from dietary-related articles. Mhurchu et al. modelled the effects of health-related taxes and subsidies on mortality in New Zealand. This was in the form of an econometric-epidemiologic modelling study, and found that a 20% subsidy on fruit and vegetables would result in 560 (95% confidence interval, 400-700) deaths prevented or postponed (DPP). Coupled with taxes on saturated fat and sodium, this would increase to 2,400 (1800 – 3000) DPP, or 8.1% annual all-cause mortality. (64)

The World Cancer Research Fund (WCRF) provides an overview of targeted subsidies related to nutrition through its NOURISHING framework. (97) This is frequently updated, and the latest update (as of 20/06/2018) highlights the following examples of subsidies in place globally – for full details please refer to the WCRF's document:

Country	Summary Detail	Evaluation
Canada	Nutrition North Canada (NNC) - provides a retail-based subsidy to isolated Northerners that enables local retailers and registered suppliers to access and lower the cost of perishable healthy foods like meat, fish, eggs, milk and bread, as well as fruit and vegetables, all of which must be transported by air to these isolated communities.	Galloway, T (2017) (123) Galloway, T (2014) (124)
UK	Healthy Start - provides pregnant women and/or families with children under the age of four with weekly vouchers to spend on food including milk, plain yoghurt, and fresh and frozen fruit and vegetables. Participants or their family must be receiving income support/jobseekers allowance or child tax credits. Pregnant women under the age of 18 can also apply.	McFadden et al. (125)
US	'Health Bucks' – in New York City and Philadelphia, when customers use income support in the form of food stamps to purchase food at farmers' markets, they receive one Health Buck worth $2 for each $5 spent, which can then be used to purchase fresh fruit and vegetables at a farmers' market.	Baronberg et al. (126) Young et al. (127)

Table 9 – Targeted subsidies for healthy food. Source: World Cancer Research Fund (97)

SECTION

06

CONCLUSIONS AND RECOMMENDATIONS

We have seen throughout this report good examples of fiscal policy implementation aimed at reducing the consumption and purchase of health-harming commodities. Where taxes have been introduced – notably in Denmark, Hungary and Mexico – decreasing consumption levels have been observed, as have changes in purchasing behaviour. In particular, the policy measures introduced in Hungary have resulted in successes such as:

- Reduced consumption of the products party to the tax;
- The reduction or removal of particular unhealthy ingredients in food products;
- Consumers substituting taxed products for healthier options, with fresh fruit and vegetables acting as substitutes in 82-86% of cases;
- an increased likelihood of overweight and obese adults changing and reducing their consumption of the taxed products;
- in relation to pre-packaged sweets, price increases because of the introduced tax was a reason cited for reducing consumption by 81% of people in 2012, and 66% of people in 2014; and
- people substituted pre-packaged sweets for other products. Of all those who substituted to one or more product, 82% switched to fresh fruit and vegetables – though 95% also resorted to making sweets at home, and 16% switched to non-packaged sweets, exempt from the tax. (62)

The introduction of a tax in Mexico similarly demonstrated changes in purchasing behaviour. Comparing purchases prior to, and over, the first year of the tax, researchers found a change of -25g per capita per month in the mean volume of purchases of taxed foods in 2014. Stratified by SES, lower SES households purchased on average 10.2% fewer taxed foods than expected, with medium SES households purchasing 5.8% fewer taxed foods than expected. Purchasing of cereal-based sweets showed a decline in purchase of -5.2% beyond the expected decline following the introduction of the tax. (64) After two years, a reduction in the volume of food purchases (1607g, per capita, per month, compared to 1798g prior to the tax), and the rate of reduction in the percentage of taxed foods purchased increased was observed. (65)

The evidence on long-term health improvement is, however, limited, which we feel is largely due to the relatively short history of these taxes being implemented, or in certain cases because health improvement was not a prime purpose of the tax's design. With many public health interventions needing a relatively long-term introduction to be able to demonstrate population health improvements, if introducing a tax aimed primarily at improving health, policy-makers should commit to the long-term introduction of the tax, to be able to accurately and constructively demonstrate the health impacts.

Fiscal measures are demonstrably a powerful tool to address specific public health concerns, although one of many approaches needed. The advancement of public health is a multi-dimensional, complex area, requiring multi-faceted solutions. Taxation of unhealthy products and services may contribute to the reduction of negative health outcomes, and thus improve health, but it is unrealistic to expect this to be the only approach. A range of interventions needs to be in place to improve health, of which fiscal measures may be one. Frameworks such as the World Cancer Research Fund's NOURISHING approach (97) provide examples of the different types of policy interventions in place globally; even though this framework is designed to highlight cancer prevention case studies, the framework could be equally translatable for other health concerns.

Observations from the examples cited in this report show that taxation, particular in the dietary field, can be influential in improving consumer purchasing choices. This has been observed in the examples from Denmark, Mexico, and Hungary. However, in order to measure this for any new tax going forward, baseline consumption data should be collected prior to the implementation of the tax, and ongoing monitoring of purchasing data should be in place. Consideration should also be given to measuring and monitoring the purchase and consumption data of potential substitute products at the earliest opportunity.

Studies referred to in this paper have identified the risk of widening inequities through the introduction of taxes which would disproportionately impact those on lower incomes – highlighting the importance of balanced and proportionate policy design in this field. One way forward to negate any risk of widening inequities if progressing with a new tax may be to use the revenues to fund subsidies of healthier options. This is supported by evidence, but has, to our knowledge, yet to be introduced anywhere. Of note, the World Health Organization considers the potential health gains from food taxes 'may be progressive and contribute to reducing health inequalities' citing that 'higher price sensitivity among low socioeconomic groups means that they may be more responsive to the tax and more likely to reduce their consumption as a result.'

Regarding diet-related taxation, in their systematic review into healthy food subsidies and unhealthy food taxation, Niebylski et al. consider that 'maximum success [is] achieved when food taxes/subsidies are at least 10–15% and used together.' (84) On the balance of evidence considered within the fat, salt and sugar (non-beverage) sections of this report, the present authors believe that this position is the most constructive approach for any envisaged food tax. However, the current devolution settlement presents difficulties in this regard. With limited tax raising powers, and a UK-wide food industry and system, it remains to be seen how a feasible 'tax and subsidy' scheme could be enacted in Wales alone, but it is an option that should be explored further.

If considering introducing a health-related tax, it would be important to have input from a range of sectors and disciplines. Observers of the Danish fat tax example cite the lack of involvement of public health professionals or the Danish Food Ministry in the design and implementation was one of its failings. (128) A co-ordinated, consistent voice can only help with policy design, implementation and ongoing monitoring, and reduce the risk of policy failure. Any multi-disciplinary group must involve expertise from the fields of public policy, public finance, public health, research and evaluation, and topic-specific representation. Undertaking a Health Impact Assessment (HIA), and following HIA approaches, is highly recommended in all cases.

Evaluation at regular intervals must be planned from the outset, and time should be spent exploring the potential unintended consequences of the tax. The public must be engaged, from the outset and as part of ongoing monitoring. Further research prior to proceeding with a potential introduction could include conducting country and product-specific economic modelling studies, to ascertain the current levels of consumption – this research could be designed in such a way that 'before' and 'after' consumption levels are captured consistently, should a fiscal measure be subsequently introduced.

Regarding diet-related taxation, it is clear from international examples that there are pros and cons to the approach of taxing specific ingredients or whole product groups. For example, in the Danish example, standard taxation was applied to all meat cuts, meaning lean cuts were treated in the same manner as fattier cuts, whereas the Hungarian example is very specific about particular products, and this has resulted in amendments to the policy and addition of additional products since the original implementation. If introducing a diet-related tax, careful consideration over what is to be taxed, at what level and on what amount of content should be a high priority in any proposed policy design.

In the Welsh context, we must bear in mind that a number of the items considered in this report (notably meat and salt) form a cornerstone of the Welsh food production industry, through examples such as Anglesey salt and livestock farming. Any attempts to introduce fiscal measures aimed at restricting or reducing consumption of these products are likely to be met with opposition by organisations such as trade and industry representatives and free-market think-tanks. We reiterate the need for a HIA approach to be followed in all new policy and/or legislative proposals in this field, which, through its design, would capture the views of a range of stakeholders, including the public and industry. Coupled with the policy impact assessments undertaken in all new policy and legislative proposals in Wales, the views of all should be captured and reflected upon – but the potential for health improvement should remain paramount.

It is also important to reflect the potential impact of the UK leaving the EU ('Brexit') on food availability and production. The Institute for Fiscal Studies has highlighted the amount of food imported to the UK from the EU, reflecting that changes in the costs of import will likely affect the cost to consumers of food products. (129) A Health Impact Assessment undertaken by Public Health Wales has appraised relevant evidence to identify potential direct and indirect impacts of Brexit on food supply and access. (19) Our report has been written in the assumption of no major changes to food supply, pricing and availability – the realities of Brexit may not subsequently reflect this assumption, therefore the reader, and policy-makers in particular, should appraise our findings and recommendations in light of the actual facts of Brexit when they come to light.

WHAT COULD CONSTITUTE EFFECTIVE TAXATION?

As was seen in the examples of international implementation of various taxes considered in Section 4 of this report, there have been a mixture of revenue raising and health improvement motivations of Governments, and confusion has been noted in various examples on the purpose of certain taxes and the specific items to be taxed, and at what level. After considering all available and relevant evidence, we believe that an effective, influential tax would depend upon policy-makers being able to consider and address the following:

- Is there a risk that the tax would exacerbate existing inequities in income and health, and if so, what steps could be put in place to negate this risk? Are the risks outweighed by the potential benefit of decreased consumption of the unhealthy product by those most likely to purchase it?
- What is the clear purpose for the tax? Is it for health improvement, revenue raising, or both?
- Are we looking to tax specific products/services or a group of products/services?
- Is there a risk of consumers substituting the taxed item to another similarly unhealthy product? Can this be prevented?
- Do we know the baseline purchase and consumption data for Wales for the products proposed to be taxed? If not, can we collect this prior to, and during, the implementation of the tax?
- Has a monitoring and evaluation plan been designed from the outset? This should include measurement of purchasing and consumption behaviour; ongoing monitoring of the changes in consumption during the taxation implementation period; opinion gathering from public, industry and other relevant stakeholders; and appropriate economic metrics.
- Will price changes be passed on directly to consumers, or is this to be a levy applied on producers/service providers?
- Is there a risk that price changes could lead to cross-border trade in border communities, and if so, how can this risk be reduced?
- Are relevant experts identified to form a multi-disciplinary Advisory Panel to design and oversee the policy?

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APPENDIX 1

SEARCH METHODOLOGY

Below are the search methods used to gather relevant material for this report.

FAT

PUBMED

Search conducted 30/04/2018

Search string: (((health) AND (fat OR "high fat" OR "saturated fat") AND (tax*[Title/Abstract] OR levy[Title/Abstract] OR levied[Title/Abstract] OR excis*[Title/Abstract])) NOT ("taxonomy" OR "syntax" OR "excision" OR "taxonomic" OR "taxonomically" OR "taxane" OR "taxi" OR "taxonic" OR parasit* OR microbial OR phenotyp*)

Filters: published in last 10 years, English language

Results = 154

Additional filters applied (results in brackets): article type: review (15)

GENERAL GOOGLE SEARCH

"fat tax" site:.org.uk OR site:.ac.uk OR site:.org OR site:.gov.uk OR .site:.ac.uk. **Restricted to publications from 14th May 2008 – 14th May 2018, results from first five pages considered.**

SALT

PUBMED

Search conducted 27/04/2018

Search string: (((health) AND (salt OR sodium chloride)) AND (tax*[Title/Abstract] OR levy[Title/Abstract] OR levied[Title/Abstract] OR excis*[Title/Abstract])) NOT ("taxonomy" OR "syntax" OR "excision" OR "taxonomic" OR "taxonomically" OR "taxane" OR "taxi" OR "taxonic" OR parasit* OR microbial OR phenotyp*)

Results = 92

Filers Applied (results in brackets) – Publication dates: 10 years (50) + article type: review (8)

OVID

Search conducted 27/04/2018

Databases: Embase 1974 to 2018 April 26; HMIC Health Management Information Consortium 1979 to January 2018; Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present; PsycINFO 1806 to April Week 4 2018; Books@Ovid April 23, 2018; Ovid Journals Database; NHS Wales Full Text Journals

Search String = ((health and (salt or sodium chloride)).mp. and (tax* or levy or levied or excis*).ab.) not ("taxonomy" or "syntax" or "excision" or "taxonomic" or "taxonomically" or "taxane" or "taxi" or "taxonic" or parasit* or microbial or phenotyp*).mp. [mp=ti, ab, hw, tn, ot, dm, mf, dv, kw, fx, dq, nm, kf, px, rx, an, ui, sy, ds, on, tc, id, tm, tx, bt, sh, ct]

Filters: published in last 10 years

Results: total, 340. Further filter applied to limit to review or original articles = 44 results

SUGAR (NON-BEVERAGE)

PUBMED
Search conducted 24/07/2018

Search string: ((((health) AND (sugar) NOT (soda OR soft drinks OR beverage* OR drinks))) AND (tax*[Title/Abstract] OR levy[Title/Abstract] OR levied[Title/Abstract] OR excis*[Title/Abstract]))

Results: 53
No filters applied.

MEAT

PUBMED
Search originally conducted April 2018, re-run 07/08/2018 prior to writing chapter to ensure currency.

Search string: (((health) AND (Meat) AND (tax*[Title/Abstract] OR levy[Title/Abstract] OR levied[Title/Abstract] OR excis*[Title/Abstract])) NOT ("taxonomy" OR "syntax" OR "excision" OR "taxonomic" OR "taxonomically" OR "taxane" OR "taxi" OR "taxonic" OR parasit* OR microbial OR phenotyp*)

Results: 9

No filters applied.

[Note: vast majority of material for this chapter identified through snowballing, and present in more general publications (e.g. articles about food/diet generally)]

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