Taxation of Sugar-Sweetened Beverages and its Impact on Dental Caries: A Narrative Review

Muhanad Alhareky
Department of Preventive Dental Sciences, College of Dentistry, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

INTRODUCTION

Dental caries is one of the largest health concerns worldwide, and it poses an economic burden for the public and governments.\(^{[1,2]}\) Excessive sugar intake is the main causative factor for caries initiation and progression. The optimal pH of oral cavity is 6.7 to 7.2, the threshold for dental caries development is pH 5.5 and dentine erosion occurs at pH 6.0. However, after sugar consumption, the pH in plaque can fall rapidly to <5.0 through production of acids (predominantly lactic acid) by bacterial metabolism. The percentage of tooth material loss in enamel and dentine erosion increases with exposure time and frequency of consumption.\(^{[3]}\)

Sugar sweetened beverages (SSBs), which comprise energy drinks, soda and fruit juices, are primary sources of added sugars. Aggressive marketing, wide availability and affordability of SSBs have led to their increased consumption worldwide.\(^{[4-6]}\) In Saudi Arabia, about 17% and 56% of 7–12-year-old children consume carbonated beverages daily and weekly, respectively.\(^{[7]}\) In Kuwait, a neighboring Gulf Cooperation Council (GCC) country, 72% of children consume soft drinks or sweets at least once a day. This was the highest consumption level among 34 countries that participated in the Health Behaviour in School-aged Children study.\(^{[8]}\) Most SSBs are acidic, with their pH ranging from 2.5 to 3.3,\(^{[9,10]}\) and numerous studies have demonstrated an association between SSB...
consumption and dental caries. In fact, longitudinal studies have also found increased likeness between SSB intake during infancy/early childhood and dental caries later in life. [20,21]

Considering its adverse effects, several interventions have been proposed to reduce SSB consumption, including ban on its sale in schools/colleges, limiting its advertisements, altering the composition and introducing tax against it. [22-23]

In fact, many countries, including most GCC countries, have already introduced some form of taxes on SSBs. [26] The impact of sugar tax on dental caries remains unclear, and thus this review explores the existing evidence in literature to assess this impact.

For this narrative review, MEDLINE/PubMed, the Cochrane Library, Web of Science and Scopus were searched for relevant articles published between January 2011 and October 2020 using the following keywords: “sugar-sweetened beverages”, “added sugar and dental caries”, “sugar tax” and “sugar consumption”.

**Impact of taxation on SSB consumption trends**

A common intervention for reducing SSB consumption is levying tax based on per calorie value/gram of added sugar or per unit sale. Such taxes have usually been implemented as excise or sales tax by various countries worldwide. Several studies across countries have found that levying such taxes has a deterrent effect on SSB consumption trends [Table 1]. [27-40] Therefore, given the association of added sugars with various health issues, including dental caries, reductions in SSB consumption due to taxation is suggestive of having a positive impact on health and in reducing the economic burden of countries.

**Impact of SSB taxation on dental caries**

A total of five simulation-based studies were identified that evaluated the likely impact of SSB taxation on dental caries [Table 2]. Four studies [25,41-43] found that such an intervention would result in reduction in DMFT (decayed, missing or filled teeth) and caries incidence, whereas one study [41] found that implementing SSB tax alone will not achieve the desired oral health outcomes.

In 2016, Schwendicke et al. [41] conducted a model-based study to estimate the effect a 20% SSB sales tax would have on caries and treatment cost in a German population aged 14-79 years over a 10-year period. They found that such measures would prevent 0.75 million caries lesions and save €0.08 billion in treatment costs over the estimated timeframe. The study also found that the benefits (dental caries and cost reduction) would be higher among younger and lower income population than the older and higher income population. The greatest reduction in caries increment (>10%) was observed in males from low- or middle-income backgrounds. Finally, the benefits of taxation were noted across all age groups of males, but surprisingly, in females, both increase in caries and treatment costs were observed. This was attributed to the fact that females had low SSB consumption, but high juice consumption, which contributed to caries and negated the effects of the taxation.

In the United Kingdom, following the Government’s initiative of levying a tax on SSBs from 2016, a study assessed the impact of the possible industry responses on obesity, diabetes and dental caries. The authors modelled three possible responses, namely, reformulation with lower sugar content, increase in the product price or introduction of higher number of mid- to low-sugar drinks, and modelled the best–worst case scenarios for each. [29] Of the six possible scenarios, except the worst case scenario for larger market share of mid- to low-sugar drinks, all other scenarios showed that industry response to SSB taxation would result in reducing dental caries, with best-modeled scenario resulting in 269,375 fewer DMFTs (range: 82,211–470,928; incidence reduction of 4·4 per 1000 person-years). The study also found that those in the 11–18 years age group are likely to have the highest relative benefit, as they have the greatest baseline SSB consumption. A more recent study found that the UK industry response was primarily to reduce the amount of sugar added in SSBs and pass a proportion of the additional costs to consumers, both of which reduces the exposure of sugar for the public. [19] Collectively, this indicates that SSB taxation may be beneficial for health, including in reducing caries.

In a cohort model designed by Sowa et al. [42] to predict the implication of SSB taxes on dental caries and utilization of dental care services in Australian settings, it was shown that 3.9 million units of DMFT can be prevented and €405 million would be saved over a 10-year period. This study and that of Briggs et al. [23] used different tax definitions, and thus the findings cannot be compared. Nonetheless, when compared with the findings of Schwendicke et al., [41] it was shown that in Australia, SSB tax implementation would lead to 0.21 DMFT units/person (treatment cost savings of about €21/person) compared with 0.46 DMFT units/person (treatment cost savings of about €14/person) in Germany.

Using a tooth-level Markov model, Jevdjevic et al. [43] estimated that implementing a 20% sales tax on SSBs in
the Netherlands would lead to 2.13 caries-free tooth years per person, prevent 1.03 million new caries lesions and avoid treatment costs of €159 million. Boys aged 6–12 years would benefit the most in terms of caries-free tooth years per person.

Although the above-mentioned studies found an association between levying SSB tax and reduction in dental caries and the cost of dental care, it should be noted they all were modeling and simulation-based studies. This is attributed to the relatively recent implementation of the tax policy as well as direct studies of dental caries and SSB taxation may not be able to account for the complex nonlinear relationship between the variables. These studies also showed that dental benefits vary based on age and income levels, with the impact being greater among those who are younger and with low-income levels. This is an important factor to consider when planning similar studies, as the information about consumption patterns, population income, price elasticity and data about dental caries status must be available. However, all four studies were conducted in high-income countries, and may have limited generalizability to developing and low-income countries, as both dental caries and SSB

| Jurisdiction                  | Year of tax introduction | Tax increase | Outcome                                                                 | Reference |
|-------------------------------|--------------------------|--------------|-------------------------------------------------------------------------|-----------|
| US state-level analysis       | Varied between states    | Average 4%   | 1 percentage point increase in the softdrink tax rate reduces the amount of calories consumed by soda by nearly 6 calories | Fletcher et al. [27] |
| Cleveland, US                 | 2003                     | 5%           | 2% decline with a standard error of 0.04                               | Colantuoni and Rojas [28] |
| Portland, US                  | 1991                     | 5.5%         | 2% decline with a standard error of 0.04                               | Colantuoni and Rojas [24] |
| Berkeley, US                  | 2015                     | US$ 0.01/oz (0.34/L) | 1-year post-tax, 9.6% decline in SSB sales (ounces/ transaction) in Berkeley stores Consumption of SSBs decreased 21% in Berkeley and 4% increase in comparison cities | Silver et al. [29] |
| Philadelphia, US              | 2017                     | US$ 0.015/oz (0.51/L) | 30-day regular soda consumption frequency was 38% lower Households decreased monthly per capita purchase volumes of (high sugar) SSBs by 3.4% and 4.0% by calories. | Falbe et al. [30] |
| Chile                         | 2014                     | Increased from 13% to 18%, for drinks containing ≥6.25g added sugar per 100ml | 21.6% reduction in high tax soft drink volumes purchased Pre vs both years posttax: decline of 7.3%, 6.3% decrease in sugar drink consumption | Zhong et al. [31] |
| Mexico                        | 2014                     | 1 peso/L     | Purchases of SSBs reduced by 4.7 L per product, a reduction by 15.4% with respect to the mean of SSB purchases before the reform | Nagamura et al. [32] |
| France                        | 2012                     | 0.0716 Euros/L | Taxed drinks consumption decreased by 9 centiliters per week per person | Caro et al. [33] |
| Catalonia, Spain              | 2016                     | 0.12 Euros/L if >8 g sugar/100 mL | 6.3% decrease in sugar drink consumption | Aguilar et al. [34-36] |
| Saudi Arabia                  | 2017                     | Soda 50% and energy drinks 100% | Annual purchases of soda and energy drinks reduced by 41% and 58%, respectively in 2018 as compared to 2016 | Alsukait et al. [40] |

Table 2: Studies on SSB taxes and its effect on caries incidence and/or treatment cost

| Title of the study                                      | Author, Year, Location | Age group | Study type         | Outcome |
|--------------------------------------------------------|-------------------------|-----------|-------------------|---------|
| Effects of Taxing Sugar-Sweetened Beverages on Caries and Treatment Costs | Schwendicke et al. 2016 [41] Germany | 14-79 yrs | Model-based approach | $0.75 million of caries lesions and treatment costs of $0.08 billion Euro over a 10-y period. |
| Health impact assessment of the UK soft drinks industry levy: a comparative risk assessment modelling study | Briggs et al. 2017 [39] United Kingdom | 4-65 yrs | Comparative risk assessment model | Greater benefit for low income, younger males. In the best model scenario, an increase in the price of SSBs would result in 269 375 (82 211-470 928; incidence reduction of 4·4 per 1000 person-years) fewer DMFT annually. The greatest benefit for oral health would be among individuals aged younger than 18 years. |
| The impact of a sugar-sweetened beverages tax on oral health and costs of dental care in Australia The caries-related cost and effects of a tax on sugar-sweetened beverages | Sowa et al. 2019 [42] Australia | Adults | Cohort model | 20% sales tax on SSBs will result in an average of 2.13 caries-free tooth years per person and around 1.03 million caries lesions prevented and avoiding treatment costs of 159 million euro. Greater benefit for males and younger age group. |
| Impact of sugar-sweetened beverage tax on dental caries: A simulation analysis | Urvannahachatima et al. 2020 [43] Thailand | Adults | Qualitative system dynamics model | The greatest benefit for oral health would be among individuals aged younger than 18 years. Tax of 20% would lead to a reduction in DMFT by 3.9 million units, savings of A$666 million over a 10-y period. |

Table 2: Studies on SSB taxations and its effect on caries incidence and/or treatment cost

| Jurisdiction                  | Year of tax introduction | Tax increase | Outcome                                                                 | Reference |
|-------------------------------|--------------------------|--------------|-------------------------------------------------------------------------|-----------|
| US state-level analysis       | Varied between states    | Average 4%   | 1 percentage point increase in the softdrink tax rate reduces the amount of calories consumed by soda by nearly 6 calories | Fletcher et al. [27] |
| Cleveland, US                 | 2003                     | 5%           | 2% decline with a standard error of 0.04                               | Colantuoni and Rojas [28] |
| Portland, US                  | 1991                     | 5.5%         | 2% decline with a standard error of 0.04                               | Colantuoni and Rojas [24] |
| Berkeley, US                  | 2015                     | US$ 0.01/oz (0.34/L) | 1-year post-tax, 9.6% decline in SSB sales (ounces/ transaction) in Berkeley stores Consumption of SSBs decreased 21% in Berkeley and 4% increase in comparison cities | Silver et al. [29] |
| Philadelphia, US              | 2017                     | US$ 0.015/oz (0.51/L) | 30-day regular soda consumption frequency was 38% lower Households decreased monthly per capita purchase volumes of (high sugar) SSBs by 3.4% and 4.0% by calories. | Falbe et al. [30] |
| Chile                         | 2014                     | Increased from 13% to 18%, for drinks containing ≥6.25g added sugar per 100ml | 21.6% reduction in high tax soft drink volumes purchased Pre vs both years posttax: decline of 7.3%, 6.3% decrease in sugar drink consumption | Zhong et al. [31] |
| Mexico                        | 2014                     | 1 peso/L     | Purchases of SSBs reduced by 4.7 L per product, a reduction by 15.4% with respect to the mean of SSB purchases before the reform | Nagamura et al. [32] |
| France                        | 2012                     | 0.0716 Euros/L | Taxed drinks consumption decreased by 9 centiliters per week per person | Caro et al. [33] |
| Catalonia, Spain              | 2016                     | 0.12 Euros/L if >8 g sugar/100 mL | 6.3% decrease in sugar drink consumption | Aguilar et al. [34-36] |
| Saudi Arabia                  | 2017                     | Soda 50% and energy drinks 100% | Annual purchases of soda and energy drinks reduced by 41% and 58%, respectively in 2018 as compared to 2016 | Alsukait et al. [40] |
consumption are sensitive to the disparity in the income of the consumers.

More recently, Urwannachotima et al.\[14\] using the system dynamics modelling, showed that in Thailand, a middle-income country, implementing SSB tax alone would likely not achieve the desired oral health outcomes. The authors suggested that in Asian countries, majority of the sugar consumed is from non-tax sugary food and beverages due to widely practiced street food culture which may contribute to unequal sugar intake. Therefore, they recommend that to maximize the benefits, the SSB tax implementation should be supplemented with oral health education and improved access to oral health services.

For Arabian Gulf countries, which are high-income countries, the introduction of SSB taxation may provide beneficial effects similar to that observed in the four high-income studies. However, given that culture and consumption trends vary across population, there is a need for similar studies in the Arab countries to analyze the effect levying SSB tax has on its consumption and, consequently, on dental caries.

CONCLUSIONS

The impact of SSB on dental caries is well established, and taxation of SSBs has consistently been shown to lower its consumption. In addition, modelling studies from developed and high-income countries have shown that SSB taxation would result in significant reductions in dental caries and its treatment costs; however, these findings were not corroborated in the only study from a developing middle-income country. As different countries have adopted different taxation structures for SSBs and were conducted over different time periods, findings from one country cannot be generalized to another. Therefore, there is a need for each country with such implementation to study the impact of SSB taxation on dental caries and its treatment costs.

Peer review

This article was peer-reviewed by two independent and anonymous reviewers.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Listl S, Galloway J, Mossey PA, Marcenes W. Global Economic Impact of Dental Diseases. J Dent Res. 2015 Oct; 94(10):1355-61.
2. Tahmassabi JF, BaniHani A. Impact of soft drinks to health and economy: A critical review. Eur Arch Paediatr Dent. 2019 Jun 8; doi: 10.1007/s40368-019-00458-0. [Epub ahead of print] PubMed PMID: 31177478.
3. Chowdhury CR, Shahnawaz K, Kumari P D, Chowdhury A, Goovirt M, Lynch E. Highly acidic pH values of carbonated sweet drinks, fruit juices, mineral waters and unregulated fluoride levels in oral care products and drinks in India: A public health concern. Perspect Public Health. 2019;139:186-194.
4. National Health and Nutrition Examination Survey (NHANES). 2011-2012. https://www.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2011.
5. Eicher-Miller HA, Zhao Y. Evidence for the age-specific relationship of food insecurity and key dietary outcomes among US children and adolescents. Nutr Res Rev. 2018;31:98-113.
6. Bailey RL, Fulgoni VL, Cowan AE, Gaine PC. Sources of Added Sugars in Young Children, Adolescents, and Adults with Low and High Intakes of Added Sugars. Nutrients. 2018;10(1). doi:10.3390/nu10010102. PubMed PMID: 29342109; PubMed Central PMCID: PMCP5793330.
7. Alsubaie ASR. Consumption and correlates of sweet foods, carbonated beverages, and energy drinks among primary school children in Saudi Arabia. Saudi Med J. 2017;38:1045-1050.
8. Honkala S, Behbehani JM, Honkala E. Daily consumption of sugary drinks and foods as a behavioural risk for health of adolescents in Kuwait. Oral Health Prev Dent. 2012;10(2):113-22.
9. Carbohydrates and Health. Scientific Advisory Committee on Nutrition. 2015. https://www.gov.uk/government/publications/sacn‑carbohydrates‑and‑health‑report.
10. Chi DL, Scott JM. Added Sugar and Dental Caries in Children: A Scientific Update and Future Steps. Dent Clin North Am. 2019;63:17-33.
11. Moynihan PJ, Kelly SA. Effect on Caries of Restricting Sugars Intake: Systematic Review to Inform WHO Guidelines J Dent Res. 2014;93:8-18.
12. Moynihan P. Sugars and Dental Caries: Evidence for Setting a Recommended Threshold for Intake Adv Nutr. 2016;7:149-56.
13. Pachori A, Kambalimath H, Maran S, Niranjan B, Bhambhani G, Malhotra G. Evaluation of Changes in Salivary pH after Intake of Different Eatables and Beverages in Children at Different Time Intervals. Int J Clin Pediatr Dent. 2018;11:177-182.
14. Ritchie LD, Raman A, Sharma S, Fitch MD, Fleming SE. Dietary intakes of urban, high body mass index, African American children: Family and child dietary attributes predict child intakes. J Nutr Educ Behav. 2011;43:236-43.
15. Wilder JR, Kaste LM, Handler A, Chapple-McGruder T, Rankin KM. The association between sugar-sweetened beverages and dental caries among third-grade students in Georgia. J Public Health Dent. 2016;76:76-84.
16. Evans EW, Hayes C, Palmer CA, Bermudez-OI, Cohen SA, Must A. Dietary intake and severe early childhood caries in low-income, young children. J Acad Nutr Diet. 2013;113:1057-61.
17. Jerkovic K, Binnekade JM, van der Kruk JJ, van der Most JA, Talsma AC, van der Schans CP. Differences in oral health behaviour between children from high and children from low SES schools in The Netherlands. Community Dent Health. 2009;26:110-5.
18. Kolker JL, Yuan Y, Burt BA, Sandretto AM, Sohn W, Lang SW, Isaal AI. Dental caries and dietary patterns in low-income African American children. Pediatr Dent. 2007;29:457-64.
19. Chi DI, Hopkins S, O’Brien D, Manel L, Orr E, Lenaker D. Association between added sugar intake and dental caries in Yupik children using a novel hair biomarker. BMC Oral Health. 2015;15:121.
20. Park S, Lin M, Onufriuk S, Li R. Association of Sugar-Sweetened Beverage Intake during Infancy with Dental Caries in 6-year-olds. Clin Nutr Res. 2015;4:9-17.
21. Lim S, Sohn W, Burt BA, Sandretto AM, Kolker JL, Marshall TA, Isaal MI. Cariogenicity of soft drinks, milk and fruit juice in...
low-income african-american children: A longitudinal study. J Am Dent Assoc. 2008;139:959-67.

22. Dooley D, Moultie NM, Sites E, Crawford PB. Primary care interventions to reduce childhood obesity and sugar-sweetened beverage consumption: Food for thought for oral health professionals. J Public Health Dent. 2017;77 Suppl 1:S104-S127.

23. Lee JY, Giannobile WV. Taxes on Sugar-Sweetened Beverages: A Strategy to Reduce Epidemics of Diabetes, Obesity, and Dental Caries? J Dent Res. 2016;95:1325-1326.

24. World Health Organization. Together Let's Beat NCDs. Taxes on sugary drinks: Why do it? Geneva, Switzerland: World Health Organization; 2017. Available from: https://apps.who.int/iris/handle/10665/260253.

25. Briggs ADM, Metten OT, Kehlbacher A, Tiffen R, Elhussein A, Rayner M, Jebb SA, Blakely T, Scarborough P. Health impact assessment of the UK soft drinks industry levy: A comparative risk assessment modelling study. Lancet Public Health. 2017;2:e15-e22.

26. https://www.obesityevidencehub.org.au/collections/prevention/countries-that-have-implemented-taxes-on-sugar-sweetened-beverages-ssbs.

27. Fletcher JM, Frisvold DE, Tefft N. Non-linear effects of soda taxes on consumption and weight outcomes. Health Econ. 2015;24:566-82.

28. Colantuoni F, Rojas C. The impact of soda sales taxes on consumption: Evidence from scanner data. Contemp Econ Policy. 2015;33:714-734.

29. Silver LD, Ng SW, Ryan-Ibarra S, Taillie LS, Induni M, Miles DR, Poti JM, Popkin BM. 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:e1002283.

30. Falbe J, Thompson HR, Becker CM, Rojas N, McCulloch CE, Madsen KA. Impact of the Berkeley Excise Tax on Sugar-Sweetened Beverage Consumption. Am J Public Health. 2016;106:1865-71.

31. Zhong Y, Aunchinloss AH, Lee BK, Kanter GP. The Short-Term Impacts of the Philadelphia Beverage Tax on Beverage Consumption. Am J Prev Med. 2018;55:26-34.

32. Caro JC, Corvalán C, Reyes M, Silva A, Popkin B, Taillie LS. Chile’s 2014 sugar-sweetened beverage tax and changes in prices and purchases of sugar-sweetened beverages: An observational study in an urban environment. PLoS Med. 2018;15:e1002597.

33. Nakamura R, Mirelman AJ, Cuadrado C, Silva-Ilanes N, Dunstan J, Suhrcke M. Evaluating the 2014 sugar-sweetened beverage tax in Chile: An observational study in urban areas. PLoS Med. 2018;15:e1002596.

34. Colchero MA, Guerrero-López CM, Molina M, Rivera JA. Beverages Sales in Mexico before and after Implementation of a Sugar Sweetened Beverage Tax. PLoS One. 2016;11:e0163463.

35. Colchero MA, Popkin BM, Rivera JA, Ng SW. Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: Observational study. BMJ. 2016;352:h6704.

36. Colchero MA, Molina M, Guerrero-López CM. After Mexico Implemented a Tax, Purchases of Sugar-Sweetened Beverages Decreased and Water Increased: Difference by Place of Residence, Household Composition, and Income Level. J Nutr. 2017;147:1552-1557.

37. Aguilar A, Gutierrez E, Seira E. The effectiveness of sin food taxes: Evidence from Mexico. The Latin American and Caribbean Economic Association (LACEA); 2017. http://www.rociniaseira.com/uploads/3/1/5/9/31599787/obesidad_24jul17_esb.pdf.

38. Capacci S, Allais O, Bonnet C, Mazzocchi M. The impact of the French soda tax on prices, purchases and tastes: An ex post evaluation. Toulouse: University of Bologna; 2018. https://www.tse-fr.eu/sites/default/files/TSE/documents/sem2017/food/mazzochi.pdf.

39. Vall Castello J, Lopez-Casasnovas G. Impact of SSB taxes on consumption. Barcelona: Universitat Pompeu Fabra; April 2018. Available from: https://www.upf.edu/documents/3223410/7582912/CRESWP201804110.pdf/e888e03c-06c2-7c2b-415f-acca4b6a9e7.

40. Asuksait R, Wilde P, Bleich S, Singh G, Folta S. Impact of Saudi Arabia’s Sugary Drink Tax on Prices and Purchases (P10-066-19). Curr Dev Nutr. 2019 Jun; 3(Suppl 1). doi: 10.1093/cdn/nxz034. P10-066-19.eCollection 2019 Jun. PubMed PMID: 31224356; PubMed Central PMCID: PMC6574539.

41. Schwendicke F, Thomson WM, Broadbent JM, Slopke M. Effects of Taxing Sugar-Sweetened Beverages on Caries and Treatment Costs. J Dent Res. 2016;95:1327-1332.

42. Sowa PM, Keller E, Stormon N, Laloo R, Ford PJ. The impact of a sugar-sweetened beverage tax on oral health and costs of dental care in Australia. Eur J Public Health. 2019;29:173-177.

43. Jevdjevic M, Trescher AL, Rovers M, Listl S. The caries-related cost and effects of a tax on sugar-sweetened beverages. Public Health. 2019;169:125-132.

44. Urwannachotima N, Hanvoravongchai P, Ansah JP, Prasertsom P, Ying Koh VR. Impact of sugar-sweetened beverage tax on dental caries: A simulation analysis. BMC Oral Health 20, 76 (2020). https://doi.org/10.1186/s12903-020-1061-5.

45. Scarborough P, Adhikari V, Harrington RA, Elhussein A, Briggs A, Rayner M, Adams J, Cummings S, Penney T, White M. Impact of the announcement and implementation of the UK Soft Drinks Industry Levy on sugar content, price, product size and number of available soft drinks in the UK, 2015-19: A controlled interrupted time series analysis. PLoS Med. 2020;17:e1003025.