

Table of Contents

- 1** The impact of a tax on sugar-sweetened beverages according to socio-economic position: a systematic review of the evidence Backholer et al. 2016
- 2** School District Policies and Adolescents' Soda Consumption Miller et al. 2016
- 3** Rethink your drink: Reducing sugar-sweetened beverage sales in a children's hospital Hartigan et al. 2016
- 4** Association between artificially sweetened beverage consumption during pregnancy and infant body mass index Azad et al. 2016
- 5** Prospective association of sugar-sweetened and artificially sweetened beverage intake with risk of hypertension Kim & Je 2016

FIND US ON SOCIAL MEDIA



We'd love to hear from you! Provide feedback on this publication at this [link](#). Send us articles you think should be included in future issues: pvallila@hfamerica.org.



POLICY

The impact of a tax on sugar-sweetened beverages according to socio-economic position: a systematic review of the evidence

Health Nutr. 2016 May 16: 1-15.

Opponents of sugary drink taxes often claim that taxes are “regressive” by placing a greater financial burden on low-income populations. Backholer reviewed 11 studies on sugary drink taxes and found that any regressive impact was small, equivalent to less than \$5 per household per year.

Debates over sugary drink taxes frequently focus on whether such taxes are “progressive” or “regressive.” Other questions are whether low-income populations pay more in taxes as a proportion of their income, and whether those populations benefit from a tax more because they are more responsive to price changes.

Backholer et al. addressed both questions in a systematic review of 11 studies on sugary drink taxes or price changes in high-income countries. The review included empirical analyses of existing taxes as well as simulation modeling of hypothetical taxes. Seven studies were based in the U.S., and one each was based in the UK, Ireland, Australia, and New Zealand.

Their results supported both sides of the “progressive vs. regressive” debate to some degree. They found that the analyses consistently reported that any beneficial

effects of the tax on overall weight were equal or greater in populations of low socioeconomic position (SEP), which the authors identified as a progressive impact. However, the authors found that low-SEP populations consistently pay a greater amount of sugary drink taxes.

That said, the differences in tax burden between high- and low-SEP groups were very small. Each of the studies that estimated differences in tax burden reported that low-SEP households would pay less than the equivalent of \$5 more per year in sugary drink taxes compared to high-SEP households. ■

Limitations: Most studies in the review relied on price elasticity estimates to project the impact of a hypothetical tax, as opposed to evaluating actual sugary drink taxes. All studies that analyzed actual taxes were based in the U.S., where existing tax rates were relatively small. The review was also limited to studies in high-income countries.

School District Policies and Adolescents' Soda Consumption

Miller et al. *J Adolesc Health*. 2016 1-7.

This study suggests high school nutrition policies may lower soda consumption. Restricting promotional products, restricting the sale of beverages, and offering healthful alternatives were associated with lower daily soda consumption among U.S. high school youth.

Schools are an important setting for shaping youth health behaviors and preferences, including consumption of sugary drinks. Miller et al. investigated the relationship between five school district-level nutrition policies and high school soda consumption in 12 large urban school districts in the U.S. Three of five policies were associated with lower soda consumption.

Authors linked two data sources (n=25,241 students) to investigate the impact of policy on soda consumption. Data on student consumption of regular soda were self-reported as part of the 2013 Youth Risk Factor Behavior Surveillance System. Data on district-level nutrition policies came from the 2012 School Health Policies and Practices Study. The school superintendent or other school contact reported on the presence of five nutrition policies: 1. require nutrition education, 2. maintain closed campuses, 3. restrict promotional products, 4. restrict sale of beverages, and 5. offer healthful alternatives.

Most districts had adopted policies stating that high schools will teach about nutrition and dietary behavior (10/12) and maintain closed campuses (8/12). Few districts (1/12) required that schools restrict the distribution of promotional products or restrict the times sugary drinks can be sold; the majority recommended that schools implement such practices. Most districts (8/12) neither required nor recommended that schools make healthful beverages available to students when other beverages are offered or sold.

Requiring nutrition education and maintaining closed campuses were not associated with lower consumption. Districts that required or recommended the following policies had lower daily soda consumption compared with districts without the policy: Restricting promotional products

(16% lower odds of daily soda consumption), restricting the sale of beverages (28% lower odds of daily soda consumption), and offering healthful alternatives (24% lower odds of daily soda consumption). ■

Limitations: The study did not include other sugary drinks such as fruit drinks and energy drinks. Results may not be generalizable to smaller or rural school districts. The presence of nutrition policies was not validated. Students reported on their own soda consumption.

Rethink your drink: Reducing sugar-sweetened beverage sales in a children's hospital

Hartigan et al. *Health Promot Pract.* 2016

A hospital-based Rethink Your Drink campaign led to a decrease in sugary drink purchases and an increase in purchase of beverages with no added sugar or artificial sweeteners. The campaign was implemented with a small budget and revenue from all drinks did not change post-campaign.

Over the course of 12 months, beginning in October 2012, the Wellness Committee at Rady Children's Hospital in San Diego (RCHSD), CA implemented a Rethink Your Drink campaign. RCHSD serves more than 192,000 children annually. The hospital cafeteria is open to hospital employees, physicians, patients, and visitors 7 days a week.

The intervention took place at the main hospital cafeteria, delicatessen, hospital Grab & Go, Starbucks cart, and patient room service. The campaign used a stop light approach to identify high, low, and no sugar beverages. The intervention included strategies to educate and encourage consumers to make healthy drink choices, as well as simple environmental changes to reinforce those choices. All beverages were repositioned in coolers in the cafeteria and vending machines so that green drinks were placed at eye level and red drinks placed at the bottom. Color-coded labels were added to the cafeteria coolers corresponding with the drinks on each shelf. Sugary drinks were eliminated from room service menus—although they were provided on request. Staff collected baseline sales data for all beverages 3 months prior to the campaign and for 4 months post-campaign.

Analysis of sales data showed a 36% decrease in the monthly sales of red drinks (sugary drinks) and a 241% increase in the monthly sales of green drinks (beverages with no added sugar or artificial sweetener) from baseline to the end of the data collection period. Revenue from all beverage sales remained the same pre-campaign, during the campaign, and 4-month post campaign. ■

Limitations: Authors did not measure purchases or behavior outside of the hospital where employees, physicians, and patients may continue to purchase sugary drinks. The study did not include a control group so it is not possible to determine if the reported changes are due to the intervention.

HEALTH IMPACTS

Association between artificially sweetened beverage consumption during pregnancy and infant body mass index

Azad et al. JAMA Pediatr (in press).

This study linked two of the most controversial areas in obesity research – artificially sweetened beverages (ASBs - e.g., diet soft drinks) and predictors of infant weight status. In a longitudinal analysis of 3,303 mother-infant dyads, researchers found that daily consumption of ASBs among mothers during pregnancy was positively associated with infant body mass index (BMI) z-score and overweight status at 1 year of age.

Sugar-sweetened beverages have been strongly associated with obesity, but the impact of artificially sweetened beverages is less consistent. Longitudinal studies have also not examined whether consumption of ASBs during pregnancy increases infants' risk of being overweight. The lack of research has led to unclear health recommendations about the safety of ASB consumption during pregnancy.

As part of the Canadian Healthy Infant Longitudinal Development (CHILD) cohort study, Azad et al. found that infants tended to have higher BMI z-score and a higher risk of overweight at 1 year of age if their mother drank ASBs daily during pregnancy (relative to infants whose mothers did not drink ASBs at all.) This association was statistically significant after adjusting for maternal BMI, diet quality, total energy intake, and other potential confounders.

The association was modified by infant sex, as it was substantially higher in male infants. The authors noted that similar results were reported in a mice study that found aspartame exposure in utero was associated with excess weight gain only in male mice. Results were also consistent with rodent studies that found that maternal non-nutritive sweetener consumption led to offspring having stronger preferences for sweet foods, increased postnatal weight gain, and increased insulin resistance. These findings support the notion that any effects were due to non-nutritive sweeteners, as opposed to other ASB ingredients, such as caffeine. ■

Limitations: Although this cohort study provides stronger evidence than a cross-sectional study, it cannot prove that ASB consumption was the cause of higher infant weight status. Unmeasured confounders may have biased the results. Furthermore, ASB consumption data were self-reported and based on a single food frequency questionnaire administered during pregnancy.

FAST FACT

Racial/Ethnic Disparities in Meeting 5-2-1-0 Recommendations among Children and Adolescents in the United States

Haughton et al. J Pediatr 2016.

In 2011-2012, 91% of 6-11 year olds and 83% of 12-19 year olds drank some sugary drink daily.

Prospective association of sugar-sweetened and artificially sweetened beverage intake with risk of hypertension

Kim and Je . Arch Cardiovasc Dis. 2016 Apr; 109 (4):242-53.

Several individual studies have reported associations between artificially sweetened beverage (ASB) consumption and hypertension, but no systematic review has been conducted. This meta-analysis pooled results across 4 longitudinal studies and found that every additional serving of ASBs per day was associated with a 9 percent greater risk of developing hypertension.

H Kim and Je pooled data from four cohorts – including 227,254 participants and 78,177 cases of hypertension – to estimate the relative risk (RR) of hypertension associated with different levels of ASB consumption. (They also analyzed the association between sugary drink consumption and risk of hypertension; results were similar to a study by Cheungpasitporn et al. that can be found in Volume 1, Issue 1 of Research Watch.)

Overall, adults who consumed ASBs most frequently had a 14 percent higher risk of hypertension (RR=1.14, 95% confidence interval (CI): 1.10, 1.18) compared to the least frequent consumers. These relative risk estimates were very consistent across the four cohorts, ranging from 1.11 to 1.20. Each additional serving of ASBs per day increased the risk of hypertension by 9 percent (RR=1.09, 95% CI: 1.06, 1.13).

Three studies in the meta-analysis adjusted for body mass index (BMI) and one study did not, but results did not vary by BMI adjustment. (Studies that adjusted for BMI had a pooled RR of 1.14; the study that did not adjust for BMI had an RR of 1.17.) Results were also consistent by sex and length of follow-up.

Kim and Je cautiously speculated one explanation of the association between ASB consumption and hypertension may be that non-nutritive sweeteners such as aspartame and saccharine increase blood pressure. However, the authors acknowledged that more research is needed to understand the mechanisms. ■

Limitations: All studies relied on self-reported measures of ASB consumption, which may be underreported. Studies also varied in terms of how hypertension was measured (self-report, objective measurement, or medical record review). Although the four studies represented four different cohorts, three of them were conducted as part of a single paper by the same research team.

Research Watch reviews the evidence on the health effects of sugar and the effectiveness of policy and other interventions to curb consumption to inform sugar reduction activities across the US.

Healthy Food America acts on scientific evidence to drive change in food policy and industry practice, giving people greater control over their health and reducing diet-related illnesses, such as obesity, diabetes, and heart disease.

This publication was prepared by Dan Taber and Petra Vallila-Buchman.