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The Use of Soda Taxes for Obesity Prevention

According to the National Health and Nutrition Examination Survey (NHANES), more than two-thirds of American adults are overweight¹ and more than one-third are obese.² The average body mass index (BMI) for American adults has increased from approximately 25 to 28 between 1960 and 2002. Similar changes have been observed in children and adolescents. This dramatic surge in obesity has resulted in rising rates of cardiovascular disease, diabetes, and other illnesses associated with diet.³ It is estimated that nine percent of medical expenses in the United States (US) result from obesity-related illnesses. Half of these are paid by public funds.⁴ To offset these costs and discourage residents from drinking sugar-sweetened beverages (SSBs), several states have implemented “soda taxes” on artificially sweetened soda, sports drinks, and fruit drinks. Approximately 34 states apply a sales tax to soft drinks (either by directly taxing soft drinks or by excluding it from the sales tax exemption granted to food), while other states apply an excise tax to SSBs.^{5, 6}

The Role of Soda in Weight Gains

The consumption of sugar-sweetened beverages has doubled in the US since 1977 and has increased internationally.⁷ According to the US Department of Agriculture (USDA), per capita

¹ For adults, a BMI ≥ 25 is considered overweight, while a BMI ≥ 30 is considered obese.

² Cynthia L. Ogden, Cheryl D. Fryar, Margaret D. Carroll, and Katherine M. Flegal, “Mean Body Weight, Height, and Body Mass Index, United States 1960–2002,” *Advance Data From Vital and Health Care Statistics*, United States Department of Health and Human Services Centers for Disease Control and Prevention, October 27, 2004.

³ Nicole Darmon and Adam Drewnowski, “Does social class predict diet quality?” *American Journal of Clinical Nutrition* 87.5 (2008): 1107-1117, <http://www.ajcn.org/cgi/content/full/87/5/1107>, accessed 26 April 2010.

⁴ Kelly D. Brownell, Thomas Farley, Walter C. Willett, Barry M. Popkin, Frank J. Chaloupka, Joseph W. Thompson, and David S. Ludwig, “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages,” *The New England Journal of Medicine* 361.16 (2009): 1599-605, <http://content.nejm.org/cgi/content/full/361/16/1599#R37>, accessed 26 April 2010.

⁵ Lisa M. Powell and Frank J. Chaloupka, “Food Prices and Obesity: Evidence and Policy Implications for Taxes and Subsidies,” *The Milbank Quarterly*, Vol. 87, No. 1, 2009 229-257.

⁶ Powell and Chaloupka, “Food Prices and Obesity: Evidence and Policy Implications for Taxes and Subsidies.”

⁷ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages.”

consumption of soft drinks increased nearly 500% over the past 50 years.⁸ As sugar-sweetened beverage consumption has increased, it has replaced other beverages, particularly milk and fruit juice, in the diet of children and adolescents, leading to an increase in caloric consumption.⁹ According to one study, approximately 67% of sugar-sweetened beverages consumed are soda.¹⁰ Soda consumption has been hypothesized as one of the leading causes of the rapid growth rate of obesity in the US.¹¹ Not only does soda contribute to caloric intake but it and other foods rich in free sugars have been shown to reduce appetite control.^{12,13} Additionally the increase in soda consumption has paralleled the rise of obesity.¹⁴ There is a strong correlation between increased consumption of sugar-sweetened beverages, an above average BMI, total daily caloric intake, and lowered nutrient intake.^{15,16} There are several biological and metabolic reasons for this.

Health Effects

Unlike sugar-sweetened foods, sugar-sweetened beverages do not seem to provide adequate satiety, which prevents individuals from compensating for the calories ingested from SSBs during later meals.¹⁷ This dynamic leads to a higher total caloric intake overall, by an average of 172 calories in children and 175 calories in adults each day.¹⁸ Over time, this can lead to significant weight gain. According to a study conducted during 1995 to 1997 on schoolchildren, the risk of obesity increased one to six times with each additional daily serving of sugar-sweetened beverage.¹⁹

Habitual intake of sugar-sweetened beverages is believed to have long-term health effects that extend beyond obesity. Some of these health effects include raised blood pressure and lowered HDL cholesterol levels. In addition, sugar-sweetened beverages have a high glycemic index that

⁸ Jason M. Fletcher, David Frisvold, and Nathan Teft, "Can Soft Drink Taxes Reduce Population Weight?" *Contemporary Economic Policy*, ISSN 1074-3529, 2009, <http://publichealth.yale.edu/faculty/labs/fletcher/fft.pdf>, accessed 8 July, 2010.

⁹ Lisa Harnack, Jamie Stang, and Mary Story, "Soft Drink Consumption among US Children and Adolescents," *Journal of the American Diabetes Association* 99.4 (1999): 436-441.

¹⁰ Lisa Powell, Jamie Chriqui, and Frank J. Chaloupka, "Associations between State-level Soda Taxes and Adolescent Body Mass Index," *Journal of Adolescent Health* 45(2009): S57-S63, <http://www.kchealthykids.org/FileLibrary/FileImage/200909%20Assoc%20Between%20Soda%20Tx%20and%20Body%20Mass%20PIIS1054139X09001062.pdf>, accessed 8 June 2010.

¹¹ Fletcher et al., "Can Soft Drink Taxes Reduce Population Weight?"

¹² Fletcher et al., "Can Soft Drink Taxes Reduce Population Weight?"

¹³ World Health Organization, Technical Report Series. "Diet, Nutrition, and the Prevention of Chronic Diseases", Geneva: WHO, 2003, 916.

¹⁴ Fletcher et al., "Can Soft Drink Taxes Reduce Population Weight?"

¹⁵ Brownell et al., "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages."

¹⁶ Powell et al., "Associations between State-level Soda Taxes and Adolescent Body Mass Index."

¹⁷ David S. Ludwig, Karen E. Peterson, and Steven L. Gortmaker, "Relation between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis," *The Lancet* 357.9255 (2001): 505-508.

¹⁸ Brownell et al., "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages."

¹⁹ Ludwig, Peterson and Gortmaker, "Relation between consumption of sugar-sweetened drinks and childhood obesity: a prospective, observational analysis."

contributes to insulin resistance and can lead to diabetes.²⁰ It is also believed that the routine consumption of sugar-sweetened beverages may lead consumers to develop a preference for sweeter, less satiating foods over healthier options.

Do Sugar-Sweetened Beverages Cause Obesity?

According to Kelly D. Brownell et al., there is a causal link between the consumption of sugar-sweetened beverages and the risk for obesity, diabetes, and heart disease because there are positive associations between SSBs and weight gain.²¹ Brownell declares that behavioral and biological mechanisms are responsible for the connection between the consumption of sugar-sweetened beverages and these health problems. For example, adverse physiological and metabolic effects of sugar include the elevation of triglyceride levels and blood pressure and the lowering of high-density lipoprotein cholesterol levels (“good” cholesterol), which could increase the risk of coronary heart disease.²² He also points to weight gain as a consequence of “poor satiating properties of sugar in liquid form,” in which many people do not adjust their calorie intake in accordance with the amount of calories in SSBs.²³ Additionally there are psychological effects that Brownell and his colleagues explored. For instance, many people consume sugar-sweetened beverages in absence of hunger in order to satisfy thirst or for social reasons, while children who habitually consume these beverages come to find them more appealing than water and less sweet foods, thus causing them to have a poor diet.²⁴

Researchers at Johns Hopkins University Bloomberg School of Public Health had findings similar to those of Brownell and his colleagues. First, weight loss is positively associated with reduced liquid calorie consumption, which has a larger impact on weight than solid calorie consumption.²⁵ Benjamin Caballero MD, PhD states, “Among sugar-sweetened beverages, a reduction of 1 serving was associated with a weight loss of 0.5 kg at 6 months and 0.7 kg at 18 months. Of the seven types of beverages examined, sugar-sweetened beverages were the only beverages significantly associated with weight change.”²⁶ Caballero and his colleagues from the Johns Hopkins School of Medicine and other distinguished medical research institutions found that of sugar-sweetened beverages, diet drinks, milk, 100% juice, coffee and tea with sugar, coffee and tea without sugar, and alcoholic beverages, the leading source of liquid calories

²⁰ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages.”

²¹ <http://content.nejm.org/cgi/content/full/361/16/1599#R37>

²² <http://content.nejm.org/cgi/content/full/361/16/1599#R37>

²³ <http://content.nejm.org/cgi/content/full/361/16/1599#R37>

²⁴ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages.”

²⁵ Liwei Chen, Lawrence J Appel, Catherine Loria, Pao-Hwa Lin, Catherine M Champagne, Patricia J Elmer, Jamy D Ard, Diane Mitchell, Bryan C Batch, Laura P Svetkey and Benjamin Caballero, “Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial,” *American Journal of Clinical Nutrition*, vol. 89, (April 2009), pp. 1299-1306.

²⁶ Liwei Chen, Lawrence J Appel, Catherine Loria, Pao-Hwa Lin, Catherine M Champagne, Patricia J Elmer, Jamy D Ard, Diane Mitchell, Bryan C Batch, Laura P Svetkey and Benjamin Caballero, “Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial.”

came from SSBs at 37%.²⁷ Researchers also found that consumption from liquid calories in beverages “increased in parallel to the obesity epidemic.”²⁸

According to a study it has been found that substituting water for SSBs is an effective way to reduce calorie intake among children and adults, thus reducing the risk of obesity and related health issues, as well as dental problems, like cavities, that are related with sugar intake.²⁹

David A. Kessler, a former commissioner for the Food and Drug Administration (FDA), has an alternative view on the subject in which he sees “entertaining” foods, which are foods that contain high-calorie ingredients mixed into different combinations like nachos and cheese, as a large contributor to the obesity epidemic.³⁰ He claims that the “craveability” of these foods is like drugs or gambling in so far as they provide a stimulus response in which a reward is involved.³¹ Through these analyses, there appears to be some consensus among experts that point to SSBs as one of the many causes of obesity.

Why Tax Sugar-Sweetened Beverages?

The correlation that exists between the consumption of SSBs and a heightened risk of obesity and obesity-related conditions is much clearer than the link that exists with other snack foods. In addition, sugar-sweetened beverages lack nutritional value.³² Sugar-sweetened beverages are also easier to define than snack foods, allowing them to be taxed more easily. This allows lawmakers more leverage in taxing the beverages.

Would a Tax on SSBs Reduce Consumption?

A tax on sugar-sweetened beverages aims to reduce consumption of these products, promote public health, and reinvest revenue generated from the tax.³³ Soft drinks are one of the more responsive food groups to price changes. Consumer preferences for soft drinks are dependent on the price charged. “The price elasticity of demand is a dimensionless construct referring to the percentage change in purchased quantity or demand with a 1% change in price. It is determined by a multitude of factors: availability of substitutes, household income, consumer preferences, expected duration of price change, and the product’s share of a household’s

²⁷ Chen et. al., “Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial.”

²⁸ Chen et. al., “Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial.”

²⁹ Chen et. al., “Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial.”

³⁰ Elizabeth Kolbert, “XXL; Why Are We So Fat?” *The New Yorker*, 20 July 2009, 73. (Lexis-Nexis Academic)

³¹ Elizabeth Kolbert, “XXL; Why Are We So Fat?”

³² Roland Sturm, Lisa M. Powell, Jamie F. Chiqui, and Frank J. Chaloupka, “Soda Taxes, Soft Drink Consumption, and Children’s Body Mass Index,” *Health Affairs* 10.1377 (2010).

³³ Tatiana Andreyeva, Michael Long, and Kelly Brownell, “The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food,” *American Journal of Public Health*, 17 Dec. 2009, <http://ajph.aphapublications.org/cgi/content/full/100/2/216>, accessed 4 May 2010.

income.”³⁴ Soft drinks have high price elasticity and it’s possible that consumption could decrease by eight to ten percent with a ten percent tax.³⁵ Some studies indicated that high taxes could affect consumption and therefore rates of obesity and overweight. Several studies have indicated that a ten percent increase in the price of these beverages would diminish consumption by eight to 11 percent.³⁶

Food selection tends to change depending upon cost of the product. For example, when sugar-sweetened beverages are too costly, consumers tend to purchase more reduced-fat milk, juice, coffee, or tea, according to one study conducted in 2004.³⁷ While these findings imply that taxation of unhealthy foods leads to substitutions of healthier foods, another study found that a tax on saturated fat lead to an increase in salt consumption and a decrease in unsaturated fats. These changes in consumption meant that the tax actually lead to unhealthier food choices.³⁸ A study on cross-price elasticity found that this phenomenon may also occur with soft drinks, as decreases in soft drink consumption were paired with increases in the consumption of other caloric beverages, such as whole milk and juice-related drinks³⁹ and that this change in consumption may explain the modest reduction in obesity levels.⁴⁰

Current Soda Taxes

State Level

Currently 34 states, including CA, FL, MD, ME, NY and RI, apply sales tax to soda sold through grocery stores/retailers or vending machines.⁴¹ Of these states, 28 have ‘disfavored’ soda by taxing it at a higher rate than other foods and beverages.⁴² State tax rates for soda sold in grocery stores ranges from 1.23% to 7%, averaging 4.5%.⁴³ On soda sold in vending machines, taxes can be as high as 8%. States have taken several different approaches to their soda taxes.

³⁴ Andreyeva, Long, and Brownell, "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food."

³⁵ Andreyeva, Long, and Brownell, "The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food."

³⁶ Kuchler, Tegene and Harris, "Taxing Snack Foods: What to Expect for Diet and Tax Revenues."

³⁷ Fred Kuchler, Tegene Abebayehu, and J. Michael Harris, "Taxing Snack Foods: What to Expect for Diet and Tax Revenues," *Agriculture Information Bulletin*, United States Department of Agriculture, Agriculture Information Bulletin, 747-08, August 2004.

³⁸ McColl, Karen, "'Fat taxes' and the financial crisis," *The Lancet*, 373, No. 9666, 7 March 2009.

³⁹ C. Schroeter, J. Lusk, and W. Tyner, "Determining the Impact of Food Price and Income Changes on Body Weight," *Journal of Health Economics*, 27(1), 2008, pp. 45–68.

⁴⁰ Fletcher, Jason M., David Frisvold, and Nathan Tefft, "The Effects of Soft Drink Taxes on Children and Adolescent Consumption and Weight Outcomes," *The Robert Wood Johnson Foundation Scholars in Health Policy Research Program*, Working Paper Series 44, August 2009.

⁴¹ Brownell et al. "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages"

⁴² Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines, 2007." *Journal of Public Health Policy* 29.2 (2008): 226-249. Environment Complete. EBSCO. Web, accessed 6 May 2010.

⁴³ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines"

For example, in Alabama, soda is taxed when purchased both in grocery stores and from vending machines, and the manufacturer of soda, based on the capacity of the individual bottling machine, is also taxed.⁴⁴ Arkansas places a privilege tax per volume of soda or soda syrup on manufacturers, wholesalers, distributors, and retailers.

States have encountered challenges in implementing their soda taxes as it directly conflicts with federal programs.⁴⁵ Currently the federal Supplemental Nutrition Assistance Program (or SNAP, formerly known as the Food Stamp Program) mandates that states must allow any food bought with SNAP funds to be exempt from state sales tax. As the federal government includes soda in its definition of food, it is impossible for states to have widespread implementation of the soda tax. As a result, the soda tax would face limited impact in consumption reduction for low-income families, often the most heavily affected by obesity. However, in cities such as Chicago, taxes are enacted against specific foods in a similar manner to state excise taxes. On a broader level, municipalities can and do implement broad sales taxes. However, since the taxes are not enacted on the state level, they are not considered to be sales taxes and can be levied even under the SNAP.⁴⁶ Additionally, license and privilege fees can be implemented. While excise taxes, which are levied against manufacturers, distributors, and wholesalers, are permitted under the SNAP, only seven states currently impose them.⁴⁷

Part of the reason so few states have excise taxes is that the food industry has taken great efforts to make states repeal existing taxes and not enact new ones. In fact, of the nine states that have repealed sugar taxes, eight of them did so following aggressive lobbying efforts by the food industry.⁴⁸ Such actions by the food industry continue up to the present day, as shown by the soft drink industry's successful advertising campaign against the proposed New York obesity tax.⁴⁹

There are several advantages to the excise tax over the sales tax. The first of these, as aforementioned, is that a sales tax specifically on one class of food, such as soda, would not be put into effect under the SNAP. Excise taxes, however, would be enacted independently of the SNAP.⁵⁰ Additionally, the excise tax would be added to the purchase price of the product,

⁴⁴ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines"

⁴⁵ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines"

²⁶ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines"

⁴⁷ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines"

⁴⁸ Jacobson, Michael F. and Kelly D. Brownell, "Small Taxes on Soft Drinks and Snack Foods to Promote Health," *American Journal of Public Health*, 90, no. 6, June 2000.

⁴⁹ Anemona Hartocollis, "Failure of State Soda Tax Plan Reflects Power of an Antitax Message." *New York Times*, 2 July 2010, <http://www.nytimes.com/2010/07/03/nyregion/03sodatx.html?pagewanted=all>, accessed, 17 July 2010.

⁵⁰ Chriqui et al., "State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines."

whereas the sales tax would only be enacted at the cash register. This means that, under a sales tax, the consumer has already decided to buy the product before the tax is added. Under an excise tax, however, the higher price is already in effect before the consumer decides to purchase the product. This will increase the chances that the tax will influence the consumer's decision.⁵¹

In order to comply with Multistate Streamlined Sales and Use Tax Agreement (SSUTA) to which Vermont agreed, Vermont must apply the standard sales tax rate (which is now six percent) to categorical products such as candy and soft drinks.⁵² Application of the excise tax, however, allows more leeway in product grouping and could include taxation on something like SSBs.

Federal Level

In May 2009, the Senate Finance Committee held hearings concerning possible options for financing health care legislation. One of the proposed legislative actions was the implementation of a federal excise tax on soda similar to the existing federal tax on cigarettes and alcohol. States have already recognized that negative health consequences associated with soda differentiate it from ordinary food, allowing it to be subject to additional taxes to generate revenues for health care funding.

A federal tax of one cent per 12-ounces would raise about \$1.5 billion annually and a tax of one cent per ounce would raise about \$16 billion per year.⁵³ A report from The Center for Science in the Public Interest indicated that a federal soda tax would reduce consumption and curb the growth of obesity.⁵⁴ As of May 2010 no legislation for a national soda tax has been proposed by Congress.

Effects of Soda Taxes

Would a Soda Tax Reduce Obesity and Overweight Rates?

A substantial body of research has established an unequivocal link between SSBs and obesity; and another body of research has found a link between taxes and consumption of SSBs (or other products, mainly cigarettes). That in of itself is enough evidence to strongly suggest that

⁵¹ Marr, Chuck and Gillian Brunet, "Taxing High-Sugar Soft Drinks Could Help Pay For Health Care Reform," *Center on Budget and Policy Priorities*, 27 May 2009, <<http://www.cbpp.org/cms/index.cfm?fa=view&id=2830>>

⁵² Soft drinks" are defined under the SSUTA as any non-alcoholic beverage that contains natural or artificial sweeteners, other than those that contain milk, milk products, soy, rice or similar milk substitutes, or greater than 50% vegetable or fruit juice by volume. "Candy" means a preparation of sugar, honey, or other natural or artificial sweeteners in combination with chocolate, fruits, nuts or other ingredients or flavorings in the form of bars, drops, or pieces; "candy" does not contain flour and does not require refrigeration. By law, these definitions must be used if any of these types of products are to be subject to a sales tax. Streamlined Sales and Use Tax Agreement, http://www.streamlinedsalestax.org/uploads/downloads/Archive/SSUTA/SSUTA_As_Amended_4_30_10.pdf (accessed July 14, 2010), sec. 308 (consistency of rates), and App. C, part II (product definitions).

⁵³ Senators Max Baucus and Chuck Grassley, Senate Finance Committee, "Roundtable Discussion on Financing Comprehensive Health Care Reform," 12 May 2009.

⁵⁴ Senate Finance Committee, "Roundtable Discussion on Financing Comprehensive Health Care Reform."

taxing SSBs at a significantly high rate would reduce weight gain and obesity in Vermont resulting in healthier Vermonters, a more productive work force, and lower health care costs for the state (see other VLRS obesity reports at www.uvm.edu/~vlrs).

Some research has attempted to establish a *direct* link between taxing SSBs and obesity reduction. Such research is not necessary given the other linkages that have been established in the research (between SSBs and obesity and between taxation and consumption). It is also difficult to accurately do given that the causes of obesity are multiple and complex.⁵⁵ Trying to assess the impact of one change in the environment of factors that contribute to obesity will result in statistics that indicate, at best, only a fraction of a decline in obesity, especially if the statistical analyses do not model potential interaction effects. Nonetheless, some research has been published that attempts to measure a direct link between taxes on SSBs and obesity (and finds small, albeit significant effects) so we summarize the findings below.

According to one study, existing soda taxes have failed to result in substantial changes in obesity rates throughout the population.⁵⁶ This is largely thought to be because the tax rates are too low.^{57, 58} However, as the price elasticity of caloric sweetened beverages has been calculated to be -1.26, meaning that demand for such beverages is elastic, there is promise that higher tax rates might be effective.⁵⁹ For instance, estimates done on the original 18% soda tax rate proposed by New York's Executive Budget show that population BMI would decrease by 0.23 units, or a 20% decrease in excess BMI gain.⁶⁰ Maine has recently increased its soda tax rate by 20 percentage points. According to Fletcher et al., this increase could lead to a BMI reduction of 0.06.⁶¹ Studies of the effects of soda taxes on obesity rates and weight loss in children, adolescents, and adults have revealed that current levels of taxation result in significant improvements only within limited segments of the population, segments that are affected by the regressive nature of the tax.^{62,63} Soda taxes currently being implemented within the US have a small, yet statistically significant, effect on weight loss among minorities, low-income families, those who watch a large amount of television, and those who have an especially high BMI.⁶⁴ Certain subgroups of children, who are more at risk for obesity, had more significant changes in consumption in reaction to increased soda taxes. These subgroups

⁵⁵ This is reflected in the low R^2 in statistical models in this research, indicating that the statistical models that were used failed to explain much of the variation or change in rates of obesity (not surprising given the difficulty of the task).

⁵⁶ Sturm et al., "Soda Taxes, Soft Drink Consumption, And Children's Body Mass Index."

⁵⁷ Sturm et al., "Soda Taxes, Soft Drink Consumption, And Children's Body Mass Index."

⁵⁸ Fred Kuchler, Tegene Ababayehu, and J. Michael Harris, "Taxing Snack Foods: What to Expect for Diet and Tax Revenues," *Agriculture Information Bulletin*, United States Department of Agriculture, Agriculture Information Bulletin, 747-08, August 2004.

⁵⁹ Travis A. Smith, Biing-Hwan Lin, and Jonq-Ying Lee, "Taxing Caloric Sweetened Beverages," *United States Department of Agriculture Economic Research Service*, Economic Research Report Number 100, July 2010.

⁶⁰ Sturm et al., "Soda Taxes, Soft Drink Consumption, And Children's Body Mass Index."

⁶¹ Fletcher et al., "Can Soft Drink Taxes Reduce Population Weight?"

⁶² Powell et al., "Associations between State-level Soda Taxes and Adolescent Body Mass Index."

⁶³ Sturm et al., "Soda Taxes, Soft Drink Consumption, and Children's Body Mass Index."

⁶⁴ Sturm et al., "Soda Taxes, Soft Drink Consumption, and Children's Body Mass Index."

include children who are already overweight, live in low-income households, and are African American.⁶⁵

According to another article, “[s]tate soft drink taxes have a statistically significant impact on behavior and weight; however, the magnitude of the effect is small. An increase in the state soft drink tax rate of 1 percentage point leads to a decrease in BMI of 0.0003 points and a decrease in obesity and overweight of 0.01 and 0.02 percentage points.”⁶⁶ In recognition of the difficulty of finding a large magnitude effect of soda taxes on obesity the researchers concluded

Although soft drink consumption is the single largest contributor of energy intake in the United States in the past decade...it represents only 7% of the total energy intake.

Therefore, we should expect only modest changes in population weight through soft drink consumption responses to small tax increases.⁶⁷

Yet another study found that a 20% tax on caloric sweetened beverages would lead to a daily net decline of 36.9 calories for adults and 42.7 for children.⁶⁸ This would lead to a 3% decrease in obese adults and a 3.1% decrease in overweight children. These decreases could be augmented if the taxes were paired with educational programs of awareness. This phenomenon has been found with cigarettes.⁶⁹

Some research has indicated that higher prices of less healthy foods like junk foods have correlated with a decrease in BMI and prevalence of overweight and obesity. “One of these studies found that an increase in the price of sugary foods would significantly reduce the prevalence of overweight and obesity among adults, leading the authors to conclude that taxing such foods, thereby increasing their relative cost, would likely be an effective strategy to reduce adult obesity rates.”⁷⁰ Additional studies have also determined a relationship between prices of fast food and weight. For example, adolescent obesity decreased six percent with a ten percent increase in the cost of fast food.⁷¹

Other research brings up several concerns about soft drink taxes. The first of these is that the tax level would either be high enough to reduce consumption and therefore not raise the predicted funds or would be low enough to raise the funds but not decrease consumption.⁷² As raising funds for educational programs are considered to be such a critical component of reducing obesity, it is difficult to choose one tax level over the other. Another concern is that an

⁶⁵ Sturm et al., “Soda Taxes, Soft Drink Consumption, And Children’s Body Mass Index.”

⁶⁶ Fletcher et al., “Can Soft Drink Taxes Reduce Population Weight?”

⁶⁷ Fletcher et al., “Can Soft Drink Taxes Reduce Population Weight?”

⁶⁸ Smith, Lin, and Lee, “Taxing Caloric Sweetened Beverages.”

⁶⁹ Smith, Lin, and Lee, “Taxing Caloric Sweetened Beverages.”

⁷⁰ Chaloupka, Frank J., Lisa M. Powell, and Jamie F. Chiqui, “Research Brief- Sugar-Sweetened Beverage Taxes and Public Health,” Healthy Eating Research and Bridging the Gap as part of the Robert Wood Johnson Foundation, July 2009,

http://www.impactteen.org/generalarea_PDFs/Beverage%20Tax%20Research%20Brief%207.31.09%20FINAL.pdf, accessed 7 July, 2010.

⁷¹ Chaloupka et al., “Research Brief- Sugar-Sweetened Beverage Taxes and Public Health”

⁷² Kuchler, Tegene and Harris, “Taxing Snack Foods: What to Expect for Diet and Tax Revenues.”

excise tax, the tax which would in theory be most effective to curb consumption, may simply be swallowed by the industry and therefore not lead to a price change or may be dispersed over all foods, meaning that there is no added disadvantage of consuming soda.⁷³ Additionally, concerns have been raised that SSB taxes are regressive, placing a greater burden on low-income households.⁷⁴

State Revenues

A soda tax is most effective when the revenue generated from the tax is reinvested into social programs specifically earmarked to decrease consumption and promote public health.⁷⁵ However, solely basing the funding of these programs on the tax revenue generated may pose a problem. If successful, a reduction in soda consumption will contribute to steadily decreasing revenues from the soda tax as more people choose other products and others never enter the market.⁷⁶

Type of Tax

There are various considerations to be weighed with different types of taxes on beverages. When a sales tax is implemented, the tax is added on at the register—after the consumer has made the decision to purchase the soda. Also, a sales tax encourages people to search for cheaper alternatives or buy in bulk containers, which cost less per ounce, resulting in lower revenues for the state and a failure to discourage consumption.⁷⁷

Alternatively, an excise tax taxes the weight or volume of a good. The producer then incorporates the cost of the tax into the price of the good. This is passed on to consumers, who are more likely to recognize the increased price of the good on the shelf than at the register as in the case of a sales tax.⁷⁸ An excise tax levied on producers is easier to collect due to the smaller number of businesses that must comply with the tax. The experience with ‘sin taxes’ on cigarette and alcohol suggest that excise taxes can have a significant effect on consumption.⁷⁹

With cigarettes, data show that an increase in the tax leads to stockpiling before implementation, followed by a temporarily substantial decline right after implementation. Additionally, adolescents and young adults are more responsive to changes in price.⁸⁰ According to the Urban Institute, the cigarette excise tax has been the major successful policy

⁷³ Kuchler, Tegene and Harris, “Current Issues in Economics of Food Markets.”

⁷⁴ McColl, Karen, “‘Fat taxes’ and the financial crisis,” *The Lancet*, 373, No. 9666, 7 March 2009.

⁷⁵ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁷⁶ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁷⁷ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁷⁸ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁷⁹ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁸⁰ National Conference of State Legislatures, “Cigarette Excise Taxes: 2010,” *National Conference of State Legislatures*, 1 July 2010.

towards reducing cigarette consumption.⁸¹ All that being said, it is unclear of how readily such statistics for tobacco would transfer over to fat or sugar taxes, as, unlike cigarette taxes, obesity taxes lack public support.⁸²

Several research groups have recommended an excise tax of one cent per ounce of sugar-sweetened beverage sold, which would increase the price paid by consumers by approximately 20%, reduce consumption by 23%, and would not affect diet beverages.^{83,84} The implementation of this tax in Vermont would generate \$31.4 million in 2010, based on consumer data from 2007.⁸⁵

Several states such as Massachusetts and New York have proposed enforcing a soda tax and using a portion of the revenue toward obesity reduction efforts.⁸⁶ A similar strategy has been suggested for Vermont.⁸⁷

Soda Industry

Interest in taxes on sugar-sweetened beverages at the state and federal level has not gone unnoticed by the beverage industry, which spent an estimated \$18 million lobbying against federal consideration of the use of soda taxes to fund the recent healthcare bill.⁸⁸ The American Beverage Association, the national “voice” for soda producers and bottlers, has positioned itself against soda taxes at the local, state, and federal level, arguing that no single product should be targeted for obesity treatment and prevention.⁸⁹ The industry has also played a pivotal role in the creation of Americans Against Food Taxes, an organization that lobbies against beverage and food taxes, whose coalition members include many major food and beverage producers and retailers.⁹⁰ This response indicates that the industry is concerned about the impact soda taxes may have on public awareness of the health dangers sugar-sweetened beverages can

⁸¹ Sara Imershein, “Soda Tax for Obesity Prevention – has the time arrived?” *Target Population*, 4 March 2010, <http://targetpopulation.wordpress.com/2010/03/04/soda-tax-for-obesity-prevention-%E2%80%93-has-the-time-arrived/>

⁸² Chriqui et al., “State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines”

⁸³ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages”

⁸⁴ Frank J. Chaloupka, “Rudd Center for Food Policy and Obesity — Drink Taxes.” *Revenue Calculator for Soft Drink Taxes*. Ed. Tatiana Andreyeva. Rudd Center for Food Policy and Obesity. <http://www.yaleruddcenter.org/sodatax.aspx>, accessed 22 April 2010.

⁸⁵ Chaloupka, “Rudd Center for Food Policy and Obesity — Drink Taxes.”

⁸⁶ Powell et al., “Associations between State-level Soda Taxes and Adolescent Body Mass Index.”

⁸⁷ Dickey, Don, “A Population Health Approach to Improving Nutrition and Physical Activity for Obesity Prevention,” *Health Care Reform Commission*, Vermont State Legislature, December 2007.

⁸⁸ Kim Geiger and Tom Hamburger, “Soft Drink Tax Battle Shifts to States,” *Los Angeles Times* 21 Feb. 2010, <http://articles.latimes.com/2010/feb/21/nation/la-na-soda-tax21-2010feb21>, accessed 9 May 2010.

⁸⁹ “News & Media - News Releases & Statements,” *American Beverage Association*, 1 April 2010. <http://www.ameribev.org/news--media/news-releases--statements/more/188/>, accessed 11 May 2010.

⁹⁰ “Americans Against Food Taxes: About Us,” *Americans Against Food Taxes*, <http://nofoodtaxes.com/about/>, accessed 12 May 2010.

cause and, ultimately, on their consumption.⁹¹

Additionally, there are concerns that the beverage industry would attempt to limit the extent of a sugar tax only to soft drinks, excluding sugar-sweetened fruit drinks. Their rhetoric is that, as they are fruit drinks, they are healthy despite their sugar levels. However, including sugar-sweetened fruit drinks is consistent with federal regulations of the Women, Infants, and Children program⁹² which only define 100% fruit juice as fruit drinks.⁹³

Lobbying Efforts Against Taxing SSBs

Groups opposed to taxing SSBs have taken the approach that tobacco companies used to fight regulation and taxation of cigarettes—that is, making vague claims about flawed methods or overstated results, claims that do not appear in any refereed scientific/social scientific journals that have passed the rigors of peer review.⁹⁴ The research that has been published and that has been cited up to this point comes almost entirely from peer reviewed journals (meaning that the methods and data have been scrutinized and cleared by other experts in these areas of study). It is classic advocacy/ideological group maneuver to make vague claims about flawed methods and overstated conclusions in order to try to create a misperception about the overall picture regarding research findings.

Conclusion

Extant research on the role of SSBs (sugar-sweetened beverages) offers evidence of a clear link between consumption of SSBs and obesity rates and an additional link between taxation and consumption. Additionally, some research has found a modest direct link between taxing SSBs and obesity rates. Overall, the picture is quite clear: consumption of SSBs is one of the factors associated with higher overweight and obesity rates and taxing such products would (especially if paired with other measures) lead to a reduction in consumption and thus a reduction in overweight and obesity rates.

Public support for these taxes appears to be increasing gradually, though data concerning soda taxes rather than the broader category of food taxes is limited. Much of the public support appears to rest on the creation of public health awareness programs with the funds generated

⁹¹ Brownell et al., “The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages.”

⁹² The Women, Infants, and Children (WIC) program is a federal program designed to assist women and children under the age of five who are at low-income and at nutritional risk. Information about this program can be accessed online at <http://www.fns.usda.gov/wic/aboutwic/>.

⁹³ Chuck Marr and Gillian Brunet, “Taxing High-Sugar Soft Drinks Could Help Pay For Health Care Reform” *Center on Budget and Policy Priorities*, 27 May 2009, <<http://www.cbpp.org/cms/index.cfm?fa=view&id=2830>>

⁹⁴ See for example, David Martosko, “Anti-soda bandwagon fueled by junk science,” *Center for Consumer Freedom*, 24 July 2003. (Published in the Seattle Times, 23 July 2003),

http://www.consumerfreedom.com/oped_detail.cfm/o/156-anti-soda-bandwagon-fueled-by-junk-science; or Prante, Gerald and Andrew Chamberlain, “The Case Against Soda Taxes to Curb Obesity,” *Tax Foundation Tax Policy Blog*, 13 June 2006, <http://www.taxfoundation.org/blog/show/1663.html>.

from soda taxes.^{95, 96}

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Disclaimer: This report has been prepared by undergraduate students at the University of Vermont under the supervision of Professor Anthony Gierzynski. The material contained in the report does not reflect the official policy of the University of Vermont.

⁹⁵ Brownell et al., "The Public Health and Economic Benefits of Taxing Sugar-Sweetened Beverages."

⁹⁶ Brownell and Frieden, "Ounces of Prevention – The Public Policy Case for Taxes on Sugared Beverages."