

Title: Applying an updated Nutrient Profile Model to promotions and advertising restrictions IA No: DHSCOA9696 Lead department or agency: Department of Health and Social Care Other departments or agencies:	Impact Assessment (IA)			
	Date: 3/2/2026			
	Stage: Development/Options			
	Source of intervention: Domestic			
	Type of measure: Secondary legislation			
	Contact for enquiries: food.legislation@dhsc.gov.uk			

Summary: Intervention and Options	RPC Opinion: GREEN
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Cost of Preferred (or more likely) Option (in 2025 prices)

Total Net Present Social Value	Business Net Present Value	Net cost to business per year
£33,341m	-£2,817m	£165m

What is the problem under consideration? Why is government action or intervention necessary?
Regular consumption of 'less healthy' food and drink (also known as high in fat, sugar and salt – HFSS), drives excess calorie intake and rising childhood obesity, increasing risks of cardiovascular disease, type 2 diabetes and other long-term conditions. The Nutrient Profiling Model (NPM) 2004/5 no longer reflects updated dietary recommendations, meaning many 'less healthy' products are not classified as 'less healthy', reducing the effectiveness of advertising and promotion restrictions. Updating to the NPM 2018 ensures criteria reflect the latest evidence and more accurately identify products contributing to poor diet and obesity.

What are the policy objectives of the action or intervention and the intended effects?
The policy aims to ensure that 'less healthy' products are more accurately identified using the updated NPM 2018, reflecting the latest Scientific Advisory Committee on Nutrition (SACN) dietary recommendations. By tightening the definition of 'less healthy', more 'less healthy' products of concern will fall within the existing advertising and promotions restrictions. This is expected to reduce children's exposure to and overconsumption of 'less healthy' food and drink products, whilst shifting the balance towards 'healthier' options through reformulation and availability. It would also have significant spill over benefits for adults.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)
All options cover the area of England for Promotions regulations and UK for Advertising regulations.
Option 1: Do nothing.
Option 2: Apply the NPM 2018 to the Promotions and Advertising regulations.
Option 3: Apply the NPM 2018 and update the product categories.

Option 2 is the preferred option because it clearly fulfils government ambition to bring current legislation up to date with the latest advice on nutrition standards. It strikes the right balance between being robust and challenging with industry and implementing proportionate regulation.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** Month/Year

Is this measure likely to impact on international trade and investment?	No			
Are any of these organisations in scope?	Micro No	Small No	Medium Yes	Large Yes
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)	Traded: N/A		Non-traded: N/A	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:  Date: 20/03/26

Summary: Analysis & Evidence

Policy Option 1

Description: Do nothing

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	High: Optional	Best Estimate:

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate			

Description and scale of key monetised costs by 'main affected groups'

No costs have been monetised under this option. Businesses who currently restrict the promotions and advertising of certain 'less healthy' products in line with the NPM 2004/5 would be expected to continue doing so.

Other key non-monetised costs by 'main affected groups'

No non-monetised benefits have been outlined under this option.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	Optional
High	Optional	Optional	Optional
Best Estimate			

Description and scale of key monetised benefits by 'main affected groups'

No costs have been monetised under this option.

Other key non-monetised benefits by 'main affected groups'

No non-monetised benefits have been outlined under this option.

Key assumptions/sensitivities/risks

Discount rate (%)

This option would see the Promotions and Advertising restrictions remaining in force but underpinned by an NPM that is out of date and no longer reflects the latest dietary recommendations.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:

Costs:	Benefits:	Net:
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Summary: Analysis & Evidence

Policy Option 2

Description: Update Nutrient Profile Model (NPM), governing restrictions on advertising, volume price promotions and checkout, end-of-aisle, and store entrance sales of 'less healthy' food and drinks.

FULL ECONOMIC ASSESSMENT

Price Base Year 2023	PV Base Year 2027	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: -8,409	High: 168,413	Best Estimate: 34,118

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	101	52	876
High	43	499	8,409
Best Estimate	17	167	2,812

Description and scale of key monetised costs by 'main affected groups'

Includes transition costs (familiarisation, knowledge sharing, product assessment and IT update costs) of £16 million for retailers and costs to manufacturers (familiarisation, knowledge sharing and free sugar assessment) of around £1 million. Retailers are projected to incur an average net profit loss of £57 million per year and manufacturers are estimated to incur an average profit loss of £12 million per year. Monetised costs are only for promotions policies.

Other key non-monetised costs by 'main affected groups'

The familiarisation costs for advertising agencies, broadcasters and online platforms, as well as the ongoing profit loss for these businesses due to reduced advertising spend, have not been monetised. These costs will be considered further in the final impact assessment. If businesses choose to reformulate their products, they may incur additional indirect costs. Retailers would experience reduced revenue from manufacturers of 'less healthy' products no longer paying for preferential location of their items.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low		0.0	0.0
High		9,057	169,289
Best Estimate		1,975	36,931

Description and scale of key monetised benefits by 'main affected groups'

A reduction in obesity-related morbidity and mortality, resulting in NHS savings of £1,261 million, social care savings of £1,132 million, an increase in economic output of £7,618 million and improvements in quality of life monetised at £26,919 million. Monetised benefits are only for promotions policies.

Other key non-monetised benefits by 'main affected groups'

We have only monetised the health benefits of the policies leading to reduced calorie intake, whereas there may be further health impacts of nutritionally improved diets. This assessment includes illustrative estimates of the impact of this policy on cases of adult and childhood obesity, and impact on obesity related diseases in childhood.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
Assumptions include the compensatory behaviour of consumers in response to the policy, the sales uplift due to products being in regulated locations and calorie reduction being proportional to spend reduction. The impact on locations promotions accounts for most of the costs and benefits of this policy and totals are sensitive to assumptions, especially compliance with existing regulations, which have been explored within sensitivity analysis to mitigate risk. An unexplored risk is the interaction effects with other policies.		

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:		
Costs: -165	Benefits: 0.0	Net: -165

Summary: Analysis & Evidence

Policy Option 3

Description: Update Nutrient Profile Model (NPM), governing restrictions on advertising, volume price promotions and checkout, end-of-aisle, and store entrance sales of 'less healthy' food and drinks and amend the product categories in scope of these restrictions (such as to include sweet spreads and savoury pastries).

FULL ECONOMIC ASSESSMENT

Price Base Year 2023	PV Base Year 2027	Time Period Years 25	Net Benefit (Present Value (PV)) (£m)		
			Low: -11,014	High: 223,575	Best Estimate: 45,771

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	11	67	1,126
High	47	654	11,014
Best Estimate	18	219	3,681

Description and scale of key monetised costs by 'main affected groups'

Includes transition costs (familiarisation, knowledge sharing, product assessment and IT update costs) of £16 million for retailers and costs to manufacturers (familiarisation, knowledge sharing and free sugar assessment) of over £1 million. Retailers are projected to incur an average net profit loss of £72 million per year and ongoing assessment costs of less than £1 million every 2 years. Manufacturers are estimated to incur an average profit loss of £16 million per year. Monetised costs are only for promotions policies.

Other key non-monetised costs by 'main affected groups'

The familiarisation costs for advertising agencies, broadcasters and online platforms, as well as the ongoing profit loss for these businesses due to reduced advertising spend, have not been monetised. These costs will be considered further in the final impact assessment. If businesses choose to reformulate their products, they may incur additional indirect. Retailers would experience reduced revenue from manufacturers of 'less healthy' products no longer paying for preferential location of their items.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	0.0	0.0
High	0.0	12,022	224,701
Best Estimate	0.0	2,645	49,452

Description and scale of key monetised benefits by 'main affected groups'

A reduction in obesity-related morbidity and mortality, resulting in NHS savings of £2,772.74 million, social care savings of £2,460 million, an increase in economic output of £16,717 million and improvements in quality of life monetised at £59,105 million. Monetised benefits are only for promotions policies.

Other key non-monetised benefits by 'main affected groups'

We have only monetised the health benefits of the policies leading to reduced calorie intake, whereas there may be further health impacts of nutritionally improved diets.

Key assumptions/sensitivities/risks	Discount rate (%)	3.5
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Assumptions include the compensatory behaviour of consumers in response to the policy, the sales uplift due to products being in regulated locations and calorie reduction being proportional to spend reduction. The impact on locations promotions accounts for most of the costs and benefits of this policy and totals are sensitive to assumptions, especially compliance with existing regulations, which have been explored within sensitivity analysis to mitigate risk. An unexplored risk is the interaction effects with other policies.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:		
Costs: -216	Benefits: 0.0	Net: -216

Evidence Base

Summary of proposal

1. In its 'Fit for the Future: The 10 Year Health Plan for England', the government set out its commitment to update the standards used to underpin the current restrictions on paid advertising of food and drink products that are 'less healthy', also known as 'High in Saturated Fat, Salt or Sugar' (HFSS), on TV and online, as well as the restrictions on promotions of 'less healthy' food and drink products by location and by volume price. These restrictions are currently underpinned by the UK Nutrient Profiling Model (NPM) 2004/5 which no longer aligns with the latest scientific advice and the Scientific Advisory Committee on Nutrition (SACN)'s dietary recommendations. SACN is the UK government's independent scientific committee that provides evidence-based advice on nutrition and related health matters. Its work directly informs public health policy, including regulations, dietary guidelines, and food standards.
2. The NPM forms part of a two-stage process for determining which products are in scope of the restrictions and are assessed as being 'less healthy'. The product needs to both:
 - a. fall within one of the product categories in the schedule to the regulations:
 - i. for advertising restrictions [The Advertising \(Less Healthy Food Definitions and Exemptions\) Regulations 2024](#)
 - ii. for promotions restrictions [The Food \(Promotion and Placement\) \(England\) Regulations 2021](#); and
 - b. score 4 or above for food, or 1 or above for drink, when applying the NPM 2004/5 using the 2011 technical guidance
3. Products within the categories of specified food or drink included in the schedule of the regulations were identified as the categories of food or drink of concern for childhood obesity.
4. To the extent appropriate, we have aligned the product categories in scope of the advertising restrictions with those that are included in the schedule to the promotion's restrictions. However, there are some differences to reflect that the advertising restrictions apply to products sold or served in the out of home sector as well as by retailers and manufacturers.
5. Since the NPM 2004/5 was developed UK dietary recommendations have been revised, in particular those for free sugars and dietary fibre. SACN recommended in its '[Carbohydrates and Health](#)' report in 2015:

Free Sugars

- a. The definition for 'free sugars' be adopted in the UK and that this comprises all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and unsweetened fruit juices. Under this definition, lactose naturally present in milk and milk products and sugars contained within the cellular structure of foods would be excluded.
- b. The population average intake of free sugars should not exceed 5% of total dietary energy.

- c. The consumption of sugar-sweetened beverages should be minimised, in both children and adults.

Dietary Fibre

- a. The average population intake of dietary fibre for children aged 2 to 5 years should approximate 15g/day, for children aged 5 to 11 years 20g/day, for children aged 11 to 16 years 25g/day and for adolescents aged 16 to 18 years about 30g/day. These values have been rounded to the nearest multiple of 5g/day and are informed by comparative intakes of dietary fibre in different aged groups in the National Diet and Nutrition Survey (NDNS).
- b. Due to the absence of information, no quantitative recommendations are made for children aged under 2 years, but from about six months of age gradual diversification of the diet to provide increasing amounts of whole grains, pulses, fruits and vegetables is encouraged.

Intakes of free sugars and dietary fibre based on data collected in the UK from 2019 to 2023 as part of the NDNS

- a. Average intakes of free sugars for adults and children aged from 4 years are around double this recommendation. Recent findings from the National Diet and Nutrition Survey confirm that this recommendation was met by only 8% of children aged 4 to 10 years and 5% of children aged 11 to 18 years (NDNS 2019 to 2023).
6. Average fibre intakes for adults are only around half the recommendation and only 4% percent of adults met the recommendation. Recommendations were met by 22% of children aged 18 months to 3 years, 14% of children aged 4 to 10 years and 4% of children aged 11 to 18 years (NDNS 2019 to 2023).
 7. UK health departments accepted the revised dietary recommendations and commissioned a review of the NPM 2004/5 in 2016, and this was carried out by the former Public Health England (PHE).
 8. Following SACN's report, the government consulted on the UK NPM 2018 in 2018. The consultation sought views on the modifications made to the NPM 2004/5, and the methodology for developing the modifications, in particular with reference to the remit and aims of the review to ensure the NPM reflects the current UK dietary recommendations.
 9. The government published the NPM 2018 on 27 January 2026. It now intends to take further action on tackling child obesity by bringing the NPM used in regulations up to date with current standards. Applying a new updated definition of what 'healthier' food is would strengthen the existing Advertising and Promotions Restrictions. Applying the 2018 model will bring products that are high in free sugars into scope of the restrictions, such as desserts, yoghurts, breakfast cereals, cereal bars and juice-based drinks. This will further reduce children's exposure to 'less healthy' products of concern for childhood obesity. It would also have significant spill over benefits for adults.
 10. Preventing obesity can help reduce obesity related illnesses such as diabetes and heart disease and increasing intakes of dietary fibre can help decrease the risk of developing heart

disease, stroke, diabetes and colorectal cancer. Additional benefits from reducing the intake of free sugars include preventing dental caries in children and adults – dental decay is the most common cause of hospitalisations in children.

11. The advertising and promotions regulations will be updated by secondary legislation. These pieces of legislation sit under the Communications Act 2003 and the Food Safety Act 1990, respectively. The government intends to consult on the proposed changes to the regulations.

Background

12. The NPM 2004/5 was developed by the Food Standards Agency (FSA) as a tool to enable the Office of Communications (Ofcom), the broadcast regulator, to identify 'less healthy' foods and drinks so that advertising for such products could be subject to restrictions during children's television programming. Ofcom made the decision to add rules to the Broadcast Committee of Advertising Practice (BCAP) Code involving the NPM in 2007 and BCAP and the Advertising Standards Authority (ASA) have been using this model for broadcast media since the restrictions came into force in April 2007.

13. The model uses a simple scoring system where points are allocated based on their nutritional content per 100g. Points are awarded for 'A' nutrients (energy, saturated fat, total sugar and sodium), and for 'C' nutrients (fruit, vegetables and nut content, fibre and protein). The score for 'C' nutrients is then subtracted from the score for 'A' nutrients to give the final nutrient profile score.

14. Foods scoring 4 or more points, and drinks scoring 1 or more points, are classified as 'less healthy'.

15. A 2018 review of the NPM 2004/5 focused on updating the model to reflect the current UK dietary recommendations, in particular those for free sugars and fibre rather than developing a new model from first principles. The approach also considered opportunities for changes to other nutrients/food components included in the NPM 2004/5. The NPM 2004/5 was modified to ensure the current UK dietary recommendations are incorporated. The differences between the NPM 2018 and the NPM 2004/5 are:

- a. the adjustment of the energy criterion in line with food labelling regulation intake of 8,400kJ (2,000kcal) as a result, nutrient components such as saturated fat and sugars were recalculated as a proportion of food/total dietary energy.
- b. the replacement of the total sugars component of the NPM 2004/5 with 5% of total dietary energy for free sugars
- c. the adjustment of the fibre criterion as a proportional change from the existing NPM 2004/5 value to the current UK dietary recommendation for fibre.
- d. the replacement of the sodium criterion with salt.
- e. updating the protein values to 45g to reflect UK dietary recommendations.

Costs and benefits

16. Applying a new updated definition of 'healthier' food and drink would strengthen the existing Advertising and Promotions Restrictions by bringing more products that are high in free sugars into scope.

17. The benefits of applying the NPM 2018 in restricting the promotion and advertising of 'less healthy' food and drink products are therefore expected to be a reduction in purchasing of excess 'less healthy' food and drink products. Excess consumptions of 'less healthy' food and drink products leads to excess calorie consumption and weight gain over time. In the long-term this will help lower obesity prevalence and obesity related morbidity and mortality, compared to a counter-factual of no restrictions.
18. Costs and benefits are estimated by largely following established methodologies used in previously published impact assessments^{1,2}, apart from transition costs associated with updating the NPM specification, which is an addition to the established methodologies. Assumptions that underlie uncertainty in our cost and benefit analyses are also unchanged from previous analysis (explored in 'Sensitivity analysis').
19. The main categories of costs are familiarisation, transition and on-going costs associated with lost profits to industry due to reduced sales of 'less healthy' food and drink products.
20. Option 2 is the current preferred option. In Option 2, government applies the NPM 2018 to restrict the promotion and advertising of 'less healthy' food and drink products in line with the existing regulations. This maintains the exemption for small and micro businesses in England (apart from those stores that are part of a symbol group) for the promotions restrictions, and the small and medium-sized enterprises (SME) exemption UK-wide for the advertising restrictions. This option ensures the policy is as targeted as possible to minimise the costs from additional administrative burden to business and the distortionary impact of regulation on the market while still having a significant impact on health at a population level.
21. For Option 2, over 25 years, expected direct costs to retailers and manufacturers include total transition costs of £17.42 million and direct lost profit of approximately £2.79 billion in 2023 prices.
22. The expected health benefits for Option 2 are estimated to be around £26.92 billion over the 25-year appraisal period. Reduced morbidity could also result in NHS and social care cost savings. Under our models, NHS savings could amount to £1.26 billion, Social Care cost savings of £1.13 billion and reduced premature mortality could be expected to deliver an additional £7.62 billion economic output through additional labour force participation. The benefits will be experienced by all age groups as the food and drink targeted is consumed across age groups.
23. Although a significant amount of the costs from obesity accrue in later life, the rising incidence in paediatric cases of type 2 diabetes³ and liver disease⁴ in the UK shows the burden of obesity is increasingly being felt in younger generations. Therefore, today's children will benefit their lifetime health from the policy being implemented from their childhood.

¹ Restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS; DHSC, 2020), available at [Impact assessment of restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar \(HFSS\)](#), accessed 26 January 2026.

² Restricting volume price promotions for high fat, sugar, and salt (HFSS) products (DHSC, 2020), available at: [Final impact assessment: restricting volume promotions of HFSS products](#), accessed 26 January 2026.

³ Candler, T. P., Mahmoud, O., Lynn, R. M., Majbar, A. A., Barrett, T. G., & Shield, J. P. H. (2018). Continuing rise of type 2 diabetes incidence in children and young people in the UK. *Diabetic Medicine*, 35(6), 737-744. available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5969249/pdf/DME-35-737.pdf>

⁴ Bush, H., Golabi, P., & Younossi, Z. M. (2017). Pediatric non-alcoholic fatty liver disease. *Children*, 4(6), 48. available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5483623/pdf/children-04-00048.pdf>

24. Under our models, the total benefits could be around £36.93 billion, giving a total net benefit present value of £34.12 billion, in addition to the benefits achieved by the existing regulations.
25. Additional illustrative modelling suggests that a calorie reduction of this scale could prevent almost 520,000 cases of adult obesity and over 110,000 cases of childhood obesity. Similarly estimates suggests that around 1,700 asthma cases, 1,500 cases of depression, 4,900 cases of hypertension, and 100 cases of type 2 diabetes could be avoided among children through this change in excess weight.
26. It is important to consider the central model outputs above in the context of the high degree of uncertainty they carry, which is explored in the 'Sensitivity analysis' subsection of this document.
27. Key risks and assumptions within this approach are set out in the 'Risks and Assumptions' section. We will aim to improve the quality of the data and evidence used across this assessment where possible for the final stage impact assessment.

Problem under consideration and rationale for intervention

What is the problem under consideration? Why is government action or intervention necessary?

28. Obesity and poor diet are a leading cause of poor health.⁵ In the past 30 years, obesity rates have almost doubled⁶, and it is a leading cause of significant mortality and morbidity, including type-2 diabetes, cardiovascular disease (CVD), liver disease, many types of cancer, musculoskeletal conditions and poor mental health.
29. With the UK now having the third highest rate of adult obesity in Europe, it remains a critical public health challenge, estimated to cost the NHS £9.3 billion a year⁷. Around 1 in 5 children leave primary school with obesity (22.2%), with more than one in three children (36.2%) aged 10 to 11 years now living with overweight or obesity.⁸
30. Overweight and obesity prevalence is high across the UK population, but there are stark inequalities across ages, geographical areas, genders, ethnic groups and for those with both mental and physical disabilities. These inequalities are growing, as rates of children with obesity are increasing significantly faster in communities with high deprivation levels compared to those with low deprivation levels.⁹

⁵ Time to Solve Childhood obesity: An Independent Report from the Chief Medical Officer (Dame Sally Davies, 2019), available at: <https://assets.publishing.service.gov.uk/media/5d9ddd6be5274a596f829bbd/cmo-special-report-childhood-obesity-october-2019.pdf>, accessed 26 January 2026.

⁶ Health Survey for England, 2024 (NHS England, 2024), available at: [Health Survey for England, 2024 - NHS England Digital](#)], accessed 3 February 2026.

⁷ The economic and productivity costs of obesity and overweight in the UK (Nesta and Frontier Economics, 2025), available at: [The economic and productivity costs of obesity and overweight in the UK .pdf](#), accessed 27 January 2026.

⁸ National Child Measurement Programme annual report, academic year 2024 to 2025 (DHSC, 2025), available at: [National Child Measurement Programme annual report, academic year 2024 to 2025](#), accessed 26 January 2026.

⁹ Public Health England 2020 'National child measurement programme (NCMP): trends in child BMI between 2006 to 2007 and 2018 to 2019' <https://www.gov.uk/government/statistics/national-child-measurement-programme-ncmp-trends-inchild-bmi-between-2006-to-2007-and-2018-to-2019>.

31. Obesity prevalence for children in the most deprived areas of the UK is more than double that in the least deprived areas.¹⁰ In addition, UK children who live with overweight and obesity are 5 times more likely to live with overweight and obesity in adulthood, in comparison to children who are not living with obesity.¹¹
32. Obesity in childhood directly affects physical and mental health and is associated with an increased risk of obesity in adulthood when the majority of overweight and obesity-related ill health occurs. Although food habits are not perfectly stable over the course of life, there is potential scope for influencing lifetime habits by intervening in childhood. Adjusting the consumption patterns of children by restricting their exposure to 'less healthy' food and drink advertising, therefore offers possible benefits in the long-term to both society and the individual.
33. Obesity is caused by regularly consuming more calories than is expended. There is consensus that excess calorie intake is the largest factor contributing to weight gain and obesity. 'Less healthy' food and drinks that are highly processed and energy-dense are often the items that are over-consumed, and this is a strong contributing factor to obesity.¹²
34. Over consumption of 'less healthy' food and drink products is a key driver of childhood obesity. Evidence suggests that basic environmental factors, such as the location of products within stores, can affect sales.¹³ Product placement in prominent in-store locations such as checkouts, aisle ends, and store entrances is typically used to promote 'less healthy' food and drink products and can often lead to impulse purchases and peer power for parents.¹⁴ Voluntary action by retailers to use Location Promotions for 'healthier' products, through the Responsibility Deal, has been limited in the past, with 'healthier' checkout pledges not implemented at scale or consistently.

Food Environment

35. Obesity is caused by a combination of complex genetic and physiological factors, mediated through environmental and socioeconomic factors impacting over a life course.¹⁵ It is subject to influences ranging from the individual level (e.g. individual choices, calorie requirements, access to facilities and knowledge about cooking) to the system level (e.g. advertising, pricing).¹⁶

¹⁰ National Child Measurement Programme annual report, academic year 2024 to 2025 (DHSC, 2025), available at: [National Child Measurement Programme annual report, academic year 2024 to 2025](#), accessed 26 January 2026.

¹¹ Simmonds M, Llewellyn A, Owen CG, Woolacott N. Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obes Rev.* 2016;17(2):95–107. Available at: [Predicting adult obesity from childhood obesity: a systematic review and meta-analysis - Simmonds - 2016 - Obesity Reviews - Wiley Online Library](#), accessed 26 January 2026.

¹² Sonntag, D., Schneider, S., Mdege, N., Ali, S., & Schmidt, B. (2015). Beyond food promotion: a systematic review on the influence of the food industry on obesity-related dietary behaviour among children. *Nutrients*, 7(10), 8565-8576. Available at: [Beyond Food Promotion: A Systematic Review on the Influence of the Food Industry on Obesity-Related Dietary Behaviour among Children](#), accessed 26 January 2026.

¹³ Larson, R. B. (2006). Core principles for supermarket aisle management. *Journal of Food Distribution Research*, 37(1), 101-105. Available at: [http://ageconsearch.umn.edu/record/8554/files/37010101.pdf](#), accessed 26 January 2026.

¹⁴ Nakamura, R., Pechey, R., Suhrcke, M., Jebb, S. A., & Marteau, T. M. (2014). Sales impact of displaying alcoholic and non-alcoholic beverages in end-of-aisle locations: an observational study. *Social Science & Medicine*, 108, 68-73. Available at: [https://www.ncbi.nlm.nih.gov/pubmed/24632050](#), accessed 26 January 2026.

¹⁵ Reducing obesity: future choices (Government Office for Science, 2007), available at: [Reducing obesity: future choices - GOV.UK \(www.gov.uk\)](#), accessed 26 January 2026.

¹⁶ Petticrew, M., Katikireddi, S. V., Knai, C., Cassidy, R., Hessari, N. M., Thomas, J., & Weishaar, H. (2017). 'Nothing can be done until everything is done': the use of complexity arguments by food, beverage, alcohol and gambling industries. *J Epidemiol Community Health*, 71(11), 1078-1083. Available at: ['Nothing can be done until everything is done': the use of complexity arguments by food, beverage, alcohol and gambling industries - PMC \(nih.gov\)](#), accessed 26 January 2026.

36. Evidence shows that dietary choices and behaviours are influenced by the food environment.^{17,18} How and where we buy food and drink, as well as the types of food available, has changed substantially in the last 30 years. This includes changes in the equipment we have in the home to store and cook food (e.g. freezers and microwave ovens) as well as growth in the places where we can buy food, including in non-food retail outlets such as clothes shops. Furthermore, there has been an increase in the numbers, types, production, availability and marketing of processed food such as ready meals, savoury snacks, pizza, ice cream and desserts, many of which are calorie dense or high in salt, saturated fat, and sugar.
37. Advertising and marketing of food and drink is ubiquitous with evidence showing that high calorie foods tend to be heavily advertised in all formats (e.g. TV, radio, posters and billboards, online and on social media including YouTube, via apps), increasing the preference, choice, purchase and consumption of these foods.¹⁹ Data shows that 'less healthy' food and drink are marketed and promoted more via price reductions and multibuys than 'healthier' products.²⁰ Data also shows that 5.5% of all sugar purchased on promotion in supermarkets is an incremental consequence of price promotions with 4% coming from higher sugar categories – this is sugar that would not have been purchased if the promotions were not in place.²¹ We also know that people living in areas of higher deprivation are subject to more advertising, thus encouraging purchasing of foods higher in fat, salt and sugar.²²
38. Data from a recent [OHID report](#) provides evidence on changes in food purchasing behaviour and the impact on diet and nutrition from 2021 (prior to the implementation of promotions legislation to restrict placement of 'less healthy' food and drink products at key selling locations) to 2023 (post implementation). It is important to note that this research coincided with food price increases and a continuing recovery from the COVID-19 pandemic which impacted on consumer behaviour. The proportion of take-home volume sales in these legislative categories that were 'less healthy' reduced from 48.5% in 2021 to 44.1% in 2023. Numerous categories showed reduction across the 2 years, but the amount of food and drink purchased that were 'less healthy' fell most rapidly in product categories that contain pizzas (57.3% to 43.1%), soft drinks (40.1% down to 30.5%), crisps and savoury snacks (93.5% down to 88.4%) and breakfast cereals (31.6% down to 25.0%). The report also shows that there was an increase in the overall amount of calories, saturated fat and salt purchased for take home and out of home purchases combined (2022 vs 2023) indicating the need to go further.
39. Children are thought to be particularly vulnerable to marketing techniques, with academic evidence showing their food preferences, purchasing and consumption can be influenced by advertising. A recent study estimated that 6.4% of UK childhood obesity and 5% of overweight is attributable to 'less healthy' TV advertising.
40. While recognising that there are a range of factors influencing children's food requests, there are multiple studies showing food advertising increases children's requests for advertised

¹⁷ Reducing obesity: future choices (Government Office for Science, 2007), available at: [Reducing obesity: future choices - GOV.UK \(www.gov.uk\)](#), accessed 26 January 2026.

¹⁸ Tackling obesity: future choices (Government Office for Science, 2007), available at: [Tackling obesity: future choices - project report \(2nd edition\) \(publishing.service.gov.uk\)](#), accessed 26 January 2026.

¹⁹ Sugar reduction: from evidence into action (Public Health England, 2015), available at: [Sugar reduction: from evidence into action - GOV.UK \(www.gov.uk\)](#), accessed 26 January 2026.

²⁰ Sugar reduction: from evidence into action (Public Health England, 2015), available at: [Sugar reduction: from evidence into action - GOV.UK \(www.gov.uk\)](#), accessed 26 January 2026.

²¹ Sugar reduction: from evidence into action (Public Health England, 2015), available at: [Sugar reduction: from evidence into action - GOV.UK \(www.gov.uk\)](#), accessed 26 January 2026.

²² Palmer, G., Green, M., Boyland, E., Vasconcelos, Y. S. R., Savani, R., & Singleton, A. (2021). A deep learning approach to identify unhealthy advertisements in street view images. *Scientific reports*, 11(1), 4884. Available at: [A deep learning approach to identify unhealthy advertisements in street view images | Scientific Reports \(nature.com\)](#), accessed 26 January 2026.

foods.²³ Studies also suggest that each additional hour of TV watched by children was associated with a 22% increased likelihood of pestering their parents.²⁴

Eating out

41. There has been huge growth in the number of out of home outlets together with the evolution of meal delivery apps, where food and drink can be delivered at the click of a button. Evidence suggests that increased access to takeaway food outlets in home, work and commuting environments was associated with higher consumption of takeaway food, greater body mass index and greater odds of obesity.²⁵ Data from Lumina Intelligence suggested that the UK restaurant market was forecast to grow in 2023 by 5.2% to a value of £18.7 billion, with further value growth to £19.5 billion predicted for 2026.²⁶ Data from the Family Food module of the Living Costs and Food Survey showed that before the Covid-19 pandemic, expenditure on out of home food and drink between 2018-2020 was relatively static.²⁷
42. Eating out is no longer a one-off event. Data from the Food Standards Agency (FSA) on eating habits shows that 52% of respondents were likely to eat out or buy takeaway for lunch about 2-3 times a month, while 23% of respondents were likely to do this about once a week or more often. The same data shows that 59% of respondents were likely to eat out or buy takeaway for dinner about 2-3 times a month, while 24% of respondents were likely to do this about once a week or more often.²⁸ The National Diet and Nutrition Survey estimates that for adults who reported eating 'out of home', this accounted for almost a quarter (23%) of their energy (calorie) intake.²⁹ In addition, the portion sizes of food purchased out of the home are estimated to be double that of food bought through supermarkets.^{30,31}
43. Data from the Institute of Fiscal Studies shows that while purchasing of out of home food and drink fell dramatically during the pandemic period, by the end of 2021 this had virtually returned to where it had been before the pandemic. However, the report also shows that in the first quarter of 2022, daily out of home consumption was around 5% higher than it had been in 2019. Data suggests that this change has been caused by a substantial shift in the places people are buying their food from; by the second half of 2021, fast food and takeaways accounted for nearly half (47%) of out of home calories, compared to 31% at the start of the pandemic, with the main losses being seen in coffee shops (a fall from 19% to 11% of out of home calories) and pubs and restaurants (a 15% reduction). It is not known if this change has been sustained, but the share of takeaways was increasing gradually before the pandemic.³²

²³ Cairns, G., Angus, K., Hastings, G., & World Health Organization. (2009). *The extent, nature and effects of food promotion to children: a review of the evidence to December 2008*. World Health Organization. Available at: [DSpace](#), accessed 28 January 2026.

²⁴ See it, Want it, Buy it, Eat it (Cancer Research UK, 2018) Available at: [see it want it buy it eat it final report.pdf](#), accessed 28 January 2026

²⁵ Burgoine, T., Forouhi, N. G., Griffin, S. J., Wareham, N. J., & Monsivais, P. (2014). Associations between exposure to takeaway food outlets, takeaway food consumption, and body weight in Cambridgeshire, UK: population based, cross sectional study. *Bmj*, 348. Available at: [Associations between exposure to takeaway food outlets, takeaway food consumption, and body weight in Cambridgeshire, UK: population based, cross sectional study | The BMJ](#), accessed 28 January 2026.

²⁶ UK restaurant market growth remains behind pubs and fast food as outlet decline hinders recovery (McAllister, 2023), available at: [UK restaurant market growth remains behind pubs and fast food as outlet decline hinders recovery \(restaurantonline.co.uk\)](#), accessed 28 January 2026.

²⁷ Family Food FYE 2022 (Department for Environment, Food & Rural Affairs, 2023), available at: [Family Food FYE 2022 - GOV.UK \(www.gov.uk\)](#), accessed 28 January 2026.

²⁸ Food and You 2 Wave 4 (Food Standard Agency, 2022), available at: [Chapter 4: Eating out and takeaways | Food Standards Agency](#), accessed 28 January 2026.

²⁹ National Diet and Nutrition Survey 2019 to 2023: report (OHID, 2025), available at: [National Diet and Nutrition Survey 2019 to 2023: report - GOV.UK](#) accessed: 2 February 2026

³⁰ Sugar reduction programme: industry progress 2015 to 2020 (Office for Health Improvement and Disparities, 2022), available at: [Sugar reduction programme: industry progress 2015 to 2020 - GOV.UK \(www.gov.uk\)](#), accessed 28 January 2026.

³¹ Calorie reduction: guidelines for the food industry (Public Health England, 2020), available at: [Calorie reduction: guidelines for the food industry - GOV.UK \(www.gov.uk\)](#), accessed 28 January 2026.

³² Augsburg, B., Farquharson, C., & McKendrick, A. (2024). *Longer-term impacts of the COVID-19 pandemic on the dietary purchasing choices of British households* (No. R306). IFS Report. Available at: [Microsoft Word - OPRU-IFS Report final edited.docx](#), accessed 28 January 2026.

What evidence is there to support the problem statement?

46. Obesity rates in the UK are some of the highest in Western Europe.³⁵ The gap in overweight and obesity rates between children from the least and most affluent families in the UK is larger than any EU country (26 points compared to the EU average of 8 percentage points).³⁶ The UK ranked 87th highest in the world for women and 55th highest in the world for men in 2022.³⁷ A major global study led by Imperial College London and published in *The Lancet* projected that by 2025, the UK would have the highest growth in obesity rates in Europe, with 38% of both men and women expected to be obese. This projection was based on data from over 19 million people across 186 countries.³⁸
47. The lifelong problems caused by obesity also expose health disparities within the UK. Obesity prevalence for children in the most deprived areas of the UK is more than double that in the least deprived areas³⁹. Obesity-related productivity costs are 22% higher in the most deprived groups than in the least deprived groups.⁴⁰ Reducing obesity prevalence would therefore help narrow these health and economic inequalities.
48. The UK was one of the first countries to develop and use an NPM. Since then, several different models have been introduced internationally based on the UK model including the voluntary Nutri-Score labelling system in Europe and the Health Star Rating System in Australia and New Zealand.
49. Since the NPM 2004/5 was developed UK dietary recommendations have been revised. In particular those for free sugars (which was effectively halved from 10% to 5% total dietary energy) and fibre (which was increased) set on the advice of the Scientific Advisory Committee on Nutrition (SACN) in their 2015 'Carbohydrates and Health' report. UK health departments accepted the revised dietary recommendations and commissioned a review of the NPM 2004/5. A review of the NPM was undertaken and consulted on in 2018.
50. Applying the NPM 2018 will bring products that are high in free sugars into scope of the restrictions, such as desserts, yoghurts, breakfast cereals, cereal bars and juice-based drinks. This will further reduce children's exposure to 'less healthy' products of concern for childhood obesity. It would also have significant spill over benefits for adults.

³⁵ Haase, C. L., Eriksen, K. T., Lopes, S., Satyrganova, A., Schnecke, V., & McEwan, P. (2021). Body mass index and risk of obesity-related conditions in a cohort of 2.9 million people: evidence from a UK primary care database. *Obesity science & practice*, 7(2), 137-147. Available at: [Body mass index and risk of obesity-related conditions in a cohort of 2.9 million people: Evidence from a UK primary care database - PMC](#), accessed 29 January 2026.

³⁶ New analysis reveals stark inequalities in obesity rates across England (The King's Fund, 2021), available at: [New analysis reveals stark inequalities in obesity rates across England | The King's Fund](#), accessed 29 January 2026.

³⁷ More than one billion people now living with obesity, global analysis suggests (Ryan O'Hare, 2024), available at: [More than one billion people now living with obesity, global analysis suggests | Imperial News | Imperial College London](#), accessed 29 January 2026

³⁸ NCD Risk Factor Collaboration. (2016). Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants. *Lancet (London, England)*, 387(10026), 1377. Available at: [Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants - The Lancet](#), accessed 29 January 2026.

³⁹ National Child Measurement Programme annual report, academic year 2024 to 2025 (DHSC, 2025), available at: [National Child Measurement Programme annual report, academic year 2024 to 2025](#), accessed 26 January 2026.

⁴⁰ The economic and productivity costs of obesity and overweight in the UK (Nesta and Frontier Economics, 2025), available at: [The economic and productivity costs of obesity and overweight in the UK .pdf](#), accessed 27 January 2026.

What gaps or harms would occur if government doesn't intervene?

51. Existing policies on advertising and promotions restrictions, as well as the voluntary sugar reduction programme and the soft drinks industry levy (SDIL) would continue to incentivise businesses to reformulate their products to reduce sugar.

52. However, failing to apply the NPM 2018 would:

- a. leave the Advertising and Promotions restrictions mis-aligned with current dietary guidelines and therefore failing to bring into scope all the 'less healthy' food and drink products of most concern in children's diets. Children are currently consuming double the recommended amount of free sugars.
- b. mean the advertising and promotions restrictions would not keep pace with changes in the food environment, marketing and product development.
- c. not address inequalities caused by obesity and efforts to prevent and reduce obesity related illness in adulthood would be considerably less effective.

If applicable, has a post-implementation review (PIR) of the existing regulations been undertaken. If so, what were its findings and how does the information the rationale? If not, why not? Has there been evaluation of any previous regulation in this area?

53. Government has a statutory duty to evaluate the impact of regulations within five years of their coming into force date. As the Location Promotions Restrictions, Volume Price Promotions Restrictions and Advertising Restrictions regulations came into force in 2022/2025 and 2026 respectively, post-implementation reviews have yet to be conducted. The PIRs will evaluate how well each of the policies are working and the extent to which they are meeting their objectives rather than being an evaluation of the NPM that underpins them.

54. We will aim to review the individual policies that rely on the NPM within timescales that coincide with the change from the NPM 2004/05 to ensure that each policy is reviewed in a consistent way. The introduction of the NPM 2018 will trigger new timescales for subsequent PIRs which we may package together better to support an assessment of the impact of the introduction of the 2018 NPM. Any findings would not change the government's ambition to apply up-to-date nutritional standards to these policies. As a result of the wider societal benefits through reductions in childhood obesity, there is a strong case to prioritise applying these updated standards ahead of the publication of future PIRs. This is discussed in more detail in the Monitoring and Evaluation Section.

55. This will allow us not only to extract learning on the implementation of these policies whilst using the NPM 2004/5 but also collect data that will provide a baseline for the changes that will arise when the NPM 2018 is introduced. This is likely to mean that the PIRs for the advertising and volume price promotion regulations will be carried out earlier than the maximum 5 years.

56. Recent findings from an evaluation of the Locations Promotions Policy⁴¹ (as part of the Diet and Health Inequalities Project, led by University of Leeds and UKRI grant-funded) revealed

⁴¹ Jenneson, V., Kininmonth, A., Wilkins, E., Chukwu, I., Eselebor, O., Pontin, F., ... & Morris, M. Did High in Fat, Sugar, and Salt (HFSS) product placement legislation in England lead to reduced HFSS purchases? An interrupted time series analysis. Available at: [OSF Preprints](#) |

a 0.63 percentage-point (95% CI: -1.24, -0.51) reduction in in-store sales of in-scope 'less healthy' products by weight and a 1.19 percentage-point (95% CI: -1.61, -0.77) reduction by unit volume, following the introduction of the legislation. This equates to 2 million fewer junk food items sold every day. In the published impact assessment, the reduction in 'less healthy' sales (in £) was estimated 6.2% of the approximately 57% of sales that were 'less healthy', which is equivalent to a 3.5 percentage point reduction.⁴² These findings demonstrate that our legislation has already driven a meaningful reduction in sales of in-scope 'less healthy' products. Findings also indicated that further legislation is needed to achieve the magnitude of change necessary to reverse obesity trends and improve population health. Applying the NPM 2018 would support these findings.

Policy objective

Policy objectives and intended outcomes

57. The main objective of this change in legislation is to take further action to tackle childhood obesity by bringing the standards which underpin the existing Promotions and Advertising Restrictions up to date, thus expanding their scope and improving their effectiveness in reducing children's exposure to 'less healthy' food or drink products. The current regulations are underpinned by the 2004/5 Nutrient Profiling Model (NPM) which no longer aligns with the latest scientific advice and current UK dietary recommendations. Applying a new updated definition of what 'healthier' food is will ensure legislation is brought up to date.
58. The benefits that are expected from restricting the promotion and advertising of 'less healthy' food and drink products include addressing inequalities caused by obesity and overweight and reducing obesity prevalence and obesity related morbidity and mortality. Other health outcomes include improving quality of life and economic benefits through additional future workforce participation.

Promotions

59. The location element of the Food (Promotion and Placement) (England) Regulations came into force on 1 October 2022. This restricts the placement of 'less healthy' food and drink products at key selling locations such as store entrances, checkouts and aisle ends in England. The volume price element of the restrictions came into force on 1 October 2025, restricting Volume Price Promotions, such as "buy-one-get-one-free" or "3 for 2" offers on 'less healthy' products.
60. **The intended outcomes** of the promotion restrictions, which are used to determine the success of the intervention, are to:

Did High in Fat, Sugar, and Salt (HFSS) product placement legislation in England lead to reduced HFSS purchases? An interrupted time series analysis, accessed 29 January 2026.

⁴² Restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS; DHSC, 2020), available at Impact assessment of restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS), accessed 26 January 2026.

- a. reduce children’s exposure to and overconsumption of ‘less healthy’ food and drink products likely to lead to excess calorie intake and, over time, weight gain, while minimising the impact on food purchases that do not contribute to childhood obesity.
 - b. shift the balance of promotions towards ‘healthier’ options, including through product reformulation, and maximise the availability of ‘healthier’ products that are offered on promotion, to make it easier for parents to make ‘healthier’ choices when shopping for their families.
 - c. create a level playing field in which stores that make voluntary progress are no longer penalised.
61. The promotions restrictions are expected to accrue health benefits of over £57 billion and provide NHS savings of £4 billion, over a 25-year period. These restrictions are currently underpinned by an out-of-date NPM. Applying a new updated definition of what ‘healthier’ food is to these restrictions will improve the intended outcomes by bringing products that are high in free sugars into scope.

Advertising

62. The Advertising (Less Healthy Food Definitions and Exemptions) Regulations came into force on 5 January 2026, although industry committed to voluntarily comply with these restrictions from 1 October 2025. They will prohibit ‘less healthy’ food and drink products from being advertised before the 9pm TV watershed and restrict paid-for advertising of these products online, UK wide.

63. **The intended outcomes** of the advertising restrictions, which are used to determine the success of the intervention, are to:

- a. reduce children’s exposure to ‘less healthy’ food and drink advertising which influences their eating habits.
- b. reduce children’s overconsumption of ‘less healthy’ food and drink products likely to lead to excess calorie intake and, over time, weight gain, while minimising the impact on food purchases that do not contribute to childhood obesity.
- c. shift the balance of advertising towards ‘healthier’ options, including through product reformulation, to make it easier for parents to make ‘healthier’ choices when shopping for their families.

64. We estimate that the current advertising restrictions will deliver around £2 billion in health benefits, NHS savings of £50 million, social care savings of £40 million. These restrictions are currently underpinned by an out-of-date NPM. Applying a new updated definition of what ‘healthier’ food is to these restrictions will improve the intended outcomes by bringing products that are high in free sugars into scope.

65. SMART intended outcomes:

- a. **Specific:** Our specific ambition is to further reduce the over consumption of 'less healthy' food and drink, improving children's diets and their health outcomes. Aligning our promotions and advertising restrictions with up-to-date dietary recommendations will help us to achieve this. Both sets of existing legislation target specific categories of food and drink that were identified as those of most significance to childhood obesity and were decided upon following previous consultation. Our current preferred option is to maintain these categories, but we will gather views on this during consultation.
- b. **Measurable:** Full impact assessments were conducted for both the location and volume price elements of the promotions restrictions and also the advertising restrictions that outline expected benefits of the policies using the NPM 2004/5. A further impact assessment will be done to estimate the expected increase in benefits when applying the NPM 2018 to these policies. A post implementation review (PIR) will be conducted within 5 years from the date of implementation which will measure the outcomes to date. We will also be monitoring consumption and purchasing behaviours which can provide an early indication on how policies are impacting consumer behaviours.
- c. **Achievable:** We regularly consult with industry and stakeholders to ensure the objectives and processes required in the legislation are achievable.
 - i. The promotions and advertising restrictions have undergone extensive consultation with industry and other stakeholders. Views were collected on which businesses and products should be in scope and on how the policy should be implemented and enforced.
 - ii. The final NPM 2018 algorithm was agreed by the Expert Group following consultation in 2018.
 - iii. We will consult on the application of the NPM 2018 to the advertising and promotions restrictions.
- d. **Realistic:** Promotions legislation applies to medium and large retailers (with 50 or more employees), while advertising restrictions applies to large businesses (with 250 or more employees). Excluding small and micro businesses ensures the legislation is realistic as the burden of complying with these regulations would be disproportionately high for them. This is a targeted intervention. Industry is aware of NPM 2004/5 and have the tools to apply the model, using the technical guidance, to calculate an NPM score on their products. Consultation will provide further opportunity for businesses to feedback on the updated draft NPM technical guidance. This will include feedback on measuring free sugars and finding the least burdensome approach.
- e. **Time-limited:** The current advertising and promotions restrictions are subject to a post implementation review (PIR), 5 years after they have been operational. The PIR cycle for the restrictions using the NPM 2018 will be set to be in line with the introduction of the NPM 2018. The PIR will assess the extent the legislation has achieved its intended effects and ensure that measures are proportionate. Certain elements of the promotion's restrictions may also be reviewed in relation to how well retailer targets are achieving their aims. The 10YHP states that by introducing

smarter regulation, focused on outcomes in the form of mandatory healthy food sales reporting for all large companies in the food sector, we expect to be able to repeal legislation restricting Volume Price Promotions and aisle placement.

How the policy aligns with HMG objectives

66. The publication, Fit for the future: 10 Year Health Plan for England, the UK government explains that obesity is one of the leading causes of poor health. In the chapter, *from sickness to prevention: power to make the healthy choice*, a commitment is made to update the standards used to categorise which foods are more or less healthy for use with the advertising and promotion restrictions.
67. Prevention is pro-growth. Failing to act to combat obesity-driven non-communicable diseases (NCDs) restricts the government's growth agenda. A reduction in the prevalence of NCDs will reduce cost pressures on the health system, decrease economic inactivity and help stimulate economic growth. Over 2.5 million people in the UK are economically inactive because of long-term sickness. This acts as a drag on economic activity and prevents the government from obtaining potential tax revenue. The NHS' unique general taxation-based funding model means that the public finances bear the cost of obesity-driven NCDs.
68. Obesity alone is estimated to cost businesses up to £23.8 billion each year, with productivity losses 22% higher in the most deprived groups than in the least deprived⁴³. Reducing obesity would therefore boost economic growth by improving productivity, while also helping to narrow health and economic inequalities⁴⁴.
69. When considering our options, it has been important to ensure any change to regulation is proportionate. We understand the need to be tough on restricting the advertising and promotion of 'less healthy' food or drink products whilst balancing the impact on business. Our preferred option of applying the NPM 2018 to our current restrictions as they are without changing how they work on the categories of food and drinks products within the regulations uses an approach industry have been engaged on, plus they are familiar with its application. The Government has committed to reducing the administrative burden of regulation on industry to support its ambition for economic growth, and our approach aligns with that ambition. We published the new NPM in January to maximise the time industry has to adapt, and we will consider an appropriate transitional period during our consultation so that industry can prepare

⁴³ The economic and productivity costs of obesity and overweight in the UK (Nesta and Frontier Economics, 2025), available at: [The economic and productivity costs of obesity and overweight in the UK .pdf](#), accessed 27 January 2026.

⁴⁴ The economic and productivity costs of obesity and overweight in the UK (Nesta and Frontier Economics, 2025), available at: [The economic and productivity costs of obesity and overweight in the UK .pdf](#), accessed 27 January 2026.

Discussion on which businesses are in scope of this policy

70. This change to legislation is focused on updating the nutrition standards that are applied to existing regulations. No change to which businesses are in scope is being recommended. The following section provides detail on how previous decisions were made as to which businesses are in scope of the existing restrictions.

Promotions

71. The size of the businesses in scope of the promotion's regulations was decided upon following consultation in 2019. Whilst many respondents highlighted the need for an even playing field, those representing smaller businesses said that the policy could disproportionately impact small businesses. Stakeholders explained that, compared to large businesses, the policy could be more burdensome for small businesses to familiarise themselves with the new regulation; assess which products are in scope of the restrictions; plan a new store layout; and implement the policy.

72. Following this feedback small businesses were exempted from the restrictions unless they are part of a symbol group. Symbol groups provide a support function to stores, often on promotions and what products to stock, similar to supermarkets, and so would not find it as burdensome compared to small/micro businesses that are not part of a symbol group.

73. Furthermore, following industry feedback and conducting further stakeholder engagement with regards to exemptions based on the size of a store, the government decided that only stores 185.8 square metres (2,000 square feet) or greater will be in scope of the location element of the restrictions. This is because stores are expected to have distinct checkout and front of store areas and typically have multiple aisles and aisle-ends.

74. Exempting small businesses and only including stores over 2,000 square feet. of the location's restrictions avoided the risk of disproportionately burdening those who might find the new requirement more challenging while still delivering significant health benefits.

Advertising

75. Advertising restrictions are applicable to large businesses only, with small and medium-sized enterprises (SME) advertisers exempt.

76. This decision to exempt SME advertisers was made following feedback to the advertising consultation in 2020. Respondents thought that these restrictions would disproportionately affect SMEs, particularly those businesses that rely on social media as their online presence and main way to reach their customers compared to large businesses that already have greater brand awareness. A think tank also raised that SMEs may unintentionally breach regulations and face penalties as a result of lack of expertise and awareness of ASA rules. These concerns were echoed by food and drink retailers and manufacturers, who thought that SMEs would require additional and clear guidance to support compliance and a longer time for implementation.

Small and micro businesses

77. Analysis of impact to small and micro businesses is included in the 'Sensitivity analysis' section of 'Summary of monetised and non-monetised costs and benefits'. Briefly, we assume that 20% of lost sales from retail will involve products produced by small and micro manufacturers. We also estimate the impact on small/micro symbol stores, which are run independently but are in scope for restrictions because they trade under common supermarket brand names.

Description of options considered

78. In line with the Better Regulation Framework, an Options Assessment was carried out and submitted to the Regulatory Policy Committee for independent scrutiny. The Options Assessment was Green rated by the Regulatory Policy Committee.

79. Including "do nothing", six options were considered overall and three were proceeded to the shortlist. These include applying the NPM 2018 to the Promotions and Advertising restrictions, as well as applying the NPM 2018 to the Promotions and Advertising restrictions and updating the product categories that have been identified as those of specific concern to childhood obesity.

80. In developing the long list, we primarily considered policy options in relation to the strategic case for the proposed regulation as detailed above. We also considered what other policies are already being implemented or are being developed separately as commitments in the NHS 10 Year Health Plan (10YHP), including the proposal to introduce mandatory reporting on the healthiness of sales for large food businesses in the UK. Our consideration was also informed by policy work and engagement with businesses and health NGOs. Within the planning for the 10YHP announcement of updating the standards behind the promotions and advertising restrictions, and the subsequent policy development work, we have also collaborated closely with the Food Standards Agency and other government departments including DCMS, DBT and HMT.

81. Our approach to longlisting aimed to explore a broad range of policy approaches designed to explore how the standards behind the promotions and advertising restrictions could best be updated to reduce obesity and minimise the additional regulatory burden on businesses. This reflects the fact that many other existing and 10YHP policies are also being implemented in tandem, and the approach to which options were and were not included was made at the strategic level.

82. The purpose of the long list was to ensure full consideration of all plausible mechanisms for strengthening the policy from minimal change to more transformative shifts, ranging from maintaining the current system to applying the updated model in various ways, as well as structural variations such as adjusting or adding product categories.

83. The long list was used as an initial exploration tool to test conceptual viability. Options were assessed against feasibility, proportionality, alignment with policy objectives, and the extent to which they addressed the core issue: ensuring the underlying classification method reflects

current dietary recommendations and effectively targets products contributing most to childhood obesity. Following this assessment, only the options offering meaningful impact while remaining operationally realistic were taken forward to the shortlist.

84. These factors are what was used to establish the viability of the options:

- **Strategic fit:** The preferred option must align with or complement existing and upcoming policies within obesity strategy, both existing policies and new commitment in the 10YHP, as well as wider government aims and commitments, such as the Growth Mission, reducing the administrative burdens of regulation on business by 25%, and the Food Strategy.
- **Business need:** The preferred option must affect a sufficient number of 'less healthy' products to achieve the impact as detailed in the objective.
- **Supplier capacity and capability:** Businesses in scope of the restrictions must have sufficient capacity and capability to make the required changes (i.e. they must be in a position where they have the opportunity/control to influence the reformulation levers).
- **Potential achievability:** The preferred option must be realistically achievable for all businesses with products in scope of the restrictions.
- **Potential value for money:** The preferred option must deliver value for money in terms of health compared to costs to business, government, as well as including all social, economic and environment benefits, costs and risk.

85. The options on our short-list are considered the most specific, measurable, achievable and realistic. While option 1 is the do-nothing option, options 2 and 3 would each bring more 'less healthy' products that are of most concern to childhood obesity into scope of our current restrictions, maximising the health benefits of the policies. Option 2 and 3 each create a varying degree of additional burden to industry that we feel is outweighed by the wider societal benefits through reductions in childhood obesity. However, while option 2 only updates the tool underpinning the policy, option 3 would be more disruptive as it more widely changes the scope of the policy. We would consider views in more detail on the effectiveness of the categories within the regulations during the consultation.

Short list options

86. In developing the short-list, we have drawn insight from the cost benefit assessment described within this impact assessment. Costs and benefits are estimated by largely following established methodologies used in previously published impact assessments^{45,46}, with updated data and assumptions where possible to reflect changes in the product landscape. To enable this, up-to-date 2024 food and drink purchasing data has been used to construct a proxy dataset that supports the calculation of both the existing (NPM 2004/05) and updated (NPM 2018) classifications. This proxy dataset represents the best available assessment at

⁴⁵ Restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS; DHSC, 2020), available at [Impact assessment of restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar \(HFSS\)](#), accessed 26 January 2026.

⁴⁶ Restricting volume price promotions for high fat, sugar, and salt (HFSS) products (DHSC, 2020), available at: [Final impact assessment: restricting volume promotions of HFSS products](#), accessed 26 January 2026.

this stage but does introduce some uncertainty. Data with more robust nutritional information has been commissioned for final impact assessment. Further detail on the construction, assumptions and considerations of this proxy dataset is provided in Annex A.

Option 1 – “Do nothing”

87. This option would see the Promotions and Advertising restrictions remaining in force but underpinned by an NPM that is out of date and no longer reflects the latest dietary recommendations.
88. While this creates no additional burdens to industry, it limits the full potential of our restrictions. Certain products that would be classified as ‘less healthy’ under the NPM 2018, currently pass the NPM 2004/5 and can therefore currently be advertised and promoted to children. Doing nothing means our restrictions would continue to be out of date with latest dietary recommendations, therefore reducing their potential to further reduce children’s exposure to ‘less healthy’ products of concern for childhood obesity. and fail to maximise the resulting health impacts.

Why we proceeded with this option to the shortlist

89. Option 1 was carried forward onto the shortlist. Although the government has already set out their commitment to updating the nutrition standards used to underpin our promotions and advertising of ‘less healthy’ food regulations, a do-nothing option will demonstrate impacts of the current agreed legislation which is underpinned by out-of-date nutrition standards.

Why this was not selected as the preferred option

90. Doing nothing would mean our restrictions would continue to be out of date with the latest dietary recommendations from the Scientific Advisory Committee on Nutrition (SACN) to reduce free sugar consumption. SACN noted this was key to reducing childhood obesity. Therefore, by having a preferred option not to introduce standards that targeted free sugars more than the NPM 2004/5, we would miss an important policy opportunity to address childhood obesity.

Option 2 – Apply the NPM 2018 to the Promotions and Advertising regulations (Preferred option)

91. This option would go further than the current restrictions, using them to their full advantage by underpinning them with NPM 2018. This would align the restrictions with the latest scientific advice and SACN’s dietary recommendations.
92. This option specifically meets government objectives to bring our policies up to date to tackle the childhood obesity crisis. This option is the most achievable and realistic as the NPM 2018 has been consulted on, and industry are aware of it. Underpinning our current restrictions with up-to-date dietary recommendations would target more products of most concern to childhood obesity by bringing more ‘less healthy’ products that currently pass the NPM 2004/5 into scope and therefore maximising the effectiveness of the policies.

93. We will engage with interested stakeholders on the updated NPM 2018 to listen to their concerns and publish technical guidance to support its use. This is ahead of further engagement as we plan to undertake a full public consultation on the application of the NPM 2018 to the advertising and promotions restrictions.

What are the expected costs and benefits

94. This option would strengthen the existing Advertising and Promotions Restrictions by bringing more products that are high in free sugars into scope.

95. Where quantified analysis has been undertaken for promotions restrictions, we estimate this could increase the number of products in scope of the legislation by 22% (see [Loss in retailer profit](#)).

96. The main categories of costs associated with this option are familiarisation, transition and on-going costs associated with lost profits to industry due to reduced sales of 'less healthy' food and drink products.

97. Over 25 years, expected direct costs to retailers and manufacturers include total transition costs of £17.42 million and direct lost profit of approximately £2.79 billion in 2023 prices.

98. The benefits of applying the NPM 2018 in restricting the promotion and advertising of 'less healthy' food and drink products are expected to be a reduction in purchasing of excess 'less healthy' food and drink products. Excess consumptions of 'less healthy' food and drink products leads to excess calorie consumption and weight gain over time. In the long-term this will help lower obesity prevalence and obesity related morbidity and mortality, compared to a counter-factual of no restrictions.

99. The expected health benefits for this option are estimated to be around £26.92 billion over the 25-year appraisal period. Reduced morbidity could also result in NHS and social care cost savings. Under our models, NHS savings could amount to £1.26 billion, Social Care cost savings of £1.13 billion and reduced premature mortality could be expected to deliver an additional £7.62 billion economic output through additional labour force participation.

100. Under our models, the total benefits could be around £36.93 billion, giving a total net benefit present value of £34.12 billion, in addition to the benefits achieved by the existing regulations.

Why we proceeded with this option to the shortlist

101. Option 2 is the preferred option and has been carried forward onto the shortlist. This option clearly fulfils government ambition to bring current legislation up to date with the latest advice on nutrition standards.

102. This option strikes the right balance between being robust and challenging with industry and implementing proportionate regulation. For example, it brings more products of concern to childhood obesity into scope of the restrictions while also providing some stability for industry by not changing the scope of the Advertising and Promotions Restrictions themselves. This enables the policies to continue to embed since their introductions.

Option 3 – Apply the NPM 2018 and update product categories

103. This option would go further than the current restrictions, both in terms of updating the underpinning NPM, but also by updating product categories that have been identified as those contributing most to children’s sugar and calorie intakes and therefore of most concern to childhood obesity. This option would require further analysis to explore its impact and the examples below are included for illustrative purposes.
104. This option, while being more ambitious, goes further than the public commitment made in the 10YHP. This option creates an opportunity to bring further products into scope of the restrictions, thereby further increasing the potential of our restrictions. This option targets the products of most concern and therefore further reduces children’s exposure to ‘less healthy’ products of concern for childhood obesity. While this option would create additional burden to industry, we feel this to be outweighed by the wider societal benefits through reductions in childhood obesity.
105. Updates to current categories could include ‘sweet spreads’ and ‘savory pastries’. These categories contain a very high proportion of ‘less healthy’ products which are of specific concern to childhood obesity. Including these would also provide closer alignment with categories included in the Sugar/Calorie reduction programmes. For example, our analysis⁴⁷ using Worldpanel by Numerator’s Take Home Data⁴⁸ estimates that 91% of calories purchased from ‘savory pastries’, are from ‘less healthy’ products, while ‘less healthy’ ‘sweet spreads’ have a high average sugar content at 34.6g per 100g.
106. Data from our National Diet and Nutrition Survey (NDNS 2019 to 2023) shows that savory pastries contribute to around 1-2% of energy and sodium intake and 2-4% saturated fat intake in children aged 1½ to 18 years. These contributions from savory pastries tend to increase with age. Sweet spreads contribute around 1% of energy intake and around 1-2% free sugars intake. These contributions to energy intake are similar to those from flavoured milk drinks, ice cream and soft drinks with added sugar for example.
107. While ‘savory pastry’ products are included as a category in the calorie reduction programme and ‘desert toppings/sauces’ are included as a sub-category under ‘sweet spreads and sauces’ in the sugar reduction programme, both categories are currently listed as a key exclusion in the promotions and advertising regulations.⁴⁹ The rationale for this has been previously challenged by stakeholders and this option looks to address this.
108. Our analysis using Worldpanel by Numerator, Take Home Data shows that, when considering non-regulated categories only, pies and quiches (which includes savory pastries)

⁴⁷ All analysis and interpretation contained in this publication were conducted independently of Worldpanel by Numerator. Worldpanel has not independently verified the findings, nor does it endorse the views or conclusions presented in this report.

⁴⁸ Worldpanel by Numerator, GB Take Home Panel, 52 w/e 1st September 2024

⁴⁹ The definition for sweet spreads reflects that used in the sugar/calorie reduction programmes. It excludes products covered by jams legislation (all syrups and honey including treacle etc; and all preserves (jams, marmalades, curds) and mincemeat. Including these would be likely to increase percentage contributions

have the highest 'less healthy' sales. Garlic Bread, Sweet Spreads, and Savoury Biscuits have the highest sales / calorie ratios.

What are the expected costs and benefits

109. This option would strengthen the existing Advertising and Promotions Restrictions even further by bringing more products in the existing product categories that are high in free sugars into scope, as well as updating product categories.
110. Where quantified analysis has been undertaken for promotions restrictions, and if we were to update current categories to include 'sweet spreads' and 'savoury pastries', we estimate that together with applying the NPM 2018, this could increase the number of products in scope of the legislation by 34% (see Loss in retailer profit).
111. The main categories of costs associated with this option are familiarisation, transition and on-going costs associated with lost profits to industry due to reduced sales of 'less healthy' food and drink products. There will also be additional ongoing costs for assessing new or reformulated products in the updated product categories on a regular cycle.
112. Familiarisation and transition costs are the same as the preferred option. The loss of profit and product assessment costs are higher than in the preferred option due to the additional products in scope.
113. Over 25 years, expected direct costs to retailers and manufacturers include total transition costs of £17.53 million, lost profit of approximately £3.74 billion in 2023 prices.
114. The benefits of applying the NPM 2018 in restricting the promotion and advertising of 'less healthy' food and drink products, and updating the product categories, are expected to be a reduction in purchasing of excess 'less healthy' food and drink products. Excess consumptions of 'less healthy' food and drink products leads to excess calorie consumption and weight gain over time. In the long-term this will help lower obesity prevalence and obesity related morbidity and mortality, compared to a counter-factual of no restrictions.
115. The expected health benefits for this option are estimated to be around £36.05 billion over the 25-year appraisal period. Reduced morbidity could also result in NHS and social care cost savings. Under our models, NHS savings could amount to £1.69 billion, Social Care cost savings of £1.51 billion and reduced premature mortality could be expected to deliver an additional £10.2 billion economic output through additional labour force participation.
116. Under our models, the total benefits could be around £49.45 billion, giving a total net benefit present value of £45.77 billion, in addition to the benefits achieved by the existing regulations.
117. This option is higher in cost and in benefits compared to our preferred option, and the total net present value is higher.

Why we proceeded with this option to the shortlist

118. Option 3 was carried forward onto the shortlist. Although this option goes further than option 2, it is included as it meets the policy objective and fulfils the government ambition to

go further on tackling childhood obesity. This option would require further analysis to explore its impact.

Why this was not selected as the preferred option

119. Option 3 would go further than the commitment made in the 10YHP by expanding the products in scope of the categories. This would be seen as a significant step for industry and will lead to an additional regulatory administrative burden to change systems to take account of the new products and potential changing store formats as new products would have restrictions on them. This would not achieve the cross-Government commitment for regulatory reform to minimise administrative burdens of new regulations. We will consider views around the effectiveness of the categories within the regulations in more detail during consultation.

Summary and preferred option with description of implementation plan

Summary and preferred option

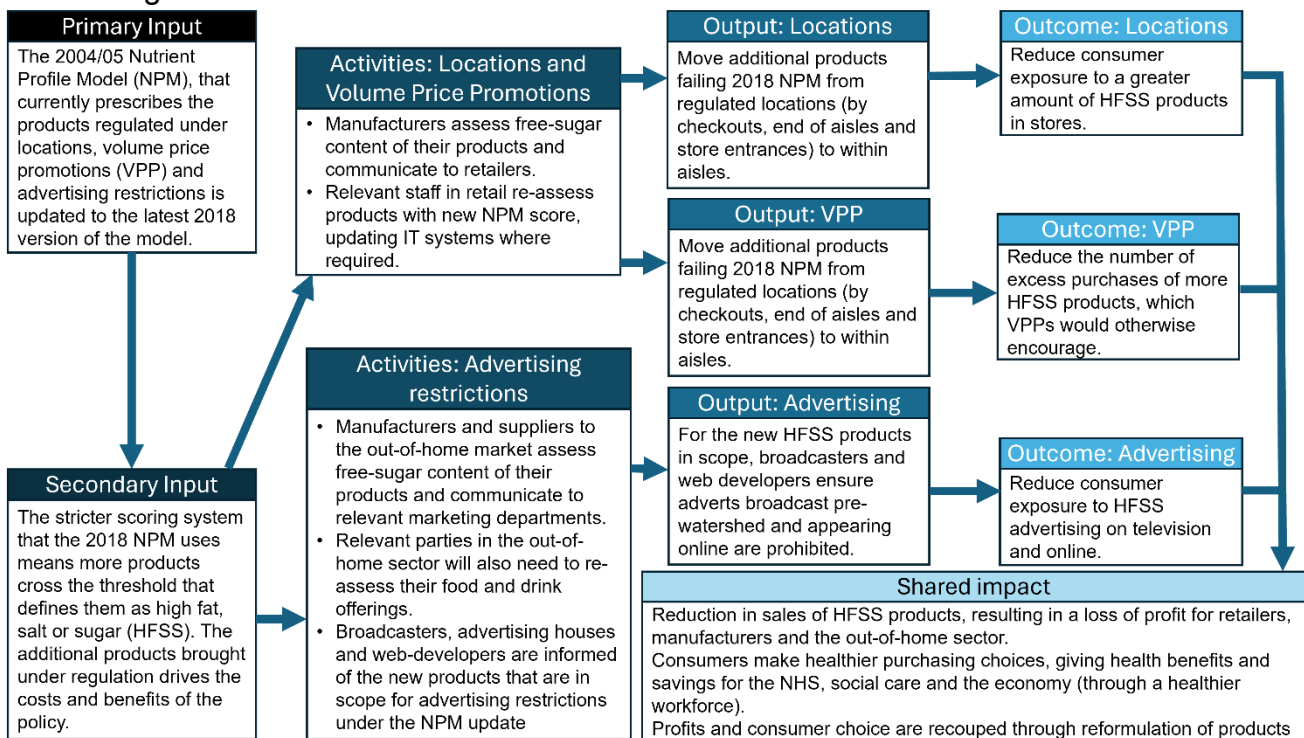
120. Option 2, applying the NPM 2018 to our promotions and advertising regulations is the preferred option.

121. This option is specific in that it directly addresses ambitions in the 10YHP to update the standards that categorise which foods are more or less healthy. Applying the NPM 2018 does not change the intended objectives or extend the scope of the legislation. The intention is to bring our restrictions up to date to current nutrition standards to ensure they can fulfil the governments ambition to take bold action to end the obesity epidemic.

122. This option is measurable as a direct comparison between the NPM 2004/5 and the NPM 2018 can be made to our policies. It is achievable as the NPM 2018 has already been designed and consulted on. It is realistic as no changes are being proposed to the overarching policy. It is time limited as all our policies are subject to a post implementation review within 5 years of implementation.

Logic Model

Image 2: NPM update logic model, and impacts on locations, volume price promotions and advertising restrictions.



Monetised and non-monetised costs and benefits of each option (including administrative burden)

Summary: Analysis and evidence

123. This table includes quantified costs for the impact of applying a new updated definition of 'healthier' food to Promotions Restrictions only. These represent the additional costs from this change in addition to those estimated within original impact assessments. At this stage it has not been possible to quantify impacts on Advertising Restrictions.

Table 1: Quantified costs for the impact of applying a new updated definition of 'healthier' food to Promotions Restrictions only (**Price base year: 2023; PV base year: 2027**)

	1. Business as usual (baseline)	2. Do-minimum option / preferred way forward	3. More ambitious preferred way forward
		Apply the NPM 2018	Apply the NPM 2018 and add product categories
Net present value (with brief description, including ranges, of individual costs and benefits)	N/A	<u>Retailers</u> Loss of profit (net): £958.38 million (£417.29 million-£4,076.58 million) Transition to NPM 2018: £0.27 million (£0.06 million-£0.86 million) Store rearrangement: £15.77 million (£9.93 million-£38.21 million) Total cost: £974.42 million <u>Manufacturers</u> Loss of profit (net): £199.08 million (£0.00 million-£1,136.68 million) Transition to NPM 2018: £1.38 million (£0.49 million-£3.64 million) Total cost: £200.46 million <u>Benefits</u> Economic benefit: £7.62 billion (£0.00-£34.91 billion) Health benefit: £26.92 billion (£0.00-£123.54 billion) NHS saving: £1.26 billion (£0.00-£5.81 billion) Social care saving: £1.13 billion (£0.00-£5.03 billion)	<u>Retailers</u> Loss of profit (net): £1.20 billion (£516.00 million-£5.14 billion) Transition to NPM 2018: £0.27 million (£0.06 million-£0.86 million) Store rearrangement: £15.77 million (£9.93 million-£38.21 million) Product assessment: £3.81 million (£1.39 million-£65.03 million) Total cost: £1.22 billion <u>Manufacturers</u> Loss of profit (net): £266.58 million (£0.00-£1.51 billion) Transition to NPM 2018: £1.49 million (£0.52 million-£3.92 million) Total cost: £268.07 million <u>Benefits</u> Economic benefit: £10.20 billion (£0.00-£46.34 billion) Health benefit: £36.05 billion (£0.00-£164.05 billion) NHS saving: £1.69 billion (£0.00-£7.73 billion) Social care saving: £1.51 billion (£0.00-£6.58 billion) Total benefits: £49.45 billion <u>Grand total NPV</u> £47.96 billion

		<p>Total benefits: £36.93 billion</p> <p><u>Grand total NPV</u> £35.76 billion</p> <p>(2023 prices, 2027 present value)</p>	(2023 prices, 2027 present value)
<p>Public sector financial costs (with brief description, including ranges)</p>	N/A	N/A	N/A
<p>Significant un-quantified benefits and costs (description, with scale where possible)</p>	N/A	<p>Non monetised costs:</p> <ul style="list-style-type: none"> • Reformulation cost to manufacturers • The impact on ingredient suppliers from reduction in 'less healthy' food and drink sales • Revenue loss to retailers <p>Non monetised benefits</p> <ul style="list-style-type: none"> • Health benefits from a potential increase in consumption of 'healthier' items • Health benefits to consumers from manufacturers reformulating their 'less healthy' food and drink products. <p>Further details can be found in the <u>non-monetised costs</u> and <u>non-monetised benefits</u> sections.</p>	
<p>Key risks (and risk costs, and optimism bias, where relevant)</p>	N/A	<p>When including results from evidence in the analysis, more conservative results are chosen to account for optimism bias.</p> <p>Key risks include:</p> <ul style="list-style-type: none"> • Interaction effects and double counting within the policies in scope of this proposal, existing policies and those announced in the 10 Year Health Plan • Locations promotions accounts for most of the costs and benefits and therefore totals are sensitivity to assumptions, especially compliance with existing regulations. • Potential over or underestimation of health benefits 	
<p>Results of sensitivity analysis</p>	N/A	<p>Sensitivity analysis has been carried out for Option 2 only; further details can be found in the <u>sensitivity analysis section</u>.</p> <p>This presents a range of scenarios which explore variation within the following variables:</p> <ul style="list-style-type: none"> • Staff wages • Business and store counts, with sensitivity in the number of retail businesses and stores whose primary function isn't to sell food and drink. 	

- | | | |
|--|--|--|
| | | <ul style="list-style-type: none">• Proportion of businesses with an online presence• Compliance with the existing location promotion regulations• The various factors underlying the transition costs.• Consumers compensation behaviour• The various factors underlying the lost profit calculations.• The various factors underlying the calorie reductions calculations |
|--|--|--|

Rationale and evidence to justify the level of analysis used (proportionality approach)

Background

124. Current **Advertising, Volume Price Promotions** and **Location Promotions** regulations use the **Nutrient Profile Model 2004/5** (NPM 2004/5) to determine which food and drink products are classified as 'less healthy' and in scope of the restrictions. Applying the NPM 2018 would bring products that are high in free sugars in scope of the restrictions and strengthen the impact of current policies.
125. Existing impact assessments for Advertising, Volume Price Promotions and Location Promotions estimate the costs and benefits of each policy based on reduced sales or exposure to products classified as 'less healthy' using NPM 2004/5. These impact assessments provide a robust assessment based on the sales, promotions and advertising landscapes at the time of writing, and the methodologies have all been Green rated by the Regulatory Policy Committee.
126. Over the last few years, the Location Promotions was implemented in October 2022 followed by the Volume Price Promotions which was delayed until October 2025. The Advertising restrictions came into force in January 2026, although industry had committed to voluntarily comply with these restrictions from 1 October 2025.
127. It is assumed that the sales, promotions and advertising landscapes will have evolved in recent years due to the implementation of Location Promotions and the anticipation of the upcoming policies. Due to the potential changes in the landscape and the delay, we were advised to update the Volume Price Promotions impact assessment to reflect the latest available data – this has again been Green rated by the Regulatory Policy Committee and has recently been published ahead of the regulations coming into force on 1 October 2025.
128. Although this update resulted in some changes to business costs following changes in the landscape, it does not significantly change the positive Net Present Value of the policy. The main changes to business costs were driven by:
- Profit margins for food and drink manufacturers are lower (6% in 2020 to 3.6% in 2023)
 - Fewer products are in scope of the regulation (58.44% in scope in 2020 compared to 36.22% in 2023), of which fewer products are classified as 'less healthy' (62% in 2020 compared to 51% in 2023)
 - Slightly fewer products are available on multibuy promotion (2.1% in 2020 compared to 2.0% in 2023)
129. The established methodologies are still considered to be robust for assessing these policies and will provide the basis of this assessment and subsequent final impact assessment as set out in the next section. While we extrapolate existing assumptions to the new products that would come under regulation due to the NPM update, these assumptions are still applicable to the new products. Further, the product categories in scope of the legislation remain constant for the preferred option explored here, with two additional product categories

added in the scenario for policy option 3. The costs and benefits presented here are for the NPM update in isolation and are in addition to costs and benefits realised under the policies appraised in the aforementioned impact assessments for the current Advertising, Volume Price Promotions and Location Promotions regulations.

130. This approach was Green rated by the Regulatory Policy Committee at Options Assessment stage.

Promotions Restrictions

131. This assessment uses methodologies established in the aforementioned IAs to provide a quantified assessment of the additional costs and benefits associated with applying the NPM 2018 to Volume Price Promotions and Location Promotions for each shortlist option:

- Apply the NPM 2018 (option 2 – preferred option)
- Apply the NPM 2018 and add product categories (option 3)

132. Where relevant and possible, data and assumptions have been updated in the existing methodologies to reflect changes in the product landscape since the original impact assessments were produced. The most significant update is the use of up-to-date food and drink purchasing data (2024), this captures changes in consumer purchasing behaviour, as well as any product reformulation carried out by industry, since the original impact assessments were produced.

133. This data has been used to create a **proxy data set** which allows us to calculate the existing (NPM 2004/5) and updated (NPM 2018) classifications for a sample of food and drink products (see Annex A). Due to considerations with the nutritional information available in the data held by the department, these classifications are the best assessment at this time but do introduce some uncertainty into this assessment. Data with more robust nutritional information has been commissioned for final impact assessment.

134. The established methodologies have been utilised in different ways to assess the impact of each option on the two promotion policies. As Volume Price Promotions has not yet been implemented, we have simply updated the analysis to a new baseline. Location Promotions has been in force since October 2022 so we assume that businesses will already be complying, to some extent, with the existing regulation.

- For **Volume Price Promotions**, the proxy data set (2024) has been used to provide an up-to-date assessment of the costs and benefits, using the NPM 2004/5 as a baseline. The same assessment is then produced applying the NPM 2018 (option 2 - preferred option), and again by applying the NPM 2018 with additional product categories (option 3). This approach allows us to simply calculate the additional costs and benefits under each option in this assessment.
- For **Location Promotions**, the proxy data set (2024) has been used to isolate products that we expect retailers have moved from regulated locations to comply with the regulation. We make assumptions about compliance in order to identify an updated baseline of products that remain in regulated locations following implementation. The cost benefit assessment is then conducted by applying the NPM 2018 (preferred option)

and again by applying the NPM 2018 with additional product categories (option 2). This enables us to calculate the costs and benefits under each option in this assessment.

135. In addition to this we have developed an approach to capture the **familiarisation costs** associated with applying the updated NPM 2018, this approach is assumption based and will be tested further at consultation stage and with stakeholders.

136. The last significant update is the use of the latest version of the Calorie Model (Version 4.2) (Annex B) to assess the health benefits of the estimated calorie reduction under each option. This version of the model includes additional obesity related conditions and updated underlying data compared to the original impact assessments and therefore provides a more complete assessment.

Advertising Restrictions

137. For the **Advertising Restrictions**, a qualitative assessment has been undertaken to describe the potential costs and benefits of each option within this assessment. The existing methodology relied heavily on analysis of industry data which was commissioned to establish the level of 'less healthy' advertising taking place on TV and online, and the time of day that takes place. This was essential for estimating the costs and benefits of the policy.

138. For this assessment it has not been possible to update this data to quantify the costs and benefits. This approach is high risk but is considered proportionate at this stage because we are at the early stages of policy implementation, including the potential application of the NPM 2018. The data required for this analysis is not easily accessible and would require a bespoke commission, as done for the previous impact assessment. It has also not been appropriate to replicate analysis using the previously commissioned data as it is from 2017 and does not reflect recent changes in the sector, including more online advertising.

139. For the final impact assessment, we plan to gather additional evidence on how the advertising landscape has evolved and, where possible, quantify the impact of applying an updated NPM. This will include drawing on insights from academics, stakeholders, and the wider evidence base to identify gaps, understand changes in advertiser behaviour, and assess what further analytical work can be undertaken.

140. Sensitivity analysis will be used to explore how the EANDCB will be affected if the costs and benefits of 'less healthy' advertising increase by the same proportion as the promotion policies and the amount that business costs would need to increase to break even with the estimated net benefits of the volume price and locations policies.

Promotions Restrictions

Monetised and non-monetised costs and benefits of each option for Promotions Restrictions (including administrative burden)

141. In this section we focus on the costs and benefits of the shortlist options for Promotions Restrictions. The table below outlines the costs and benefits captured in the analysis for which option and which costs are additional to those in the existing methodologies.

Table 2: overview of costs and benefits for Promotions Restrictions

	Description	Context (for monetised costs methodology)	Policy	Methodology
Monetised costs	Transition costs associated with businesses the familiarising themselves with the NPM 2018.	Retailers and manufacturers will need to pay staff to understand how the NPM 2018 is calculated, especially in relation to the free sugar requirements.	Shared	New
	Transition costs associated with assessing free sugar of products in scope of the regulation.	Technicians will be paid for assessing free sugars.	Shared	New
	Transition costs associated with assessing new products coming into scope of the regulation.	For option 3, new product categories come into scope which will need to be assessed for NPM score, in addition to those already in scope via previous legislation.	Shared	Existing
	Transition costs associated with distributing familiarisation and product assessment information to stores.	Manufacturers will need to liaise with retailers to communicate the free sugar content of their products.	Shared	New
	Transition costs associated with making changes to data stores and websites for new products coming into scope	Retailers with an online offering will need to pay IT professionals to integrate free sugar information into their data.	Shared	New
	Transition costs associated with the reorganisation of stores to replace new 'less healthy' food and drink items located in restricted locations.	Retailers will need to pay store staff to move in-scope products that fail the NPM out of regulated locations and replace them with non-restricted goods.	Locations	Existing
	On-going cost associated with assessing new or reformulated products	For option 3, new product categories come into scope, for which retailers will need to assess NPM scores every 1-3 years to keep up to date with new/reformulated products in their offering.	Shared	Existing
	Loss in profit to retailers and manufacturers because of reduced sales of 'less healthy' food and drinks	'Less healthy' food and drink products not on volume price promotion or at high-footfall locations will become less attractive to consumers.	Locations and VPP	Existing

	Profit offset to retailers and manufacturers due to retailers switching to price cuts	Retailers may use price cuts to pass on the same level of saving to consumers as Volume Price Promotions, though these are less attractive than Volume Price Promotions.	VPP	Existing
	Profit offset to retailers and manufacturers due to consumers compensatory behaviour and businesses using alternative marketing techniques	Consumers may replace purchases of restricted 'less healthy' food and drink products with unrestricted 'less healthy' goods.	VPP	Existing
	Profit offset to retailers and manufacturers from consumers purchasing food and drink products within aisles and in other locations within the store.	Consumers will still purchase 'less healthy' food and drink products at other locations, but there will be fewer impulse purchases due to less footfall/exposure to 'less healthy' goods within aisles.	Locations	Existing
	Profit offset to retailers and manufacturers from consumers purchasing 'healthier' products	Consumers may replace purchases of restricted 'less healthy' food and drink products with 'healthier' goods.	Locations and VPP	Existing
Non-monetised costs	Reformulation cost to manufacturers		Locations and VPP	Existing
	Impact on retailer and manufacturer relationship		Locations and VPP	Existing
	The impact on ingredient suppliers from reduction in sales of 'less healthy' food and drink products		Locations and VPP	Existing
Monetised benefits	A reduction in excess purchases of 'less healthy' food and drink products and therefore calorie overconsumption, with a consequent reduction in childhood obesity Prevalence		Locations and VPP	Existing
	A reduction in obesity-related morbidity and mortality, resulting in NHS and social care savings, and an increase in economic output		Locations and VPP	Existing

	A potential increase in consumption of 'healthier' items, contributing to further health benefits		Locations and VPP	Existing
Non-monetised benefits	Impact on consumers and consumer surplus		Locations and VPP	Existing
	Benefits to consumers as a result of reformulation		Locations and VPP	Existing
	Impact on productivity from preventing obesity related ill health		Locations and VPP	Existing
	Reinvested cost savings to the NHS		Locations and VPP	Existing

142. The magnitude of the costs and benefits could be significantly influenced by wider factors such as the proportion of sales offset from moving 'less healthy' food and drink products within aisles, consumers compensating behaviour and businesses using alternative marketing strategies to promote products. These have been factored into the calculations to an extent, and assumptions have been varied in the sensitivity analysis.

Monetised costs for Promotions Restrictions

Transition costs for Promotions Restrictions

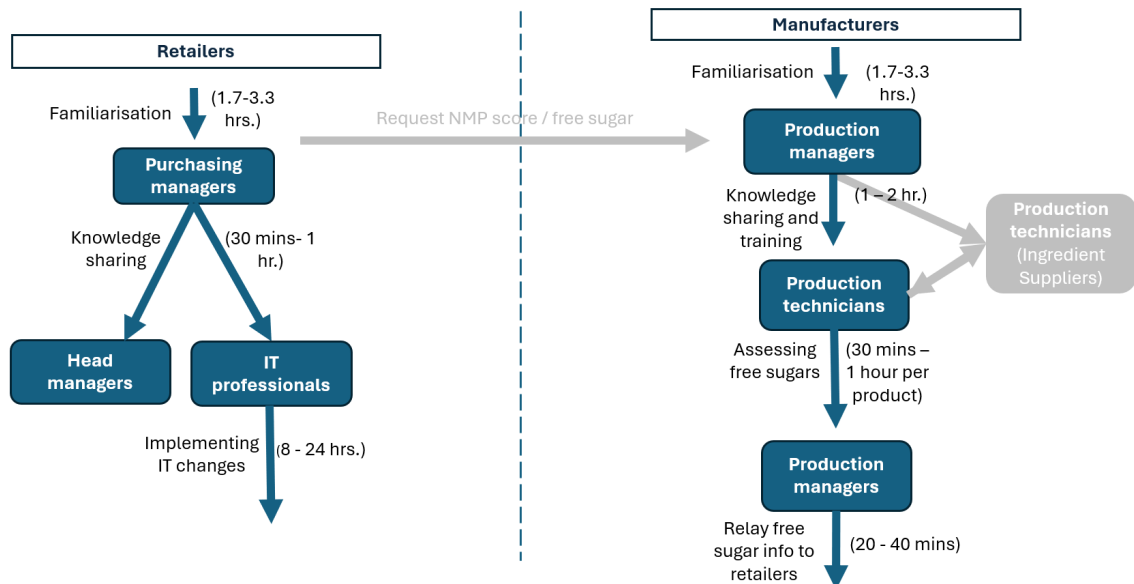
Transition costs are expected to fall within five categories:

- Familiarisation
- Product assessment, including NPM 2018 assessment.
- Knowledge sharing / training costs
- Updating IT systems
- Store planning and adjustment.

143. It is important to note that the transition costs estimated here are based on several assumptions covering the time it will take for businesses to familiarise themselves with the NPM 2018, assess new and existing products, and reorganise stores. These costs are considered as direct costs and captured in the EANDCB.

144. Sensitivity analysis using the maximum and minimum wage rate percentiles and other key assumptions has been conducted throughout this section to consider some of this uncertainty, the results of which are outlined in the summary table.

Image 3: flow chart of transition costs for Promotions Restrictions



Familiarisation

145. We assume that each retailer and manufacturer will have one manager who is responsible for understanding the change to the regulation and making their stores aware of the changes. DHSC will provide technical guidance to help businesses understand the NPM 2018 and the additional information that is required for them to calculate the score. This guidance is currently expected to be around 10,000 words. A report in 2013 by the consultancy EFTEC found that typical reading speeds for normal prose are 250-300 words per minute and technical text 50 – 100 words per minute. Assuming the technical guidance will be technical text and taking a midpoint of 75 minutes, we assume it will take 2.2 hours to read the guidance. We will consider a range of 1.7 to 3.3 hours within the sensitivity analysis.

146. Within retail we assume this takes place by a purchasing manager within head office equivalent to 'Purchasing managers and directors'. The median hourly wage rate for a head office manager is £25.57 in 2023 prices. This captures a large range of different level managers, as we cannot predict which member of staff a business would assign this role. This is uprated by 19% to £30.36 to account for non-wage labour costs such as national insurance and pensions⁵⁰.

147. Within manufacturers we assume this takes place by a production manager within head office equivalent to 'Production managers and directors in manufacturing'. The median hourly wage rate for a head office manager is £24.95 in 2023 prices. This captures a large range of different level managers, as we cannot predict which member of staff a business would assign this role. This is uprated by 19% to £29.63 to account for non-wage labour costs such as national insurance and pensions.

⁵⁰ Index of Labour Costs per Hour, UK: July to September 2020 (Office for National Statistics, 2020), available at: [Index of Labour Costs per Hour, UK - Office for National Statistics](#), accessed 29 January 2026. Based on non-wage labour costs as a percentage of total labour costs. ONS estimated that the value of labour costs was estimated at £22.80 per hour at whole economy level and wage costs contributed £19.20, with non-wage costs, such as pensions and National Insurance contributions, making up the rest. Based on this estimate we have uplifted wage costs by 18.75% to account for non-wage costs.

148. In practice, the wage rate will vary by business depending on the size and scale of the organisation. Sensitivity analysis using the maximum and minimum wage rate percentiles has been conducted to consider some of this uncertainty, the results of which are outlined below. For option 2 we estimate that there are 622 retailers and 1,049 manufacturers in scope in England and therefore our central estimate using the median average wages indicates that familiarisation cost to business will be £42,000 and £69,000 respectively, with a total of £111,000. For option 3 we estimate that there are 622 retailers and 1,120 manufacturers in scope in England and therefore our central estimate using the median average wages indicates that familiarisation cost to business will be £42,000 and £74,000 respectively, with a total of £116,000.

Knowledge sharing / training costs

We assume that purchasing and production managers who familiarise themselves with the changes will need to distribute this within their organisations.

Retail

149. As we assume that familiarisation of the NPM 2018 is done by a purchasing manager at a head office level within retailers, there would be an additional cost of this information being passed to a manager responsible for assessment of products. The original impact assessments assumed that assessment of products occurs at a business rather than store level. We assume that one purchasing manager at the head office will take 45 minutes, with a range of 30 minutes to 1 hour, to share this information with the assessment manager. Taking uplifted wage of the purchasing manager at head office (£30.36) and the uplifted wage of a 'Managers, directors and senior officials' (£28.35) for an assessment manager in the 622 retailers, the cost of sharing this information would be £27,000.

150. Similarly, we also assume that for online only retailers and retailers with an online offering (estimated to be 374 retailers), there would be an additional cost of information at the head office level being passed to IT professional who would be responsible of making these changes to the websites or data stores. Taking the uplifted wage of the purchasing manager at head office (£30.36) and the uplifted wage of an IT professional (£30.03), the cost of sharing this information would be £17,000.

151. We have assumed that information on what products to promote in the key locations (following product assessment at a head office level) will also be shared at the same time.

Manufacturer

152. As we assume that familiarisation of the NPM 2018 is done at a head office level within manufacturers, there would be an additional cost of this information being passed to production teams. We assume that one production manager at the head office will take 1 hour 30 minutes, with a range of 1 to 2 hours, to share this information with production technician. Given the changes to the calculation and the new information required on free sugar we expect this will include training sessions.

153. For option 2, taking uplifted wage of the production manager at head office (£29.63) and the uplifted wage of a 'Planning, process and production technicians' (£19.31) for the production technician in the 1,049 manufacturers, the cost of sharing this information would be £138,000. For option 3, taking uplifted wage of the production manager at head office (£29.63) and the uplifted wage of a 'Planning, process and production technicians' (£19.31) for the production technician in the 1,120 manufacturers, the cost of sharing this information would be £147,000. Given the ingredient information required, for example on free sugar, we expect manufacturers will also need to pass on information and offer training sessions for ingredient suppliers involved in the supply chain. This has not been monetised at this stage as it is a second order effect, however we have used a wider range within the sensitivity to account for this.

Product assessment, including NPM 2018 assessment

154. To comply with this change in the regulations retailers will need to assess whether each of the products they stock is within the categories in scope of the restrictions and, if yes, they will need to assess whether it is considered 'less healthy' by calculating the NPM 2018 score.

155. DHSC provided guidance to help businesses implement the existing promotions restrictions, it is therefore assumed that they are familiar with this process and have most of the information available to assess their products. One of the key differences with the NPM 2018 is the requirement to know the free sugar content of each product. To assist retailers and minimise the burden of this assessment, DHSC will provide guidance to help businesses understand the NPM 2018 and the additional information that is required to calculate the score.

NPM 2018 assessment

156. Both options include a one-off cost to business of calculating the NPM 2018. It is expected that retailers will contact the manufacturers of their own brand products to request the 'less healthy' status of each product, and that manufacturers will calculate the NPM 2018 and 'less healthy' status of each branded product.

157. It is expected that assessing the free sugar of each product in scope will be novel and require the most time. We have included all in scope manufacturers to capture own brand and branded products. For option 1 there are 1,049 manufacturers in scope in England, for option 2 there are 1,120. From engagement with industry stakeholders, we expect that a team of 3 staff, with a range of 2 to 4, will be required to assess the free sugars of each product, this could include nutritionists, research and development staff, and those involved in the supply chain.

158. We have also assumed it will take 45 minutes, with a range of 30 minutes to 1 hour, to assess each product. As described within the knowledge sharing section, this includes time for manufacturers to contact ingredient suppliers to request ingredient information such as free sugar. The cost will depend on the number of products stocked by each business. Our analysis using Worldpanel by Numerator, Take Home Data, estimates an average of 25 in scope products per manufacturer in Option 2 and 26 products per manufacturer in Option 3.

159. For option 2, we have used the median wage of three product technicians (£19.31) multiplied by the assessment time per product (45 minutes), the number of in scope manufacturers (1,049), and the average number of products (25) resulting in a cost of £1.16 million. For option 3, we have used the median wage of three product technicians (£19.31) multiplied by the assessment time per product (45 minutes) and the number of in scope manufacturers (1,120) and the average number of products (26) resulting in a cost of £1.25 million.

Product assessment

160. Option 3 also includes the cost of assessing the additional products coming into scope through amending the legislative categories. Within this assessment we have included costs and benefits for amending the legislative categories to include 'Sweet Spreads' and 'Savoury Pastries'.

161. Our analysis of Worldpanel by Numerator, Take Home Data estimates that including 'Sweet Spreads' and 'Savoury Pastries' results in an additional 3.2% of products in scope which will require a one-off product assessment. The cost of product assessment follows the established methodology set out on page 50 of locations promotions impact assessment. The assumptions for the staff doing the assessment and the time taken for assessment remain the same. We have updated the number of businesses to reflect the current landscape and the wages to the latest prices. For option 3 only, this results in one-off product assessment for retailers at a cost of £429,000.

Relaying information

162. Following product assessment, we assume a cost for manufacturers relaying information back to retailers. This is captured in the summary table as knowledge sharing. We assume this relaying of information is between the production manager within manufacturers and store managers within retailers. This is assumed to take 30 minutes with a range of 20 to 40 minutes.

163. For option 2, taking uplifted wage of the store manager (£28.35) and the uplifted wage of a production manager (£29.63) in 622 retailers and 1,049 manufacturers, the cost of sharing this information would be £9,000 for retailers and 16k for manufacturers totalling £24,000. For option 3, taking uplifted wage of the store manager (£28.35) and the uplifted wage of a production manager (£29.63) in 622 retailers and 1,120 manufacturers, the cost of sharing this information would be £9,000 for retailers and £17,000 for manufacturers totalling £25k.

Updating IT systems

164. We assume that online only retailers and retailers with an online offering will need to make changes to their IT systems to store the NPM 2018 and make changes to websites for new products coming into scope.

165. This is estimated to take one IT professional 16 hours, with a range of 8 to 24 hours, in each of the 374 retailers. Taking the uplifted wage of the IT professional (£30.03) this is estimated to cost retailers £180,000.

Store planning and adjustment

166. Once products have been assessed, retailers need to re-plan store layouts so ‘less healthy’ food and drink items are no longer placed at checkouts, ends-of-aisles and store entrances. Due to the range of possible store designs, we assume that this planning occurs at store level. It is possible that some of this planning may not be necessary in addition to what was done for the original policies, however, in the absence of evidence these costs have been included for additional products coming into scope.

167. The cost of store planning and adjustment follows the established methodology set out on page 51 of locations promotions impact assessment. The assumptions for the staff involved remains the same. To reflect that fewer products need planning and arrangement compared to the original policy, we have reduced the time taken by a factor of 4. This reduces the time taken for planning to 6 hours for stores which are 2,000-3,000 square feet, to 36 hours for those more than 3,000 square feet and reduces the time taken for rearrangement to 2 hours. We have updated the number of stores to reflect the current landscape and the wages to the latest prices. For both options, the estimated total cost for planning is £15.1 million and re-arranging will be £680,000. This results in total costs for retailers of £15.8 million.

Summary

Table 3: Transition costs for Promotions Restrictions for option 2 in 2023 prices (£ millions)

Option 2	Low	Central	High
Retailers	10.00	16.04	39.07
Manufacturers	0.49	1.38	3.64
Total	10.48	17.42	42.71

Table 4: Transition costs for Promotions Restrictions for option 3 in 2023 prices (£ millions)

Option 3	Low	Central	High
Retailers	10.22	16.47	42.88
Manufacturers	0.52	1.49	3.92
Total	10.74	17.96	46.80

Ongoing costs for Promotions Restrictions

168. The on-going costs for Promotions Restrictions are expected to fall under these three main categories:

- Ongoing product assessment
- Loss in retailer profit
- Loss in manufacturer profit

These costs will occur throughout the 25-year appraisal period. Sensitivity analysis using key assumptions has been conducted throughout this section to consider some of the uncertainty, the results of which are outlined in the summary table.

Ongoing product assessment

169. The original impact assessments included ongoing product assessment costs for retailers as a result of the promotions regulations. As new products come into the market or products are reformulated, in order to comply with the regulations, retailers will need to assess whether

each of the products they stock is within the categories in scope of the restrictions and, if yes, they will need to assess whether it is considered 'less healthy' by calculating its NPM score.

170. Stakeholder engagement for the original policies highlighted that products have a general reformulation cycle, where reformulation occurs between every 6 months to 3 years; the impact assessment assumed a central scenario of 2 years. Assessment is assumed to take 30 minutes to 1 hour per product and the number of products assessed is proportional to the percentage of total products which come into scope via the policy. The maximum number of food and drink products that could be appraised in each retailers' inventory is 25,000 for the largest retailers (Tesco and Amazon), 16,500 for other supermarket chains and 1,000 for all other retail businesses in scope, which have been doubled in the upper-limit calculations.

171. This assessment assumes the proposed changes will come into force for Volume Price Promotions restrictions and location restrictions at the same time. Both sets of restrictions will apply to the same products. This means businesses subject to both restrictions will only need to assess a product once to establish if it is subject to both restrictions. This is therefore a shared cost across both policies.

172. For option 2 it is assumed that as the legislative categories have not changed, the same products will be assessed on an ongoing cycle. Following the familiarisation costs to assess the free sugar of the products, this is not expected to have an ongoing cost above that estimated in the original impact assessments^{51,52}. For option 3 where the legislative categories are amended to include 'Sweet Spreads' and 'Savoury Pastries', we expect additional products to come into scope of this product assessment cycle.

173. The ongoing cost of product assessment follows the established methodology set out on page 52 of locations promotions impact assessment. The assumptions for the staff doing the assessment and the time taken for assessment remain the same. We have updated the number of businesses to reflect the current landscape and the wages to the latest prices. For option 3 only, this results in one-off product assessment for retailers at a cost of £5.14 million over the 25-year appraisal period. These costs are considered as direct costs and captured in the EANDCB.

Table 5: Ongoing product assessment for Promotions Restrictions for option 3 in 2023 prices (£ millions)

Option 3	Low	Central	High
Ongoing product assessment	1.80	5.14	91.50 ⁵³

⁵¹ Restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS; DHSC, 2020), available at [Impact assessment of restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar \(HFSS\)](#), accessed 26 January 2026.

⁵² Restricting volume price promotions for high fat, sugar, and salt (HFSS) products (DHSC, 2020), available at: [Final impact assessment: restricting volume promotions of HFSS products](#), accessed 26 January 2026.

⁵³ The reason for the high upper value is due to sensitivity in staff wages (table 15) and number of products and time taken for assessment (table 20).

Loss in retailer profit

174. Retailers are expected to plan promotions and store layouts to maximise profits. Consequently, any restriction on their ability to do this is expected to affect sales and reduce profits.

- For Location Promotions, there is a direct loss in profit due to a loss in sales. There is also expected to be indirect gains in sales from consumers buying 'less healthy' and 'healthier' products and from moving 'less healthy' items within aisle. This is used to estimate the net loss in profit.
- For Volume Price Promotions, there is a direct loss in profit due to a loss in sales. There is also expected to be indirect gains in sales from consumers buying 'less healthy' and 'healthier' products and if retailers chose to offset any loss of profit by switching to price cuts. This is used to estimate the net loss in profit.
- Analysis commissioned from Worldpanel by Numerator⁵⁴ found that 'less healthy' products under the 2004/5 NPM purchased on promotion account for 6.1% of overall Food and Drink volume, though within legislative categories, 'less healthy' items are generally promoted less, except for Confectionery, Ice Cream and Chips. A similar analysis has not been conducted for the additional products classed as unhealthy under the 2018 NPM.
- There is significant variation in the upper and lower estimates for lost profit, largely driven by wide ranges in the percentage of calories compensated for as consumers adapt to the promotion restrictions (0%-100%) and the percentage of sales lost when impacted products are moved from checkouts to aisles (16%-90%).
- Direct losses are considered as direct costs and captured in the EANDCB.

175. Both options within this assessment are expected to increase the number of products in scope of the legislation, which means we expect additional lost profit for retailers.

- Option 2, through use of the NPM 2018, which will classify additional products as 'less healthy'.
- Option 3, through first adding additional legislative categories, which will first bring more products into scope, and then use of the NPM 2018 which will classify additional as 'less healthy'.

176. The original Volume Price Promotions impact assessment included ongoing lost profit retailers incurred due to restrictions to Volume Price Promotions. The updated impact assessment updated the analysis to include the latest data and evidence as to reflect the current policy landscape; this is set out in detail from page 52 of the updated impact assessment.

177. At a high level, the Volume Price Promotions methodology first estimates the total sales of 'less healthy' products that occur due to Volume Price Promotions. We use the value of food and drink retail sales, with the proportion of excess sales (sales that would not happen if the product was not on promotion) that occur due to Volume Price Promotions, assuming that the proportion of regulated sales that are excess is in proportion of the percentage of total retail expenditure that is excess. The proportion of sales in scope of the policy and that fail the NPM is then applied. To calculate the value of lost sales, we estimate that a proportion of the sales

⁵⁴ Worldpanel by Numerator, Take Home Data, 2 years to 4th August 2024. Unpublished analysis commissioned by DHSC.

will be offset by retailers using alternative marketing strategies to promote products, like temporary price cuts and consumers compensating the lost calories. The retailer profit margin is applied to lost sales, to calculate the total lost profit to retailers. Likewise, the original locations promotions impact assessment included ongoing impact of removing 'less healthy' products from checkouts on checkout, end of aisle and store entrances as set out in detail on page 53 of the impact assessment.

178. The Location Promotions methodology first estimates the total sales of 'less healthy' products that occur at checkouts, end of aisles and store entrances, we use the value of food and drink retail sales, with the proportion of sales that occur in each location, proportion of sales in scope of the policy and the products that fail the NPM. To calculate the value of lost sales, we estimate that a proportion of the sales will be offset by retailers from moving 'less healthy' items within aisle and consumers compensating the lost calories. The retailer profit margin is applied to lost sales, to calculate the total lost profit to retailers.
179. We have used these established methodologies to isolate the additional loss of profit due to the policy options in this assessment. First a proxy data set was created which allows us to calculate the existing and updated NPM classifications for a sample of food and drink products from Worldpanel by Numerator, Take Home Data (see Annex A). This analysis estimates that Option 2 will increase the number of products in scope of the legislation by 22%, whilst option 3 increases the products in scope of the legislation by 34%. In terms of sales, the new products represent an increase of 27% and 36% in scope of the promotions restrictions, for options 2 and 3 respectively.
180. The established methodologies have then been utilised in different ways to assess the impact of each option on the two promotion policies. As Volume Price Promotions has not yet implemented, we have simply updated the analysis to a new baseline. Location Promotions has been in force since October 2022 so we assume that businesses will already be complying, to some extent, with the existing regulation.
- For Volume Price Promotions, the proxy data set has been used to provide an up-to-date assessment of the loss of profit using the NPM 2004/5 as a baseline. The same assessment is then produced applying the NPM 2018 (option 2 - preferred option), and again by applying the NPM 2018 with additional product categories (option 3). This allows us to simply calculate the additional loss of profit under each option in this assessment.
 - For Location Promotions, the proxy data set has been used to isolate products that we expect retailers have moved from regulated locations to comply with the regulation. We make assumptions about compliance to define a new baseline of products that remain in regulated locations following implementation. The loss of profit assessment is then conducted by applying the NPM 2018 (preferred option) and again by applying the NPM 2018 with additional product categories (option 3). This enables us to calculate the additional loss of profit under each option in this assessment.

181. For option 2, this approach implies direct annual lost profits of around £115.62 million. The direct loss of retailer profit because of the regulation is estimated at a total of £2.79 billion in 2023 prices over the 25-year appraisal period.

182. Factoring in offsetting across the two policies through consumers buying ‘less healthy’ and ‘healthier’ products, retailers moving ‘less healthy’ items within aisle, and retailers choosing to switch to price cuts over volume price promotions results in an indirect gain in profit of £1.46 billion in 2023 prices over the 25-year appraisal period. This equates to a net loss in retailer profit of £1.43 billion over the 25-year appraisal period in 2023 prices. We have assumed that consumers will substitute ‘less healthy’ products impacted by the policy with healthier alternatives, but we have not investigated how this might vary by product category or how available ‘like-for-like’ substitutions will be for the product categories in scope.

183. For option 3, this approach implies direct annual lost profits of around £149.42 million. The direct loss of retailer profit because of the regulation is estimated at a total of £3.74 billion in 2023 prices over the 25-year appraisal period. Factoring in offsetting across the two policies through consumers buying ‘less healthy’ and ‘healthier’ products, retailers moving ‘less healthy’ items within aisle, and retailers choosing to switch to price cuts over volume price promotions results in an indirect gain in profit of £1.95 billion in 2023 prices over the 25-year appraisal period. This equates to a net loss in retailer profit of £1.79 billion over the 25-year appraisal period in 2023 prices. Direct loss in profit is considered a direct cost and captured in the EANDCB.

184. The table below outlines the expected impact of the policy on retailer profits over the 25-year appraisal period in 2023 prices.

Table 6: Retailer profit summary for Promotions Restrictions for option 2 in 2023 prices (£ millions)

Option 2	Low	Central	High
Direct loss in profit	937.92	2,890.43	9,108.53 ⁵⁵
Indirect gain in profit	315.46	1,460.85	3,027.63
Net impact on profit	622.46	1,429.58	6,080.90
Average annual direct profit loss	37.52	115.62	364.34
Average annual net profit loss	24.90	57.18	243.24

Table 7: Retailer profit summary for Promotions Restrictions for option 3 in 2023 prices (£ millions)

Option 3	Low	Central	High
Direct loss in profit	1,186.32	3,735.46	11,744.54
Indirect gain in profit	416.61	1,945.71	4,077.85

⁵⁵ The reason for the high upper value is largely down to sensitivity is the proportion of sales lost when goods are moved to aisles and profit margins (table 21).

Net impact on profit	769.70	1,789.74	7,666.70
Average annual direct profit loss	47.45	149.42	469.78
Average annual net profit loss	30.79	71.59	306.67

Loss in manufacturer profit

185. The calculations above provide estimates of the possible shifts in sales resulting from the legislation. While all retailers will experience offsetting increases in sales of other products, there will be clear distributional impacts for manufacturers of ‘less healthy’ products.
186. The original Volume Price Promotions impact assessment included ongoing lost profit manufacturers incurred due to shifts in sales resulting from the legislation. The updated impact assessment updated the analysis to include the latest data and evidence as to reflect the current policy landscape; this is set out in detail on page 68 of the impact assessment⁵⁶. Likewise, the original locations promotions impact assessment included ongoing lost profit manufacturers incurred due to shifts in sales resulting from the legislation as set out in detail from page 57 of the impact assessment.
187. At a high level these methodologies first estimate the manufacturers lost revenue by applying an assumption for the retailers mark up to the reduction in retail sales. Using the manufacturer’s profit margin, we can then estimate the change in profits. To calculate the net loss in manufactures profit, we assume some of the lost profit is offset through gains for ‘healthier’ manufactures.
188. As was done for loss in profit for retailers, we have used these established methodologies to isolate the additional loss of profit due to the policy options in this assessment. For option 2, this approach implies direct annual lost profits of around £51.14 million. The direct loss of manufacturer profit because of the regulation is estimated at a total of £1.28 billion in 2023 prices over the 25-year appraisal period. It is also assumed that the offsetting in sales in the retail sector outlined above will feed into the manufacture sector resulting in an indirect gain in profit of £0.98 billion in 2023 prices over the 25-year appraisal period. This equates to a net loss in manufacturer profit of £296.97 million over the 25-year appraisal period in 2023 prices.
189. For option 3, this approach implies direct annual lost profits of around £68.94 million. The direct loss of manufacturer profit because of the regulation is estimated at a total of £1.72 billion in 2023 prices over the 25-year appraisal period. It is also assumed that the offsetting in sales in the retail sector outlined above will feed into the manufacture sector resulting in an indirect gain in profit of £1.33 billion in 2023 prices over the 25-year appraisal period. This equates to a net loss in manufacturer profit of £397.65 million over the 25-year appraisal period in 2023 prices. The lost profit for ingredient suppliers and other manufacturers involved in the supply chain has not been monetised as it is a second order effect and not in scope.

⁵⁶ Restricting volume price promotions for high fat, sugar, and salt (HFSS) products (DHSC, 2020), available at: [Final impact assessment: restricting volume promotions of HFSS products](#), accessed 26 January 2026.

Table 8: Manufacturer profit summary for Promotions Restrictions for option 2 in 2023 prices (£ millions)

Option 2	Low	Central	High
Direct loss in profit	353.18	1278.39	3370.77
Indirect gain in profit	353.18	981.42	1675.22
Net impact of profit	0.00	296.97	1695.55
Average annual direct profit loss	14.13	51.14	134.83
Average annual net profit loss	0.00	11.88	67.82

Table 9: Manufacturer profit summary for Promotions Restrictions option 3 in 2023 prices (£ millions)

Option 3	Low	Central	High
Direct loss in profit	476.03	1723.62	4523.46
Indirect gain in profit	476.03	1325.97	2271.83
Net impact of profit	0.00	397.65	2251.63
Average annual direct profit loss	19.04	68.94	180.94
Average annual net profit loss	0.00	15.91	90.07

Increase from costs and benefits under NPM 2004/5

190. For volume price promotions restrictions, additional total lost profit felt by retailers and manufacturers due to the NPM update is estimated to be 27% of that under NPM 2004/5. Since our datasets cover a period before the volume price promotions were implemented, the percentage increase is estimated directly from our analysis by calculating the percentage increase in loss profit due to products restricted by NPM 2018, relative to NPM 2004/5. Similarly, predicted daily calorie intake reduction is impacted proportionally.

191. For locations restrictions, since our data covers a period since the policy was implemented, the additional impact on profit is calculated using the total lost profit for manufacturers and retailers in the published impact assessment⁵⁷ (page 69). Accounting for the different price bases, the value from our analysis is approximately 18% higher.

Non-monetised costs for Promotions Restrictions

Costs to government

192. To enforce the existing legislation, the promotion of these products is checked as part of normal inspection visits. These are the primary method of enforcement used by local authorities and are carried out on the basis of a combination of risk and intelligence, which was highlighted through consultation of the original policies.

⁵⁷ Restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar (HFSS; DHSC, 2020), available at [Impact assessment of restricting checkout, end-of-aisle, and store entrance sales of food and drinks high in fat, salt, and sugar \(HFSS\)](#), accessed 26 January 2026.

193. We anticipate enforcement costs to remain at a similar level, as the nature of the regulation has not changed, just the number of products in scope has increased. Though there is potential that with more products in scope of this regulation that there are a greater number of potential breaches in the regulations.

Reformulation

194. Some manufacturers might respond to the changes in these restrictions by reformulating the additional products coming into scope in order to be able to promote them in restricted locations and use Volume Price Promotions. The original locations promotions impact assessments set this out in detail on page 58.

195. The costs of any reformulation will likely vary substantially from one product to another, depending on the amount of changes that need to be made, the cost of alternative ingredients, the time taken to reformulate the products and the cost associated with revising labels and advertising reformulated products. Due to the uncertainties surrounding these costs and the commercially sensitive nature of this information we have not been able estimate the cost of any potential reformulation at this stage. The cost of reformulation would also be considered as indirect cost, as there is no requirement under this policy for manufacturers to reformulate.

Retailer-manufacturer relationship

196. The estimates above take a somewhat simplistic view of the relationship between manufacturers and retailers. Decisions about the timings and types of promotions which are offered during any given week will be the result of a series of negotiations between retailers and manufacturers. Stakeholder engagement for the original policies identified that manufacturers of products are willing to pay a premium to retailers to ensure their products receive prominent positioning within stores. Restricting the placement of 'less healthy' products within certain locations would clearly have substantial implications for this relationship, as would restricting the use of Volume Price Promotions.

197. We expect this cost to apply to these policy options as further products come into scope of the regulations. However, due to the lack of publicly available information in this area, it has not been possible to assess the implications of these restrictions on this relationship. The original Location Promotions impact assessments set this out in detail on page 59.

The impact on ingredient suppliers

198. In addition to the impact on manufacturers and retailers, there could be an impact on ingredient suppliers for assessing the free sugar in products and as the reduction in sale of 'less healthy' products would reduce their profits.

199. The NPM 2018 assessment costs and lost profit for ingredient suppliers involved in the supply chain has not been monetised as it is a second order effect. We do not think it is proportionate to monetise the impact on profit to these businesses as it could be due to a number of other factors (e.g. reformulation programmes) and therefore it is difficult to

understand the impact on their profits as a result of this policy alone. In addition, we currently do not have data on the number of ingredient suppliers working with manufacturers affected by this policy and this information was not possible to gather from stakeholders for this assessment.

The Impact on consumer utility

200. While unhealthy foods are associated with negative health impacts, and choices around their consumption are not always entirely rational, it is important to acknowledge that consumers may derive enjoyment or satisfaction from consuming these products. Restricting access to certain foods could therefore result in a loss of utility for some individuals. Although the overall health benefits of the regulations are expected to be positive, we recognise that these benefits may be partially offset by the reduction in consumer enjoyment. The extent of this offset is uncertain and has not been quantified, but it is a relevant consideration when assessing the full impact of the policy.

Monetised benefits for Promotions Restrictions

Calorie reduction estimate

201. This policy aims to reduce obesity prevalence across the population by reducing excess calorie intake from food and drinks classified as 'less healthy'. This assessment follows the established methodology for estimating the calorie reduction as set out in the Location Promotions impact assessment from page 61 and the updated Volume Price Promotions impact assessment from page 73. By the existing methodology, calorie reduction is proportional to the reduction in retail sales, so the sensitivity in the calorie reductions is inherited from sensitivity in the sales share and sales uplift due to products being in regulated locations, as well as the calorie compensations factor that offsets the policies' impacts on consumer behaviour (table 21).

202. To estimate the calorie reduction the net loss in sales (see loss of retailer profit section) is split into two parts, the net loss in 'less healthy' and net gain in 'healthier' sales. The loss in 'less healthy' and gain in 'healthier' sales is applied to the total sales of 'less healthy' and 'healthier' products in the market, to calculate the percentage change in 'less healthy' and 'healthier' sales. The percentage reduction in 'less healthy' and increase in 'healthier' sales is applied to the calorie intake of 'less healthy' and 'healthier' products to calculate the calorie reduction from changes in consumption of 'less healthy' and 'healthier' products, to get the net reduction in calories.

203. To simplify the analysis, the approach to calorie reduction assumes the percentage change in sales of products equates to the same percentage change in calories purchased, and this is the same for both 'less healthy' and 'healthier' products. In reality, our analysis using Worldpanel by Numerator, Take Home Data shows that £ for £, consumers receive 39% more calories from 'less healthy' products than 'healthier' products.

204. For final impact assessment we will consider improving upon this methodology to factor in the difference in sales to calorie ratios. As with loss of profit, this assessment then isolates the

additional calorie reduction under each option resulting from the additional products coming into scope of the regulations.

- For Volume Price Promotions, the proxy data set has been used to provide up-to-date assumptions using the NPM 2004/5 as a baseline. The same assessment is then produced applying the NPM 2018 (option 2 - preferred option), and again by applying the NPM 2018 with additional product categories (option 3). This allows us to simply calculate the additional calorie reduction under each option in this assessment.
- For Location Promotions, the proxy data set has been used to isolate products that we expect retailers have moved from regulated locations to comply with the regulation. We make assumptions about compliance to define a new baseline of products that remain in regulated locations following implementation. The calorie reduction assessment is then conducted by applying the NPM 2018 (preferred option) and again by applying the NPM 2018 with additional product categories (option 3). This enables us to calculate the additional calorie reduction under each option in this assessment.

205. Using Worldpanel by Numerator, Take Home Data, we have estimated that the proportion of calories purchased that are ‘less healthy’ and ‘healthier’ across the whole food and drink market is 51% and 49% respectively under the current NPM, and 57% and 43% respectively under the NPM 2018. This means that a larger proportion of calories purchased are classified as ‘less healthy’ using the NPM 2018 and therefore the policies result in an additional calorie reduction compared to the current NPM.

206. In addition to this, further legislative categories are in scope of Option 3, meaning that the estimated calorie reduction is larger still. The estimated calorie reductions for specific age-gender groups for each option are displayed in the table below.

Table 10: Current calorie consumption and expected reductions for Promotions Restrictions for option 2

Option 2	Males				Females			
	4-10	11-18	19-64	65+	4-10	11-18	19-64	65+
Mean daily calorie intake (NDNS adjusted for under-reporting)	2011	2387	2486	2245	1863	2030	1968	1846
Calorie reduction from ‘less healthy’ goods	-13.66	-16.21	-16.88	-15.25	-12.65	-13.79	-13.66	-12.53
Calorie increase from ‘healthier’ goods	+3.00	+3.57	+3.71	+3.35	+2.78	+3.03	+2.94	+2.76
Net calorie reduction	-10.65	-12.64	-13.17	-11.89	-9.87	-10.75	-10.42	-9.78

Table 11: Current calorie consumption and expected reductions for Promotions Restrictions for option 3

Option 3	Males				Females			
	4-10	11-18	19-64	65+	4-10	11-18	19-64	65+

Mean daily calorie intake (NDNS adjusted for under-reporting)	2011	2387	2486	2245	1863	2030	1968	1846
Calorie reduction from 'less healthy' goods	-18.31	-21.73	-22.63	-20.44	-16.96	-18.49	-17.92	-16.81
Calorie increase from 'healthier' goods	+4.05	+4.80	+5.00	+4.52	+3.75	+4.09	+3.96	+3.71
Net calorie reduction	-14.27	-16.93	-17.63	-15.92	-13.21	-14.40	-13.96	-13.09

Health benefits

207. To estimate the long-term benefits of reducing calorie intake, we use the DHSC Calorie Model Version 4.2. This is a key difference from the original impact assessments which used Calorie Model Version 3 – the latest version uses up to date data and further obesity related conditions.

208. The calorie model is a Markov model that follows cohorts of individuals over time, comparing two scenarios: a “control” group where no policy is implemented, and a “treatment” group where average daily calorie intake is reduced. The calorie reduction input into the model is a sum of the calorie reductions estimated from the NPM update’s impact on both the locations and volume price promotions restrictions, assuming no interactions between the policies. Interaction between policies will be considered further at impact assessment stage to mitigate the risk of double-counting benefits.

209. The model’s starting point is the estimated reduction in daily calories per person, which is converted into changes in body weight. From there, the model estimates BMI trajectories over time, which in turn affect the risk of developing ten obesity-related diseases such as type 2 diabetes, heart disease, and some cancers. From these changes in disease risk, the model estimates four main outcomes:

- NHS costs, based on reduced need for treatment.
- Social care costs, reflecting the link between obesity and long-term care needs.
- Economic output, through reduced mortality and morbidity
- QALYs, which combine length and quality of life.

210. These outcomes are calculated by tracking differences between the control and treatment groups over time. The model uses data from the Health Survey for England to estimate realistic changes in BMI across the life course. Each of these components have been adjusted by the appropriate discount rate to give the approximate present cash value of future benefits, in line with HMT’s Green Book. The general discount rate of 1.5% is applied to the Economic Output, NHS Costs and Social Care Costs with the health discount rate of 3.5% applied to the Health Benefits. QALYs are valued at £70,000 per QALY and the three other components are calculated based on 2019 prices. See Annex C: The DHSC Calorie Model for a full description of the DHSC Calorie Model.

211. To conduct the Calorie Model runs we needed to make the following assumptions to meet the requirements for the model's parameters.

- We have chosen to model a 25-years policy lifetime, which is consistent with other obesity related impact assessments, and a 25-year appraisal period. Meaning, we assume an active policy lifetime of 25 years.
- We have assumed that children and adults maintain the same average calorie reduction for their entire life. This is a standard assumption that is used in the Calorie Model as we lack robust evidence to suggest whether behaviour is or is not maintained in the long term.

Key limitations of calorie model

212. The DHSC Calorie Model of necessity is a simplified representation of real-world events. It does not consider all potential health conditions, all types of individual circumstances and all types of economic impact. The model assumes that the historical data it is based on (in terms of treatment costs, transition probabilities, population profiles and many other parameters) is a reasonable basis from which to predict the future.

213. In the model, individuals can only develop obesity-related diseases in adulthood, meaning that health benefits are only captured for adults. The model does not estimate any potential impacts of the policy on childhood health prior to reaching adulthood and, as a result, benefits may be underestimated for policies with a meaningful, short-term health impact on children.

214. The model assumes that any calorie reduction achieved as a result of the policy is maintained consistently for their entire life. In reality, behaviours may change over time. This could mean the model overestimates long-term health benefits. The model estimates average effects across age cohorts, rather than simulating individuals. It does not account for differences in behaviour across groups, such as by gender, deprivation, or ethnicity, which may mean some inequalities in health impacts are missed. There are several factors that may lead to over or underestimation within the health benefits calculated by the DHSC Calorie Model:

- The model does not include the additional health and social care costs associated with individuals living longer, as is standard practice for health economic analysis. However, it is acknowledged that living longer will entail additional costs for health, social care and welfare, so this could result in overestimation.
- The model monetises health outcomes through QALY gains for individuals, as well as estimating economic output through productivity gains from reduced morbidity and mortality. As QALYs are a measure of length and quality of life which may be influenced by an individual's ability to undertake usual daily activities, this could capture some productivity effects. This is assumed to be negligible but could be an area of overestimation.
- Conversely, the model does not consider all potential health conditions, variations in individual circumstances, or the full range of economic impacts associated with obesity and related conditions, which may result in underestimation of benefits.

Results

215. For option 2, total discounted economic health benefits are estimated at £36.93 billion over a 25-year appraisal period. Reduced morbidity would result in reduced cost pressures to the

NHS, resulting in NHS savings of £1.26 billion over the period. The health benefits to the population are estimated at 385 thousand QALYs worth around £26.91 billion at £70,000 per QALY. Social care savings would amount to £1.13 billion and reduced premature mortality would be expected to deliver an additional £7.62 billion economic output through additional labour force participation.

Table 12: Option 2 - Monetised health benefits for Promotions Restrictions in 2023 prices - figures discounted over 25 years

Benefit	NPV over 25 Years (£m)
Monetised health benefit (QALYs at £70,000)	26,919.40
NHS savings	1,261.11
Social care savings	1,132.42
Economic output	7,617.58
Total	36,930.51

216. For option 3, total discounted economic health benefits are estimated at £49.45 billion over a 25-year appraisal period. Reduced morbidity would result in reduced cost pressures to the NHS, resulting in NHS savings of £1.69 billion over the period. The health benefits to the population are estimated at 515 thousand QALYs, worth around £36.05 billion at £70,000 per QALY. Social care savings would amount to £1.51 billion and reduced premature mortality would be expected to deliver an additional £10.20 billion economic output through additional labour force participation.

Table 13: Option 3 - Monetised health benefits for Promotions Restrictions in 2023 prices - figures discounted over 25 years

Benefit	NPV over 25 Years (£m)
Monetised health benefit (QALYs at £70,000)	36,050.30
NHS savings	1,689.69
Social care savings	1,511.98
Economic output	10,200.18
Total	49,452.16

Non-monetised benefits for Promotions Restrictions

There are several additional health benefits which we have either not been able to monetise and/or include in our assessment of the overall net present value of the policy.

Illustrative impact on obesity prevalence

217. Evidence shows that energy dense diets such as those that are high in sugar can contribute to excess calorie intake, which if sustained leads to weight gain and obesity.

218. This policy aims to create a healthier food environment to reduce excess calories and obesity prevalence across the population.

219. The calorie reduction estimate section outlines our approach to estimating per person per day calorie reductions. These are set out in the table 10 for option 2.

220. The DHSC BMI Prevalence Model has been used to simulate changes in body mass index (BMI) from these changes in calorie intake at population level (see [Annex C](#)). The model is based on equations by [Henry \(2005\)](#) and is calibrated for the population in England using height and weight data from [Health Survey for England \(HSE\)](#). Population data from [Office for National Statistics \(ONS\)](#) is used alongside the model to illustrate the population affected.

221. Using this model, a calorie reduction of this scale could translate into reducing cases of adult obesity by almost 520,000 and childhood obesity by over 110,000.

Illustrative impact on obesity related disease in childhood

215. A growing number of children living with overweight or obesity are developing health conditions during childhood, including asthma, depression, hypertension and Type 2 diabetes.

216. The Calorie Model which has been used to monetise health benefits does not include obesity related diseases within childhood, so the model does not account for health benefits during this period. These illustrative impacts aim to provide a sense of scale of diseases that could be prevented in children.

217. For Option 2, using the BMI Prevalence Model, the estimated calorie reductions translate into an average change in BMI of 0.21 among children. This BMI change is then used as the input to the Healthy Weight Policy Research Unit Childhood Obesity Ready Reckoner (HWPRU CORR), which estimates impacts on conditions during childhood (see [Annex D](#)). These conditions represent the four outcomes for which sufficiently robust evidence exists on the relationship with childhood obesity.

218. Applying this BMI change within the HWPRU CORR produces illustrative estimates of the reduction in the prevalence of obesity-related diseases among children:

- Asthma: 1,700 fewer cases
- Depression: 1,500 fewer cases
- Hypertension: 4,900 fewer cases
- Type 2 diabetes: 100 fewer cases

219. These impacts are described as illustrative because the CORR is a simple, assumption based, indicative approach. Annex D outlines the assumptions and limitations.

220. Results are expressed as the change in current case prevalence under a steady-state counterfactual. These figures are not annual case reductions or short-term forecasts but comparative differences between baseline prevalence and the counterfactual BMI distribution.

221. When compared to baseline prevalence levels, the estimated reductions are small in proportional terms: asthma and depression each fall by less than 1%, while hypertension and type 2 diabetes see larger proportional reductions of around 3%.

Impact on consumers and consumer surplus

222. We do not expect there to be an impact on consumer surplus, the 'benefit' consumers gain from having a personal valuation of the product that is greater than the price they paid. Our analysis assumes that savings from products sold on volume price promotions will be passed to consumers through price discounts instead, therefore the consumer surplus impact would be expected to be minimal under that assumption. There may be some positive impact on consumer health, as detailed above.

223. There is some uncertainty regarding the effect of the policy on individuals, with some people possibly losing out if businesses pass on the cost of the regulation to consumers through increased prices. The impact of this is likely to be greater for lower income households who tend to spend a greater proportion of their incomes on food and drink than average.⁵⁸ This is outlined in further detail on page 64 of the locations promotions impact assessment.

Benefits to consumers as a result of reformulation

224. As described above, some manufacturers might respond to these restrictions by reformulating. If businesses were to reformulate or create new 'healthier' products, this would lead to further indirect health benefits for consumers, however as the decision for a business to reformulate could be dependent on a number of factors including other active reformulation programmes, organisational strategy or ingredient availability. Therefore, the benefits to consumers from reformulation could be as a result of a number of factors, not this policy alone. However, due to the uncertainties surrounding how much reformulation might take place we have not estimated the impact of any potential reformulation. Consequently, it is possible that the health benefits presented above are an underestimate.

Impact on productivity from preventing obesity related ill health

225. The economic output benefits are derived from additional economic output from having a larger and healthier population in the treatment group, due to fewer obesity related deaths. However, preventing obesity related ill health will also result in a workforce which is likely to be more productive, take fewer sick days and reduce illness related to early retirement. This impact is not estimated quantitatively in the model at present and as a result remains unmonetised.

Reinvested cost savings to the NHS

226. As highlighted earlier, lower levels of obesity related ill health are expected to reduce demand for NHS healthcare compared to the counterfactual, generating cost savings for the health service and additional resources which can be used to treat patients. Given there are waiting lists for NHS treatments and demand for care overall is expected to continue to increase as the population ages, it seems likely that any spare capacity in the system would be backfilled with additional treatments. This would be an indirect benefit and be contingent on government spending decisions.

⁵⁸ Family Food (2016/17, (Department for Environment, Food & Rural Affairs, 2018), available at: [Family Food 2016/17: Summary - GOV.UK](#), accessed 29 January 2026.

Advertising Restrictions

227. In this section, we focus on the cost and benefits of the shortlist options for the Advertising restrictions. The table below outlines the costs and benefits expected for each policy options.

Table 14: overview of costs and benefits for Advertising restrictions

	Description
Monetised costs	Transition costs to Manufacturers and Retailers
	Transition costs to advertising agencies
	Transition costs to Broadcasters
	Transition costs to Online Platforms
Non-monetised costs	Costs to businesses from removed advertising spend resulting in lost revenue
	Costs to government from enforcement of the new rules (including Ofcom and the ASA)
	Costs to content creators, including social media users and production companies
	Costs to OOH businesses
	Costs to wholesalers
Non-monetised benefits	Costs to consumers
	Wider economic impacts
	Reduction in exposure to 'less healthy' products Health Benefits...

Monetised and non-monetised costs and benefits of each option for Advertising restrictions (including administrative burden)

Monetised costs for Advertising restrictions

228. Transition costs (familiarisation and adjustment to new restrictions) will impact broadcasters, online platforms, advertising agencies, regulators and retailers/manufacturers as they will need to understand how the new rules affect how their products can be marketed on TV and online.

Manufacturers / Retailers

229. Following from the time taken by retailers and manufacturers to familiarise themselves with the NPM 2018 format (Volume Price Promotions and Location Promotions, Transition costs), we expect commensurate time allocated by marketing arms of retail, manufacturers and OOH businesses to familiarise themselves with the new rules and adjust their marketing practices accordingly. This is assumed to take between 1.7-3.3 hours for each business and a further 8-16 hours to assess their relevance to their marketing activities and implement changes. The

median gross hourly wage rate for an advertising and marketing professional in the UK is £20.70 per hour based on the 2024 Annual Survey of Hours and Earnings (ASHE).⁵⁹ Uprating this by 22%⁶⁰ to £25.25 per hour to account for non-wage labour costs such as national insurance and pensions, we estimate transition costs between £409,000-£814,000. Additionally, manufacturers, retailers and OOH businesses will incur an ongoing profit loss due to less consumer demand, which is estimated in section Sensitivity analysis, Impact on 'less healthy' advertising.

Advertising agencies

230. Advertising agencies act as the intermediary between manufacturers (their clients) and broadcasters/publishers (suppliers), developing advertising campaigns and brokering the purchase of advertising impacts/impressions for their clients. There are an estimated 18,865 advertising agencies in the UK with 139k employees.⁶¹ Based on assumptions made in the Advertising Restrictions Impact Assessment, we expect at least half of an advertising agency's staff would need to be trained on the updated regulations. This is assumed to take between 1-3 hours for each employee. Using the median gross hourly wage rate for an advertising and marketing professional in the UK, as used above for retailers and manufacturers, we estimate transition costs between £1.75 million - £5.26 million. This is purely an indication of scale, as this does not take into account any increase in due diligence required by agencies to ensure adverts sought by SMEs meet the exemption, also the wage rate will vary by business depending on the size and scale of the organisation.

Broadcasters

231. Broadcasters provide the schedule capacity for advertising and would need to comply with new restriction guidance; accommodate additional client/agency demand for commercial impacts outside the watershed; and make appropriate changes to their schedules and rate cards (costs per thousand impacts). In the UK there are approximately 750 channels in scope of Ofcom regulation⁶² who will need to familiarise themselves with these changes. We assume that it will take 4-8 hours⁶³ of a relevant professional reviewing the new rules and discussions among senior managers on any changes to internal policy or processes. Using the same gross hourly wage rate set out above, we estimate transition costs between £76,000 - £152,000. As above, this is purely an indication of scale.

Online Platforms

232. Platforms will not be required to implement any changes in response to the regulations; however, they may still need to familiarise themselves with the requirements placed on advertisers. There is no definition of online platforms in general or for those involved in the

⁵⁹ Earnings and hours worked, UK region by industry by two-digit SIC: ASHE Table 5 (Office for National Statistics, 2025), available at: [Earnings and hours worked, UK region by industry by two-digit SIC: ASHE Table 5 - Office for National Statistics](#), accessed 29 January 2026.

⁶⁰ [RPC short guidance note - implementation costs, September 2025 \(Regulatory Policy Committee, 2019\)](#), available at: [RPC short guidance note - implementation costs, September 2025 - GOV.UK](#), accessed 29 January 2026.

⁶¹ Advertising Agencies in the UK - Market Research Report (2015-2030) (Thomas Weale), available at: [Advertising Agencies in the UK - Market Research Report \(2015-2030\)](#)

⁶² Ofcom, June 2025 - Ofcom are unable to provide a precise figure because licences are always being granted, surrendered, rescinded or revoked. It should also be noted that not all licensed channels are broadcasting - Ofcom does not require licensed channels to inform them if they are broadcasting.

⁶³ The previous advertising impact assessment estimated this would require 8-16 hours. Given that this policy is not entirely new and simply adding additional products, we assume familiarisation to broadcasters to take half the time as previously set out.

advertising market. It has therefore not been possible to provide an estimate here. We assume these costs would be in the same range as those for broadcasters.

Non-monetised costs for Advertising restrictions

Costs to business from removed advertising spend

233. As a result of the increased restrictions, direct costs to businesses include the removed advertising spending to broadcasters and online platforms and the returns advertisers would have received from this spending. Total advertising spend on TV was over £5 billion in 2024⁶⁴ and is the greatest driver of profit, with an average full profit ROI of £5.61 for every pound spent.⁶⁵

234. TV and online advertising provide a good return on investment for ‘less healthy’ manufacturers; the increased restrictions are likely to result in lost ROI. Though there are a range of options available to them to achieve similar commercial outcomes. They can advertise in different mediums, market alternative products or brand adverts that are compliant with this restriction, reformulate their product to meet the restriction guidelines and switch advertising spend to watershed hours, for example. In contrast, broadcasters and online platforms will have limited options to mitigate against lost advertising revenue, the main ones are by scheduling advertising outside the restrictions or finding alternative categories of advertising to fill their commercial breaks and ad space. We have limited evidence on how advertising agencies, the intermediaries between ‘less healthy’ manufacturers and broadcasters, would be impacted by this restriction. If agencies are acting on behalf of their manufacturers, then they are still likely to work with these clients and support them to advertise in unrestricted media. Agencies will lose revenue if advertising spend was retained by ‘less healthy’ manufacturers and retailers, presumably reinvested into other parts of their businesses.

Costs to government

235. Ofcom, the statutory regulator for media markets and for enforcement of broadcasting and advertising restrictions in the UK, is the preferred statutory backstop regulator for ‘less healthy’ advertising. Ofcom will be able to delegate day-to-day frontline monitoring and enforcement to an appropriate regulator. Ofcom and the ASA stated for the [Advertising Restrictions IA](#) that costs of enforcement would be £530,000 per year from 2024 onwards. We anticipate enforcement costs to remain at a similar level, as the nature of the regulation has not changed, just the number of products in scope has increased. Though there is potential that with more products in scope of this regulation that there are a greater number of adverts to review which have been flagged as potentially breaching the regulations.

Costs to content creators, including social media users and production companies

236. Adverts can make up a substantial proportion of content creators’ incomes. Whilst there is no data on the extent to which ‘less healthy’ adverts currently support content creators online, it could be expected that certain types of content are associated with food and drinks adverts, such as food blogs, and that these may therefore be affected to a greater extent than other

⁶⁴ Advertising Association and WARC Expenditure Report (WARC, 2025), available at: Advertising Association and WARC Expenditure Report | WARC Media, April 2025, accessed 29 January 2026.

⁶⁵ The safest place a brand can be; TV advertising returns to growth in UK

types of content. Content producers and advertisers will still be able to substitute away from 'less healthy' adverts. The restrictions could also lead to an impact on businesses involved in the production of TV adverts if the overall demand for adverts falls.

Costs to OOH businesses

237. We expect there to be an impact to OOH profits as the NPM 2018 brings more products in scope for advertising restriction. As our dataset currently only treats take-home retail, we are not able to cost this impact.

Costs to wholesalers

238. In addition to the impact on manufacturers and retailers, there could be an impact on wholesalers, who work with smaller manufacturers and retailers⁶⁶, as the reduction in sale of 'less healthy' products would reduce their profits. There is also potential for lost profit for ingredient suppliers due to a reduction in sales of 'less healthy' products.

Wider economic impacts

239. Loss in profits for broadcasters, online platforms, advertising agencies, retailers and manufacturers could have wider economic impacts. For example, lower profits for retailers and manufacturers could lead to them decreasing investment in new machinery or premises and/or reducing the number of staff they employ. This would have a negative knock-on impact on aggregate demand and employment in the economy. Though it is also possible that this policy creates an opportunity for 'healthier' manufacturers and retailers selling 'healthier' products, who may see an increase in demand if adverts of 'healthier' products are increasingly shown and visible to audiences. This could result in increases in employment and investment. It should be noted that investment and employment decisions by these businesses are likely to be influenced by a wide range of factors beyond this measure (including interest rates, wage costs, trade).

Costs to Households (Consumers)

240. It is possible that businesses could choose to pass on the costs of complying with restrictions by increasing the price of 'less healthy' products. Though we anticipate this to be unlikely. Analysis of consultation responses from the [Advertising Restrictions IA](#) highlighted that retailers and manufacturers are most likely to respond to the restrictions with price cuts; alternative below the line marketing; reformulation of products; substitute product or overall brand adverts; advertise 'less healthy' products post-watershed and advertise 'less healthy' products on other forms of media to offset the loss of sales due to further TV and online advertising restrictions.

Non-monetised benefits for Advertising restrictions

⁶⁶ We assume large retailers work directly with manufacturers.

241. To estimate the health benefits of a potential reduction in children's exposure to advertising, an OPRU meta-analysis⁶⁷ was used in the previous impact assessment⁶⁸ to estimate the number of extra calories consumed per minute of food advertising. Reduction in advertisement viewing time, adjusted for the projected trend in decreased television viewership and increased online exposure amongst children, was used in conjunction with calories per minute viewing to determine an estimate for the reduced calorie consumption per day. The latter was used as input to the calorie model (see annex C) to determine monetised health benefits for children. Analogous impact on adults was not monetised.

242. Due to the shift in advertising landscape, a similar analysis using the same evidence is not pursued in this assessment and an approach will be considered further at final impact assessment stage.

Sensitivity analysis

Variation in key assumptions in approach for Promotions Restrictions

243. It is recognised that many of the calculations within this assessment currently only generate costs based on plausible assumptions. The specific choices of these assumptions can have a substantial impact on the final estimates. We have selected a few variables for sensitivity analysis based on the degree to which they are uncertain, and the extent to which they determine the direction and magnitude of the policy's NPV. It is important to note that although this section treats sensitivities in the estimated costs, the monetised benefits inherit the sensitivities in sales lost, which proportionally impacts the predicted reduction in calorie intake, from which monetised benefits are derived.

244. These variables are:

- Staff wages (which impacts knowledge sharing, familiarisation and product assessment)
- Business and store counts, which are the same in the low and central scenarios (being businesses that we are confident sell 'less healthy' goods in scope), but include a number of retail businesses and stores whose primary function isn't to sell food and drink in the high scenario (which impacts knowledge sharing, familiarisation and product assessment)
- Proportion of businesses with an online presence (which impacts IT update costs)
- Compliance with the existing location promotion regulations (which impacts profit loss)
- The various factors underlying the transition costs.
- Consumers compensation behaviour (which impacts profit loss and benefits)
- Products requiring ongoing product assessment.
- The various factors underlying the lost profit calculations (which also impacts benefits)

The ranges within these variables have been described throughout and are summarised in the tables below.

⁶⁷ Russell, S. J., Croker, H., & Viner, R. M. (2019). The effect of screen advertising on children's dietary intake: A systematic review and meta-analysis. *Obesity reviews*, 20(4), 554-568. Available at: [The effect of screen advertising on children's dietary intake: A systematic review and meta-analysis - Russell - 2019 - Obesity Reviews - Wiley Online Library](#), accessed 29 January 2026.

⁶⁸ Introducing a 2100-0530 watershed on TV and online restriction for paid advertising of food and drink that are High in Fat, Salt and Sugar (HFSS) products (Department for Digital, Culture, Media & Sport; Department for Health and Social Care, 2021), available at: [Impact assessment](#), accessed 29 January 2026.

Table 15: Hourly wages (uplifted)

Job title	Low		Central		High	
Managers, directors and senior officials	£	14.86	£	28.35	£	63.03
Managers and directors in retail and wholesale	£	13.51	£	18.51	£	36.54
Stock control clerks and assistants	£	12.69	£	15.37	£	18.86
Information Technology Professionals	£	18.20	£	30.03	£	48.69
Sales Assistants and Retail Cashiers	£	11.88	£	13.06	£	16.92
Purchasing managers and directors	£	17.97	£	30.36	£	40.51
Production managers and directors in manufacturing	£	15.25	£	29.63	£	60.47
Planning, process and production technicians	£	15.20	£	19.31	£	25.02

Table 16: Business counts

Business size	Low		Central		High	
Micro		55,250		55,250		56,043
Small		6,151		6,151		6,188
Medium		470		470		475
Large		150		150		152

Table 17: Store counts

Store size (sq. ft.)	Business size	Low	Central	High
<1000	Micro	19,872	19,872	20,238
	Small	6,920	6,920	6,974
	Medium	-	-	-
	Large	5,403	5,403	5,403
1000-1999	Micro	22,565	22,565	22,980
	Small	7,858	7,858	7,919
	Medium	-	-	-
	Large	6,135	6,135	6,135
2000-3000	Micro	11,202	11,202	11,408
	Small	3,901	3,901	3,931
	Medium	869	869	872
	Large	3,045	3,045	3,045
>3000	Micro	-	-	-
	Small	-	-	-
	Medium	-	-	-
	Large	9,083	9,083	9,083

Table 18: Proportion of businesses with an online presence

Business size	Low	Central	High
Micro	33%	33%	33%
Small	33%	33%	33%
Medium	30%	60%	70%
Large	30%	60%	70%

Table 19: Transition costs

Value	Low	Central	High
Store rearrangement			
Number of store clerks	1	1	2
Number of employees per store	2	2	4
Number of stores included (2000-3000 sq. ft.)	3,915	3,915	3,917
Number of stores included (>3000 sq. ft.)	9,083	9,083	9,083
Time to plan rearrangement (2000-3000 sq. ft.) (hrs.)	6	6	6
Time to plan rearrangement (>3000 sq. ft.) (hrs.)	36	36	36
Time taken for rearrangement (hrs.)	1	2	4
Transition to NPM 2018			
Familiarisation time for NPM 2018 (hrs.)	1.7	2.2	3.3
Time to share knowledge purchasing managers → Head managers (hrs.)	0.5	0.75	1
Time to share knowledge purchasing managers → IT professionals (hrs.)	0.5	0.75	1
Time to share knowledge production managers → Planning, process and production technicians (hrs.)	1	1.5	2
Time taken for NPM 2018 assessment (hrs.)	0.5	0.75	1

Time to relay free sugar info (manufacturer → retailers)	0.33	0.5	0.67
Time to update IT	8	16	24
Number of purchasing managers	1	1	2
Number of production managers	1	1	2
Number of production technicians	2	3	4

Table 20: Ongoing costs

Value	Low	Central	High
<i>Product assessment</i>			
Time taken for product assessment (hrs.)	0.5	0.5	1
Number of products assessed (largest businesses)	25,000	25,000	50,000
Number of products assessed (other supermarkets)	16,500	16,500	33,000
Number of products assessed (other)	1,000	1,000	2,000
<i>Loss in profit (both volume price and locations restrictions)</i>			
Retailers' profit margin	1.0%	3.0%	5.0%
Manufacturers' profit margin	2.0%	3.6%	5.0%
Retailers' mark-up	35.0%	52.5%	70.0%
Adjustment for compensating behaviour	100.0%	40.0%	0.0%
<i>Loss in profit (locations only)</i>			
Checkout sales share	5.0%	7.1%	15.0%
Margin of 'less healthy' goods when moved to aisles	5.0%	19.1%	19.1%
Checkout sales lost if goods were moved to aisles	16.0%	70.0%	90.0%
End of aisle sales share	10.0%	20.0%	30.0%
End of aisle sales uplift	35.0%	55.0%	83.0%

Store entrance sales share	10.0%	20.0%	40.0%
Store entrance sales uplift	35.0%	55.0%	83.0%

Table 21: Benefits

Value	Low	Central	High
Compliance with existing locations restrictions	72%	86%	100%

NPV

245. By varying the key assumptions in calculating the costs and benefits detailed above simultaneously, we can estimate a range in inputs into the Net Present Value (NPV).

246. It's not thought likely that these situations would occur, but they can give some indication as to the extremes of the expected outcomes presented in table 23.

247. The table below presents the range of scenarios for the NPV for Option 2, as estimated over a 25-year assessment period. The table shows that if we assume high costs (high scenario) and medium impact (central scenario benefits), the policy will still generate a positive NPV of £31.67 billion. In the medium costs (central scenario), low impact (low scenario benefits) there would be a negative NPV of -£1.17 billion.

Table 22: Summary of discounted costs and benefits in 2023 prices – Option 2 (£m)

Group affected	Impact	Central cost, low benefit	High cost, central benefit	Low cost, central benefit	Central cost, high benefit
Retailers	Transition – Familiarisation, Knowledge sharing / training / relaying information, Changes to IT Systems	£0.27	£0.86	£0.06	£0.27
	Transition – Store planning and adjustment	£15.77	£38.21	£9.93	£15.77
	Lost profit (net)	£958.38	£4,076.58	£417.29	£958.38
Total retailer impact		£974.42	£4,115.65	£427.29	£974.42
Manufacturers	Transition – Familiarisation, Product assessment (free sugar), Knowledge sharing / training / relaying information	£1.38	£3.64	£0.49	£1.38
	Lost profit (net) – 'less healthy' manufacturers	£484.25	£1,623.44	£102.62	£484.25
	Gain in profit– 'healthier' manufacturers	£285.17	£486.76	£102.62	£285.17
Total manufacturer impact		£200.46	£1,140.32	£0.49	£200.46
Government	NHS savings	£0.00	£1,261.11	£1,261.11	£5,810.32
	Social care savings	£0.00	£1,132.42	£1,132.42	£5,027.99
Total government impact		£0.00	£2,393.53	£2,393.53	£10,838.31
Wider society	Health benefits	£0.00	£26,919.40	£26,919.40	£123,539.70

	Economic output	£0.00	£7,617.58	£7,617.58	£34,910.84
Total wider society impact		£0.00	£34,536.98	£34,536.98	£158,450.54
NPV		-£1,174.89	£31,674.54	£36,502.73	£168,113.96

Impact of the advertising restrictions

248. Though a full analysis of the costs and benefits of applying the NPM 2018 to existing advertising restrictions will be treated at impact assessment stage, the following analysis estimates the potential cost to retailers and manufacturers of the policy options, assuming an increase in costs proportionate to that estimated for promotions restrictions.

249. This analysis draws on costs for a ban on advertising in-scope products failing the NPM 2004/5 online and on TV pre-watershed, inflated to 2023 prices. Calculating ongoing profit loss for promotions restrictions under the NPM 2018 and comparing against estimated profit loss of the same under the NPM 2004/5 (drawing on previously published impact assessment figures for locations promotions restrictions), we estimate the overall impact to ongoing profit loss for the two shortlisted policy options in table 23.

Table 23: Estimated percentage increase in business costs due to the NPM 2018 applied to promotions restrictions (£m)

Policy	Cost to businesses (NPM 2004/5), £m	Cost to businesses (NPM 2004/5, 2023 prices), £m	Option 2						Option 3					
			Lower		Central		Upper		Lower		Central		Upper	
			Cost to business, £m	% increase	Cost to business, £m	% increase	Cost to business, £m	% increase	Cost to business, £m	% increase	Cost to business, £m	% increase	Cost to business, £m	% increase
VPP	£16.99	£16.99	£2.11	12.4%	£4.55	26.8%	£6.74	39.7%	£2.86	16.8%	£6.19	36.4%	£9.16	53.9%
Locations	£1,045.30	£1,237.55	£43.61	3.5%	£143.05	11.6%	£435.11	35.2%	£56.00	4.5%	£187.10	15.1%	£566.84	45.8%
Total	£1,062.29	£1,254.54	£45.71	3.6%	£147.60	11.8%	£441.85	35.2%	£58.86	4.7%	£193.29	15.4%	£576.00	45.9%

250. Applying the percentage increases in total cost of promotions restrictions for each scenario explored in table 24 to the analogous costs to retailers and manufacturers of advertising restrictions, we estimate the range of costs of the NPM update in table 25.

Table 24: Estimated percentage increase in business costs due to the NPM 2018 applied to advertising restrictions (£m)

Restriction element	Direct cost to businesses (2019 prices £m)	2019 → 2023 price scaling	Direct cost to businesses (2023 prices, £m)	Option 2			Option 3		
				Lower	Central	Upper	Lower	Central	Upper
TV watershed ban	£30.24	1.183919921	£35.80	£1.3	£4.2	£12.6	£1.7	£5.5	£16.4
Online ban	£2.05	1.183919921	£2.43	£0.1	£0.3	£0.9	£0.1	£0.4	£1.1
Total	£32.3	1.183919921	£38.23	£1.4	£4.5	£13.5	£1.8	£5.9	£17.6

251. To further treat this issue and to demonstrate the unlikelihood that advertising costs would greatly diminish the benefits already estimated for promotions restrictions, table 25 considers the degree to which advertising costs would need to increase to 'break-even', such that total costs and benefits would be equal. This assumes no direct benefits from applying the NPM 2018 to advertising restrictions.

Table 25: % increase in advertising restrictions costs that would break even with estimated net benefits of applying NPM 2018 to promotions restrictions (£m)

Policy option	Average net annual benefits (VPP and locations), 2023 prices, £m			% increase in cost to break even		
	Lower	Central	Upper	Lower	Central	Upper
Option 2	£45.71	£1,827.84	£8,614.74	#N/A	4781%	22535%
Option 3	£58.86	£2,452.00	£11,445.86	#N/A	6414%	29940%

Impact on small and micro businesses for Promotions Restrictions

252. All policy options considered apply restrictions only to large and medium retailers. However, there are estimated to be impacts on small and micro businesses due to:

- Large and medium retailers sourcing products from small and micro manufacturers.
- Symbol stores, which are treated as being part of large businesses in the analysis, though are mainly small/micro and independently owned in reality.

253. The previous locations promotions restrictions impact assessment used a value of 20% as the proportion of goods supplied from small and micro manufacturers. This was based on stakeholder engagement that identified 37% of retailers worked with 'smaller' suppliers, using the proportion of suppliers whose products generate less than £250,000 in sales. It was believed that this number may have also included larger manufacturers, so was down weighted to 20%.

254. Using the assumption that small/micro manufacturers are responsible for 20% of in-scope products, which make up 20% of in-scope retail sales, table 24 shows the estimated cost to small/micro manufacturers of the policy.

Table 26: Manufacturer profit summary for option 2 in 2023 prices (£ millions)

Cost	Low	Central	High
Direct loss in profit	70.64	255.68	674.15
Indirect gain in profit	70.64	196.28	335.04
NPM 2018 transition cost	0.10	0.28	0.73
Net cost	0.10	59.67	339.84

Cost to small/micro retail businesses is estimated by replicating the results of tables 2, 4 and 5, isolating store/business counts and market share to that of small/micro symbol businesses.

Table 27: Retailer profit summary for option 2 in 2023 prices (£ millions)

Cost	Low	Central	High
Direct loss in profit	51.49	158.68	500.05

Indirect gain in profit	17.32	80.20	166.21
NPM 2018 transition cost	<0.01	0.01	0.02
Store rearrangement	0.55	0.78	2.18
Net cost	£34.73	£79.27	£336.03

255.

Summary of costs and benefits

256. The tables below outline expected impact of the policy for each option, with quantifications where currently possible. These impacts have been estimated over a 25-year assessment period for each option.

257. As described throughout, this table includes quantified costs for the impact of applying a new updated definition of 'healthier' food to Promotions Restrictions only. These represent the additional costs from this change in addition to those estimated within original impact assessments. At this stage it has not been possible to fully quantify impacts on Advertising Restrictions.

258. The net present value presented here includes direct and indirect (net) costs to business.

Table 28 Summary of discounted costs and benefits in 2023 prices – Option 2 (£m)

Group affected	Impact	Central estimate (£m)
Retailers	Transition – Familiarisation, Knowledge sharing / training / relaying information, Changes to IT Systems	0.27
	Transition – Store planning and adjustment	15.77
	Lost profit (net)	958.38
Total retailer impact		974.42
Manufacturers	Transition – Familiarisation, Product assessment (free sugar), Knowledge sharing / training / relaying information	1.38
	Lost profit (net) – 'less healthy' manufacturers	484.25
	Gain in profit – 'healthier' manufacturers	285.17
Total manufacturer impact		200.46
Government	NHS savings	1,261.11
	Social care savings	1,132.42
Total government impact		2,393.53
Wider society	Health benefits	26,919.40
	Economic output	7,617.58
Total wider society impact		34,536.98
Net Present Value		35,755.62

Table 29 Summary of discounted costs and benefits in 2023 prices – Option 3 (£m)

Group affected	Impact	Central estimate (£m)
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Retailers	Transition – Familiarisation, Knowledge sharing / training / relaying information, Changes to IT Systems	0.27
	Transition – Store planning and adjustment	15.77
	Ongoing – product assessment	3.81
	Lost profit (net)	1,199.83
Total retailer impact		1,219.68
Manufacturers	Transition – Familiarisation, Product assessment (free sugar), Knowledge sharing / training / relaying information	1.49
	Lost profit (net) – ‘less healthy’ manufacturers	266.58
	Gain in profit – ‘healthier’ manufacturers	385.28
Total manufacturer impact		268.07
Government	NHS savings	1,689.69
	Social care savings	1,511.98
Total government impact		3,201.67
Wider society	Health benefits	36,050.30
	Economic output	10,200.18
Total wider society impact		46,250.48
Net Present Value		47,964.40

Direct costs and benefits to business calculations

259. The direct costs to business have been included in the EANDCB for the preferred option. These include:

- Familiarisation costs
- Knowledge sharing / training / relaying information
- NPM 2018 assessment
- Changes to IT systems
- Loss of profit to retailers
- Loss of profit to manufacturers

260. Our assessment of EANDCB for the preferred option is £164.9 million per year in 2025 prices and 2027 present value base year. As described throughout, this assessment includes costs for the impact of applying a new updated definition of ‘healthier’ food to Promotions Restrictions only. These represent the additional costs from this change in addition to those estimated within original impact assessments. At this stage it has not been possible to quantify impacts on Advertising Restrictions.

Risks and assumptions

261. This section sets out the key risks and assumptions associated with the data and evidence used in this assessment. We provide a view on the quality of evidence used throughout and highlight our key evidence gaps. We will aim to improve the quality of the evidence where possible for the final stage impact assessment.

262. Evidence used in this assessment are of mixed quality. We believe some evidence used is robust. However, in some instances we have had to make assumptions. These include:
- Food-to-go sales in retail are impacted proportionally to take-home sales.
 - The calories per £ spent is the same for 'less healthy' and 'healthier' goods. This follows from the earlier impact assessments' analysis, but we aim to make improvements on this assumption in the forthcoming impact assessment. This impacts the calorie compensation part of the analysis and could be improved by calculating the kcal/£ for the 'less healthy' and 'healthier' goods separately. We would expect this to show that consumers would generally need to spend more on 'healthier' goods to compensate for fewer 'less healthy' goods bought.
263. There are some areas of the analysis that we consider to be informed by limited evidence, for example:
- Compliance to existing promotions restrictions, and in particular the degree to which non-compliance is continuing to influence the sale of 'less healthy' goods. We have based this on a study of 25 stores which found breaches in 28% and extrapolated this to a proportion of sales of restricted goods that occur at regulated locations.
 - Changes to the retail market: The analysis currently uses a 1% annual growth as used in the previous impact assessments, which was agreed with Worldpanel by Numerator based on 5 years of data describing the volume of take-home food and drink purchases.
 - The 30-70% of retail businesses with an online presence figure were based on stakeholder engagement with 5 retailers and therefore is not a conclusive estimate.
 - The number of businesses and stores that will be affected by the policy, since some specialised stores, in addition to non-specialist retailers (*i.e.* supermarkets), may also sell 'less healthy' food/drink products as part of their inventory.
264. Since the cost/benefit analysis presented here is based on existing methodologies, there is a risk that the methodologies do not extend to the new products coming into regulation through the policy. This risk is largely mitigated by the fact that for the preferred option the product categories in scope of legislation is unchanged, while two additional categories are included in the scope of policy option 3.
265. A key risk is that the impact on locations promotions accounts for most of the costs and benefits of this policy and therefore totals are sensitivity to assumptions, especially compliance with existing regulations. These assumptions have been explored within sensitivity analysis to mitigate this risk. A further key risk is the interaction effects with other policies. This assessment considers the impact of further restricting the promotions placement of 'less healthy' products in isolation to the other policies announced in the 10 Year Health Plan or any possible future actions by government.
266. Due to the number of policies in force or coming into force, the potential interactions between options have not been quantified. The central estimates consider the impact of volume price and location restrictions and make some attempt to reduce double counting, for example through transition costs and ongoing product assessment. The final impact assessment will also aim to consider the interaction with the Advertising restrictions. We

recognise that there will be interactive effects between this policy and others being proposed or already enacted such as:

- Soft drink industry levy
- Mandatory reporting on ‘healthier’ sales
- Sugar Reduction Programme and Calorie Reduction Programme
- Energy Drinks to Under 16s

267. The locations promotions impact assessment outlines potential interactions with these policies from page 88. There are also assumptions made in post-processing the Worldpanel by Numerator, Take Home Data that underpins the majority of the analysis of costs and benefits. This topic is treated separately in the ‘Limitations’ section of Annex A. Limitations of the modelling underpinning monetised benefits is explored in the ‘Key limitations of calorie model’ subsection.

268. Lastly, we recognise that this initial analysis is high risk due to the absence of robust, quantified data for Advertising Restrictions impacts. However, we believe this approach is proportionate given that we are at the early stages of policy implementation, including the potential application of the NPM 2018. For the final impact assessment, we will collect further evidence on changes in the advertising landscape and quantify the impact of updating the NPM where feasible.

Impact on small and micro businesses

269. All policy options considered apply restrictions only to large and medium retailers. However, there are estimated to be impacts on small and micro businesses due to:

- Large and medium retailers sourcing products from small and micro manufacturers.
- Symbol stores, which are treated as being part of large businesses in the analysis, though are mainly small/micro and independently owned in reality.

270. The previous locations promotions restrictions impact assessment used a value of 20% as the proportion of goods supplied from small and micro manufacturers. This was based on stakeholder engagement that identified 37% of retailers worked with ‘smaller’ suppliers, using the proportion of suppliers whose products generate less than £250,000 in sales. It was believed that this number may have also included larger manufacturers, so was down weighted to 20%.

271. Using the assumption that small/micro manufacturers are responsible for 20% of in-scope products, which make up 20% of in-scope retail sales, table 24 shows the estimated cost to small/micro manufacturers of the policy.

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Cost	Low	Central	High
Direct loss in profit	70.64	255.68	674.15
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Table 31: Retailer profit summary for option 2 in 2023 prices (£ millions)

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NPM 2018 transition cost	<0.01	0.01	0.02
Store rearrangement	0.55	0.78	2.18
Net cost	£34.73	£79.27	£336.03

Wider impacts (consider the impacts of your proposals)

Does the measure impact on the ease of doing business in the UK?

272. The advertising policy is a reserved matter so the NPM 2018 would be applied UK-wide. Scotland and Wales are progressing their own promotions restrictions policies underpinned by the NPM 2004/5 so we will engage with them as they may also want to consider using the NPM. Health policy is devolved and so will diverge but a common approach would support the UK Internal Market (UKIM).
273. Applying NPM 2018 could expand an existing barrier to entry for ‘less healthy’ products. The attractiveness of the business environment may be impacted as a greater range of ‘less healthy’ products would not be able to be promoted or advertised. This regulation only impacts ‘less healthy’ food and drink and would therefore not have an impact on businesses bringing innovative healthy products or services to market.
274. There may be an impact on retailers that receive products with price promotions printed on the label, as these may need to be voided if the product fails the NPM.

Does the measure support commitments to improve the environment and decarbonise?

275. There is no evidence to suggest that a restriction on the promotion of ‘less healthy’ products will have a significant impact on the environment. It is possible that retailers use high-profile locations and price promotions to promote the sale of products that are close to expiry. There may therefore be a risk that a greater proportion of these go unsold and are thus discarded as waste.
276. Neither do we expect any environmental effects (positive or negative) to arise as a result of the advertising policy. There is unlikely to be any change in use of natural assets, as the policy will primarily result in changes to existing advertising campaigns, with the possibility of product reformulation as a secondary outcome. The policy is not geographically specific, as it

relates to broadcast TV and online services across the UK and it is unlikely to cause scarcity for goods and services.

Does the measure have any significant or adverse distributional impacts?

277. Promotions and advertising restrictions are population-level, structural policies and the impact on inequalities will depend on consumption patterns by deprivation. If lower socio-economic groups purchase more products within scope, they are likely to gain greater benefits, which could help narrow the inequalities gap.
278. For promotions, we do not know how the use of the excluded businesses varies by socioeconomic group. If such businesses were used more by lower socioeconomic groups, excluding them from the intervention could mean the impacts of the policy are greater in the higher socioeconomic groups, worsening the inequality gap. We believe the way in which multi-buy promotions are used only differs slightly across all socioeconomic groups.
279. In terms of the advertising restrictions, research conducted by Cancer Research UK found that individuals from deprived communities have a higher recall of unhealthy food advertising, with those recalling watching television adverts every day found to be 40% more likely to be from the most deprived group compared to the least deprived. This suggests that individuals in more deprived communities may be more affected by unhealthy food advertising on TV.
280. Socio-economic disparities in diet and health are well documented and multifaceted. The Health Survey for England 2022 shows a clear deprivation gradient in obesity, rising from 22.1% in the least deprived areas to 35.7% in the most deprived, with normal weight most common in the least deprived areas⁶⁹.
281. Analyses of food purchasing and reformulation trends ([Analysis of food categories in the calorie reduction guidelines: 2017 to 2021](#), [Changes in food purchasing behaviour and the impact on diet and nutrition: 2021 to 2023](#)) indicate that lower social grades (C2/D/E) buy more calorie-dense foods and higher-sugar drinks, while higher grades (A/B) purchase reformulated or premium options, though overall differences are moderate.
282. NDNS 2019–2023 ([National Diet and Nutrition Survey 2019 to 2023: report - GOV.UK](#)) reinforces this pattern: higher-income households consume more fruit, vegetables, and fibre and have better micronutrient status, whereas lower-income groups show poorer diet quality and higher risk of deficiencies, although energy and free sugar intakes vary only modestly by income.
283. Importantly, despite these socio-economic gradients, most people across all demographics fail to meet UK dietary recommendations, suggesting widespread nutritional challenges alongside persistent inequalities.

⁶⁹ Health Survey for England, 2022 Part 2 (NHS England, 2022), available at: [Health Survey for England 2022 \[NS\] - NHS Digital](#), accessed 26 January 2026.

A summary of the potential trade implications of measure

Does the measure support international trade and investment?

284. The regulation is unlikely to have a direct impact on international trade. There would be no barriers to exports or imports. It is uncertain whether there will be indirect impacts. The UK was one of the first countries to develop and use an NPM. Since then, several different models have been introduced internationally based on the UK model including the voluntary Nutri-Score labelling system in Europe and the Health Star Rating System in Australia and New Zealand. The system is therefore internationally recognised.

Monitoring and Evaluation

Factors affecting the approach the PIR will use

285. Updating the standards underpinning the Promotions and Advertising Restrictions aims to deliver health benefits by widening the number of products captured under the 'less healthy' definition. The rationale for the introduction of NPM 2018 is that it will align with up-to-date dietary recommendations and increase the impact of these policies both individually and cumulatively.

286. Currently none of the existing policies have reached the point at which a PIR is due, and their implementation dates vary. We are aiming to adjust the timings for the first PIRs of these policies so that they take place before the introduction of the NPM 2018. The PIR studies for these existing policies would then provide a baseline for evaluating changes to their impact as a result of the introduction of NPM 2018. However, it should be noted, as outlined in section 2, that findings from them would not change the government's ambition to apply up-to-date nutritional standards to these policies. Subsequent PIRs for these policies would therefore not only review the individual policies and whether they were still delivering against their objectives but also provide for a more focused look across each policy on the additional costs and benefits accrued as a result of introducing the NPM 2018.

287. A key feature of applying the NPM 2018 to these policies is that it will take place within a wider policy and economic context into which other significant new policies will be introduced. For example, the introduction of mandatory reporting and targets. Additionally, trends impacting on food inflation and affordability are likely to continue and will likely continue to shape food purchasing patterns in different ways for different income groups. Evaluation of the impact of any one policy with any sense of certainty of attribution will therefore be difficult. Very few of the more robust approaches that rely on randomisation and a strong counterfactual, as set out in the Green and Magenta Books, will be useful in these circumstances.

288. The most promising approach to attribution is likely to be through identification of trends and any changes in trends that appear to be associated with the point in time when a policy is introduced (interrupted timeseries analysis). We would want to look at:

- a. Global sales of 'healthier' vs 'less healthy' products – how has the policy impacted on the population?

- b. Individual products and product categories such as the new products that will be captured in our obesity regulations by the introduction of the NPM 2018 – has the NPM 2018 enhanced the impact of the policies within which it is used (namely location and volume-price promotions and advertising).
- c. Whether and how the NPM score profile of products on the market as a whole and within relevant product categories changes over time and whether this arises through new product development, withdrawal of existing products or reformulation (changes to product composition).

289. Consideration will be given to the resource requirements associated with the acquisition and analysis of a data set to support the needs of multiple future PIR requirements and how we can ensure that policies are evaluated in ways that ensure that findings are compatible.

Timing of the NPM 2018 PIR

290. The detailed plan for the NPM 2018 PIR will develop as more information about the policy and details about the preferred options, which may affect the scope of the PIR, emerge. The current plan is to undertake the PIR in the 4th year post implementation of the NPM 2018 using data collected during years 1-3. This will:

- a. provide feedback during early implementation on issues that need to be resolved promptly.
- b. provide an early assessment on the impacts of the policy.
- c. highlight any changes that may need to be made to make the policy more effective.
- d. help minimise the difficulties in teasing out the impacts from different policies that may be introduced after the NPM 2018 (e.g. mandatory reporting)

Evaluating the impact of NPM 2018

291. Although all three of the policies to which the NPM 2018 will apply have similar objectives - the reduction in purchasing and consumption of 'less healthy' foods - they also operate with different mechanisms. Whilst the location and volume-price promotions policies aim to restrict the promotion of 'less healthy' foods within supermarkets thereby reducing purchasing of these products, the advertising policy has a specific focus on reducing the exposure of children to specific types of advertising of 'less healthy' foods and reducing demand. The impact of the NPM 2018 will therefore need to be evaluated both at the 'global' or cumulative level but we will also need to evaluate its role within the individual policies.

292. While we will need to continue delivering periodic PIRs of the individual policies, we will also need to use these individual PIRs to assess the impact of any ongoing benefits from the NPM 2018. This is to ensure that issues associated with the design and delivery contexts, that are specific to these individual policies, are still regularly reviewed in their own right, while in the context of the changes to the NPM scoring system introduced by NPM 2018. For example, whilst the NPM 2018 may set a higher bar for the promotion of products by location, the

effectiveness of other features of policy design, such as enforcement, are likely to influence whether the impact can be attributed solely to the NPM 2018. Similarly, there are likely to be shifts in the price promotions landscape resulting from the introduction of different technologies, such as personalised promotions, that may affect the policy's overall impact on sales despite the greater number of products that will be captured by the NPM scoring system.

Assessing whether the NPM 2018 policy's original objectives have been met: global and policy-specific impacts

Impact on overall sales

293. Overall, across the restrictions, the impact of the NPM policy on overall sales of 'healthier' products will be monitored through trends in sales data as outlined above. Where possible, (e.g. for sales made on price-promotions, which can be identified within commercial sales datasets), change will be attributable to the specific policy. Differences in the range of products in-scope of the individual regulations using NPM 2018 will also need to be taken into account. Tracking trends in sales of individual or groups of products brought into scope of restrictions as a result of NPM 2018 from before the introduction will help us assess the impact of NPM 2018.

Impact on businesses

294. The NPM 2018 is more complex than the NPM 2004/5 and brings many more products within scope of the regulations on promotion and advertising. As a result, it will be important to adequately evaluate the impacts on businesses (and enforcement agencies) in terms of the additional costs they are faced with.

295. Businesses have also already shown that they are likely to respond to location and volume-price regulations in ways that whilst complying with the letter of the law, present unintended consequences. Whilst the introduction of the NPM 2018 may widen the number of products that will be classified as 'less healthy' and therefore subject to restrictions, there are still products that can be promoted in restricted locations and using volume-price as a promotional mechanism that are not healthy, including alcohol and tobacco products. Evidence of these practices are beginning to emerge from evaluations of the Location Promotions regulations, and it is possible that the introduction of the NPM 2018 will exacerbate these trends.

Impact on consumers

296. As mentioned above, the NPM 2018 will be introduced within an already complex policy environment. PIRs of the current policies using the NPM 2004/5 will identify any ways in which these policies impact on consumers and the subsequent PIRs carried out after the introduction of NPM 2018 will then examine whether these have been exacerbated by the widening of the range of products classified as less healthy. The location promotions were designed as a change to the food environment that was unlikely to have been noticed by consumers. Similarly, children are unlikely to notice a reduction in exposure to advertising of 'less healthy' foods, however, there have been concerns raised about the introduction of the volume-price promotions and their potential to raise the costs of grocery shopping for some households.

297. For the Advertising restrictions, we have already commissioned baseline research that quantifies children's exposure to advertising of 'less healthy' products prior to the introduction of the advertising restrictions now planned for next year. This already has a plan attached to it that will see this research repeated post implementation, and we may wish to consider whether a 3rd stage of similar research, carried out following the introduction of the NPM 2018 may be feasible and worthwhile in helping to identify any additional impact on children's exposure to advertising of 'less healthy' foods. We have also commissioned research to see if we can develop a direct link between children's advertising exposure and purchases made by parents in response to children's pestering. We may consider repeating this if proportionate and likely to deliver additional evidence on the impact of NPM 2018 and if resources permit.

298. It will also be important to track whether the introduction of NPM 2018 exacerbates any shifts to brand advertising which has already been identified as a potential unintended consequence of the policy in its current form.

Impact on regulatory and local authority enforcement services

299. PIRs of the individual policies to which the NPM 2018 will apply will be used to explore the experiences of enforcement by the Advertising Standards Authority and local authority Regulatory Services and the extent to which the NPM 2018 has changed their roles, responsibilities and workloads compared to the situation under the current policies.

Impact on the 'less healthy' profile of products: reformulation and the introduction of new products

300. It will also be important to continue monitoring the impact of the policy on businesses' reformulation practices and assess whether new product development contributes to a 'healthier' profile of products on offer. Some early work to assess the extent to which the Location Promotions regulations have brought about changes to healthiness of the food offer of food across categories and businesses has been commissioned as part of the Evaluation of the Location Promotions regulations. Learning from this can be deployed to develop an ongoing monitoring strategy.

301. Monitoring the changes to the 'less healthy' profile of products within food categories will provide insights into whether the policy is successful in achieving reformulation not only to the 'low hanging fruits' which have 'less healthy' scores which are close to the threshold for products to achieve a 'healthier' classification, but also to influence the healthiness of products with more challenging profiles.

Assessing unintended consequences

302. We will assess the policy to identify any unintended consequences, including:

- a. Risk of only incentivising reformulation of products close to the NPM threshold, or businesses choosing not to reformulate at all if seen to be too challenging. This could also have a knock-on effect on health-focused investment.
- b. Risks of 'gaming' the NPM scoring system. Under the old system businesses found loopholes that allowed them to develop very sweet products using unusual

ingredients (e.g. date paste for confectionary). The NPM 2018 will potentially reduce these opportunities, but it will be important to assess the extent to which foods remain 'less healthy' on one dimension of the NPM scoring system (e.g. sugar) but still pass the NPM score threshold overall.

- c. Costs to businesses higher than expected and passed on to consumers.
- d. Businesses may continue or increase their use of the restricted locations within stores to promote 'less healthy' out of scope foods/drinks and/or health-harming non-food products, such as alcohol or tobacco products.

Monitoring requirements and Data Sources

303. Food systems are complex (see for example ([Reducing obesity: obesity system map](#)) with many factors contributing to health outcomes such as obesity. Monitoring of factors associated with any one policy can help provide indicative information but are ultimately likely to be limited by the complexity of the interplay between these and other factors within the system.

304. The aim of this policy is to extend the number of products assessed as 'less healthy' and therefore subject to other regulatory policies including restrictions on the use of in-store locations and volume-price promotions and restrictions on advertising primarily aimed at children. These restrictions should result in lower purchasing of the 'less healthy' products, fewer calories consumed and ultimately to a reduction in obesity prevalence.

305. There are a range of data sources described below which would allow us to monitor different aspects of this logic model, although it should be noted, as discussed above, there will be challenges when monitoring the policy to attribute any change to any specific policy and to isolate from any potential changes to the wider economic context, such as food price inflation.

306. The main evidence needs to monitor and evaluate this policy therefore relate to

- a) the impact of the policy on the healthiness of sales including how healthy sales vary by socio-economic group
- b) the extent to which the policy incentivises product reformulation
- c) the impact on obesity prevalence

Monitoring the impact on sales

307. NPM 2018 will extend the scope of the obesity regulations to include more products, particularly those high in free sugars and with higher fibre content, such as sweetened yoghurts, more desserts, more breakfast cereals and cereal bars. In this OA the benefits of the policy have been assessed by estimating its impact on calories and the health benefits that can be derived from modelling reduced calorie intake on obesity prevalence although there may also be health benefits from changing consumption of other nutritional components e.g. reducing salt and fat consumption and increasing the intake of fibre.

308. There is currently no single source of data that allows us to monitor the healthiness of sales by the 2018 NPM score. Whilst we can currently use commercial sales data (Worldpanel by Numerator), the NPM 2018 requires more detailed ingredients data for individual products to generate the NPM score. We will need to see how the commercial sector responds to these new requirements. We believe it will be in the interest of commercial providers to also capture the NPM 2018. Additionally, there work funded by the UKRI with the Quadram Institute to develop a world class food composition database may support our data needs in the future.
309. In the meantime, we will be restricted to approaches to generating monitoring data such as those developed to produce the modelling for this assessment or planned for final impact assessment. This could involve combining data from two commercial data sources, matching data on different products by their barcodes. For final impact assessment, we have commissioned academic assistance with the development and analysis of this combined data source. We will require at least one further data set to provide baseline data against which to evaluate the policy and at least one post-implementation data set that will allow us to measure change. More regular data would allow us to more closely assess the impact over time and identify whether the nature of the change has been that of a more sudden 'step' change or more gradual 'slope' change).
310. There are several options for acquiring this data.
- DHSC to commission the dataset and analysis.
 - DHSC to commission the dataset and undertake the analysis in-house.
 - DHSC to commission a wider evaluation of which the sales dataset and its analysis is a component part.
311. It is also possible that academic research teams will independently bid for resources for evaluation of this policy or in this general policy area and that this would affect our approach to commissioning monitoring data. We welcome the input from academics but their ability to sustain a research interest over time can sometimes be limited and their research priorities may not fully align with our PIR requirements.

Monitoring the impact on the 2018 NPM by socio-economic group/income

312. Given the disparities in obesity prevalence by income, it is important that the widening of the range of products captured by the obesity restrictions does not inadvertently exacerbate these differences. Analysis by NESTA using commercial sales data and the current NPM shows that there is a small but significant gradient in the average NPM of food purchased by households with different income levels with lower income households purchasing more 'less healthy' foods. Monitoring the effects by household income and also for different household types (particularly for the impact on households with children) will be important.
313. As mentioned above, there is no single data source currently that incorporates both sales data and sufficient data on the ingredients of different products to support calculation of the NPM 2018. Whilst commercial sales data based on household panels or sample can also provide access to household level data, this is usually at a higher cost. DHSC has not directly purchased the household level data for its own use previously due to its higher cost and therefore may need to rely on commissioning this with NIHR support.

Monitoring the impact on reformulation and new product development

314. Product development and reformulation is a complex and time-consuming process. Despite this we know that the announcement of the first obesity policies did incentivise some businesses to develop reformulation strategies. As with the impact on sales, the NPM 2018 should have the effect of adding impetus to these strategies given that a wider range of products will be affected by the restrictions on advertising and promotion. There is very little known about the scale and pace of and trends in reformulation and how it is influenced by our NPM-based policies. We would, as a minimum, want to monitor trends in reformulation across the change from the old to the new NPM scoring system, ideally covering the period 2025-2029 (assuming a 2027 introduction date), but ideally extending beyond this given that the extended time frames associated with reformulation. Additionally, having access to ongoing monitoring data will also support M&E for the Mandatory Reporting and Targets policy.
315. An approach to evaluating reformulation that triggered by the introduction of the Location Promotion regulations is currently pursued by an academic research team who we commissioned to deliver evaluation of this policy for our PIR. This involves the use of commercial product data (Accuity) which supports calculation of NPM scores. This analysis focuses on the products on offer rather than those purchased but looks at both the reformulation (recipe change) of existing products as well as the introduction of new products and the extent to which these are 'more' or 'less' healthy. This work has not yet got underway so we may wish to reserve judgement on its value. A strong limitation is that it takes not account of sales and sales trajectories (the rate at which new products gain market share after introduction to the market). Assuming this proves to provide a robust and cost-effective approach to monitoring reformulation, we may wish to explore whether this approach could be extended to support ongoing monitoring over a longer time period if funding could be provided or whether sales could be incorporated into this data set.

Monitoring impact on Consumption

316. DHSC undertakes a dietary survey – the National Diet and Nutrition Survey. From this it is possible to obtain estimates of calorie consumption within the home by deducting calories consumed when eating out at cafes and restaurants etc.
317. However, the survey is known to underestimate the amount of calories consumed and analysts have suggested that an increased level of under-reporting coupled with an increasingly low response rate underpinned the finding of declining calorie consumption over time (Declining survey response rates and changes in UK food purchases and consumption). A similar situation arises with sources of data which estimate consumption based on purchasing patterns, namely DEFRA's Family Food Survey.

Monitoring obesity prevalence

318. We have a number of different sources of data on obesity prevalence for both adults and children. These include the following:
- For adult obesity prevalence: Health Survey for England and Sport England's Active Lives Survey
 - For child obesity: Health Survey for England and the National Child Measurement Programme

319. As with the monitoring of consumption, due to the complex network of factors which contribute to obesity, it is unlikely that we would be able to attribute any changes to obesity prevalence solely to this policy. At the current time, for example, we can expect that the scale and pace in the growth in the number of adults taking weight loss drugs will have some impact on adult obesity prevalence figures, even if this proves unsustainable.

Monitoring the impact of the wider economic context

320. It has been shown that food price inflation has led to a shift to cheaper, lower quality products but that these products have themselves been subject to higher rates of inflation (see [Cheaper grocery products rose in price much faster than more expensive products between 2021 and 2023](#)). There is a need to monitor trends in price and the relationship between price and quality and how this might make it increasingly more difficult for lower income households to shift the balance of their purchases from 'less healthy' to 'more healthy' products. The differential rates of inflation between higher and lower quality products also suggests the potential that there are financial incentives for manufacturers to increase rather than reduce their provision of 'less healthy' products. This study was based on analysis of commercial sales data (Worldpanel by Numerator) and could therefore be replicated at a future date if Numerator sales data sets for the UK can incorporate the 2018 NPM score for products.

Commissioning mixed-methods evaluative research

321. As mentioned above, it is not only the changes to the NPM scoring system that matter when it comes to assessing impact on sales, consumption and obesity prevalence. We also need to assess how the individual policies to which it applies are being delivered. We plan to undertake PIRs for these policies that look at the issues associated with the policy design, policy delivery and explores any assumptions underpinning the policies at IA stage, including the estimates of costs and benefits. To this end we envisage commissioning mixed methods evaluative research across the Location, Volume-price and Advertising policies within the 5-year period post introduction of the 2018 NPM (currently planned for 2027).

Annex A: Data set with NPM classifications

Data

322. A data set has been created by DHSC for this assessment using a sample of food and drink products from Worldpanel by Numerator's , Take Home Data (2024)⁷⁰.

323. The panel is made up of 30,000 households and is designed to be demographically representative of the Great British population, such as by region, household size, presence of children, and age of main shopper. Data from the panel is demographically weighted to reflect the respective populations.

⁷⁰ Worldpanel by Numerator, GB Take Home Panel, 52 w/e 1st September 2024. All analysis and interpretation contained in this publication were conducted independently of Worldpanel by Numerator. Worldpanel has not independently verified the findings, nor does it endorse the views or conclusions presented in this report.

324. Nutrition data is collected directly from food labels by Worldpanel by Numerator fieldworkers visiting stores on a rolling basis throughout the year. The frequency of data collection is every 4 months. The collection of nutrition data has also been supplemented with web scraping information from Tesco, Sainsburys, Asda and Iceland websites on a weekly basis, with the aim of improving the timeliness of nutrition information for manufacturer products sold in those stores, and own label products for those retailers.

325. It is worth noting that although fieldworkers enter stores to collect nutrition information on a rolling 4-month basis, this does not update all products in the dataset each time. If no nutrition information is found for a product during a reporting period, then the most recently collected information is used. The web scraping from four retailers mentioned earlier helps to reduce the use of older data.

326. Where Worldpanel by Numerator is able to collect the nutrition data, usually for the majority of products in a category, this is termed 'real'. Where this is not possible, nutrition values are either copied across from similar products in the same brand (for example using a different pack size, known as 'cloned') or an average value for the category or product type is calculated and used instead, known as 'imputed'.

Data cleaning

327. Before analysis the data is cleaned. This involves checking and making any adjustments to the nutrition data to ensure that it is as accurate as possible. Cloned and imputed data are checked to ensure the nutrition data is accurate and where necessary if an average has been used or the nutrition data looks inaccurate, it is excluded from the dataset.

NPM classifications

NPM 2004/5

328. The NPM 2004/5 was developed by the Food Standards Agency (FSA) in 2004-2005 to provide Ofcom, the broadcast regulator, with a tool to differentiate foods based on their nutritional composition, in the context of television advertising foods to children.

329. The model uses a simple scoring system where points are allocated based on their nutritional content per 100g. Points are awarded for 'A' nutrients (energy, saturated fat, total sugar and sodium), and for 'C' nutrients (fruit, vegetables and nut content, fibre and protein). The score for 'C' nutrients is then subtracted from the score for 'A' nutrients to give the final nutrient profile score.

330. Foods scoring 4 or more points, and drinks scoring 1 or more points, are classified as 'less healthy'.

NPM 2018

331. Since the NPM 2004/5 was developed UK dietary recommendations have been revised. In particular those for free sugars (which was effectively halved from 10% to 5% total dietary energy) and fibre (which was increased) set on the advice of the Scientific Advisory Committee on Nutrition (SACN) in their 2015 'Carbohydrates and Health' report. UK health departments

accepted the revised dietary recommendations and commissioned a review of the NPM 2004/5. A review of the NPM was undertaken and consulted on in 2018.

332. The main differences between the NPM 2004/5 and the NPM 2018 include:
- Protein value has been updated to 45g to reflect UK dietary recommendations.
 - Fibre values have been revised to reflect current UK dietary recommendations.
 - Total energy intake has been updated to 8,400 kJ (2000 kcal)
 - Sodium has been replaced with salt to reflect UK dietary recommendations.
 - Total sugars have been replaced with free sugars to reflect current UK dietary recommendations.

333. The NPM 2018 is now strengthened to be more discerning towards foods and drinks that are high in free sugars including products like sweetened yoghurts, fruit juices and smoothies, desserts, some breakfast cereals and cereal bars. This means some products that were previously defined as ‘healthier’ by the NPM 2004/5 may now be defined as ‘less healthy’.

Mapping of legislative categories

334. Each product within the Worldpanel by Numerator, Take Home Data is assigned to a sub-category, which are grouped together in categories and then further grouped by sector. For the analysis, the sub-categories were mapped to the promotions and advertising legislative categories. In some cases, sub-categories contained products that were out of scope of the legislative categories and where possible were excluded from the dataset.

335. The table below shows the product categories in Option 1 which aligns with the legislative categories in scope of the Volume Price Promotions and Location Promotions and advertising restrictions, and in option 2 which adds additional categories.

Table 32 Legislative categories within shortlist options

Option 1	Option 2
Soft drinks with added sugar	Soft drinks with added sugar
Savoury snacks	Savoury snacks
Breakfast cereals	Breakfast cereals
Confectionery (chocolate and sweets)	Confectionery (chocolate and sweets)
Ice cream, ice lollies, frozen yoghurt, water ices and similar frozen products	Ice cream, ice lollies, frozen yoghurt, water ices and similar frozen products
Cakes and cupcakes	Cakes and cupcakes
Sweet biscuits	Sweet biscuits
Morning goods	Morning goods
Desserts and puddings	Desserts and puddings
Sweetened yoghurt and fromage frais	Sweetened yoghurt and fromage frais
Pizza	Pizza
Potato products	Potato products

Ready meals, meal centres, breaded and battered products	Ready meals, meal centres, breaded and battered products
	Savoury pastries
	Sweet spreads

Free sugars and fruit, vegetables and nut proxy

Free sugars

336. A pragmatic approach was used to assign free sugars proxy values to the sub-categories, based on the methodology used in the 'Changes in food purchasing behaviour and the impact on diet and nutrition: 2021 to 2023' OHID report which was informed by data from the NDNS nutrient databank that contains robust total sugar and free sugar data.

337. The methodology used in the OHID report estimated what percentage of total sugar data could be classified as free sugars for each category whereas this analysis was carried out at sub-category level. Following the matching of sub-categories to legislative categories, the original free sugar proxy for each category was reviewed and amended as necessary for each sub-category.

Fruit, vegetables and nut (FVN) proxy

338. Worldpanel by Numerator assigned a proxy FVN score at category level, assuming that all products in the same category have the same FVN score.

339. Similar to the free sugar proxy, the FVN score for each category and sub-category was reviewed and amended as necessary.

Considerations

340. The following summarises considerations regarding the Worldpanel by Numerator, Take Home Data (2024). A wider exploration of the considerations of the analysis in this document is discussed in the 'Risks and assumptions' section within 'Summary of costs and benefits'.

Data Quality

- Date of the data used (last nutrition data collected September 2024) – therefore not reflective of more recent reformulation efforts of products and nutrition information ascribed to products is updated on a six-monthly basis.
- Use of imputed values for some products based on category average data – particularly for fibre as fibre values are not always available. This is due to values, such as fibre, not being available on packs and therefore an imputed value is required.
- 'Trace' or 'less than' values may cause **overestimation** in the dataset. For products that state 'trace' or 'less than' on pack, Worldpanel attribute a consistent figure of 0.0001g for 'trace' and 'less than'.

Methodology Considerations

- Free sugar proxy - Worldpanel by Numerator report on total sugars on pack. Free sugars are not reported on pack and therefore a proxy needs to be applied. Considerations include:
 - No sales, volume or product count weighting was applied.

- Where NDNS data was not available to inform decision making, assumptions were made based on the likelihood of free sugars being present, the presence of other sugars (e.g. potential dairy and intact vegetable/fruit content) and similar products.
- 'Trace' and 'less than' nutrition data on product labels do not equate to zero in the dataset. Where sugar data is unexpected, none of the total sugar data has been attributed to free sugars. For others (e.g. 'fresh beef' where some of the products therein contain marinades or glazes) all total sugar data was attributed to free sugars
- Sub-categories are often grouped together according to state (e.g. ambient, chilled or frozen product). This distinction is not consistent across the NDNS coding frame.
- FVN proxy – Worldpanel by Numerator follow the rules set out in the NPM 2004/5 documentation. However, due to manufacturer pack limitations where FVN is not displayed on pack, an estimation at category level is applied.

Other

- Reduced representation of foods purchased out of home, including takeaway, delivery and eating out sectors. This data is available through Worldpanel by Numerator's Out of Home panel. This publication is using data from Worldpanel by Numerator's Take Home panel.
- Products where the nutritional data was presented in millilitres (ml) in the dataset were excluded leading to gaps in the dataset.

Annex B: Calorie Model

341. This annex outlines the Department of Health & Social Care (DHSC) Calorie Model, explaining its purpose, function, and role in supporting policy development. It also provides an illustrative example and a brief overview of the model's historical developments.

What is the Calorie Model?

342. The Calorie Model is a simulation model, written in R, developed by analysts at the Office for Health Improvement and Disparities (OHID) within DHSC. It draws on earlier modelling work developed by Public Health England (PHE).

343. The purpose of the model is to simulate the long-term impacts of policies that affect calorie intake at a population level. By estimating changes in calorie intake, alongside other key assumptions, the model estimates effects on health outcomes, NHS treatment costs, social care costs and economic output.

344. Typically, the model is used to quantify the benefits of reduced calorie intake, but it can also assess the impact of calorie increases.

345. The model is calibrated for the population in England,⁷¹ using 2019 data as the baseline.⁷²

How does the model work (summary)?

346. The Calorie Model is a cohort-based Markov model.⁷³ It divides the population into annual cohorts by year of birth, and the health of each cohort is modelled over time, based on expected body mass index (BMI) and the associated probability of acquiring obesity-related diseases. A change in calorie intake influences BMI, which in turn affects the likelihood of ill health.

347. Each cohort is divided into health states: healthy, diagnosed with an obesity-related disease, or deceased. Transitional probabilities are used to estimate how many individuals move between states each year, with new births added to the population. This allows the model to estimate the expected prevalence of obesity-related diseases and their associated impacts.

348. Policy interventions are modelled using a control and treatment approach. The control scenario assumes no policy change, while the treatment scenario applies a reduction or increase in calorie intake. The effects of the policy are measured by comparing the two scenarios over time.

⁷¹ Model results can be applied to the rest of the UK by applying a pro-rata adjustment based on population size. This may not take full account of demographic and health-related differences but should suffice on an indicative basis.

⁷² We use Health Survey for England (HSE) and Office for National Statistics (ONS) population data and projections.

⁷³ Further background information about this type of model can be found at Cornell University (2014) Markov Models for Health Economic Evaluations: The R Package heemod. Available at: <https://arxiv.org/abs/1702.03252>.

What outputs does the model produce?

349. The model produces several key outcomes for each scenario:

- Total benefit or cost in present value terms resulting from a calorie change, which includes:
 - Monetised health changes (measured in QALYs)⁷⁴
 - Change in NHS treatment costs.
 - Change in social care costs.
 - Economic productivity impacts
- A timeline showing when these effects are expected to occur.
- The number of premature (aged under 75 years) deaths expected in the scenario compared with the control.
- The number of disease years expected in the scenario compared with the control.

350. The model also allows for detailed interrogation of different age group and BMI changes, as well as sensitivity analysis for input parameters.

How does the model work (detailed) and what assumptions are used?

351. The main input parameter is the expected change in calorie intake per person per day.⁷⁵

This value (or range) must be generated externally, using available research, analysis or estimation techniques. The model can explore the effect of various calorie changes and perform sensitivity analysis around, but it does not generate the correct calorie change to use.

352. The calorie change can be adjusted depending on the age, gender and BMI category of the population being affected. This allows for modelling of policies targeting specific groups, such as children.

353. Changes in weight and BMI resulting from the calorie reduction are calculated and provide a starting point for further analysis in the model.

354. The model then considers how changes in BMI affect 10 obesity-related diseases: type 2 diabetes, coronary heart disease (CHD), stroke, colorectal cancer, breast cancer, liver disease, uterine cancer, upper gastrointestinal cancer, kidney cancer and osteoarthritis. It calculates the changes in disease prevalence, resulting in the number of diseases and

⁷⁴ Quality-adjusted life years (QALYs) are the standard currency used in health evaluations to measure the duration and quality of life combined. A value of 1.00 represents a year of life in perfect health. Someone living with an obesity-related disease is assumed on average to have a lower quality of life and/or a lower life expectancy than someone of similar age without that disease. The social value of QALYs (i.e. the value placed on them by the public) is £70,000 each. Further detail on how and why QALYs are used is provided in [HMT's Treasury Green Book - page 72](#).

⁷⁵ Equivalent inputs (such as an expected change in weight or BMI status) can also be used with appropriate conversion upfront.

deaths avoided under the treatment scenario. These diseases were chosen based on their relationship with excess BMI, prevalence and mortality rates, and impact on quality of life.

355. The model partly accounts for comorbidities. In previous versions, individuals in a disease state could only transition to the dead state or remain in that state. In this version, disease-to-disease transitions are modelled, but the model does not track a person’s history of diseases. Therefore, when an individual transitions from one disease to another, the costs associated with the first disease are no longer counted. To minimise bias, disease transitions are allowed only from less severe to more severe diseases. The severity ranking is based on mortality rates, as shown in Table.

Table 33: Diseases in the Calorie Model, ranked by severity

Upper GI Cancer	Highest – Most Severe
CHD	
Stroke	
Colorectal Cancer	
Kidney Cancer	
Uterine Cancer	
Breast Cancer	
Liver Disease	
Type 2 Diabetes	
Osteoarthritis	Lowest – Least Severe

BMI analysis

356. Individual weights are modelled using the differential equations developed by Hall et al.⁷⁶ These equations assume an individual’s weight to consist of fat and fat-free mass. Weight changes are modelled based on the imbalance between energy intake and expenditure, with the assumption that an individual remains at the same BMI percentile throughout life.

357. These equations were implemented using the deSolve⁷⁷ package in R. The original model predicted the same weight loss per calorie reduction regardless of starting body weight, but this simplification has been removed. The new model predicts greater weight loss per calorie reduction for individuals with higher initial BMI.

358. These updates allow the model to account for weight changes during childhood. The equations include a growth term that reduces at age 18 years, meaning the model naturally transitions from childhood into adulthood.

359. Currently, there is limited evidence linking excess weight to diseases in childhood, so the model does not account for health benefits during this period. If future data reveals strong

⁷⁶ Hall KD, Butte NF, Swinburn BA, and Chow CC. Dynamics of childhood growth and obesity: development and validation of a quantitative mathematical model. *The lancet Diabetes & endocrinology*. 2013 Oct 1;1(2):97-105.

⁷⁷ Soetaert K, et al. (2023) deSolve: Solvers for Initial Value Problems of Differential Equations. Available: [deSolve-package function - RDocumentation](#)

associations between excess BMI and childhood diseases, the model may be updated to capture this.

Groups of people considered within the model

360. The model divides the population by age, sex, and five BMI categories: underweight, healthy weight, overweight, obese, and very obese. Age can be modelled in individual years or grouped categories, with age-specific parameters (e.g. mortality rate and disease incidence) applied as necessary.

361. The model also accounts for health benefits in adults with a BMI above 22 kg/m², even if they are not categorised as overweight. The risk of the diseases included in the model increases with BMI, so including this group allows the extra benefits of weight reduction to be captured. Underweight is modelled as a separate group and has no health consequences associated with it.

362. The starting population can be defined by the user, allowing for evaluation of policies that target specific groups (e.g., only children or only adults).

363. The model uses Markov modelling to simulate transitions between health states (healthy, diseased, or deceased). The `heemod`⁷⁸ package in R is used for this modelling, with transition probabilities being entered as an input. The whole population starts in the healthy state, and the package then simulates state transitions over time.

364. Each year (one cycle of the Markov model), the model calculates the proportion of the population in each state, producing a trajectory over time.

Calculating results

365. NHS savings are calculated based on reduced treatment requirements for each disease.

366. Economic productivity effects are assessed in two categories:

- Mortality effects: Reduced mortality increases the size of the workforce, with economic output being modelled based on median wages by age and gender.
- Morbidity effects: Changes in productivity due to illness are modelled using employment rates that vary by diseases.

367. Social care savings are estimated by calculating the reduced need for social care due to fewer overweight and obese individuals requiring care.

⁷⁸ Filipović-Pierucci A, Zarca K and Durand-Zaleski I (2017). "[Markov Models for Health Economic Evaluation: The R Package heemod.](#)" *ArXiv e-prints*. R package version 0.8.0, 1702.03252

368. QALY changes are based on reduced deaths and fewer people living with obesity-related diseases. The model calculates the QALY value for individuals in disease states, adjusted for age and sex, and then converts these into QALYs.⁴
369. The model assumes that individuals' QALY values are affected by age and sex, even if they are healthy, to account for other age-related health issues not modelled explicitly.
370. Premature deaths (aged under 75 years, according to OHID definition) are calculated based on reductions in obesity-related diseases.
371. Disease mortality rates are constant for a given disease, regardless of BMI, but vary with age and sex.
372. Discount rates are applied to account for the time value of costs and benefits, following principles of the HMT The Green Book.⁷⁹
373. The model can be run over user-defined timeframes. Long time periods (typically 20-50 years) are often used to capture long-term health benefits.
374. The model can accommodate policies that extend over multiple years, incorporating new children born during the policy period based on Office for National Statistics population projections.
375. Once a policy period ends, the model stops adding new children but continues to model the benefits for the existing population over the evaluation period selected. This ensures that benefits that do not occur until later in life are modelled.

How robust and reliable is the model?

376. The model has evolved over several years, incorporating new evidence and modelling improvements. It has been independently assured, and the results have regularly been used to support published Impact Assessments.
377. However, the model has limitations:
- It predicts the effect of calorie intake changes on health and economic outcomes but cannot predict the impact of a policy on calorie changes. It relies on external analysis for these estimates.
 - It simplifies real-world conditions and does not account for every possible disease, individual circumstance, or economic impact.
 - It assumes that past data (in terms of treatment costs, transition probabilities, population profiles and many other parameters) is reasonable for future predictions.
 - In the model, individuals can only develop obesity-related diseases in adulthood, meaning that health benefits are only captured for adults. This means benefits may

⁷⁹ HM Treasury (2022). [The Green Book: Central Government Guidance on Appraisal and Evaluation](#). Page 116

be underestimated for policies with a meaningful, short-term health impact on children.

- It assumes that any calorie reduction achieved because of the policy is maintained consistently for their entire life. In reality, behaviours may change over time.
- It estimates average effects across age and sex cohorts, rather than simulating individuals. It does not account for differences in behaviour across groups, such as by deprivation, or ethnicity, which may mean some inequalities in health impacts are missed.
- Results vary depending on the chosen evaluation period.

378. There are several factors that may lead to over or underestimation within the health benefits calculated by the DHSC Calorie Model:

- The model does not include the additional health and social care costs associated with individuals living longer, as is standard practice for health economic analysis. However, it is acknowledged that living longer will entail additional costs for health, social care and welfare, so this could result in overestimation of benefits.
- The model monetises health outcomes through QALY gains for individuals, as well as estimating economic output through productivity gains from reduced morbidity and mortality. As QALYs are a measure of length and quality of life which may be influenced by an individual's ability to undertake usual daily activities, this could capture some productivity effects. This is assumed to be negligible but could be an area of overestimation.
- Conversely, the model does not consider all potential health conditions, variations in individual circumstances, or the full range of economic impacts associated with obesity and related conditions, which may result in underestimation of benefits.

379. Ongoing work aims to refine and improve the model and address its limitations.

Sensitivity analysis and optimism bias are used to ensure model results are appropriately interpreted and used.

Illustrative Analysis

Table 341: Illustrative analysis, Calorie Model version 4.3

25 years					
Calorie reduction (per person per day)	Economic Output	NHS Costs	QALYs	Social Care Costs	Total
5 kcal	2,708	466	11,679	426	15,279
10 kcal	5,416	933	23,363	848	30,560
20 kcal	10,831	1,869	46,739	1,684	61,123
10 years					

Calorie reduction (per person per day)	Economic Output	NHS Costs	QALYs	Social Care Costs	Total
5 kcal	920	177	2,776	211	4,084
10 kcal	1,841	354	5,553	420	8,168
20 kcal	3,679	709	11,100	833	16,321

Benefit figures are for England, in £million and rounded to the nearest million. Figures are discounted to give present values.

Developmental history of the model

Version 1

380. Public Health England (PHE) first developed a weight management economic assessment tool in 2014⁸⁰. This tool was used to support analysis for reduction, and later calorie reduction. Through a series of developments, it became Version 1 of the Calorie Model, developed in collaboration with DHSC.

381. The model and its assumptions were the subject of a Technical Consultation Document⁸¹, published by DHSC in 2018.

382. The original model was built in Microsoft Excel.

Version 2

383. After the consultation, DHSC analysts developed a more advanced version using R programming language. This Version 2 of the model offered improved flexibility, more accurate modelling of weight gain and loss, the ability to extend the evaluation period, and enhanced functionality to model adult and children separately.

384. These Version 2 changes were published in 'Further advertising restrictions for products high in fat, salt and sugar: impact assessment': Annex E⁸².

Version 3

385. Version 3 of the model was developed by DHSC analysts in late 2019. This version added liver disease to the list of obesity-related diseases, added limited modelling of comorbidities, expanded the economic productivity component, and improved the QALY calculations by incorporating age-related health deterioration.

⁸⁰ PHE, April 2014 [PHE launch weight management economic assessment tool - GOV.UK \(www.gov.uk\)](http://www.gov.uk)

⁸¹ DHSC, DHSC Calorie Model, August 2018. [Online]. Available: [Department of Health and Social Care calorie model \(publishing.service.gov.uk\)](http://publishing.service.gov.uk)

⁸² DHSC/DCMS, March 2019 [Online]: [Introducing a 9pm to 5:30am watershed on TV advertising of HFSS products and similar protection for children viewing adverts online: impact assessment \(publishing.service.gov.uk\)](http://publishing.service.gov.uk)

386. These Version 3 updates were published in 'Total restriction of online advertising for products high in fat, sugar and salt (HFSS): Evidence Note' Annex A.⁸³

Version 4

387. Version 4 was developed by DHSC analysts in mid-2022. It added several additional conditions to the disease list, including osteoarthritis, kidney cancer, upper gastrointestinal cancer, uterine cancer, and kidney cancer.

Version 4.1

388. Version 4.1 included a full update of the underlying data and cost assumptions to reflect 2019 or the latest available data.

Version 4.2

389. Version 4.2 was developed by DHSC analysts in mid-2025. This version made minor changes to the structure of the code.

Version 4.3

390. The current model is Version 4.3, developed by DHSC analysts in late-2025. This made minor changes to the structure of functions to improve efficiency and reliability.

391. Quality assurance (QA) was carried out across versions in line with the principles of Government's Aqua Book, and through engagement with internal and external experts for independent assurance.

392. Further details on the history and development of the model can be found in the published documents referred to.

Annex C: DHSC BMI Prevalence Model

393. This annex outlines the Body Mass Index (BMI) Prevalence Model, explaining its purpose, function, and role in supporting policy development. It also provides a brief overview of the model's historical developments.

⁸³ DHSC, June 2021 [Online]: [Evidence note - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/evidence-notes/total-restriction-of-online-advertising-for-products-high-in-fat-sugar-and-salt)

What is the BMI Prevalence Model?

394. The BMI Prevalence Model is used to simulate changes in BMI from changes in calorie intake at a population level. BMI Prevalence Model 1.4 (the current model) was developed by DHSC analysts in mid-2023 and is now in use.
395. The model's purpose is to simulate the long-term impacts of policies that affect calorie intake at a population level. By changing calorie intake, alongside other key assumptions, the model estimates the change in prevalence across BMI categories.
396. Typically, the model is used to quantify the reduction in obesity prevalence from reduced calorie intake, but it can also assess the impact of calorie increases.
397. The model is based on equations by Henry (2005) and is calibrated for the population in England using height and weight data from Health Survey for England (HSE). Population data from Office for National Statistics (ONS) is used alongside the model to illustrate the population affected.

How does the model work (summary)?

398. The BMI Prevalence Model applies population level equations developed by Henry (2005), along with assumptions about average activity levels, to determine the amount of calories required to maintain a stable weight.
399. To assess the impact of a calorie change, the model compares the population's current stable weight (based on Health Survey for England data) with the new stable weight after the change.
400. The difference between these weights represents the expected change in weight due to the change in calorie intake.
401. This is then used to re-calculate prevalence across BMI categories and obesity prevalence across the population, showing how a change in calories could affect rates of obesity across the population.

What outputs does the model produce?

402. For a given calorie reduction, the model outputs new prevalence rates for both adults and children:
- a. Underweight
 - b. Healthy weight
 - c. Overweight

- d. Obese
- e. Severely Obese
- f. Obesity rate (including severely Obese)

403. It can also output average BMI and weight change among the targeted group.
404. It does not reflect the time taken to change weight, nor does it consider interventions that target specific demographic groups, differing impacts on individuals, or varying activity levels.
405. Model outputs are applied to population data from Office for National Statistics (ONS) to illustrate the results in terms of the number of people affected.

How does the model work (detailed) and what assumptions are used?

406. The BMI Prevalence Model is a static simulation model, built in R, which estimates how sustained changes in calorie intake would affect the distribution of BMI categories.
407. The primary purpose of the model is to simulate the impact of population wide policies, though it is also possible to target the model at specific weight statuses where appropriate.
408. The main input needed is an estimated change in daily calorie intake per person. This value (or range) must be generated outside of the model, using available research, analysis or estimation techniques.
409. The model uses a sample of record level height, weight, age and sex data from the Health Survey for England from 2015, 2018 and 2019.
410. This is used to estimate how many people are in each BMI category in England. Adult BMI is classified by World Health Organization's BMI classification and child BMI by UK National BMI centiles classification.
411. The model uses an equation (1) to predict how many calories (total energy intake) each person in the sample needs to maintain their current weight. This considers age, sex, and how active people are on average.
412. This is based on an equation from Henry (2005) and activity levels from SACN (2011).

(1)	$Total\ energy\ intake = a \times (xW + y)$	
a	Age specific activity multiplier	
x	Age and sex specific weight multiplier	
W	Weight in kg	
y	Age and sex specific regression constant	

413. Given a change in calorie intake, the model works out how people's weight would change as a result. It then estimates how these changes in weight would affect the number of people in each weight status.
414. This provides an estimated change in the prevalence rates amongst weight statuses, including obesity prevalence. These are adjusted using Health Survey for England survey weighting to ensure outputs are representative.
415. The model makes a series of assumptions for simplicity which are outlined in Table 1.

Table 35: Assumptions

Assumption	Description
Equations are valid for everyone	The equations are adjusted for age and sex, but otherwise, everyone is treated the same.
Energy balance principle	If people eat fewer or more calories, their weight changes as the equations predict.
Fixed activity levels	Activity levels are set by age and do not change because of the policy or weight loss.
Instant weight loss	The model assumes people's weight changes instantly when their calorie intake changes.
Uniform effectiveness	Everyone affected by the policy is assumed to have the same change in calories.
Static population	The population is treated as static, with no changes over time.
Uniform effect	The model inputs are an average across the population; therefore, the effect is assumed to be the same for all groups, regardless of background or behaviour.

How robust and reliable is the model?

416. It is a well-established model with a sound method which has been assured through internal DHSC governance processes.
417. It provides a consistent approach for estimating the impact of policy interventions.
418. The underlying data and equations are publicly available.
419. It has been regularly updated with the latest available data and evidence.
420. However, the model has limitations:
- a) It does not consider that people may respond differently to the given policy or have different activity levels.
 - b) It assumes that weight changes happen instantly without allowing for time for weight to change.

- c) It is not designed to give precise predictions of policy impacts and is therefore most suitable for population wide policy simulation.

Developmental history of the model

Version 1

Initial models developed in R for adults and children.

Version 1.1

Model restructured to combine models for adults and children, with added outputs for changes in weight and BMI.

Version 1.2

Model developed to add BMI targeting to specific weight statuses.

Version 1.3

Model output developed to include weight categories for underweight, healthy weight, obese, obese (including severe obese) and severe obesity.

Version 1.4 (current model)

Model updated to use the latest record level Health Survey for England data for both adults and children.

Reviewed underlying weight loss equations and physical activity inputs.

Annex D: HWPRU Childhood Obesity Ready Reckoner

421. This annex outlines the **Childhood Obesity Ready Reckoner (CORR)**, explaining its purpose, function, and role in supporting policy development. It also provides a brief overview of the model's previous developments.

What is the Childhood Obesity Ready Reckoner?

422. The Childhood Obesity Ready Reckoner is an indicative population level comparative risk model, developed by researchers from the NIHR Policy Research Unit in Healthy Weight, building on an example model provided by analysts within the Department of Health & Social Care (DHSC).

423. The model's purpose is to estimate the health effects at a population level associated with policies that will affect weight status (BMI or zBMI) during childhood. It does this by the translation of changes in weight status to health outcomes (expressed as the change in the number of cases for England). Changes in childhood BMI or zBMI are linked to defined 4 diseases (asthma, depression, type 2 diabetes and hypertension), using derived dose-response relationships. The full assumptions are set out below. Whilst the model is purposively designed at a population level the mechanisms could be adapted to estimate effects upon sub-populations.

424. The model produces steady-state counterfactual estimates rather than short-term forecasts, describing how current disease prevalence would differ under alternative distribution scenarios.
425. The model is calibrated for an indicative child population, representing children aged under 20 years in England. It uses pooled data from Health Survey England (HSE) for years 2019 and 2022 to derive baseline weight status distributions. Disease prevalence estimates were derived from the Global Burden of Disease (GBD) for 2023⁸⁴ for asthma and type 2 diabetes; from the Mental Health of Children and Young People (MHCYP) 2017 survey⁸⁵ for depression, and from the Health Survey of England⁸⁶ for hypertension (2003–2019).

Model Scope

426. Model Population

- Children and young people (between the ages of 2 and 19)
- All sexes
- National scale (England)

427. Health Outcomes

- Asthma
- Depression
- Type 2 diabetes
- Hypertension

428. Exposure Measures

- Body Mass Index (BMI)
- zBMI (age and sex standardised using UK90 growth references)

How does the model work (summary)?

429. A synthetic child population distribution of BMI and zBMI is defined using pooled HSE data.
430. Policy scenarios are input as an absolute change in either BMI or zBMI.
431. The model estimates the health impacts of reducing BMI or zBMI in childhood.
432. Defined changes are applied to the population distribution as either a universal change (i.e. applied equally across the population) or on a multiplicative scale (proportional change applied on the log BMI scale, which has a bigger effect on children with a higher BMI).
433. Derived dose-response relationships using published associations are used to estimate individual-level relative risks for each disease outcome under baseline and shifted scenarios. The model includes four diseases: asthma, depression, type 2 diabetes and hypertension.
434. Population Impact Fractions (PIFs) are calculated as the proportional reduction in mean relative risk across the population and applied to baseline disease prevalence to estimate changes in case prevalence.

⁸⁴ Global Burden of Disease (2023) <https://vizhub.healthdata.org/gbd-results/>

⁸⁵ NHS Digital (2018) Mental Health of Children and Young People in England, 2017. <https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-of-children-and-young-people-in-england/2017/2017>

⁸⁶ Moody et al (2025) OP19 Childhood and adolescent elevated blood pressure and hypertension 2003–2019: analysis of trends and risk factors using the health survey for England.

435. The model is interpreted as a steady-state counterfactual. Estimated changes in disease prevalence represent the difference that would be observed if the shifted distribution had been persistently over preceding years. Results do not represent short-term forecasts, annual case reductions, or immediate effects following a policy intervention.

436. Point estimates and uncertainty ranges are produced using a deterministic scenario approach. Three models are run using the point estimate, lower confidence limit, and upper confidence limit of the published dose-response relationships. The resulting outputs are presented as central, low, and high estimates.

How does the model work (detailed)?

Indicative population distribution

437. An indicative child population (all sexes, between 2 and 19 years of age) was derived from two years of Health Survey for England data (2019 and 2022). The data was pooled in order to construct a sufficiently large and stable synthetic distribution.

438. The HSE child dataset reports age in bands rather than exact years. To enable BMI standardisation:

- Mid-point ages were assigned to each age band (e.g. HSE age 2–4 ~ 3, 5-7 ~ 6, 8–10 ~ 9, 11–12 ~ 11.5, 13–15 ~ 14, 16–19 ~ 17.5)
- Based upon these mid-points BMI values were converted to age and sex standardised zBMI scores using the UK90 growth reference

439. The derived HSE population dataset is treated as a fixed synthetic population (in terms of persons, age and sex) within the model.

Baseline Disease Prevalence

440. For the baseline disease prevalence inputs, we used the following sources:

- GBD 2023 for asthma and type 2 diabetes (<20 years, England).⁸⁷ These estimates represent the prevalence, including the point estimate and uncertainty interval (lower and upper bounds).
- MHCYP 2017 for depression (ages 5–19 years, England).⁸⁸ This source reports prevalence as 2.10% (95% CI: 1.70–2.50%), which we applied to the Office for National Statistics (ONS) population estimate to derive counts.
- HSE for hypertension (ages 5–15 years, England). This source reports prevalence as 1.8% (95% CI: 1.6–2.1%), which we applied to the ONS population estimate to derive counts.
- 2024 ONS data for the population of children aged 5–19 years in England (10,492,611).⁸⁹

Disease	Coverage	Ages	Point estimate	Lower limit	Upper limit
Asthma	2023	<20y	215,547.83	160,982.10	281,691.80

⁸⁷ GBD permalink: <https://vizhub.healthdata.org/gbd-results?params=gbd-api-2023-permalink/6cff418142879d14fc8c78cfb7afbafd>

⁸⁸ Excel spreadsheet 'MHCYP 2017: Appendix A – Confidence intervals and standard errors.xls' - Table 2. Available at: <https://digital.nhs.uk/data-and-information/publications/statistical/mental-health-of-children-and-young-people-in-england/2017/2017>

⁸⁹ Excel spreadsheet: '2024 England and Wales edition of this dataset.xlsx'. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/analysisofpopulationestimatestoolforuk>

Depression	2017	5–19y	220,344.83	178,374.39	262,315.28
Type 2 diabetes	2023	<20y	3,630.27	2,219.11	5,138.74
Hypertension	2003–2019	5–15y	188,867.00	167,881.78	220,344.83

Model inputs

441. The main model input is a dynamic interface and allows users to define:

- the anthropometric measurement scale at which a change is intended (BMI or zBMI).
- the change in mean measurement (to 2 decimal places).
- the method by which it should be applied to the population; either as a universal (same for everyone) or multiplicative (proportional) distributional shift [see the Mathematical Appendix].

442. In the current implementation, all scenarios assume full population exposure to the specified BMI/zBMI shift. Uptake rates and targeted sub-populations are not modelled.

Estimating changes in health outcomes

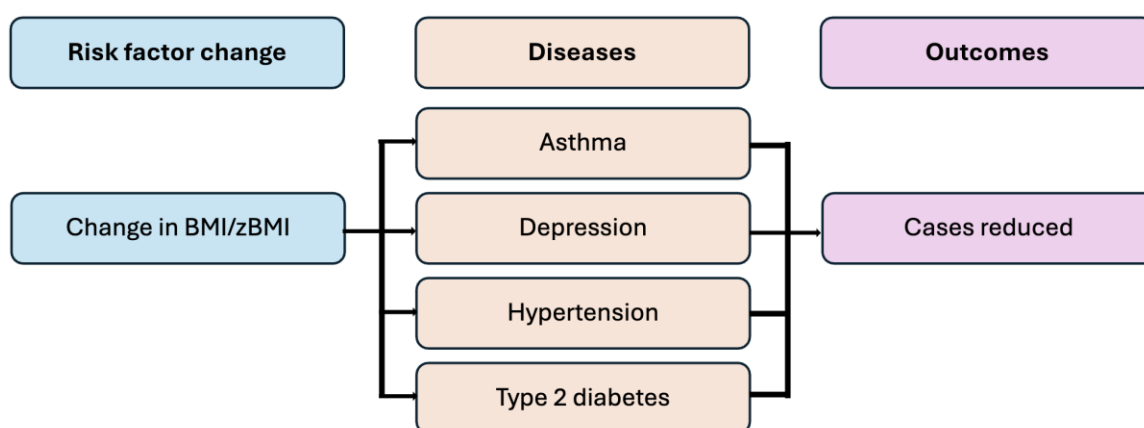
443. Relative risks were identified through a targeted literature review. The risks used throughout are derived for disease incidence and in applying these to prevalence outcomes, it is assumed that changes in incidence lead to proportional differences in prevalence. We selected studies with reasonable effect sizes, using several criteria including consistency of evidence across multiple papers, and overall methodological quality. Where estimates of effect size varied, we prioritised studies reporting more conservative estimates to minimise the risk of overestimation. Additional considerations included the relevance of the study population and context to the UK, the use of appropriate disease classifications, and adequate adjustment for key confounders.

Risk Factor	Disease	Source
BMI	Asthma	Abdeldayem et al (2024)
BMI	Depression	Sutaria et al (2019)
BMI	Type 2 diabetes	Abbasi et al (2017)
BMI	Hypertension	Moody et al (2025)

Disease	HW	OW	OB	Adjustment
Asthma	1 (ref)	1.16 (1.0–1.36)*	1.41 (1.17–1.7)*	Sex and deprivation index at baseline
Depression	1 (ref)	1.04 (0.95–1.14)	1.32 (1.17–1.50)	Of the 11 studies - Age (7), SES (5)
Type 2 diabetes	1 (ref)	1.3 (0.9–1.8)	3.75 (3.07–4.57)	Age, height
Hypertension	1 (ref)	2.29 (1.48–3.54)	3.22 (2.21–4.69)	Unclear – sex, age, year, IMD

*Adjusted odds ratio, ** prevalence ratio. HW = healthy weight, OW = overweight, OB = obesity.

444. For each disease outcome, relative risks were modelled using a log-linear dose-response function, anchored at healthy weight, which is treated as the reference category (relative risk fixed at 1). Dose-response parameters were derived using weight status category midpoints (representing the mean of the relevant anthropometric measurements of individuals within the category) corresponding to healthy weight, overweight, and obesity [see the Mathematical Appendix].
445. For each individual in the synthetic population, relative risks were calculated under baseline and shifted scenarios. These individual-level risks were aggregated to calculate Population Impact Fractions (PIFs), representing the proportional change in average disease risk across the population.
446. **Baseline prevalence** of disease is calculated based on Global Burden of Disease data, assuming the target population has the same prevalence rates as the general population aged under 20 years.
447. PIFs were applied to baseline prevalence to estimate differences in the number of people living with each disease under baseline and shifted scenarios. In the current implementation, all scenarios assume full population exposure to the specified BMI/zBMI shift; so uptake rates are implicitly set to 100%.
448. Estimated changes in case numbers represent comparative differences between baseline and shifted scenarios, rather than forecasts of future disease burden. Results should be interpreted as indicative and conditional on the stated assumptions.



What assumptions are used?

Population Assumptions

449. Pooled HSE data (2019 and 2022) is assumed to be an adequate synthetic representation of the whole child population aged 2–19 years in England.
450. There are no differences in either disease risk or incidence rates across socio-demographic groups.

Model Assumptions

451. Disease dose-response relationships are log-linear across the range of anthropometric measures, with healthy weight fixed at 1.
452. Relative risks derived from weight status category midpoints are applicable at the individual level.

Epidemiological Assumptions

453. BMI/zBMI causally affect disease risk as expressed in the dose-response estimates defined by literature.

454. The model uses a simple approach which means **interaction effects** between diseases are not captured (e.g. the impact in preventing diabetes will not affect the risk of asthma or hypertension).
455. We assume risk ratios derived for specific age groups apply universally to the full age profile of the synthetic population (e.g. for hypertension we have applied the risk ratio for 5–15 years to 2–19 years).
456. Risk factors are assumed to be **independent** with no overlap between cases of diseases saved due to z-BMI (e.g., the reduction in asthma cases due to improved z-BMI is considered separately from the reduction due to physical activity).
457. The **health effects** represent a steady-state counterfactual scenario in which contemporary prevalence would be altered based upon the shifted distribution associated with the input anthropometric measurement change. No assumptions are made regarding the timing or speed of transition.
458. A proportional reduction in disease incidence risk is assumed to result in an **equivalent reduction in** disease prevalence.
459. Disease duration is the same for all cases of each disease, determined for each disease by a literature search.

How robust and reliable is the model?

460. The model is a simple indicative approach which uses the best available data and evidence. Like all models, it relies on a set of assumptions, including inputs and the findings will be sensitive to model inputs and assumptions.
461. It has been quality assured within HWPRU and has been subject to internal governance processes at DHSC. We could not validate this with other models, as none exist that we are aware of.
462. The model has several limitations, the key amongst which include:
- It predicts the effect of changes in BMI on health outcomes but cannot predict the impact of a policy on BMI. It relies on external analysis for estimates of change in BMI.
 - The synthetic population is based on pooled HSE data and may not fully represent all structural population characteristics that may affect changes in health outcomes from changes in BMI.
 - Uncertainty is represented only through dose-response relationships; uncertainty in population structure and disease incidence is not explicitly modelled
 - Distributional shifts preserve individual rank order within the BMI distribution and do not reflect heterogeneous intervention effects across subgroups.
 - Multiplicative shifts are calibrated to match target mean BMI or zBMI only; other distributional properties (e.g. variance or tail behaviour) are not constrained.
 - Population Impact Fractions assume that changes in disease incidence are proportional to changes in average relative risk across the population and do not capture changes in the variance or shape of the risk distribution.
 - The PIF calculation assumes that changes in disease incidence are proportional to changes in mean relative risk across the population.
 - Dose-response relationships are anchored at healthy weight (RR = 1) and assumed log-linear, limiting the ability to represent non-linear risk gradients or risks below the reference category.

- It does not account for all disease conditions or individual circumstance.
- It assumes that past data (in terms of prevalence, and other parameters) is a reasonable estimate of current disease status.

463. Ongoing work aims to refine and improve the model and address its limitations.

Developmental history of the model

Version number	Key Changes
1	Initial model created using a DHSC internal model as an example.
2	Model replicated in R and expanded by using mid-points derived from Health Survey for England and using a distribution shift.
3	R Shiny app developed, to allow users to input different scenario parameters.

Mathematical Appendix

Distribution Shifts

Universal (additive) shift

For universal (additive) distribution shifts, the same absolute change is applied to all individuals, regardless of baseline BMI or zBMI. Where X_i denotes the anthropometric measure of interest for individual i , where $X \in \{BMI, zBMI\}$.

$$X'_i = X_i + \Delta X$$

where, $i = 1, \dots, n$ and indexes the individuals in the population; X_i is the baseline anthropometric measurement (BMI or zBMI) for individual i ; ΔX is the user-defined absolute change applied uniformly across the population; and x'_i is the shifted anthropometric measurement for individual i .

This formulation produces a parallel shift of the entire distribution, preserving relative differences between individuals while uniformly increasing or decreasing BMI or zBMI across the population.

Multiplicative Shift

For multiplicative distribution shifts, changes are applied proportionally to the population on the log-scale (therefore children with a higher BMI see a larger reduction and children with a lower BMI see a smaller reduction).

For BMI-based multiplicative shifts, BMI is transformed on the log scale, where BMI_i denotes the baseline measurement for individual i .

The shifted value for individual i is defined as:

$$BMI'_i = \exp(\ln(BMI_i) + \delta)$$

where, $i = 1, \dots, n$ and indexes the individuals in the population; BMI_i is the baseline anthropometric measurement for individual i ; δ is a scalar shift parameter applied uniformly on the log scale; and BMI'_i is the shifted BMI value.

The value of δ is derived numerically such that the arithmetic mean of the shifted distribution matches the target population mean implied by the specified user-defined absolute change in BMI:

$$\frac{1}{N} \sum_{i=1}^N BMI'_i = \mu_{BMI, \text{target}}$$

where $\mu BMI_{\text{target}} = BMI_{\text{baseline}} + \Delta BMI$

Because the transformation operates on the log-scale, individuals with higher baseline values of BMI_i experience larger absolute changes than those with lower baseline values. This preserves the relative ordering of individuals while inducing a proportional change across the distribution.

For scenarios in which zBMI is selected, multiplicative shifts are applied to BMI, and zBMI is recalculated using the LMS growth reference:

$$BMI'_i = \exp(\ln(BMI_i) + \delta),$$

$$zBMI'_i = LMS(BMI'_i, age_i, sex_i)$$

The value of δ is derived numerically such that the arithmetic mean of the shifted distribution matches the target population mean implied by the specified user-defined absolute change in zBMI (no closed-form solution exists due to the non-linear LMS transformation):

$$\frac{1}{N} \sum_{i=1}^N zBMI'_i = \mu zBMI_{\text{target}}$$

where $\mu zBMI_{\text{target}} = zBMI_{\text{baseline}} + \Delta zBMI$

Estimating Change in Health Outcomes

For each disease outcome (asthma; depression, type 2 diabetes; and hypertension) d and weight status category $c \in \{\text{healthy, overweight and obesity}\}$ relative risk ratios were modelled as a log-linear function derived from the category mid-points (representing the mean of the relevant anthropometric measurements of individuals within the category) \bar{X}_c

$$\ln(RR_{c,d}) = \alpha_d + \beta_d \bar{X}_c$$

where $RR_{c,d}$ is the relative risk for disease d in weight status category c ; α_d and β_d are disease-specific intercept and slope parameters; and \bar{X}_c is the mean zBMI in category c .

This equation is applied separately for the point estimate (PE), lower limit (LL), and upper limit (UL) of the relative risks:

$$RR_c^{PE}, RR_c^{LL}, RR_c^{UL}$$

Once α_d and β_d are estimated for each disease outcome and uncertainty bound (PE, LL, UL), the model is applied at the individual level to derive relative risks based on individual BMI or zBMI values.

$$RR_{i,d} = \exp(\alpha_d + \beta_d X_i)$$

where X_i is the BMI or zBMI of individual i . This formulation allows calculation of RRs for each individual while maintaining consistency across PE, LL, and UL values.

For each individual, original and shifted relative risks are computed:

$$RR_{i,d}^{\text{original}} = \exp(\alpha_d + \beta_d X_i),$$

$$RR_{i,d}^{\text{shifted}} = \exp(\alpha_d + \beta_d X'_i)$$

Standard Population Impact Fractions (PIFs) are calculated to summarize the proportional reduction in average risk across the population:

$$PIF_d = 1 - \frac{\sum_{i=1}^N RR_{i,d}^{\text{shifted}}}{\sum_{i=1}^N RR_{i,d}^{\text{original}}}$$

The PIFs are applied to the baseline disease prevalence (I_d) to estimate the change in number of cases:

$$\text{Change in Cases}_d = PIF_d \times I_d$$

These calculations reflect the point estimate (PE) and confidence limits (LL, UL) of the relative risks to provide uncertainty intervals.

This formulation assumes a steady-state relationship whereby proportional changes in disease incidence translate into proportional differences in prevalence.