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**TAX006 Is sugar tax likely to succeed in its objective of curbing obesity
in South Africa?**

AUTHOR(S): Nasreen Seedat University of n1seedat@gmail.com
 Depika Singh Witwatersrand Depika.Singh@wits.ac.za

ABSTRACT:

Obesity is on the increase in South Africa; resulting in burgeoning public health care costs. This is because obesity is a contributing factor to many diseases including diabetes mellitus, ischaemic heart disease and hypertension. The consumption of sugar-sweetened beverages has been linked to such weight gain and obesity. Consequently, a sugar tax on sugar-sweetened beverages has been proposed to curb obesity in South Africa. This was due to come into effect on 1 April 2017. It has been postponed from 1 April 2017 due to delays in the parliamentary process.

A literature review was performed to determine whether, based on international experience and findings, sugar tax is likely to curb obesity in South Africa. Various electronic articles as well as published local and international journal articles were consulted to provide evidence in this regard.

From the literature review performed it appears that the mere implementation of sugar tax is not likely to curb obesity in South Africa; yet coupled with other methods, sugar intake and obesity may be reduced.

Key words: Sugar tax, obesity, sugar-sweetened beverages, diabetes mellitus, and fat tax

INTRODUCTION

Background

Sugar addicts will be required to spend more on their sugar-sweetened drinks from April 2017 (Mapumolo, 2016:1). The South African Minister of Finance, Pravin Gordhan, announced in his Budget Speech that government would be implementing sugar tax on all sugar-sweetened beverages (Chinyanga, 2016:1). This is said to be in a bid to curb obesity in South Africa as part of the South African Department of Health's intention to reduce obesity by 10% by 2020 (Chinyanga, The New Age, 2016:1).

Obesity is a contributing factor to many diseases including diabetes mellitus, ischaemic heart disease and hypertension that place significant pressure on the country's health care system (Mapumolo, 2016:1). The South African economy lost approximately R29 billion between 2009 and 2015 due to these diseases with obese workers requiring 49% more paid time off than those who are not obese (Mapumolo, 2016:1).

The Treasury's deputy-director general for Tax and Financial Sector Policy, Ismail Momoniat, stated that the aim with implementing sugar tax is to reduce the consumption of sugar-sweetened beverages by making the beverages more expensive; not to raise additional tax revenue (Kahn, 2016:1). There is, however, no doubt that the additional tax revenue created will be an added benefit to Treasury; given the burgeoning budget deficit (Chinyanga, 2016:1).

Karen Hofman, professor in Public Health at the University of the Witwatersrand, is of the opinion that if this tax is not implemented, 250 000 more South Africans will become obese within the next three years. Obesity in an additional 250 000 people may thus be prevented, if implemented (Mapumolo, 2016:1).

Research problem and questions

The objective of this research report is to address the following research problem:

Is sugar tax likely to succeed in its objective of curbing obesity in South Africa?

To achieve this objective, the following research questions have been formulated

What is the relationship between sugar intake and obesity?

Which other countries implemented Sugar Tax regulations and why were these countries relevant for inclusion in the research study?

What do the sugar tax regulations of these other countries entail?

What were the recommendations for and the criticisms against the regulations of these respective countries?

Based on available research, did the implementation of sugar tax in these countries curb obesity in their citizens?

What do the proposed sugar tax regulations in South Africa entail?

Considering the success or failure of sugar tax in other countries in curbing obesity, is sugar tax likely to succeed in its objective of curbing obesity in South Africa?

Which alternative methods should rather be considered to curb obesity in South Africa?

Importance and relevance of the research

The proposal for the implementation of sugar tax by the South African Minister of Finance, Pravin Gordhan, brought about much criticism; with many purporting it will not be effective in curbing obesity. The Beverage Association of South Africa indicated that its goal of curbing 'excessive sugar intake' had failed overseas (Isaacs, 2016:1). Another criticism was that the tax would be slightly regressive with low-income consumers paying more tax than high-income consumers as lower-income earners tend to consume sugar-loaded products (Chinyanga, 2016). Others have stated that South Africa was becoming a "Nanny State" with the introduction of yet another sin tax (Chinyanga, 2016:1). The Beverage Association of South Africa stated that sugar-sweetened beverages accounted for less than 10% of daily caloric intake and therefore the tax would not be effective in reducing sugar intake (Appasamy, 2016).

Joe Maila, spokesman to the South African Minister of Health, Aaron Motsoaledi, stated that sound evidence exists demonstrating that price significant influences consumers' demand for products. Research completed by the South African Department of Health and the Centre for Diabetes demonstrated that sugar tax is the most effective method to combat obesity (Appasamy, 2016).

Karen Hofman, professor in Public Health at the University of Witwatersrand stated that, not only had research proven that sugar tax will curb obesity in South Africa, but that the tax will also encourage South African citizens to reconsider their sugar intake and will cause them to make healthier food choices (Mapumolo, 2016:1).

Research methodology

A literature review was performed to ascertain whether, based on international experience and findings, sugar tax was likely to curb obesity in South Africa. Various electronic articles as well as published local and international journal articles were used to provide evidence in this regard.

Scope and Limitations

Scope of research report

The scope of the research report was limited to analyses of the following countries i.e. United Kingdom, Mexico, United States of America, Denmark and South Africa. The aforementioned countries were selected for inclusion in the research report for the following reasons:

Firstly, sugar tax is considered to be most effective in countries with a high prevalence of obesity and high soft drink consumption by the general population (Jou & Techakehakij, 2012).

The United States of America, United Kingdom, Mexico and South Africa have amongst the highest rates of obesity in the world. This is evident from the following:

In the United States 40.4% of women are obese, with Mexico at 37.5% of and the United Kingdom at 26.8%. This is comparable with the 39.2% of South African women who are obese (World Obesity Federation, 2012).

Significant soft drink consumption is further noted in the United States of America, United Kingdom, Mexico and South Africa (Jou & Techakehakij, 2012; National Treasury, 2016:7). In the United States, citizens consume approximately 203 000 calories per day attributable to soft drinks. In Mexico, an average of 120 000 calories attributable to soft drinks are consumed daily. In the United Kingdom women consume 63 grams of sugar per day; men consume 22 grams of sugar daily. This is only in respect of sugar-sweetened beverage (Jou & Techakehakij, 2012). South Africans consume approximately 184 millilitres of sugar-sweetened beverages per day (Manyema *et al.*, 2014: 4). On average, 35 grams of sugar are contained in a 330 millilitre can of coke (National Treasury, 2016:3). According to the World Health Organisation the daily normal intake of sugar should be 25 grams (Jaslow, 2014).

Secondly, the per capita consumption of sugar-sweetened soft drinks in South Africa has increased from 39 litres per annum in 2011 to 48 litres per annum in 2016 and it is expected to continue to grow (Business Monitor International, 2012).

South Africa should thus study countries with similar obesity and soft drink consumption trends to identify the most effective methods to curb obesity; albeit it is sugar tax.

Finally, Denmark implemented a tax on soft drinks during the 1930's, but it was abolished in 2014 (EU Food Law, 2013). The reasons as to why this long standing tax law was abolished is considered to be relevant to the research and will be considered in determining the efficacy of sugar tax in curbing obesity in citizens. Denmark is thus included in the research report; albeit the country does not have a high obesity rate or a rate of soft drink consumption.

Limitations of the research report

The scope of the research was limited to the following countries i.e. United States of America, United Kingdom, Denmark, Mexico and South Africa.

Sugar tax has not yet become effective in South Africa; it is thus difficult to estimate the true impact and outcome of the tax. Further, no clinical research regarding the impact of sugar tax on obesity in South Africa is available at present.

THE RELATIONSHIP BETWEEN SUGAR TAX AND OBESITY

Introduction

Sugar is not only present in its natural form in many food stuffs; many soft drinks, juices, canned foods, sauces, cereals and others contain added sugar (Khanna, 2016:1). Such added sugar is typically refined sugar i.e. natural cane sugar of which the fibre is removed (Chinyanga, 2016). Many of these foods also contain added sugar in the form of fructose corn syrup that is considered to be more harmful than refined sugar (Khanna, 2016:1).

The consumption of soft drinks accounts for approximately 10.3% of the daily caloric intake (Teagle, 2016). The World Health Organization recommended that added sugar should not exceed 5% of the daily calorie intake (Teagle, 2016).

According to the Harvard School of Public Health every can of soft drink contains approximately 10 teaspoons of sugar (Chinyanga, 2016). Modern lifestyle has caused a shift to fast food consumption with increased portion sizes and an unprecedented increase in the consumption of soft drinks. South Africa ranks within the top 10 consumers of sugar-sweetened beverages worldwide (Child, 2014).

The correlation between sugar intake and obesity

Sugar-sweetened beverages do not provide the feeling of 'fullness' associated with food and are typically consumed as an addition to a meal; resulting in the consumption of more calories than had one just consumed the food alone (National Treasury, 2016:6).

Sugar, not utilised for energy, is converted in the liver into fatty acids that are stored as excess fat. The body also produces an insulin hormone in order to lower blood glucose levels; yet when the blood glucose level drops significantly, one craves and consume sugar again to compensate for it (Hand, 2009). Furthermore, according to a registered dietician, Judith Johnson, where the cells of the body become resistant to the insulin, any sugar intake may be harmful (Health24, 2016).

The harmful effects of increased sugar intake and obesity

The harmful effects of sugar have been the subject of much scrutiny in the last few years. It has been established that sugar is not merely empty calories; it has harmful effects much worse than initially thought (Khanna, 2016:2).

As indicated above, a diet high in sugar contributes to obesity. Obesity is a cause of many lifestyle diseases including hypertension, ischaemic heart disease, cerebrovascular events and diabetes mellitus (Manyema *et al.*, 2014:1). Diabetes mellitus may lead to amputations, blindness and kidney failure (Mapumolo, 2016). The risk of disease increases directly with an increase in weight (Mapumolo, 2016). According to the World Health Organisation these diseases account for 2.8 million deaths annually (Manyema *et al.*, 2014:1). In South Africa, approximately 2 million South Africans have been diagnosed with types 1 and 2 diabetes mellitus (Mapumolo, 2016). Type 2 diabetes is linked directly to obesity (Mapumolo, 2016). It is estimated that 5 million more people in South Africa are living with the disease without diagnosis (Mapumolo, 2016).

Obesity increases health care costs, mortality rates and sick days in South Africa (Chinyanga, 2016). It reduces productivity and lessens a quality of life (Chinyanga, 2016). Many obese children are tormented about their weight resulting increased absenteeism from school, low self-esteem, depression and social isolation (Telegraph, 2016).

Obesity rates in South Africa

Various studies have been performed in respect of obesity rates in South Africa. In a study published by Lancet, South Africa was identified as the country with the highest overweight rate in sub-Saharan Africa. It was found that 7 out of 10 women and 4 out of 10 men were

overweight (Chinyanga, 2016). Similar statistics were demonstrated in a study by the University of Washington's Institute for Health Metrics and Evaluation (Health24, 2016).

A study performed by the pharmaceutical company GlaxoSmithKline, indicated that South Africa was the third most obese nation worldwide.

It was found that 61% of South Africans were overweight or obese; the global rate was just under 30% (Chinyanga, 2016). The shift towards fast food consumption has caused South Africans to not only be obese but malnourished as well (Teagle, 2016).

Research by Karen Hofman, professor in Public Health at the University of the Witwatersrand revealed that the South African economy lost R29 billion between 2009 and 2015 due to diseases caused by obesity. Obese workers cost their employers 49% more than non-obese workers in the form of paid leave (Mapumolo, 2016). Obesity caused an increase in health care costs in South Africa, of between 11% and 23%, depending on the severity of the obesity or comorbid disease. (Manyema *et al.*, 2014: 1-2)

Conclusion

Excessive sugar intake has been proven to cause obesity. Following an increase in the consumption of fast foods and soft drinks by its citizens, South Africa has become one of the most obese countries worldwide. Consequently, an increase in lifestyle diseases as well as an increase in public health costs were noted.

INTERNATIONAL FINDINGS IN RESPECT OF SUGAR TAX

Introduction

Many countries have already implemented a sugar tax and many more are considering its implementation (World Cancer Research Fund International, 2016:1-6).

The following countries have already implemented a form of a sugar tax:

Barbados implemented a 10% sugar tax from 1 August 2015 on sugary drinks. The revenue realised from this tax will be utilised within the health care sector (World Cancer Research Fund International, 2016:1). Belgium increased its health tax by €0.03; resulting in a tax of €0.068 per litre of soft drinks from 1 January 2016. This tax applies to all sugar-sweetened beverages. Furthermore, any substance utilised in the soft drink manufacturing process is also taxed at €0.41 per litre if liquid and €0.68 per 100 kilograms if powder (World Cancer Research Fund International, 2016:1). Chile increased its tax on sugar drinks, with a sugar content greater than 6.25 grams of sugar per 100 millilitres, from 13% to 18%; effective from January 2015. Soft drinks with a sugar content less than 6.25 grams per 100 millilitres are taxed at 10% (World Cancer Research Fund International, 2016:2). The Dominican Republic implemented 10% sugar tax on all food and drinks with a high sugar content from 1 September 2015. Foods with a high sugar content include *inter alia* chocolate and sweets (World Cancer Research Fund International, 2016:2). Finland had a tax on candy and non-alcoholic beverages. This tax will be scrapped with effect from 1 January 2017 (World Cancer Research Fund International, 2016:2). It was implemented in 2011. The reason for its removal is that not all sugary products fell within the tax net and thus some products became more expensive to produce (Hofverberg, 2015).

France implemented a soda tax from January 2013 at €0.11 per 1.5 litre of soda (World Cancer Research Fund International, 2016:2). French Polynesia implemented a tax on sugary foods and drinks in 2003 (World Cancer Research Fund International, 2016:2). Hungary has a health tax on food and drink high in salt, sugar and caffeine content at varying rates. Soft drinks are taxed at \$0.24 per litre. Other drinks that contain sugar are taxed at \$0.47 per litre (World Cancer Research Fund International, 2016:3). Mauritius implemented a sugar tax on soft drinks in January 2013. It is MUR 0.3 per gram of sugar content (World Cancer Research Fund International, 2016:3). Samoa implemented a tax on soft drinks in 1984. The rate is 0.4 Samoan Tala per litre (World Cancer Research Fund International, 2016:3). St Helena introduced a tax on soft drinks on 27 May 2014. The rate is at £0.75 per litre (World Cancer Research Fund International, 2016:3) and Tonga implemented a tax on soft drinks at 1 Tonga Pa'anga per litre (World Cancer Research Fund International, 2016:4).

Countries included in research report for further study

Only the following countries will be analysed in this research report in respect of sugar tax i.e. United Kingdom, Mexico, United States of America, Denmark and South Africa.

United Kingdom

In the 2016 budget speech Chancellor George Osborne announced that the United Kingdom would levy a sugar tax on sugary drink manufacturers (Fisher, 2016). This comes in response to concerns regarding the increasing rate of obesity amongst children in the United Kingdom (Triggle, 2016). The tax amount levied will depend on the sugar content in the sugar-sweetened beverage (Triggle, 2016). The tax will only come into effect during 2018, thus providing soft drink manufacturers with an opportunity to reformulate their product recipes and sugar content (Fisher, 2016).

Beverages with a sugar content exceeding 5 grams per 100 millilitres will be taxed at a rate of £0.18 per litre (Triggle, 2016). Beverages with a sugar content exceeding 8 grams per 100 millilitres will carry a tax of £0.24 per litre. Examples of beverages with high sugar content include Coke® and Pepsi® whilst those with lower sugar content include Fanta® and Sprite®. Pure fruit juices and milk-based beverages will be exempt from sugar tax (Triggle, 2016).

According to Chancellor George Osborne this tax will raise an income of approximately £520 million per year. It will be utilised to fund sport in primary schools in England. Tax revenue raised in the rest of the United Kingdom will be spent according to the discretion of the 'devolved administrations' of Scotland, Wales and Northern Ireland (Triggle, 2016).

Arguments in favour of sugar tax in the United Kingdom

Those in support of the sugar tax have lauded the tiered system of levying the tax. Drinks with a sugar content of less than 5 grams per 100 millilitres will be exempt from sugar tax (Triggle, 2016). Those with a medium sugar content of between 5-8 grams per 100 millilitres will be charged £0.18 per litre and drinks with a sugar content exceeding 8 grams per 100 millilitres will be charged £0.24 (Triggle, 2016). This is believed to encourage consumers to select drinks with lower sugar content (Marron, 2016).

Manufacturers may opt to lower the sugar content of beverages and increase marketing of beverages with low sugar content (Marron, 2016).

Another favourable aspect of the sugar tax is that small producers will be exempt from this tax (Triggle, 2016).

Criticism against sugar tax in the United Kingdom

There has been much opposition to this tax with the following reasons being cited:

- Firstly, despite the tax being imposed on soft drink manufacturers, consumers will ultimately bear the burden as increased costs will be transferred onto them directly. The sugar tax will affect poor citizens most as a larger percentage of their earnings are spent on paying taxes (Quince, 2016);
- Secondly, the sugar tax will increase inflation. The British Government will have to pay £1 billion upfront in 2018 and 2019 due to the increased costs of borrowing as a result of inflation increases (Quince, 2016);
- Thirdly, milk-based drinks that will be exempt from sugar tax may contain more sugar than soft drinks. Other foods including *inter alia* sweets, chocolate and cereal that may have a high sugar content will not be taxed (Quince, 2016); and
- Finally, some people believe even more tiers are required for the tax to be effective in curbing sugar intake (Marron, 2016).

Mexico

Mexico implemented a sugar tax on sugar-sweetened beverages in response to the increased obesity rates (Guthrie & Esterl, 2016). Mexico has the highest per capita soda consumption worldwide (Guthrie & Esterl, 2016). During 2012, the average Mexican citizen consumed 163 litres of sugar-sweetened beverages (Pineda, 2016).

One 330 millilitres can of Coke® alone represents 7% of daily caloric intake (Coca-Cola). This is well in excess of the recommendation made by the World Health Organization namely that added sugar be limited to 5% of the daily calorie intake (Teagle, 2016). The aim of the sugar tax was to reduce soda consumption and lower burgeoning obesity rates (Guthrie & Esterl, 2016).

Mexico implemented the sugar tax in January 2014. The tax was imposed on all sugar-sweetened drinks; whether in the form of powder, syrup, flavour extract or actual sugar. This includes *inter alia* soda drinks, fruit juices, energy drinks and milk products. The tax is levied at a rate of 1 Mexican Peso per litre of sugar-sweetened beverage (Pineda, 2016).

The estimated revenue from the sugar tax was expected to equate £ 693 million (Pineda, 2016). The revenue, however, raised was a third more than estimated (Guthrie & Esterl, 2016). Regrettably, the revenue raised was not utilised to combat obesity. (Pineda, 2016)

Arguments in favour of sugar tax in Mexico

According to research published in the British Medical Journal the tax on sugar-sweetened beverages cut the sales of soft drinks by 12% in the first year (Colchero *et al.*, 2016: 352). In poorer households the drop was even more significant with a drop in sales of 17% noted (Telegraph, 2016). Research performed across 53 cities in Mexico (including more than 6 200 households) demonstrated that the average person purchased 4.2 litres less sugar-sweetened beverages (Telegraph, 2016). Non-sugar sweetened beverages and bottled

water gained popularity with an increase in sales of 4% during 2014 (Pineda, 2016). According to Tom Sanders, professor of Nutrition and Dietetics at King's College in London, Mexico is a poor country and therefore a sugar tax would have greater impact upon sugar-sweetened soft drink sales (Telegraph, 2016). It was estimated that the reduction in consumption would reduce obesity by 1%.

Dr Juan Rivera Dommarco, director of the Mexican Research Centre in Nutrition, noted that more than 400 000 cases of diabetes would be prevented by 2050 if the tax remained (World Health Organisation, 2016: 240).

Research demonstrated that consumers consumed less soda drinks following an educational campaign that linked diabetes mellitus to sugar-sweetened beverages (Guthrie & Esterl, 2016).

Criticism against sugar tax in Mexico

Soft drink manufacturers in Mexico claim that sugar-sweetened beverages form less than 10% of daily caloric intake and therefore the tax cannot be effective in curbing obesity (Guthrie & Esterl, 2016).

According to a study performed by the Beverage Marketing Corporation, the implementation of the sugar tax system resulted in the loss of 3 000 jobs in Mexico in the first quarter of 2014 (Guthrie & Esterl, 2016). It also demonstrated that the average daily caloric intake decreased by just 0.2% in Mexico (Guthrie & Esterl, 2016).

The National Institute of Public Health in Mexico is of the opinion that a higher levy is needed for the tax to be effective. Mexican Senator, Armando Rios Piter, considered doubling the tax rate to decrease the burgeoning health costs associated with increased morbidity due to soft drink consumption (Guthrie & Esterl, 2016).

United States of America

A tax on sugar-sweetened beverages was only implemented in two cities in the United States i.e. Berkeley and Philadelphia (Sanger-Katz, 2015, The Guardian, 2016).

Sugar tax in Berkeley came into effect in March 2015 at a rate of \$0.01 per ounce of sugar-sweetened beverage (Sanger-Katz, 2015; Krugel *et al.*, 2016: 4). The rate for syrups (used to sweeten drinks) was calculated taking into account the volume produced by the syrup (Ecology Center, 2016). The tax was imposed on drinks high in sugar content and low in nutrient content i.e. soda drinks, energy drinks, sugar-sweetened juices and syrups used to sweeten drinks. Pure fruit juices and drinks with milk as primary ingredient were exempt from the tax (Ecology Center, 2016). In contrast to taxing the beverage manufacturers, the tax was imposed on the companies distributing these beverages throughout Berkeley and was added to their license fee (Ecology Center, 2016).

Sugar tax on sugar-sweetened beverages became effective in Philadelphia on 16 June 2016. The tax was levied at a rate of \$0.015 per ounce of sugar-sweetened beverage. The tax was estimated to raise revenue of \$90 million in its first year.

Funds were to be utilised to fund pre-kindergarten facilities, community schools and recreation centres (The Guardian, 2016).

Arguments in favour of sugar tax in the United States

Berkeley community leaders advocated for a sugar tax, to combat the rise in diabetes mellitus amongst its citizens; particularly its children (Ecology Center, 2016; World Health Organisation, 2016). It was found that 40% of grade 9 students in Berkeley were overweight (Ecology Center, 2016). It was estimated that 2 in 3 Californian teenagers consumed a sugary drink each day (Ecology Center, 2016). These drinks were considered to be the primary source of sugar in American diets (Ecology Center, 2016). It was noted that the sugar contained in soft drinks increased the risk of developing type 2 diabetes mellitus more than the sugar present in food (Ecology Center, 2016).

A panel of health experts were established to advise the Berkeley City Council how to best apply the tax revenue raised in order to promote a healthy lifestyle amongst children and reduce sugar intake (Ecology Center, 2016). As at March 2016, \$1.5 million was raised from the sugar tax (Ecology Center, 2016). It was utilised to establish school gardening programmes (Ecology Center, 2016).

It was agreed that the objective of the sugar tax i.e. to promote the health of Berkeley citizens was achieved. Implementation of the tax further raised awareness about the direct relationship between sugar intake, obesity, diabetes mellitus and other comorbid diseases. Tax revenue raised will continue to be utilised in programmes to promote health and reduce the consumption of sugar-sweetened beverages (Ecology Center, 2016).

Research performed by the Public Health Institute in Oakland and the University of North Carolina demonstrated that the tax was passed onto consumers by supermarkets and small businesses. This was a significant step in reducing consumption that could lead to a reduction in obesity and related comorbid diseases such as diabetes mellitus. (Lochner, 2015)

The improvement of public health in Philadelphia where more than 68% of adults were overweight was regarded as an added benefit of the tax (The Guardian, 2016).

Arguments against sugar tax in the United States

Many reports have demonstrated that this tax has in fact failed to reduce consumption. People in Berkeley already travel extensively to purchase groceries; thus the risk of cross-border shopping (and seemingly reduced local consumption) is high (Sanger-Katz, 2015; Krugel *et al.*, 2016:4).

The prices of sugar-sweetened beverages did not increase as significantly as those in other countries; therefore, there would not be as high a reduction in consumption rates nor as large an improvement in health (Sanger-Katz, 2015; Krugel *et al.*, 2016:4). Less than half of the tax was passed onto consumers (Crawley & Frisvold, 2015). It was estimated that only 22% of the tax was passed onto consumers of Pepsi® and Coke® (Boscia, 2015).

Denmark

Denmark abolished its sugar-sweetened beverage tax on 1 January 2014; a tax that had been effective since the 1930's (UNESDA, 2013). It was a gradual abolishment: First a 50% reduction in July 2013 and then a complete abolishment from January 2014 (UNESDA, 2013). This was in a bid to increase employment and growth within Denmark (UNESDA,

2013). In 2013, the tax was imposed at a rate of €0.22 per litre (The Spectator, 2016). Despite it grossing €60 million in tax revenue each year, €38.9 million in VAT was conceded due to the purchase of illegal soft drinks (The Spectator, 2016).

Arguments in favour of sugar tax in Denmark

The sugar tax raised tax revenue of €60 million per year. The tax was implemented with the objective of reducing sugar intake. At the time of abolishment, 7% of Danes had reduced their sugar intake (The Spectator, 2016).

Criticism against sugar tax in Denmark

There were several reasons for the abolishment of the tax. It was purported that the negative consequences outweighed the benefits. One reason was the regressive nature of the tax. Another was the impact of cross-border shopping on employment in the regions near borders. It was estimated that 5 000 jobs were lost due to it. Cross-border shopping also affected the environment adversely (UNESDA, 2013).

Denmark also scrapped a fat tax that was in place for a year. The tax was initially implemented in a bid to improve the health of Danish citizens (EU Food law, 2013). This tax was levied at a rate of £1.78 on any food containing more than 2.3% saturated fat (Snowdon, 2015; The Spectator, 2016).

The criticism against it was the same as for sugar-sweetened beverage tax i.e. cross-border shopping adversely affecting employment (Snowdon, 2015). It inflated food prices, raising the cost of living (Snowdon, 2015; EU Food law, 2013). Some citizens merely continued to purchase fatty food opting for cheaper brands; defeating the purpose of improving health (Snowdon, 2015). A minimal decrease in obesity was noted (Snowdon, 2015). Only 7% of Danes reduced their intake of fatty foods (The Spectator, 2016).

Conclusion

A sugar tax was implemented in many countries in a bid to curb obesity. Research has shown that the effect of a sugar tax on obesity rates has been minimal and will need to be coupled with alternative methods to be effective.

The implementation of sugar tax has further brought many negative consequences: increased unemployment, rates of inflation and cross-border shopping.

SUGAR TAX IN SOUTH AFRICA

Background

On 8 July 2016, the South African National Treasury released a policy paper regarding the taxation of sugar-sweetened beverages in South Africa. This followed the announcement by Minister of Finance, Pravin Gordhan, that a tax on sugar-sweetened beverages would come into effect from 1 April 2017 in order to curb growing obesity rates due to excess sugar intake. (National Treasury, 2016:1-2)

Obesity is the primary cause of various non-communicable diseases including *inter alia* diabetes mellitus and cardiovascular disease. As part of the

Strategic Plan for the Prevention and Control of Non-communicable Diseases (2013 – 2017) and the National Strategy for the Prevention and Control of Obesity (2015- 2020), the Department of Health undertook to reduce obesity by 10% by 2020. The imposition of a sugar tax was to facilitate the realisation of this objective. (National Treasury, 2016:2)

The sugar-sweetened beverage market in South Africa has grown rapidly in the last 20 years (National Treasury, 2016:7). This has been due to an increase in the 'affordability, availability and acceptability' of sugar-sweetened beverages (National Treasury, 2016:7). Soft drinks are regarded as the most popular drink consumed by children in urban areas (National Treasury, 2016:7). As this may become a habit, many children may continue to consume soft drinks regularly as they grow older (National Treasury, 2016:7).

Statistics provided by Coca-Cola South Africa indicated that the average person consumed 67 litres of Coke® in one year (Manyema *et al.*, 2015). A further study demonstrated that South Africans consume approximately 184 millilitres of sugar-sweetened beverages each day (Manyema *et al.*, 2015).

This may lead to obesity later in life; potentially causing diabetes mellitus and other non-communicable diseases (National Treasury, 2016:7). More citizens will thus be dependent on the public health care system. This is a cost that can easily be prevented (National Treasury, 2016:7).

In addition to the non-communicable diseases caused by obesity, tooth decay was another primary concern due to the consumption of sugar-sweetened beverages. According to a report from a National Children's Oral Health Survey the prevalence of dental caries for children aged 4-6 years old was between 50% – 60% (National Treasury, 2016:5).

Sugar tax was perceived to be the most cost effective means in achieving the goal of curbing obesity. The expected *per person* cost of imposing a sugar tax was R0.20. This was the cheapest option compared to the cost of implementing the following strategies: food advertising regulation (R0.90 per person), food labelling (R2.50 per person), worksite interventions (R4.50 per person), and mass media campaigns (R7.50 per person), school-based interventions (R11.10 per person) and physician counselling (R11.80 per person) (National Treasury, 2016: 8).

The World Health Organisation encouraged its members to implement taxes in order to reduce sugar consumption and encourage citizens to make healthier food choices. This was part of its 2013 Global Action Plan. The World Health Organisation requested that Member States develop policies to encourage the reduction of sugars added to food and beverages. (National Treasury, 2016:5)

Target

Soft drinks are being targeted (not sugar-sweetened foods) due to the low nutritional value. Sugar sweetened beverages do not provide the feeling of 'fullness' that food does and are generally an addition to a meal, resulting in the consumption of extra calories than had one had just consumed the food alone. These extra calories, if not converted to energy, will be stored as fatty tissue, contributing to rising obesity rates (National Treasury, 2016:6).

The sugar sweetened beverages to be taxed are any beverages that contain 'added caloric sweeteners'. Examples of these include soft drinks, energy drinks, ice tea, vitamin water and

lemonade. Beverages such as pure fruit juices and unsweetened milk products that have no added sugar will be exempt from the tax. (National Treasury, 2016:16)

Rate

The rate of tax that was proposed was R0.0229 per gram of sugar in sugar-sweetened beverages (National Treasury, 2016:3). This proposed rate was based on a 20% tax on South Africa's most popular soft drink, Coca-Cola® (National Treasury, 2016:3). Coca-Cola® has an average of 35 grams of sugar in a 330 millilitre can (National Treasury, 2016:3). Studies demonstrated that a rate of 20% would be most effective in curbing obesity (Manyema *et al.*, 2015: 1; National Treasury, 2016). The grams of sugar would be based on the 'current product labelling framework' (National Treasury, 2016:3). If a sugar-sweetened beverage does not have a nutritional label, the assumed volume of sugar is 50 grams per 330 millilitres (National Treasury, 2016:3). This is a bid to encourage nutritional labelling. A legislative framework for nutritional labelling is expected to be introduced in the near future (National Treasury, 2016:3).

A specific rate (cents per gram) has been chosen for the sugar tax rather than an *ad valorem* rate (percentage of volume). This means that the rate that has been selected will need to be regularly adjusted in order to take into account inflation (National Treasury, 2016:14)

A study demonstrated that 20% tax on sugar-sweetened beverages would reduce obesity in adults by 2.4% potentially. This was based on a mathematical model comparable with international studies. It was estimated that a 20% tax in India would reduce obesity by 3% whilst a 20% tax rate in the United Kingdom was expected to reduce obesity by 1.3% (Manyema *et al.*, 2014:5).

An adjustment to the proposal was released in 2017. A threshold was created of 4 grams per 100 millilitres of sugar sweetened beverages (National Treasury, 2017: 1). Therefore, only sugar sweetened beverages in excess of that amount of sugar will be subject to sugar tax (National Treasury, 2017: 1). The proposed rate will also decrease to R0.0221 per gram of sugar in sugar-sweetened beverages (National Treasury, 2017: 1). This proposed decrease is said to reduce the negative impact on jobs (National Treasury, 2017: 2). In addition, milk products will also be fully exempt from sugar tax (National Treasury, 2017: 1)

Implementation of sugar tax

The proposed sugar tax will be put into legislation through the Customs and Excise Duty Act No. 91 of 1964 (National Treasury, 2016:20). For purposes of simplicity and to minimize costs, the general excise administration principle (duty-at-source) will be applied in respect of the sugar tax (National Treasury, 2016:3). Therefore, producers and importers of the sugar-sweetened beverages will be required pay over the sugar tax to the South African Revenue Service (National Treasury, 2016:15). This will be 'collected at the factory gates or at the ports of entry' (National Treasury, 2016:20). If producers thus decide to reformulate products in order to reduce their tax liability, the goal of the sugar tax, i.e. to reduce sugar consumption, will be met (National Treasury, 2016:15-16).

Arguments in favour of sugar tax in South Africa

The use of sugar tax to curb obesity and promote a healthy lifestyle is based on 'standard economic theory' (National Treasury, 2016:9). This theory states that a change in price affects the demand for a product (National Treasury, 2016:9). If healthier food and beverage options are cheaper than their unhealthier counterparts, demand for the healthier option will rise (National Treasury, 2016:9). The amount by which demand is affected depends on the price elasticity of demand. The price elasticity of sugar-sweetened beverages in South Africa is estimated to be – 1.299 (National Treasury, 2016:10). This means that a tax rate of between 10% and 20% may result in a change in demand from sugar-sweetened beverages to healthier alternatives and thereby curbing obesity (National Treasury, 2016:10). Subsidising fruit and vegetables in addition to raising taxes may further assist in promoting healthier food options and curbing obesity (National Treasury, 2016:9).

National Treasury addressed the criticism of the tax being one that is regressive in nature (affecting the poor more than the rich) by stating that the benefits of a reduction in consumption of sugar-sweetened beverages will minimize this negative aspect. Poorer communities are more affected by obesity and thus will benefit most. Poorer communities are more dependent on the public health care system and it is hoped that this tax will reduce health care costs in the future (National Treasury, 2016:10). South Africa already spends more on health care than recommended by the World Health Organisation (Appasamy, 2016). The World Health Organisation recommends that 5% of GDP be spent on health care whilst South Africa at present spends 8.9% (Appasamy, 2016). This is bound to increase should South African citizens' sugar intake not be kept under control.

Criticism against sugar tax in South Africa

The Beverage Association of South Africa stated that sugar-sweetened beverages accounted for less than 10% of daily caloric intake and therefore the tax would not be effective in reducing sugar intake (Appasamy, 2016). They have also stated that the goal of curbing 'excessive sugar intake' had failed overseas (Isaacs, 2016:1). In a submission to Treasury, the Beverage Association of South Africa claimed that between 62 000 and 72 000 jobs would be lost due to the implementation of a sugar tax in South Africa (Check, 2016).

Conclusion

National Treasury proposed the implementation of a sugar tax on sugar-sweetened beverages in a bid to curb obesity and decrease public health care costs (tax effective from 1 April 2017). The rate of tax being proposed was R0.0229 per gram of sugar in sugar-sweetened beverages. Producers and importers would be required to pay the tax over to the South African Revenue Service but as this cost will be transferred onto consumers, the consumer will bear the ultimate burden. There has been widespread criticism of the tax citing a potential increase in unemployment rates and the proven ineffectiveness of curbing obesity abroad.

CONCLUSION AND RECOMMENDATIONS

Evidence from various countries proves that sugar tax, on its own, is ineffective in curbing obesity:

Firstly, in the United Kingdom it was decided that a multi-tier tax was required (not merely a single rate sugar tax) for the tax to be effective in curbing sugar intake and obesity (Triggle, 2016);

Secondly, in Mexico it was evident that only a small portion of daily caloric intake was attributable to sugar-sweetened beverages; thus the mere implementation of a sugar tax may be ineffective in decreasing sugar intake and obesity at large as only a small proportion of daily caloric intake is attributable to sugar-sweetened beverages (Guthrie & Esterl, 2016);

Thirdly, in Berkeley and Philadelphia it was noted that consumers were not affected by price increases due to sugar tax due to the option of cross-border shopping (Sanger-Katz, 2015). Sugar tax without action to prevent the illegal sale of sugar-sweetened soft drinks is ineffective (Sanger-Katz, 2015); and

Finally, in Denmark it was noted that the fat tax was ineffective in curbing obesity with only a minimal rate reduction noted; nor was there any indication that the sugar-sweetened soft drink tax in place since the 1930s effectively kept obesity at bay (Snowdon, 2015).

From the above it is evident that sugar tax on its own in many countries failed to curb obesity rates. It thus appears unlikely that the implementation of sugar tax on its own in South Africa will have a different outcome.

Another concern regarding sugar tax is the consequent loss of jobs. This is especially a problem in South Africa where unemployment rates are significant. 3 000 jobs were lost in Mexico in the first quarter in 2014 (Guthrie & Esterl, 2016). 5 000 jobs were lost in Denmark during the period in which sugar tax was effective (UNESDA, 2013). The main reason stated for its scrapping in Denmark was to create employment and promote economic growth (UNESDA, 2013).

There is also a risk that cheaper sugar-sweetened soft drink alternatives would be manufactured; meaning that soft drink consumption would not decrease and obesity rates would continue to increase.

The South African National Treasury failed to address these issues. National Treasury also did not indicate how the tax revenue generated from the sugar tax would be used.

Recommendations to support sugar tax in reaching its objective of curbing obesity include the following:

Firstly, educating communities on the adverse effects of obesity and the manner in which healthier lifestyles may be obtained. Education material i.e. 'The Sugar Film' demonstrating the harmful effects of sugar should be screened on various television channels in the country (Health24, 2016a);

Secondly, the broadcast of thought-provoking campaigns (advertisements) demonstrating the negative effects of obesity and excessive sugar consumption;

Thirdly, labels on soft drinks that indicate that the beverage is more expensive due to sugar tax. Manufacturers should further be required to indicate the adverse effects of sugar on label with the sugar content in bold print;

Fourth, regulating sugar-sweetened soft drink marketing as is done with alcoholic beverages;

Fifth, drinking of water as a healthier alternative should be encouraged through education as well as by ensuring that all South Africans have access to clean water;

Sixth, healthier food options including fruit and vegetables should be subsidised in order to encourage healthy eating patterns. Vegetable gardens should be cultivated in the poorer communities in South Africa

Finally, exercise programmes should be promoted and school sport funded. Sporting facilities, infrastructure and teams should be developed.

REFERENCE LIST

APPASAMY, Y. 2016. Sugar Sector's Bitter Pill [Online]. Sowetan Live. Available: <http://www.sowetanlive.co.za/news/2016/03/12/sugar-sector-s-bitter-pill> [Accessed 31 March 2016].

BOSCIA, T. 2015. Study: Berkeley soda tax falls flat. Available: <http://www.news.cornell.edu/stories/2015/08/study-berkeley-soda-tax-falls-flat> [Accessed 30 June 2016].

BUSINESS MONITOR INTERNATIONAL 2012. South Africa Food and Drink Report Q2 includes 5-year industry forecasts to 2016 [Online]. Available: <http://store.bmiresearch.com/south-africa-food-drink-report.html> [Accessed 1 April 2016].

CAWLEY, J. & FRISVOLD, D. 2015. The Incidence of Taxes on Sugar-Sweetened Beverages: The Case of Berkeley, California. *National Bureau of Economic Research working paper* [Online]. Available: <http://www.nber.org/papers/w21465.pdf> [Accessed 30 June 2016].

CHECK, A. 2016. SA's proposed sugar tax: claims about calories & job losses checked [Online]. Daily Maverick. Available: <http://www.dailymaverick.co.za/article/2016-08-31-sas-proposed-sugar-tax-claims-about-calories-job-losses-checked/#.V8z5y1R96M8> [Accessed 1 September 2016].

CHILD, K. 2014. Soft drinks tax could cut sugar intake. Available: <https://www.wits.ac.za/media/news-migration/files/The%20Herald%20210114.pdf> [Accessed 31 March 2016].

CHINYANGA, D. F. 2016. Proposed sugar tax outweighs hit to our pockets [Online]. Independent Online. Available: <http://www.iol.co.za/business/opinion/proposed-sugar-tax-outweighs-hit-to-our-pockets-2002099> [Accessed 1 April 2016];

Available:<http://pressoffice.mg.co.za/afrocentrichealth/PressRelease.php?StoryID=266886>. [Accessed 14 September 2016]

COCA-COLA. *How many calories are there in a 330ml can of Coca-Cola Classic?* [Online]. Available: <http://www.coca-cola.co.uk/faq/calories-in-330ml-can-of-coca-cola> [Accessed 1 September 2016].

COLCHERO, M., POPKIN, B., RIVERA, J. & NG, S. 2016. *Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study* [Online]. Available: <http://www.bmj.com/content/352/bmj.h6704> [Accessed 6 May 2016].

CORNELSEN, L. & CARRIEDO, A. 2015. Health-related taxes on food and beverages. Available: <http://foodresearch.org.uk/health-related-taxes-on-food-and-beverages/> [Accessed 12 May 2016].

ECOLOGY CENTER 2016. This is the story of how Berkeley took on Big Soda - and won [Online]. Available: <http://www.berkeleyvsbigsoda.com/faq> [Accessed 30 June 2016].

EU FOOD LAW 2013. Denmark drops decades old soft drinks tax [Online]. EU Food Law. Available:<http://www.eurofoodlaw.com/countryreports/eumemberstates/denmark/denmark-drops-decades-old-soft-drinks-tax-64140.htm> [Accessed 4 May 2016].

FISHER, D. 2016. Sugar tax could sweeten a market failure [Online]. Nature. Available: <http://www.nature.com/news/sugar-tax-could-sweeten-a-market-failure-1.19646> [Accessed 30 June 2016].

GUTHRIE, A. & ESTERL, M. 2016. Soda Sales in Mexico Rise Despite Tax [Online]. The Wall Street Journal. Available: <http://www.wsj.com/articles/soda-sales-in-mexico-rise-despite-tax-1462267808> [Accessed 30 June 2016].

HAND, L. 2009. Public health takes aim at sugar and salt [Online]. Available: <https://www.hsph.harvard.edu/news/magazine/sugar-and-salt/> [Accessed 19 May 2017].

HEALTH24 2016. Will a sugar tax trim the fat off South Africans? Available: <http://www.health24.com/Medical/Diabetes/Who-is-at-risk/will-a-sugar-tax-trim-the-fat-off-south-africans-20160302> [Accessed 31 March 2016]

HOFVERBERG, E. 2015. Finland: Tax on Chocolate and Sweets to Be Eliminated 2017 [Online]. Law Library of Congress. Available: <http://www.loc.gov/law/foreign-news/article/finland-tax-on-chocolate-and-sweets-to-be-eliminated-2017/> [Accessed 1 September 2016].

JASLOW, R. 2014. *World Health Organization lowers sugar intake recommendations* [Online]. CBS News. Available: <http://www.cbsnews.com/news/world-health-organization-lowers-sugar-intake-recommendations/> [Accessed 31 March 2016].

- JOU, J. & TECHAKEHAKIJ, W. 2012. International application of sugar-sweetened beverage (SSB) taxation in obesity reduction: Factors that may influence policy effectiveness in country-specific contexts. Available: <http://www.ncbi.nlm.nih.gov/pubmed/22727243> [Accessed 1 April 2016].
- KAHN, T. 2016. SUGAR TAX: Deterrent likely to be met by bitter opposition. Available: <http://www.bdlive.co.za/national/health/2016/02/25/sugar-tax-deterrent-likely-to-be-met-by-bitter-opposition> [Accessed 9 April 2016].
- KHANNA, V. 2016. Time to bring sugar into the 'sin tax' net. Available: <https://www.sph.nus.edu.sg/sites/default/files/Time%20to%20bring%20sugar%20into%20the%20'sin%20tax'%20net.pdf> [Accessed 31 March 2016].
- KRUGEL, C., ENGELBRECHT, S., SAMUEL, C. & FEDDERSON, M. 2016. Taxing your sweet tooth: Effective nudge or economic burden? Available: <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/05/KPMG-Taxing-Your-Sweet-Tooth.pdf> [Accessed 2 July 2016].
- LOCHNER, T. 2015. Berkeley: First-in-nation soda tax begins to show results [Online]. The Mercury News. Available: http://www.mercurynews.com/news/ci_29137613/berkeley-first-nation-soda-tax-begins-show-results [Accessed 30 June 2015 2016].
- MALNICK, E. 2014. Health watchdog weighs up sugar tax and reduction targets. Available: <http://www.telegraph.co.uk/news/health/news/10900183/Health-watchdog-weighs-up-sugar-tax-and-reduction-targets.html> [Accessed 31 March 2016].
- MANYEMA, M., VEERMAN, J. L., CHOLA, L., TUGENDHAFT, A., LABADARIOS, D. & HOFMAN, K. 2015. Decreasing the Burden of Type 2 Diabetes in South Africa: The Impact of Taxing Sugar-Sweetened Beverages. Available: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0143050> [Accessed 31 March 2016].
- MANYEMA, M., VEERMAN, L. J., CHOLA, L., TUGENDHAFT, A., SARTORIUS, B., LABADARIOS, D. & HOFMAN, K. J. 2014. The Potential Impact of a 20% Tax on Sugar-Sweetened Beverages on Obesity in South African Adults: A Mathematical Model. Available: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0105287> [Accessed 31 March 2016].
- MAPUMOLO, Z. 2016. Death by sugar [Online]. City Press. Available: <http://citypress.news24.com/News/death-by-sugar-20160310> [Accessed 31 March 2016].
- MARRON, D. 2016. Britain builds a better soda tax [Online]. Available: <http://www.taxpolicycenter.org/taxvox/britain-builds-better-soda-tax> [Accessed 30 June 2016].
- NATIONAL TREASURY. 2016. Taxation of Sugar Sweetened beverages [Online]. Available: <http://www.treasury.gov.za/public%20comments/Sugar%20sweetened%20beverages>

[/POLICY%20PAPER%20AND%20PROPOSALS%20ON%20THE%20TAXATION%20OF%20SUGAR%20SWEETENED%20BEVERAGES-8%20JULY%202016.pdf](#)

NATIONAL TREASURY. 2017. Tax on Sugary beverages [Online]. Available: <http://www.treasury.gov.za/public%20comments/Sugar%20sweetened%20beverages/2017022701%20-%20QandA%20Tax%20on%20Sugary%20Beverages.pdf>. [Accessed 22 May 2017].

PINEDA, E. 2016. What the world can learn from Mexico's tax on sugar-sweetened drinks [Online]. The Conversation. Available: <http://theconversation.com/what-the-world-can-learn-from-mexicos-tax-on-sugar-sweetened-drinks-56696> [Accessed 30 June 2016].

QUINCE, W. 2016. 10 reasons why the sugar tax is a terrible idea [Online]. Available: <http://blogs.spectator.co.uk/2016/03/10-reasons-why-the-sugar-tax-is-a-terrible-idea/> [Accessed 30 June 2016].

SANGER-KATZ, M. 2015. Yes, soda taxes seem to cut soda drinking [Online]. The New York Times. Available: <http://www.nytimes.com/2015/10/13/upshot/yes-soda-taxes-seem-to-cut-soda-drinking.html> [Accessed 30 June 2016].

SNOWDON, C. 2015. A tax on sugar won't work, as the shipwreck of the Danish 'fat tax' shows [Online]. Spectator Health. Available: <http://health.spectator.co.uk/a-tax-on-sugar-wont-work-as-the-shipwreck-of-the-danish-fat-tax-shows/> [Accessed 4 May 2016].

TALBOT, L. & PIENAAR, S. 2012. Fat Tax as an Alternative Tax in South Africa. International Business & Economic Research Journal [Online]. Available: <http://repository.up.ac.za/handle/2263/21390> [Accessed 31 March 2016].

TEAGLE, A. 2016. Budget's battle of the bulge: How sweet is SA's sugar tax? Available: <http://www.dailymaverick.co.za/article/2016-03-06-budgets-battle-of-the-bulge-how-sweet-is-sas-sugar-tax/> [Accessed 31 March 2016].

GUARDIAN 2016. Philadelphia becomes first major US city with a soda tax [Online]. The Guardian. Available: <https://www.theguardian.com/us-news/2016/jun/16/philadelphia-passes-soda-tax-first-city-sugar> [Accessed 30 June 2016]

NEW AGE 2016. English hospitals plan to introduce sugar tax. Available: <http://www.thenewage.co.za/english-hospitals-plan-to-introduce-sugar-tax/> [Accessed 31 March 2016].

SPECTATOR. 2016. Denmark tried Osborne's sugar tax: Here's what happened [Online]. Available: <http://www.spectator.co.uk/2016/03/denmark-tried-osbornes-sugar-tax-heres-what-happened/> [Accessed 4 May 2016].

THE GUARDIAN. 2016. *Philadelphia becomes first major US city with a soda tax* [Online]. Available: <https://www.theguardian.com/us-news/2016/jun/16/philadelphia-passes-soda-tax-first-city-sugar> [Accessed 30 June 2016].

- TELEGRAPH 2016. Sugar tax in Mexico cuts sales of sugary drinks by 12 per cent. Available: <http://www.telegraph.co.uk/news/health/news/12085408/Children-aged-five-eating-own-weight-in-sugar-every-year.html> [Accessed 12 May 2016].
- TRIGGLE, N. 2016. Sugar tax: How will it work? [Online]. BBC. Available: <http://www.bbc.com/news/health-35824071> [Accessed 30 June 2016].
- UNESDA 2013. Denmark abolishes excise duty on Soft Drinks [Online]. Why Food & Drink Taxes Won't Work. Available: <http://www.fooddrinktax.eu/dk-abolishes-sd-excise/> [Accessed 4 May 2016].
- WORLD OBESITY FEDERATION. 2012. World map of obesity [Online]. Available: <http://www.worldobesity.org/resources/world-map-obesity/> [Accessed 4 May 2016].
- WORLD CANCER RESEARCH FUND INTERNATIONAL. 2016. Nourishing framework – Use economic tools. Available: <http://www.wcrf.org/sites/default/files/Use-Economic-Tools.pdf> [Accessed 12 May 2016].
- WORLD HEALTH ORGANISATION 2016. Putting taxes into the diet equation. Available: <http://www.who.int/bulletin/volumes/94/4/16-020416.pdf> [Accessed 30 June 2016].