The Evaluation of Seattle's Sweetened Beverage Tax

Frequently Asked Questions (FAQs)

4/13/2020

FAQs - General

What is the Sweetened Beverage Tax (SBT)?

As of January 1, 2018, there is a tax on sugar-sweetened beverage products distributed within Seattle. The Sweetened Beverage Tax is not a sales tax charged directly on consumers. Instead, this tax makes distributors pay a tax on sugar-sweetened beverage products they distribute within the City of Seattle. The tax rate is 1.75 cents per ounce on sugary beverages.

What types of beverages are subject to the Sweetened Beverage Tax?

The following table lists the types of beverages that are subject to the Sweetened Beverage Tax:

Taxed Beverages	Non-taxed Beverages
Regular sodas	Diet drinks
Energy and sport drinks	Bottled water
Fruit drinks	100% juice
Sweetened waters	Milk (including soy, rice, almond, coconut)
Pre-sweetened coffees and teas	Beverages for medical use
Syrups and concentrates used to make sugary drinks in coffee shops, restaurants and fast food	Infant or baby formula
	Alcoholic beverages

Why did Seattle pass this tax?

Research has shown that sugary drinks can lead to type 2 diabetes, heart disease and stroke, weight gain and tooth decay. Taxing sugary drinks reduces their sales and consumption. Tax revenue from sales on sugar-sweetened beverages in Seattle is currently being used to fund programs to help improve access to healthy food and fund programs and services for families with children ages 5 and younger.

How is the revenue raised by this tax being used?

The money raised from this tax is supporting a range of healthy food access and early learning programs.

Category	2019 Investment
Food Access Expanding support for food banks and programs that increase fruits and vegetables offered in childcare, preschools, schools and after school, as well as serving and delivering nutritious meals and groceries to low income families and older people. Also expanding Fresh Bucks, which helps people on a tight budget afford healthy food.	$9.9 million
Child Health, Development, Early Learning Supporting childcare subsidies for working families, as well as quality childcare through training and consultation for childcare providers. Supporting home visiting programs and providing new services for children with developmental delays.	$7.8 million
Tax Administration	$800,000

A small portion of the revenue supports the administration of the Sweetened Beverage Tax Community Advisory Board. Funds also support a 5-year evaluation to study the effects of the tax on economic outcomes and health behaviors.	

In 2018, the City collected more revenue than it originally estimated. Does this mean consumption of sugary beverages is increasing?

The amount of revenues collected from the tax does not answer the question of whether there has been any change in the consumption of sugary beverages. The revenues are an indication of current distribution volumes into Seattle; it does not give us information about volumes before the tax or about the change after the tax. Before the tax was passed, the City had no Seattle-specific data on the volume of sweetened beverages purchased or consumed. The City adopted a relatively conservative estimate of how much revenue the tax would generate. Implementing the tax gave the City access to data about beverage consumption for the first time and demonstrated that the initial estimate was conservative. The amount of revenues exceeding projections does not give us information about how distribution or consumption volumes changed as a result of the tax.

Two evaluations expected to be published in 2020 address the question of whether beverage consumption changed one year after tax implementation: one from Lisa Powell and the other from the Seattle research team. Both are discussed further below.

How is the impact of the Sweetened Beverage Tax being evaluated?

There are two primary evaluations taking place – one is required by city ordinance and being conducted by a Seattle research team; another is an external evaluation conducted by Dr. Lisa Powell.

Seattle Research Team

The ordinance that created the Sweetened Beverage Tax also required the City Auditor to "contract with academic researchers to complete an annual evaluation of the effects of the tax." The ordinance further stipulates the following:

> *"In contracting with academic researchers, the City Auditor should consider researchers with a proven track record of rigorous policy evaluation for impacts on behavior, health, and economic outcomes. A minimum of $500,000 per year for at least the first five years, beginning with the date of adoption of this ordinance, shall be dedicated to this evaluation. The evaluation shall assess, but not be limited to, the impact of the tax on:*
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> *1) economic outcomes (such as household food expenditures, beverage prices and sales, jobs, and store revenues) and*
> *2) health behaviors (such as dietary purchases and consumption),*
> *3) intermediate health outcomes, and*
> *4) identification and assessment of food deserts in the city, and*
> *5) the effectiveness and efficiency of the foodbank network in the city.*
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> *The evaluation shall also assess, but not be limited to, the process of implementing the tax, including perceptions of city residents and specifically low income households, food retailers, tax administrators, and city officials. The evaluator will collaborate with the Sweetened Beverage Tax Community Advisory Board to develop the evaluation. The evaluation will rely on data collected specifically for the purposes of the evaluation from populations in Seattle as well as*

outside Seattle to enable a rigorous comparison of trends in behavior, health, and economic outcomes as a result of this ordinance." Ordinance 125324, Sect. 5.B

The Seattle research team that the City Auditor contracted with beginning in 2017 includes Public Health – Seattle & King County, the University of Washington, and Seattle Children's Research Institute.

The Seattle research team has publicly presented the following SBT reports (which are available on the Office of City Auditor website):

- Sweetened Beverage Tax Baseline Report (released in 2018)
- Sweetened Beverage Tax Six Month Store Audit Report (released in 2019)
- Sweetened Beverage Tax Report on Healthy Food Availability and Food Bank Network (released in 2019)

In April 2020, the Seattle research team released a report describing the findings collected from data at 12 months after tax implementation. The 12 month report has two components:

1. Retail audit (led by Dr. Jesse Jones-Smith at UW)
2. Cohort study of lower-income children and parents (led by Dr. Brian Saelens at Seattle Children's Research Institute)

External Evaluation Study

Dr. Lisa Powell, a health economist at the University of Illinois Chicago, published a study in 2020 called, "The Impact of Seattle's Sweetened Beverage Tax on Beverage Prices and Volume Sold" in the academic journal *Economics and Human Biology.* The study examines the impact on beverage prices and volume of beverages sold one year after implementation of the tax using UPC barcode (scanner) data from Nielson. This report (referred to as the Powell 2020 study), and the two upcoming Seattle studies, are discussed in further detail below.

FAQs – 12 Month Store Audit

What is the 12 Month Store Audit?

The Store Audit is part of a three-year study to determine the extent to which Seattle's tax on distributors of sugary beverages is passed through to customers via higher retail prices. The study began just before the tax went into effect (the first report, the Baseline or Pre-tax Store Audit, was issued in August 2018) and was repeated 6-months (report issued in January 2019), and again 12-months later. The store audit will be repeated one more time at approximately 24 months after the start of the tax.

How were the Store Audits done?

A trained research team from University of Washington traveled to over 400 stores in Seattle and a comparison area in South King County (where there is no tax on sugary beverages) to collect information on the prices of taxed and non-taxed beverages. Prices were collected *before the tax and* at *6 and 12 months after* the tax went into effect. The team collected price information at supermarkets, grocery stores, corner stores, drug stores, warehouses, gas stations, coffee shops, and counter-service restaurants. Store locations were geographically balanced.

Researchers then calculated the changes in beverage prices in Seattle above and beyond price changes for the same beverages in the comparison area. The comparison area (Federal Way, Kent, Auburn) is assumed to reflect the trend in price changes Seattle would have seen if the City had not passed the Sweetened Beverage Tax.

If this is a tax on sugary beverages, why are researches also studying the prices of non-taxed beverages?

Researchers are also looking at whether the price of non-taxed beverages changed, because distributors and retailers may choose to spread the cost of the tax over a variety of products.

What was the main finding of the 12-Month Store Audit?

This study found that, 12 months after the tax went into effect, distributors are passing the tax to consumers via higher retailer prices. On average, the "price pass-through" of the tax on sugary beverages was 1.55 cents per ounce. Because the tax rate is 1.75 cents per ounce, this amounts to an 89% price pass-through rate. For example:

Before the Sweetened Beverage Tax:	**12-Months after the Sweetened Beverage Tax:**
 **$1.80 for 2-Liter Soda** (68 ounces)	 **$2.95 for 2-Liter Soda** (68 ounces) (68 ounces * 1.55 cents per ounce pass through = $1.05 tax)

Is it surprising that the prices of sugary beverages in Seattle increased as a result of the Sweetened Beverage Tax?

No. In response to the Sweetened Beverage Tax, distributors were expected to increase sugary beverage prices for retailers. Retailers, in turn, were expected to increase the shelf prices of sugary

beverages paid by consumers. The Store Audit study is assessing whether these expected price increases actually occurred, and to what extent.

Did all types of sugary beverages increase in price?
In Seattle, all beverages subject to the tax increased significantly in price, except for the caloric flavor-syrup add-on at coffee shops. Price increases differed by sugary beverage type. For example, the average pass-through rate ranged from 82% for soda beverages to 115% for bottled tea drinks.

Did the price increases of sugary beverages vary by store type?
Yes, the price increases of sugary beverages varied by store type. In supermarkets and superstores, the average pass-through was 86%. In grocery stores, drug stores, and small stores, the average pass trough was greater than 100%.

Store type	Average pass-through of taxed beverages
Supermarkets and superstores (e.g. Safeway, QFC, Target)	86% (1.50 cents per ounce)
Grocery stores (Red Apple, Viet-Wah) & Drug stores (Walgreens, CVS, Rite Aid)	101% (1.76 cents per ounce)
Small stores (7-Eleven, gas stations, convenience stores)	82% (1.43 cents per ounce)

Did the price increases in stores near the border vary from other Seattle stores?
While prices in stores near the northern and southern borders of Seattle also increased, they were lower than elsewhere in the City. The average price pass-through was 64% in stores close to the border; citywide, the average price pass-through was 89%.

What about non-sugary beverages not subject to the tax – did these increase in price too?
Prices of non-sugary beverages increased significantly, *but only in certain store types*. For example, the price of non-taxed beverages did not increase in supermarkets and superstores. However, the price of non-taxed beverages did increase significantly in grocery stores, drug stores, and small stores. The price increases of non-taxed beverages in these stores appear to be driven by increases in the price of diet soda and bottled sugar-free tea drinks. The price of bottled water did not increase and, in the majority of store types, neither did the price of milk.

Store type	Price increases in non-taxed beverages
Supermarkets and superstores (e.g. Safeway, QFC, Target)	None
Grocery stores (Red Apple, Viet-Wah) and Drug Stores (Walgreens, CVS, Rite Aid)	0.36 cents per ounce
Small stores (7-Eleven, gas stations, convenience stores)	0.61 cents per ounce

Why does the 12-month UW Retail Audit find an 89% pass-through of the tax while the Powell study finds only a 59% pass through of the tax?

There are differences in the study design and data sources that would make us expect different estimates of the price pass-through. Similar differences were seen between store audit and scanner data studies done in Philadelphia – the scanner data in Philadelphia found a 43% pass-through at supermarkets while a Philadelphia store audit found an approximately 100% pass-through (Roberto, 2019) (Cawley, 2018).

The information below explains some of the differences in these study approaches and why the Powell study may be an underestimate of the price pass-through.

1. **The first reason is that the Powell study would not have picked up any beverage tax added as a separate line item on the receipt.** The on-the-ground work of the Seattle UW research team found that three large supermarket chains have been doing precisely this—adding the tax at the register as a separate line item on the receipt (Figure 1).

Fred Meyer, QFC, and Metropolitan Market have all taken this approach. The Powell methodology does not capture this amount because it is not linked to a UPC barcode and therefore their estimate of the price pass-through does not include the actual price of the tax for all transactions at these three retailers (and possibly others). Although we do not know which stores are included in the Powell study, if any of these three chains are included, their check-out transactions are likely to contribute a large fraction of the volume of taxed beverages in the Powell study (since they are chain supermarkets and since households likely purchase their large volume taxed beverages in supermarkets).

FIGURE 1. EXAMPLE OF RECEIPT THAT INCLUDES BEVERAGE TAX SEPARATELY ADDED AT THE REGISTER TO THE LISTED SHELF PRICE.

Figure note: Unlike the Powell and Leider study, the Seattle research team collected information about taxes added on at the register (as shown in this receipt) and was able to include it in their estimation of price pass through, which leads to a higher estimate of pass-through.

The Seattle UW research team's data does include taxes added at the register, which leads to a higher estimate of pass-through. After the publication of the Powell study, the Seattle UW research team tested to see whether their results would be more similar to the Powell study had they not not accounted for the tax added at the register. The resulting estimates were much closer to Powell's. (Appendix G) Therefore, we believe this omission from the Powell data is a large driver of the difference in estimates.

2. The other difference derives from the sampling of stores and beverages. Beverages sold at a sample of stores (Powell study) versus a sample of beverages available on store shelves at a sample of stores (UW study) - this difference in design affects the pass-through estimates in two ways:

    a. The scanner data (Powell study) provides data on all beverages sold compared to a sample of popular beverages on store shelves (UW study). This means that the scanner data gives information to estimate pass-through based on what people buy (the Powell study talks about this as 'weighting' the data to reflect the proportions in which people purchase different types and sizes of beverages). The UW research team beverage sample is based on what people see on the shelves. This means the UW pass-through estimate reflects the

change in shelf price for each beverage, but it is not weighted to be in proportion to the amount of each beverage that consumers purchase.

b. As mentioned above, the Powell study relies on UPC barcode (scanner) data, or store check-out transactions, whereas the Seattle study uses the price on the shelf. If people are more likely to buy taxed beverages only when the products are on sale (for a lower total price), the average price paid will be lower for the scanner data than for the price observed on the shelf at one point in time (i.e., products may sit on the shelf longer when not on sale). This difference in the source of the price data would also lead to a lower estimate of pass-through in the Powell study compared to the Seattle study.

Of note, similar differences in the pass-through estimates were seen in Philadelphia when comparing the estimates from scanner data (43% pass-through at supermarkets) to estimates from store audits (approximately 100% pass-through) (Roberto, 2019) (Cawley, 2018).

FAQs – 12 Month Child Cohort

What is the 12 Month Child Cohort?
The Seattle Children's Research team recruited a sample of lower income families with children living in Seattle and South King County to complete surveys about their beverage consumption before, 6-months, and 12-months after the Seattle sugary beverage tax went into effect. This is considered a cohort study because we are asking the same people over time to see whether their consumption changed.

How were the surveys of the child cohort done?
Our survey of beverage consumption was based on an existing survey that was adapted to better capture consumption of taxed and non-taxed beverages. The survey asks about the frequency of consumption for each type of beverage in the past month and then the typical size of that beverage type consumed (e.g., 8 oz/1 cup, 16 oz/2 cups, etc.). From this, we calculated the average daily consumption of taxed and non-taxed beverages. Surveys were available in English, Spanish, Somali, or Vietnamese and administered in person, online, or by phone. Parents reported on their own beverage consumption as well as the consumption of younger children (<12-yearsold). Older children self-reported their beverage consumption. Parents also completed surveys about demographics and other aspects of their households.

What was the main finding of the 12-month child cohort?
Both children and parents in Seattle reduced their consumption of taxed beverages from before to 12 months after the Seattle sugary beverage tax was implemented. However, there was an unexpected similar change among children and parents in the comparison area (South King County), which do not have sugary beverage taxes.

Why would we see a decrease in consumption of sugary beverages in the comparison area where there is no sugary beverage tax?
There are a few possible reasons why we would have seen a decrease in sugary beverages in the comparison area. First, it could be that media and other information associated with the sugary beverage tax in Seattle made parents and children more aware of their beverage choices both inside and outside of Seattle and resulted in similar decreases in sugary beverage consumption. Second, there has

been a general decline in the consumption of sugary beverages in the population, so it could be that we are seeing this decline among both the Seattle and comparison area parents and children in our cohort. Third, something else could have been happening in the comparison area (that was not a tax) that could have resulted in decreased sugary beverage consumption. We are not aware of any major initiatives in the broader King County area focused on decreasing sugary beverages, but we can't rule this out. Fourth, it could be that comparison area families were shopping in Seattle stores or eating in Seattle restaurants that were subject to the sugary beverage tax, and they reduced their sugary beverage purchase and consumption as a result. Finally, it could be that people report lower beverage consumption on surveys over time regardless of whether their beverage consumption actually changes. This could also explain why we found decreases in non-taxed beverage consumption over time among both Seattle and comparison area families.

Is it surprising that the consumption of sugary beverages in Seattle decreased while revenues from the tax exceeded projections?

As indicated above, the revenue estimates were conservative and there was no comprehensive and reliable estimate of sugary beverage consumption or beverage volume prior to the tax on which to base a more reliable revenue projection. So, it is not surprising that revenues from the tax exceeded projections.

Is it surprising that consumption of sugary beverages in Seattle decreased while volume of sugary beverages fell 22% relative to Portland, OR a year later (per Powell 2020)?

It would be expected that consumption of sugary beverages decreased if the volume purchased of such beverages decreased. Indeed, the unadjusted Seattle-based estimate of decreased volume purchased of sugary beverages was 30% in the Powell 2020 study, which is very similar to the observed decrease in reported consumption of children's and parent's sugary beverages in the cohort study (33-36%). While the Powell 2020 study used Portland, Oregon as the primary comparison area (not South King County like in the cohort study), the Powell 2020 study found that volume purchased of sugary beverages did not change much in stores in the 2-mile radius outside Seattle which includes a portion of the cohort comparison area. This is not consistent with the cohort finding that parent and child consumption of sugary beverages decreased in the cohort comparison area.

FAQ Powell 2020 study on beverage prices and volume sold

Citation: Powell LM, Leider J, The Impact of Seattle's Sweetened Beverage Tax on Beverage Prices and Volume Sold, *Economics and Human Biology* (2020), doi: https://doi.org/10.1016/j.ehb.2020.100856

What is the Powell 2020 study?
The Powell 2020 study looked at the impact of the Seattle tax on beverage prices and volume of beverages sold one year after implementation of the tax. It used UPC barcodes (scanner data) from Nielson and compared changes in Seattle to those in Portland, Oregon, where there is no beverage tax. It also looked at changes in the 2-mile border area of Seattle, relative to the comparison site, to determine if people are avoiding the Seattle tax by going across the border to shop for beverages.

What were the main findings of the Powell 2020 study?

- Volume sold of sugary beverages fell 22% in Seattle relative to Portland after the introduction of Seattle's beverage tax,
- There was no cross-border shopping associated with Seattle's beverage tax, and
- Sugary beverage prices rose by an estimated 59% after introduction of Seattle's beverage tax (see below for limitations of this estimate).

Who funded the Powell 2020 study? Did the City of Seattle fund the Powell study?
The Powell 2020 study was supported by a grant from Bloomberg Philanthropies' Obesity Prevention Initiative. While the City of Seattle was interested in this research, the City of Seattle did not fund this study after learning that Dr. Powell was likely to secure non-City funds. The City and the Seattle research team engaged Dr. Powell in the planning and coordination of the City-funded study to avoid redundancies between the two projects.

How was the Powell 2020 study done?
The Powell research team analyzed Nielson's UPC barcodes (scanner data) from retailers who sell beverages in Seattle and Portland, Oregon (comparison area), and a two mile-buffer around both cities. Store-level scanner data covered supermarkets and grocery, convenience (including some non-chain), drug, mass merchandise, and dollar stores. Researchers analyzed data for two years prior to the tax (January 1, 2018) and one year following implementation of the tax.

What store types were included in the Powell study and how is that different from the UW retail audit?
The Seattle research team, led by the UW, conducted an audit of retailers. The UW Retail Audit and the Powell study both included data from supermarkets, grocery stores, mass merchandisers, and convenience stores. The Powell study included dollar stores (which the UW study did not). The UW Retail Audit additionally included warehouses (such as Costco), fast food/quick service restaurants, and a large number of independent small grocers and small convenience stores.

Does Nielson UPC barcode (scanner) data show what the store names are or what the mix of store types are? Does it include locations of stores in case I wanted to know what the price pass-through is in my neighborhood?
The Nielsen dataset used in the Powell study does not include store names or store types. The Powell study does not know the mix of store types and therefore is not able to control for store type. To our knowledge, the Nielsen data used in the Powell study does not have the specific location of stores in the sample.

FAQ How is Powell's study different from the Seattle research team's evaluation?

Although the approaches were different, both the Powell 2020 study and the Seattle research team study evaluated the impact of the tax on price pass-through and consumer behavior 12 months after implementation of the Seattle tax. Together, the studies across all research teams provide complementary perspectives for a more comprehensive look at the impact of the tax in Seattle. Below is an explanation of some of the variation between the studies.

Determining Pass-Through Rate: Differences in Data

The UW research team looked at the impact of the tax on beverage prices and found that 6 months after tax implementation, sugary beverage prices rose. While the Powell study used information from check-out transactions based on UPC barcodes, the UW research team visited retailers and collected beverage price data based on shelf price (regular price and discounted prices) and included beverage taxes separately added at the register. The UW study included data from retailers across the city, with stores and restaurants of each type sampled in each city council district. To our knowledge, the Powell study included stores that automatically share check-out data with Nielsen and include these store types: supermarkets, grocery stores, mass merchandisers, and dollar and convenience stores. The UW study did not include dollar stores but did include warehouses and restaurants and likely includes more small and independently-owned stores as compared to the Powell study.

Impact on Cross-Border Shopping

Both the Powell team and UW team looked at tax implications on cross-border shopping. The Powell study showed no change in volume of beverages sold across the border and concluded that no cross-border shopping occurred. The UW team looked at intention to shop across the city border in order to avoid the Sweetened Beverage Tax. Before the tax was implemented, the UW team interviewed 851 adults in Seattle about their intention to shop for beverages across the border and found that most (77%) adults did not intend to do so. The Seattle research team will repeat this survey at 24 months after tax implementation.

Impact on Consumer Behavior

Both the Powell team and Seattle Children's Research team are looking at impact on consumer behavior. The Powell team measured change in consumer behavior using beverage volumes sold. The research team from Seattle Children's Research interviewed lower-income families to learn whether they changed their intake of beverages after the tax. Twelve months after tax implementation, the Seattle Children's Research team found that among lower-income families, self-reported consumption of sugary beverages fell in Seattle. The change was similar to the reduction found in the comparison area.

Why does the Powell 2020 study say it's the first study to assess SBT impact in Seattle in terms of either consumption or sales volume? Isn't the City funding a study of SBT impact?

The Powell 2020 study is the first study available in the peer-reviewed literature to report findings on the impact of the Seattle Sweetened Beverage Tax on price pass-through and change in volume of taxed beverages. The City is funding a Seattle research team to conduct a five-year study of the SBT impact. The Seattle research team includes a child cohort to assess consumption, and expect to release a report of findings in the first quarter of 2020. The Seattle research team is not studying change in sales volume. The Seattle research team's previous reports include findings on baseline (pre-tax) conditions in a

publicly released report in 2018 and also findings about the impact of the tax on beverage prices after 6 months of tax implementation in a publicly released report in 2019.

Is the City funding a study of SBT impact on cross-border shopping?

While the Powell 2020 study is the first study to report findings on the SBT impact on cross-border shopping, as measured by change in volume of taxed beverages, the City is funding the Seattle research team to study intention to shop across the city border in order to avoid the Sweetened Beverage Tax. Before the tax was implemented, the Seattle research team interviewed adults in Seattle about their intention to shop for beverages across the border and found that most (77%) adults did not intend to do so. The research team reported these findings in the publicly released 2018 baseline report and in peer-reviewed literature (Oddo 2019, BMC Public Health). The Seattle research team is repeating the survey of Seattle adults (twenty-four months after tax implementation) to ask whether or not they shopped for beverages across the border in order to avoid the beverage tax.