

Econometric and comparative risk assessment scenario modelling of the proposed UK sugary drink tax on health

Adam D M Briggs, Oliver T Mytton, Ahmed Elhussein, Peter Scarborough

British Heart Foundation Centre on Population Approaches for Non-Communicable Disease Prevention, Nuffield Department of Population Health (A D M Briggs MFPH, P Scarborough DPhil), and Oxford University Medical School, Medical Sciences Division (A Elhussein BA), University of Oxford, Oxford, UK; and UKCRC Centre for Diet and Activity Research, Department of MRC Epidemiology, University of Cambridge School of Clinical Medicine, Cambridge, UK (O T Mytton MPH)

Correspondence to:

Dr Adam D M Briggs, British Heart Foundation Centre on Population Approaches for Non-Communicable Disease Prevention, Nuffield Department of Population Health, University of Oxford, Oxford OX3 7LF, UK

adam.briggs@dph.ox.ac.uk

Abstract

Background In March, 2016, the UK Chancellor of the Exchequer announced a two-tier industry levy on sugar-sweetened beverages (SSBs). Both the response from soft drink companies and the details of the legislation are uncertain. For example, companies might react by reformulating products, passing on the price change to consumers, or introducing new products and changing marketing strategy. We aimed to estimate the effect of possible industry responses on incidence of diabetes, obesity, and dental caries to inform design and implementation of the legislation.

Methods We modelled the effects of an SSB price change, product reformulation, and a change in market share between high-sugar, mid-sugar, and low-sugar drinks. Routine data were identified on SSB consumption, expenditure, and waste, population height and weight, diabetes incidence, and dental caries. UK-specific own and cross-price elasticity data were estimated to model the effect of the tax on SSB purchases. A comparative risk assessment model was developed using published estimates of the association between SSB consumption and disease in adults and children.

Findings An SSB price change resulting from the tax could result in 82 000 (95% CI 4 000 to 183 000) fewer obese adults and children, 11 000 (4000 to 19 000) fewer cases of diabetes per year, and 149 000 (45 000 to 262 000) fewer decayed, missing, or filled teeth annually. Reformulation could result in 144 000 (5, 000 to 307 000) fewer obese individuals, a fall in 19 000 (7 000 to 33 000) cases of diabetes, and 269 000 (82 000 to 471 000) fewer decayed, missing, or filled teeth. Change in market share between SSBs and diet soft drinks could lead to a 122 000 (5 000 to 276 000) fall in the obese population, 16 000 (6000 to 29 000) fewer cases of diabetes, and 224 000 (65 000 to 412 000) fewer decayed, missing, or filled teeth. The greatest benefit for obesity and oral health would be among individuals under 18 years old, with people over 65 years old experiencing the largest decreases in incidence of diabetes.

Interpretation How the soft drink industry implements the SSB levy could have substantial impacts on the health benefits of the policy. These data could be used to help inform the Government's consultation and maximise health impact.

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Contributors

ADMB, PS, and OTM conceived the project. ADMB, OM, AE, and PS identified data and did the modelling. ADMB wrote the initial draft of the abstract. All authors reviewed and contributed to the final draft of the abstract.

Declaration of interests

ADMB and OTM are members of the UK Faculty of Public Health. OTM is a member of the UK Health Forum. Each of these organisations has a position statement supporting taxes on SSBs. Neither of these organisations had any role in the writing of this abstract. All other authors declare no competing interests.