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POLICY

Health impact assessment of the UK soft drinks industry levy: a comparative risk assessment modelling study.

Briggs AD, Mytton OT, Kehlbacher A, et al. *Lancet Public Health*. 2016 (in press)

Key Question: What are the comparative health impacts of potential industry responses to the UK's proposed sugary drink tax?

Key Finding: Among various possible responses from beverage makers, reformulating drinks to contain 30 percent less sugar would have the largest impact on obesity, type 2 diabetes, and dental caries.

Implications: The impact of the UK sugary drink tax will depend on how industry responds. Reformulation would have the most positive impact.

In March 2016, the UK government announced a proposal to tax drinks based on the amount of sugar they contain. The tiered tax would include a high tax for drinks with more than 8 grams of sugar per 100 ml and a moderate tax for drinks with 5–8 grams of sugar per 100 ml. The impact of a tiered approach is unknown because no other country has implemented such a tax.

As Briggs and colleagues point out, the impact is likely to depend on how industry responds. Industry could adapt in different ways, including reformulating products to include less sugar, adjusting the market

share to include a higher percentage of low- and mid-sugar drinks, or increasing the prices of different products. Briggs and colleagues modeled the impact of each of these responses, including better- and worse-case scenarios that represented different levels (e.g., reformulating products to have 30 percent less sugar or 5 percent less sugar). The authors modeled the impact of each scenario on cases of obesity, type 2 diabetes, and dental caries.

The largest public health impact occurred in the better-case scenario for reformulation, in which industry reduced the sugar content of high-sugar drinks by 30 percent and mid-sugar drinks by 15 percent. This scenario would lead to 144,383 fewer individuals with obesity, 19,094 fewer new cases of type 2 diabetes per year, and 269,375 fewer cases of decayed, missing, or filled teeth (DMFT). The effects on obesity and DMFT would be larger in children than adults, whereas the effect of diabetes would be largest in adults older than 65.

Each of the other scenarios would also have a positive impact, except for the worse-case change in sugary drink market share. This scenario assumed minor reductions in the market share of high- and low-sugar drinks (e.g., shifting from 36 percent high-sugar drinks to 33 percent high-sugar drinks) and a doubling of the market share for mid-sugar drinks (6 percent to 12 percent). ■

Limitations: The authors did not model how taxes may affect consumption through raising awareness or investing revenue in public health programs. Their analyses were limited to obesity, type 2 diabetes, and DMFT in the total UK population; they did not model other outcomes such as quality of life, mortality, or health care costs. They also did not examine differences by sub-group.

HEALTH IMPACTS

Sugar-sweetened beverage but not diet soda consumption is positively associated with progression of insulin resistance and prediabetes. [🔗](#)

Ma J, Jacques PF, Meigs JB, et al. *J Nutr*. 2016;146:2544-50.

Key Question: Does consuming sugary and artificially sweetened drinks increase insulin resistance and the risk of prediabetes in middle-aged adults?

Key Finding: Only sugary drink consumption was associated with insulin resistance and risk of prediabetes. Diet soda was not significantly associated with either outcome.

Implications: This study adds to growing evidence that sugary drinks contribute to prediabetes and type 2 diabetes, but there is less evidence that diet sodas have any impact.

A growing topic of debate and confusion is whether artificially sweetened drinks such as diet soda are as harmful as sugary drinks. This study examined whether both sugary drinks and diet soda increase risk of prediabetes and insulin resistance over time, using data from the Framingham Heart Study's Offspring Cohort.

Participants in this Offspring cohort are examined every 3-4 years, with each examination including measurements of prediabetes, homeostasis model assessment of insulin resistance (HOMA-IR), and dietary consumption. Unlike many cohort studies that rely on a single measure of consumption at baseline, Ma and colleagues estimated long-term consumption of sugary drinks and diet soda by using the average intake across multiple examinations. Their definition of sugary drinks was limited to carbonated drinks and fruit drinks, and diet soda was limited to low-calorie carbonated drinks.

People in the highest category of sugary drink consumption (median of 6 servings/week) had a 46 percent greater risk of prediabetes than people in the lowest category (generally non-consumers). Likewise, people who consumed more sugary drinks tended to have greater insulin resistance. Both associations were virtually unchanged after controlling for body mass index. In contrast, there was no statistically significant association between diet soda consumption and either prediabetes risk or insulin resistance. ■

Limitations: Several types of sugary drinks and artificially sweetened drinks were not included in the study. Insulin was measured using different approaches over time, which made it impossible to analyze changes in HOMA-IR. The study population was primarily middle-aged and white, which limits the generalizability of results.

MORTALITY AND DISEASE TRENDS

Mortality in the United States, 2015 [🔗](#)

Xu JQ, Murphy SL, Kochanek KD, Arias E. NCHS data brief, no 267. Hyattsville, MD: National Center for Health Statistics. 2016.

Key Question: Did life expectancy change in the US between 2014 and 2015?

Key Finding: Life expectancy declined from 78.9 to 78.8 years, as death rates from most leading causes of death increased. This was the first time since 1993 that life expectancy decreased in the US.

Implications: Previous gains in life expectancy may be reversed if these trends continue. Investing in disease prevention is crucial, as many leading causes of death are preventable.

A change of 0.1 years doesn't sound like much, but it grabbed headlines this month when a Centers for Disease Control and Prevention report announced that life expectancy in the US decreased from 78.9 to 78.8 years. The decline was statistically significant and alarmed many public health leaders because it was the first time in more than 20 years that life expectancy had declined. The results were released as part of a National Center for Health Statistics report that included overall and disease-specific death rates for the leading causes of death.

Death rates significantly increased for eight of the 10 leading causes of death. This includes several chronic diseases that have been linked to sugary drinks (e.g., heart disease, diabetes,

stroke). Cancer was the only leading cause of death for which the death rate declined from 2014 to 2015.

The increases in overall death rate occurred primarily among non-Hispanic black men (0.9 percent), non-Hispanic white men (1.0 percent), and non-Hispanic white women (1.6 percent). Death rates among Hispanics were unchanged. There are substantial racial/ethnic and sex disparities in death rates, which ranged from 438.3 (per 100,000) among Hispanic women to 1070.1 among non-Hispanic black men.

The last time life expectancy declined for the total population was 1993, during the peak of the HIV/AIDS epidemic. Since then, life expectancy declined for certain age groups in some years, but never for the total population. Many public health leaders cautioned that the 2015 decline was not attributable to specific factors, given that it occurred for many different diseases, but noted that most of the leading causes of death in the US are preventable. ■

Limitations: The study focused only on reporting the overall death rates and life expectancy, not attributing them to specific causes. It did not report differences by income, education, or other socioeconomic measures.

Disparities in the prevalence of diagnosed diabetes - United States, 1999-2002 and 2011-2014. [🔗](#)

Beckles GL, Chou CF. *Morb Mortal Wkly Rep.* 2016;65(45):1265-69.

Key Question: How does the prevalence of diabetes vary by socioeconomic status overall and within racial/ethnic groups?

Key Finding: Between 1999-2002 and 2011-2014, disparities in diabetes prevalence by socioeconomic status worsened over time among Hispanics and whites, but not among blacks.

Implications: Diabetes prevention interventions should examine whether these efforts have differential impact based on socio-economic status and race.

The Centers for Disease Control and Prevention (CDC) previously described how diabetes varies by race and socioeconomic status and the widening of racial and socioeconomic disparities over time, 2004-2010. To add to these data, CDC recently looked at how diabetes risk varies by education and poverty status within racial and ethnic groups. Using data from the National Health Interview Survey (NHIS) for the time periods 1999-2002 and 2011-2014, Beckles and colleagues found that over time, those with less education and income were more likely to have diabetes than higher education and income counterparts and that these differences worsened over time among whites, but not blacks.

NHIS is a representative, cross-sectional household survey that selects one adult from a household to answer a set of questions. The randomly selected adult was asked whether he or she had ever been told by a healthcare professional that he or she had diabetes. Authors looked at how diabetes prevalence among those with varying levels of education and income

varied across the whole population, and then within three racial/ethnic groups - white, black, and Hispanic. Authors were interested to see whether disparities changed between 1999-2002 and 2011-2014.

For the population overall, from 1999-2002 to 2011-2014, disparities widened between those with less than a high school education compared with those college educated or higher, increasing from a 4.7 percentage point difference to a 6.7 percentage points difference, a 42 percent increase in disparity. Similarly, the disparities between those living in poverty versus those with high incomes increased from 4.7 percentage points to 7.1 percentage points, a 49 percent increase in disparity. By race/ethnicity, disparities in diabetes by educational attainment and poverty increased over time among whites (44 percent by education status and 67 percent by poverty status), but not significantly among blacks. Among Hispanics, only diabetes disparities by educational attainment increased significantly over the time period, increasing by 89 percent. ■

Limitations: All data come from self-report and may be subject to recall and social desirability bias. When missing, income data were imputed. The definition of diabetes did not include undiagnosed diabetes, which is a significant proportion of total diabetes cases.

Trends in obesity among participants aged 2-4 years in the special supplemental nutrition program for women, infants, and children - United States, 2000-2014. [🔗](#)

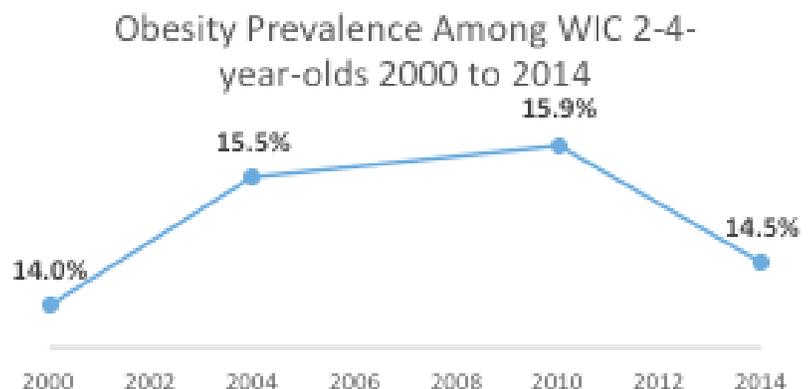
Pan L, Freedman DS, Sharma AJ, et al. *Morb Mortal Wkly Rep.* 2016 Nov 18;65(45):1256-60.

Key Question: What are obesity trends for 2-4-year-old participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) from 2000 to 2014?

Key Finding: 61 percent of WIC agencies in states, the District of Columbia, and US territories experienced modest but statistically significant declines in obesity among 2-4-year-old participants.

Implications: These declines may indicate investment in obesity prevention efforts is paying off, but more investment is needed as young children in WIC are much more likely to have obesity than the average child.

Using data from the WIC Participants and Program Characteristics (WIC PC) census data, Pan and colleagues analyzed obesity trends among low-income young children in the US for the years 2000 to 2014. WIC households have gross income equal to or below 185 percent of the US poverty level. This is the first study



to use WIC PC data to examine obesity among low-income WIC young children. To complete their analysis, authors used a large dataset that included more than 22 million 2-4-year-olds whose height and weight was measured by trained staff. Fifty-six WIC agencies in states, the District of Columbia, and US territories were included.

In 2014, young children in WIC were more likely to have obesity (14.5 percent) than the national average (8.9 percent). Since 2010, obesity has decreased in all racial/ethnic groups (non-Hispanic black, Hispanic, non-Hispanic white, American Indian/Alaska Native, and Asian/Pacific Islander) and in 34 of 56 WIC agencies.

From 2000 to 2010 there was an increase in obesity with a subsequent decrease in 2010 to 2014 (see line graph). All racial/ethnic groups followed this pattern except for Asian/Pacific Islanders whose obesity prevalence decreased in all years. In all years, American Indian/Alaska Native and Hispanic 2-4-year-olds were more likely to have obesity. Kansas experienced the largest increase 2000 to 2004 (11.8 percent to 16.7 percent) and Puerto Rico experienced the largest decrease 2010 to 2014 (20.3 percent to 13.9 percent). From 2010 to 2014, most WIC agencies (61 percent) experienced a significant decline in obesity and seven percent experienced a significant increase. The largest increase occurred in Nebraska, where obesity increased from 14.4 percent to 16.9 percent.

Authors suggest several possible contributors to the decline in obesity, including the 2009 WIC food package revisions that brought the program into alignment with the US Dietary Guidelines for Americans, the American Academy of Pediatrics infant feeding practices guidelines, the Institute of Medicine report on obesity prevention, and local efforts to promote healthy eating and physical activity in early childhood education settings. ■

Limitations: Results may not be generalizable to all young children from low-income families since only half of WIC eligible children were enrolled in the program. Authors did not evaluate any policies or programs, so attributing the decline to anything in particular is just speculation.

Permanent tooth loss and sugar-sweetened beverage intake in US young adults.

Kim S, Park S, Lin M. *J Public Health Dent*. 2016 (in press)

Kim and colleagues analyzed data from the 2012 Behavioral Risk Factor Surveillance System which is a state-based phone survey that monitors health behaviors and outcomes. In 2012, 18 states included an optional set of questions on sugary drink intake (regular soda and fruit-flavored drinks). Authors analyzed self-reported sugary drink intake and tooth loss due to tooth decay or gum disease (n=22,526 young adults aged 18-39 years). Young adults who reported drinking one to two sugary drinks per day had a 58 percent increased chance of losing one to five teeth, compared to those who reported drinking none. Young adults with less frequent sugary drink intake, less than one per day, had a 44 percent increased chance of tooth loss.

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 (@DanTaber47) and Petra Vallila-Buchman.