

Letters

RESEARCH LETTER

Pass-Through of a Tax on Sugar-Sweetened Beverages at the Philadelphia International Airport

Taxes on sugar-sweetened beverages (SSBs) have been proposed as a possible approach to prevent obesity and improve diets.^{1,2} These taxes have recently been implemented in Berkeley, California, and Philadelphia, Pennsylvania. A goal of the taxes is to increase prices and dissuade consumption, but the taxes are levied on beverage distributors, and it is unclear how much of the tax is passed through to consumers as higher retail prices vs being paid by distributors or manufacturers. This study estimated the extent to which the tax of 1.5 cents per ounce on SSBs in Philadelphia (implemented on January 1, 2017) raised retail prices.

Methods | The Philadelphia International Airport straddles the city border, with some terminals in Philadelphia that are subject to the beverage tax, and other terminals in Tinicum that are not. Retailers in the airport were visited once before the tax (December 21, 2016) and twice after the tax took effect (January 14, 2017, and February 5, 2017). On each visit, a 20-ounce bottle of regular Coke or Pepsi was purchased, with fountain drinks purchased at 4 stores that did not sell bottles. To ensure that stores on the taxed and untaxed sides of the airport were similar, only retail chains (including bakeries, restaurants, and newsstands) that had locations on both sides of the airport were examined.

Data were pooled from before and after implementation of the tax for all stores. Stata (StataCorp), version 15.0, was used to estimate (1) mean price per ounce by city and time and (2) difference-in-difference regressions with standard errors clustered at the store level. Because of concerns that stores in the untaxed side of the airport would raise their prices once their taxed competitors had done so, additional analyses focused on the change in prices in taxed stores. Two-sided hypothesis tests were conducted, with a *P* value of less than .05 considered significant.

Results | The study included 31 stores: 21 on the taxed side of the airport (Philadelphia) and 10 on the untaxed side (Tinicum).

The mean price per ounce of SSBs in December 2016 (before the tax) was 12.37¢ per ounce in the untaxed side and 12.53¢ per ounce in the taxed side; in February 2017 (after the tax), it had risen to 12.93¢ per ounce in the untaxed side and 13.92¢ per ounce in the taxed side (Table 1). By February, prices had risen 0.83¢ per ounce (95% CI, 0.33¢-1.33¢; *P* = .002) more in taxed than untaxed stores. Based on this difference-in-differences model, 55.3% (95% CI, 22%-89%; *P* = .002) of the tax was passed on to consumers.

Stores on the untaxed side of the airport might have raised their prices at the same time or soon after those on the taxed side did, so the change in prices within the taxed stores was estimated. The taxed stores increased their prices by 0.91¢ per ounce (95% CI, 0.60¢-1.23¢; *P* < .001) by January and 1.39¢ per ounce (95% CI, 1.20¢-1.58¢; *P* < .001) by February (Table 1). Using only data for taxed stores, the percentage of the tax passed on to consumers was 61% (95% CI, 40%-82%; *P* < .001) in January and 93% (95% CI, 80%-105%; *P* < .001) in February.

Discussion | Thirty-six days after the Philadelphia tax on SSBs was levied on beverage distributors, stores subject to the tax in the Philadelphia airport raised their prices of SSBs by 93% of the tax. Moreover, stores on the untaxed side of the airport may have raised their prices in response.

Limitations of the study include the assessment of only 1 size of soda (20-oz bottles), 2 brands of soda (Coke and Pepsi), and 1 location (the Philadelphia International Airport). No control beverages were included, historic price data were not available, and the change measured was short-term. Although prices were collected from airport retailers, which limits generalizability, airport vendors are required by their leases to charge no more than prices elsewhere in Philadelphia to prevent price gouging.

The pass-through of the tax on SSBs in the Philadelphia airport (93%) was higher than that found in Berkeley, California,

Table 1. Mean Price and Mean Change in Price of Sugar-Sweetened Beverages (SSBs) at the Tinicum Side (Untaxed) vs Philadelphia Side (Taxed) of the Philadelphia International Airport^a

	Tinicum Side Price		Philadelphia Side Price		
Time Point	Mean (95% CI), ¢/oz (n = 10 Stores)	Mean Change vs December 2016 (95% CI), ¢/oz	Mean (95% CI), ¢/oz (n = 21 Stores)	Mean Change vs December 2016 (95% CI), ¢/oz	Difference in Mean Change (95% CI), ¢/oz
Before new tax on SSBs					
December 2016	12.37 (10.83-13.91)		12.53 (11.80-13.25)		
After new tax on SSBs					
January 2017	12.78 (11.07-14.48)	0.41 (−0.08 to 0.89)	13.44 (12.59-14.29)	0.91 (0.60 to 1.23)	0.51 (−0.01 to 1.03)
February 2017	12.93 (11.21-14.64)	0.56 (0.03 to 1.09)	13.92 (13.18-14.66)	1.39 (1.20 to 1.58)	0.83 (0.33 to 1.33)

^a Standard errors are clustered at store location level.

which previous studies estimated was in the range of 43% to 69%.^{3,4} Future studies should investigate explanations for this difference and examine how the Philadelphia tax affected the purchase and consumption of SSBs and the health of consumers.

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