AN EXPLORATION OF THE 2018 SUGAR-SWEETENED BEVERAGE TAX ON THE PURCHASES OF BLACK AFRICAN WOMEN RESIDING IN PIETERMARITZBURG, KWAZULU-NATAL

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ABSTRACT

The incidence of death from non-communicable diseases (NCDs) is escalating steadily. Several studies conducted in South Africa have shown that obesity is more problematic among females than males, and particularly among Black Africans. Recent literature suggested that the consumption of sugar-sweetened beverages (SSBs) could have contributed towards this problem. In 2018, the South African Government implemented taxes on SSBs. This study was conducted before the SSB tax implementation; however, it was important to investigate the potential effect SSB tax is likely to have on the current SSB purchasing behaviour of Black South African women.

A cross-sectional study was conducted among 439 Black African female SSB purchasers, residing in Pietermaritzburg, KwaZulu-Natal. The main objectives were to determine the types of SSB purchased; assess the purchasing frequency; investigate the factors that influenced purchases and explore the effect of the 2018 SSB tax on future SSB purchases.

Carbonated fizzy drinks were the most frequently purchased beverage. Price and taste were found to be important factors considered by respondents when purchasing SSBs. Nearly half of the respondents indicated the intention to continue purchasing SSBs as usual despite the future price increase due to the SSB tax. Although most of the literature had suggested that higher tax rates could decrease demand for SSBs, this study's findings show that the SSB tax alone would not have major impact on changing consumer purchasing behaviour

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INTRODUCTION

Overweight and obesity is becoming a universal public health challenge. In 2016, according to the World Health Organization (WHO) (2020), around 39% of adults globally, aged 18 years and older, were overweight, and 13% were obese. The 2016 South Africa Demographic and Health Survey (SADHS), found that the prevalence of both overweight and obesity was significantly higher in South African women at 70%, compared to 31% in men (Statistics South Africa, 2017).

Fiscal interventions such as taxes are gradually being suggested worldwide as a tool to combat obesity in the population (Lloyd & Maclaren 2018; Moodie, Sheppard, Sacks, Keating & Flego 2013). In February 2016, the National Treasury of South Africa proposed a tax on SSBs, which was implemented in 2018. The SSB tax rate consisted of a threshold of 4 g sugar per 100 ml of beverage, below which the sugar content would not be taxed. The 2018 tax rate was planned to add 2.1 cents per gram for sugar contents exceeding 4g per 100 ml of beverage. This tax was applied to all SSBs except milk-based drinks and 100% fruit juice (Republic of South Africa, Minister of Finance 2017).

South African women are reported to have the highest rates of obesity in the entire sub—Saharan African region (Ng, Fleming, Robinson, Thomson, Graetz *et al.* 2014). Among South African women, Black South Africans have a high prevalence of overweight and obesity (24.9% and 39.9% respectively) compared to Coloured/Mixed Ethnicity (24.4% and 34.9%) as well as Asian/Indian (22.8% and 32.4%) and are more affected by Non-Communicable Diseases (NCDs) than other population groups (Shisana, Labadarios, Rehle, Simbayi, Zuma, Dhansay,

Reddy, Parker, Hoosain, Naidoo, Hongoro, Mchiza, Steyn, Dwane, Makoae, Maluleke, Ramlagan, Zungu, Evans, Jacobs, Faber & SANHANES-1 Team 2013).

Unlike other countries, a very limited number of studies related to the impact of SSB tax on consumer purchases as well as their potential associated health effects, have been conducted in South Africa. Research from the perspective of the consumers is required to understand the effect of fiscal interventions on SSB purchases. Therefore, it was anticipated that the results of this study would assist in providing insight regarding the following questions:

- What are the demographic characteristics of Black African women who purchased SSBs?
- What are the types of SSBs that Black African women purchased?
- How often were the SSBs purchased by Black African women?
- What were the main factors that influenced the purchases of SSBs by Black African women?
- What effect would 2018 SSB tax have on future purchases of SSBs by Black African women?

LITERATURE REVIEW

This section explores previous studies related to the impact of SSB taxes on consumer purchases.

Background to obesity, non-communicable diseases and sugar-sweetened beverages

Overweight and obesity have several causes, but the main reported cause is when energy intake exceeds energy expenditure (WHO 2015). The increased intake of foods and beverages that are high in added sugars and fat, combined with decreased physical activity levels, leads towards a positive energy balance resulting in weight gain. Overweight and obesity is a main risk factor for NCDs including cardiovascular diseases, type-2 diabetes, respiratory diseases and cancers (WHO 2016;

Xi, Bo, Huang, Reilly, Li, Zheng, Barrio Lopez, Martinez-Gonzalez & Zhou 2015). Lack of physical activity, environmental factors and genetics, as well as poor or unbalanced diets are contributing towards the development of NCDs (WHO 2016). The consumption of SSBs has been linked to increased risk of individuals developing NCDs such as type-2 diabetes, high blood pressure, cholesterol and cardiovascular diseases (Xi et al. 2015).

Types of sugar-sweetened beverages most commonly consumed

The SSB industry can be subdivided under two main groups: i) soft drinks which include juice, bottled water, sport and energy drinks, and carbonated fizzy drinks; as well as ii) hot drinks consisting of tea and coffee. For the purpose of this study the term carbonated fizzy drinks will be used in reference to carbonated beverages. The two leading carbonated fizzy drink manufacturers are the Coca-Cola Company and PepsiCo, Inc. (Bailey 2014). The increased consumption of SSBs worldwide has raised concern with regards to preference for SSBs over other beverages. This aspect will be further investigated in the next section addressing the factors that motivate consumers to purchase SSBs

Factors influencing sugar-sweetened beverages purchasing and consumption

Numerous social and environmental factors are linked to the purchase and consumption of SSBs. These include marketing and promotion, price, taste, design and packaging, loyalty to the product, recommendation by friends and family members as well as impact on health. These will now be discussed in more detail.

Marketing/ Promotion of sugar-sweetened beverages

Beverage companies use promotions and marketing as the best platforms to persuade consumers to purchase their products. SSBs are purposely placed at eye level, on the shelves of supermarkets, so that they can be easily seen and purchased by customers (Tugendhalf, Manyema, Veerman, Chola, Labadarios & Hofman 2015). Purchases of SSBs are also influenced by various practices such as advertisements containing unconfirmed health claims, end of aisle displays, 'buy-oneget -one-free promotions', sponsorships and celebrity endorsement of beverages (Tedstone, Targett & Allen 2015). Consequently, a holistic approach is required in order to direct consumer purchases into a more positive path.

Price

Pricing strategies greatly determined the type and quantity of products to be purchased as consumers greatly take the price consideration when doing shopping (Steenhuis, Waterlander & De Mul 2011). For example, focus group research in Belgium related to the determinants of eating behaviour in 35 European university students, found that price influenced food and beverage purchase decisions (Deliens, Clarys, De Bourdeaudhuij & Deforche 2014). Similar findings were also supported by the South African National Health Nutrition Examination Survey-1 (SANHANES-1) where price was reported to be a major determinant (64.5%) of food purchasing among the South African population (Shisana et al. 2013).

Taste

Taste has been reported as one of the main factors that has an important influence on the consumers' choice of most food and beverages consumed. The sweet taste perception of food including SSBs has a serious influence on SSBs selection (Drewnowski, Mennella, Johnson & Bellisle 2012). The Black South African population were reported to have a higher consumption of added sugars than any of the other race groups (Temple & Steyn 2013). Increased consumption of added sugars towards increased contributes rates of overweight and obesity (Drewnowski et al. 2012).

Design and packaging

Food and beverage companies spend a substantial amount of time and money in order to design products that will be most appealing to consumers and increase purchases (Chandon & Wansink 2012). This has a great impact on consumer purchasing behaviour as it attracts the attention of people who could be tempted to try the product due to this new design and appealing packaging (Chandon & Wansink 2012).

Product loyalty

The choice of beverages that customers purchase or consume is mostly based on the label or brand of the products (Chandon & Wansink 2012). In their 2010 annual review, Coco-Cola reported a significant increase of around 50% in consumption of highly advertised Coca-Cola products in South Africa between the years 1992 and 2010 (Coca-Cola Company 2010). Most people associate and refer to carbonated fizzy drinks in general as "CocaCola" due to the strong product profile of this brand.

Recommendation by friends/family

Food and beverage choice can also be considered as an important social activity that may be readily influenced by family, friends and the environment (Higgs & Thomas 2016). A review study of 69 eligible experiments with over 5800 participants, between 1974 and 2014, reported that social factors have a huge impact on the quantity of food and beverage products consumed by people. They often adjusted their food and beverage consumption according to the choices of their family members, friends and social group members (Cruwys, Bevelander & Hermans 2015).

History of the decision to implement a sugar sweetened beverage tax in South Africa

In May 2012, the Department of Health (DOH) initiated their Strategic Plan for the Prevention and Control of NCDs 2013-2017 and, in

December 2015, a National Strategy for the Prevention and Control of Obesity 2015-2020. Both strategies aimed to reduce obesity prevalence by 10% before 2020. According to 2016 South Africa Demographic and Health Survey (SADHS), around 70% of South African women and 31% of men are overweight or obese. The increased negative health effects of SSBs had led to action in order to limit their consumption. Many options can be considered including the control of marketing for SSB products, limiting portion sizes and taxation. The National Treasury of the South Africa Government had opted for tax on SSBs that came into effect in April 2018.

Increasing the price of high-sugar foods and non -alcoholic drinks through taxation potentially reduces demand. However, as Niebylski, Redburn, Duhaney & Campbell (2015) have argued, a tax on SSBs might have little effect because SSBs are only a small proportion of their total diet.

The literature reviewed indicated a gap in South African knowledge on the impact that SSB tax might have on purchasing these products. Therefore, it was important to investigate the types of SSBs purchases, the factors motivating consumers to purchase SSBs and the potential impact of SSBs tax on consumer purchases before the tax was implemented.

RESEARCH DESIGN AND METHODOLOGY

Study design, sampling and sample size determination

A cross-sectional study design was used in this study. The study population included Black African women aged 19 and older, shopping at the Edendale Mall in Pietermaritzburg, South Africa. The Greater Edendale Mall was considered as the most suitable site to conduct this study as it was the only shopping mall in the area with more than 100 stores, shops, restaurants, banking and entertainment facilities. It was anticipated that this would

TABLE 1: TABLE USED TO DETERMINE SAMPLE SIZE FROM POPULATION SIZE

	Confidence	ce level = 95%	6	Confidence level = 99%			
		Margin of erro	or	Margin of error			
Population size	5%	2,5%	1%	5%	2,5%	1%	
100	80	94	99	87	96	99	
500	217	377	475	285	421	485	
1000	278	606	906	399	727	943	
10000	370	1332	4899	622	2098	6239	
100000	383	1513	8762	659	2585	14227	
500000	384	1532	9423	663	2640	16055	
1000000	384	1534	9512	663	2647	16317	

TABLE 2: LEVEL OF EDUCATION AND SIZE OF HOUSEHOLDS OF RESPONDENTS (N=439)

		n	%
Education level	Up to Grade 11	156	35.5
	Matric	172	39.2
	Certificate	55	12.5
	Diploma	28	6.4
	Degree	28	6.4
Size of household	Live alone	1	0.2
	Two	27	6.2
	Three	116	26.4
	Four	172	39.2
	Five	88	20.0
	Six or more	35	8.0

attract respondents from different backgrounds who lived in and around Edendale.

The 2016 Community Survey data and 2011 Census SubPlace Msunduzi Income data from STATS SA were used to obtain the female population size of Edendale and urban townships surrounding the Greater Edendale Mall. All women in the areas totalled 90761 (Table 1).

Black Africans (99.49%) formed the majority of the population (Statistics South Africa 2011). Since the number in the target population, 90 761, was too large; consultation with a professional statistician determined that it would be necessary to survey 384 Black African women consumers (Table 2). A Professional Statistician also advised that an additional 15% of the population be sampled to allow for incorrectly completed questionnaires and drop outs (Hendry 2017).

Black African women were targeted for this study because of the significant increase of obesity

among this population group (39.9%) (Shisana et al. 2013). The inclusion of only female subjects in this study can be justified as women were most likely to be responsible for purchasing food and beverages for their family and therefore would have an influence on the beverages their family members consume.

Respondents were selected using nonprobability sampling which involved convenience sampling, i.e. selecting participants present inside the mall where the survey was conducted. Many advantages can be derived from this form of sampling method including: that it is not expensive and can be conducted in a short period of time.

Data collection process

A five-part questionnaire approved by a Professional Statistician was used to conduct this study. The researcher chose to use the

interview approach as this would encourage a higher response rate (Silman & MacFarlane 2002). The questionnaires were designed in both in English and isiZulu.

Section A: Demographic characteristics

Demographic characteristics were assessed using closed-ended questions. Respondents' age, home, language, education level, number of household members including themselves was asked in the first part of this section. Questions regarding the subjects' total monthly household income as well as estimated monthly household money available for food and beverage purchases were asked to define the socio-economic characteristics of the sample population. Monthly total household incomes were assessed using the same criteria as the Statistics South Africa (STATS SA 2012).

Section B: Types of SSB purchased by consumers

The types of SSB purchased included: fizzy drinks, sport drinks, energy drinks, flavoured waters, sweetened ice drinks, and squashes—concentrated-syrups juices. The SSBs listed in the questions of this section were based on the beverages sold at the Greater Edendale Mall, and commonly-used beverages included in a previous study that had assessed the dietary intake of South African adults (Mchiza, Steyn, Hill, Kruger, Schonfeldt, Nel & Wentzel-Viljoen 2015).

Section C: Factors that influenced consumers to purchase SSBs

The third section of the questionnaire comprised questions related to motivating factors behind SSB purchases: price, design & packaging, product advertising, brand, taste, impact on health, loyalty to the product, and recommendation by friends and family. factors selected in this study were adjusted from a previous study that assessed the factors that influenced consumers' consumption of SSBs (Deliens, Clarys, De Bourdeaudhui & Deforce 2014).

Section D: Frequency of SSB purchases by consumers

In this section of the questionnaire, the main task was to ascertain how often SSBs were purchased. Response options provided were: "less often than once a month", "at least once a month", "once a month", "2/3 times a week", "4/5 times a week", "6 times a week" and "every day".

Section E: Impact that the 2018 SSB tax could have on future SSB purchases

Three types of question were included in this section. In the first part, dichotomous questions ("yes" or "no") were used as a tool to assess the awareness of the respondents on government intention of implementing the SSB taxes in South Africa. "In the second and third parts, questions assessing perceptions of the impact of SSB taxes on future consumer purchases as well as influence of education level on the decision to purchase fizzy drinks after implementation of the forthcoming 2018 SSB tax were asked respectively. Similar response options were provided in the second and third parts: "continue purchasing", "reduce amount" and "switch to cheaper SSB" "stop purchasing".

Ethical considerations

This study formed part of a Master of Science in Human Nutrition dissertation. Ethical approval was obtained from the University of KwaZulu–Natal's Biomedical Research Ethics Committee (BREC Reference: BE287/17). The respondents were requested to sign a consent form in either English or isiZulu prior to participating in the study, after being informed of the aim of the study and that the participation in the study was entirely on a voluntary, anonymous and confidential basis.

Statistical analysis

The Statistical Package for Social Sciences Version 21 (IBM Corp, Armonk, NY, USA) was used to analyse the data. Results were

TABLE 3: TYPE OF SUGAR-SWEETENED BEVERAGES PURCHASED BY THE RESPONDENTS (N=439)

Types of sugar-sweetened beverage		Packaging size	n	%
Fizzy drinks	Coca-Cola	2 litre	160	36.4
	Sparletta	2 litre	79	18.0
	Coo-ee	2 litre	152	34.6
	Total		391	89.0
Sport drinks	Energade	1 litre	2	0.5
	Powerade	500 ml	1	0.2
	Powerade	750 ml	1	0.2
	Total		4	0.9
Energy drinks	Red Bull	250 ml	3	0.7
	Red Bull	473 ml	1	0.2
	Play	330 ml	1	0.2
	Total		5	1.1
Flavoured water drinks	Aquelle	1.5 litre	15	3.4
	Total		15	3.4
Squashes, Concentrates and	Brookes Oros	2 litre	1	0.2
Syrups (Juices)	Brookes Oros	5 litre	2	0.5
	Ceres Fruit Squash or Nectar	1 litre	1	0.2
	Ceres Fruit Squash or Nectar	1.75 litre	1	0.2
	Fruitree Concentate Squash	2 litre	2	0.5
	Fruitree Concentate Squash	5 litre	8	2.1
	Wild Island Smoothies	1 litre	2	0.5
	Fusion Dairy Blend Concentrate	750 ml	5	1.1
	Fusion Dairy Blend Concentrate	5 litre	2	0.5
	Total		24	4.9

TABLE 4: THE INFLUENCE OF EDUCATION LEVEL ON TYPES OF CARBONATED FIZZY DRINK PURCHASED

Education level	Coo-ee 2 litre			Sparletta 2 litre				Coca-Cola 2 litre					
	No		Yes	Yes No		Yes		s No		Yes			
	n	%	n	%	N	%	n	%	n	%	n	%	
Up to Grade 11	74	47.4%	82	52.6%	136	87.2%	20	12.8%	119	76.3%	37	23.7%	
Matric	111	64.5%	61	35.5%	134	77.9%	38	22.1%	112	65.1%	60	34.9%	
Certificate	48	87.3%	7	12.7%	49	89.1%	6	10.9%	18	32.7%	37	67.3%	
Diploma	28	100.0%	0	0.0%	21	75.0%	7	25.0%	12.0	42.9%	16	57.1%	
Degree	26	92.9%	2	7.1%	20	71.4%	8	28.6%	18	64.3%	10	35.7%	

TABLE 5: THE FREQUENCY OF SUGAR-SWEETENED BEVERAGE PURCHASES

Frequency	n	%
Less than once a month	20	4.6
At least once a month	202	46.0
Once a week	194	44.2
2-3 times a week	22	5.0
4-5 times a week	1	0.2
6 times a week	-	-
Everyday	-	-

TABLE 6: THE FACTORS INFLUENCING THE PURCHASE OF SUGAR-SWEETENED BEVERAGES

Level of importance	Factors	Mean	Standard Deviation
Mara important	The price	4.62	0.503
More important	The taste	4.00	0.512
	The brand	2.86	0.481
	Product advertising	2.70	0.556
Loggimnortant	Impact on health	2.13	0.645
Less important	Design and packaging	1.90	0.532
	Recommendation by friends/family	1.78	0.502
	Loyalty to the product	1.76	0.532

TABLE 7: ARE YOU AWARE OF SUGAR-SWEETENED BEVERAGE TAX?

	n	%
Yes	80	18,2
No	359	81.8
Total	439	100

presented as percentages with means and standard deviation calculated. A p-value of less than 0.05 was noted as being statistically significant. A one-sample t-test was used to determine the factors that related to the purchases of SSBs; thereafter, mean scores were used to assess which factors were considered more important when purchasing SSBs.

FINDINGS AND DISCUSSION

The demographic characteristics of the respondents

A total of 442 Black African women aged 19 and older, shopping at the Greater Edendale mall and residing in Pietermaritzburg, participated in the survey. Three respondents did not fully complete the questionnaire and were excluded from the study, therefore the response rate for this study was 99.3%. The final number of respondents included in the analysis was 439. The mean age of the respondents was 33.69 years with a standard deviation (SD) of 8.163, while the minimum and maximum ages were 19 and 55 years respectively. Table 3 presents respondent levels of education and household sizes.

Types of sugar-sweetened beverages purchased

Carbonated fizzy drinks were the most frequently purchased beverage (n=391, 89.0%). Table 4 presents the types of SSBs purchased by respondents and Table 5 presents the influence of education level on types of carbonated fizzy drink purchased.

Among all carbonated fizzy drinks available for purchase, three major brands of fizzy drinks dominated the list Coca-Cola 36.4%; Coo-ee 34.6% and Sparletta 18.0%. Respondents most commonly purchased 2 litre bottles (n=391, 89.0%) (Table 4) and more than half of respondents with Grade 11 and less (n=82, 52.6%) purchased Coo-ee brand (Table 5). It could be argued that the people with Grade 11 and less, were likely to have a smaller income than people with tertiary level education, who could afford a more expensive brand such as Coca-Cola.

Purchase frequency for sugar-sweetened beverages

Less than half of the respondents reported that they purchased SSBs "At least once a month" (n=202, 46.0%) as well as "Once a week" (n=194, 44.2 %,). The lowest frequency

TABLE 8: THE IMPACT OF 2018 SUGAR-SWEETENED BEVERAGE TAX COULD HAVE ON FUTURE PURCHASES

	Continue purchasing		Reduce amount		Switch to cheaper SSB		Stop purc	hasing
	n	%	n	%	n	%	n	%
Carbonated fizzy drinks	203	46.2	131	29.8	56	12.8	2	0.5
Energy drinks	1	0.2	3	0.7	-	-	-	-
Sport drinks	1	0.2	3	0.7	-	-	-	-
Flavoured water drinks	1	0.2	13	3.0	-	-	2	0.5
Squashes, Concentrates & Syrups (Juices)	7	1.6	4	0.9	12	2.7	-	-
Total	213	48.5	154	35.1	68	15.5	4	1.0

TABLE 9: THE INFLUENCE OF EDUCATION AND INCOME ON THE DECISION TO PURCHASE FIZZY DRINKS ONCE THE 2018 SSB TAX HAS BEEN IMPLEMENTED

	Carbonated fizzy drinks									
			Continue pur- chasing		chasing amount pur-		Switch to cheaper drinks		Stop purchasing	
		n	%	n	%	n	%	n	%	
	Up to Grade 11	79	56.8	21	15.1	38	27.3	1	0.7	
Education	Matric	109	68.1	37	23.1	14	8.8	0	0	
level	Certificate	12	24.0	34	68.0	3	6.0	1	2.0	
levei	Diploma	3	13.0	19	82.6	1	4.3	0	0	
	Degree	0	0	20	100	0	0	0	0	
	Up to R5553	96	63.2	27	17.8	29	19.1	0	0.0	
l	R5554 - R10009	60	56.1	29	27.1	17	15.9	1	0.9	
Income Level	R10010 - R18544	37	44.0	37	44.0	9	10.7	1	1.2	
	R18545 - R44948	10	21.7	35	76.1	1	2.2	0	0.0	
	R44949 and above	0	0.0	3	100	0	0.0	0	0.0	

(n=1, 0.2%) was observed among respondents who purchased SSBs on a "4-5 times a week" basis. Table 6 presents the frequency of SSB purchases by respondents.

When analysing the results of this study in relation to the frequency of SSB purchases, it was found that most respondents (n=396, 90.2%) indicated that they purchase SSBs between one and four times a month. It is also important to note that respondents were purchasing SSBs on behalf of the entire household members, and the "once a week" SSB purchasing frequency rate could be justifiable if SSBs were popular in the households of these respondents.

Factors that influenced the purchases of sugar-sweetened beverage

Factors that were significantly important:

Based on the analysis of the results from this study, it was found that the following factors were significantly important when purchasing SSBs: price (mean = 4.62, p<0.05) and taste (mean = 4.00, p<0.05). Factors influencing the purchase of SSBs are presented in Table 7.

Price: The results of this study indicated that price had a great influence on SSB purchases by the respondents. Considering the income status of most respondents who participated in this study, this was expected. The pricing strategies greatly determined the type and quantity of products to be purchased as

consumers seriously take price into consideration when making purchases (Steenhuis et al.2011). The SANHANES-1 study had also revealed price as a major determinant (64.5%) of food and beverages purchasing among the South African population (Shisana et al., 2013).

Taste: Previous studies have indicated that taste was one of the main factors that had a vast influence on the purchasing of most The sweet taste perception of beverages. carbonated fizzy drinks has been found to have an influence on their purchases (Sartor et al. 2011). Sweetness has a great sensory appeal and has been identified as being the most preferred characteristic beverages (Drewnowski et al. 2012). Beverage companies subsequently produce more tasty, appealing and appetising products in order to attract people and increase consumer purchases (Chandon & Wansink 2012).

Impact of 2018 sugar-sweetened beverage tax

Consumer awareness of 2018 sugarsweetened beverage tax

Table 8 presents awareness of the forthcoming SSB tax. More respondents (n=359, 82%) indicated that they were not aware of this SSB tax that would be applied later in 2018.

Interestingly, among the few respondents (n=45, 12%) who were aware, around two-thirds had either a diploma (n=18, 64%) or degree (n=19, 68%). It could be expected, as seen in other studies, that respondents with higher levels of education were more likely to be aware of the changes ahead (Kourouniotis, Keast, Riddell, Lacy, Thorpe & Cicerale 2016).

Impact that could have 2018 tax on sugarsweetened beverage purchases

Based on the findings of this study, a number of respondents (n=213, 49%) indicated that if the price of the beverage increased, they would

continue to purchase and consume the beverage as usual. Table 9 presents the impact that could have 2018 SSBs tax on future purchases.

It could be stated that these respondents (n=359, 82.0%) may have already been purchasing the cheapest available SSB. Conversely, nearly one-third of respondents (n=151, 35.1%) reported that they would reduce their SSB purchases and consume smaller amounts of SSBs. Fewer respondents (n=68, 15.5%) indicated that they would switch to cheaper drinks, and very few (n=4, 1.0%) confirmed that they would stop purchasing SSBs.

Analysis of the results from each type of SSB indicated that a significant number of respondents who regularly bought fizzy drinks (n=203, 46.2%) reported that they would continue purchasing beverages after SSB tax implementation. However, it was reported that the sale of some brands of fizzy drinks had dropped after implementation of SSB tax but slightly increased around end of the year due to festive seasons (Nel & Musingadi 2019).

Influence of demographic characteristics on SSB purchases after the forthcoming 2018 tax implementation

The influence of education on the decision to purchase fizzy drinks once the 2018 SSB tax has been implemented are presented in Table 10.

Education level: An important relationship was noted between level of education of respondents and the purchase of fizzy drinks after the implementation of SSB tax. Most respondents with matric and less (n=188, 62.8%) reported that they would continue purchasing SSBs even if prices increased due to tax.

CONCLUSION

Carbonated fizzy drinks were the most frequently purchased beverage. Price and taste were found to be the most important factors considered by respondents when purchasing SSBs. Nearly half of the respondents indicated the intention to continue purchasing their preferred beverages as usual despite the price increase due with the forthcoming SSB tax. The study findings indicate that the SSB tax alone would not have a major impact on the purchasing behaviour of the Black African women and their family members. Better education about obesity and its associated health risks as well as increased health awareness campaigns, conducted alongside with sugar tax could influence the purchasing behaviour of people.

Taking into consideration that differences in SSB purchasing were observed in this study, depending on socio-economic status of respondents, the high frequency of consumption of added sugars from carbonated fizzy drinks by Black African women and their family members requires further investigation. Since this study was conducted over a short period of time, future studies should be conducted to explore the long-term purchasing behaviour of people after the SSB tax.

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REFERENCES

Bailey, S., 2014, 'A guide to the non-alcoholic beverage industry' [Research].

Chandon, P. & Wansink, B., 2012, 'Does food marketing need to make us fat? A review and solutions', *Nutrition Reviews* 70(10), 571593.

Coca-Cola Company, 2010, 'Annual Reviews', viewed 11 February 2017, from http://www.cocacolacompany.com/ content/dam/journey/us/en/private/fileassets/pdf/ 2012/12/TCCC 2010 Annual Review Lo.pdf.

Cruwys, T., Bevelander, K.E. & Hermans, R.C.J. 2015. 'Social modelling of eating: A review of when and why social influence affects food intake and choice', *Appetite* 86, 3-18.

Deliens, T., Clarys, P., De Bourdeaudhui, J.I. & Deforche, B., 2014, 'Determinants of eating behaviour in university students: a qualitative study using focus group discussions', *British Medical Journal Public Health* 14(53), 1-12.

Drewnowski, A., Mennella, J.A., Johnson, S.L. & Bellisle, F., 2012, 'Sweetness and Food Preference', *The Journal of Nutrition* 142(7), 1142–1148.

Hendry,G, 2017, 'Professional Statistician. Johannesburg, South Africa', *Personal communication*, 1 March 2017.

Higgs, S. & Thomas, J., 2016, 'Social influences on eating', Current *Opinion in Behavioural Sciences* 9, 1-6.

Kourouniotis, S., Keast, R.S.J., Riddell, L.J., Lacy, K., Thorpe, M.G. & Cicerale, S, 2016, 'The importance of taste on dietary choice, behaviour and intake in a group of young adults', *Appetite* 103, 1-7.

Lloyd, P. & Maclaren, D., 2018, 'Should We Tax Sugar and If So How?', *The Australian Economic Review* 52 (1), 19–40.

Mchiza, Z.J., Steyn, N.P., Hill, J., Kruger, A., Schönfeldt, H., Nel, J. & Wentzelviljoen, E., 2015, 'A Review of Dietary Surveys in the Adult South African Population from 2000 to 2015', *Nutrients* 7, 8227-8250.

Moodie, M., Sheppard, L., Sacks, G., Keating, C. & Flego, A., 2013, 'Cost- Effectiveness of Fiscal Policies to Prevent Obesity', *Current Obesity Reports* (2)3, 211-224.

Moore, G., Young, A, Hassan, A. & James, K.,

2019, "Will the Implementation of a Sugar Tax Reduce Obesity Levels? An Insight from Scotland", *Indonesian Journal of Contemporary Management Research* (1)21-32.

National Department Of Health (NDOH), 2013, 'Strategic Plan for the Prevention and Control of Non-Communicable Diseases'. *Pretoria*, South Africa: NDOH.

National Treasury of South Africa, 2016, 'Policy Paper and Proposals on Taxation of Sugar-sweetened beverages', *Pretoria*:

Government Printer, viewed 16 February 2018, from [http:// www.treasury.gov.za/public comments/Sugarsweetened beverages/policy paper and proposals on the taxation of sugarsweetened beverages, 8 July 2016.

Nel, M. & Musingadi, K. 2019. Sugar tax leaves a bitter taste for the beverage sector, viewed 12 March 2020, from BMi Research - www.bmi.co.za.

Ng, M., Fleming, T., Robinson, M., Thomson, B. & Graetz, N., *et al.*, 2014, 'Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013'. 2014, *The Lancet* 384 (9945), 766–81.

Niebylski, M., Redburn, K., Duhaney, T. & Campbell, N., 2015, 'Healthy food subsidies and unhealthy food taxation: A systematic review of the evidence', *Nutrition* 31(6), 787–795.

Republic of South Africa, Minister of Finance, 2017, 'Draft: Rates and Monetary

Amounts and Amendment of Revenue Law Bill. 22 February 2017', viewed 21 May 2017, from http://www.treasury.gov.za/public comments/ Draft Rates and Monetary Amounts and Amendment of Revenue Laws Bill 22 February 2017pdf.

Sartor, F., Donaldson, L.F., Markland, D.A., Loveday, H., Jackson, M.J. & KUBIS, H.P., 2011, 'Taste perception and implicit attitude toward sweet related to body mass index and soft drink supplementation', *Appetite* 57, 237–246.

Shisana, O., Labadarios, D., Rehle, T., Simbayi, L., Zuma, K., Dhansay, A., Reddy, P., Parker, W., Hoosain, E., Naidoo, P., Hongoro, C., Mchiza, Z., Steyn, N.P., Dwane, N., Makoae, M., Malulele, T., Ramlagan, S., Zungu, N., Evans,

M.G., Jacobs, L., Faber, M. & Sanhanes-1 Team, 2013, 'South African National Health and Nutrition Examination Survey (SANHANES-1)'. cape town: HSRC Press.

Silman, A.J. & Macfarlane, G.J., 2002, *Epidemiological studies: a practical guide*, 2nd ed. Cambridge: Cambridge University Press.

Statistics South Africa. 2017. Demographic and Health Survey 2016: Key Indicator Report, viewed 2 Mars 2020, from http://www.statssa.gov.za/ publications/f2003-00-092016.pdf.

Statistics South Africa, 2016, Community Survey 1016 Technical Report, viewed 26 February 2020, from http// www.statssa.gov/CS-2016Technical-report Web.pdf

Statistics South Africa, 2012, Income and Expenditure of Households 2010/2011, Statistical release P0 100', viewed 20 October 2017, from http:// www.statssa.gov.za/publications/P0100/P01002011.pdf.

Steenhuis, I.H.M., Waterlander, W.E. & De Mul, A., 2011, 'Consumer food choices: The role of price and pricing strategies', Public *Health Nutrition* 14(12), 2220-2226.

Temple, N.J. & Steyn, N.P., 2013, 'Sugar and health: A food based dietary guideline for South Africa', South African Journal of Clinical Nutrition 26(3), 100-104.

Tedstone, A., Targett, V. & Allen, R., 2015, Public Health England: Sugar reduction the evidence for action', viewed 10 June 2017, from http://www.gov.uk/ government/publications/sugar reduction evidence-into-action.

Tugendhalf, A., Manyema, M., Veerman, L.J., Chola, L., Labadarios, D. & Hofman, K.J., 2015, 'Cost of inaction on sugar-sweetened beverage consumption: Implications for obesity South Africa'. *Public Health Nutrition* 1-9.

World Health Organisation (WHO), 2020, 'Global region, newsroom: Obesity and overweight', viewed 15 Mars 2017, from https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight.

World Health Organisation (WHO), 2016, 'Evidence brief for policy reducing the consumption of sugar-sweetened beverages and their negative health impact in Estonia', viewed 13 June 2017, from https://www.sm.ee/sites/default/files/content-editors/

Ministeerium_kontaktid/Uuringu_ja_analuusid/
Tervisevaldkond/ evipnet_europe_ebp_1_est_
\reducing_th_consu mption_of_sugarsweetened beverages. Pdf
World Health Organisation (WHO) 2015, 'World
Health Organisation Guideline: Sugars intake for
adults and children', viewed 18 May 2017, from
http:// www.who.int/nutrition/publications/

guidelines/sugars intake/en/.

Xi, Bo, Huang, Y., Reilly, K.H., Li, S., Zheng, R., Barrio Lopez, M.T., Martinez-Gonzalez, M.A & Zhou, D., 2015, 'Sugar-Sweetened Beverages and Risk of Hypertension and CVD: A Dose–Response Meta-analysis', *British Journal of Nutrition* 113(5), 709–717.