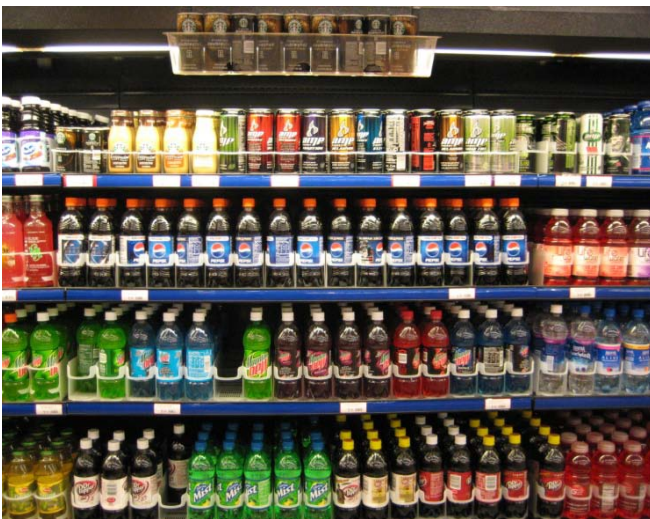


## Sugar-Sweetened Beverage Prices

### *Estimates from a National Sample of Food Outlets*

*The findings in this brief are based on data from the Bridging the Gap Community Obesity Measures Project (BTG-COMP), a large-scale effort conducted by the Bridging the Gap research team. BTG-COMP identifies local policy and environmental factors that are likely to be important determinants of healthy eating, physical activity, and obesity. BTG-COMP collects, analyzes, and shares data about local policies and environmental characteristics relevant to fast-food restaurants, food stores, parks, physical activity facilities, school grounds, and street segments in a nationally representative sample of communities where public school students live.*



### Introduction

Sugar-sweetened beverage (SSB) consumption is highly prevalent in the U.S. and associated with a number of negative health outcomes such as type 2 diabetes, dental caries, and obesity.<sup>1-3</sup> As a result, there is a significant public health focus on policies aimed at reducing SSB intake.<sup>4</sup> In particular, a number of jurisdictions at the local and state levels have proposed SSB taxes—including taxes on regular sodas, isotonic sports drinks, energy drinks, juice drinks, and other sweetened beverages—in order to generate revenue, reduce consumption of unhealthy beverages, and promote public health.<sup>5</sup> SSB taxes have mostly been proposed on a per-unit volume basis, often in the range of a penny per ounce.

To estimate the potential impact of per-unit SSB taxes on outcomes such as consumption, tax revenue, employment, and health, researchers and policymakers need information on prices in order to assess the percentage change in price associated with a given per-unit tax on volume. Estimates of average per-unit prices for SSBs are not widely available since such prices can vary significantly depending on the package size, source of purchase, and type of SSB. This brief provides estimates of the average price per ounce (oz) for SSBs overall and by category for five types of SSBs including regular soda, juice drinks, isotonic sports drinks, energy drinks, and enhanced water.

## Methods

The data for this study were drawn from the BTG Food Store Observation Form (BTG-FSOF) and the BTG Fast Food Observation Form (BTG-FFOF), direct observation audit instruments that were used to collect data in 2010, 2011, and 2012 in a national sample of 468 communities where 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade public school students live. Each year, food stores were sampled to obtain a representative sample of supermarkets (carries fresh meat, has 4 or more cash registers, and at least two of three service counters (butcher, deli, and/or bakery)), grocery stores (carries fresh meat but not a supermarket), and limited service stores (does not carry fresh meat; e.g., convenience store, drug store, and dollar store). Observational data used to assess prices of packaged SSBs in our study were collected in 8959 food stores, including 955 supermarkets, 870 grocery stores, and 7134 limited service stores. Data collected using the BTG-FFOF were based on a representative sample of chain and non-chain fast-food restaurants. In order to determine per-oz prices of fountain drinks in fast-food restaurants, this study drew on BTG-FFOF data from the top 20 fast-food restaurant chains for a total sample of 2801 outlets across three years. Measures available from the BTG-COMP and used to derive average per-oz SSB prices by SSB type were as follows:

### Regular Soda

- 2L bottle (Coca-Cola, Pepsi, least expensive cola)<sup>a</sup>
- 12 can case (Coca-Cola, Pepsi, least expensive cola)<sup>a</sup>
- 20 oz and 12 oz bottle or can (Coca-Cola, Pepsi)<sup>a</sup>
- Fountain drink (small and large sizes)<sup>b</sup>

### Juice Drink

- 59 oz carton or bottle (Minute Maid, Tropicana)<sup>a</sup>
- 15.2 oz and 12 oz bottle (Minute Maid, Tropicana)<sup>a</sup>

### Isotonic Sports Drink

- 20 oz and 32 oz bottle (Gatorade, Powerade)<sup>a</sup>

### Energy Drink

- 8.4 oz and 16 oz can (Red Bull, Monster, Rock Star)<sup>a</sup>

### Enhanced Water

- 20 oz bottle (Vitamin Water, Sobel Life, Propel)<sup>a</sup>

Note: <sup>a</sup> BTG-FSOF; <sup>b</sup> BTG-FFOF

Prices per oz were estimated based on the BTG-COMP data using complex survey design features including strata, clustering at the primary sampling unit, and sampling weights. Overall price estimates for isotonic sports drinks, energy drinks, and enhanced water were based on the average

of the individual sizes noted above. To calculate the average prices of regular soda and juice drinks, we weighted our price estimates based on the source (e.g., food store, fast-food restaurant, and other source) from which SSBs are consumed by individuals aged two and above. We further weighted the proportion of store-based regular soda and juice drinks based on the distribution of package sizes purchased by households from food stores. For the source of SSB consumption, we drew on day 1 24-hour dietary recall data from the 2009–2010 National Health and Nutrition Examination Survey (NHANES) to determine the share of regular soda consumed from stores, fast-food restaurants, and other sources, and the share of juice drinks consumed from stores and other sources. We determined the distribution of package sizes purchased for regular soda (2L, multipack (i.e., case of cans), and single bottle/can <1.5L) and juice drinks (<1.5L bottle versus larger package size) from the 2010 Nielsen Homescan data.

Finally, we also provide an overall SSB price estimate based on consumption shares obtained from day 1 24-hour dietary recall data from NHANES 2009–2010 for the five types of SSBs available in our study. Note, however, that we did not have data on sweetened teas and coffee drinks and other miscellaneous SSBs and, therefore, our overall estimate assumed that prices for those SSBs are equal to the average SSB price. All prices were adjusted for inflation and reported in real 2012 dollars.

## Study Findings

Table 1 shows the average price per oz for SSBs overall and by SSB category. The overall average price of SSBs was 5.9¢ per oz. The average price of regular soda was 4.9¢ per oz, ranging from 2.5¢ per oz when purchased as a two-liter bottle from a food store to 7.2¢ per oz for an individual-size bottle or can purchased from a food store. The per-unit cost of a fountain drink from a fast-food restaurant was slightly cheaper than its individual-size bottle or can counterpart from the store (6.6¢ versus 7.2¢). The average price of juice drinks was 7.5¢ per oz and was found to have a substantial quantity discount when bought as a family- versus individual-size container (3.3¢ versus 12.6¢). Individual-size isotonic sports drinks and enhanced water cost, on average, 6.0¢ and 7.9¢ per oz, respectively. The most expensive SSB on a per-volume basis was energy drinks, which cost 20.7¢ per oz, on average.

**Table 1: Average prices of sugar-sweetened beverages (SSBs) per ounce (oz), by beverage type and size**

	Price per oz (cents)
<b>SSBs</b>	<b>5.9</b>
<b>Regular Soda</b>	<b>4.9</b>
Family size: 2L bottle	2.5
Family size: 12 can case	3.3
Individual size: 12 and 20 oz bottle/can	7.2
Individual size: fountain drink	6.6
<b>Juice Drinks</b>	<b>7.5</b>
Family size: 59 oz carton/bottle	3.3
Individual size: 15.2 and 12 oz bottle	12.6
<b>Isotonic Sports Drinks</b>	<b>6.0</b>
<b>Energy Drinks</b>	<b>20.7</b>
<b>Enhanced Water</b>	<b>7.9</b>

Notes: Prices are adjusted for inflation and shown in real dollars for 2012.

## Conclusions

Based on average SSB price estimates derived from a national sample of food outlets, a penny-per-ounce tax on SSBs would represent a 16.9% tax on SSBs overall and a 20.4% tax on regular soda, a 13.3% tax on juice drinks, a 16.7% tax on isotonic sports drinks, a 4.8% tax on energy drinks, and a 12.7% tax on enhanced water. Assuming that taxes are fully passed on to consumers,<sup>6,7</sup> these are the percentage increases in SSB prices that consumers could expect to face from a penny-per-ounce tax. Therefore, based on an average price elasticity of demand of -1.2,<sup>8</sup> consumption of SSBs overall would be expected to fall by 20.3% (by 24.5% for regular soda, 16.0% for juice drinks, 20.0% for isotonic sports drinks, 5.8% for energy drinks, and 15.2% for enhanced water) with the introduction of a penny-per-ounce tax on SSBs.

## Suggested Citation

Powell LM, Isgor Z, Rimkus L, and Chaloupka FJ. Sugar-Sweetened Beverage Prices: Estimates from a National Sample of Food Outlets. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago, 2014.  
[www.bridgingthegapresearch.org](http://www.bridgingthegapresearch.org)

## About Bridging the Gap

*Bridging the Gap* is a nationally recognized research program of the Robert Wood Johnson Foundation dedicated to improving the understanding of how policies and environmental factors influence diet, physical activity and obesity among youth, as well as youth tobacco use. The program identifies and tracks information at the state, community and school levels; measures change over time; and shares findings that will help advance effective solutions for reversing the childhood obesity epidemic and preventing young people from smoking. Bridging the Gap is a joint project of the University of Illinois at Chicago's Institute for Health Research and Policy and the University of Michigan's Institute for Social Research. For more information, visit [www.bridgingthegapresearch.org](http://www.bridgingthegapresearch.org).

## Endnotes

1. Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review. *Am J Clin Nutr.* 2006;84(2):274-288.
2. Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health.* 2007;97(4):667-675.
3. Han E, Powell LM. Consumption patterns of sugar-sweetened beverages in the United States. *J Acad Nutr Diet.* 2013;113(1):43-53.
4. Brownell KD, Frieden TR. Ounces of prevention—the public policy case for taxes on sugared beverages. *N Engl J Med.* 2009;360(18):1805-1808.
5. Chiqui JF, Chaloupka FJ, Powell LM, Eidson SS. A typology of beverage taxation: multiple approaches for obesity prevention and obesity prevention-related revenue generation. *J Public Health Policy.* 2013;34(3):403-423.
6. Besley TJ, Rosen HS. Sales taxes and prices: an empirical analysis. *Natl Tax J.* 1999;52(2):157-178.
7. Kenkel DS. Are alcohol tax hikes fully passed through to prices? Evidence from Alaska. *Amer Econ Rev.* 2005;95(2):273-277.
8. Powell LM, Chiqui JF, Khan T, Wada R, Chaloupka FJ. Assessing the potential effectiveness of food and beverage taxes and subsidies for improving public health: a systematic review of prices, demand and body weight outcomes. *Obes Rev.* 2013;14(2):110-128.