Out of Sight, Out of Mind?

Young people's recall of health information and messaging on food packaging and advertising, and what information they want to see

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CANCER RESEARCH UK

Reference

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Authors

Jessica Newberry Le Vay[1], Nathan Critchlow[1,2], Albany Newman[3], Alizée Froguel[4], Malcolm Clark[4], Jyotsna Vohra[3]

[1] Policy & Implementation Research, Cancer Research UK
[2] Institute of Social Marketing and Health, University of Stirling
[3] Cancer Policy Research Centre, Cancer Research UK
[4] Policy Development, Cancer Research UK

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Cancer Research UK

Cancer Research UK is the world's largest independent cancer charity dedicated to saving lives through research. We support research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses. In 2018/19, we committed £546 million to fund and facilitate research in institutes, hospitals and universities across the UK. Thanks to research, survival in the UK has doubled since the 1970s so, today, 2 in 4 people survive their cancer. Our ambition is to accelerate progress and see 3 in 4 patients surviving their cancer by 2034.
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Foreword

Front of pack nutrition labelling is a valuable tool that helps people make informed choices about the food they buy. Which? consumer research shows almost nine in ten adults are aware of the current multiple traffic light label and the same number find it helpful.

However, despite the UK having the highest rates of childhood obesity in Western Europe, little research has been carried out on young people in terms of labelling. This report provides us with important insight into young people's recall of seeing and engaging with health information on packaging and in advertising, and what health information they think is important.

Over the years Which?'s research has consistently shown that people find the traffic light colours the most important and useful aspect of the label, followed by the percentage of the reference intake for each nutrient and the amount of each nutrient found in a portion.

Despite the wealth of evidence, front of pack labelling is currently voluntary and inconsistently applied: while many retailers and brands do use the current multiple traffic light label, many do not.

Now that we have left the European Union, the UK is able to legislate to make front of pack labelling mandatory and we support this to create a level playing field. Furthermore, we want to see a consistent label used across all brands and products so that it becomes more recognisable and as a result easier to use.

Better food labelling in shops, and also when eating out should help both young people and adults understand what's in their food. This must happen alongside the planned restrictions on the advertising and promotion of foods high in fat, salt and/or sugar, to also help address the powerful influence of external factors, such as marketing.

While mandatory front of pack labelling is an important step forwards, improving food packaging should not stop there. Under current UK law, health and nutrition claims permitted on foods are tightly regulated. Going forward we would like to see the UK maintain the current approach to ensure children and adults aren't misled by exaggerated or false claims.

Another area we would also like to see greater consistency is portion sizes. Recent research by Which? showed huge variation in the portion sizes used by manufacturers, both across brands and products but also within the same brand. For example, portion sizes recommended on the packaging of a well-known chocolate brand range from 25g to 45g depending on the size of the bar. Similarly, recommended serving sizes of a well-known sugary drink vary between 150ml and 330ml depending on the size of the can or bottle.

Which? has a long history of campaigning on food promotions, food labelling and advertising of foods to children. We welcome this report from Cancer Research UK, which adds to the evidence base supporting policy changes needed at a population level that would give people the tools to be better informed about what they eat.

Shefalee Loth
Principal Food Researcher, Which?

Executive Summary

Almost a quarter of children in England start reception overweight or with obesity, rising to more than one in three children when they leave primary school.[1] Obesity among children and young people is not only associated with poor emotional and psychological health, but a child with obesity is five times more likely than one without to have obesity as an adult,[2] and therefore potentially at greater risk of morbidity, disability and premature mortality in adulthood – including cancer.[3, 4]

Food labelling can help guide consumers to healthier options…

Food and drink packaging provides a cost-effective, high-reach opportunity to communicate product information, health messages, and health warnings (hereafter 'health information'), through mechanisms such as labelling. The type of information this can encompass is broad, from nutritional information to serving suggestions to information on eating a balanced diet. As a policy intervention, it has the potential to guide consumers towards healthier options.

Under the UK's current system, mandatory nutritional information must be shown on the back of the pack.[5] Voluntary front of pack labelling has been in place since 2013, reportedly adopted by two-thirds of the UK's packaged food and drink market.[6] However, the front of pack system used varies from product to product so, despite fairly high uptake, there is a lack of consistency.

…Including young people

Young people come into contact frequently with pre-packaged food.[7] Desire to eat healthily is an influencing factor over their food choice,[8] and autonomy over their food choices increases with age.[9] This presents an opportunity for health information on packaging to guide young people towards healthier food options.

Despite this opportunity, young people find current labelling inadequate and misleading, and are supportive of clearer labelling.[8]

An opportunity to improve

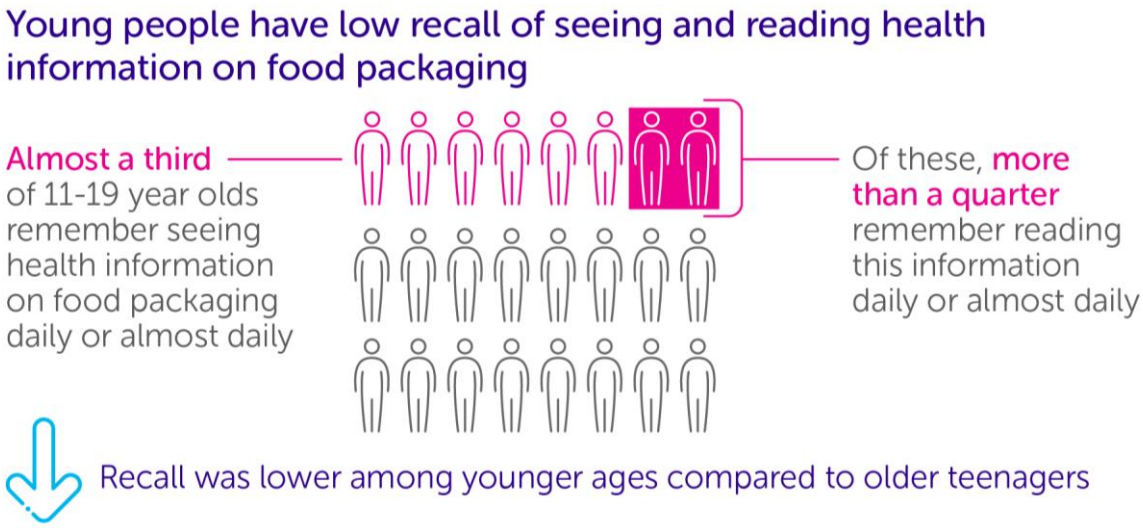
The UK's exit from the European Union, which has regulated our health labelling to date,[6] and the UK Government's recent consultation on front of pack labelling[10] presents an opportunity to review how the UK's current system of providing health information is working and ways it could be improved. The recent Health and Social Care White Paper makes clear that the Government is committed to bringing forward changes.

Using data from a 2019 UK-wide survey of 11-19 year olds (hereafter 'young people'), this report examines whether the UK's current system of providing health information is reaching and engaging young people, and what information young people want to see. In doing so, this report aims to support the development of labelling which is effective with this age group.

Key findings

Young people have low recall of seeing and reading health information on food packaging

Of the 3,394 young people surveyed, almost a third (31%) recalled seeing health information on food packaging daily or almost daily. Of these who had recalled seeing health information, more than a quarter (29%) recalled reading or looking closely at it. This suggests there is the potential for increasing the reach and engagement that health information on packaging has with this age group.



This recall is even lower for health information in food advertising

While young people's recall of health information on food packaging is low, it is even lower in advertising: almost a tenth (8%) of young people recalled seeing health information in advertising daily or almost daily and, of these, around one in seven (15%) recalled reading this information or looking closely at it.

Young people see HFSS foods as unhealthy…

When given a list of 14 foods typically high in fat, salt and/or sugar (HFSS), almost eight in ten (78%) young people identified ten or more foods as very or somewhat unhealthy. Energy drinks, cakes, sweets/chocolate and sugary drinks were all perceived as unhealthy by more than 90% of young people.

…But not milk-based drinks and flavoured yoghurts

The exceptions were milk-based drinks, which around a third (34%) of young people identified as unhealthy, and flavoured yoghurts, which around a quarter (26%) identified as unhealthy. These two foods were also those with highest levels of ambiguity: around a third of young people said milk-based drinks (33%) and flavoured yoghurts (31%) were neither healthy nor unhealthy. This may be due in part to misidentification of the healthiness of these foods, but it should be noted that these categories do also contain non-HFSS products which young people could have been recalling.

Young people agree that health information should be displayed on packaging…

When asked whether nine types of information should be shown on packaging, agreement was highest for information on allergies (89% strongly or somewhat agreed), ingredients and additives (86%), and nutritional information (85%). All this information is currently mandatory, suggesting that the current information displayed does align with what young people want to see, but the low levels of recalled exposure and engagement suggest how this information is communicated could be improved.

Young people who agreed with the statements tended to agree with multiple forms of information; 83% of young people agreed with half or more of the statements.

Most young people identify HFSS foods as unhealthy

Out of 14 typically HFSS foods, 78% of young people* identified ten or more as unhealthy. Perceptions of healthiness varied by food type:

More than 90% saw energy drinks, cakes, sugary drinks, sweets or chocolate as unhealthy

Around a third saw milk-based drinks as unhealthy

Around a quarter saw flavoured yoghurts as unhealthy

*Aged 11-19

...Including clear and easy to see front-of-pack nutritional information...

More than eight in ten (81%) young people agreed that clear and easy to see nutritional information on the front of the pack – information which is currently voluntary and inconsistently applied – should be present on packaging.

...And information on calories...

Calorie information was also a top choice amongst young people, with more than eight in ten (81%) agreeing that this information should be displayed on packaging. Calorie information is currently mandatory on food packaging, but again, high agreement among young people for having this information but low recall of seeing or reading it suggests that how this information is communicated on packaging could be improved.

...But not exercise or eating a balanced diet

Agreement amongst young people was lowest for information on exercising regularly (49%) and on eating a balanced and healthy diet (63%).

Differences across demographic groups is a priority for further research

A successful system of providing health information is one which is effective with everyone, including those with weaker nutritional knowledge, so demographic differences are a key consideration in improving how information is communicated.

This study provides a starting point for understanding how young people may engage with health information differently, and suggests there are differences by ethnicity and may be differences by deprivation in young people's perception of food healthiness and agreement with having health information on packaging. More research is needed to better understand these differences and inform development of new labelling systems.

What should government do?

The UK's current system of providing health information is not reaching or engaging all young people, and may even be exacerbating health inequalities. Young people themselves have given a clear steer to focus more on certain types of health information, such as

front-of-pack and calorie labelling, over the more general advocations for a balanced diet and greater exercise favoured by parts of the food industry.

UK and devolved Governments' approach to health information should better reflect the views, and meet the public health needs, of consumers.

Including health information on packaging has the potential to guide people towards healthier options, including at the point of purchase and consumption. Labelling which is effective in equipping young people to make these decisions is therefore an important policy intervention.

The UK's current system of nutrition labelling must be improved to maximise its effectiveness with this age group.

We are calling for the front of pack label chosen through the UK Government's consultation process to be made mandatory across all pre-packaged food and drink, on pack or at point of purchase. A mandatory system would create a level playing field and ensure that consistent information is available to all consumers across all products.

Eating healthily also goes beyond these immediate purchase decisions. Policy action is needed to address the many other factors which makes it hard to be healthy, including: adverts and price promotions for unhealthy foods, tempting checkout deals, products high in fat, salt and sugar, bigger portions and the convenience of fast food. These, and many other environmental and systemic factors, contribute to the high levels of overweight and obesity in the UK.

Thus, improving health information is a vital part of a wider package of measures needed to reduce obesity levels. Reducing young people's exposure to adverts for less healthy products should be the priority, given the way it influences their food choices; and how any health information is either absent from or over-ridden by the frequency and impact of that marketing.

It is necessary for the UK Government to follow through on its commitments and introduce advertising restrictions on TV and online for junk food adverts, and a ban on price and location promotions for HFSS products, in order to tackle some of the key factors which contribute to the high levels of excess weight in the UK.

UK and devolved Governments are currently finalising the details of which types of HFSS products the marketing and promotions restrictions would apply to. This study highlights that young people are generally adept at identifying categories which consist mainly of less healthy food and drink, and these also closely match those under consideration.

The UK Government should hold firm and ensure all the main contributors of calories and sugar to young people's diets – those categories in Public Health England's sugar and calorie reduction programme – are within the scope of the forthcoming HFSS marketing and promotions restrictions. Devolved government should do likewise when they introduce similar HFSS promotions restrictions.

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Introduction

Childhood obesity in the UK

Overweight and obesity is the second leading cause of cancer in the UK, after smoking. Obesity is associated with a range of health conditions, including 13 types of cancer.[4] In 2017/18 in England, obesity was a factor in 711,000 hospital admissions,[11] and in 2014/15 obesity was estimated to cost the NHS £6 billion, and the wider economy £27 billion. By 2050, it is predicted that across the UK these costs will rise to £10 billion to the NHS and £50 billion to wider society.[12]

Childhood obesity rates are of particular concern; almost a quarter of children in England start reception with overweight or obesity, rising to more than one in three children when they leave primary school.[1] Obesity prevalence is more than twice as high for children living in the most deprived areas than for children in the least deprived areas of the UK, rising to almost four times as high for severe obesity.[1]

Obesity in children and young people is not only associated with poor emotional and psychological health, but a child who is obese is five times more likely compared with a non-obese child to be so as an adult[2] and therefore potentially at greater risk of morbidity, disability and premature mortality in adulthood.[3] Recent events have shown just how wide-ranging the risks of obesity can be; emerging evidence suggests people with overweight or obesity are at a greater risk of worse outcomes from Covid-19.[13] Ensuring we give children the best chance of growing up to be healthy will support us to be more resilient to acute public health crises such as Covid-19 in future.

Young people and food choice

Young people's food choice is influenced by a huge range of factors: cost, availability, marketing and advertising, food appeal, time, convenience, autonomy, parental food practices, socioeconomic position, school food environment, and social and cultural norms.[9, 14] As children become adolescents, parental control over their food choice diminishes and other influencing factors (such as cost and convenience) become more important.[9] Health concerns and a desire to be healthy also impact young people's food choice, and the importance of eating healthily increases with age.[8] Strategies to reduce young people's intake of food high in fat, salt and/or sugar (HFSS) should address the multitude of factors which influence what young people eat.

These strategies include those which support young people's decision making at the point of purchase and consumption. The UK consumes almost four times as much pre-packaged food as fresh food - the second highest calorific load of pre-packaged food globally.[15] Young people's consumption of pre-packaged food is also high; self-reported data suggests that an 11-19 year old consumes, on average, 18 portions each week of 'pocket money' items such as confectionary, sugary drinks, crisps, energy drinks, cakes and biscuits.[7]

Knowing that young people's autonomy over their choices increase with age, that desire to eat healthily is an influencing factor, and that young people come into contact frequently with pre-packaged foods presents an opportunity to examine the potential for health information on packaging to help guide them towards healthier options.

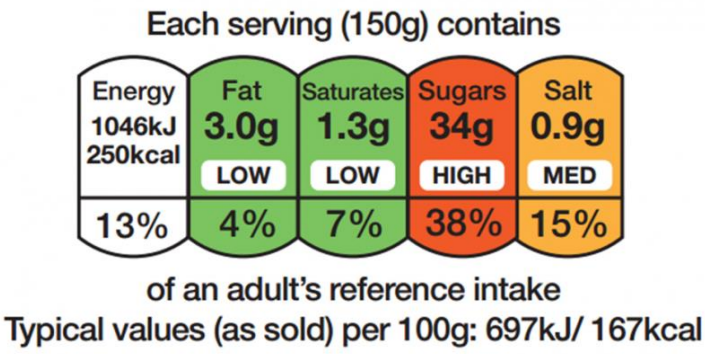
Food labelling can be a cost-effective, high-reach policy intervention

Packaging and advertising for food and drinks provides an important opportunity to communicate key product information, health messages, and health warnings to consumers (hereafter 'health information'). A key mechanism for this is labelling; which can include information such as the ingredients, nutritional information and guidance on serving size. Other mechanisms include health messages, such as advice on consuming the product as part of a balanced diet. Clearly displaying health information on packaging ensures that it is present at point of purchase, increasing the possibility it is also present at consumption, and therefore maximises the opportunity for supporting consumers to make informed, healthy decisions. Inclusion of this information – particularly for HFSS products – on packaging and in advertising is therefore a cost-effective[16, 17] and potentially a high-reach policy intervention to tackle obesity.

Health information can have positive impacts on people's diets. Evidence suggests that food labelling can decrease unhealthy dietary options by 13% and increase vegetable consumption by 14%.[18] Elsewhere, it is estimated that labelling can increase the amount of people choosing a healthier food product by 18%.[19] Labelling can also positively influence reformulation; decreasing product contents of sodium by 9% and artificial trans-fat by 64%.[18]

Front of pack labelling in particular – such as the multiple traffic light label (Figure 1) - may aid understanding of nutritional quality, encourage the selection and purchase of healthier foods, and promote industry reformulation.[20] Modelling studies suggest that front of pack labelling could lead to a substantial reduction in chronic disease mortality: a nutri-score front of pack labelling system in France was estimated to avoid 3% of all deaths from diet-related non-communicable diseases.[21]

Figure 1: The multiple traffic light label[22]



Current food and drink labelling in the UK

To date, regulation on health labelling in the UK has been provided by the European Union (EU) Food Information to Consumers Regulation, which makes nutritional labelling mandatory for the majority of pre-packaged foods. Mandatory information includes a list of ingredients, allergen information, a nutrient declaration, and certain health warnings (e.g. caffeine or sweeteners).[23] A voluntary agreement between food producers and the UK government for front of pack labelling has also been in place since 2013, and has been reportedly adopted by

two-thirds of the UK's packaged food and drink market.[6] However, which front of pack system is used varies from product to product, so despite this fairly high uptake, there is a lack of consistency.

In the case of food and drink advertising, current restrictions prevent the advertising of HFSS foods during children's television shows, with commitments from the UK Government to further restrict all HFSS advertising before 9pm on television and online, with the potential to extend this to a total ban on online HFSS advertising.[24] However, we know currently that young people recall seeing a large number of HFSS advertising; more than eight in ten young people recall seeing HFSS food advertising through TV, social media and billboards in the past month.[25] There is no mandatory requirement to display nutritional information in advertising, but there are restrictions on what nutrition and health claims are permitted.[26] While preventing young people from being exposed to HFSS marketing is ultimately what is needed to reduce the influence of this on their diet,[27, 28] international examples – such as France - highlight the use of mandatory health messaging in alcohol advertising as a key counterpoint and moderator to the marketing message for young people incidentally exposed.[29]

Effective labelling brings challenges

While labelling may have the potential to bring benefits to diet and health, in reality there are challenges with the system the UK currently has in place.

Evidence around food labelling and health inequalities is limited, but use and understanding of nutrition information panels – which are mandatory in the UK - has been shown to be significantly lower in lower income, lower literacy and in ethnic minority groups.[30] Front of pack labelling has been shown to be the easiest to understand and most popular format across all social groups.[31] As this information is currently voluntary and applied inconsistently, there is a risk that foods not covered by the scheme are those which are more affordable for or targeted to more disadvantaged groups.[31]

Blurred boundaries between providing health information and marketing techniques may also limit the effectiveness of health information in driving consumers' nutritional knowledge. Nutrition and health claims are common: one study indicated that in the UK, 35% of pre-packaged food and drink had at least one nutrition and health-related claim, higher than in other European countries.[32] Some evidence suggests that foods carrying health-related claims have slightly better nutrition profiles than those without.[33] However, elsewhere it has been suggested that 75% of the sampled products which made one of your five-a-day' claim were made up of less than 80g fruit and vegetables – the minimum amount required to count as one portion.[34]

Lack of standardisation of serving sizes among similar products may also compromise the usability of nutritional information, while varying serving sizes may also be used as a marketing strategy to enable reporting of lower nutrient and energy claims.[35] As an example, a 300ml bottle of orange juice may provide nutritional information per 100ml and recommend that a serving is only 150ml, half of what is contained in the bottle.

An opportunity for better health information

The UK's exit from the European Union presents an opportunity to revisit regulations around health information on packaging.[10] And the NHS Health and Social Care White Paper, published in February 2021, proposes to give ministers the power to do just that, allowing ministers to

introduce new strengthened labelling requirements. As part of the UK Government's 2020 obesity strategy[24] a consultation on front of pack nutrition labelling was launched in July 2020. This has the purpose of ensuring the UK has a system which is evidence-based and supports all consumers to make healthier decisions about food and drink.[10] This consultation has presented an opportunity to review the current system for providing consumers with health information on food packaging, and build on it to improve it through developing a system which is effective in equipping everyone, across demographic groups, with information on the nutritional quality of what they are purchasing and consuming.

Given the high rates of childhood obesity, such information must also successfully reach young people and effectively support them to make informed decisions about their consumption. Much of the evidence on labelling so far has focused on adults, rather than young people. Qualitative research indicates young people view product labelling as inadequate, with the print too small to allow proper scrutiny and full information not being provided. Young people indicate they are supportive of protective measures, including clearer product labelling.[8]

It is crucial that sufficient evidence is available to inform the development of improved mechanisms of providing health information. A large degree of the evidence on food labelling also comes from experimental, rather than real world, settings. There is a need for more research to understand how people – including young people - may be engaging with health information in a real-world context, and therefore how well current food labelling designs are working.

Research aims

Starting in 2017, the Cancer Policy Research Centre (CPRC) at CRUK has conducted a study which aims to understand, and provide a repeat monitor of, perceptions towards diet and food marketing among young people in the UK. Using this data, this analysis aims to understand to what extent the UK's current system of providing health information is reaching and engaging young people, and what information young people want to see. By investigating these questions, this report aims to support the development of health labelling which is successful in reaching young people and effective in guiding them towards healthier options.

This report aims to explore:

1) How often young people in the UK recall seeing and reading health information on food and drink packaging.

2) How often young people in the UK recall seeing and reading health information in food and drink advertising.

3) Young people's perception of food healthiness.

4) What type of health information young people think should be present on food and drink packaging.

5) How awareness of health information on packaging and in advertising, nutritional knowledge, and support for health messaging varies by key demographic groups.

Methods

Survey design

The Youth Obesity Policy Survey (YOPS) is a repeat cross-sectional survey of 11-19 year olds from across the UK, which aims to monitor young people's dietary attitudes and behaviours over time. This report is based on data from the 2019 wave of YOPS; the second time that YOPS has been conducted. Survey design was largely based on the 2017 YOPS survey, the development of which is described elsewhere.[36] The development of questions new to the 2019 wave was based on a qualitative scoping study conducted by ScotCen.[8] A pilot (*n*=101) was conducted prior to launching the survey.

The survey was hosted by YouGov, a market research company, who recruited a sample intended to be demographically representative of the UK population via their non-probabilistic online panel between September and November 2019 (*n*=3,394). Participants aged 16 or over were approached directly to be involved, whereas those under 16 were recruited through existing adult panel members. A survey weight (using Office for National Statistics 2019 population data and based on age, sex, ethnicity, region, and Index of Multiple Deprivation (IMD) enabled descriptive data to be representative of the UK population. Population characteristics are displayed in Table 1.

Table 1: Demographics and BMI category of adolescents in the 2019 Youth Obesity Policy Survey

	Unweighted		Weighted	
	%	*n*	*%*	*n*
Sex				
Male	46.8	1,589	51.0	1,731
Female	53.2	1,805	49.0	1,663
Age				
11-15 years old	55.4	1,881	53.0	1,799
16-19 years old	44.6	1,513	47.0	1,595
Country				
England	76.5	2,597	84.4	2,865
Scotland	12.8	434	7.8	265
Wales	7.2	243	4.7	160
Northern Ireland	3.5	120	3.1	105
Ethnicity				
White British	77.3	2,625	76.5	2,596
Other ethnicity	14.1	478	22.8	775
Not stated	8.6	291	0.7	23
IMD Quintile				
1 (most deprived)	15.5	527	20.0	679
2	17.6	596	20.0	679
3	19.8	671	20.0	679
4	20.5	696	20.0	679
5 (least deprived)	26.6	904	20.0	679
BMI Category				
Underweight	13.9	1,532	14.2	1,546
Healthy weight	45.1	471	45.6	483
Overweight	10.9	369	10.8	367
Obese	3.9	132	4.2	142
Not stated	26.2	890	25.2	856

Measures

Demography

Data on age, sex (collected by YouGov as 'gender' but referred to hereafter as 'sex'), ethnicity (coded White British vs. other ethnicities), resident country (coded: England, Scotland, Wales, Northern Ireland) were collected. The binary coding of ethnicity was for the purposes of statistical power and is acknowledged as a limitation of the analysis. Data were also collected on Index of Multiple Deprivation (IMD), which is a measure of deprivation within local areas based on elements such as income, crime and education.[37]

Body Mass Index

Data were collected on height (selected from a list of options given in feet and inches or in centimetres) and on weight (options given in stones and pounds, kilograms, or pounds only). In both cases, participants could also respond 'Don't know' or 'Prefer not to say.' This information was reported by the parent(s)/guardian(s) of participants aged 11-15 years old, as part of the consent process, and directly by participants aged 16-19 years old. Body Mass Index (BMI) was calculated using the height and weight data and categorised using the extended International Obesity Task Force BMI classification, adjusting for age and sex, as underweight, healthy weight, overweight or obese.[38] Self-reported BMI data has been shown to have strong agreement with measured anthropometric data in young adults and is therefore seen as a sufficient proxy.[39] It should be noted that parental estimates of their child's height and weight are generally shown to be underreported.[40, 41]

Seeing and reading/looking closely at health information on packaging and advertising

Participants were prompted with the statement '*In the past month how often, if at all, have you **seen** any nutritional information, health messages or health warnings…*' and then asked separately about: (1) '*on food and drink packaging*' and (2) '*in food and drink advertising.*' For both, frequency of awareness was reported on a six-point scale (1=Every day - 6=Not in the past month), or participants could also indicate 'Not sure if seen in the last month'. Advertising was not defined, but participants had previously answered questions on how often they saw various examples of advertising (i.e. seen adverts for unhealthy food/drink on television, on billboards, and social networking sites).[25]

All participants who reported some awareness (i.e. excluding 'not in the past month' or 'not sure') were subsequently prompted with the statement '*In the past month how often, if at all, have you **read or looked closely** at the nutritional information, health messages or health warnings...*'Again, they were asked separately about: (1) '*on food and drink packaging*' and (2) '*in food and drink advertising*', with frequency reported on the same six-point frequency scale as above (including 'not sure).

For part of the analysis, the self-reported frequency of seeing health information on food packaging was binary coded based on if it was seen **Daily or almost daily vs. Less often/Not in the past month**. Participants who responded 'Every day' and '5-6 times per week' were coded as 'Daily or almost daily,' and all other participants were coded as 'Less often/Never.' Those who reported 'Not sure' were excluded from the binary variable, as they did not provide either an affirmative response nor did they clearly reject having seen it. A comparable binary variable was also created for reading or looking closely at health information on advertising (excluding

'not sure' responses and those who reported no awareness), although given small numbers of participants reporting to have seen or read this information Daily or Almost daily, the binary variables were coded as **Weekly vs. Less often/Not in the past month**.

Perceived healthiness of different food and drink groups

Participants were prompted with the statement '*How healthy or unhealthy do you think the following food and drink products are?*' and provided with 17 food and drink groups. This consisted of 14 typically HFSS foods (e.g. cakes, crisps, sweets or chocolate), two non-HFSS foods (fruit and vegetables), and one HFSS-alternative (sugar-free soft drinks). The emphasis on HFSS rather than non-HFSS foods provided in the survey question is due to the focus of the YOPS study on young people's dietary attitudes around HFSS foods. Food group options (Appendix Table 1) were based on the 2017 wave of YOPS, which were developed based on collaboration with policy experts, Public Health England's sugar reduction programme categories, and the research literature on unhealthy products.[36] Participants gave their response on a five-point Likert scale (1=Very unhealthy - 3=Neither unhealthy nor healthy - 5=Very healthy), with a 'Not sure' option. For each HFSS food, a binary variable was created based on whether a participant identified the food as unhealthy (i.e. Very/Somewhat unhealthy) vs not (i.e. Neither healthy or unhealthy, or Very/Somewhat healthy). For the non-HFSS foods and HFSS-alternative, binary variables were created similarly but vice versa (i.e. identifying the food as Very/Somewhat healthy vs Not).

Agreement with presence of health information on packaging

Participants were prompted with the statement '*To what extent do you agree or disagree that food and drink packaging should display the following information…*' and then presented with nine examples of nutritional information and health messaging (e.g. calories, information on allergens, guidance on serving size). For each, participants self-reported their degree of agreement on a five-point Likert scale (1=Strongly disagree - 3=Neither agree nor disagree - 5=Strongly agree), while an additional 'Not sure' response option was also provided.

For each form of nutritional and health information, we created a binary variable based on whether a participant affirmatively **Agreed that the health information should be displayed on the packaging** (i.e. Strongly agree/Somewhat agree) **vs. Not** (i.e. 'Neither agree nor Disagree,' 'Somewhat disagree' or 'Strongly disagree'). Responses of 'Not sure' were excluded from this binary variable. We also created a composite score for agreement across the nine forms of nutritional and health information, ranging from zero (did not agree for any of the statements) to nine (agreed to all the statements).

Analysis

Data were analysed using SPSS version 26. Weighted frequencies examined young people's recall of seeing and reading health information on food packaging and advertising, young people's knowledge of food healthiness, and young people's support for health information being present on food packaging.

A series of binary logistic regressions were conducted to examine to what extent key outcome variables were associated with demography and BMI group. The dependent variables in the models were: (1) seeing and reading health information on packaging and on advertising; (2)

correct identification of product healthiness for each food item; (3) and agreement with health information being present on food packaging for the nine forms of information. Participants who indicated 'Not sure' for any variable were excluded on a mode-by-model basis. Those who did not indicate any awareness of health message on packaging and/or advertising were (e.g. said 'Not in the past month' or 'Not sure') were excluded from the models examining reading or looking closely and health information on packaging and advertising. Covariates of age, sex, ethnicity, country of residence, IMD and BMI group were included in each model. The reference categories, and contrast functions, are reported in the results. All regressions were conducted on unweighted data, due to the factors used to construct the weights being included in the models.

Ethics

The project was reviewed by the General University Ethics Panel (GUEP 670) at the University of Stirling. YouGov's in-house team also included a lead for ethical and quality assurance, ensuring adherence to best practice throughout data collection. This included ensuing informed consent was obtained, post-survey signposting to support organisations and confidentiality of personal information.

Results

How often do young people recall seeing and reading health information on packaging?

Young people's recall of seeing and reading health information on food packaging is low

Overall, young people recalled seeing heath information on food packaging relatively infrequently. When prompted with the statement, '*In the past month how often, if at all, have you seen any nutritional information, health messages or health warnings on food and drink packaging,*' almost a third (31%) recalled seeing this information Daily or almost daily, and almost a quarter (23%) recalled seeing it Weekly. Around a tenth (11%) did not recall seeing this information at all in the past month. Around a quarter (26%) were 'Not sure' if they had seen this in the past month (Table 2).

Among those who recalled seeing health information on packaging in the past month, frequency of reading or looking closely was similarly low. More than a quarter (29%) of young people said they looked at this information Daily or almost daily, around a third (34%) said they did so Weekly, and almost one in six (16%) said they had not read or looked closely at this information in the past month. More than one in twenty (7%) said they were 'Not sure' if they had read or looked closely.

Table 2: Recall of seeing and reading health information on food packaging

	Seeing health information on packaging [1]		Reading or looking closely at health information on packaging[2]	
Frequency	**%**	***n***	**%**	***n***
Daily/Almost daily	31	1,059	29	609
Weekly	23	794	34	725
Less than weekly	8	275	15	314
Not in the past month	11	376	16	335
Not sure	26	890	7	146

Notes:
Data are weighted
[1] Weighted base = All participants (n=3,394)
[2] Weighted base = All who reported some awareness in the past month (i.e. excluding 'not in the past month' (n=2,128) (i.e. excluding 'Not in the past month' and 'Not sure' for awareness).

This recall is even lower in younger age groups

Two binary logistic regressions were conducted, with seeing health information on packaging and reading or looking closely as the respective dependent variables (both: Daily/Almost daily vs. Less often/Not in the past month) and key demographics and BMI group as covariates. The reading or looking closely model only included those who reported some awareness in the past month.

These regressions found that young people aged 11-15 were less likely to both recall seeing health information on packaging daily or almost daily compared to 16-19 year olds (OR_{Adj} = 0.50, 95% CI = 0.42-0.59) or recall reading and looking closely at it Daily or almost daily (OR_{Adj} = 0.40, 95% CI = 0.32-0.51) (Appendix Table 2).

Young people with an obese BMI were more likely to recall reading health information on packaging Daily or almost daily compared to young people with a healthy weight BMI (OR_{Adj} = 1.72, 95% CI = 1.05-2.83). However, this association was only observed for reading health information on packaging. It was not observed for seeing health information on packaging (which had no overall association with BMI grouping) and, for reading or looking closely, was observed only for young people with an obese BMI and not those with an overweight BMI (OR_{Adj} = 1.24, 95% CI = 0.90 – 1.72).

How often do young people recall seeing and reading health information in advertising?

Few young people recall seeing, and even fewer reading, health information in advertising

Young people's recall of seeing and reading health information in food advertising was lower than reported for packaging. Almost a tenth (8%) recalled seeing health information in advertising Daily or almost daily, around a fifth (19%) recalled seeing it Weekly, and more than a fifth (22%) said they did not recall seeing health information in advertising in the past month. Almost four in ten (38%) were unsure if they had seen health information in advertising.

Among those who reported some awareness of health information in advertising in the past month, around one in seven (15%) recalled reading this information Daily or almost daily, and almost a third (29%) recalled reading or looking closely Weekly. More than a quarter (27%) did not recall reading or looking closely at health information in advertising the past month, and around one in ten (11%) were unsure if they had (Table 3).

Table 3: Young people's recall of seeing and reading health information on food advertising

	Seeing health information in advertising (%)[1]		Reading or looking closely at health information in advertising (%)[2]	
Frequency	**%**	**n**	**%**	**n**
Daily/Almost daily	8	270	15	196
Weekly	19	631	29	391
Less than weekly	13	444	19	251
Not in the past month	22	749	27	363
Not sure	38	1,300	11	144

Notes:
Data are weighted
[1] Weighted base = All participants (n=3,394)
[2] Weighted base = All who reported some awareness in the past month (n=1,345)

Two binary logistic regressions were conducted, with seeing health information on advertising and reading or looking closely as the dependent variables (both: At least weekly vs. Less often/Not in the past month) and key demographics and BMI group as covariates. The reading or looking closely model only included those who reported some awareness in the past month. There were no associations between any key demographics or BMI group and seeing health information in food advertising at least weekly. White British participants were less likely to recall reading or looking closely at health information in food advertising at least weekly than participants from other ethnicities (OR_{Adj} = 0.56, 95% CI = 0.40-0.78) (Appendix Table 3).

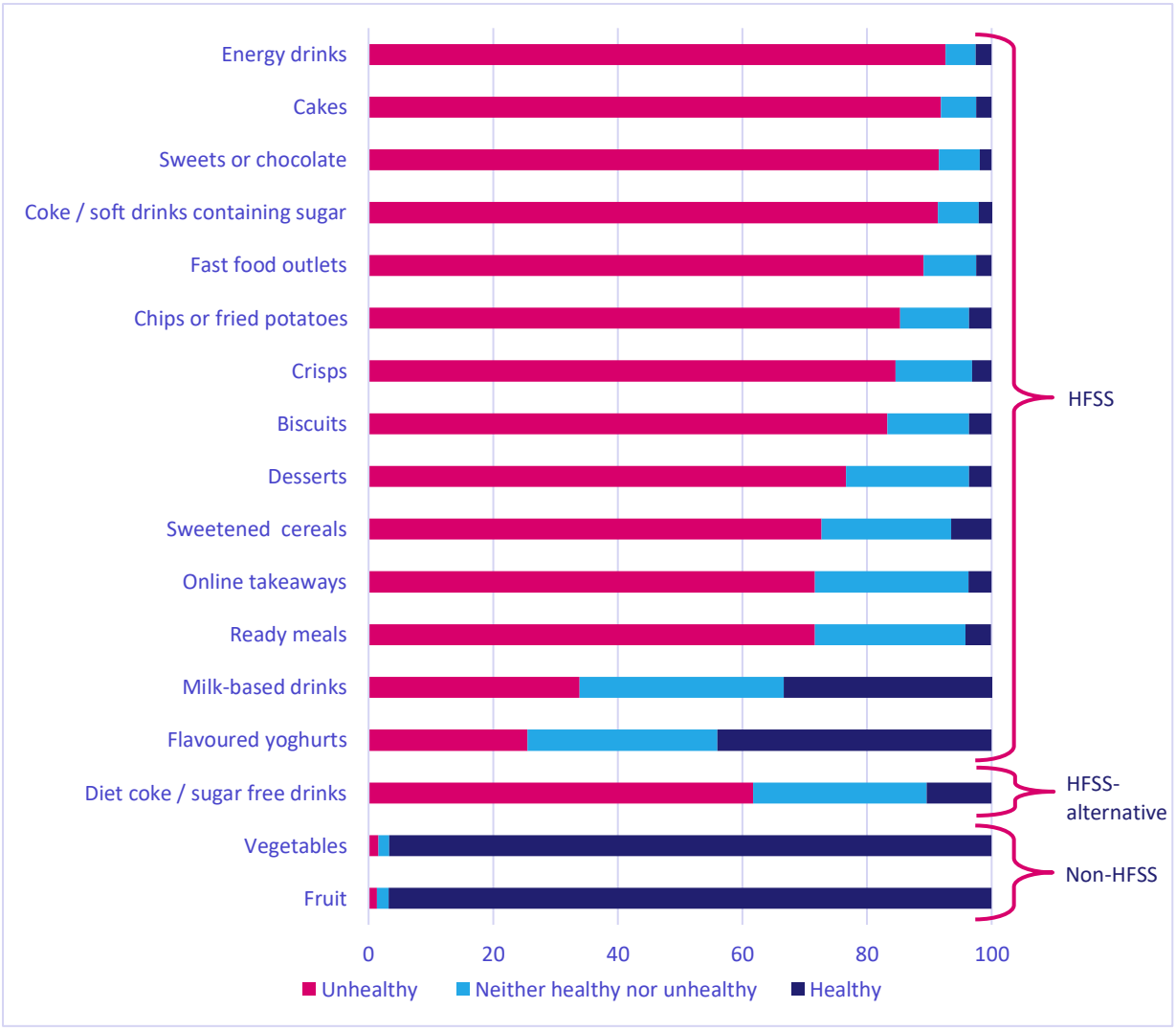
Young people's perception of HFSS food

Most young people identified HFSS foods as unhealthy

Most young people perceived typically HFSS food and drinks to be Very/Somewhat unhealthy (Figure 2, Appendix Table 4). For 12 of the 14 HFSS foods assessed, over 70% of participants identified them as either very or somewhat unhealthy. For example, nine in ten young people identified energy drinks (93%), cakes (92%), sweets or chocolate (92%) soft drinks containing sugar (91%), and fast-food outlets (89%) as being unhealthy.

The exceptions to this were milk-based drinks (34% identified as unhealthy) and flavoured yoghurts (26% identified as unhealthy). These two foods were also those with highest levels of ambiguity: around a third of young people said that milk-based drinks (33%) and flavoured yoghurts (30%) were neither healthy nor unhealthy. Additionally, more than six-in-ten participants (62%) perceived sugar free drinks as unhealthy, with again a high level of ambiguity with over a quarter (28%) identifying these as neither healthy nor unhealthy.

Figure 2: Perceptions of the healthiness of a range of food and drink items



Notes:
Percentages (%) are valid; the data exclude those who said 'not sure' to each food/drink group

Overall, more than nine in ten (92%) participants identified at least half of the 14 typically HFSS foods as very or somewhat unhealthy. Almost eight in ten (78%) identified ten or more as unhealthy, and 10% of participants identified all 14 as unhealthy.

Perception of healthiness for some foods varied by age, ethnicity, deprivation and BMI

A series of binary logistic regressions were computed, with identification of food/drink group healthiness as the dependent variables (for HFSS foods, Very or somewhat unhealthy vs other, for non-HFSS and HFSS-alternative foods, Very or somewhat healthy versus other). Key demographics, BMI group, and frequency of seeing health information on packaging were covariates. Given the mandatory requirement to include health information packaging and not in advertising, advertising was not included as a covariate. To provide granular understanding of associations, a separate model was conducted for each food and drink group. These are summarised below, with full output available in Appendix Table 5.

Participants from younger age groups (11-15 year olds) were less likely to perceive HFSS foods as unhealthy for 12 of the 14 typically HFSS foods, compared to older adolescents (16-19 year

olds). For example, 11-15 year olds were less likely than 16-19 year olds to identify energy drinks (OR_{Adj} = 0.45, 95% CI = 0.32-0.63) or crisps (OR_{Adj} = 0.56, 95% CI = 0.45-0.70) as unhealthy. The exceptions to this, where no association with age group was observed, were takeaways delivered by online platforms and flavoured yoghurts. There was also no association between age and both non-HFSS foods (fruit and vegetables).

For half of the HFSS foods, male participants were less likely to perceive these as unhealthy than female participants. For example, this was the case for sugary drinks (OR_{Adj} = 0.72, 95% CI = 0.56-0.94), chips or fried potatoes (OR_{Adj} = 0.78, 95% CI = 0.63-0.96) and sweetened cereals (OR_{Adj} = 0.81, 95% CI = 0.69-0.96). This association was not seen for other HFSS foods, or for non-HFSS foods.

Participants from White British backgrounds were more likely to perceive HFSS foods as unhealthy for 9 of the 14 HFSS foods compared to those from other ethnicity backgrounds. This was the case, for example, for cakes (OR_{Adj} = 2.17, 95% CI = 1.56-3.02) and fast food (OR_{Adj} = 1.87, 95% CI = 1.39-2.52). Participants from other ethnicities had greater identification of flavoured yoghurts as unhealthy (OR_{Adj} = 0.78, 95% CI = 0.63-0.98). No associations were seen for crisps, sugar sweetened cereals, ready meals or milk-based drinks. For the two non-HFSS foods, participants from White British backgrounds were more likely to identify fruit (OR_{Adj} = 2.30, 95% CI = 1.41-3.75) and vegetables (OR_{Adj} = 2.12, 95% CI = 1.29-3.49) as healthy.

Associations between IMD and perception of food healthiness were inconclusive. For many food groups, there was an overall/omnibus association between IMD and correct identification. This included for sweets and chocolate, fast food outlets, chips/fried potatoes, biscuits, desserts, ready meals, milk-based drinks, flavoured yoghurts, fruit, and vegetables. However, the patterns of association relative to the most deprived quintile within these food groups exhibited inconsistent trends. For example, some food groups (e.g. biscuits and fast food) appeared to have a linear relationship with IMD quintile, with correct identification more likely among those from the more affluent quintiles versus the most deprived. For other food groups, however, there were either only associations between the most affluent quintile relative to the most deprived, but not the quintiles in between (e.g. milk-based drinks and sweets/chocolate), or no clear pattern (e.g. desserts only showed associations for the fourth IMD quintile relative to the most deprived, but no other associations).

Sugar free drinks were considered separately, due to their being an HFSS-alternative and therefore neither 'healthy' nor 'unhealthy' by our definition of HFSS versus non-HFSS. In this model, 11-15 year olds were more likely to identify sugar free drinks as healthy (OR_{Adj} = 2.20, 95% CI = 1.67-2.90), compared to 16-19 year olds. Moreover, those with an overweight (OR_{Adj} = 1.68, 95% CI =1.17-2.41) or obese BMI (OR_{Adj} = 2.24, 95% CI = 1.33-3.76), were more likely to perceive these products to be healthy compared to those with a healthy BMI. There was also an association between IMD, with young people from more affluent quintiles less likely than those from more deprived quintiles to perceive sugar free drinks as healthy. For example, those from the fourth (OR_{Adj} = 0.65, 95% CI = 0.45-0.94) and fifth quintile (OR_{Adj} = 0.59, 95% CI = 0.41-0.84) were less likely to perceive these products as healthy compared to the most deprived quintile.

No consistent associations were seen between frequency of seeing health information on packaging with correct identification of food healthiness.

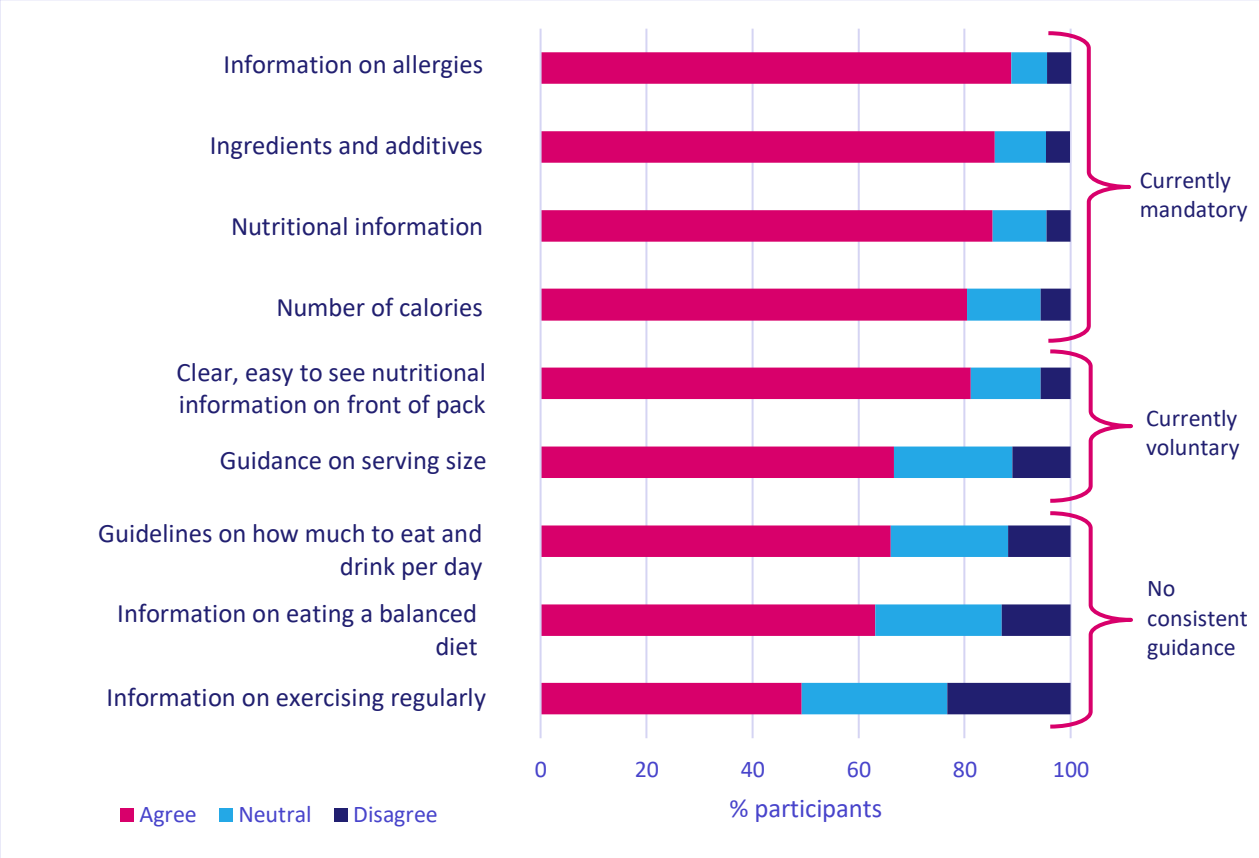
Young people's agreement with having health information on packaging

Most young people agree that health information should be present on packaging

Young people were asked to what extent they agreed or disagreed that nine forms of nutritional information and health messaging should be displayed on food and drink packaging.

For five of these forms of information, at least 80% of participants either strongly or somewhat agreed that they should be present. Agreement was highest for information on allergies (89%), information and additives (86%), nutritional information (85%), clear and easy to see nutritional information on the front of the pack (81%) and number of calories (80%). Agreement was lowest for information on exercising regularly (49%) and eating a balanced diet (63%) (Figure 3, Appendix Table 6).

Figure 3: Agreement with nine forms of health information being present on food packaging

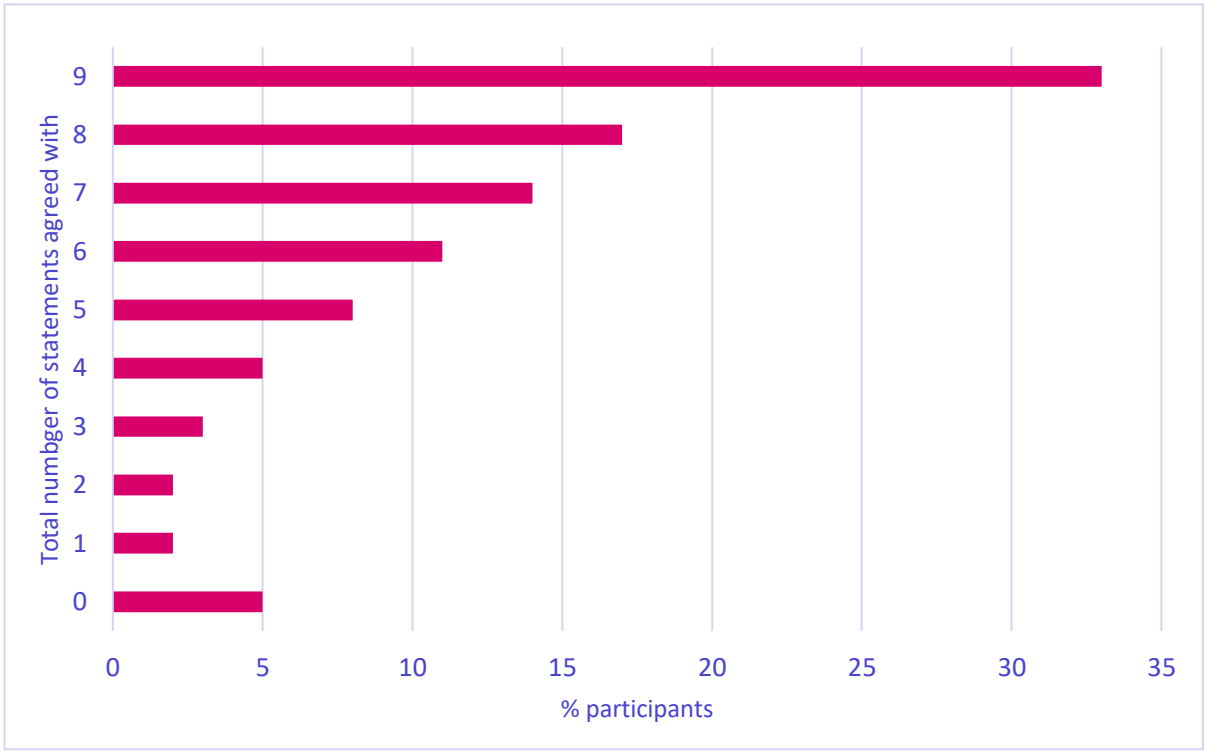


Notes:
Data are weighted
Base: All participants (*n*=3,394)
Percentages (%) are valid; i.e. excluding those who said 'not sure' for each item.

Young people who agreed with the statements tended to agree with multiple forms of information. A third (33%) of young people agreed that all nine forms of information should be

present on food packaging, and 83% of young people agreed with half or more of the statements (Figure 4).

Figure 4: Number of health information statements young people agreed should be present on food packaging



Notes:
Data are weighted
Base: All participants (*n*=3,394)
Percentages (%) are valid; i.e. excluding those who said 'not sure' for any item.

Agreement that health information should be displayed on packaging differs by age, sex, deprivation and BMI

A series of binary logistic regressions were computed with support for each form of health information as the respective dependent variables (each coded: Strongly agree/Somewhat agree vs. Neutral or Strongly/Somewhat disagree) and key demographics and BMI group as the covariates. A separate model was conducted for each health information statement. The below provides a summary of the findings from across these models. Consistent associations were seen across age, sex, deprivation and BMI group (Appendix Table 7).

Across the binary logistic regressions, there were several associations between age and agreement. Specifically, for six of the nine forms of information, 11-15 year olds were less likely than 16-19 year olds to agree the information should be present. This included, for example, information on allergies (OR_{Adj} = 0.68, 95% CI = 0.52-0.87), ingredients and additives (OR_{Adj} = 0.66, 95% CI = 0.52-0.82), nutritional information (OR_{Adj} = 0.58, 95% CI = 0.46-0.73), and easy to see information on the front of the pack (OR_{Adj} = 0.7, 95% CI = 0.57-0.85). The exceptions to this, where no associations with age group were seen, were guidelines on how much to eat and

drink per day, information on eating a balanced diet and information on exercising regularly.

Male participants were less likely to agree the information should be present than female participants for four types of information. These were: clear and easy to see nutritional information on the front of the pack (OR_{Adj} = 0.80, 95% CI = 0.66-0.97), guidance on serving size (OR_{Adj} = 0.78, 95% CI = 0.67-0.92), guidelines on how much to eat or drink per day (OR_{Adj} = 0.85, 95% CI = 0.73-1.00), and information on eating a balanced diet (OR_{Adj} = 0.82, 95% CI = 0.71-0.96).

For two forms of information, young people from White British backgrounds were more likely to agree with the information being displayed on packaging than young people from other ethnicities. These were information on allergies (OR_{Adj} = 1.57, 95% CI = 1.16-2.13) and nutritional information (OR_{Adj} = 1.47, 95% CI = 1.11-1.94).

Associations between IMD and agreement with displaying health information on packaging were inconclusive. For several types of information, there was an overall/omnibus association between IMD and agreement. This was the case for ingredients and additives, nutritional information, clear and easy to see nutritional information on the front of the pack, and guidance on serving size. However, the pattern of association was inconsistent across types of information. For example, in the case of ingredients and additives there was only an association for the fifth quintile relative to the most deprived (OR_{Adj} = 1.85, 95% CI = 1.32-2.61). For guidance on serving size there was no clear pattern, with only an association for the fourth quintile (OR_{Adj} = 1.39, 95% CI = 1.07-1.83) relative to the most deprived. For clear and easy to see nutritional information on the front of the pack, associations were seen with the second, third and fifth quintiles – but not the fourth - relative to the most deprived, with agreement more likely among young people from less deprived quintiles.

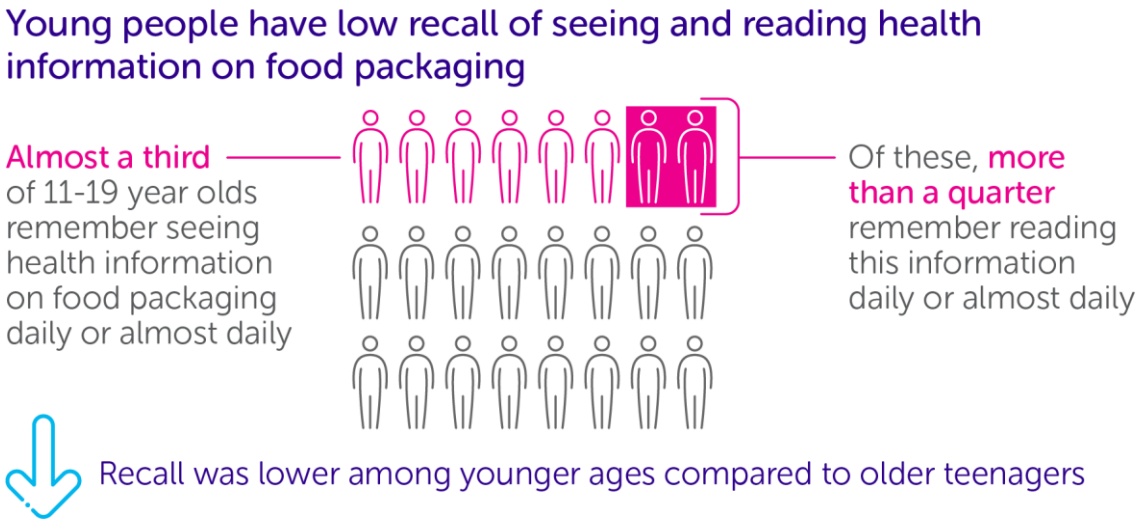
For four types of information, there was an overall/omnibus association between BMI group and agreement. This included information on calories, guidance on serving size, guidelines on how much to eat and drink each day, and information on a balanced diet. Young people with an underweight BMI were less likely to agree the information should be present than those with a healthy BMI for information on calories (OR_{Adj} = 0.74, 95% CI = 0.57-0.97), guidance on serving size (OR_{Adj} = 0.73, 95% CI = 0.57-0.92) and guidelines on how much to eat and drink per day (OR_{Adj} = 0.76, 95% CI = 0.61-0.96). A further association was seen for guidelines on how much to eat and drink per day, where young people with an obese BMI were more likely to agree the information should be present relative to those with a healthy BMI (OR_{Adj} = 1.46, 95% CI = 1.11-1.93). This same association where those with an obese BMI were more likely to agree was seen for information on eating a balanced diet (OR_{Adj} = 1.52, 95% CI = 1.16-1.99).

Discussion

Evidence on how effective health information is with young people is limited – particularly in a real-world context. This is the first study to quantitatively investigate young people's awareness of being exposed to and engaging with health information on food and drink packaging and advertising in the UK, and to examine what types of health information young people want to see on packaging.

Young people have low recall of seeing or reading health information on food packaging and in advertising

An 11-19 year old is estimated to consume, on average, 18 portions each week of 'pocket money' foods such as confectionary, sugary drinks, crisps, energy drinks, cakes and biscuits,[7] where they are likely to come into contact with packaging. This analysis shows that, in the past month, almost a third of young people recalled seeing health information on packaging daily or almost daily. Of these, only a quarter recalled reading or looking closely at it. This discrepancy between high exposure to packaging but low recall of engaging with health information suggests there is an opportunity to improve the current system to better reach consumers and provide them with product and health information on the foods they purchase and consume, and to increase engagement with this important age group.

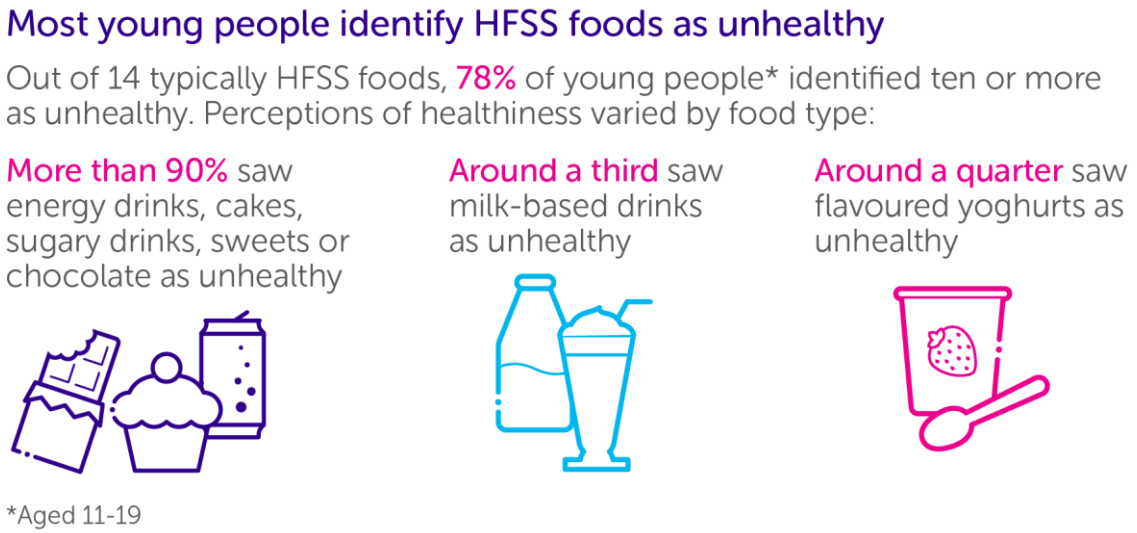


Health information on both packaging and advertising have been examined here, despite health information only being mandatory on packaging. By examining both, this analysis indicates that while young people are not being reached or engaged by health information on food packaging, they are also not getting it from advertising: almost a tenth of young people recalled seeing health information in advertising daily or almost daily in the past month. Of these, only around one in seven recalled reading this information or looking closely at it. The difference in awareness between packaging and advertising could be driven by less frequent exposure to health information in advertising compared to packaging, given some information is mandatory on packaging and all information is voluntary in advertising. It could also be due

to differences the frequency with which young people recall being exposed to packaging and advertising. Nevertheless, recent analysis from this same sample suggests at least half of young people recall seeing 2-3 instances of unhealthy food marketing (including advertising) every day.[25] We know exposure to HFSS advertising is associated with consumption of HFSS foods,[27, 28] and there could be an opportunity for health information in advertising to mitigate some of this influence, which is currently being missed given the discrepancy between the requirements for health information on packaging versus no fixed approach to information in advertising.

Most young people identify typically HFSS foods to be unhealthy, but this is not associated with seeing more health information

This analysis suggests that the HFSS categories align with the foods young people perceive to be unhealthy; when given a list of 14 typically HFSS foods, 78% of young people identified ten or more of them as very or somewhat unhealthy.



Seeing health information more frequently was not associated with identifying a greater number of HFSS foods as unhealthy, after controlling for demographics and BMI group. This could be an indication that current health information is not effectively equipping this age group with information on what they are eating and drinking. However, it could be an indication of what health information does and doesn't do: effective ways of communicating health information are needed to support decision making at the point of purchase and consumption, rather than being intended to build overall health knowledge. Information on nutrients in isolation may not be enough for young people to use as a guide to a product's overall healthiness; overall indicators such as traffic light labelling and nutri-score may be better placed. This study uses perception of product healthiness as a proxy for nutritional knowledge, but it may be that other aspects of health literacy, such as knowing whether a product is high in sugar may be more strongly associated with recall of health information on packaging. We therefore cannot assume that the lack of association here means that current health information on packaging is not driving any nutritional knowledge full stop. The evidence on labelling shows it can be an effective tool at decreasing unhealthy dietary decisions and increasing healthier ones,[18,19] but these decisions at the point of purchase and consumption

are not the same as overall health literacy.

Young people had much lower identification of milk-based drinks and flavoured yoghurts as unhealthy compared to the other typically HFSS foods. In both cases, around a third of young people identified the product as neither healthy nor unhealthy, suggesting a level of ambiguity. In 2018, the UK Government introduced the Soft Drinks Industry Levy, taxing soft drinks with contained more than 5g of sugar per 100ml,[42] and have since rejected extending this to sugar-sweetened milk-based drinks.[43] These categories are likely to be more heterogenous in how healthy or unhealthy they are, compared to categories such as fast food and sugar sweetened soft drinks, and many yoghurts and milk-based drinks will fall outside the HFSS classification. While 'HFSS' is not a classification young people would use, that milk-based drinks and flavoured yoghurts are categories that do encompass healthier options could explain the degree of ambiguity and perception of these foods as healthy by some young people.

Levels of ambiguity were also high for diet and sugar dree drinks, with over a quarter of young people identifying these as neither healthy nor unhealthy. These products were more likely to be identified as healthy by adolescents who were younger, who had an overweight or obese BMI, and who were from the more deprived IMD quintiles. The introduction of the Soft Drinks Industry Levy has led to a shift in purchasing towards diet and sugar free drinks.[44] It is therefore important to understand perceptions around these products, which can also help build our understanding of where and why in the population these purchasing shifts towards diet and sugar free drinks are happening.

Young people agree with having health information on food packaging

Previous research has already shown that young people are supportive of protective measures, including clearer product labelling. They perceive current labelling to be inadequate, with full information not being provided.[8] This study builds on this evidence to ask; if we know young people are supportive of improving product labelling, what health information might they most like to see?

The three types of information that young people most agreed should be present on food and drink packaging are already mandatory: allergies, ingredients and additives and nutritional information. This is a positive indication that the information that must be present currently does align with the information young people want, but the low levels of reach and engagement also seen in this study suggest that while the information might be right, the presentation may not be. The fourth most agreed-with information was clear and easy to see nutritional information on the front of the pack, information which is currently voluntary. Displaying this information on the front of the pack has been voluntary since 2013, and has been adopted by two-thirds of the UK's packaged food and drink market.[6] This study, however, suggests that young people would like to see this clear front-facing information be consistently displayed across all food and drinks – highlighting the importance of the UK Government's recent consultation on front of pack labelling.[10]

The high levels of agreement indicates there is acceptability among this age group of food labelling as a policy intervention, aligning with evidence elsewhere suggesting high acceptability.[45] However, acceptability does not necessarily translate into effectiveness. More evidence is needed on the effectiveness of different forms of information with this age group.

Which groups might be most vulnerable?

Younger adolescents have lower recall, poorer nutritional knowledge and lower agreement with health information on packaging

This study suggests that age plays a role in young people's recall of seeing, engaging with and attitudes towards health information, and their nutritional knowledge. Younger age groups (11 to 15 year olds) had lower recall of seeing and reading health information on packaging, poorer identification of which foods are unhealthy and which are not, and had lower agreement for most types of health information being present on packaging, compared to older ages (16 to 19 year olds). We could expect participants at the younger end of this age group to come into contact with packaging less, as it may be the caregiver who makes purchasing and consumption decisions. Lower recall of seeing and reading health information among younger ages could also relate to lower health literacy, having been exposed to less information around health.

That health information on food packaging may be less effective with younger ages does not necessarily mean this should be a priority group for improved labelling. Equipping people with the knowledge to support them in making healthier diet choices is important, and as it is in older age groups that parental control declines,[9] autonomy increases and importance of health on food choice increases,[8] there may be greater opportunity to maximise the effectiveness of labelling in that older age group.

A starting point for further research into demographic differences

With any population level policy, different people will be impacted in different ways. This study presents a starting point for understanding how current labelling may be perceived by different demographic groups and for informing the development of improved labelling. While demographic differences were observed here, it is important to note that the cross-sectional nature of the research cannot identify causality, so we cannot determine whether certain demographics are driving differences in how young people perceive and engage with health information beyond noting their association. The way information on demographics was collected and used here is also limited: ethnicity data was aggregated as 'White British' versus 'other ethnicities' rather than a breakdown of young peoples' ethnicities. This binary coding of ethnicity was done for the purposes of statistical power. The findings in the study suggest there may be variation in young people's health knowledge and attitudes towards health information by ethnicity, but research is needed with improved data collection to have enough data to fully explore these observed differences.

While overall this analysis was inconclusive about any associations with IMD, some associations suggested that young people from more deprived backgrounds had lower perception of some HFSS foods as unhealthy, and lower agreement with some types of health information being present on packaging, than those from less deprived backgrounds. It is crucial that policies to tackle obesity support young people from more deprived backgrounds; currently, obesity prevalence for children in the most deprived areas is over double that of those living in the least deprived areas, and this gap has widened over time.[11, 46] This study again presents a starting point for further research, and is limited in how deprivation data was collected: IMD is a composite measure across multiple domains such as income, living environment, health deprivation and disability, meaning when used as a proxy for deprivation as it has been used here, it cannot be determined which aspect of deprivation may be driving observed differences.

Front of pack labelling is the easiest form of information to understand and the most popular format across all social groups.[31] Mandatory front of pack labelling, which is designed in a way which does reach and engage all young people and equip them with information, may support reducing these differences in nutritional knowledge. However, while nutritional knowledge is important in supporting people to make informed decisions at the point of purchase and consumption, eating healthily goes beyond just nutritional knowledge and many other factors play a role in both these immediate decisions and beyond, and disproportionately impact some groups more than others. Issues of affordability and access play a key role in these inequalities.[47, 48]

Study strengths and limitations

This study benefits from being based on a large, UK-wide survey of young people's dietary attitudes and behaviours, with 3,394 participants. Survey design was informed by prior survey iterations, qualitative scoping work and pilot testing.[8, 36]

A key limitation is the cross-sectional design of this study, which means the analyses cannot show causal relationships and the possibility of reverse causality cannot be ruled out, for example as discussed in relation to IMD and ethnicity above. In coming from an online non-probabilistic market research panel, this data captures a large number of young people across the UK, but findings may have limited external generalisability to other parts of the population and data were not available on which adult panel members may have been likely to encourage their children to participate.

The data used in this study relied on self-reported recall of seeing and reading health information. This presents a limitation in the reliability and validity of the data, which may be an underestimation or overestimation of how frequently young people are really being exposed to and engaging with this information. Analysis was constrained by sample size, so demographic comparisons – for example by ethnicity – were limited, and could have been aided if informed by a power analysis.

Survey questions on health information do not distinguish between mandatory information, voluntary information and health claims, meaning the recall reported here could relate to any of these forms of information. Further to this point, we cannot be certain what young people were recalling and what their interpretation of health messaging may be. While health and nutrition claims do have approval processes,[23, 26] we know that the use of health and nutrition claims as a marketing tactic can lead to 'health halo effects', creating the perception of a food as healthy when it is not in reality.[34, 49] Some young people could have been recalling such marketing tactics as legitimate health information.

Perception of how healthy or unhealthy a range of typically HFSS foods are was used as a proxy for nutritional knowledge, but the information provided on packaging does not neccassarily build a picture of a product's overall healthiness. Other measures, such as knowing a product is high in sugar, may be more directly linked. This limits the conclusions which can be drawn about the associations between information exposure and nutritional knowledge. The food categories used here are also only illustrative of typically unhealthy foods and drinks, but not all products which fall into the HFSS categories would be HFSS. It should also be noted that the overall choices of foods included in the study are heterogenous (e.g. a single item, 'cake,' versus whole meals, 'ready meals') which aiming to capture a breadth of consumption but limits comparison across foods. By looking at individual foods rather than an aggregate measure

across all HFSS foods we asked about, we cannot gain insight into any demographic associations with overall HFSS healthiness perceptions.

Future research

Health information on food and drink packaging and advertising remains an area where evidence is lacking. Further research is needed to develop our understanding on how young people perceive and interact with this information, in order to develop a system which is effective in informing this age group.

Key areas for future work include:

- How young people's exposure and engagement may vary for differing forms of health information, for example mandatory nutritional information, voluntary information such as front of pack labelling, and health claims.
- This study highlights that current mandatory health information may not be driving knowledge of whether a food is healthy or not. More direct investigation is needed on whether information on packaging can drive young people's nutritional knowledge, and where young people get their health information from.
- This study provides insight into the types of health information young people have the highest and lowest agreement with being present on food packaging. This provides a basis for further investigation on whether what young people agree with translates into effectiveness.
- Further research is needed to inform the development of labelling which is beneficial across demographic groups, including ethnicity and deprivation.

Policy Recommendations

The UK Government is currently reviewing front of pack nutrition labelling, aiming to ensure the UK has a system which is evidence-based and supports all consumers to make healthier decisions about food and drink.

The recent consultation stressed the importance of a labelling system which supports everyone, regardless of background or characteristics. Given the high rates of childhood obesity in the UK, children and young people must be a key focus of this, especially in older adolescents who have more control over what they eat.

This study shows that the current health information is inadequate in reaching and engaging 11-19 year olds. We believe that a lack of consistency in the front-of-pack labelling currently available is limiting the impact that it has, and this could explain why young people told us that that health information on packaging was not reaching or engaging them. We know that currently consumers seeking to utilise front-of-pack nutritional labelling do not always have that option available to them. Not only do a significant proportion of products still not use the full traffic-light system; but some also use their own systems which means products cannot be easily compared, and is likely to increase the risk of confusion among consumers. In addition, front-of-pack labelling is frequently unavailable, or not clearly visible, when shopping online.

Whichever front of pack labelling system is chosen by the UK Government, in order to be effective, it must be consistent across all products.

We are calling for whichever front of pack label that ends up being chosen by the UK Government's consultation to be made mandatory across all pre-packaged food and drink, on pack or at point of choice. A mandatory system would create a level playing field and ensure that consistent information is available to all consumers across all products.

It is instructive that compared to young people's support for front-of-pack nutrition information and calorie labelling, there was a large drop-off in support for daily intake guidance or information on eating a balanced diet or exercising regularly. Those latter options are ones the food industry is most keen to push, often at the expense of more consistent and mandatory approaches.

The UK Government's approach to health information and the prioritisation of policy initiatives within this space should reflect the wishes and public health needs of young people, and indeed of all consumers.

We know from previously published survey analysis that this cohort of young people still regularly see and are influenced by HFSS advertising. Yet few recall seeing, and even fewer reading, health information in advertising. So there seems to be a big mismatch between the impact of those HFSS adverts and any positive health information that might be contained within them.

Indeed, health information messages (including labelling) are one of a multitude of factors influencing food choice, and even knowing that a product is unhealthy does not stop young people finding it enjoyable to consume, and from being influenced by factors such as price, taste, convenience and marketing.

It is necessary for the UK Government to follow through on its commitments and introduce a 9pm watershed for junk food adverts on television, an end to such adverts online, and restrictions on price and location promotions for HFSS products, in order to tackle some of

the key factors which contribute to the high levels of excess weight in the UK.

Such population-wide measures are also likely to be better than health education and information initiatives on their own in addressing some of the demographic inequalities highlighted in this study.

The study also showed that young people were reasonably good at identifying what broad types of foods are very or somewhat unhealthy. This was true not only for desserts, snacks, sugary drinks and other typical impulse purchases, but also for sweetened cereals, fast food, online takeaways and ready meals. These categories would seem to be the most appropriate to be the target of any measures to limit young people's exposure to the marketing and promotions of less healthy food and drink. The UK Government has already indicated that all those categories would be in scope of the promotions restrictions, but there has been no final decision yet.

The UK Government should hold firm and ensure all the main contributors of calories and sugar to young people's diets – those categories in Public Health England's sugar and calorie reduction programme – are within the scope of the forthcoming HFSS marketing and promotions restrictions. And devolved government should do likewise when they introduce similar HFSS promotions restrictions.

Conclusion

Evidence on how effective food labelling may be with young people is limited – particularly in a real-world context. Using data from a large survey of young people from across the UK, this is the first study to quantitatively investigate young people's awareness of being exposed to and engaging with health information on food and drink packaging and advertising in the UK, and to examine what types of health information young people might most agree should be present on packaging.

This study indicates that young people have low recall of seeing or reading health information on food packaging – despite some health information being mandatory – and even lower recall of health information in food advertising. This suggests there is room to increase the reach and engagement of health information on packaging with young people, through better labelling, and CRUK are calling for a front of pack label to be made mandatory across all pre-packaged food and drink.

Young people do perceive typically HFSS foods to be unhealthy, with the exception of milk-based drinks and flavoured yoghurts. Agreement among young people for having health information on packaging was high, especially for information on allergens, ingredients and additives, nutritional information, clear and easy to see front of pack information, and calories. Improving the UK's system of providing health information should reflect the wishes and public health needs of young people, and all consumers.

This study provides a starting point for understanding how young people may be perceiving and engaging with health information in different ways. Demographic differences should be key areas for further exploration to support development of labelling systems which are effective in equipping everyone with information to guide them to healthier options at the point of purchase and consumption.

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Appendices

Table 1: Food groups used in the 2019 YOPS, wording given as per survey

HFSS foods	**Non-HFSS foods**	**HFSS-alternatives**
Cakes	Fruit	Diet Coke or sugar free soft drinks
Biscuits	Vegetables	
Chips or fried potatoes		
Coke or other soft drinks that contain sugar (not Diet coke or diet soft drinks)		
Crisps		
Desserts		
Energy drinks e.g. Red Bull, Monster		
Flavoured yoghurts e.g. Muller Fruit Corner		
Milk based drinks e.g. Yazoo		
Ready meals e.g. frozen pizzas, chips, burgers		
Sweetened cereals e.g. Cheerios, Frosties, Coco Pops		
Sweets or chocolate		
Fast food outlets e.g. McDonalds or Greggs		
Takeaways delivered by online platform e.g. Deliveroo or Just Eat		

Table 2: Binary logistic regressions examining the associations between demographic factors and seeing and reading health information on packaging daily or almost daily

	Seeing health information on packaging daily or almost daily[1,3,5,7]			Reading or looking closely at health information on packaging daily or almost daily[2,4,6,8]		
Variables	**OR_{Adj}**	**95% CI**	**p**	**OR_{Adj}**	**95% CI**	**p**
Age						
16-19 years	REF	-	-	REF	-	-
11-15 years	0.50	0.42-0.59	<0.001	0.40	0.32-0.51	<0.001
Sex						
Female	REF	-	-	REF	-	-
Male	1.12	0.94-1.33	0.196	0.90	0.72-1.11	0.304
Ethnicity						
Other	REF	-	-	REF	-	-
White British	1.15	0.91-1.46	0.231	1.17	0.88-1.56	0.289
Country						
England	REF	-	0.985	REF	-	0.162
Scotland	1.01	0.78-1.31	0.911	0.69	0.49-0.97	0.035
Wales	0.95	0.67-1.35	0.764	1.14	0.75-1.73	0.549
N' Ireland	0.95	0.57-1.57	0.841	1.03	0.54-1.96	0.929
IMD						
1 (Most deprived)	REF	-	0.988	REF	-	0.898
2	1.04	0.76-1.41	0.812	1.04	0.71-1.53	0.836
3	1.07	0.79-1.44	0.669	1.12	0.77-1.63	0.554
4	1.00	0.74-1.34	0.977	0.99	0.68-1.43	0.944
5 (Least deprived)	1.03	0.77-1.36	0.856	0.96	0.67-1.37	0.818
BMI Group						
Healthy	REF	-	0.133	REF	-	0.002
Underweight	0.97	0.75-1.25	0.794	0.96	0.70-1.31	0.788
Overweight	0.79	0.60-1.04	0.096	1.24	0.90-1.72	0.187
Obese	1.18	0.77-1.82	0.451	1.72	1.05-2.83	0.031
Not stated	0.80	0.64-0.99	0.045	0.65	0.48-0.88	0.006

Notes:
OR_{Adj}= Adj. Odds Ratio; 95% CI = 95% Confidence Interval; n.s. = non-significant (p>0.05); data are unweighted
[1] Unweighted base = All participants (n=3,394)
[2] Unweighted base = Those reporting some awareness on packaging in the past month (n=2,089)
[3] DV= Health information on packaging seen daily or almost daily (Yes/No; Not sure excluded)
[4] DV = Read health information on packaging daily or almost daily (Yes/No; Not sure excluded)
[5] Cases excluded due to missing data on one or more variable, including 'not sure for awareness' (*n*=1,132)
[6] Cases excluded due to missing data on one or more variable, including 'not sure for reading' (*n*=320)
[7] Test of coefficients, $\chi^2(14)=78.80, p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=8.14$, p = 0.420, Nagelkerke $R^2=0.05$.
[8] Test of coefficients, $\chi^2(14)=101.06, p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=6.87$, p = 0.551, Nagelkerke $R^2=0.08$.

Table 3: Binary logistic regressions examining associations between demographic factors and seeing and reading health information in advertising at least weekly

	Seeing health information in advertising at least weekly[1,3,5,7]			Reading or looking closely at health information in advertising at least weekly[2,4,6,8]		
Variables	**OR_{Adj}**	**95% CI**	**p**	**OR_{Adj}**	**95% CI**	**p**
Age						
16-19 years	REF	-	-	REF	-	-
11-15 years	0.96	0.80-1.16	0.664	0.99	0.77-1.26	0.907
Sex						
Female	REF	-	-	REF	-	-
Male	1.09	0.90-1.31	0.381	0.93	0.73-1.19	0.560
Ethnicity						
Other	REF	-	-	REF	-	-
White British	0.86	0.67-1.12	0.260	0.56	0.40-0.78	0.001
Country						
England	REF	-	0.181	REF	-	0.631
Scotland	0.83	0.63-1.11	0.210	0.87	0.59-1.28	0.480
Wales	0.68	0.46-1.01	0.057	0.99	0.60-1.63	0.972
N' Ireland	1.05	0.61-1.80	0.854	0.65	0.31-1.36	0.252
IMD						
1 (Most deprived)	REF	-	0.432	REF	-	0.402
2	0.99	0.71-1.37	0.932	1.25	0.81-1.93	0.320
3	0.92	0.66-1.26	0.589	1.24	0.81-1.90	0.314
4	0.86	0.63-1.18	0.358	0.90	0.59-1.36	0.606
5 (Least deprived)	0.78	0.58-1.06	0.113	1.09	0.73-1.63	0.666
BMI Group						
Healthy	REF	-	0.790	REF	-	0.821
Underweight	0.98	0.74-1.29	0.879	1.16	0.81-1.66	0.424
Overweight	1.02	0.76-1.37	0.908	0.87	0.59-1.28	0.485
Obese	0.89	0.56-1.40	0.604	1.00	0.56-1.79	0.989
Not stated	0.87	0.68-1.10	0.244	0.96	0.69-1.34	0.806

Notes:
OR_{Adj}= Adj. Odds Ratio; 95% CI = 95% Confidence Interval; n.s. = non-significant (p>0.05); data unweighted
[1] Unweighted base = All participants (n=3,394)
[2] Unweighted base = Those reporting some awareness in advertising in the past month (n=1,324)
[3] DV= Health information in advertising seen at least weekly (Yes/No; Not sures excluded)
[4] DV = Read health information in advertising at least weekly (Yes/No; Not sures excluded)
[5] Cases excluded due to missing data on one or more variable, including 'not sure for awareness' (*n*=1,508)
[6] Cases excluded due to missing data on one or more variable, including 'not sure for reading' (*n*=263)
[7] Test of coefficients, $\chi^2(14)=14.87$,p = 0.387; Hosmer & Lemeshow, $\chi^2(8)=4.83$, p= 0.776, Nagelkerke $R^2=0.01$.
[8] Test of coefficients, $\chi^2(14)=19.50$,p = 0.147; Hosmer & Lemeshow, $\chi^2(8)=12.11$, p= 0.147, Nagelkerke $R^2=0.02$.

Table 4: Knowledge of the healthiness of a range of food items

		Unhealthy		Neither healthy nor unhealthy		Healthy	
	Product category	**%**	***n***	**%**	***n***	**%**	***n***
HFSS	Energy drinks	93	3,072	5	159	2	86
	Cakes	92	3,087	6	189	2	82
	Sweets or chocolate	92	3,084	7	221	2	65
	Coke or other soft drinks that contain sugar	91	3,073	6	218	2	72
	Fast food outlets (e.g. McDonald's)	89	2,994	8	283	3	84
	Chips or fried potatoes	85	2,864	11	373	4	122
	Crisps	85	2,835	12	414	3	103
	Biscuits	83	2,794	13	441	4	120
	Desserts	77	2,548	20	657	4	120
	Sweetened cereals	73	2,434	21	695	6	218
	Ready meals	72	2,393	24	810	4	138
	Takeaways delivered by online platform	72	2,299	25	794	4	118
	Milk- based drinks	34	1,099	33	1,059	33	1,085
	Flavoured yoghurts	26	841	30	1,005	44	1,451
HFSS-alternative	Diet coke or sugar free drinks	62	2,059	28	930	10	347
Non-HFSS	Fruit	1	45	2	64	97	3,262
	Vegetables	2	55	2	56	97	3,260

Notes:
Percentages (%) are valid; that is, the data exclude those who said 'not sure' to each food/drink group

Table 5: Binary logistic regressions examining associations between demographics and perception of food healthiness

	Energy drinks			Cakes			Sweets or chocolate			Coke or other soft drinks that contain sugar			Fast food outlets			Chips or fried potatoes		
Variables	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**
Age																		
16-19 years	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
11-15 years	0.45	0.32-0.63	<0.001	0.47	0.34-0.64	<0.001	0.44	0.33-0.61	<0.001	0.48	0.35-0.64	<0.001	0.48	0.36-0.63	<0.001	0.72	0.58-0.91	0.005
Sex																		
Female	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
Male	0.62	0.46-0.82	0.001	0.86	0.65-1.13	0.279	0.90	0.69-1.17	0.418	0.72	0.56-0.94	0.015	0.77	0.61-0.97	0.029	0.78	0.63-0.96	0.017
Ethnicity																		
Other	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
White British	1.90	1.33-2.72	<0.001	2.17	1.56-3.02	<0.001	2.12	1.54-2.93	<0.001	1.49	1.06-2.09	0.021	1.87	1.39-2.52	<0.001	1.76	1.35-2.30	<0.001
Country																		
England	REF		0.143	REF		0.231	REF		0.425	REF		0.310	REF		0.131	REF		0.083
Scotland	1.20	0.75-1.91	0.449	1.32	0.83-2.12	0.246	1.38	0.87-2.20	0.168	0.73	0.51-1.05	0.092	0.93	0.65-1.34	0.709	1.08	0.77-1.50	0.665
Wales	0.78	0.46-1.33	0.358	0.69	0.42-1.13	0.140	0.84	0.50-1.40	0.499	0.95	0.56-1.60	0.839	0.61	0.40-0.94	0.024	0.64	0.44-0.94	0.021
N' Ireland	3.20	1.00-10.27	0.051	1.25	0.59-2.64	0.560	1.21	0.59-2.45	0.605	1.32	0.63-2.77	0.466	0.78	0.44-1.36	0.371	1.29	0.71-2.34	0.407
IMD																		
1 (Most deprived)	REF		0.143	REF		0.071	REF		0.044	REF		0.065	REF		0.013	REF		0.005
2	1.00	0.64-1.57	0.998	1.19	0.77-1.83	0.431	1.15	0.75-1.76	0.533	1.41	0.93-2.13	0.102	1.61	1.10-2.36	0.015	1.31	0.93-1.85	0.128
3	1.23	0.78-1.94	0.380	1.29	0.84-1.98	0.243	1.01	0.67-1.53	0.949	1.51	1.00-2.27	0.048	1.43	0.99-2.05	0.057	1.03	0.75-1.43	0.846
4	1.62	1.00-2.63	0.048	1.63	1.05-2.54	0.031	1.41	0.91-2.17	0.123	1.69	1.12-2.56	0.013	1.72	1.18-2.49	0.005	1.45	1.03-2.03	0.034
5 (Least deprived)	1.47	0.93-2.31	0.097	1.76	1.14-2.71	0.010	1.77	1.14-2.73	0.010	1.69	1.14-2.51	0.009	1.78	1.25-2.55	0.002	1.72	1.23-2.40	0.001
BMI group																		
Healthy	REF		0.115	REF		0.508	REF		0.018	REF		0.539	REF		0.003	REF		0.243
Underweight	0.67	0.44-1.01	0.053	0.73	0.49-1.08	0.114	0.58	0.41-0.84	0.004	0.93	0.63-1.37	0.716	0.55	0.40-0.77	<0.001	0.73	0.54-0.98	0.039
Overweight	0.75	0.48-1.17	0.206	1.11	0.68-1.82	0.684	1.20	0.74-2.00	0.461	1.43	0.88-2.32	0.151	1.15	0.75-1.77	0.525	0.97	0.68-1.38	0.858
Obese	0.84	0.41-1.74	0.638	0.88	0.43-1.82	0.739	0.86	0.43-1.72	0.679	0.80	0.43-1.52	0.500	1.26	0.62-2.56	0.533	0.90	0.53-1.54	0.707
Not stated	1.18	0.81-1.72	0.402	0.88	0.63-1.23	0.452	1.08	0.77-1.51	0.674	1.04	0.75-1.42	0.829	0.83	0.62-1.10	0.196	1.05	0.81-1.37	0.705
Seeing health information on packaging																		
Not in the past month	REF		0.003	REF		0.216	REF		0.197	REF		0.021	REF		0.240	REF		0.145
Less than weekly	2.02	0.87-4.69	0.100	1.08	0.57-2.06	0.807	1.67	0.82-3.40	0.158	1.48	0.79-2.77	0.223	0.90	0.53-1.52	0.690	1.71	1.00-2.93	0.049
At least weekly	0.57	0.34-0.96	0.035	0.75	0.46-1.21	0.236	0.78	0.48-1.25	0.298	0.79	0.51-1.22	0.293	0.83	0.55-1.25	0.374	0.92	0.64-1.33	0.669
Daily or almost daily	0.83	0.49-1.41	0.496	0.99	0.61-1.60	0.955	0.90	0.56-1.44	0.659	1.19	0.76-1.86	0.440	0.97	0.65-1.47	0.902	0.95	0.67-1.37	0.797
Not sure	1.00	0.59-1.70	1.000	1.17	0.72-1.90	0.538	1.00	0.62-1.58	0.961	1.35	0.87-2.11	0.185	1.22	0.81-1.85	0.343	1.08	0.75-1.55	0.699

Notes:
OR_{Adj}= Adjusted Odds Ratio; data unweighted; pink=significant
Base = All participants (n=3,394)
DV= Perception of food healthiness (Very or somewhat unhealthy vs other; Not sure marked as missing)
Cases excluded due to missing data on one or more variable: Energy drinks=361, Cakes=319, Sweets or Chocolate=308, Coke or other soft drinks containing sugar=315, Fast food outlets=316, Chips or fried potatoes=318
Energy drinks: Test of coefficients, $\chi^2(18)=79.79$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=5.64$, $p=0.688$, Nagelkerke $R^2=0.07$. Cakes: Test of coefficients, $\chi^2(18)=65.11$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=7.08$, $p=0.528$, Nagelkerke $R^2=0.05$. Sweets or chocolate: Test of coefficients, $\chi^2(18)=76.77$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=10.75$, $p=0.216$, Nagelkerke $R^2=0.06$. Coke or other soft drinks containing sugar: Test of coefficients, $\chi^2(18)=62.78$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=1.42$, $p=0.994$, Nagelkerke $R^2=0.05$. Fast food outlets: Test of coefficients, $\chi^2(18)=88.49$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=8.77$, $p=0.363$, Nagelkerke $R^2=0.058$. Chips or fried potatoes: Test of coefficients, $\chi^2(18)=63.26$,$p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=11.37$, $p=0.182$, Nagelkerke $R^2=0.04$

Table 5 (cont): Binary logistic regressions examining associations between demographics and perception of food healthiness

	Crisps			Biscuits			Desserts			Sweetened cereals			Ready meals			Takeaways delivered by online platform		
Variables	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**
Age																		
16-19 years	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
11-15 years	0.56	0.45-0.70	<0.001	0.78	0.62-0.97	0.024	0.39	0.32-0.48	<0.001	0.68	0.57-0.81	<0.001	0.68	0.57-0.81	<0.001	1.00	0.84-1.20	0.974
Sex																		
Female	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
Male	0.88	0.72-1.07	0.200	0.79	0.65-0.97	0.024	0.87	0.73-1.03	0.110	0.81	0.69-0.96	0.012	0.87	0.74-1.02	0.084	0.97	0.82-1.14	0.682
Ethnicity																		
Other	REF		-	REF		-	REF		-	REF		-	REF		-	REF		-
White British	0.94	0.67-1.31	0.231	1.90	1.47-2.44	<0.001	1.38	1.09-1.75	0.008	1.18	0.94-1.48	0.153	1.24	1.00-1.55	0.054	1.50	1.20-1.87	<0.001
Country																		
England	REF		0.969	REF		0.285	REF		0.001	REF		0.914	REF		0.995	REF		0.772
Scotland	1.04	0.76-1.43	0.799	1.35	0.96-1.89	0.083	1.40	1.05-1.87	0.022	0.96	0.75-1.23	0.761	0.98	0.77-1.25	0.872	1.04	0.81-1.34	0.737
Wales	1.07	0.71-1.62	0.746	0.95	0.63-1.43	0.807	0.63	0.46-0.87	0.005	1.07	0.77-1.48	0.700	0.99	0.72-1.36	0.932	1.03	0.74-1.43	0.860
N' Ireland	1.10	0.64-1.88	0.733	1.28	0.73-2.26	0.385	1.35	0.84-2.16	0.214	1.12	0.94-1.48	0.619	0.96	0.63-1.45	0.832	1.27	0.80-2.00	0.307
IMD																		
1 (Most deprived)	REF		0.231	REF		<0.001	REF		0.007	REF		0.223	REF		0.006	REF		0.263
2	0.94	0.67-1.31	0.703	1.16	0.84-1.59	0.362	1.22	0.91-1.63	0.182	1.22	0.93-1.61	0.155	1.17	0.89-1.53	0.252	0.90	0.67-1.19	0.449
3	1.21	0.86-1.69	0.267	1.42	1.03-2.00	0.032	1.17	0.88-1.55	0.271	1.26	0.97-1.65	0.087	1.29	0.99-1.68	0.061	0.81	0.62-1.07	0.136
4	1.20	0.86-1.67	0.287	1.78	1.28-2.47	0.001	1.72	1.29-2.31	<0.001	1.29	0.99-1.69	0.059	1.65	1.26-2.16	<0.001	1.05	0.79-1.39	0.726
5 (Least deprived)	1.28	0.93-1.77	0.128	1.98	1.44-2.73	<0.001	1.27	0.97-1.67	0.079	1.34	1.04-1.73	0.024	1.34	1.04-1.72	0.024	0.86	0.66-1.12	0.264
BMI group																		
Healthy	REF		0.129	REF		0.192	REF		0.052	REF		0.327	REF		0.510	REF		0.104
Underweight	0.71	0.53-0.95	0.019	0.73	0.54-0.98	0.036	0.69	0.54-0.90	0.005	0.78	0.61-0.99	0.038	0.94	0.74-1.20	0.609	0.81	0.64-1.04	0.098
Overweight	1.12	0.78-1.61	0.538	1.11	0.77-1.58	0.582	0.85	0.64-1.14	0.283	0.91	0.69-1.19	0.494	1.07	0.82-1.40	0.628	1.10	0.83-1.46	0.497
Obese	0.82	0.49-1.38	0.464	0.78	0.47-1.29	0.326	1.17	0.71-1.92	0.534	0.93	0.61-1.41	0.719	0.83	0.55-1.23	0.347	1.27	0.81-1.99	0.296
Not stated	0.90	0.70-1.16	0.419	0.91	0.71-1.17	0.457	0.95	0.77-1.18	0.644	0.98	0.80-1.20	0.841	1.12	0.92-1.37	0.267	0.85	0.69-1.04	0.110
Seeing health information on packaging																		
Not in the past month	REF		0.119	REF		0.198	REF		0.707	REF		0.130	REF		0.943	REF		0.374
Less than weekly	1.48	0.91-2.42	0.117	0.93	0.59-1.46	0.751	1.20	0.80-1.81	0.368	1.20	0.83-1.74	0.328	0.94	0.65-1.36	0.750	0.87	0.59-1.27	0.462
At least weekly	0.89	0.63-1.26	0.520	0.88	0.61-1.25	0.460	0.93	0.68-1.26	0.624	1.14	0.86-1.52	0.364	0.93	0.70-1.24	0.606	0.77	0.57-1.05	0.095
Daily or almost daily	1.11	0.78-1.57	0.570	1.20	0.84-1.71	0.317	1.03	0.76-1.39	0.870	1.34	1.02-1.77	0.039	1.00	0.75-1.32	0.977	0.76	0.57-1.02	0.068
Not sure	1.19	0.85-1.69	0.315	1.12	0.79-1.60	0.526	1.02	0.76-1.38	0.892	1.02	0.78-1.35	0.865	0.92	0.70-1.22	0.575	0.86	0.64-1.17	0.335

Notes:
OR_{Adj}= Adjusted Odds Ratio; data unweighted; pink=significant. Base = All participants (n=3,394)
DV= Perception of food healthiness (Very or somewhat unhealthy vs other; Not sure marked as missing)
Cases excluded due to missing data on one or more variable: Crisps=321, Biscuits=322, Desserts=354, Sweetened cereals=327, Ready meals=332, Takeaways delivered by online platform=458
Crisps: Test of coefficients, $\chi^2(18)=56.13$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=2.39$, p =0.967, Nagelkerke $R^2=0.03$. Biscuits: Test of coefficients, $\chi^2(18)=81.37$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=5.07$, p = 0.751, Nagelkerke $R^2=0.05$. Desserts: Test of coefficients, $\chi^2(18)=148.87$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=6.80$, p =0.559, Nagelkerke $R^2=0.07$. Sweetened cereals: Test of coefficients, $\chi^2(18)=55.62$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=9.04$, p =0.339, Nagelkerke $R^2=0.03$. Ready meals: Test of coefficients, $\chi^2(18)=48.85$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=11.52$, p =0.174, Nagelkerke $R^2=0.02$. Takeaways delivered by online platform: Test of coefficients, $\chi^2(18)=30.66$,p=0.031; Hosmer & Lemeshow, $\chi^2(8)=3.10$, p =0.928, Nagelkerke $R^2=0.02$.

Table 5 (cont): Binary logistic regressions examining associations between demographics and perception of food healthiness

	Milk-based drinks			Flavoured yoghurts			Fruit			Vegetables			Diet coke or sugar free drinks		
Variables	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**
Age															
16-19 years	REF		-	REF		-	REF		-	REF		-	REF		-
11-15 years	0.50	0.43-0.59	<0.001	1.09	0.91-1.30	0.338	0.97	0.61-1.54	0.901	0.79	0.49-1.27	0.329	2.20	1.67-2.90	<0.001
Sex															
Female	REF		-	REF		-	REF		-	REF		-	REF		-
Male	0.90	0.77-1.05	0.184	0.84	0.71-0.99	0.038	0.85	0.55-1.31	0.462	0.88	0.57-1.36	0.559	0.90	0.71-1.14	0.391
Ethnicity															
Other	REF		-	REF		-	REF		-	REF		-	REF		-
White British	1.05	0.84-1.31	0.668	0.78	0.63-0.98	0.033	2.30	1.41-3.75	0.001	2.12	1.29-3.49	0.003	1.45	0.99-2.12	0.054
Country															
England	REF		0.184	REF		0.378	REF		0.530	REF		0.313	REF		0.575
Scotland	0.93	0.73-1.18	0.491	0.99	0.77-1.27	0.931	0.74	0.40-1.37	0.332	0.97	0.50-1.86	0.915	1.09	0.77-1.55	0.622
Wales	1.22	0.90-1.65	0.540	0.77	0.54-1.09	0.136	0.66	0.30-1.48	0.316	5.32	0.73-38.76	0.099	1.25	0.82-1.91	0.298
N' Ireland	0.90	0.58-1.39	0.210	1.20	0.79-1.83	0.401	1.55	0.37-6.48	0.551	0.66	0.26-1.70	0.392	0.77	0.39-1.50	0.434
IMD															
1 (Most deprived)	REF		0.049	REF		0.035	REF		0.019	REF		<0.001	REF		0.049
2	1.02	0.77-1.35	0.906	1.44	1.08-1.94	0.015	1.11	0.60-2.08	0.740	1.81	0.97-3.38	0.064	0.67	0.46-0.98	0.040
3	1.31	1.00-1.71	0.054	1.52	1.14-2.02	0.004	1.36	0.72-2.57	0,351	1.71	0.94-3.12	0.078	0.73	0.50-1.05	0.089
4	1.14	0.87-1.49	0.350	1.19	0.89-1.59	0.243	1.96	0.98-3.93	0.058	5.16	2.22-12.03	<0.001	0.65	0.45-0.94	0.022
5 (Least deprived)	1.35	1.05-1.75	0.020	1.26	0.95-1.66	0.103	3.17	1.50-6.71	0.003	3.13	1.61-6.10	0.001	0.59	0.41-0.84	0.004
BMI group															
Healthy	REF		0.019	REF		0.036	REF		0.099	REF		0.390	REF		0.003
Underweight	0.79	0.62-1.01	0.055	0.76	0.59-0.98	0.037	0.52	0.29-0.91	0.022	0.59	0.32-1.08	0.086	1.41	0.99-2.00	0.058
Overweight	0.92	0.71-1.19	0.508	0.81	0.61-1.07	0.131	0.83	0.41-1.71	0.619	1.00	0.46-2.21	0.996	1.68	1.17-2.41	0.005
Obese	1.57	1.07-2.29	0.021	1.26	0.85-1.88	0.251	0.64	0.24-1.67	0.359	0.55	0.21-1.45	0.226	2.24	1.33-3.76	0.002
Not stated	0.89	0.73-1.08	0.232	0.81	0.66-1.00	0.047	1.21	0.66-2.22	0.538	0.90	0.51-1.57	0.706	1.08	0.81-1.46	0.593
Seeing health information on packaging															
Not in the past month	REF		0.573	REF		0.205	REF		0.601	REF		0.549	REF		0.568
Less than weekly	1.17	0.82-1.67	0.378	1.19	0.82-1.73	0.370	1.06	0.33-3.40	0.926	2.56	0.69-9.50	0.160	0.73	0.42-1.27	0.257
At least weekly	1.01	0.76-1.34	0.933	1.01	0.75-1.37	0.940	0.69	0.29-1.64	0.399	1.03	0.47-2.25	0.935	0.98	0.66-1.46	0.979
Daily or almost daily	1.12	0.85-1.46	0.431	1.22	0.91-1.63	0.178	0.59	0.26-1.36	0.215	0.90	0.43-1.88	0.771	0.81	0.54-1.20	0.805
Not sure	0.96	0.72-1.26	0.750	0.95	0.71-1.28	0.731	0.79	0.33-1.88	0.588	1.11	0.52-2.38	0.786	0.96	0.66-1.42	0.964

Notes:

OR_{Adj}= Adj. Odds Ratio; n.s. = non-significant (p>0.05); data unweighted

[1] Base = All participants (n=3,394)

[2] DV= Perception of food healthiness (HFSS: Very or somewhat unhealthy vs other; Not sure marked as missing. Non-HFSS and diet drinks: Very or somewhat healthy vs other; Not sure marked as missing)

[3] Cases excluded due to missing data on one or more variable: Milk based drinks=435, Flavoured yoghurts=376, Fruit=308, Vegetables=307, Diet coke or sugar free drinks=336.

Milk based drinks: Test of coefficients, $\chi^2(18)=123.05$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=8.83$, p =0.357, Nagelkerke $R^2=0.06$.

Flavoured yoghurts: Test of coefficients, $\chi^2(18)=39.65$,p=0.002; Hosmer & Lemeshow, $\chi^2(8)=4.71$, p =0.788, Nagelkerke $R^2=0.02$.

Fruit: Test of coefficients, $\chi^2(18)=38.71$,p=0.003; Hosmer & Lemeshow, $\chi^2(8)=19.05$, p =0.015, Nagelkerke $R^2=0.06$.

Vegetables: Test of coefficients, $\chi^2(18)=48.36$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=5.74$, p =0.677, Nagelkerke $R^2=0.70$.

Diet coke or sugar free drinks: Test of coefficients, $\chi^2(18)=79.52$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=17.58$, p =0.025, Nagelkerke $R^2=0.05$.

Table 6: Agreement with nine forms of health information being present on food packaging

	Agree it should be present		Other (neutral/disagree)	
Information	**%**	***n***	**%**	***n***
Information on allergies	89	2,817	11	357
The ingredients and additives in the product	86	2,699	14	449
Nutritional information, such as how much fat, salt, and sugar it contains	85	2,674	15	461
Clear and easy to see nutritional information on the front of the pack	81	2,550	19	589
The number of calories	80	2,520	20	611
Guidance on serving size	67	2,067	33	1,031
Guidelines on how much to eat and drink per day	66	2,069	34	1,063
Information on eating a balanced and healthy diet	63	1,985	37	1,162
Information on exercising regularly	49	1,538	51	1,579
Notes: Data are weighted Base: All participants (*n*=3,394) Percentages (%) are valid; i.e. excluding those who said 'not sure' for each item.				

Table 7: Binary logistic regressions examining association between demographics and agreement with nine forms of health information being present on food packaging

	Information on allergies			Ingredients and additives			Nutritional information such as fat, salt and sugar			Clear and easy to see nutritional information on front of pack			Number of calories		
Variables	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**
Age															
16-19 years	REF		-	REF		-	REF		-	REF		-	REF		-
11-15 years	0.68	0.52-0.87	0.003	0.66	0.52-0.82	<0.001	0.58	0.46-0.73	<0.001	0.70	0.57-0.85	<0.001	0.69	0.57-0.84	<0.001
Sex															
Female	REF		-	REF		-	REF		-	REF		-	REF		-
Male	0.97	0.77-1.24	0.827	0.86	0.70-1.07	0.173	0.87	0.70-1.08	0.205	0.80	0.66-0.97	0.022	0.87	0.72-1.04	0.128
Ethnicity															
Other	REF		-	REF		-	REF		-	REF		-	REF		-
White British	1.57	1.16-2.13	0.004	1.31	0.99-1.74	0.061	1.47	1.11-1.94	0.007	1.28	0.99-1.66	0.057	1.06	0.82-1.37	0.656
Country															
England	REF		0.850	REF	0.66-1.27	0.738	REF		0.170	REF		0.293	REF		0.334
Scotland	1.03	0.71-1.49	0.885	0.92	0.57-1.32	0.595	0.71	0.52-0.96	0.027	0.79	0.60-1.05	0.103	1.08	0.81-1.44	0.622
Wales	1.16	0.70-1.93	0.568	0.87	0.47-1.35	0.505	0.93	0.61-1.43	0.748	0.89	0.61-1.30	0.542	0.79	0.56-1.13	0.192
N' Ireland	1.28	0.65-2.50	0.474	0.79	0.99-1.74	0.393	0.87	0.50-1.50	0.611	0.77	0.48-1.23	0.272	0.76	0.48-1.21	0.243
IMD															
1 (Most deprived)	REF		0.083	REF		0.006	REF		<0.001	REF		0.006	REF		0.142
2	1.37	0.92-2.04	0.121	1.15	0.81-1.62	0.428	1.00	0.71-1.40	0.996	1.60	1.16-2.22	0.004	1.12	0.87-1.64	0.279
3	1.39	0.94-2.04	0.098	1.42	1.00-2.01	0.050	1.31	0.93-1.85	0.118	1.36	1.00-1.85	0.049	1.09	0.81-1.48	0.564
4	1.21	0.83-1.75	0.323	1.26	0.90-1.77	0.178	1.44	1.02-2.03	0.039	1.35	0.99-1.82	0.055	1.26	0.94-1.72	0.135
5 (Least deprived)	1.70	1.16-2.47	0.006	1.85	1.32-2.61	<0.001	2.08	1.47-2.94	<0.001	1.72	1.28-2.32	<0.001	1.44	1.07-1.93	0.017
BMI group															
Healthy	REF		0.282	REF		0.149	REF		0.063	REF		0.205	REF		0.018
Underweight	0.72	0.52-1.02	0.061	0.67	0.49-0.91	0.010	0.64	0.47-0.87	0.004	0.74	0.56-0.98	0.038	0.74	0.57-0.97	0.029
Overweight	1.04	0.69-1.58	0.843	0.91	0.63-1.30	0.587	0.98	0.68-1.41	0.904	0.80	0.59-1.10	0.166	1.27	0.91-1.76	0.155
Obese	0.88	0.48-1.62	0.678	0.96	0.54-1.70	0.889	0.83	0.48-1.44	0.515	0.82	0.51-1.33	0.427	1.61	0.91-2.82	0.100
Not stated	1.08	0.80-1.47	0.620	0.90	0.69-1.18	0.441	0.97	0.74-1.27	0.815	0.98	0.77-1.26	0.892	0.93	0.74-1.18	0.563

Notes:
OR_{Adj}= Adj. Odds Ratio; n.s. = non-significant (p>0.05); data unweighted
[1] Base = All participants (n=3,394)
[2] DV= Agreement that information should be present (Agree/Neutral or Disagree; Not sure marked as missing)
[3] Cases excluded due to missing data on one or more variable: Information on allergies=489, Ingredients and additives=513, Nutritional information=526, Clear and easy to see nutritional information on front of pack=529, Number of calories=530.
Information on allergies: Test of coefficients, $\chi^2(14)=31.25$,p=0.005; Hosmer & Lemeshow, $\chi^2(8)=4.15$, p = 0.843, Nagelkerke $R^2=0.02$.
Ingredients and additives: Test of coefficients, $\chi^2(14)=44.08$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=6.81$, p = 0.557, Nagelkerke $R^2=0.03$.
Nutritional information: Test of coefficients, $\chi^2(14)=71.62$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=3.69$, p = 0.884, Nagelkerke $R^2=0.04$.
Clear and easy to see nutritional information on front of pack: Test of coefficients, $\chi^2(14)=46.46$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=12.25$, p = 0.140, Nagelkerke $R^2=0.03$.
Number of calories: Test of coefficients, $\chi^2(14)=42.00$,p<0.001; Hosmer & Lemeshow, $\chi^2(8)=5.46$, p = 0.707, Nagelkerke $R^2=0.02$.

Table 7 (cont): Binary logistic regressions examining association between demographics and agreement with nine forms of health information being present on food packaging

	Guidance on serving size			Guidelines on how much to eat and drink per day			Information on eating a balanced and healthy diet			Information on exercising regularly		
Variables	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**	**OR_{Adj}**	**95% CI**	**P**
Age												
16-19 years	REF		-	REF		-	REF		-	REF		-
11-15 years	0.73	0.62-0.86	<0.001	0.88	0.74-1.03	0.107	1.04	0.89-1.22	0.592	1.13	0.97-1.32	0.114
Sex												
Female	REF		-	REF		-	REF		-	REF		-
Male	0.78	0.67-0.92	0.002	0.85	0.73-1.00	0.044	0.82	0.71-0.96	0.013	0.93	0.80-1.21	0.342
Ethnicity												
Other	REF		-	REF		-	REF		-	REF		-
White British	1.04	0.83-1.29	0.758	1.03	0.83-1.29	0.762	0.84	0.68-1.04	0.115	0.82	0.67-1.01	0.062
Country												
England	REF		0.544	REF		0.437	REF		0.934	REF		0.212
Scotland	0.92	0.73-1.17	0.518	0.83	0.65-1.04	0.107	0.93	0.74-1.17	0.529	0.97	0.77-1.21	0.772
Wales	0.98	0.71-1.34	0.876	0.95	0.70-1.29	0.726	0.96	0.71-1.30	0.803	0.80	0.60-1.08	0.139
N' Ireland	0.75	0.50-1.14	0.174	1.04	0.68-1.59	0.826	0.98	0.65-1.49	0.933	1.34	0.89-2.01	0.157
IMD												
1 (Most deprived)	REF		0.029	REF		0.519	REF		0.071	REF		0.285
2	1.01	0.77-1.33	0.947	0.93	0.71-1.22	0.588	0.85	0.65-1.11	0.233	0.96	0.74-1.24	0.735
3	1.03	0.79-1.34	0.825	1.05	0.80-1.37	0.726	1.06	0.82-1.38	0.664	1.02	0.79-1.31	0.901
4	1.39	1.07-1.83	0.016	1.09	0.84-1.42	0.526	1.02	0.79-1.32	0.881	0.93	0.73-1.20	0.587
5 (Least deprived)	1.26	0.97-1.62	0.079	1.14	0.89-1.47	0.307	1.20	0.94-1.55	0.143	1.16	0.92-1.48	0.216
BMI group												
Healthy	REF		0.010	REF		0.001	REF		0.012	REF		0.288
Underweight	0.73	0.57-0.92	0.007	0.76	0.61-0.96	0.022	0.94	0.75-1.18	0.602	1.01	0.81-1.27	0.914
Overweight	1.17	0.89-1.53	0.264	1.46	1.11-1.93	0.007	1.52	1.16-1.99	0.002	1.23	0.97-1.58	0.093
Obese	1.38	0.89-2.14	0.152	1.21	0.80-1.84	0.366	1.09	0.73-1.62	0.670	0.99	0.68-1.46	0.976
Not stated	0.94	0.77-1.14	0.509	0.90	0.74-1.09	0.270	0.92	0.76-1.11	0.379	0.91	0.76-1.10	0.325

Notes:
OR_{Adj}= Adj. Odds Ratio; n.s. = non-significant (p>0.05); data unweighted
[1] Base = All participants (n=3,394)
[2] DV= Agreement that information should be present (Agree/Neutral or Disagree; Not sure marked as missing)
[3] Cases excluded due to missing data on one or more variable: Guidance on serving size=563, Guidelines on how much to eat and drink per day=535, Information on eating a balanced and healthy diet=520, Information on exercising regularly=546
Guidance on serving size: Test of coefficients, $\chi^2(14)=55.21, p<0.001$; Hosmer & Lemeshow, $\chi^2(8)=10.67$, p = 0.221, Nagelkerke $R^2=0.03$.
Guidelines on how much to eat and drink per day: Test of coefficients, $\chi^2(14)=32.26, p=0.04$; Hosmer & Lemeshow, $\chi^2(8)=4.37$, p = 0.822, Nagelkerke $R^2=0.02$.
Information on eating a balanced and healthy diet: Test of coefficients, $\chi^2(14)=30.02, p=0.008$; Hosmer & Lemeshow, $\chi^2(8)=12.03$, p = 0.150 , Nagelkerke $R^2=0.01$.
Information on exercising regularly: Test of coefficients, $\chi^2(14)=20.04, p=0.129$; Hosmer & Lemeshow, $\chi^2(8)=5.12$, p = 0.744, Nagelkerke $R^2=0.01$.