

POLICYLAB

RESEARCH AT A GLANCE | SUMMER 2022

A SYNOPSIS OF EMERGING POLICYLAB RESEARCH

UNDERSTANDING THE IMPACT OF SUGARY DRINK TAXES ON CHILDREN'S HEALTH

WHAT IS THE PROBLEM:

Nutrition-related chronic diseases like diabetes and cardiovascular disease are a major public health issue, and children in families with lower incomes are at the highest risk for developing them.

Youth ages 9–18 consume the highest amounts of added sugars per day compared to any other age group.¹



Consuming sugary drinks is one modifiable health behavior associated with nutrition-related diseases. Taxes on sugary drinks have the potential to improve such health behaviors. However, sugary drink taxes, like the Philadelphia Beverage Tax, have yet to be widely implemented in the United States. One reason for their absence is that some view them as regressive, or disproportionately burdensome to people with lower incomes. Additionally, little is known about their impact on youth and what makes these policies acceptable and equitable in the eyes of individuals with lower incomes.

In a typical American diet, about one-third of the total added sugars a person consumes come from sugary drinks, such as fruit drinks, sports drinks and soda. Youth ages 9–18 consume the highest amounts of added sugars per day compared to any other age group.¹ We know that taxing sugary drinks is associated with reduced sales of sugary drinks, but the impact of these taxes on consumption has been less clear.^{2–5} It is essential to understand how sugary drink taxes influence youth consumption of sugary drinks to evaluate the impact such taxes can have on child health.

WHAT WE ASKED:

Is a tax on sugary drinks associated with reduced soda consumption among adolescents, and are some groups more responsive to the tax than others?

How do parents of children ages 2–11 years with lower incomes perceive the fairness and effectiveness of the Philadelphia Beverage Tax?

WHAT WE DID:

We used Youth Risk Behavior Surveillance System (YRBSS) data to compare self-reported soda intake of high school students in Philadelphia to students in seven other U.S. cities from 2013 to 2019, before and after implementation of Philadelphia's Beverage Tax. Additionally, we looked at reported intake of juice and milk to see if students substituted either of these beverages for soda after the tax went into effect. Because we know that soda intake differs by demographic factors, we then looked at the change in reported soda intake by race/ethnicity and by weight status (overweight or obese, obese, or healthy weight) to see if different groups of students responded differently to the tax.

We also interviewed 30 parents of children ages 2–11 years with lower incomes living in Philadelphia to characterize their perceptions of the Philadelphia Beverage Tax. We recruited participants from Children's Hospital of Philadelphia's (CHOP) Primary Care Network, using Medicaid insurance status as a marker of lower income, and gave gift cards to compensate them for their time. The interview guide focused on whether or not participants perceived the tax as fair and effective, with "effective" referring to the tax's ability to reduce individuals' intake of sugary drinks and to raise revenue for free pre-K and improvements to schools, parks and libraries in the city.

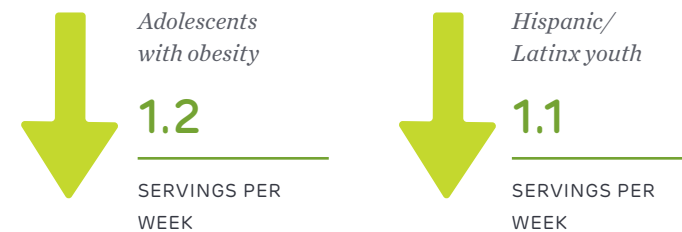
WHAT WE FOUND:

In the first study, we found that:



The Philadelphia Beverage Tax was associated with a reduction of nearly 1 serving of soda per week per adolescent.

When we looked at specific demographic factors, we found the greatest reduction in soda consumption occurred among:



Both of these subgroups are known to consume high amounts of sugary drinks in general. Additionally, there was no evidence that youth substituted 100% juice or milk for soda after the tax was implemented.

In the second study, we learned that:



Parents with lower incomes perceived the Philadelphia Beverage Tax as fair as long as the tax's revenue was used as promised: to fund free pre-K and improve city schools, parks and libraries.

Many parents called for accountability from the city to better show how the tax's funds are being spent. Among the parents interviewed, there were mixed feelings about the tax's effectiveness on soda consumption, as some reported their families reduced their intake of sugary drinks, while others disclosed avoiding the tax by traveling outside city limits to purchase these beverages.

WHAT IT MEANS:



STUDY METHODS

In the first study, we conducted a difference-in-differences regression analysis using survey data from the YRBSS to compare the mean change in self-reported soda intake from high school students in Philadelphia and students in seven other U.S. cities before and after implementation of the Philadelphia Beverage Tax. School districts that included the soda intake question on the YRBSS survey and that had two years of survey data before and after tax implementation in 2017 were included in the analysis. This included: Philadelphia, Pa.; New York, N.Y.; Baltimore, Md.; Orange County, Fla.; Palm Beach County, Fla.; Broward County, Fla.; San Diego, Calif.; and Los Angeles, Calif.

The exposure was implementation of the Philadelphia Beverage Tax, and our primary outcome was self-reported soda intake. Secondary outcomes included self-reported 100% juice and milk intake. We controlled for age, sex, race and ethnicity, and body mass index. We also controlled for school district to account for time-variant characteristics that could produce differences in absolute levels of soda consumption by school district.

After the main analysis, we also conducted subgroup analyses by race/ethnicity and by weight status (“obese” or “overweight or obese”) to evaluate if groups of students with known differences in soda consumption patterns responded differently to the tax.

In the second study, we interviewed parents with lower incomes to characterize their perceptions of the Philadelphia Beverage Tax. We recruited participants from a primary care pediatric clinic in West Philadelphia that serves a large, low-income patient population (73% of patients), and included English-speaking Philadelphia-residing parents and caregivers of children ages 2–11 years with Medicaid insurance (as a marker of lower income). We sampled parents of preschool- and elementary school-aged children because their children are the most likely to benefit from the programs to which the tax revenue is directed, so they may have a distinct perspective on the perceived fairness and effectiveness of the policy. We conducted interviews via telephone due to the COVID-19 pandemic, and participants received a \$30 gift card for participation.

We used a conceptual model that proposes that a policy’s intrusiveness influences its perceived fairness and effectiveness, and its perceived fairness and effectiveness in turn influence the policy’s public acceptance. With this conceptual model, we developed a semi-structured interview guide exploring awareness of the tax as well as perceptions of its fairness and effectiveness. We then used constant comparison to perform a thematic analysis of the interview data, identifying new themes as they emerged. The dominant themes that arose informed our conclusions and policy recommendations.

RELATED POLICYLAB WORK

Children’s Hospital of Philadelphia, PolicyLab. Understanding Low-income Parents’ Perceptions of the Philadelphia Beverage Tax [Online]. Available at: <https://policylab.chop.edu/our-research/pilot-grants/understanding-low-income-parents-perceptions-philadelphia-beverage-tax>

PUBLICATIONS

Edmondson EK, Roberto CA, Gregory EF, Mitra N, Virudachalam S. Association of a sweetened beverage tax with soda consumption in high school students. *JAMA Pediatr.* 2021;175(12):1261–1268. doi: [10.1001/jamapediatrics.2021.3991](https://doi.org/10.1001/jamapediatrics.2021.3991)

Edmondson EK, Shea JA, Gregory EF, Roberto CA, Garcia SM, Kwon J, Virudachalam S. Low-income parents’ perceptions of a sweetened beverage tax in Philadelphia. *Journal of Nutritional Science.* 2022;11. doi: [10.1017/jns.2022.64](https://doi.org/10.1017/jns.2022.64)

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2. Roberto CA, Lawman HG, LeVasseur MT, et al. Association of a beverage tax on sugar-sweetened and artificially sweetened beverages with changes in beverage prices and sales at chain retailers in a large urban setting. *JAMA.* 2019;321(18):1799–1810. doi: [10.1001/jama.2019.4249](https://doi.org/10.1001/jama.2019.4249)
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5. Silver LD, Ng SW, Ryan-Ibarra S, et al. Changes in prices, sales, consumer spending, and beverage consumption one year after a tax on sugar-sweetened beverages in Berkeley, California, US: A before-and-after study. *PLoS Med.* 2017;14(4):e1002283. doi: [10.1371/journal.pmed.1002283](https://doi.org/10.1371/journal.pmed.1002283)



The mission of PolicyLab at Children’s Hospital of Philadelphia (CHOP) is to achieve optimal child health and well-being by informing program and policy changes through interdisciplinary research. PolicyLab is a Center of Emphasis within the Children’s Hospital of Philadelphia Research Institute, one of the largest pediatric research institutes in the country.

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