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POLICY

The impact of taxation and signposting on diet: an online field study with breakfast cereals and soft drinks

Zizzo DJ, Parravano M, Nakamura R, Forwood S, Suhrcke M. Center for Health Economics Research Paper 131. June 2016.

Using an online shopping simulation, researchers in the UK found that a 20% tax on less healthy cereals reduced purchases by 48-54%, whether or not the tax was posted for consumers. For less healthy beverages, a 20% tax significantly decreased (53%) purchases when the tax was posted, but otherwise had no impact.

Zizzo et al. assessed how two tax rates (20% and 40%) impacted purchases of cereals and beverages by a nationally representative sample (n=1,000) of UK consumers. Researchers divided cereals and beverages into healthier and less healthy categories, based on energy density, saturated fat, total sugar and sodium and protein contents together with an estimate of the fruit, vegetable, and nut contents.

During August-October 2015 participants were given a \$13 (£10) budget to complete a series of shopping tasks through a website that mimicked the appearance of a regular online grocery store. During each task, the supermarket contained either breakfast cereals or beverages. In the first task, prices for products were untaxed and matched to a local supermarket chain. Next, the prices of the less healthy products were taxed by either 20% or 40%, while the prices of the healthier products remained at the

baseline level. Participants were randomly assigned to see the price increase posted as a tax or to see the final price only.

The authors found that a 20% tax on less healthy cereals reduced demand by similar amounts whether consumers saw the final price only (48% decrease) or saw the tax posted (54% decrease). A 40% tax rate on the same products did not substantially decrease demand beyond the impact of the 20% tax.

For less healthy beverages, a 20% tax reduced demand (52%) when the consumer saw the tax posted, but the tax did not impact demand when consumers saw only the final price without information about the tax. A 40% tax reduced demand by approximately the same amount whether consumers saw the final price only (68% decrease) or saw the tax posted (62% decrease). ■

Limitations: Consumers might behave differently in a real life and in-person shopping experience during which they are spending their own money.

Impact of sugars and sugar taxation on body weight control: a comprehensive literature review

Bes-Rastrollo M, Sayon-Orea C, Ruiz-Canela M, Martinez-Gonzalez MA. *Obesity*. 2016 (in press)

A comprehensive literature review on fructose, sucrose, and sugary drinks found that conclusions about health effects varied by whether authors received food industry funding. This paper also reviewed studies on sugary drink taxes and concluded that taxes alone would be insufficient to reduce obesity but are an integral part of multicomponent strategies.

In the past, different systematic reviews on fructose, sucrose, and sugary drinks have reached different conclusion about adverse health effects. Bes-Rastrollo et al. reviewed 24 systematic reviews about sugary drinks and obesity and 23 systematic reviews about fructose or sugary drinks and metabolic outcomes. In particular, they analyzed whether conclusions were associated with industry funding.

Reviews were substantially more likely to report null associations if the authors reported conflicts of interest with food companies. For example, reviews with a stated conflict of interest were 5.3 times as likely to conclude that there was no association between sugary drinks and obesity, compared to reviews on the same topic that stated no conflict of interest.

A similar pattern was found for reviews on the association between fructose or sugary drinks and other adverse metabolic outcomes, such as type 2 diabetes. Industry-sponsored reviews were more likely to report a null or beneficial association. Only three out of 16 systematic reviews without a conflict of interest reported a null association, whereas 26 out of 34 industry-sponsored reviews reported a null or beneficial association. Ben-Rastrollo et al. also noted that industry-funded groups tended to analyze the topic in different ways.

Non-industry-funded groups tended to focus on levels of fructose or sugary drink intake, whereas industry-funded reviews tended to focus on the effect of pure fructose when substituted for other carbohydrates. Ben-Rastrollo et al. speculated that the latter approach led to over-adjustment bias.

Most studies of sugary drink taxes were simulations (18 out of 24). These simulation studies tended to report that excise taxes would reduce weight gain or obesity, though the effect sizes were small. Nonetheless, the authors concluded that small effects could have a large impact on a population level, particularly if combined with other economic and structural approaches. ■

Limitations: Most studies that were included in the systematic reviews were observational, not randomized trials. The review of tax studies was limited almost entirely to simulations and cross-sectional studies; longitudinal studies on taxes only analyzed sales or purchasing data.

CONSUMPTION TRENDS

Dietary intake among U.S. adults, 1999-2012 [🔗](#)

Rehm CD, Peñalvo JL, Afshin A, Mozaffarian D. *JAMA*. 2016; 315(23):2542-53.

New data on adult dietary intake show worsening disparities, as white, higher income, and higher educated adults reported greater improvements from 2003-04 to 2011-12. Targeted interventions are needed to diminish disparities.

Authors analyzed dietary recall data from seven waves of the CDC's National Health and Nutrition Examination Survey (1999-2000 to 2011-12) to describe trends in diet quality among U.S. adults (sample size ranged by wave: 4,237-5,762). Authors used the American Heart Association's 2020 Strategic Impact Goals for diet to construct a diet score for each respondent. Authors also evaluated individual foods and nutrients linked to major health outcomes.

Overall, U.S. adults reported improvements in diet quality from 1999-2000 to 2011-12, but with worsening disparities by race/ethnicity, education, and income level. Intake of total fruits and vegetables, processed meat, saturated fat, and sodium did not significantly change from 1999-2000 to 2011-12.

Trends in proportion of adults reporting poor diet quality 2003-04 to 2011-12

- The proportion of adults reporting poor diet quality declined from 55.9% to 45.6% (2003-04 to 2011-12).
- In 2011-12, more low-income adults (60.6%) reported a poor diet than high income adults (35.7%).
- Compared with 2003-04, in 2011-12 there was greater disparity in the proportion of low- versus high-income adults reporting poor diet quality (17.3 percentage points difference in 2003-04 versus 24.9 percentage points difference in 2011-12).

Trends in diet score improvements 2003-04 to 2011-12

- Older adults continue to report higher quality diets than younger adults.
- While white and black adults reported improved diet quality in 2011-12, Mexican-American adults reported no improvement in eight years.
- Adults of low education and low income reported smaller improvements in diet quality compared with high education and high-income counterparts. ■

Added sugars

- U.S. adults, on average, consumed 10 ounces of sugary drinks per day in 2011-12, a decline of ~4 ounces compared to 1999-2000.
- Approximately two-thirds of adults consumed more sugar than is recommended (2009-12). Added sugars intake decreased 4.4 teaspoons per day from 1999-2000 to 2011-12.

Limitations: Self-reported dietary information is vulnerable to random and systematic error. A large number of statistical tests were performed without adjustment for multiple comparisons, so some statistically significant trends may represent false-positive results (i.e., type I error).

ATTITUDES AND BELIEFS

Believing that certain foods are addictive is associated with support for obesity-related public policies

Moran A, Musicus A, Soo J, Gearhardt AN, Gollust SE, Roberto CA. *Prev Med.* 2016 (in press)

This study found that beliefs about the addictive nature of foods and beverages impacts level of support for public policies intended to curb their consumption. Crafting messages about the addictive nature of some foods and beverages may be an effective strategy to increase support for obesity prevention policies.

The addictive nature of tobacco garnered public support for a host of tobacco prevention policies, including taxation. Could information about the addictive nature of some foods impact beliefs about the need for government intervention to address overconsumption of these foods? Moran et al. explored how beliefs about the addictive nature of foods and beverages influence support for obesity prevention policies.

U.S. adults (n=999) were recruited through Amazon Mechanical Turk to complete an online survey in February 2015. The survey included several measures, including beliefs about the addictive potential of processed foods (including sugary drinks) and unprocessed foods, drugs, tobacco, alcohol, and three behaviors (e.g., gambling); level of support for 12 obesity prevention policies; and demographic and political characteristics. Tested policies included sugary drink taxes, warning labels, portion size caps, and energy drink bans.

More than 60 percent of respondents viewed coffee, regular soda, and energy drinks as highly addictive, while less than 20 percent viewed sports drinks as highly addictive. Just shy of 40 percent viewed diet soda as highly addictive. Respondents were more likely to rate tobacco,

drugs, behaviors (video games, pornography, gambling) and alcohol (except wine) as being highly addictive than any processed food category (except coffee).

Only menu labeling in restaurants (67%) and restricting sugary drinks in schools (61%) were supported by the majority of respondents. Sugary drink taxes (47%), taxing junk food (43%), restricting food advertisements in hospitals (42%), and restricting portion sizes of sugary drinks (26%) were less supported.

Believing certain foods are addictive was significantly and positively associated with support for seven of 12 tested policies: limits on sugary drink portions; restrictions on food marketing to children; banning energy drinks; food warning labels; mandatory industry salt and sugar reduction; and a junk food tax. The magnitude of the association between beliefs about food addictiveness and support for policies was highest for warning labels and energy drink bans. ■

Limitations: Compared to the general population, this sample was younger and more highly educated, and included a lower proportion of black and Hispanic individuals. Study was cross-sectional and there may be alternative explanations for the findings.

OBESITY TRENDS

Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014 [↗](#)

Ogden CL, Carroll MD, Lawman HG, Fryar CD, Kruszon-Moran D, Kit BK, Flegal KM. *JAMA*. 2016; 315(21): 2292-9.

Trends in obesity among adults in the United States, 2005-2014 [↗](#)

Flegal KM, Kruszon-Moran D, Carroll MD, Fryar CD, Ogden CL. *JAMA*. 2016; 315(21): 2284-91.

Two major studies analyzed long-term trends in child/adolescent and adult obesity, respectively, in the U.S. The most recent data, collected in 2013-14, indicated that the prevalence of obesity is 17.0% in children and adolescents (ages 2-19 years), 35.0% in adult men, and 40.4% in adult women. Trends over time differed by age and sex, as obesity has increased in some sub-groups (e.g., adult women) and decreased in others (2-5 year olds).

Ogden et al. analyzed trends from 1988-94 through 2013-14, including a total of 40,780 children and adolescents. Among younger children (ages 2-5), the prevalence of obesity increased from 7.2% in 1988-94 to 13.9% in 2003-04, and subsequently decreased to 9.4% in 2013-14. Trends in children 6-11 also improved over time, but not to the same degree. The prevalence in this age group increased from 11.3% in 1988-94 to 19.6% in 2007-08 and has remained relatively stable since then (17.4% in 2013-14).

Trends were less encouraging in adolescents (ages 12-19). The prevalence of adolescent obesity steadily increased from 10.5% in 1988-94 to 20.6% in 2013-14. Furthermore, the prevalence of extreme obesity in adolescents more than tripled during the same timespan

(2.6% to 9.1%). The prevalence of extreme obesity also steadily increased in all age groups combined (2.6% to 6.0%).

Flegal et al. focused on adults and analyzed trends in the past decade, 2005-06 through 2013-14. Statistically significant increases in obesity prevalence were observed in women but not men. The prevalence among women particularly increased from 2011-12 to 2013-14 (36.9% to 41.1%, adjusted for age, race/ethnicity, smoking status, and educational category), whereas the prevalence among men has been stable since 2005-06.

Likewise, the prevalence of extreme (i.e., Class 3) obesity has steadily increased from 2005-06 to 2013-14 among women but not men. The adjusted prevalence of extreme (Class 3) obesity was almost twice as high among women compared to men in 2013-14 (10.0% versus 5.5%, adjusted for age, race/ethnicity, smoking status, and educational category.) ■

Limitations: Obesity is defined by body mass index, which is known to be an imperfect measure of body fatness. Neither study followed individuals over time; all data came from the National Health and Nutrition Examination Survey (NHANES), which collects data from a different cross-sectional sample at different time points. Thus, trends may have been affected by demographic factors that were not included in the analyses.

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.