MRC Epidemiology Unit

UNIVERSITY OF CAMBRIDGE

Evidence based nutrition policy: lessons from the UK Soft Drinks Industry Levy

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Outline

1. The Soft Drinks Industry Levy (SDIL)
2. Our evaluation – theory, practice and key findings
3. Evidence synthesis
4. Policy impacts and next steps

The UK Soft Drinks Industry Levy

- National policy designed by HM Treasury
- Explicitly aimed to encourage reformulation
- A tiered levy* on large** manufacturers and importers of identified soft drinks***
- Announced 16th March 2016, Implemented 1st April 2018 (to allow time for reformulation)
- Promise that revenue raised from levy would fund children's health initiatives (e.g. school sports and healthy school breakfast clubs)

Sugar (g/100ml)	Levy (£/litre)
>8	£0.24
5-8	£0.18
<5	£0.00 (no levy)

* Not index linked

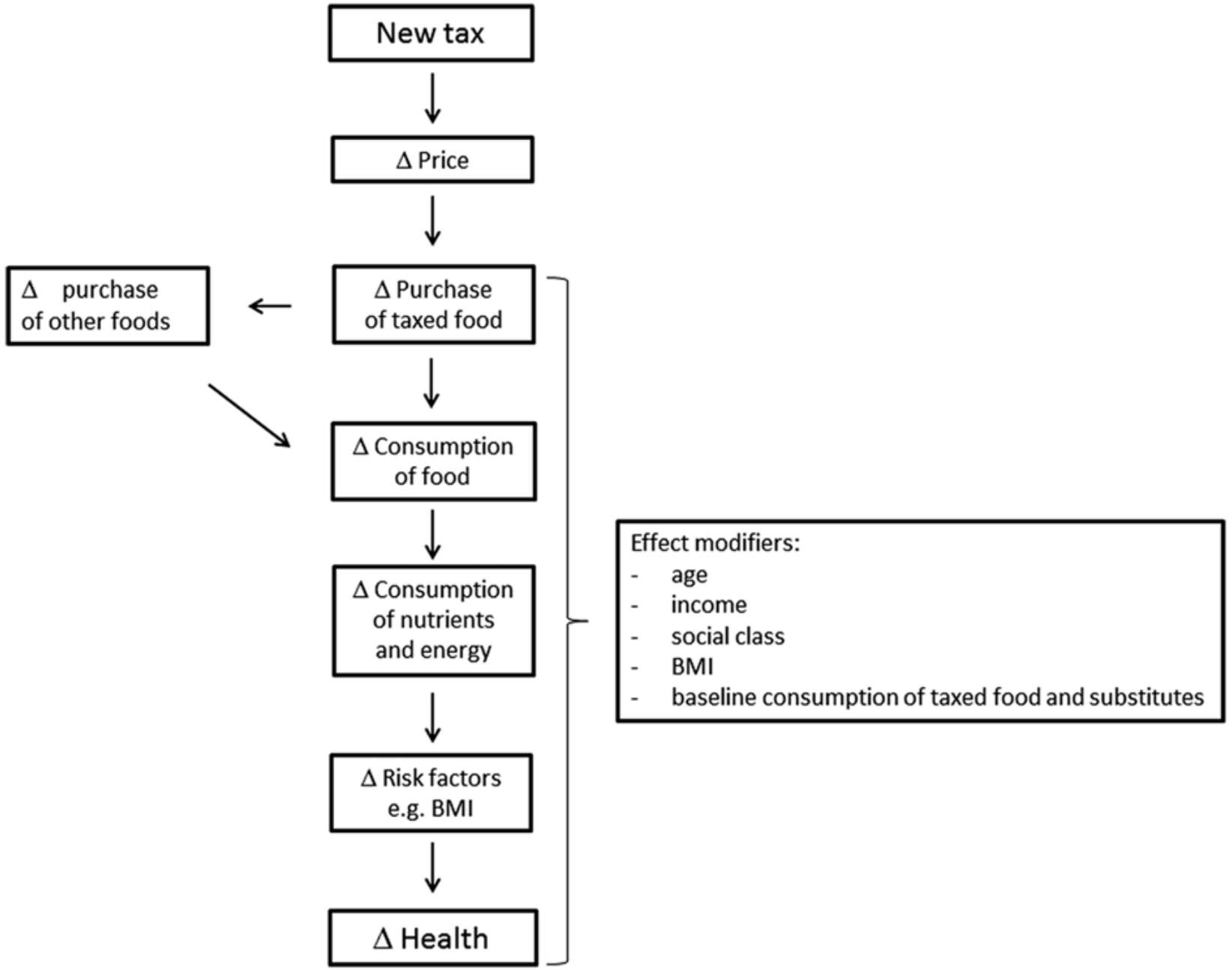
Exemptions

** <1 million liters per year

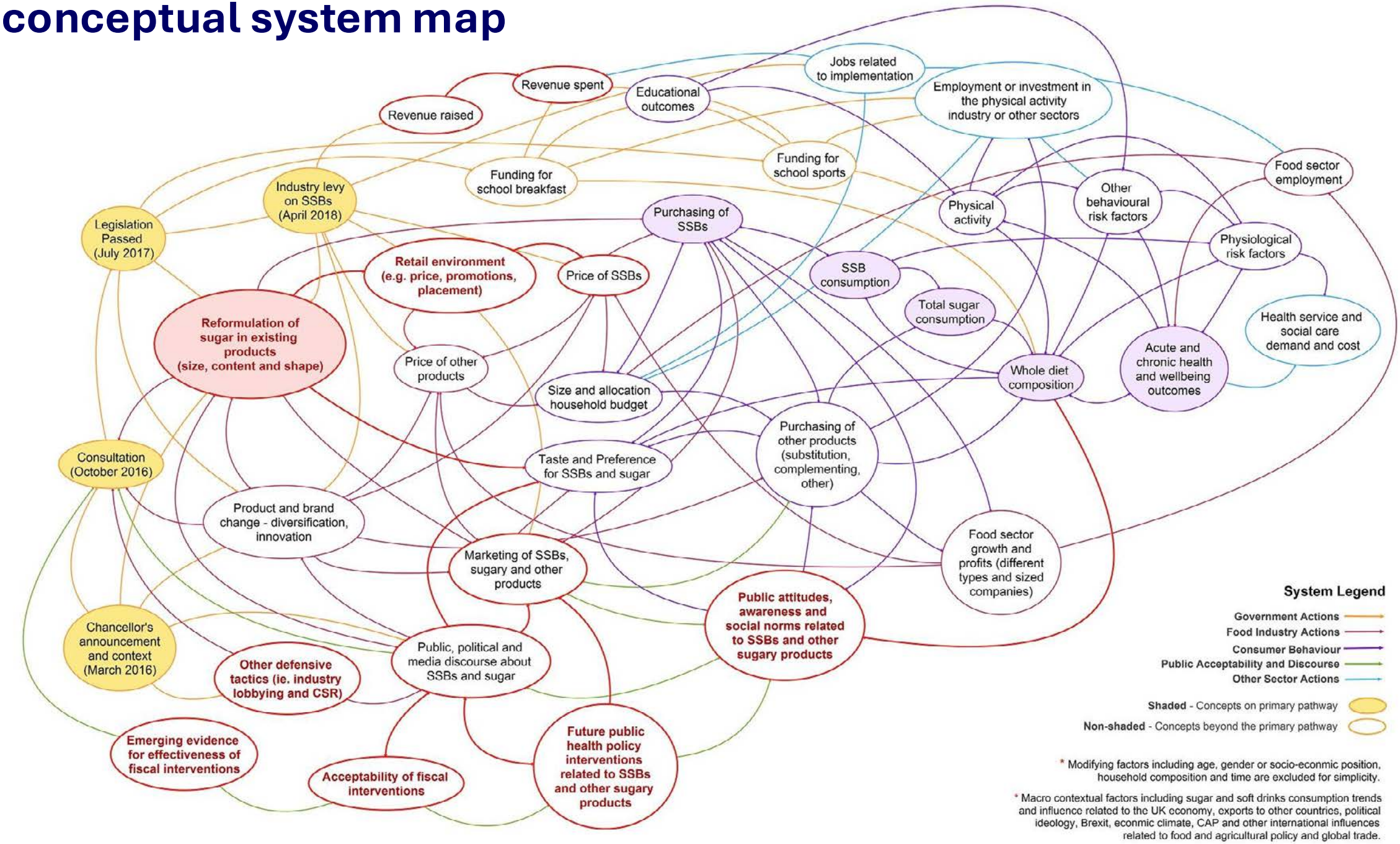
*** <5g/100ml of added sugar, milk based drinks, pure fruit juices, alcohol

Prior theorisation of food/drink tax mechanisms of action

Mytton et al. Evaluating the Health Impacts of Food and Beverage Taxes. Curr Obes Rep, 2014; 3: 432-439



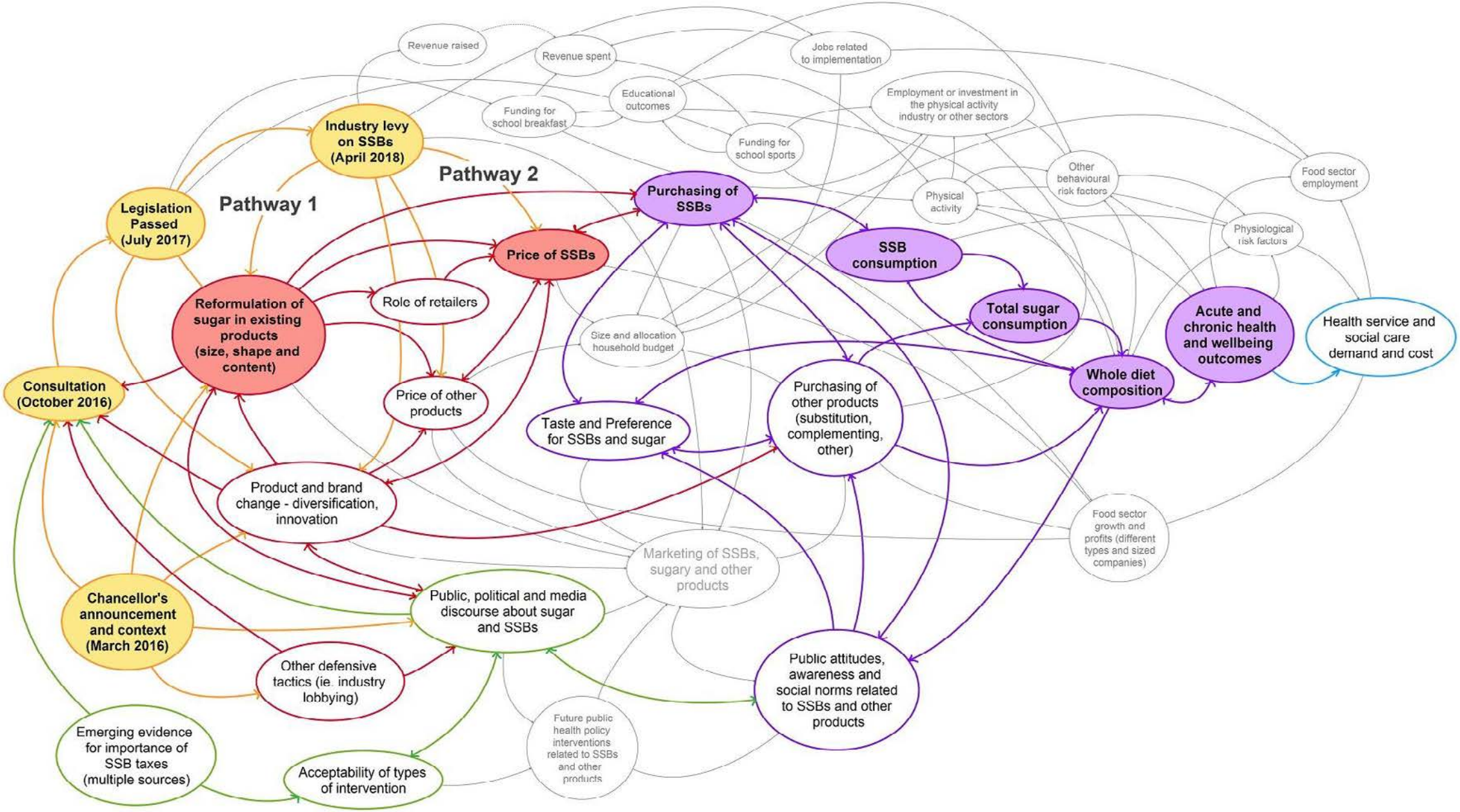
SDIL conceptual system map



Priority data sources identified from the system map

	System map factor with measurement available	Data type	Data source	Work Package	Cost for access	Cost for collection
Industry Actions	Reformulation of sugar in existing products *and* role of retailers	Commercial sales data	Kantar WorldPanel	WP1	Yes	No
	Product and brand change - diversification, innovation	Supermarket inventory data	Online supermarket websites	WP1	No	Yes
	Price of other products	Supermarket inventory data	Online supermarket websites	WP1	No	Yes
	Price of SSBs	Supermarket inventory data	Online supermarket websites	WP1	No	Yes
	Other defensive tactics (i.e. industry lobbying)	Industry communications and interviews	Industry online publications and stakeholders	WP4	No	No
Consumer Behaviour	Purchasing of SSBs	Commercial sales data	Kantar WorldPanel	WP1	Yes	No
	Purchasing of other products (substitution, complementing, other)	Commercial sales data	Kantar WorldPanel	WP1	Yes	No
	Taste and preference *and* public attitudes for SSBs and sugar	Commercial sales data	Kantar WorldPanel	WP1	Yes	No
	SSB consumption	National Survey	National Diet and Nutrition Survey	WP1	No	No
	Total sugar consumption	National Survey	National Diet and Nutrition Survey	WP1	No	No
	Whole diet composition	National Survey	National Diet and Nutrition Survey	WP1	No	No
	Acute and chronic health and wellbeing outcomes	Administrative data, national study and PRIMEtime model estimates	Hospital Episode Statistics (dental caries); National Child Measurement Programme (childhood adiposity); Office for National Statistics and the General Register Offices for Scotland and Northern Ireland and Hospital Episode Statistics (model)	WP1 & WP2	No	No
Public Acceptability and Discourse	Media, political and public discourse on SSBs and sugar	News media coverage, social media, documentation and online sources	LexisNexis, Twitter, Parliamentary records and documents and online media	WP4	No	No
	Acceptability of types of intervention	Focus groups	General public including parents, children and young adults	WP4	No	Yes
	Emerging evidence for importance of SSB taxes	Interviews	Professional stakeholders	WP4	No	Yes
Government Actions	Chancellor's announcement	Documentation	UK Treasury	WP1-5	No	No
	Consultation	Documentation	UK Treasury	WP1-5	No	No
	Legislation passed	Documentation	UK Treasury	WP1-5	No	No
	Industry levy	Documentation	UK Treasury	WP1-5	No	No
Other Sectoral Actions	Health service and social care demand and cost	Micro (PRIMEtime) and Macro (Computable general Equilibrium) model estimates	Office for National Statistics and the General Register Offices for Scotland and Northern Ireland and Hospital Episode Statistics (micro), Global Trade Analysis Project and UK Treasury (macro)	WP3	No	No

SDIL system map – available data



SDIL evaluation design

A mixed methods, natural experimental evaluation with a whole system focus in six work packages over three two-year time periods (2014-20)

1. Theorising the intervention as events in a complex adaptive system
2. Controlled interrupted time series analyses to evaluate impacts of the SDIL on:
   - Soft drink product formulation, volumes and prices, product diversification, purchases, and consumption
   - Prevalence of childhood obesity and hospital admissions for severe dental caries
3. Modelling chronic disease outcomes over short (5 years), medium (5-10 years) and long term (>10 years)
4. Economic evaluation to assess impacts of SDIL on individuals, households, Treasury, industry, the NHS and the UK economy
5. Qualitative research to determine the perceived acceptability and impacts of the SDIL - interviews with professionals and the public, thematic content analysis of news media, governmental discourse
6. Updating of systems map, evaluation of system change, synthesis of findings and casual inference from WPs1-5, refinement of intervention theory

Prior to announcement **Apr 2014- Mar 2016**	Announcement to implementation **Apr 2016- Apr 2018**	Following implementation **Apr 2018- Mar 2020**

SDIL evaluation: key findings

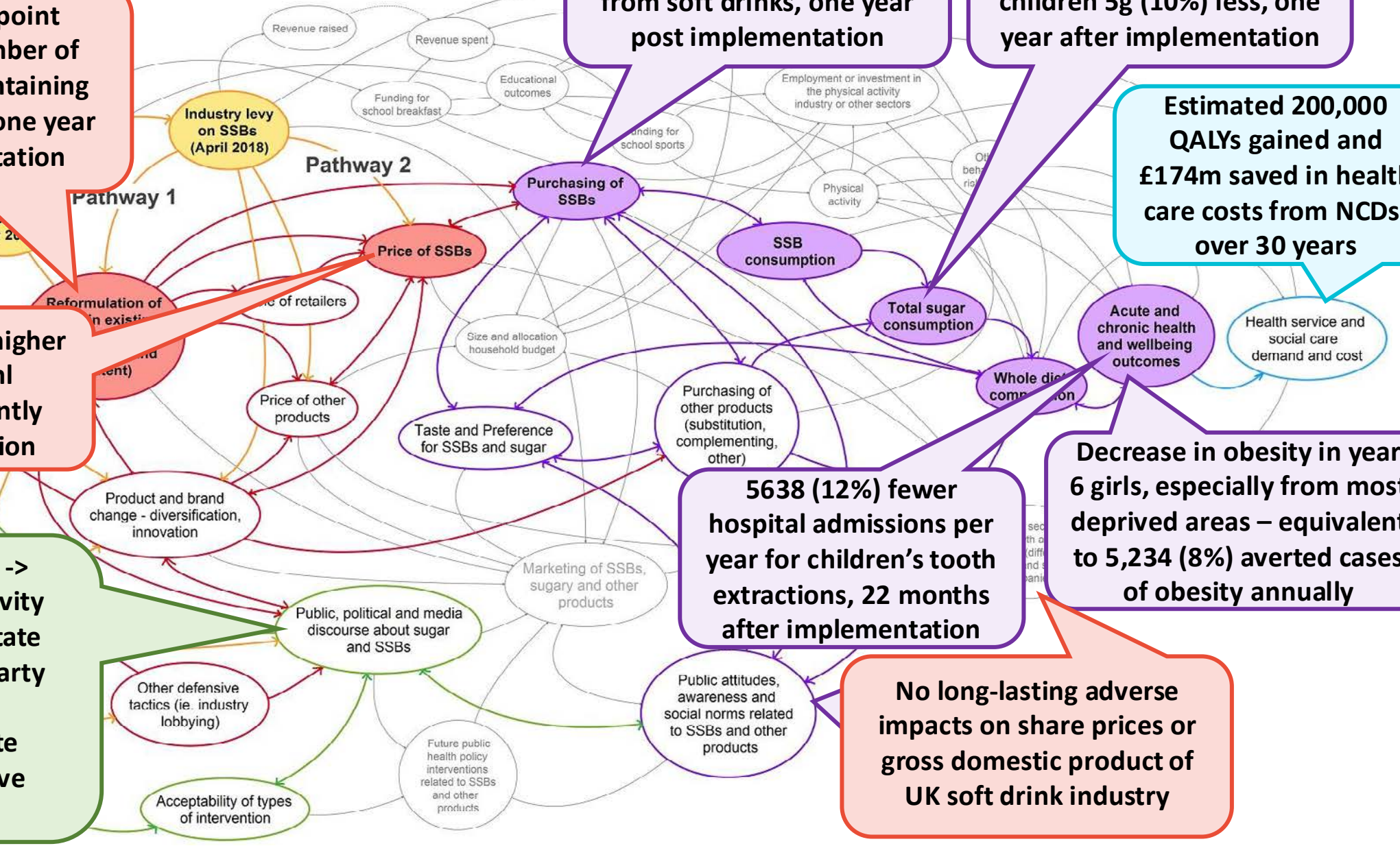
34 percentage point reduction in number of eligible drinks containing >5g sugar/100ml one year post implementation

8g (3%) per household per week reduction in sugar from soft drinks, one year post implementation

Adults consumed 11g (20%) less sugar per day and children 5g (10%) less, one year after implementation

Estimated 200,000 QALYs gained and £174m saved in health care costs from NCDs, over 30 years

Prices of lower and higher tier drinks per ml increased significantly post implementation



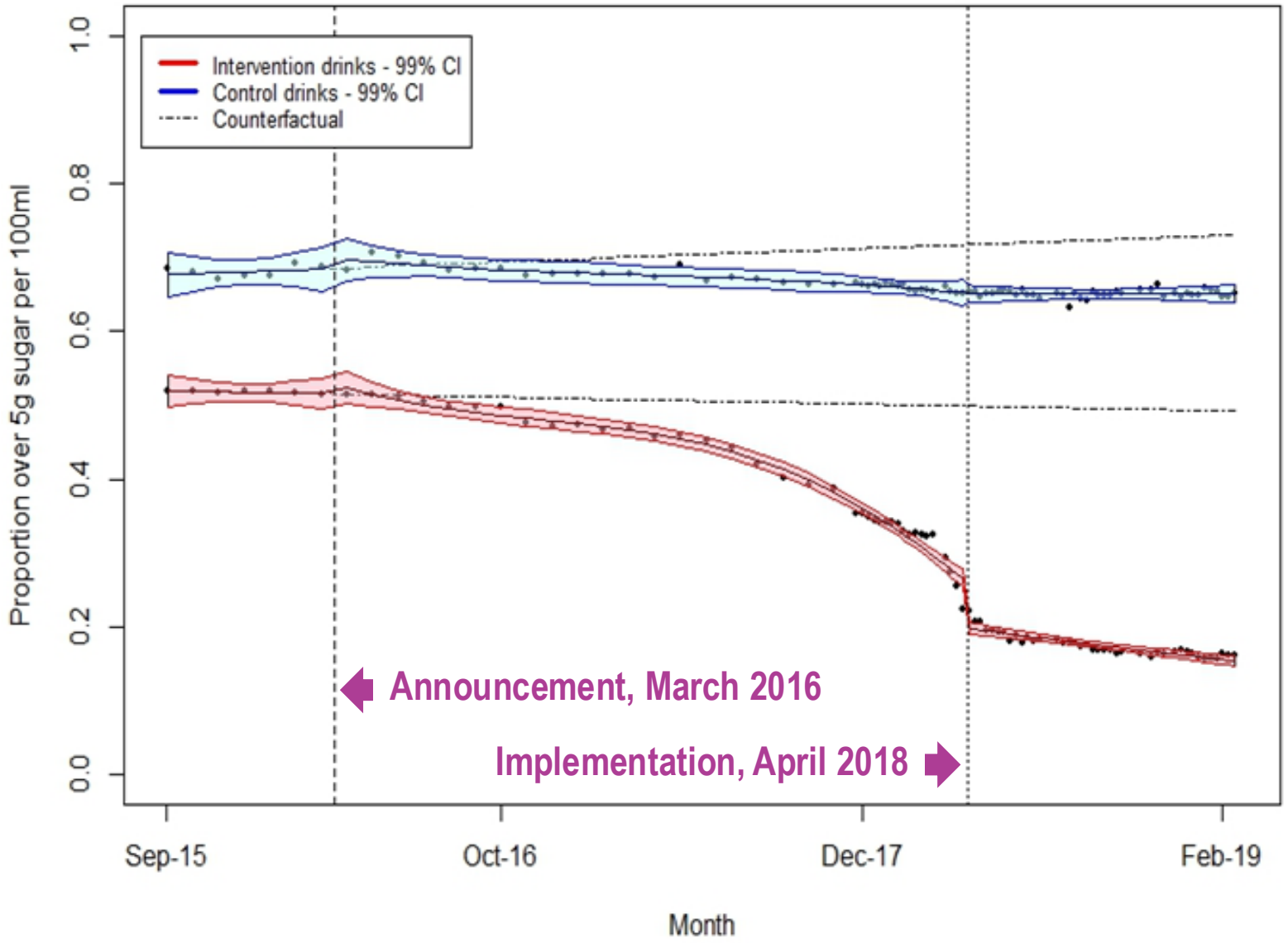
5638 (12%) fewer hospital admissions per year for children's tooth extractions, 22 months after implementation

Decrease in obesity in year 6 girls, especially from most deprived areas – equivalent to 5,234 (8%) averted cases of obesity annually

Industry: rejection -> acceptance -> positivity
Politicians: nanny state discourse -> cross-party support
Media: nanny state discourse -> positive impacts

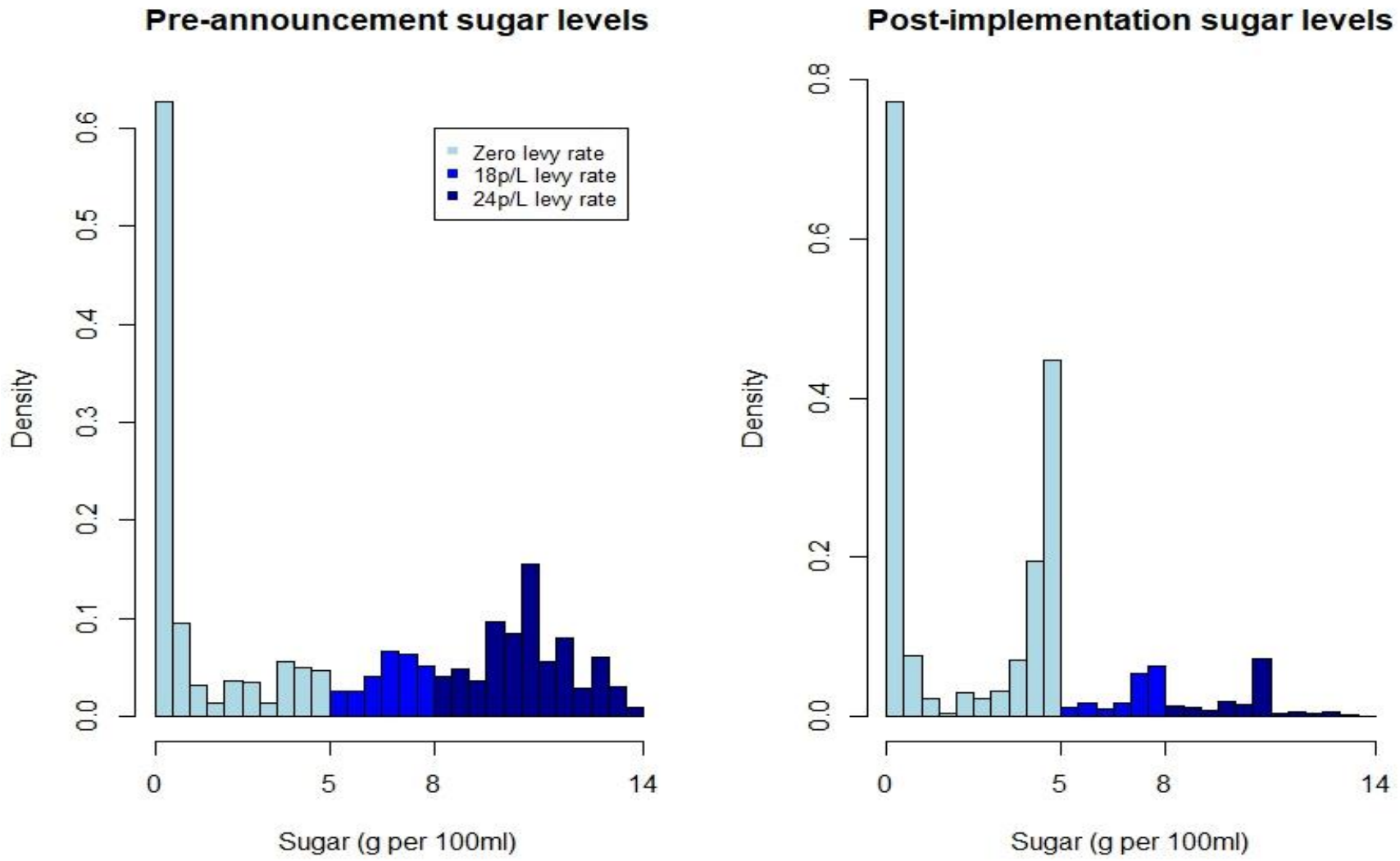
No long-lasting adverse impacts on share prices or gross domestic product of UK soft drink industry

Proportion of soft drinks over the lower levy threshold



Scarborough et al, *Plos Med, 2020* https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003025

Sugar levels in drinks before announcement and after implementation



Scarborough et al, *Plos Med*, 2020 https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003025

Varied industry reactions

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Time to stockpile Irn-Bru? How the sugar tax will change our favourite drinks

A tax on sugary soft drinks comes into effect on Friday. The industry has found ingenious ways to get the levels down – from 'restructured sugar' to artificial sweeteners. But will it make their products any healthier?

Regular IRN-BRU is reducing its sugar content

12 Oct 2017

From January 2018 IRN-BRU will contain approximately 50% less sugar.

The sugar content per 100ml will reduce from 10.3g to 4.7g.

For a time old and new products may be on shelf together so remember to check the label.

NUTRITIONAL INFORMATION - TYPICAL VALUES PER 100ml	
ENERGY	85 kJ/20 kcal
CARBOHYDRATES	4.8g
of which sugars	4.7g

Regular IRN-BRU will remain a sugary drink but will now be blended with a mix of low calorie sweeteners including aspartame, a source of phenylalanine.

People with diabetes should be aware of the carbohydrate content change and should seek medical advice.

Other medical questions should be raised with a health professional.

For production information please visit : www.agbarr.co.uk/our-brands/irn-bru/ or contact consumercare@agbarr.co.uk

Coca-Cola to sell smaller bottles at higher prices in response to sugar tax

Soft drink manufacturer refuses to alter recipe, as rivals face backlash over reduced sugar Irn-Bru in Scotland

▲ The plans will see a 1.75 litre bottle of Coke shrink to 1.5 litres and increase in price by 20p Peter Kovalev/TASS

Coca-Cola is to use smaller bottles and sell at higher prices rather famous sugar-laden secret recipe, while Irn-Bru faces a growing c backlash over fears a new lower sugar version will ruin Scotland's drink.

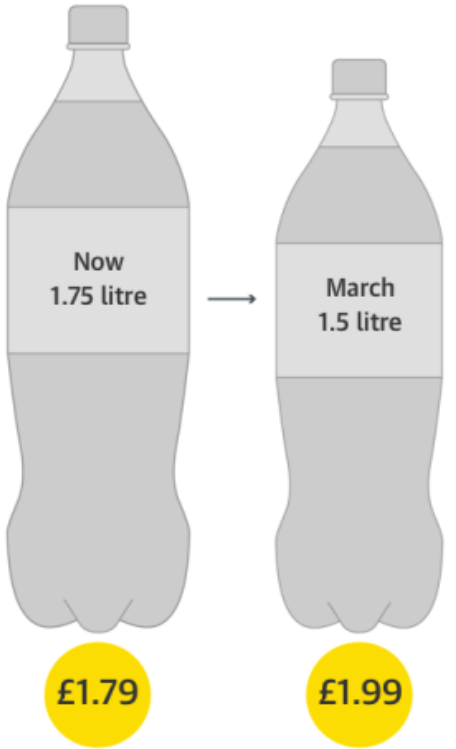
The changes are part of the preparations underway in the fizzy dri the sugar tax. The cost of some "price marked packs" of Coca-Col newsagents and convenience stores will increase by more than 10 before the new tax comes into effect the following month.

The plans will see a 1.75 litre bottle of Coke shrink to 1.5 litres an time increase in price by 20p to £1.99. The price of a 500ml bottle

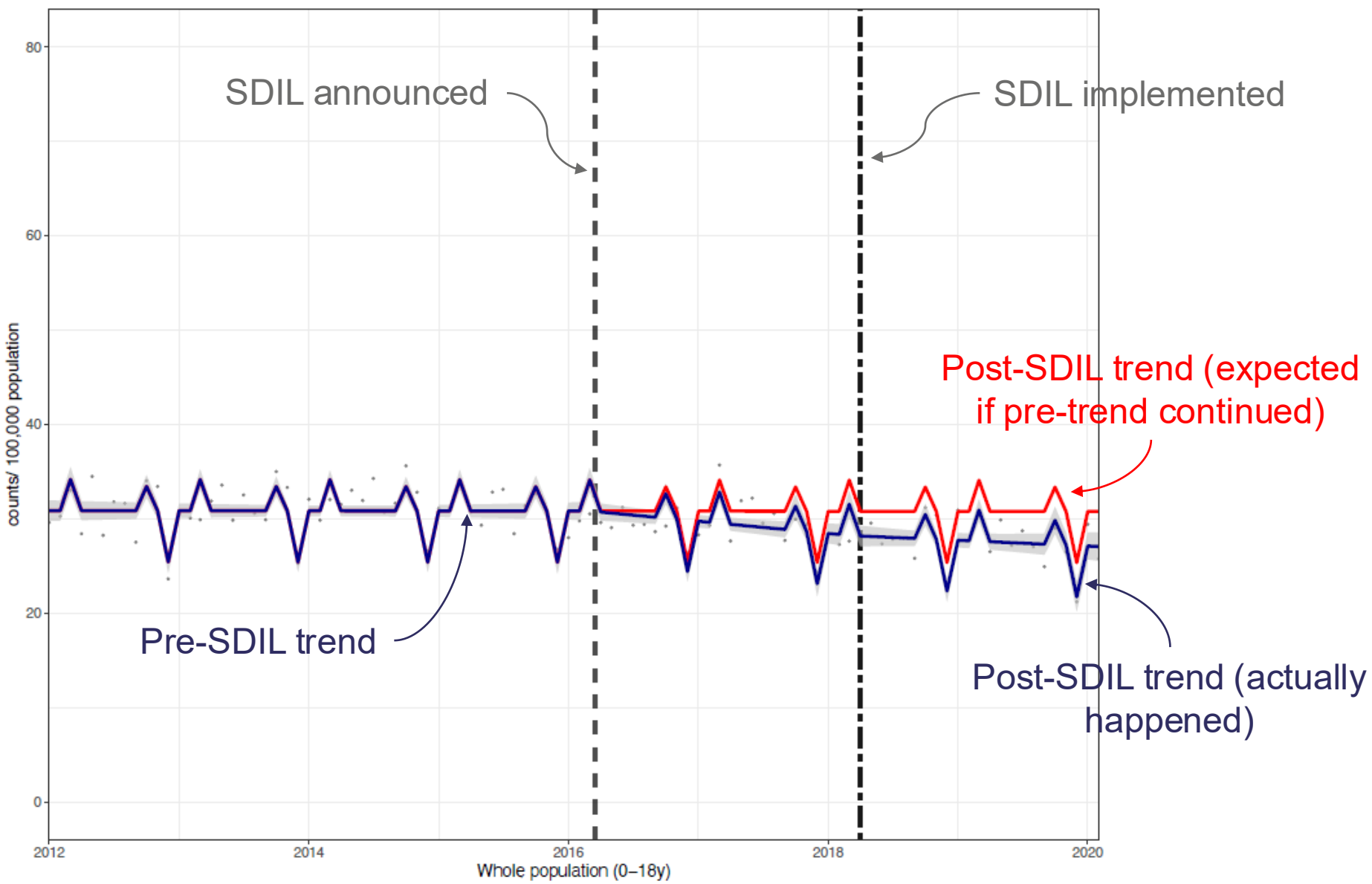
£1.02/ml
⇨£1.33/ml

Bottle sizes

Coca-Cola is shrinking its bottles from 1.75l to 1.5l



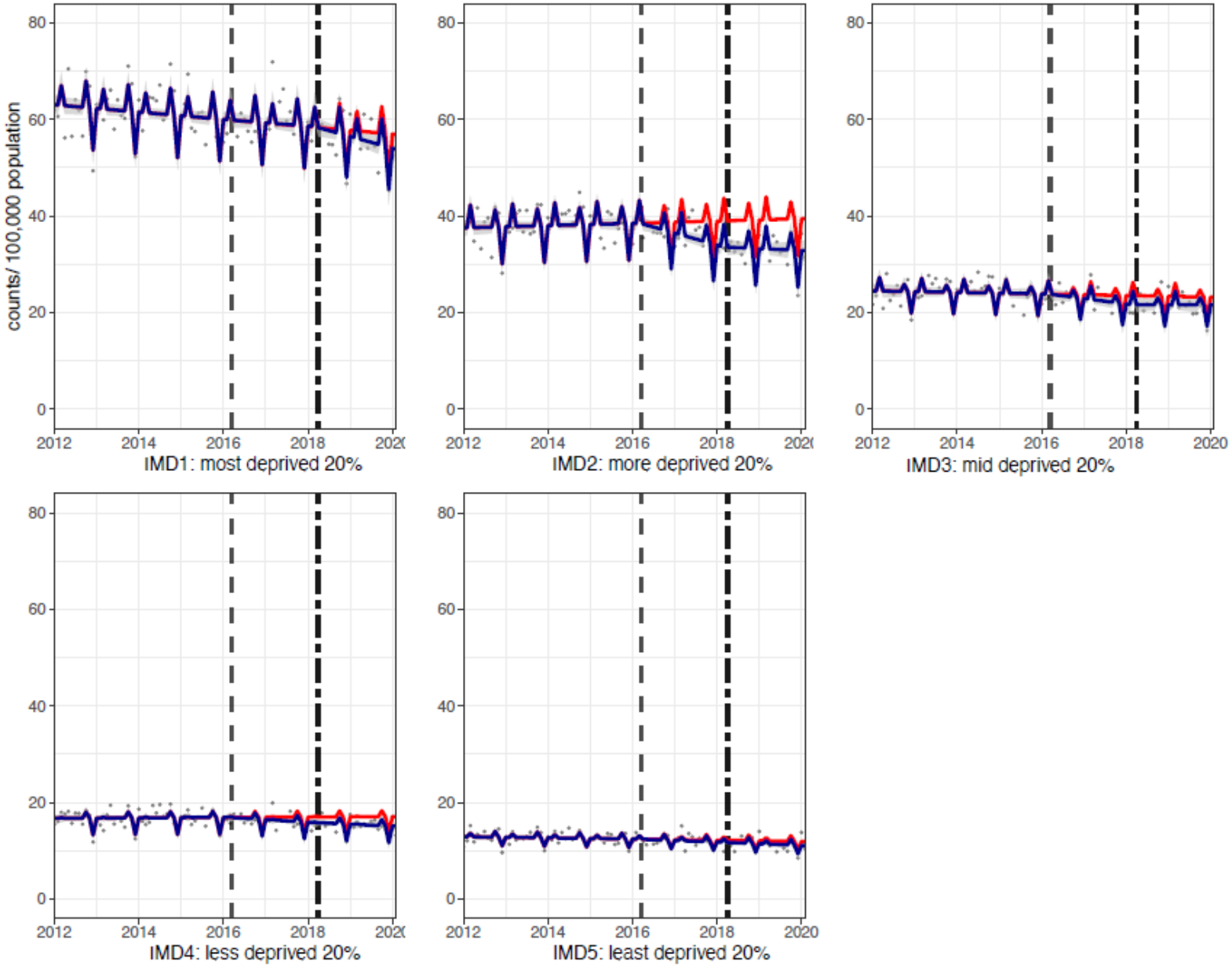
Childhood hospital admissions for carious tooth extractions



All children 0-18y

- absolute reduction of 3·7 admissions (95% CI: 5·2 to 2·2) / 100,000 population/month
- relative reduction of 12·1% (95% CI: 17·0%, 7·2%)

Rogers NT, *et al. BMJ Nutrition, Prevention & Health* 2023;**6:**doi: 10.1136/bmjnph-2023-000714



Childhood hospital admissions for carious tooth extractions

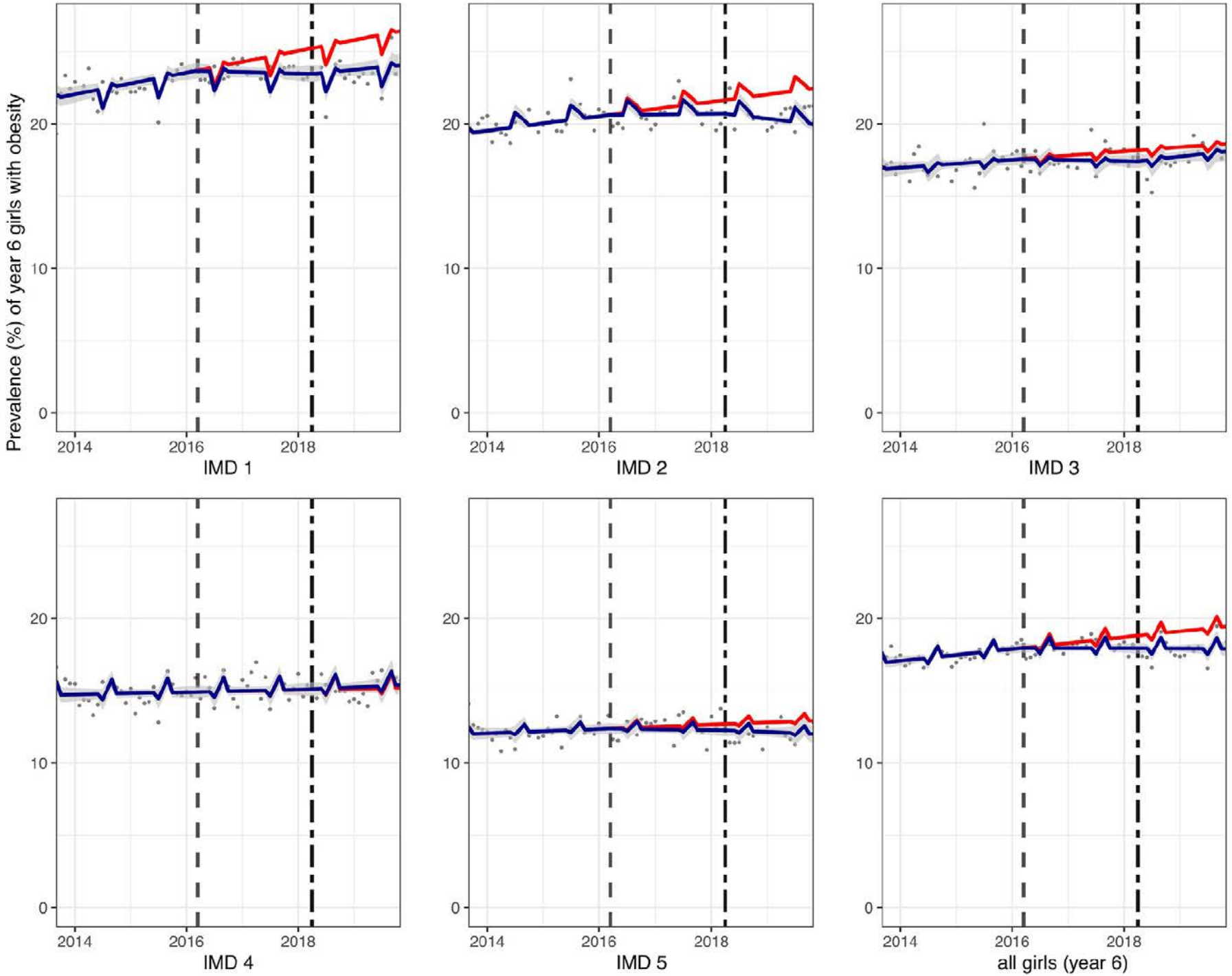
By deprivation group

IMD group	Relative reduction (95%CI)
1 (most)	**-5·4 (-10·0, -0·75)**
2	**-16·8 (-22·4, -11·3)**
3	-6·8 (-15·6, 2·1)
4	**-11·7 (-17·2, -6·2)**
5 (least)	**-7·2 (-12·5, -1·9)**

Rogers NT, *et al. BMJ Nutrition, Prevention & Health* 2023;**6:**doi: 10.1136/bmjnph-2023-000714

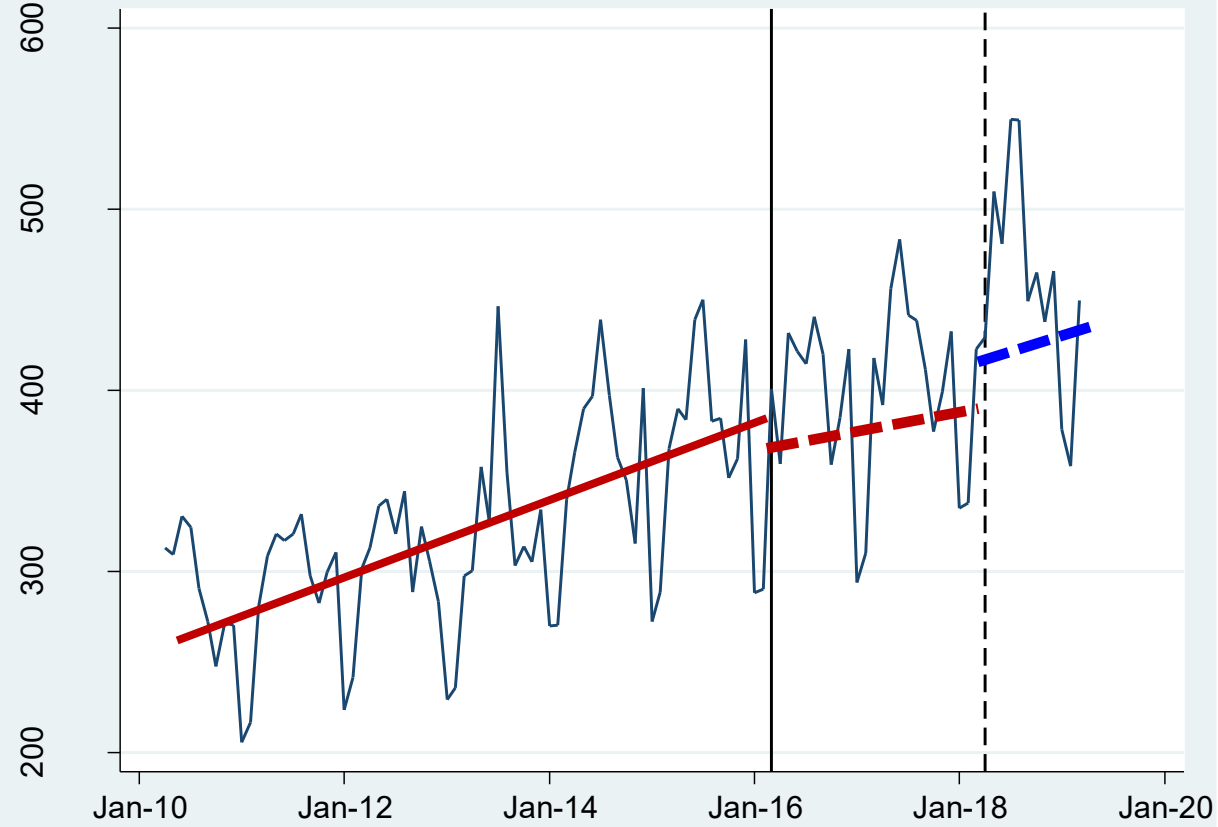
Impact of SDIL on childhood obesity: ITS of NCMP data by IMD quintile – year 6 girls (10-11 years)

Rogers NT, et al. (2023) PLoS Med 20(1): e1004160. https://doi.org/10.1371/journal.pmed.1004160



Impact of SDIL on UK manufacture of soft drinks

UK soft drinks manufacturers' domestic turnover (CPI adjusted)



Solid and dashed vertical lines indicate the SDIL announcement in March 2016 and the implementation in April 2018 respectively.

ITS results:
Statistically significantly impact on both the level (-5.6%) and trend (-0.5%) of turnover in the two-year period between the SDIL announcement and implementation (2016-18)

Reversion of trend after implementation

Industry largely mitigated effects of the SDIL before implementation

Law et al, *Economics & Human Biology, 2020* (https://www.sciencedirect.com/science/article/pii/S1570677X19302606)

Modelled impacts of SDIL on NCDs, QALYs and inequalities in children and adolescents

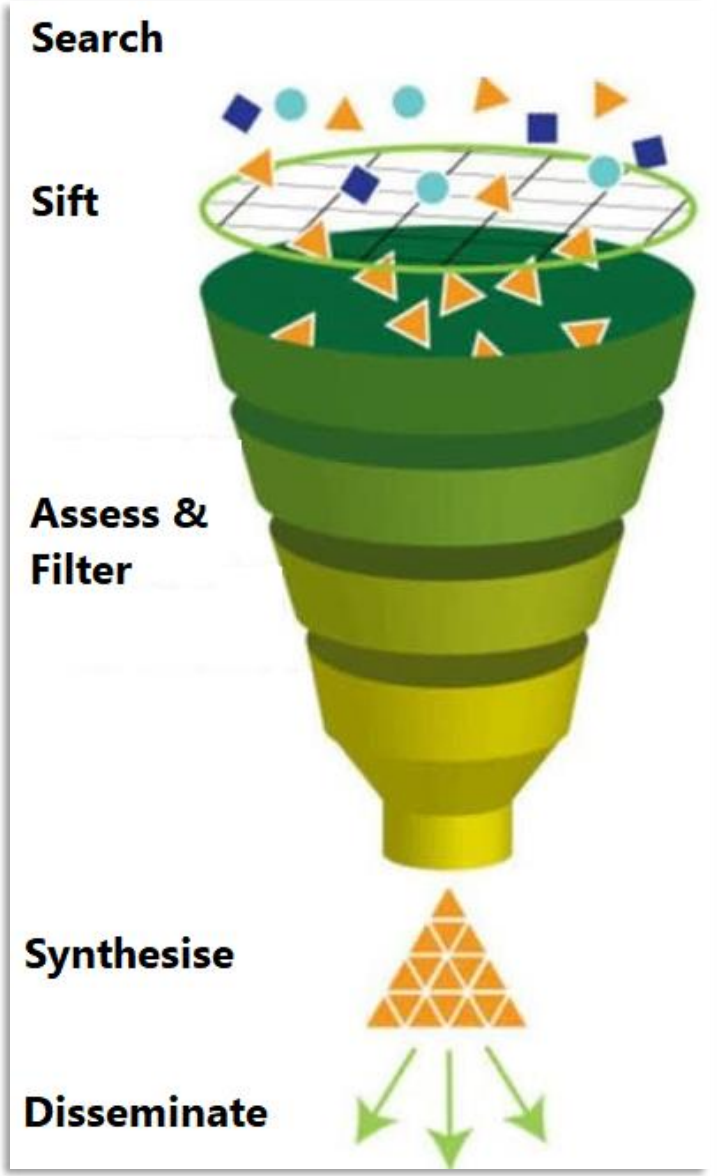
Using the PRIMETIME lifetable model, reductions in sugar in purchased drinks are estimated to lead to:

- 3,600 (95% uncertainty interval: 946 to 6,330) fewer cases of dental caries (DMFT) in children and adults, in the first 10 years after implementation
- 64,100 (54,400 to 73,400) fewer children and adolescents classified as overweight or obese, in the first 10 years after implementation.
- Reduced prevalence of overweight and obesity in the UK by 0.18 percentage points (0.059 to 0.31) for males and 0.20 percentage points (0.064 to 0.34) for females
- Impacts largest for children and adolescents in the most deprived areas (Q1: 11,000 QALYs [8,370 to 14,100], compared with least deprived areas (Q5: 1,860 QALYs [929 to 2,890]).
- If the simulated effects sustained over life course, it is predicted there will be a small but significant reduction in slope index of inequality: 0.76% (−0.9 to −0.62) for females and 0.94% (−1.1 to −0.76) for males.

Cobiac LJ, et al. (2024) PLoS Med 21(3): e1004371. https://doi.org/10.1371/journal.pmed.1004371

Evidence synthesis – methods

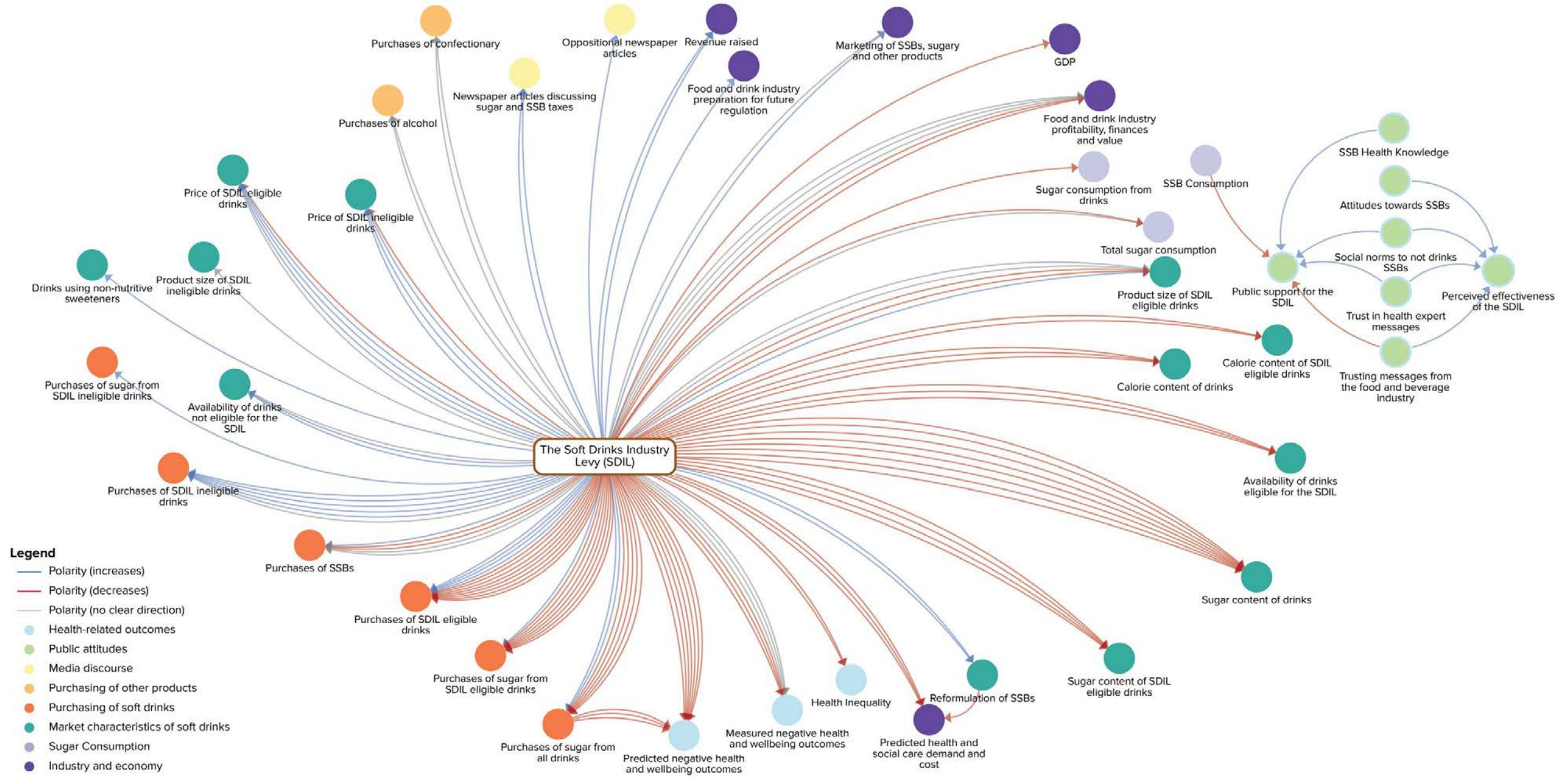
- Systematic review of all empirical studies of the SDIL
- Informed by our conceptual systems map of the hypothesised pathways
- Searched 9 peer reviewed literature databases and grey literature sources (Google, trial and funder databases, Gov.uk and NGO web sites etc., March 2016-March 2024
- All relevant outcomes
- Independent double screening and data extraction
- Identified nodes and connections along causal pathways mapped using Kumu.io



Evidence synthesis – findings

- After duplicates removed, 850 records were identified for screening, 183 full texts reviewed and 38 studies included
- 33 quantitative studies, 2 mixed-methods, 3 qualitative
- 16 studies from our NIHR-funded SDIL evaluation included
- 265 variables identified and assigned to 41 categories (nodes)
- In some studies it was unclear whether they were assessing the impact of announcement, implementation or both, hence combined in analysis
- 133 connections between 41 nodes across studies, representing 43 unique connections
- Connections grouped into 8 thematic categories (colour coded)

Map showing number and polarity of pathways from studies identified in the systematic review

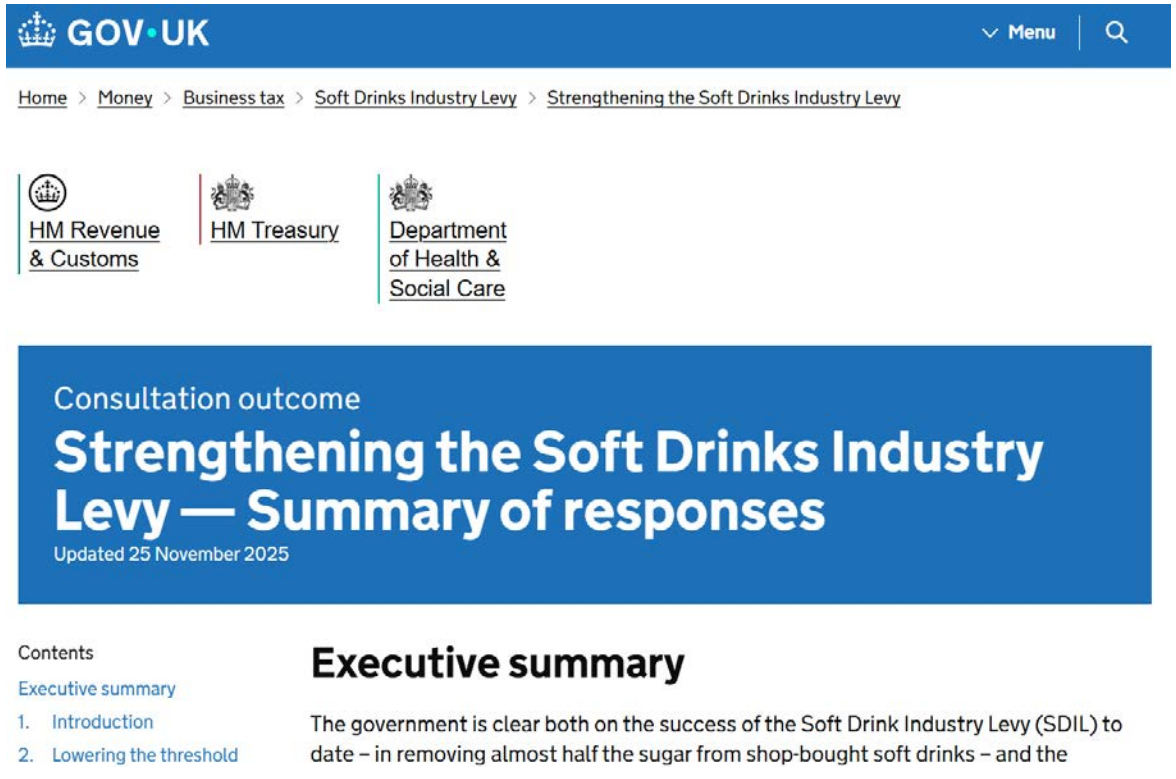


Conclusions of the evidence synthesis

- High level of consistency in findings of studies exploring the UK SDIL:
  - Achieved primary aim of reformulation to reduce sugar content
  - Reduced purchasing of sugar from eligible drinks without increasing purchasing of substitute products such as alcohol and confectionary
  - Estimated longer-term improvements in acute and chronic health outcomes, and reduced health and social care costs modelled
  - Few long-term negative impacts for industry.
- Most studies focused on simple, two-node pathways
- Researchers and funders could helpfully move away from examination of a narrow set of variables and outcomes embedded in simple, linear pathways, towards broader assessments of multiple connections between outcomes and their relationships, informed by systems thinking

Policy impacts and next steps

- Government announced consultation on reviewing the SDIL in mid-2025 and announced changes in autumn 2025
  - Rates to be increased incrementally over 5 years to catch up with inflation
  - Lowering of lower threshold to 4.5g sugar/100ml
  - Extension to (closed cap) milk-based drinks
- Revised SDIL needs evaluating (likely small impacts)
- UK needs a wider unhealthy food and beverage tax to shift the food system (e.g. Henry Dimbleby's proposed tiered tax on sugar and salt)


GOV·UK Menu

Home > Money > Business tax > Soft Drinks Industry Levy > Strengthening the Soft Drinks Industry Levy

HM Revenue & Customs | HM Treasury | Department of Health & Social Care

Consultation outcome

Strengthening the Soft Drinks Industry Levy — Summary of responses

Updated 25 November 2025

Contents

Executive summary
1. Introduction
2. Lowering the threshold

Executive summary

The government is clear both on the success of the Soft Drink Industry Levy (SDIL) to date – in removing almost half the sugar from shop-bought soft drinks – and the

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- The evaluation of the SDIL was funded by the UK National Institute of Health Research, Public Health Research Programme, grants 16/49/01 (£50k) and 16/130/01 (£1.5m)
- MW was funded as Director of the NIHR PHR Programme, 2014-20
- None of the investigators received any funding from any commercial entities

- https://studies.mrc-epid.cam.ac.uk/sdil
- https://fundingawards.nihr.ac.uk/award/16/130/01

Thanks

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