



Department
of Health &
Social Care

Equality Assessment

Childhood obesity: A plan for action - Chapter 2

September 2018

DH ID box
Title: Equality Assessment Childhood obesity: A plan for action - Chapter 2
Author: Global and Public Health Group/ Obesity Branch/Childhood Obesity Team/10800
Document Purpose: Consultation
Publication date: August 2018
Target audience: <ul style="list-style-type: none"> • Parents and families • Charities and non-governmental organisations • Nutritionists and dietitians • Educational professionals and organisations • Local government • Research organisations • Industry bodies • Businesses • Regulators • Broadcasters • Members of the public
Contact details: Email: Childhood.Obesity@dh.gsi.gov.uk Childhood Obesity Team Department of Health and Social Care 6th Floor, 39 Victoria Street London SW1H 0EU

You may re-use the text of this document (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence/

© Crown copyright 2016

Published to gov.uk, in PDF format only.

www.gov.uk/dh

Table of Contents

Table of Contents	1
1. Introduction	2
2. Childhood obesity: A plan for action - Chapter 2	3
3. Assessment against protected characteristics.....	4
Age	4
Disability	5
Gender Reassignment	5
Pregnancy and maternity.....	5
Race.....	6
Religion and belief	8
Sex	8
Sexual orientation	9
Marriage and civil partnership.....	9
Summary of the effects of the policies on people with protected characteristics.....	10
Annex.....	11
References	13

1. Introduction

- 1.1. This paper examines the impact of the policy intentions set out in the Government's *Childhood obesity: A plan for action - Chapter 2* on people with protected characteristics. This is in accordance with our duties under the Equality Act 2010.
- 1.2. Under the Equality Act 2010 (the Act), the Department of Health and Social Care (DHSC), as a public authority, is legally obliged to give due regard to the public sector equality duty when making policy decisions. The public sector equality duty is also known as the general equality duty.
- 1.3. DHSC, as a public authority must, in the exercise of its functions, have due regard to the need to:
 - a) Eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act;
 - b) Advance equality of opportunity between people who share a protected characteristic and those who do not; and
 - c) Foster good relations between people who share a protected characteristic and those who do not.
- 1.4. The public sector equality duty covers consideration of the following protected characteristics: age, disability, gender reassignment, pregnancy and maternity, race, religion and belief, sex, and sexual orientation, with marriage and civil partnership being a protected characteristic under (a) above.

2. Childhood obesity: A plan for action - Chapter 2

- 2.1. Obesity remains one of the biggest public health challenges of our time with nearly a quarter of children in England obese or overweight by the time they start primary school aged five, rising to one third by the time they leave aged 11.¹ These figures disproportionately affect those in lower socio-economic groups, whilst obesity also has links with age, race, disability and sex.² This is impacting on children's health now, with type 2 diabetes in children strongly associated with obesity³ and also in the future as obese children are more likely to be obese adults.⁴ This in turn increases their risk of developing life threatening conditions such as some cancers, type 2 diabetes, heart and liver disease.^{5,6} To improve the health of our children both now and in the future, the Government published *Childhood obesity: A plan for action - chapter 2* in June 2018. It sets a new national ambition to halve childhood obesity and significantly reduce the gap in obesity between children from the most and least deprived areas by 2030.
- 2.2. Underneath this ambition is a package of evidence based policies that aim to reduce the prevalence of unhealthy influences by reshaping our food environment, to help parents to make more informed, healthier choices about the food they and their children eat. This includes proposals to reduce children's exposure to marketing of unhealthy food and drink products in store, on TV and online, to restrict the sale of energy drinks, to introduce calorie labelling in the out-of-home sector, to offer support to local authorities to take action at a local level, and to encourage physical activity in the school day through active mile initiatives and increased funding to support walking and cycling to school.
- 2.3. The plan calls on all – parents, manufacturers, the out-of-home sector (e.g. restaurants, cafes and takeaways), retailers, broadcasters, online media, local authorities and schools to play their part in meeting the ambition by 2030.
- 2.4. This document is intended to be read in conjunction with the plan, which sets out more detailed information about the policy objectives. The policies are not designed to increase disadvantage between individuals or groups, particularly those that share protected characteristics as set out in the Equality Act 2010. We have considered whether there are any unintended consequences and how we can mitigate any disadvantages as well as to comply with the public sector equality duty. The following section will examine the impact of the policies in the plan on various groups sharing protected characteristics.
- 2.5. The policies under consideration in this document cover all parts in the plan. For a summary please see the annex. Broadly, these cover:
 - Sugar reduction
 - Calorie reduction
 - Advertising
 - Promotions
 - Local authorities
 - Schools

3. Assessment against protected characteristics

- 3.1. In general, all the proposed policies are targeted at children but they will have an effect on the whole population. Some protected characteristics have higher rates of overweight and obesity than average, therefore for the populations with these protected characteristics there may be a larger scope for health benefits.
- 3.2. There is no evidence to suggest that the price of food and drinks will increase as a result of the proposed policies. Consequently, we do not expect people with protected characteristics who may also be financially vulnerable to be negatively impacted by these policies.
- 3.3. This section will examine the impact of the policies in Chapter 2, individually where appropriate, and otherwise as a package of measures, on various groups sharing protected characteristics.

Age

- 3.4. Obesity prevalence is different across age groups. [Public Health England \(PHE\) analysis](#)⁷ of National Child Measurement Programme (NCMP) data shows that obesity and overweight prevalence increases in children in England as they progress through primary school. Around 1 in 10 children in Reception and 1 in 5 children in Year 6 is obese. There are increasing trends in obesity and being overweight in Reception and Year 6 boys and girls. For example, between 2006/07 to 2016/17 obesity prevalence for children in Year 6 increased from 15.8% to 18.1% for girls and 19% to 21.8% for boys.
- 3.5. In adults, 2016 results from the [Health Survey for England \(HSE\)](#)⁸ showed that obesity and overweight rates went up with age, but decreased in the oldest age groups. Obesity ranged from 10% of men aged 16-24 to a peak of 34% of men aged 55-64, and the equivalent range for women was from 13% aged 16-24 to 34% aged 55-64. This decreased to 23% of men and 16% of women aged 85+.
- 3.6. The proposed policies aim to reduce childhood obesity and have been chosen in order to particularly target those products that contribute most to childhood obesity. However, some of the policies will have an effect on the whole population, not discriminating between age groups. We do not anticipate any negative impact of the proposed policies and, therefore, do not foresee any group being disadvantaged by age.
- 3.7. The policies applying to the wider food environment and affecting people in all age groups include:
 - Out-of-home energy labelling
 - Price and location promotions
 - Government Buying Standards for Food and Catering Services update
 - Potential impacts from local authority trailblazer programmes where changes are made that impact the local food environment
 - Advertising restrictions

- 3.8. One exception is the ban of energy drinks for children. It is proposed to apply to under 16s or under 18s only and therefore does not affect other age groups. The reason for this is that regular consumption of caffeinated energy drinks by children has been linked with adverse health outcomes such as headaches, sleeping problems, irritation and tiredness. DHSC analysis has shown that energy drinks are often high in sugar as well as caffeine, may contain more sugar than full-sugar soft drinks, and are therefore a contributor to both obesity in children and dental problems.
- 3.9. Furthermore, the Healthy Food Schemes focus mainly on children and there are also resources for health and care professionals to support healthier weight throughout pregnancy and childhood.
- 3.10. In general, some age groups may experience a larger impact than others from the policies. For example, advertising of high fat, salt, and sugar (HFSS) foods have a statistically significant impact on children's food preferences and consumption⁹, whereas there is no equivalent evidence for adults¹⁰, so this policy is expected to have a greater impact on children than adults. Nevertheless, the policies may affect all age groups to some extent.
- 3.11. The benefits from the proposed policies arise mostly as health benefits at older ages. For example, around 44% of the incidence of diabetes, 23% of heart disease and between 7% and 41% of certain cancers (breast, colon and endometrial) are attributable to excess body fat.¹¹ These conditions all increase with age. The individuals affected by the proposed policies today (including children) will benefit if they can maintain a lower weight as a result of the interventions in place.

Disability

- 3.12. There are links between obesity and disability in childhood and adulthood. Disabled children have a higher risk of obesity, which increases with age, and are at greater risk of developing associated conditions as adults (e.g. diabetes, cardiovascular disease or mobility issues). In adults, there is a two-way relationship between obesity and disability; i.e. disabled adults are more likely to be at risk of obesity, while obese adults may develop complications leading to disabilities because of being obese.
- 3.13. We expect that the proposed policies will have a positive impact on disabled and non-disabled individuals. As mentioned above, the proposed policies are targeted at children. However, most policies affect the food environment and therefore all age groups and adults with disabilities are also expected to benefit from the policies.

Gender Reassignment

- 3.14. We have considered the impact of the proposals on the protected characteristic of gender reassignment. There is no evidence to suggest that the proposed policies will have a negative impact on people who share this protected characteristic as compared with people who do not share this protected characteristic.

Pregnancy and maternity

- 3.15. Women who are obese when they become pregnant have increased risks to their own and their babies' health. They are more likely to experience complications in labour¹² and their children have increased risks of obesity in childhood and adulthood, and other health conditions later in life including heart disease, diabetes, and

asthma.^{13,14,15,16} Maternal obesity is also associated with an increased risk of infant mortality.¹⁷

- 3.16. Although maternal obesity rates are not routinely monitored in England, we do know that obesity in pregnant women has increased, which is likely to increase the risks passed on to children. Between 1989 and 2007, [maternal obesity](#) (the proportion of pregnant women with a BMI greater than 30) has doubled from 7.6% to 15.6%.¹⁸ PHE analysis found that almost 50% of all women of childbearing age in England are either overweight or obese and therefore they and their children are at [greater risk during and after the pregnancy](#).¹⁹
- 3.17. Even though the policies are targeted at children, they would have an effect on the wider food environment, as mentioned in paragraph 3.4, and would affect the eating behaviour of all age groups, including women at childbearing age. Therefore, we can expect a positive impact from the proposed policies on maternal obesity rates, and a knock-on positive impact on the associated risks with maternal obesity.
- 3.18. Moreover, the commitment to provide health and care professionals with the latest training and tools to better support children, young people and families to reduce obesity includes support for healthier weight throughout maternity. These resources include consistent messages to support healthier weight during pre-conception and maternity, which were published in June 2018. Further resources will follow, as part of the ambition to increase the number of women starting and continuing through pregnancy at a healthy weight.
- 3.19. The Healthy Start Scheme currently promotes a healthy diet for pregnant women. Healthy Start vouchers are issued to pregnant women (at least 10 weeks into pregnancy) if they are eligible through qualifying benefits. Healthy Start is also given to any pregnant woman under-18 regardless of qualifying benefits. The Healthy Start scheme offers these women a weekly £3.10 voucher to spend on Fruit, Vegetables and Milk. These women are also entitled to Healthy Start vitamins. The Department will be consulting on options to improve the current Healthy Start scheme.

Race

- 3.20. PHE (2017/18) have found notable differences in obesity prevalence across racial groups for both [children](#) (Figure 1) and [adults](#) (Figure 2).^{20,21}

Figure 1 Obesity prevalence in children by ethnicity (NCMP (2016/17))

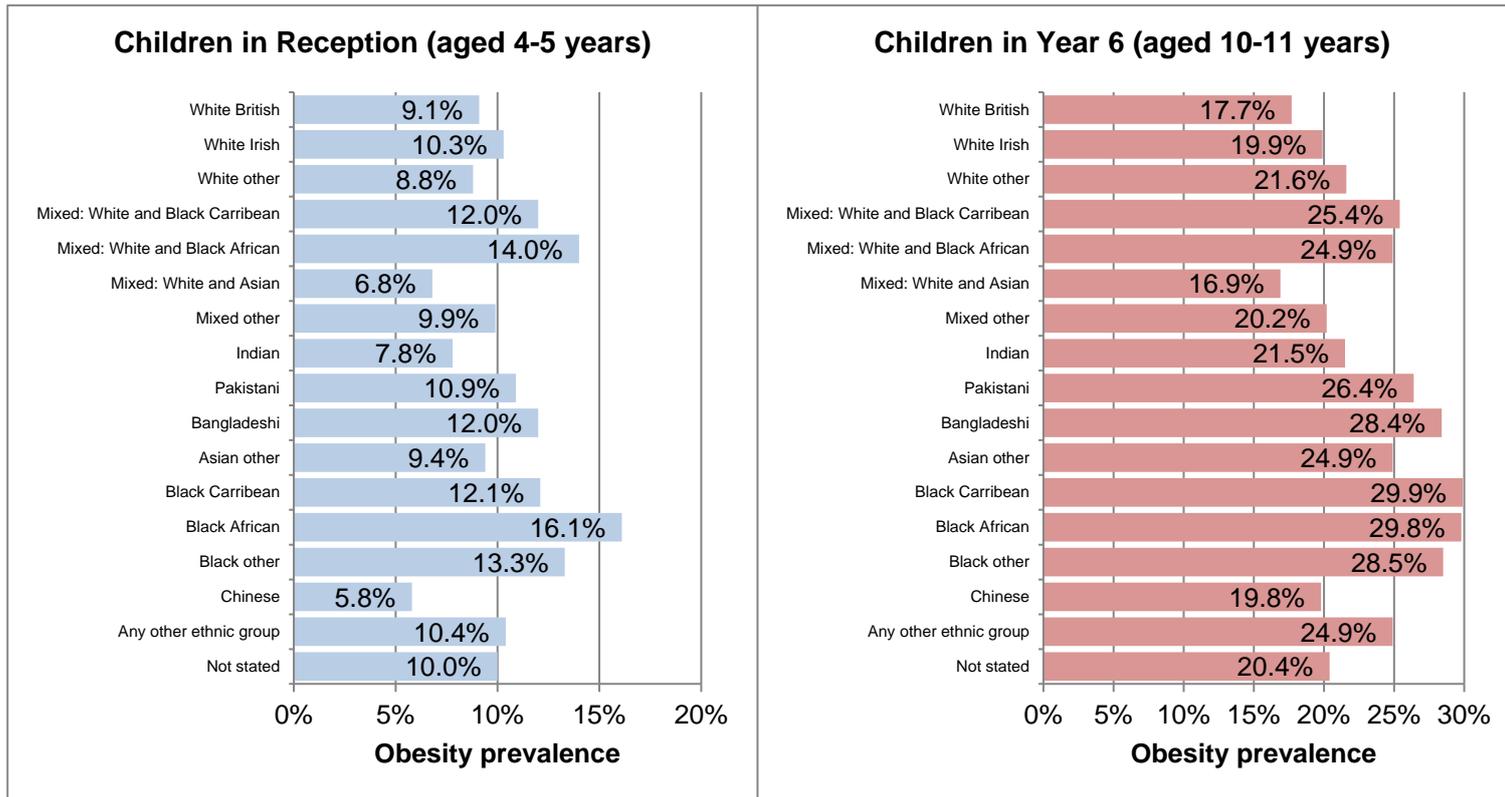
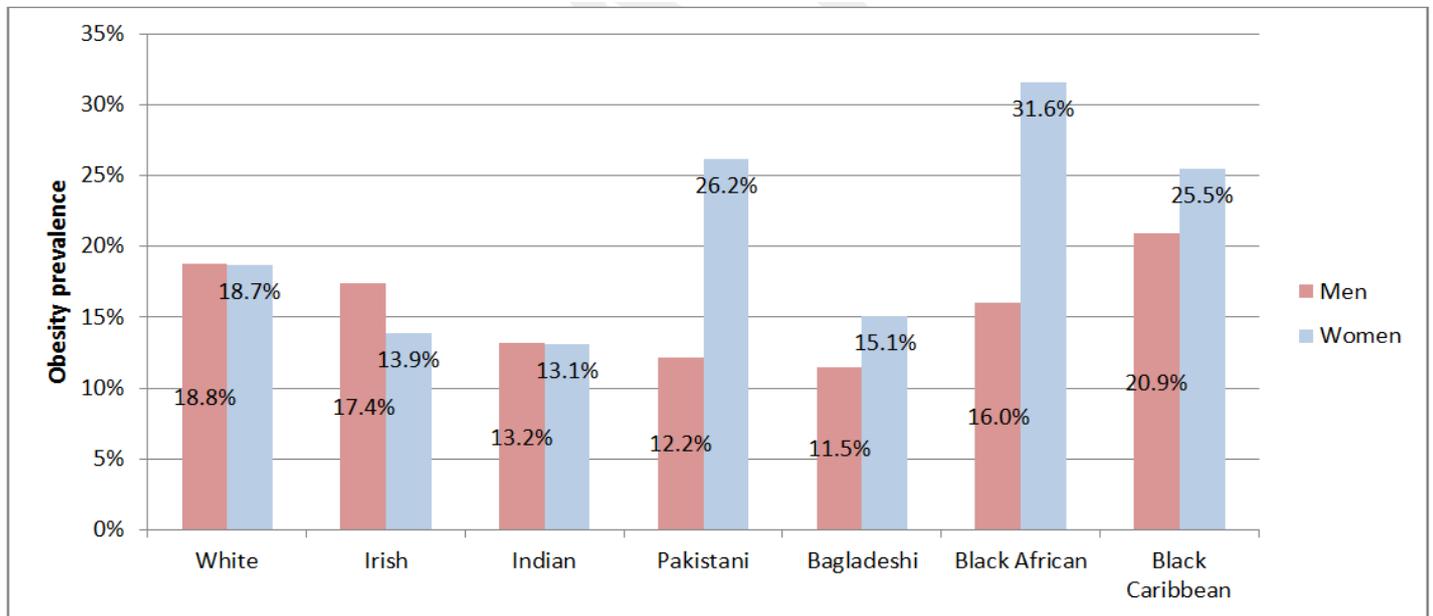


Figure 2 Obesity prevalence in adults by ethnicity (HSE 2006-2010 (five-year average))



- 3.21. Boys in Year 6 from all minority ethnic groups are more likely to be obese than White British boys, with boys of Pakistani ethnicity having the highest prevalence of obesity at 34.1%, followed by other Asian ethnicities with 30.8%. For girls in Year 6, obesity prevalence is highest for children from Black Caribbean (31.5%) and Black African (29.4%) ethnic groups.
- 3.22. Differences in weight between racial groups arise due to various factors such as environmental factors, health behaviours, socio-economic status, access to health care, social marginalisation, or discrimination.²² The fact that ethnic differences persist even when controlling for deprivation and controlling for interaction suggests that cultural and genetic differences within some ethnic minority groups may account for the increased likelihood of children from these groups becoming obese or overweight.^{23,24,25,26,27}
- 3.23. People from different ethnic groups have different levels of risk to develop conditions associated with obesity and being overweight. For the same level of BMI, people of African ethnicity appear to carry less fat and people of Asian ethnicity generally have a higher percentage of body fat than people of the same age and [gender](#).^{28,29} Some ethnic minority groups (especially those of Asian descent) are at risk of type 2 diabetes and cardiovascular disease at a lower BMI than other groups.³⁰ The proposed policies are targeted at children from all ethnicities and are therefore expected to have a positive effect on all ethnic groups.
- 3.24. The policies are implemented in a way that does not differentiate by race. However, some ethnic groups experience higher obesity prevalence and the potential for a reduction in obesity may be higher. The reasons for differences in obesity prevalence across ethnicities are various and it is difficult to state how different groups will benefit from the policies: If the causes of obesity in each ethnic group are the same, then they would expect to have a similar impact. If causes are genetic or specific to lifestyles that are adopted by some socioeconomic groups, then these may not be impacted equally by these policies.
- 3.25. The local authority trailblazer programme will support participating authorities to tackle childhood obesity at a local level with a particular focus on addressing the inequalities and ethnic disparities in their area. In this way, there is potential for trailblazer authorities to have a positive impact on local ethnic disparities.

Religion and belief

- 3.26. We have considered the impact of the proposals on the protected characteristic of religion and belief. There is no evidence to suggest that the proposed policies will have a negative impact on people who share this protected characteristic as compared with people who do not share this protected characteristic.

Sex

- 3.27. There are differences in obesity prevalence depending on gender:
- [For children in Reception](#), the obesity prevalence is 10% for boys and 9.2% for girls. In Year 6, 21.8% of boys and 18.1% of girls are obese.³¹
 - Almost 7 out of 10 men (66.8%) and almost 6 out of 10 women are [overweight or obese](#) (57.8%).³²

- 3.28. The differences by gender have various underlying possible reasons. As these policies are focused on tackling childhood obesity, we have considered whether there is a differential impact expected on girls and boys. There is little data to identify the difference in girls' and boys' diets. National Diet and Nutrition Survey (NDNS) [data](#)³³, for example, cannot be reliably analysed by gender. (NDNS cannot be analysed reliably by gender because of its small sample size and the persistent problem of under-reporting that is common to all diet diaries.) Nevertheless, there is no evidence to suggest that the proposed policies have different effects depending on sex.
- 3.29. Regular physical activity also contributes towards maintaining a healthy weight. Health Survey for England data tells us that fewer girls than boys meet the UK Chief Medical Officers' guidelines for physical activity. Our proposed actions are not gender specific and will support both girls and boys to lead more active and healthier lives. As [girls are on average less active than boys](#)³⁴, it is possible that they will benefit more from more regular physical activity than boys, as, for example, the proposed active mile initiative and investment in cycling equipment would promote.

Sexual orientation

- 3.30. We have considered the impact of the proposals on the protected characteristic of sexual orientation. There is no evidence to suggest that the proposed policies will have a negative impact on people who share this protected characteristic as compared with people who do not share this protected characteristic.

Marriage and civil partnership

- 3.31. We have considered the impact of the proposals on the protected characteristic of marriage and civil partnership. There is no evidence to suggest that the proposed policies will have a negative impact on people who share this protected characteristic as compared with people who do not share this protected characteristic.

Summary of the effects of the policies on people with protected characteristics

Protected characteristic	Likely effect of policy
Age	Neutral (except the proposed ban of energy drinks for children)
Disability	Positive – there is a link between obesity and disability. Reducing obesity results in health benefits for people with this protected characteristic
Gender Reassignment	Neutral
Pregnancy and maternity	Positive – The policies aim at reducing childhood obesity but e.g. the Healthy Food Schemes also improve women’s nutrition during and after pregnancy.
Race	Neutral or positive – some ethnicities have a higher prevalence of obesity and therefore the potential for health benefits due to weight reduction is bigger. However, the policies do not specifically target children of any ethnicity. Moreover, as the cause for the differences in prevalence as measured against race are difficult to measure, we are unable to accurately predict to what extent any ethnic minority group may benefit from the policies.
Religion and belief	Neutral
Sex	Neutral
Sexual orientation	Neutral
Marriage and civil partnership	Neutral

Annex

Childhood Obesity Chapter 2 policies

Policy list: Childhood Obesity: A plan for action, Chapter 2
<p>Sugar reduction</p> <ul style="list-style-type: none">• HM Treasury will consider the sugar reduction progress achieved in sugary milk drinks as part of its 2020 review of the milk drinks exemption from SDIL. Sugary milk drinks may be included in the SDIL if insufficient progress on reduction has been made.• We will consult before the end of 2018 on our intention to introduce legislation ending the sale of energy drinks to children.• We may also consider further use of the tax system to promote healthy food if the voluntary sugar reduction programme does not deliver sufficient progress.• As part of the next phase of the sugar reduction programme we will review the scope for reformulation of product ranges aimed exclusively at babies and young children. PHE will review the evidence and publish their approach in 2019.
<p>Calorie reduction</p> <ul style="list-style-type: none">• Explore what additional opportunities leaving the European Union presents for food labelling in England that displays world-leading, simple nutritional information as well as information on origin and welfare standards. We will continue to work with the devolved administrations to explore the potential for common approaches.• Introduce legislation to mandate consistent calorie labelling for the out-of-home sector (e.g. restaurants, cafes, and takeaways) in England, with a consultation before the end of 2018.• There are no current plans to place a ban on using brand equity and licensed characters, cartoon characters and celebrities to promote HFSS products. The NIHR Obesity Policy Research Unit will continue to review the evidence base of the effect of marketing and advertising on children, including in these areas.• In addition:• Later this year, we will review the latest industry progress on salt reformulation to see if more can be done to reduce salt intakes in future years.
<p>Advertising</p> <ul style="list-style-type: none">• Consult, before the end of 2018, on introducing a 9pm watershed on TV advertising of HFSS products and similar protection for children viewing adverts online, with the aim of limiting children's exposure to HFSS advertising and driving further reformulation. We will explore options for implementing a 9pm watershed to ensure that any restrictions are proportionate, help to incentivise reformulation in line with the aims of the sugar and calorie reduction programmes, and consider a focus on those products that children consume and most contribute to the problem of childhood obesity.• Currently online advertising rules are drawn up by the Advertising Standards Authority (ASA) on a self-regulatory basis. We will consider whether this continues to be the right approach for protecting children from the advertising of unhealthy food and drinks, or whether legislation is necessary. We will ensure any further restrictions are designed effectively for the digital space, taking into account how content is consumed online and considering options for enforcement.

Promotions

- We intend to ban price promotions, such as buy one get one free and multi-buy offers or unlimited refills of unhealthy foods and drinks in the retail and out-of-home sector through legislation, consulting before the end of 2018.
- We intend to ban the promotion of unhealthy food and drink by location (at checkouts, the end of aisles and store entrances) in the retail and out-of-home sector through legislation, consulting before the end of 2018.

Local authorities

- Develop a trailblazer programme with local authority partners to show what can be achieved within existing powers and understand “what works” in different communities.
- Develop resources that support local authorities who want to use their powers. We will help set out the economic business case for a healthy food environment and provide up to date guidance and training for planning inspectors.
- In 2019 we will define a set of standards to demonstrate what “good” green infrastructure looks like.
- We will continue the NCMP for children in Reception and Year 6.
- We will provide health and care professionals with the latest training and tools to better support children, young people and families to reduce obesity, including a digital family weight management service.
- Consult, before the end of 2018, on strengthening the nutrition standards in the Government Buying Standards for Food and Catering Services, to bring them into line with the latest scientific dietary advice.

Schools

- Be bold in our update of the School Food Standards to reduce sugar consumption. The update will be coupled with detailed guidance to caterers and schools so they are well prepared to adapt to the changes.
- Review how the least active children are being engaged in physical activity in and around the school day.
- Promote a national ambition for every primary school to adopt an active mile initiative, such as the Daily Mile.
- Invest over £1.6million during 2018/19 to support cycling and walking to school.
- Consult, before the end of 2018, on our plans to use Healthy Start vouchers to provide additional support to children from lower income families.
- Ofsted is developing a new inspection framework for September 2019. This will consider how schools build knowledge across the whole curriculum and how they support pupils’ personal development more broadly, including in relation to healthy behaviours.
- Ofsted will undertake research into what a curriculum that supports good physical development in the early years looks like.

References

- ¹ NHS Digital (2017) National Child Measurement Programme 2016/17
- ² NHS Digital (2017) National Child Measurement Programme 2016/17 and PHE (2014) [Obesity and disability - children and young people](#)
- ³ Abbasi A, Juszczak D, et al. (2017) Body mass index and incident type 1 and type 2 diabetes in children and young adults: a retrospective cohort study. *Journal of the Endocrine Society*, 1(5), 524-537.
- ⁴ Simmonds, M, Llewellyn et al. (2016) Predicting adult obesity from childhood obesity: a systematic review and meta analysis. *Obesity reviews*, 17(2), 95-107.
- ⁵ Guh et al. (2009) The incidence of co-morbidities related to obesity and overweight: a systematic review and meta- analysis. *BMC Public Health*, 9(1), 88.
- ⁶ Scheen, A J. (2002) Obesity and liver disease. *Best Practice & Research Clinical Endocrinology and Metabolism*, 14(4), 703-716.
- ⁷ PHE(2018) Patterns and trends in childhood obesity <https://www.gov.uk/guidance/phe-data-and-analysis-tools#obesity-diet-and-physical-activity> (last accessed 03/08/2018)
- ⁸ Health Survey for England (2016) <https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/health-survey-for-england-2016> (last accessed /2018)
- ⁹ For children: e.g.
Andreyeva, T. et al (2010) Exposure to food advertising on television: Associations with children's fast-food and soft drink consumption and obesity, online available at http://www.uconnruddcenter.org/resources/upload/docs/what/advertising/ExposureFoodAdsTV_EHB_3.11.pdf (last accessed 09/02/18)
Cairns G, Angus K, Hastings G. The extent, nature and effects of food promotion to children: a review of the evidence to December 2008. World Health Organization, WHO Press; 2009.
- ¹⁰ For adults: e.g.
Mills SD, Tanner LM, Adams J. Systematic literature review of the effects of food and drink advertising on food and drink-related behaviour, attitudes and beliefs in adult populations. *Obesity Reviews*. 2013 Apr 1;14(4):303-14.
Boyland EJ, Nolan S, Kelly B, Tudur-Smith C, Jones A, Halford JC, Robinson E. Advertising as a cue to consume: a systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults, 2. *The American journal of clinical nutrition*. 2016 Jan 20;103(2):519-33.
- ¹¹ WHO (2014), Obesity Fact Sheet: <http://www.wpro.who.int/mediacentre/factsheets/obesity/en/>
- ¹² Ovesen P, Rasmussen S and Kesmodel U (2011), Effect of Prepregnancy Maternal Overweight and Obesity on Pregnancy Outcome. *Obstetrics & Gynecology*; 118(2):305-312.
- ¹³ Leddy MA, Power MA, Schulkin J (2008), The Impact of Maternal Obesity on Maternal and Fetal Health, *Rev Obstet Gynecol.*; 1(4): 170–178.
- ¹⁴ Drake AJ, Reynolds RM (2010), Impact of maternal obesity on offspring obesity and cardiometabolic disease risk, *Reproduction*; 140:387-398.
- ¹⁵ Santangeli, Sattar and Huda (2015), Impact of Maternal Obesity on Perinatal and Childhood Outcomes, *Best Practice & Research Clinical Obstetrics & Gynaecology*; 29(3):438–448.
- ¹⁶ Forno E et al. (2014), Maternal Obesity in Pregnancy, Gestational Weight Gain, and Risk of Childhood Asthma. *Pediatrics*; 134(2):e535-e546.
- ¹⁷ Chen A et al. (2009), Maternal Obesity and the Risk of Infant Death in the United States, *Epidemiology*; 20(1): 74–81.
- ¹⁸ PHE (2015) Compilation of webpages "Maternal obesity"
https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjl pPbv4-HbAhXHKcAKHRJ1DxMQFggxMAE&url=https%3A%2F%2Fkhub.net%2F%2Fdocument_library%2Fget_file%3Fuuid%3Da5768682-fb3d-4fda-ab4a-937a8d80f855%26groupId%3D31798783&usq=AOvVaw3Bxju7_vbb2sqX2dNQdB6D (last accessed 03/08/2018); Heslehurst et al (2010), A nationally representative study of maternal obesity in England, UK: trends in incidence and demographic inequalities in 619 323 births, 1989–2007, *International Journal of Obesity*; 34, 420–428.
- ¹⁹ PHE (2015) Guidance - Childhood obesity: applying All Our Health
<https://www.gov.uk/government/publications/childhood-obesity-applying-all-our-health/childhood-obesity-applying-all-our-health> (last accessed 03/08/2018)
- ²⁰ PHE(2018) Patterns and trends in childhood obesity <https://www.gov.uk/guidance/phe-data-and-analysis-tools#obesity-diet-and-physical-activity> (last accessed 03/08/2018)

-
- ²¹ PHE (2017) Patterns and trends in adult obesity <https://www.gov.uk/guidance/phe-data-and-analysis-tools#obesity-diet-and-physical-activity>, PHE Collection National Diet and Nutrition Survey <https://www.gov.uk/government/collections/national-diet-and-nutrition-survey> (last accessed 03/08/2018)
- ²² Sankar, P., Cho, M. K., Condit, C. M., Hunt, L. M., Koenig, B., Marshall, P., ... & Spicer, P. (2004). Genetic research and health disparities. *Jama*, 291(24), 2985-2989.
- ²³ Falconer CL, Park MH, Croker H, et al.(2014) Can the relationship between ethnicity and obesity-related behaviours among school-aged children be explained by deprivation? A cross-sectional study. *BMJ Open* 2014;4:e003949. doi: 10.1136/bmjopen-2013-003949
- ²⁴ Albuquerque, D., Stice, E., Rodríguez-López, R., Manco, L., & Nóbrega, C. (2015). Current review of genetics of human obesity: from molecular mechanisms to an evolutionary perspective. *Molecular genetics and genomics*, 290(4), 1191-1221.
- Fernández, J. R., Pearson, K. E., Kell, K. P., & Brown, M. M. B. (2013). Genetic admixture and obesity: recent perspectives and future applications. *Human heredity*, 75(2-4), 98-105
- ²⁵ Stryecki, C., Alyass, A., & Meyre, D. (2018). Ethnic and population differences in the genetic predisposition to human obesity. *Obesity Reviews*, 19(1), 62-80.
- ²⁶ Cheng, C. Y., Kao, W. L., Patterson, N., Tandon, A., Haiman, C. A., Harris, T. B., ... & Coresh, J. (2009). Admixture mapping of 15,280 African Americans identifies obesity susceptibility loci on chromosomes 5 and X. *PLoS genetics*, 5(5), e1000490.
- ²⁷ Zilanawala, A., Davis-Kean, P., Nazroo, J., Sacker, A., Simonton, S. and Kelly, Y., 2015. Race/ethnic disparities in early childhood BMI, obesity and overweight in the United Kingdom and United States. *International Journal of Obesity*, 39(3), pp.520-529.
- ²⁸ Obesity and Ethnicity (2011). https://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwicqv6hkdrZAhVEAcAKHRn0BTIQFggsMAA&url=https%3A%2F%2Fkhub.net%2Fdocuments%2F31798783%2F32039025%2FObesity%2Band%2Bethnicity%2F834368ce-e47a-4ec6-b71c-7e4789bc7d19%3Fversion%3D1.0&usq=AOvVaw11jjj0LcNFID_1Lkzjqw8e (last accessed 03/08/2018)
- ²⁹ WHO, E. C. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet* (London, England), 363(9403), 157.
- ³⁰ Ibid.
- ³¹ PHE(2018) Patterns and trends in childhood obesity <https://www.gov.uk/guidance/phe-data-and-analysis-tools#obesity-diet-and-physical-activity> (last accessed 03/08/2018)
- ³² PHE (2017) Patterns and trends in adult obesity <https://www.gov.uk/guidance/phe-data-and-analysis-tools#obesity-diet-and-physical-activity> (last accessed 03/08/2018)
- ³³ PHE Collection National Diet and Nutrition Survey <https://www.gov.uk/government/collections/national-diet-and-nutrition-survey> (last accessed 03/08/2018)
- ³⁴ PHE (2015) Guidance - Childhood obesity: applying All Our Health <https://www.gov.uk/government/publications/childhood-obesity-applying-all-our-health/childhood-obesity-applying-all-our-health> (last accessed 03/08/2018)