

OCTOBER 2018

POLICY IN BRIEF



American
Heart
Association.

Tiered Sugary Drink Tax Revenue Calculations

3 THINGS TO KNOW

1

Sugary Drink Tax Tiers:

1. (no tax) Beverages with less than 7.5g. added sugars per 12-oz.
2. (1 or 2 cent per oz. tax) Beverages with 7.5g. to less than 30g. added sugars per 12-oz.
3. (2 or 3 cent per oz. tax) Beverages with 30g. or more added sugars per 12-oz.

2

Health Implications of Tiered Taxes: A tiered tax approach would lead to a greater reduction in sugary drink purchases than a volume-based tax.

3

Revenue Implications of Tiered Taxes: A tiered 1 cent per oz. and 2 cent per oz. tax would generate more revenue than a flat one cent per ounce approach. A tiered 2 cent per oz. and 3 cent per oz. tax would generate less revenue than a flat 2 cent per oz. tax due to drastic reductions in tier 3 beverage purchases.

Background

Building off the November 2017 report, *Distribution of Sugar Content in Sugary Drink Purchases in the U.S.: Implications for Tiered Taxation*,¹ and the University of Connecticut Rudd Center for Food Policy and Obesity Revenue Calculator for Sugary Drink Taxes,² researchers estimated the revenue impact of tiered sugary drink taxes versus a uniform volume-based approach (ex. one cent per oz.). A tiered sugary drink tax categorizes sugary drinks into tiers based on the amount of added sugars per 12-oz., and then levies the tax by volume. This tiered approach taxes beverages with more added sugars at a higher rate than beverages with less added sugars. For the purposes of these revenue estimates, the researchers used 3 tiers: tier 1 contained beverages with less than 7.5g of added sugars per 12-oz.; tier 2 contained beverages with 7.5g to less than 30g of added sugars per 12-oz.; and, tier 3 contained beverages with 30g. or more of added sugars per 12-oz. The tax revenue model estimated potential tax revenue for both the tiered approach and the uniform volume approach for the year of 2018 for all U.S. states and 10 municipalities (Long Beach, Los Angeles, Sacramento, and San Diego, CA, Denver, CO, Montgomery County, MD, Minneapolis, MN, New York City, NY, and Cleveland and Columbus, OH).

Findings

The results show that tier 3 beverages make up about two-thirds of all sugary drink purchases by volume nationwide. The percent of tier 3 beverages purchased throughout the country varies by state — from 56-57 percent of sugary drink purchases on the West Coast to 75 percent of sugary drink purchases in some Midwestern states. Tier 2 beverages make up another one-third of all sugary drink purchases, with a higher percent purchased on the West Coast and Hawaii than in other parts of the country. Tier 1 beverages make up a very small percent of sugary drink purchases — less than 1 percent across all states — and have very little impact on the beverage market.

When Tier 2 is taxed at 1 cent per oz. and Tier 3 is taxed at 2 cents per oz.

For a tiered tax of 1 cent per oz. for tier 2 and 2 cent per oz. for tier 3 beverages, total tax revenue is predicted to be 30 percent higher than tax revenue projections for a flat penny per ounce tax on all sugary drinks. In contrast to revenue, the tiered tax is projected to lead to significantly lower per person sugary drink purchases when compared



to the penny per ounce tax. The difference varies by region, from an approximate 15 percent decline in purchases on the West Coast to 25 percent decline in purchases in the Midwest, which reflects the higher per person purchases of tier 3 beverages in the Midwest. The tiered tax brings both greater tax revenue and more public health benefit by causing a greater reduction in sugary drink purchases than the flat penny per ounce tax.

When Tier 2 is taxed at 2 cents per oz. and Tier 3 is taxed at 3 cents per oz.

With a 2 cent per oz. tax for tier 2 and 3 cent per oz. tax for tier 3 beverages versus a flat tax of 2 cent per oz., both tax revenue and per person purchases of sugary drinks are higher with the flat 2 cent per oz. tax in most states. This is due to the relatively large tax on tier 3 beverages (up to 60 percent), which could lead to up to 80 percent decline in purchases of tier 3 beverages. Due to the drastic reduction in tier 3 purchases, the tiered tax would lead to lower total tax revenue despite a higher tax rate than with a flat 2 cent per oz. tax. Of note, tax revenue appears to be similar in states from the West Coast where per person purchases of tier 3 beverages are much lower compared to other states, as can be seen with the California example below. In all states, per person purchases of sugary drinks decline at a larger rate with a tiered tax than a flat tax.

State	1 cent/oz. Tax		1c./oz. and 2c./oz. Tiered Tax		2 cent/oz. Tax		2c./oz. and 3c./oz. Tiered Tax	
	Per Capita Purchases, Gal./Yr.	Revenue	Per Capita Purchases, Gal./Yr.	Revenue	Per Capita Purchases, Gal./Yr.	Revenue	Per Capita Purchases, Gal./Yr.	Revenue
California	22.35	\$916,266,521	18.86	\$1,210,959,661	16.94	\$1,389,278,476	13.46	\$1,396,555,123
Georgia	35.38	\$381,163,843	27.56	\$492,281,568	25.30	\$545,120,022	17.49	\$487,245,876
Massachusetts	31.26	\$221,088,971	24.54	\$285,605,204	22.52	\$318,545,060	15.81	\$287,714,749
Minnesota	42.38	\$242,754,541	31.87	\$319,002,774	29.95	\$343,110,273	19.46	\$298,622,654
Texas	32.93	\$971,751,526	25.69	\$1,254,810,114	23.55	\$1,389,760,361	16.32	\$1,244,549,141

Examples of revenue calculations for uniform volume-based taxes and tiered sugary drink taxes

Recommendations

A tiered tax should be implemented over a flat volume-based tax whenever possible, because it is predicted to lead to a greater reduction in sugary drink purchases and may also generate more revenue. The tiered tax of 2 cent per oz. and 3 cent per oz. is preferable to the 1 cent per oz. and 2 cent per oz. tiered tax because it is predicted to lead to a greater reduction in sugary drink purchases.

Data and Methodology for Sugary Drink Tax Calculations

The researchers used proprietary industry data from the Beverage Marketing Corporation (BMC) on total sales of packaged and fountain beverages sold across all retail channels in the U.S. The data were based on annual gallonage (volume of gallons sold) for the total year of 2015 using the following categories: carbonated soft drinks (CSD), fruit drinks, sports drinks, ready-to-drink (RTD) tea, enhanced water, energy drinks, and RTD coffee. Diet drinks were not included.

Per capita beverage sales across states/municipalities were determined by per capita sales within their regional markets, which was adjusted up or down for each state/municipality based on their socio-demographic composition. The researchers used the 24-hour dietary recall data from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 to assess consumption of each sugary drink category (e.g., sport drinks, soft drinks) by age, race/ethnicity, and education. The researchers matched the U.S. Census and NHANES population groups on education, race/ethnicity, and age. The adjustment weighed differences in sugary drink consumption by education most heavily (75 percent), also accounting for the variation by race/ethnicity (15 percent) and age (10 percent).

Changes in beverage volume over 2016-2018 were based on the BMC projected gallonage sales for 2020 and actual sales in 2015. A compound annual growth rate was calculated for 2015-2020 and used in projections of annual changes for 2015-2018 to project sales in 2018.

Distribution of Sugary Drink Purchases Data: Within each beverage category, brand-level data for 2016 on volume sold were provided for each product with added sugars in the top segment of that beverage market. The top segment coverage in volume sold varied from 78 percent for RTD teas to 91 percent for sodas to 98 percent for energy drinks. Brands with very small market shares outside of the top 78-98 percent range were assumed to have a similar distribution of sugar as other named brands within the corresponding beverage category.

To describe the distribution of sugar content in sugary drinks by state/municipality, researchers used data available from the Rudd Center Sugary Drink Tax Calculator on projected 2018 beverage sales by beverage category in each



state/municipality. The state-level sales were derived from regional BMC sales data and further adjusted for each state/municipality based on its socio-demographic composition using NHANES and Census data. The distribution of grams of sugar by 8-ounces across beverage brands for each beverage category was applied to the state/municipality-level data by beverage category and then aggregated across the beverage categories for the given states/municipalities.

Population Data: Researchers projected state and municipal population for 2018 based on the 2010 U.S. Census data, U.S. Census Bureau population estimates for 2015–2016, and annual rate of change between 2010 and 2016 (assumed to stay constant for 2017–2018 projections).

To produce per capita estimates for sales of sugary drinks by sugar content, researchers used the 2016 American Community Survey (ACS) 1-year data file from the U.S. Census Bureau and for the state per-capita estimates, they used state-level population estimates from the U.S. Census Bureau for 2015.

Beverage Prices: Retail prices in 2018 dollars for CSDs, fruit drinks, sports drinks, energy drinks and enhanced water were based on the data from the Bridging the Gap Community Obesity Measures Project (BTG-COMP). To adjust for inflation, the researchers converted 2012 BTG price data into 2018 prices using the Consumer Price Index for carbonated beverages (sodas and energy drinks) and non-carbonated beverages (fruit beverages and others). RTD tea and coffee prices were not available from the BTG sources; instead they calculated these prices based on the BMC 2015 wholesale dollar sales and gallonage. Inflation-adjusted beverage prices were assumed to remain constant over time. Importantly, average beverage prices were assumed to be constant across states and cities/counties.

Model Assumptions:

1. Tax pass through rate was assumed at 100 percent, or a full pass of the tax, onto retail price for consumers, as would be expected based on economic theory. The same pass through is assumed for all types of beverages.
2. The price elasticity of demand for sugary drinks was assumed to equal -1.21, as shown in prior literature review. The same price elasticity was assumed for all types of beverages.

Important Local Adjustments:

1. There is no adjustment for tourism consumption. Researchers used the residential population of state/cities and per capita sales to calculate total beverage sales.
2. We used national prices, which could be significantly lower or higher than local prices in certain markets.

How to Get More Information

To find out the revenue estimates for your state, ask questions about the analysis, or get more details about the methodology, please contact Christine Compton (christine.compton@heart.org) or Katie Bishop Kendrick (katie.bishopkendrick@heart.org).