

State Sales Tax Rates for Soft Drinks and Snacks Sold through Grocery Stores and Vending Machines, 2007

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ABSTRACT

Junk food consumption is associated with rising obesity rates in the United States. While a "junk food" specific tax is a potential public health intervention, a majority of states already impose sales taxes on certain junk food and soft drinks. This study reviews the state sales tax variance for soft drinks and selected snack products sold through grocery stores and vending machines as of January 2007. Sales taxes vary by state, intended retail location (grocery store vs. vending machine), and product. Vended snacks and soft drinks are taxed at a higher rate than grocery items and other food products, generally, indicative of a "disfavored" tax status attributed to vended items. Soft drinks, candy, and gum are taxed at higher rates than are other items examined. Similar tax schemes in other countries and the potential implications of these findings relative to the relationship between price and consumption are discussed.

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INTRODUCTION

Obesity is a complex public health issue associated with many preventable causes of death such as heart disease and stroke. In 2005, 23.9% of US adults were obese and obesity prevalence increased in all states from 1995 to 2005 (1). Consumption of

sugar-based soft drinks and snack items contribute to weight gain and obesity in both juvenile and adult populations (2-4). The retail sales volume attributable to the sale of cold beverages (including soft drinks, sport drinks, teas, etc.) and snacks is substantial. Adolescents between the ages of 12 and 19 spent approximately \$159 billion on food, candy and soft drinks in 2005 alone (5). Also, the sale of cold beverages and snack products combined amounted to \$34.3 billion or 73% of all retail sales from vending machines in 2006 (6).

Obesity is not just the result of individual behavior, but influenced by environmental, social, cultural and genetic factors (7-9). For example, schools provide a primary venue for accessing soft drinks and snacks. While many food service managers strive to provide healthy choices, they cite many barriers, including the competing food and beverage options found in vending machines (3,9). In 2004 alone, data from the Centers for Disease Control and Prevention revealed that 95% of schools in 27 states had vending machines that sold soft drinks and sports drinks, both of which have been found to contain excessive amounts of sugar (9). Another study of 251 schools found that 74% of junior high schools and 98% of senior high schools had vending machines, with 75% of the beverages and 85% of the snack foods determined to be of poor nutritional value (3). However, in response to the growing concern over access to soft drinks and snack products in schools, several beverage and food manufacturers entered into a series of voluntary agreements with the Alliance for a Healthier Generation, a joint initiative of the William J. Clinton Foundation and the American Heart Association, to restrict access to these products in US schools. The agreement with the beverage industry limits portion sizes and restricts beverage sales in schools to low-calorie and nutritious beverages. The beverage agreement aims to implement the standards in 75% of schools in the United States prior to the beginning of the 2008-2009 school year (10). The snack food agreement with five of the leading food manufacturer's in the United States establishes voluntary guidelines for the sale of competitive foods in schools (including snacks, side items, and desserts) that seek to provide healthier choices for sale of such products in schools (11).

At the same time, US medical expenditures for obesity-related disease and illness were estimated at \$92.6 billion in 2002 dollars, with additional costs in lost productivity (12). Taxpayers are

responsible for financing about half of obesity-related medical costs through Medicare and Medicaid (12). As obesity rates for both children and adults continue to climb, as well as obesity-attributable medical expenditures, public health advocates search for effective prevention and intervention strategies.

Although the appropriateness of government intervention in obesity prevention is opposed by some, public health advocates point to victories such as reduced smoking rates, increased motor vehicle safety, and increased vaccination rates, to support regulation to combat obesity (13). The success of tobacco excise taxes on reductions in tobacco consumption has often been used as an indicator for the success of imposing specific excise taxes on soft drinks and snacks (14). A snack or soft drink tax could help narrow the gap between the disproportionate costs of healthy foods vs. non-healthy foods, no longer promoting non-healthy foods by means of being the "cheapest choice" available. Miljkovic *et al.* recently found that increasing the current price of sugar-based foods by 1% decreases the probability of a normal person from becoming overweight or obese by 2.32% and 3.07%, respectively (15). They concluded that "a price increase of addictive foods via additional taxes may be a suitable policy tool in preventing an increase in overweight and obesity since the normal [ie, non-obese, non-overweight] population is responsive to price changes" (15, p. 59). Additional data suggest that a state-level relationship exists between implementation of soft drink and snack taxes and changes in obesity prevalence (16).

Recent data on the state-level tax variation of soft drinks and snacks is not readily available; the most recent data on this topic was published in 2000 (17). The current study provides recent data with a focus on sales tax rates as these taxes are applied directly to consumers and because state excise taxes on soft drinks and snack products were repealed between the late 1990s and early 2000s (18). (The exception to this is Hawaii that levies a general excise tax in lieu of a sales tax (19). For purposes of this study, we are equating the Hawaii general excise tax with a sales tax.) As indicated in Table 1, only seven states levied any kind of tax upon snack and soda items outside of their sales tax regimes as of 1 January 2007. This study did not focus on these kinds of taxes because they, for the most part, are not paid for by the retailer or consumer, but instead are

Table 1: Summary of non-sales taxes levied on soft drinks and snack items (effective as of 1 January 2007)

State Tax

- AL
1. License tax upon ice cream manufactures who sell any part of their output at wholesale based on the number of inhabitants in the place of business (35,000 people or more: \$5; 7,000–35,000 people: \$10; and less than 7,000 people: \$50).
 2. License tax placed on the manufacturer of soda bottles based on the capacity of the individual bottling machine: Runs from \$40 for machines with capacity of less than 16 bottles/minute to \$500 for machines with capacity of 500 bottles/minute.
 3. Annual license fee placed upon the wholesaler (\$50) and retailer (\$2.50) of soft drinks placed in bottles. Does not apply to wholesalers who also have bottling license, and retailer tax is waived if they sell soda by means of a soda tap.
 4. Annual retailer license tax on soda sold via dispensing device, based on the number of inhabitants where the retailer is located: Less than 5,000 inhabitants: \$10; 5,000–15,000 people: \$15; 15,000–25,000: \$20; over 25,000: \$25. All of these are in addition to another annual \$2.50 retailer license tax.
- AR
1. Privilege tax of \$0.21/gallon of soda placed upon manufacturers, wholesalers, distributors, and retailers. The tax upon retailers applies only if the soda is bought from an unlicensed manufacturer, distributor, or wholesaler.
 2. Privilege tax of \$2/gallon placed upon manufacturers, distributors, wholesalers, and retailers of soda syrup. Tax on retailers is only if bought from an unlicensed manufacturer, distributor, or wholesaler.
 3. Privilege tax of \$0.21/gallon of soft drink that can be made according to the manufacturer's directions on manufacturers, distributors, wholesalers, and retailers of soft drink mix sold in a powder form. Retailers are only taxed if the soft drink powder is bought from an unlicensed manufacturer.
- RI
- Excise tax of \$0.04/case (24 12 oz. cans) of soft drinks placed upon the manufacturer.
- TN
- Privilege tax of 1.90% of gross receipts of soft drinks placed on the manufacturer and retailer of soft drinks.
-

Table 1 (Continued)

<i>State</i>	<i>Tax</i>
VA	Excise tax placed upon the wholesaler and distributor of soft drinks ranging from \$50 to \$33,000 depending on gross receipts.
WA	<ol style="list-style-type: none"> 1. Business and occupation tax placed upon manufacturers of ice cream, yogurt, or cheese of 0.138% of gross receipts. 2. Excise tax of \$1/gallon of soda syrup placed upon wholesalers and retailers of soda syrup. Any sale of previously taxed syrup is exempt from this excise tax.
WV	<ol style="list-style-type: none"> 1. Excise tax placed upon manufacturers, distributors, wholesalers, and retailers of \$0.01/0.5 l or fraction of soda placed in bottles. 2. Excise tax of \$0.80/gallon or fraction thereof of soda syrup placed upon manufacturers, distributors, wholesalers, and retailers of soda syrup. 3. Excise tax of \$0.84/4 l or fraction thereof of soda syrup placed upon manufacturers, distributors, wholesalers, and retailers of soda syrup.

placed upon manufacturers, distributors, and wholesalers. Taxes in Maine and the District of Columbia, which were previously reported in (17), have been repealed since that study was published.

This study seeks to answer two overarching questions: (a) How do sales tax rates vary by state, product (i.e., soft drinks and snacks), and retail location (i.e., vending machine vs. grocery stores)? (b) To what extent are soft drinks and/or snack products subject to higher state sales tax rates than other food products (i.e., "disfavored tax status")?

STUDY DATA AND METHODS

Data collected for this study included state sales tax rates for soft drinks and snack products sold through grocery stores and vending machines, effective as of 1 January 2007. For purposes of this study, "state" was defined to include the 50 states and the District of Columbia. Snack products of interest included candy, chewing gum, chips, pretzels, ice cream, popsicles, milkshakes, and baked

goods. These snack products were identified for inclusion based on a review of state statutes completed by the study authors in an earlier pilot study.

Data were compiled via primary legal research (20) using state statutory laws available in Lexis-Nexis, a commercial legal research provider, and were compared to data available from the Federation of Tax Administrators (FTA) (21). The FTA data confirmed that product-specific sales tax data only needed to be gleaned for 38 states since eight states imposed a flat, known tax on all foods, regardless of item, and five states did not impose any sales tax. The data were verified through telephone queries to the state tax administrator/department of revenue. Based on these calls, 27 states' (or 71% of states whose laws were captured) tax rates were determined to have been correctly coded as part of the initial legal research and analysis. In instances where the state verification identified a discrepancy, the state administrative codes (i.e., regulations) were reviewed to determine if a definition existed that would change the interpretation of the statutory coding (five states). When the regulatory review did not clarify the discrepancy (six states), the tax rate was verified through an on-site verification process whereby the items in question (e.g., soft drinks, gum, and candy) were purchased through a retail transaction in the state of interest. The on-site verification process confirmed that the original coding was, in fact, correct although contradictory to what the state tax officials indicated in those six states. Thus, in the end, the primary legal research was determined to be accurate in 33 of the 38 states reviewed (86.8%), with five states' (13.2%) data needing to be updated based on the state verification process.

RESULTS

How Do Sales Tax Rates for Soft Drinks and Snack Items Vary by State, Product, and Retail Location?

Overall, sales taxes are applied in 40 states (78.4%) for at least one of the items captured for this study. Sixteen states tax all "food products" sold through vending machines and five states tax "all items sold through vending machines" (Table 2). The highest sales tax rates are applied in Mississippi (7% for grocery items and 8% for vended items across all products examined); the lowest tax rates

Table 2: Sales tax rates and disfavored tax status for soft drinks and selected snack products by state (effective as of 1 January 2007)

State*	Soft drinks			Candy		Chewing gum	
	Food tax rate (%)	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†
AL	4.00	4.00		4.00		4.00	
AR	6.00	6.00		6.00		6.00	
CA†	0.00	6.25	B	0 (6.25)	VM	0 (6.25)	VM
CO	0.00	0.00		0.00		2.91	B
CT	0.00	6.00	B	6.00	B	6.00	B
DC†	0.00	0 (5.75)	VM	0 (5.75)	VM	0 (5.75)	VM
FL§	0.00	6.00	B	6.00	B	0 (6.0)	VM
GA§	0.00	0 (4.0)	VM	0 (4.0)	VM	0 (4.0)	VM
HI	4.00	4.00		4.00		4.00	
IA†	0.00	5.00	B	5.00	B	5.00	B
ID§	6.00	6.00		6.00		6.00	
IL	1.00	6.25	B	1.00		1.00	
IN†	0.00	6.00	B	6.00	B	6.00	B
KS	5.30	5.30		5.30		5.30	

Table 2: (Continued)

State*	Soft drinks			Candy		Chewing gum	
	Food tax rate (%)	Sales tax rate (vending machine tax rate if different) (%)	Disfa-vored/ higher tax than food tax for G/VM/Both [†]	Sales tax rate (vending machine tax rate if different) (%)	Disfa-vored/ higher tax than food tax for G/VM/Both [†]	Sales tax rate (vending machine tax rate if different) (%)	Disfa-vored/ higher tax than food tax for G/VM/Both [†]
KY [†]	0.00	6.00	B	6.00	B	6.00	B
MD [†]	0.00	5.00	B	5.00	B	5.00	B
ME [†]	0.00	5.00	B	5.00	B	5.00	B
MN [†]	0.00	6.50	B	6.50	B	6.50	B
MO	1.23	1.23		1.23		1.23	
MS [§]	7.00	7.0 (8.0)	VM	7.0 (8.0)	VM	7.0 (8.0)	VM
NC [†]	0.00	4.50	B	4.50	B	0 (4.5)	VM
ND	0.00	5.00	B	5.00	B	5.00	B
NE [†]	0.00	0 (5.5)	VM	0 (5.5)	VM	0 (5.5)	VM
NJ [†]	0.00	7.00	B	7.00	B	7.00	B
NM [§]	0.00	0 (5.0)	VM	0 (5.0)	VM	0 (5.0)	VM
NY [†]	0.00	4.00	B	4.00	B	4.00	B
OH	0.00	5.50	B	0.00		0.00	
OK	4.50	4.50		4.50		4.50	

Table 2: (Continued)

State*	Soft drinks			Candy		Chewing gum	
	Food tax rate (%)	Sales tax rate (vending machine tax rate if different) (%)	Disfa-voiced/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfa-voiced/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfa-voiced/ higher tax than food tax for G/VM/Both†
PA	0.00	6.00	B	0.00		0.00	
RI	0.00	7.00	B	7.00	B	7.00	B
SC	3.00	3.0 (5.0)	VM	3.0 (5.0)	VM	3.0 (5.0)	VM
SD	4.00	4.00		4.00		4.00	
TN	6.00	6.00		7.00	B	6.00	
TX†	0.00	6.25	B	6.25	B	6.25	B
UT	2.75	2.75		2.75		2.75	
VA†	1.50	1.5 (4.0)	VM	1.5 (4.0)	VM	1.5 (4.0)	VM
WA†	0.00	6.50	B	0 (6.5)	VM	0 (6.5)	VM
WI	0.00	5.00	B	5.00	B	5.00	B
WV†	5.00	5.00		5.00		5.00	
WY	0.00	0 (4.0)	VM	0 (4.0)	VM	0 (4.0)	VM

Table 2: (Continued)

State*	Chips/pretzels		Ice Cream		Popsicles		Milkbakes/baked goods	
	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/ Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/ VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/ Both†	Sales tax rate (Vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/ Both†
AL	4.00		4.00		4.00		4.00	
AR	6.00		6.00		6.00		6.00	
CA†	o (6.25)	VM						
CO	0.00		0.00		0.00		0.00	
CT	0.00		0.00		0.00		0.00	
DC†	o (5.75)	VM						
FL§	o (6.0)	VM	6.00	B	6.00	B	o (6.0)	VM
GA§	o (4.0)	VM						
HI¶	4.00		4.00		4.00		4.00	
IA†	o (5.0)	VM						
ID§	6.00		6.00		6.00		6.00	
IL	1.00		1.00		1.00		1.00	
IN†	o (6.0)	VM						
KS	5.30		5.30		5.30		5.30	
KY†	o (6.0)	VM						
MD†	0.00		5.00	B	5.00	B	o (5.0)	VM

Table 2: (Continued)

State*	Chips/pretzels		Ice Cream		Popsicles		Milkshakes/baked goods	
	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food for G/VM/Both†
ME†	0 (5.0)	VM						
MN†	0 (6.5)	VM						
MO	1.23		1.23		1.23		1.23	
MS§	7.0 (8.0)	VM						
NC†	0 (4.5)	VM						
ND	0.00		0.00		0.00		0.00	
NE†	0 (5.5)	VM						
NJ†	0 (7.0)	VM						
NM§	0 (5.0)	VM						
NY†	0 (4.0)	VM						
OH	0.00		0.00		0.00		0.00	
OK	4.50		4.50		4.50		4.50	
PA	0.00		6.00	B	0.00		0.00	
RI	0.00		0.00		0.00		0.00	
SC	3.0 (5.0)	VM						
SD	4.00		4.00		4.00		4.00	

Table 2: (Continued)

State*	Chips/pretzels		Ice Cream		Popsicles		Milkshakes/baked goods	
	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†	Sales tax rate (vending machine tax rate if different) (%)	Disfavored/ higher tax than food tax for G/VM/Both†
TN	6.00		6.00		6.00		6.00	
TX†	0 (6.25)	VM						
UT	2.75		2.75		2.75		2.75	
VA†	1.5 (4.0)	VM						
WA†	0 (6.5)	VM						
WI	0.00		5.00	B	0.00		0.00	
WV†	5.00		5.00		5.00		5.00	
WY	0 (4.0)	VM						

* Only states with sales taxes for soft drinks and selected snack products are included. Eleven states do not apply sales tax to these products: AK, AZ, DE, LA, MA, MI, MT, NH, NV, OR, and VT.

† G=grocery store; VM=vending machine; Both=grocery store and vending machine.

‡ State taxes all "food products" sold through vending machines (n=16).

§ State taxes all "items" sold through vending machines (n=5).

¶ Hawaii does not levy a sales tax but, rather, a general excise tax that is imposed on businesses but passed on to the consumer in the form of higher prices. For purposes of this study, we equated Hawaii's general excise tax with the sales taxes in other states.

(other than no tax) are applied in Illinois (1% for snack products sold through grocery stores or vending machines) and Missouri (1.23% for soft drinks sold through grocery stores and vending machines).

Sales taxes are applied to soft drinks sold through vending machines in 39 states and to snack products in 32–38 states, depending on the item (see Table 3). Sales taxes are less prevalent on items sold through grocery stores, ranging from a high of 34 states (soft drinks) to a low of 15 states (chips, pretzels, milkshakes, and baked goods).

Sales taxes are higher for soft drinks than for snack products and for vended items as compared to grocery items. In the states where a sales tax applies, the sales tax rate for soft drinks ranges from a low of 1.23% (grocery stores and vended items) to a high of 7% (grocery stores) and 8% (vending machines). The sales tax applied to all snack products examined for this study ranged from a low of 1% (grocery stores and vended items) to a high of 7% (grocery stores) and 8% (vending machines).

The average sales tax rate for vended soft drinks is 4.02%, while the average sales tax rate for vended snack products ranges from 3.13% (chips and pretzels) to 3.74% (chewing gum). The median sales tax rate for vended soft drinks is 5% compared with 4.50% (candy and chewing gum) and 4% (chips, pretzels, popsicles, milkshakes, and baked goods). The median sales tax rate for items sold through grocery/convenience stores ranges from a high of 4.50% (soft drinks) to a low of 0% (chips, pretzels, ice cream, popsicles, milkshakes, and baked goods). Across the snack products examined for this study, sales taxes were higher for candy and gum and lower for chips, pretzels, ice cream, popsicles, milkshakes, and baked goods.

Do State Sales Tax Rates "Disfavor" Soft Drinks and Snack Products?

Interestingly, 28 states tax soft drinks and/or snack products at a higher rate than the food tax rate in the state, indicative of the "disfavored" status attributed to these products (see Tables 2 and 3). The disfavored tax rate is much more common for products sold through vending machines than for products sold through grocery

Table 3: Summary statistics for state sales tax rates for soft drinks and snack products by retail location and product (effective as of 1 January 2007)

Retail location	Product						
	Soft drinks	Candy	Chewing gum	Chips/pretzels	Ice cream	Popsicles	Milkshakes/baked goods
Grocery stores							
Tax rates (%)							
Low tax excluding 0%'s	1.23	1.00	1.00	1.00	1.00	1.00	1.00
High tax	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Mean tax	3.43	2.87	2.70	1.20	1.63	1.42	1.20
Median tax	4.50	3.00	2.75	0.00	0.00	0.00	0.00
State summary information							
States with sales tax on product	34	30	29	15	19	17	15
States with 0% sales tax on product	17	21	22	36	32	34	36
Disfavored tax status							
States with higher tax than food tax	20	16	14	0	4	2	0
% of states with higher tax than food tax	39.22	31.37	27.45	0.00	7.84	3.92	0.00

Table 3 (Continued)

Retail location	Product						
	Soft drinks	Candy	Chewing gum	Chips/pretzels	Ice cream	Popsicles	Milkshakes/ baked goods
<i>Vending machines</i>							
Tax rates							
Low tax excluding 0%'s	1.23	1.00	1.00	1.00	1.00	1.00	1.00
High tax	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Mean tax	4.02	3.71	3.74	3.13	3.45	3.24	3.24
Median tax	5.00	4.50	4.50	4.00	4.00	4.00	4.00
State summary information							
States with sales tax on product	39	37	38	32	35	33	33
States with 0% sales tax on product	12	14	13	19	16	18	18
Disfavored tax status							
States with higher tax than food tax	28	26	26	20	23	21	21
% of states with higher tax than food tax	54.90	50.98	50.98	39.22	45.10	41.18	41.18

stores. Further, a disfavored tax status is more likely to be applied to soft drinks in both vending machines and grocery stores than to the snack products examined for this study. A disfavored tax status attributable to soft drink and snack products sold through vending machines ranged from 20 states (chips and pretzels) to 28 states (soft drinks) and from 0 states (chips, pretzels, milkshakes, and baked goods) to 20 states (soft drinks) for sales through grocery stores.

DISCUSSION AND PUBLIC HEALTH POLICY IMPLICATIONS

This manuscript sheds additional light on what has become a fairly complex and important topic of discussion in the public health struggle to prevent obesity, namely the use of taxes as (a) a potential mechanism for discouraging consumption of soft drinks and snack products that are high in calories and fat and which provide little, if any, nutritional value; and (b) a potential source of revenue that could be dedicated to obesity prevention and diet change-related intervention programs. This paper attempts to clarify some misconceptions that may exist regarding whether or not states actually tax soft drinks and/or snack products. Prior reports have stated that no state currently levies a "tax" on snack products (16,18); however, the data reported herein confirmed that 40 states do, in fact, impose sales tax on soft drinks and/or snack products and, in several cases, these taxes are higher than the standard state sales tax for food products generally (i.e., disfavored tax status).

The approach currently employed in the United States to apply sales taxes to snack products and soft drinks is similar to that applied elsewhere in the developed world. For example, through the value added tax (VAT) in the European Union (EU) or a general service tax (GST) in Canada and Australia (22,23), other countries are similarly taxing snack products and soft drinks. In Canada, sales taxes apply to soft drinks, sweets, and snack foods (24,25). At the same time, the application of the VAT in EU countries is similar to the variance in application (or not) of state sales taxes and exemptions for various food products in the United States. In the United Kingdom, some products are not subject to the VAT (e.g., cakes, cookies) unless a type of chocolate (referred to as a "chocolate button") is applied, while others (e.g., carbonated drinks, ice cream, and confections) are subject to the VAT (22,25). In Ireland, the VAT is not applied to food

and beverages intended for human consumption except for certain products including ice cream and confectionary (25). However, like the approach in the United States, such taxation is primarily for general revenue-generation purposes rather than for obesity prevention or other public health-oriented purposes (22,25).

There are no current examples of a specific “junk food” or “fat tax” being applied to snack products and soft drinks or other unhealthy food products in the United States or abroad (22,23). Enactment of “junk food” or “fat taxes” in the form of an excise tax, similar to those levied on the sale of cigarettes, would be considered an additional tax that would be imposed on top of the sales tax. In the United States, in the late 1990s and early 2000s, the grocery lobby was successful in repealing state excise taxes on such products and have continued to contribute heavily to election campaigns to dissuade such taxation at the state level (16,18). We are aware of only one metropolitan area, Chicago, with a specific tax (similar to an excise tax) on soft drinks that is set at 3% of the gross receipts of soft drinks sold at retail (26). However, local governments in many states can (and do) levy municipal-level sales taxes across the board (without referencing junk food/beverages in particular) that results in a higher overall price of these products. However, at present the only state-level taxes on soft drinks and snack products that are directly levied upon consumers in the United States are sales taxes.

Evidence is beginning to emerge as to the relationship between taxation and obesity rates or snack/soft drink consumption, with some studies indicating positive associations between changes in price or state taxation and changes in obesity prevalence (15,16), and other studies estimating that the demand for snack products would only change by a negligible amount at lower tax rates (27). Tefft examined the impact of changes in state sales taxes on soft drink expenditures and found that a 1% effective tax increase is associated with an increased soft drink expenditure of 0.5% (28); however, it is unknown whether such a change in price would result in reduced consumption. French *et al.* have indicated that a price reduction is associated with increased consumption of low-fat food products available from vending machines (29,30) and with fruit and vegetable purchases in school cafeterias and worksites (31). However, these price reductions were somewhat higher than a typical sales tax so it may be difficult to draw a comparison with

taxation of unhealthy products. Furthermore, these studies did not examine the impact of a price increase or reduction on unhealthy snack products and soft drinks or on the sale of such products from grocery stores so it is unknown whether a similar pattern would occur for non-healthy food and beverages and in other locations. At the same time, data from other public health areas indicate that higher cigarette (32) and alcohol (33) taxes are associated with reduced consumption and reduced consequences associated with consuming those products and many have suggested borrowing from the lessons from these areas when seeking to introduce policy solutions relative to other public health issues, including the obesity issue (34,35). There also has been recent discussion as to the potential revenue-generation aspects of imposing "junk food" taxes. One study estimated that a 1 cent national tax on a 12-ounce soft drink could generate an estimated \$1.5 billion annually (17) that could be dedicated for obesity prevention and reduction efforts.

DISPROPORTIONATE OR DISFAVORED TAXES

This study also provided recent data on the extent to which states are applying higher sales taxes to soft drinks and snack products sold through grocery stores and vending machines as compared to food products generally. Essentially, the concept of disproportionate or disfavored tax rates stems from government discouraging or encouraging certain behaviors by exemption or imposition of tax (36). Governments encourage consumption of "necessity foods" by exempting them from sales tax, or imposing a lower sales tax rate. Fairness of a disproportionate tax on soft drinks and snack products is debatable and is considered by some to be "paternalistic" or "regressive" (37). While imposing taxes on unhealthy food choices might narrow the price gap between healthy and unhealthy food choices, imposing such a tax might affect the people less able to afford it. Some studies have cited that specific taxes on soft drinks and snack products might disproportionately affect minorities, who have limited access to full-service supermarkets in urban neighborhoods (38,39). However, others contend that government intervention in this arena could potentially positively affect one of the most vulnerable sectors of society, our children, by potentially discouraging consumption or encouraging other, more positive, behaviors (13).

Fairness aside, the ability of states to apply a disproportionate sales tax to soft drinks and snacks to combat obesity is hampered by federal regulation. In order to participate in the Federal Food Stamp Program, states must allow any food bought with food stamps to be exempt from state sales tax (40). The federal definition of food is inclusive of snack items and soft drinks, meaning snack and soft drink items bought with food stamps are exempt from any state sales tax (40). While this exemption might mitigate the impact on the poor, it limits the potential impact of higher sales taxes for these products on reductions in consumption. Furthermore, although non-sales taxes are applicable under the Food Stamp Program, only seven states currently impose these additional taxes that are relatively small and that are predominantly levied against manufacturers, distributors, and wholesalers. Thus, the impact of these non-sales taxes on Food Stamp recipients is likely to be negligible. If a "junk food tax" in the form of an excise tax were to be applied to soft drinks and snack products, such a tax could be levied under the Food Stamp program; however, readers should consult with Federal authorities to confirm this point should it come to fruition.

LIMITATIONS

This study should be viewed in light of several limitations. First, we present cross-sectional data for only one time point. Changes in sales tax rates since the study reference date are not reported. Second, we only focused on one aspect of state taxation of soft drinks and snack products. While the literature indicates that no state excise taxes currently exist with regard to snack products (15,18), there are other types of taxes for soft drinks and snack products, including license and privilege fees that are applied to manufacturers, distributors, wholesalers, and retailers. Third, data collection was limited to state tax statutes with administrative regulations used for confirmatory purposes. Other sources of policy information were not included but were not deemed directly relevant for this study. Fourth, we do not make any attempt to link the state sales tax rates with consumption rates or overweight and obesity prevalence or incidence data. Such analyses are the subject of future study. This study was intended to be descriptive in nature and to provide recent data on the state sales tax schemas relative to soft drinks and snack products. Finally, it is

important to recognize that this study only examined one type of tax (i.e., sales taxes) applied to the sales of soft drinks and snacks sold through grocery stores and vending machines. Data on consumption of snack products through vending machines were readily accessible – such consumption was estimated to account for less than 3% of energy intake in 1996 (latest year of data availability) (41). Focus should turn to venues outside of the home where a higher percentage of calories are consumed – namely, restaurants, fast food, and other carryout venues which, together account for approximately one-third of all food consumed (42) and 77% of all food-away-from-home expenditures (43). Examination of the variation in state sales taxes applying in these locations is currently underway by members of the study team.

CONCLUSIONS

This study presents timely data on the variance in sales tax rates across the 50 states and D.C. for soft drinks and snack products sold through grocery stores and vending machines. States tend to “disfavor” sale of these products through vending machines more than through grocery stores by imposing a higher sales tax than the “standard” food tax in the state. While sales taxes are only one piece of the overall price of soft drinks and snack products, they are applied to at least one of these products in 40 states and similar types of taxes are applied in many developed countries. Thus, it will be useful to explore the relationship between the state variation and changes in price and consumption patterns to determine whether such a policy strategy is an effective tool at discouraging unhealthy behaviors regarding consumption of snack products and soft drinks. Barring the imposition of additional taxes by the states (akin to the cigarette excise tax) that would further increase the price of such products and possibly reduce consumption, public health policy makers and advocates should focus their attention on mechanisms for dedicating revenue from the sales taxes on soft drinks and snack products to support obesity prevention and/or vigorous dietary exchange programs. This study underscores one aspect of the complexity of the obesity issue facing the public health community and further confirms that a wide range of creative policy solutions

are needed to improve health outcomes, which may include state-level intervention through taxes.

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