

City of Seattle Sweetened Beverage Tax Overall Evaluation Findings

On June 6, 2017, the Seattle City Council passed Ordinance 125324 imposing a tax on engaging in the business of distributing sugar-sweetened beverages in Seattle. The Seattle Sweetened Beverage Tax was set at 1.75-cents-per ounce and went into effect on January 1, 2018. In the Ordinance, the Seattle City Council mandated a long-term evaluation of the impact of the tax. From 2017-2023, a team of researchers from Public Health—Seattle & King County, the University of Washington, and Seattle Children’s Hospital Research Institute collaborated on an evaluation of these tax effects. In this time, we produced 13 reports and five peer-reviewed publications. Below we present a high-level summary of the key evaluation findings, five years after tax implementation.

Results

The City of Seattle’s Sweetened Beverage tax (SBT) **increased the prices** of sugary drinks in Seattle almost the full amount of the tax, **without any effect on** snack or food prices, or **small business closures or revenue**. The tax was associated with **increased awareness** of the negative health outcomes associated with sugary drinks, and **reduced gains in body mass index (BMI)** among Seattle adults and youth. While reported consumption of taxed beverages went down in Seattle among a sample of children and parents in lower income households, we could not attribute the decline to the tax, as consumption of these beverages in a comparison group also declined. However, other research¹ found a substantial decline in purchasing of taxed beverages in Seattle. In **follow-up interviews with participants in the beverage consumption study, individuals in the** comparison area and in Seattle cited health concerns, beverage prices, media coverage, and participation in the study as reasons for drinking fewer sugary drinks, with beverage prices being a stronger reason among those in Seattle.

(1) Economic outcomes

Our assessment of economic outcomes included a **food retailer store audit** to measure price changes over time across a variety of retailers, as well as an analysis of **Washington Department of Revenue data** to assess any SBT impact on store revenue or store closure in the City of Seattle.

Sugary drink prices increased. Two years after the implementation of the SBT, we observed high and consistent pass-through of the amount of the tax on the price of taxed beverages to consumers in the city of Seattle. Overall, we found an average statistically significant price pass-through of 1.73 cents per ounce (or 99% of the amount of the tax) relative to comparison area.

No observed impact on store revenue. We found no evidence that the tax was associated with declines in business *revenue* or business *closure* in small independent food stores in Seattle versus the comparison area. In the year after the tax was implemented (2018), small independent food stores in Seattle experienced increased revenue or attenuated declines in revenue, relative to stores in the comparison area, but these differences were not statistically significant. Some models show statistically significant revenue growth in Seattle stores in the second year of the tax (2019), relative to comparison area stores.

(2) Health outcomes

Our assessment of health outcomes included an **analysis of BMI from adult and youth electronic health records** within the Kaiser Permanente of Washington Health System and Seattle Children’s Hospital Odessa Brown Children’s Clinic to understand the effect of the SBT on adult and youth BMI, as well as an analysis of WA **Healthy Youth Survey** data to understand any changes in sugary drink consumption and youth weight status.

The tax was associated with lower increases in BMI among adults. We examined health records of 1,158,854 clinic visits from 98,787 unique patients aged 18-65 (23,487 in Seattle and 75,300 outside of, but nearby Seattle in non-taxed areas). We found that BMI was increasing over time in this cohort of adult patients in both Seattle and the comparison area. However, our results suggest that the timing of the tax was associated with modestly lower increases in BMI for people in Seattle relative to those in the comparison area.

¹Powell LM, Leider J. Impact of a sugar-sweetened beverage tax two-year post-tax implementation in Seattle, Washington, United States. *J Public Health Policy*. 2021 Dec;42(4):574-588. <https://pubmed.ncbi.nlm.nih.gov/34732842/>

The tax was associated with lower BMI² among youth. Including a sample of 24,097 unique youth patients (7,078 in Seattle; 17,019 outside of Seattle in non-taxed areas in King, Pierce, and Snohomish counties), we found that the tax was associated with lower BMI%95th² from before to after the tax among children living in Seattle versus the comparison area. Our more conservative model³ suggested the tax was associated with a 0.99 percentage point relative decrease in BMI%95th. This is a 1.2% reduction from baseline levels in Seattle. This is a small, but reasonable, beneficial effect associated with the timing of Seattle’s SBT.

Small decreases in BMI (based on self-reported weight and height) and overweight status among youth also seen in public health surveillance data. In a sample of 63,210 King County youth (11,719 Seattle students), we found no significant associations between the tax and changes in daily sugary drink consumption or obesity prevalence (through 2021). We did find a small decrease in youths’ average reported BMI (by 0.244 unit) and a decrease in the prevalence of youth with overweight (by 2.9%) in Seattle relative to elsewhere in King County.

(3) Health behaviors and beliefs

Our assessment of health behaviors included **a survey of norms and attitudes** to understand and measure health behaviors and sugar-sweetened beverage tax impressions over time, surveys with an enrolled **cohort of children in lower-income households and their parents** to understand beverage consumption and dietary patterns over time and as a result of the SBT, and in-depth **qualitative interviews and follow-up** with cohort families to understand reasons for dietary changes, and perceived tax impacts.

Families self-reported drinking fewer sugary drinks. Two years after the SBT went into effect, children and parents reported drinking fewer sugary drinks. However, this decrease was similar for those living in a comparison area not subject to the tax. In interviews with a subset of participants, nearly all parent participants described personal health as their top reason for decreasing sugary drink consumption. Many participants in Seattle and some in the comparison area also described being influenced by the tax; most reported buying fewer sugary drinks due to price increases while shopping in Seattle and others reported influences of media about the tax and sugary drinks. Both Seattle and comparison area parents reported that participating in the study made them more aware of their sugary beverage intake and motivated them to decrease consumption.

Opinions on the tax stayed similar, while attitudes towards sugary drinks became more negative over time among lower-income individuals, and economic concerns grew among higher-income individuals. While there was no detectable impact of living with an SBT on overall support for one, there were important differences in tax impact by income level. For lower-income adults, living with the tax had no impact on beliefs of the tax impact on economic outcomes; for higher-income adults, beliefs of the tax impact on several economic outcomes became significantly more negative. While higher-income respondents did not change their perceptions of the health effects of sugary beverages or excess sugar, there was a relative increase in the percent of lower-income Seattle respondents who believed that sugary beverages increase the risk for health problems.

Research Team

Led by Co-Investigators Dr. Nadine Chan (PHSKC), Dr. Jesse Jones-Smith (UW), and Dr. Brian Saelens (Seattle Children’s), the research study teams included Dr. Melissa Knox, Dr. Vanessa Oddo, Dr. David Arterburn, Lina Pinero Walkinshaw, Maya Rowlands, Dr. Stephen Mooney, Leah Neff-Warner, Dr. Jessica Godwin, Dr. Suman Chakrabarti, Joanna Eavey, Dr. Myduc Ta, Kaylin Bolt, Dr. Lin Song, Dr. Roxana Chen, Dr. Louise Carter, Daniel Casey, Dr. Amy Tran Edmonds, Mary Podrabsky, Abigail Schachter, Alicia Yang, Ping Qu, Lauren Sawyer, Selame Kidane, Fathom Abdulle, Johnnie Trujillo. The Evaluation Team is very grateful to the many contributors and partners who provided support over the course of this work.

All individual evaluation reports can be found here:

<https://www.seattle.gov/cityauditor/reports>

² We looked at change in BMI%95th, a recommended measure of relative child BMI, as our primary outcome – Hales et al. *Vital Health Stat* 1. Dec 2022 <https://pubmed.ncbi.nlm.nih.gov/36598420/>

³ A synthetic control difference-in-difference model