Department of Health & Social Care

# Childhood obesity: a plan for action

## A consideration of interactions between modelled policies

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# 1.0 Introduction and Purpose of the Paper

1. The Cross-Whitehall *Childhood Obesity – A Plan for Action (August 2016)* (referred to as Chapter 1 for the purpose of this document) and *Chapter 2 (July 2018)* commits to a range of policies to address childhood obesity.

2. A number of policies proposed in Chapter 2 are aimed at changing the food landscape and reducing calories consumed at a population level. They do this through either attempting to reduce the calories in each portion of the everyday foods that we eat, or reducing the number of portions of high fat, sugar and salt (HFSS) products consumed. This paper considers the possible interactions between these policies and those in Chapter 1 that are also altering the food landscape.

3. This paper considers four of the proposed regulatory policies from Chapter 2 and looks at the possible interactions between these proposed policies with three Chapter 1 policies. The policies considered and the reason for their inclusion in this assessment is detailed in section 1.1.

4. Consultation impact assessments are available for the four regulatory policies considered in this document. The analyses in these impact assessments are separately modelled and do not attempt to consider every interaction between the discussed policies. This is appropriate at consultation stage as the policies have not been finalised.

5. This paper highlights that modelling these policies in isolation may result in a small overstatement of the potential impacts. However, the policies' estimated benefits greatly outweigh the predicted costs, meaning any overstatement would not make these policies cost ineffective.

6. The out-of-home calorie labelling policy, for example, needs to realise only 6% of estimated benefits to be cost effective.

## Report Structure

7. Section 1.2 contains a summary of the interactions we plan to investigate further and consider in the final impact assessments. There may be additional interactions that become evident through the consultation process.

8. Section 2 considers the *direct* interactions between individual policies.

9. Section 3 considers any *indirect* interactions between individual policies.

10. Section 4 considers the modelling approach and considers consistency between independent and simultaneous modelling of the policies.

11. Finally, Section 5 considers some of the possible unintended consequences of the suite of policies.

# 1.1 Summary of Policies

12. The policies covered in this document are those that are being targeted at the population in the retail and out-of-home environment, aiming to influence consumer behaviour. Policies not covered are those that are focused in certain settings such as schools, specific local authority areas, the NHS, and government buildings. This is because these are likely to only have marginal direct interactions with the other policies.

13. Chapter 1 includes three key policies, listed below, that are expected to have a nationwide and population-level impact on consumer behaviour and calorie consumption.

14. The policies considered from Chapter 2 are listed below. The consultation impact assessments are available for these four regulatory policies. In addition, as announced in the Childhood Obesity Plan Chapter 2, the proposed advertising restrictions can be expected to interact with these policies. However, at present there are insufficient details available to consider the interactions.

A consideration of interactions between modelled policies

| Policy | Description/Preferred Option |
|---|---|
| ***Chapter 1*** | |
| **Soft Drinks Industry Levy (SDIL)** | Levy on the manufacturers and importers of sugar sweetened beverages in 2 tiers.<br><br>https://www.gov.uk/topic/business-tax/soft-drinks-industry-levy |
| **Sugar Reduction Programme** | Public Health England (PHE) led programme to reduce sugar by 20% in the product categories contributing most to children's sugar intake by 2020.<br><br>https://www.gov.uk/government/collections/sugar-reduction |
| **Calorie Reduction Programme** | PHE led programme to reduce calories in product categories contributing significantly to children's calorie intake (excluding unprocessed items) by 20% by 2024.<br><br>https://www.gov.uk/government/collections/sugar-reduction#calorie-reduction- |
| ***Chapter 2*** | |
| **Out-of-Home (OOH) energy labelling** | Mandatory energy labelling with reference to daily calorie intake in out-of-home locations.<br><br>https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2 |
| **Location Promotions** | A ban on the sale of high fat, sugar or salt (HFSS) products at check-out, store entrance or end-of-aisle locations.<br><br>https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2 |
| **Price Promotions** | Ban on volume-based promotions on HFSS products.<br><br>https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2 |
| **Energy Drinks** | Ban on the sale of drinks containing more than 150mg/L of caffeine to children, excluding tea and coffee.<br><br>https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action-chapter-2 |

# 1.2 Summary of Policy Interactions Assessment

**Key:**

The introduction of policy **(1)** may reduce the estimated benefits of policy **(2)**. This will be investigated at final stage.

The introduction of policy **(1)** may reduce the estimated benefits of policy **(2)**. There are currently no plans to estimate at final stage.

The introduction of policy **(1)** is not expected to significantly change the estimated benefits of policy **(2)**.

The introduction of policy **(1)** may increase the estimated benefits of policy **(2)**. These will be investigated at final stage.

The introduction of policy **(1)** may increase the estimated benefits of policy **(2)**. There are currently no plans to estimate at final stage.

| | | **Policy (1) affecting Policy (2)** | | | | | |
|---|---|---|---|---|---|---|---|
| | | Soft Drinks Industry Levy **(1)** | Sugar & Calorie Reduction Programmes **(1)** | Out-of-Home (OOH) energy labelling **(1)** | Location Promotions **(1)** | Price Promotions **(1)** | Energy Drinks **(1)** |
| **Policy (2) being affected by Policy (1)** | Soft Drinks Industry Levy **(2)** | | No policy interaction due to non-overlapping product ranges | Policy already implemented | Policy already implemented | Policy already implemented | Policy already implemented |
| | Sugar & Calorie Reduction Programmes **(2)** | No policy interaction due to non-overlapping product ranges. | | **Para 43** | **Para 39** | **Para 39** | **Para 32** |
| | Out-of-Home (OOH) energy labelling **(2)** | **Para 30** | **Para 44** | | **Para 26** | **Para 26** | **Para 32** |
| | Location Promotions **(2)** | **Para 30** | **Para 20** | **Para 27** | | **Para 23**<br>**Para 25** | **Para 32** |
| | Price Promotions **(2)** | **Para 30** | **Para 20** | **Para 27** | **Para 24**<br>**Para 25** | | **Para 32** |
| | Energy Drinks **(2)** | **Para 34** | **Para 34** | **Para 34** | **Para 34** | **Para 34** | |

# 2.0 Intended First Order Policy Effects

15. The interventions here are all designed to reduce calorie intake. To simplify our policies we can model them in two categories: policies designed to restrict the number of servings consumed, and policies designed to reduce the calories per serving.

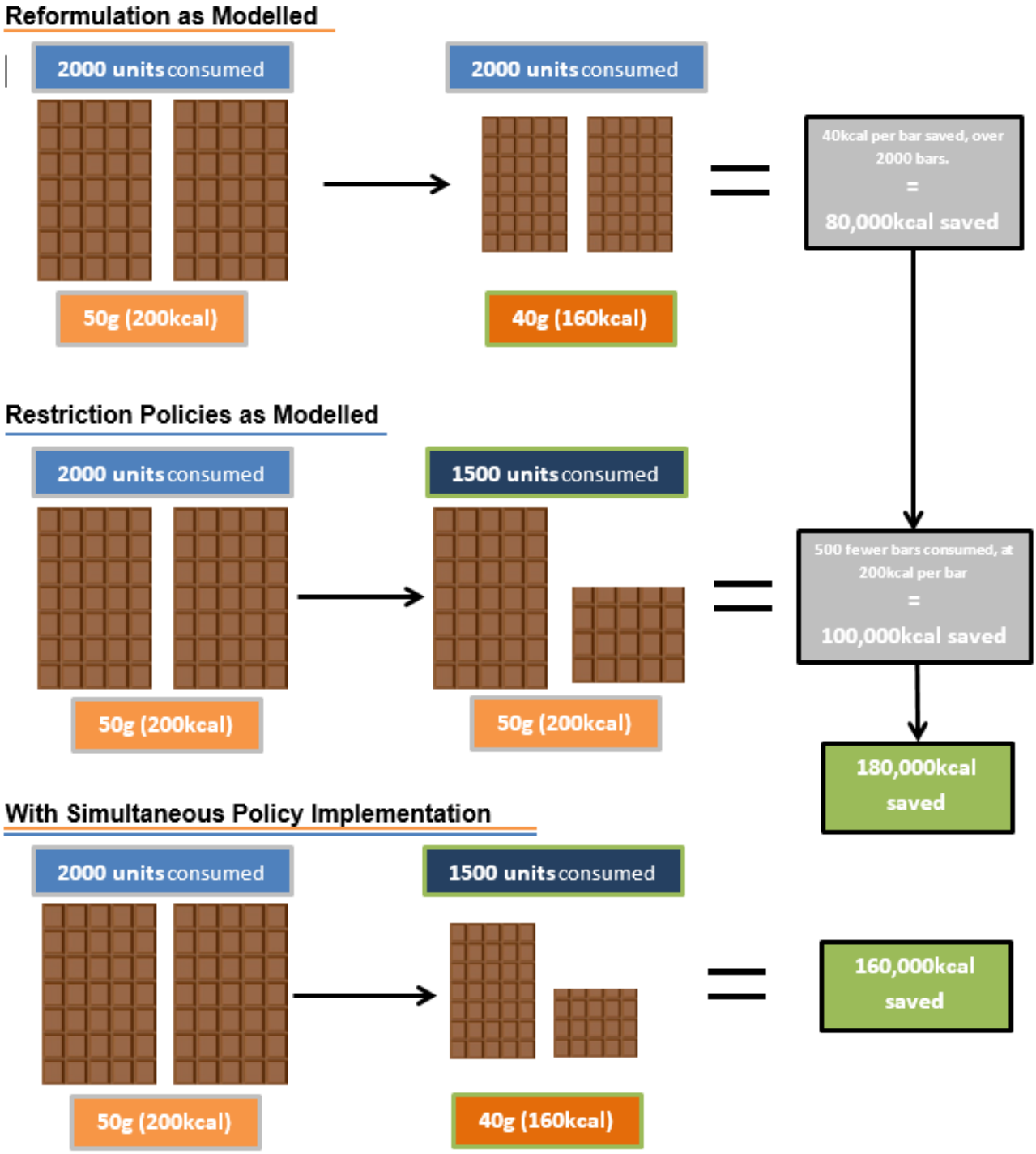

| Policy | Quantified Benefit Mechanism | Intended Policy Type |
|---|---|---|
| **Soft Drinks Industry Levy (SDIL)** | A displacement from regular soft drinks to diet soft drinks due to a price increase.<br><br>Incentive for manufacturers to reduce sugar in drinks to avoid the levy. | Restriction<br>Reformulation |
| **Sugar Reduction Programme** | Less sugar in each portion which can lead to a reduction in calories consumed. | Reformulation |
| **Calorie Reduction Programme** | Fewer calories in each portion which can lead to a reduction in calories consumed. | Reformulation |
| **Out-of-Home (OOH) energy labelling** | Using the information provided in out-of-home settings, some consumers will choose lower calorie items. Additionally, energy labelling may encourage businesses to reformulate. | Restriction<br>Reformulation |
| **Location Promotions** | Lower exposure to HFSS products will lead to lower purchasing and therefore consumption of HFSS products.<br><br>A potential unquantified benefit is manufacturers may reformulate products. | Restriction |
| **Price Promotions** | Removing multi-buy offers will lead to lower purchasing of HFSS products and therefore consumption of HFSS products.<br><br>A potential unquantified benefit is manufacturers may reformulate products. | Restriction |
| **Energy Drinks** | Calorie reductions remain unquantified in net present value calculations. | Restriction |
| ***Total Estimated Impact*** | *This paper acknowledges there may be some interactions between the policies. However, at the consultation stage where policies are yet to be decided, we have not quantified these interactions.*<br><br>*This figure is the sum total of individually modelled calorie reductions for the average 19-65 year old adult.* | **Approx. 110kcal/day calorie reduction (internal DHSC anlysis)** |

# 2.1 First Order Policy Interactions

## 2.1.1 Reduction and Reformulation Policy Interactions

16. The impacts from Childhood Obesity Plan Chapter 2 policies are modelled in isolation from all other obesity policies including both the SDIL and reformulation programmes. It is likely that the reformulation and restriction policies will interact with each other to decrease the sum of the individual isolated impacts.

17. The below illustration shows that when modelled in isolation, we may be overstating the sum of the benefits. These effects have not been modelled or monetised and as such all figures are purely illustrative.



18. The calorie data we use to quantify benefits is prior to the implementation of the SDIL and PHE reduction policies. This illustration shows that we are likely overestimating the calorie benefits of our restriction policies (out-of-home energy labelling and location and price promotions) as they do not account for reformulation from the SDIL or PHE's reformulation programmes which is reducing the average calories per portion.

19. If PHE's reduction programmes achieve their stated goals, up to 20% of calories could be removed. As mentioned in para 5**,** despite this the policies need to realise only a small percentage of the estimated benefits for them to outweigh the costs.

20. More work is required to understand the potential to model these interactions. Where possible, the expected effects of reformulation will be accounted for in the final stage impact assessments.

## 2.1.2 Additional Policy Interactions

21. In addition to the interactions between restriction and reformulation policies there are multiple additional interactions between specific policies. The main interactions are considered in turn below.

### Price and Location Promotion Interactions

22. A restriction on price promotions and location promotions are two separate policies. The corresponding impact assessments have therefore been modelled as individual policies. Due to the policies being under development and subject to consultation, they have been modelled assuming no interactions. However, we know many of the products on price promotions are also situated at the end of aisles. This means if both policies are implemented, they will have smaller combined impacts than the sum of the independent modelling, both in costs and benefits.

23. The locations promotion analysis already partially accounts for products being on price promotion. The study used to form the assumptions in the locations promotions analysis looks at the effectiveness of end-of-aisle displays after factoring in the effects of price, price promotion and number of display locations. This means the locations promotions analysis accounts for price promotions as far as is possible with the current evidence.

24. The price promotion analysis conducted by Kantar does not account for the location of the product. A study found location promotions boost product sales by an estimated 50%[1]. If price promotions are more likely to be in the location promotion areas, then some of the increased sales due to price promotions observed in the Kantar analysis will be due to the products' location. This implies that the implementation of location and price promotions simultaneously may result in lower benefits than have been modelled in the price promotions analysis. Currently we are unaware of any data that allows us to estimate the scale of this effect. We will reconsider this at the final IA stage.

25. There would be cost savings if both policies were implemented simultaneously. Each policy has administration costs for assessing products against the Nutrient Profile Model to see if they fall under the proposed restrictions. If both policies were implemented it is possible that a large proportion of this assessment cost could be shared across both policies. This would be investigated and estimated at final stage if appropriate.

## Out-of-Home (OOH) energy labelling and other Chapter 2 policies

26. The OOH energy labelling policy is proposed to require the labelling of all items on menus and displays, including pre-packaged items such as soft drinks and snacks. In the out-of-home setting, those pre-packaged products that are deemed HFSS will be subject to the location and price promotion restrictions which may decrease the sale of these out-of-home pre-packaged products.

27. There is likely to be a marginal interaction between these policies. However, these cannot be easily accounted for in the existing calculations in the consultation IAs. This is because the methodology employed in each case does not cover any data in which these interactions could take place:
    a. OOH energy labelling estimates come from data looking at meals in the out-of-home sector, the majority of which we expect will not contain any pre-packaged foods.
    b. The price and location promotion impact assessments use Kantar Worldpanel data that only looks at food and drink purchased to be consumed at home. This means the price and location promotion impact assessments do not contain a monetised estimate of impact from OOH settings.

28. These methodologies will be reviewed if appropriate at final stage and adjustments for the potential interactions will be considered.

## Soft Drinks Industry Levy (SDIL) and Chapter 2 policies

29. Due to the SDIL only being active from April 2018, all models use sales data prior to its implementation.

30. Soft drink sales, and the sugar consumed from them, will make up a proportion of sales in scope for restriction under the OOH calorie labelling, location promotions and price promotions. As the SDIL has already been shown to reduce the sugar content of these products, it is likely that some of the modelled benefits in these policies shall not be realised.

31. This will be investigated at the final stage and modelled where reasonable estimates can be made.

## Energy Drinks

32. Energy drinks will make up a small component of the range of products in scope for the SDIL, OOH calorie labelling, location promotions and price promotion policies. If the sale of energy drinks were restricted to children this may lower the calories consumed in the business as usual scenarios of the other policies.

33. This effect is likely to be small as energy drinks make up a small proportion of the products in scope and the restrictions will only apply to children, a subset of the entire population. Additionally, we expect there to be significant displacement to other soft drinks which would offset the majority of any small benefits reduction.

34. As the energy drinks impact assessment does not include any benefits from calorie reductions in the net present value, it is not necessary to make any adjustments for interactions with other policies.

35. It is highly uncertain how children would change their energy drink consumption behaviour if any of the other policies were introduced. The energy drinks impact assessment assumes that the SDIL causes a partial shift from ‘regular’ energy drinks to ‘diet’ energy drinks. We could assume that the other policies would have a similar displacement effect.

# 3.0 Second Order Policy Interactions

## 3.0.1 Incentives and Levers across the System

36. The reformulation work currently overseen by PHE is implemented through a structured and transparently monitored voluntary programme. This relies on food manufacturers, retailers, and businesses in the out-of-home sector cooperating and taking action.

37. The proposed new restrictive legislation would provide a new additional set of incentives for reformulation. The restriction criteria for these policies are yet to be decided; however manufacturers whose products are close to the restriction criteria will have strong additional incentives to reformulate their products out of the restrictions. We expect this will support PHE’s reformulation programmes, although this is not modelled due to the uncertainties around the expected benefits and costs of reformulation to businesses.

## Price and Location Promotion Restrictions and Reformulation

38. If products fall within any new restrictive regulations, there will be additional incentives for manufacturers to reformulate to move their products out of the restrictions.

39. This will be more likely to occur for products that are close to the threshold. Manufacturers of previously borderline products would have incentives to reformulate under PHE’s voluntary reformulation programmes; however introducing a legislative restriction on sale provides a strong additional incentive to reformulate.

40. There are currently no reformulation benefits quantified in the location and price promotions analysis due to the uncertainties around the costs and benefits to business of reformulation, which will be a key component in industry’s decision to reformulate.

41. Small calorie reductions are likely to have significant positive health impacts as demonstrated in the impact assessments published alongside this. If these policies drove some products to reformulate beyond what the sugar and calorie reformulation programmes alone would have incentivised, there would be significant additional health benefits.

## Out-of-Home (OOH) Energy Labelling

42. The OOH energy labelling analysis includes an estimate of benefits from outlets reformulating their menus to continue to appeal to consumers once the calorie content is displayed.

43. Freshly prepared and unpackaged items such as meals sold in restaurants and in hot food counters are in scope of PHE's reduction programmes. The mechanism for incentivising this voluntary action is reporting progress in such a way that provides opportunity for public scrutiny. By implementing mandatory out-of-home energy labelling, PHE will have more reliable information to further develop the reporting of reformulation progress.

44. Additional reformulation that comes from public scrutiny through PHE's reporting mechanisms is not factored in to the OOH energy labelling analysis. This may lead to further reformulation leading to additional obesity reductions.

# 3.0.2 Compensatory Behaviour by Individuals and Industry

45. Policies may not fully realise their modelled benefits if consumers or businesses change their behaviour to access or supply more HFSS food and drinks.

## Consumer Response

46. The benefits due to reformulation and restriction on promotions are realised through behaviours requiring no active decision making by consumers. This means people will be consuming fewer calories even if their conscious behaviour remains the same.

47. It is possible that implementing multiple policies removing calories from people's diets, the effect may become great enough to result in additional calorie seeking.

48. Assumptions on calorie replacement are made in each individual impact assessment. Calorie replacement is highly uncertain, however in the central scenario the location and price promotions analysis assumes 40% of calories are replaced. For out-of-home energy labelling, a 40% calorie replacement is assumed for the reformulation side of the policy and no adjustment is made for the informative benefits from the policy. It is possible that the actual calorie replacement is higher than this, meaning we may be overstating calorie reductions. The higher the combined total impact of the policies, the higher the risk of increased calorie replacement becomes.

49. The expected total calorie reduction of the policies is around 110kcal/day for the average adult. This means the sum of the policies do not exceed the excess calorie intake in even the youngest overweight and obese children. Therefore, we expect the sum of the calorie reductions will have no additional calorie replacement compensation effect.

### Excess calorie intake in overweight and obese children

| | Age | Proportion overweight or obese | Energy intake | Excess calorie intake |
|---|---|---|---|---|
| **Boys** | 4 - 10 | 26% | 1871 | 146 |
| | 11 - 15 | 33% | 3133 | 498 |
| | 16 - 18 | 32% | 3621 | 505 |
| **Girls** | 4 - 10 | 25% | 1760 | 157 |
| | 11 - 15 | 33% | 2536 | 229 |
| | 16 - 18 | 35% | 2748 | 291 |

*Source:* Public Health England. (2018). Calorie reduction: The scope and ambition for action. Retrieved from: https://www.gov.uk/government/publications/calorie-reduction-the-scope-and-ambition-for-action

### Industry Response

50. While industry will be required to comply with the new legislation, future strategies adopted by industry may unintentionally conflict with the intentions of the policy and reduce some of the expected benefits. In the case of world-leading policies such as these, there is no way to assess the potential magnitude of this.

51. Assumptions are made for this possibility within the individual impact assessments and we hope to gather further evidence in the consultation.

52. The implementation of multiple policies targeting HFSS products will help to align industry's strategies with the policy intentions through incentivising sugar and calorie reduction. There is no evidence on which to assess how the industry response will vary with multiple policy implementation compared to if the policies had been implemented in isolation.

# 4.0 Addition of Benefits

53. The model used to estimate the benefits from a reduction in calories gives linear benefits to additional calories removed. This means modelling the policies individually or together yields identical results.

54. The only exception to this is if the policies result in a reduction of more than 320 kcal per day. This is the lowest calorie reduction for which the person of fewest excess calories in the model stops accruing health benefits. For any number below 320 kcal/day reduction, every person in the model continues to accrue linear health benefits. This is not the case here as the sum of the policies has an estimated 110 kcal per day reduction.

55. Further details are provided in the 'Technical Consultation Document: DHSC Calorie Model'[2] published alongside the impact assessments.

# 5.0 Unintended Consequences

56. Any new regulations can create unintended consequences. There are some areas that may be vulnerable to these and our understanding will be enhanced through the consultation process.

## Micro Businesses

57. There are proposals, to be consulted on, to make adjustments for micro businesses in the promotion restrictions and out-of-home energy labelling policies. Micro businesses include many high street convenience stores, coffee shops and restaurants. They often compete directly with larger businesses on the high street for the sale of high fat, sugar and salt foods.

58. Excluding micro businesses from any of these policies might give them an advantage over larger businesses that would be subject to the regulations. The potential for this will be further considered after reviewing responses to the consultations.

59. The way in which micro businesses are defined is to be consulted on; it may be based on turnover, working time equivalent, floor space or a combination of these for each policy. Regardless of definition, there will be some businesses close to the threshold which may create perverse incentives for businesses. Businesses may reduce the hours of their staff, seek to trade as multiple businesses or adjust their business model, such as franchising, to comply with the micro business definition. We would welcome any evidence of the likelihood of these consequences through the consultation process.

## Disproportionate Impacts on Individual Businesses

60. As these policies use similar criteria to define the restrictions, the impact will be greater for some businesses that are affected across multiple policies, such as large food manufacturers and retailers.

61. Due to the complexity of food manufacturing and retailing and the commercial sensitivity of any business arrangements between manufacturers and retailers, it is not possible to attribute specific impacts directly to individual businesses. Therefore, it is not possible to identify the possible knock-on consequences should any individual businesses be disproportionately impacted.

## References

[1] 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 (1982), 108(100), 68–73. http://doi.org/10.1016/j.socscimed.2014.02.032

[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/736417/dhsc-calorie-model-technical-document.pdf

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