A WEIGHTY ISSUE

A STUDY OF UK ADULTS' CONSUMPTION BEHAVIOURS, KNOWLEDGE OF CALORIE AND ADDED SUGAR GUIDELINES AND PHYSICAL ACTIVITY LEVELS

MARCH 2017

CANCER RESEARCH UK

FOREWORD

Cancer Research UK has made and continues to make highly significant and useful contributions to the nation's knowledge not only about cancer but also about the precipitating preventable causes thereof.

This report investigates the use UK's consumption of ready meals, fast food and takeaway, confectionary and soft drinks, as well as the public's physical activity levels and knowledge of sugar and calorie guidelines.

Cancer is linked to a number of lifestyle factors. After smoking, overweight and obesity is the largest contributor to the incidence of cancer in the population. Overweight and obesity is associated with over 18,000 new cancer cases in the UK each year and is a risk factor for thirteen types of cancer, including those affecting the breast (after menopause), bowel and womb.

The 2015 Health Survey for England found that 63% of adults in England were overweight or obese, with 27% classed as obese. It is very important that action is taken now to prevent this situation from deteriorating further.

Amongst other things this report highlights the worryingly high levels of unhealthy ready meal consumption in the UK. This also demonstrates the importance of reformulation as part of a comprehensive obesity strategy. Such programmes should look at calorie reduction in commonly consumed food amongst adults, including ready meals and foods consumed in and outside of the home.

Similarly, it is important to consider the variations in consumption, knowledge and physical activity between males and females and different groups outlined in this report to prevent the gaps from widening further. These differences demonstrate the need for tailored and targeted interventions.

This report was carried out by the Policy Research Centre for Cancer Prevention. The Centre is part of Cancer Research UK's commitment to produce high quality research, building the evidence base to inform policy development on topics relevant to cancer prevention, including obesity.

Long may Cancer Research UK continue to produce such important and influential data.

Professor John A.H. Wass
Professor of Endocrinology, University of Oxford and Lead for Obesity, Royal College of Physicians London.

REFERENCE

This report should be referred to as Birch J, Hooper L, Rosenberg G & Vohra J (2017) A Weighty Issue. Cancer Research UK.

AUTHORS

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ACKNOWLEDGEMENTS

CANCER RESEARCH UK

Every year around 300,000 people are diagnosed with cancer in the UK and more than 150,000 people die from cancer. Cancer Research UK is the world's leading cancer charity dedicated to saving lives through research. The charity's pioneering work has been at the heart of the progress that has already seen survival rates in the UK double in the last forty years. As the largest fundraising charity in the UK, we support research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses. In 2015/16, we spent £404 million on research. We receive no funding from the Government for our research, and of every £1 donated, 80p was available for investment in our core purpose.

CONTENTS

EXECUTIVE SUMMARY

Overweight and obesity is the single biggest preventable cause of cancer after smoking and is estimated to cause 18,100 cancer cases each year in the UK[1]. Thirteen types of cancer[2] including, breast (after menopause), bowel and womb[1] are linked to this risk factor. In addition to cancer, evidence shows obesity to be a risk factor for diabetes, coronary heart disease, stroke and other health conditions[3]. In 2012 the total economic cost of obesity to the UK was estimated at £47 billion[4] .

To date there is only limited research into the consumption of ready meals, fast food and takeaways and confectionary amongst the UK adult population. By gaining a better understanding of the behaviours associated with regularly consumed food categories, we can better inform population level interventions. To date, no UK data has yet linked physical activity and weight to consumption behaviours and knowledge of calorie and added sugar guidelines. The data used explores adult consumption behaviour and how this links to calorie and sugar consumption guideline knowledge, as well as physical activity for the first time on a UK-wide scale.

METHODS

This study was carried out by the Policy Research Centre for Cancer Prevention (PRCP) at Cancer Research UK. It follows a recent publication which found that only 1 in

NUMBER OF READY MEALS AND TAKEAWAYS CONSUMED IN A WEEK BY UK ADULTS

22 MILLION TAKEAWAY

79 MILLION READY MEALS

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[1] Parkin DM, Boyd L. 8. Cancers attributable to overweight and obesity in the UK in 2010. Br J Cancer. 2011;105 Suppl 2:S34-7.
[2] Lauby-Secretan B, Scoccianti C, Loomis D, Grosse Y, Bianchini F, Straif K. Body Fatness and Cancer—Viewpoint of the IARC Working Group. New England Journal of Medicine. 2016;375(8):794-8.
[3] World Health Organization. Global Health Risks-Mortality and burden of disease attributable to selected major risks. The Lancet. 2015
[4] McKinsey Global Institute. Overcoming obesity: An initial economic analysis. 2014.

4 people are aware of the link between obesity and cancer[5]. The aim of this study was to measure food and soft drink consumption behaviours, physical activity levels, and calorie and sugar guideline knowledge in the UK adult population; and to explore the associations between these. A sample of 3,293 members of the general population completed the online survey.

KEY FINDINGS

- Seventy-nine million ready meals are consumed by adults in the UK each week.
- Twenty-two million fast food and takeaways were consumed by adults in the UK each week.
- Almost a third (31%) of people consumed confectionery every day.
- Males consumed significantly more ready meals, soft drinks and fast food and takeaways than females.
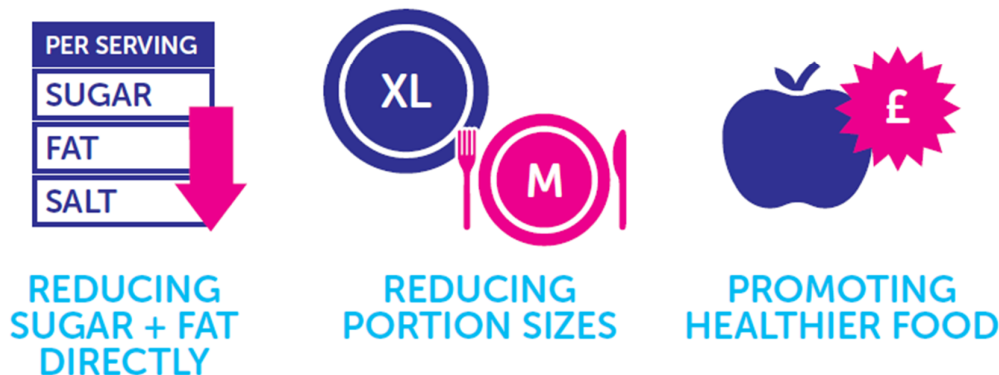- The 18-24 age group consumed more soft drinks, confectionery, ready meals and fast food and takeaways than older age groups.
- Despite consuming the highest levels of unhealthy food, the 18-24 age group had a better knowledge of calorie guidelines than those aged 45 or older.
- Significantly more people in Scotland consumed confectionery at least once a day than in England (39% vs. 30%).
- Almost a half (46%) of obese people were sufficiently active.

This report has shown that differences exist in the reported consumption behaviours, physical activity levels and diet guideline knowledge between different sexes and age groups. Having a better understanding of calorie guidelines or being more likely to meet minimum exercise requirements did not necessarily lead to better consumption behaviours or having a lower BMI.

MORE THAN 100 MILLION READY MEALS AND TAKEAWAYS ARE EATEN BY ADULTS IN THE UK EACH WEEK

THE FOOD INDUSTRY CAN HELP US BY:

PER SERVING
SUGAR
FAT
SALT

XL M

£

REDUCING SUGAR + FAT DIRECTLY

REDUCING PORTION SIZES

PROMOTING HEALTHIER FOOD

[5] Hooper L, Anderson A, Forster A, Rosenberg G, Vohra J. Public knowledge of the link between obesity and cancer. Cancer Research UK, 2016.

POLICY AND PUBLIC HEALTH RECOMMENDATIONS

There is a need for a wide-ranging, comprehensive obesity strategy – as outlined in a Cancer Research UK and UK Health Forum report released in 2016[6] – to reduce levels of obesity in the UK.

The results in the report highlight the importance of reformulation of food high in fat, sugar and salt as part of a comprehensive obesity strategy. Such programmes should look at calorie reduction in commonly consumed food amongst adults, such as ready meals, and foods consumed outside of the home.

It is important to consider the variations in consumption, knowledge and physical activity levels between males and females and other groups outlined in this report to prevent such disparities from widening further. This demonstrates the need for tailored and targeted interventions, to compliment population level measures.

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[6] Cancer Research UK, UK Health Forum. Tipping the scales: Why preventing obesity makes economic sense. 2016.

INTRODUCTION

Overweight and obesity is the single biggest preventable cause of cancer after smoking and is linked to 18,100 cases of cancer each year in the UK alone (approximately 5% of all cancer cases(1)). Thirteen types of cancer are linked to overweight and obesity(2)(Figure 1) , with the largest number of weight-linked cases in the UK being for breast (after menopause), bowel and womb(1). It is known that in addition to cancer, evidence shows obesity to be a risk factor for diabetes, coronary heart disease, stroke and other health conditions(3), and in 2012 the total economic cost of obesity alone to the UK was estimated at £47 billion(4).

BEING OVERWEIGHT CAN CAUSE 13 TYPES OF CANCER

Larger circles indicate cancers with more UK cases linked to being overweight or obese

Number of linked cases are currently being calculated and will be available in 2017

Oesophagus

Breast
after menopause

Pancreas

Kidney

Bowel

Womb

Meningioma
(a type of brain tumour)

Thyroid

Liver

Upper stomach

Gallbladder

Ovarian

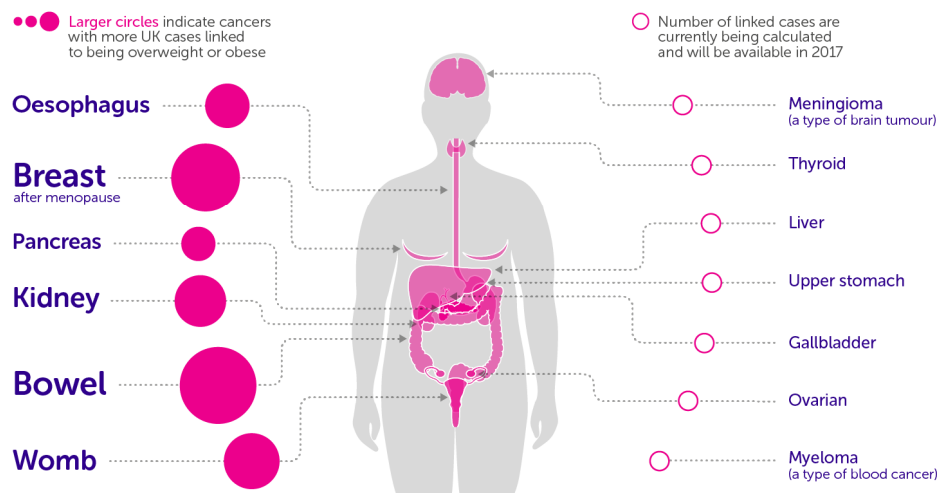Myeloma
(a type of blood cancer)

FIGURE 1 CANCERS CAUSED BY OVERWEIGHT AND OBESITY

In 2015, 63% of adults in England(5) were overweight and obese. The remaining devolved nations show a similar level of adult overweight or obesity: 65% in Scotland(6), 59% in Wales(7) and 60% in Northern Ireland(8). A modelling study carried out by Cancer Research UK and the UK Health Forum estimated that if current trends of overweight and obesity continued, there will be an estimated further 670,000 cancer cases over the next 20 years(9). Furthermore, these obesity levels are disproportionally affecting people who have a lower income, with 45% of people in the lowest income quintile predicted to be obese by 2035 as compared to 38% in the highest quintile(9). Awareness of the link between obesity and cancer is also affected by social grade, with those from the highest socioeconomic grade significantly more likely to be aware of the link than those from the lowest socioeconomic grade (30% vs. 22%)(10).

In order to combat the rising impact of obesity on the health of the nation, a multi-faceted approach is needed. There have been a number of reports reviewing the evidence for different policy interventions to address this growing problem(4, 11, 12). All conclude that it is a complex, systemic issue with no 'silver bullet' solution. Instead, a wide-ranging programme of action is required that includes fiscal measures, restrictions on junk food marketing and promotions (including sponsorship and pricing policy), and processed food reformulation. In December 2016, the draft legislation for the Soft Drink Industry Levy was published(13). This

provided the clearest indication to date of how the Government intends to implement the levy and potential effects of the legislation. Alongside this, Public Health England have begun a programme for reducing sugar in the top nine food sources of sugar for children (excluding soft drinks). The aim is to reduce the amount sugar in these products by 20% by 2020(11).

The Government has set out guidelines for minimum physical activity levels, and added sugar and calorie consumption. Current guidelines for physical activity(14) indicate that individuals should, as a minimum, complete at least: 150 minutes of moderate (activity where the heartbeat increases and individuals feel warmer, such as cycling or brisk walking) physical activity a week; 75 minutes of vigorous activity (such as running) spread across a week; or a combination of the two. The most recent available data for levels of physical activity in England is from the Health Survey for England 2012(15), which showed that 67% of men and 55% of women met the Government's physical activity guidelines. Similarly, more recent (2015) data found that 67% of men and 59% of women in Scotland met minimum physical activity guidelines(6). Data from 2012 showed that 59% of men and 49% of women in Northern Ireland met minimum guidelines(16). There are currently no data available from Wales reflecting recent physical activity guidelines.

The Scientific Advisory Committee on Nutrition (SACN) guidelines state that added sugar should form no more than 5% of total calorie intake(11). This is equivalent to 30g or 7 teaspoons or cubes of sugar per day. The daily suggested calorie allowance is 2500 calories for men and 2000 for women(17) to maintain a healthy weight. Polling by Diabetes UK, British Heart Foundation and Tesco(18) has found that up to two-thirds of people do not know how many calories the average person needs to maintain a healthy weight. Some attempt has been made to link nutritional knowledge to food consumption behaviours (19, 20). However there is no evidence to date exploring additional links between these and physical activity, or applying consumption behaviours at the population level.

UK-wide data on food consumption have previously been collected in the National Diet and Nutrition Survey (NDNS). The survey frequently collects data on food consumption, nutrient intake and nutritional information(21) on both adults and children in the UK through a food diary method. Physical activity data is also collected as part of the NDNS. However, no data were collected regarding knowledge of calorie and added sugar guidelines in the population.

A report published by Cancer Research UK in September 2016 showed low levels of public awareness of the links between obesity and cancer, with only 1 in 4 people recalling the link (10). This report is the second in this series and considers the relationships between diet, physical activity, weight and knowledge of calorie and added sugar guidelines. Currently, no UK data have linked physical activity and weight to health knowledge and consumption behaviours. This report aims to fill these gaps.

AIM AND OBJECTIVES

To measure food and soft drink consumption behaviours, physical activity levels and diet guideline knowledge in the UK adult population and explore associations between these.

A UK-wide survey was carried out to:

- Explore which factors are associated with the consumption of ready meals, fast food and takeaways, confectionery and soft drinks in the UK.
- Investigate the public's knowledge of calorie and added sugar guidelines.
- Describe levels of physical activity across the UK.
- Estimate overall population consumption of: ready meals, fast food and takeaways, confectionary and soft drinks by UK adults.

METHODS

SURVEY DEVELOPMENT

The study design was based on an alcohol awareness study conducted by the University of Sheffield and Cancer Research UK(22). Additional items were incorporated from other survey tools (22-26) and adapted where necessary to be relevant to obesity (Appendix 1). Where no existing tools could be found, questions were developed in consultation with colleagues working on obesity policy development in Scotland and tested with the Policy and Information Patient Sounding Board, Cancer Research UK and the Scottish Obesity Network. The survey was designed to be self-administered and completed online. Survey domains can be broken down into:

DEMOGRAPHIC INFORMATION

The market research company who conducted the survey (YouGov) holds demographic information regarding respondents' gender, age, education, geographical location, and household income. YouGov used the National Readership Survey (NRS) system to group the respondents into four social grades: AB, C1, C2, and DE. These classifications are based on income and profession. The highest social grade is group A and the lowest is E. The two highest and two lowest social grades have been grouped together to form AB and DE respectively and C1 and C2 refer to the two middle social grades.

BMI

YouGov hold data on height and therefore respondents were asked to self-report only their weight. Options to answer in kilograms or pounds were provided with a "prefer not to say" option.

PHYSICAL ACTIVITY LEVELS

Questions were taken from the International Physical Activity Questionnaire (IPAQ) Short form Version 2.0(27) which give a measure of how much walking, moderate intensity and vigorous intensity exercise each respondent undertakes. The International Physical Activity Questionnaire short form allows for a score to be generated for each respondent that places each response into one of three categories: inactive (insufficiently active), minimally active (sufficiently active) and highly active. The latter two categories would indicate that an individual is at least meeting public health recommendations. Individuals would have to either: complete three or more days of at least 20 minutes of vigorous activity a day; five days of at least 30 minutes of moderate-intensity or walking; or five days of a combination of the above activities meeting a minimum score on the tool of 600 MET-mins(27).

CONSUMPTION BEHAVIOURS

Respondents were asked how frequently they consumed confectionery, soft drinks, ready meals and fast food/takeaways. Items for each consumption question were taken from validated tools(28) and adapted to be appropriate to the UK population. The responses were grouped into three variables for each consumption behaviour. For ready meals and fast food and takeaways the categories included: once a week or more; 1 to 3 times a month and less than once a month. The soft drink and confectionery variables were categorized into: at least once a day; 2 to 6 times per week; and once a week or less.

CANCER AWARENESS

Answers provided in the free text field (on which health conditions could result from being overweight or obese) were coded into two variables, 1 if cancer was mentioned and 0 if it was not. The unprompted question was used to find out to what degree cancer was at the forefront of people's minds when thinking about health conditions linked to being overweight or obese.

KNOWLEDGE OF CALORIE GUIDELINES

Respondents were asked to answer "Do you know how many calories it is recommended someone like you should consume each day?" in a free text box. Males who answered 2500 and females who answered 2000 calories were coded as answering correctly.

STAKEHOLDER ENGAGEMENT

The first draft of the survey was developed with guidance from internal teams at Cancer Research UK and Professor Annie Anderson, Professor of Public Health Nutrition, University of Dundee. The Scottish Cancer Prevention Network as well as colleagues working on obesity policy development in Scotland and the Cancer Research UK Policy and Information Patient Sounding Board provided feedback on the questions (e.g clarity, content and style of questions). The questions were refined according to feedback received and a final draft of the survey was agreed with the project team and Professor Annie Anderson.

PILOTING

Prior to launching the online survey YouGov pilot tested the survey with 85 people. This showed a low rate of drop outs across all domains and that there were no specific points at which this was occurring. It also showed an average completion time of 14 minutes and that no further amendments were required.

SAMPLING/ RECRUITMENT

Data collection took place 24th February – 8th March 2016 with a sample of 3,293 adults (aged 18+) representative of the UK population (England, Wales, Scotland and Northern Ireland) based on age, gender, region and education. Booster samples of an additional 500 participants were applied in each of the devolved nations.

For quota sampling by region, the following categories were used: England (North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, South West), Wales, Scotland and Northern Ireland.

Members of the YouGov panel were invited to complete the online survey and automated sampling was applied to ensure the quotas for each region were met. Each participant was credited 50 points (equivalent to 50p) to their YouGov account upon completing the survey.

ANALYSIS

Data were analysed using IBM SPSS version 23 and Statacorp Stata Statistical Software release 13.

WEIGHTING

Weights were applied to age, gender, social grade and region.

BMI

BMI was self-reported and calculated for each respondent: BMI = weight (kg) / (height (m))^2.

STATISTICAL ANALYSIS

Univariate ordinal logistic regression models were run to examine the relationship between socio-demographic factors, as well as BMI, and consumption patterns of soft drinks, fast food/takeaways, ready meals and confectionery and physical activity. Variables that were significantly ($p<0.05$) associated with consumption behaviours, were then entered into a multivariable ordinal logistic regression, with step-wise elimination of non-significant variables.

Population figures were gained by applying the consumption findings to the 18+ population indicated using the Office for National Statistics estimated population of 51,339,161 for 2015(29). Mid-points for each category of consumption behaviour were used.

Results using weighted data are presented, unless specified. Rounding may mean that percentages do not add up exactly to 100%. Findings from multivariate analysis are presented unless specified. Univariate results are included in the appendix.

ETHICAL CONSIDERATIONS

Ethical guidance followed by YouGov was adhered to during this study. At the start of the survey a consent to proceed box was provided which included reassurance about confidentiality, anonymity and the use of the data. Sources of further information and helplines were provided at the end of the survey.

RESULTS

KEY SOCIO-DEMOGRAPHICS

A nationally representative sample (n=3,293) of adults in England, Wales, Scotland and Northern Ireland was obtained and weighted analysis applied to age, gender, social grade and region(Table 1) were used. The largest proportion of respondents (40%) were of normal weight (BMI: 18.5 – 25) based on self-reported weight and height. Those in the overweight (BMI: 25 – 30) group comprised 29% of the sample and 20% were obese (BMI: 30+). It is worth noting that 9% of the sample did not provide their weight.

TABLE 1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

	N = 3293	
	Unweighted Sample N (%)	Weighted Sample N (%)
Gender		
Male	1580 (48)	1604 (48.7)
Female	1713 (52)	1689 (51.3)
Age		
18-39	1006 (30.5)	1202 (36.5)
40 - 59	1274 (38.7)	1126 (34.2)
60+	1013 (30.8)	965 (29.3)
Region of Residence		
North East	89 (2.7)	135 (4.1)
North West	234 (7.1)	362 (11)
Yorkshire & the Humber	173 (5.3)	273 (8.3)
East Midlands	145 (4.4)	237 (7.2)
West Midlands	179 (5.4)	290 (8.8)
East of England	206 (6.3)	306 (9.3)
London	272 (8.3)	428 (13)
South East	294 (8.9)	451 (13.7)
South West	181 (5.5)	280 (8.5)

Wales	503 (15.3)	158 (4.8)
Scotland	513 (15.6)	280 (8.5)
Northern Ireland	504 (15.3)	92 (2.8)
Social grade		
AB – Higher & intermediate managerial, administrative, professional occupations	913 (27.7)	724 (22)
C1 – Supervisory, clerical & junior managerial, administrative, professional occupations	1037 (31.5)	988 (30)
C2 – Skilled manual occupations	538 (16.3)	494 (15)
DE – Semi-skilled & unskilled manual occupations, Unemployed and lowest grade occupations	805 (24.4)	1087 (33)
BMI		
Underweight	75 (2.3)	85 (2.6)
Normal Weight	1244 (37.8)	1327 (40.3)
Overweight	1015 (30.8)	944 (28.7)
Obese	700 (21.3)	648 (19.7)
Not calculated	259 (7.9)	290 (8.8)

CONFECTIONERY

Almost a third (31%) of the sample ate confectionery – such as sweets and chocolates, cakes, muffins, sweet pies, pastries or biscuits – at least once a day. This was higher in Scotland, where 39% consumed confectionery at least once a day (vs. 30% in England, p=0.003). A small but significant difference in consumption was found between the AB and DE socioeconomic groups (33% vs. 29%, p=0.003). A third of 18-24 year olds consumed confectionery at least once a day, significantly more than the quarter of 55-64 year olds (p=0.014). More parents than non-parents consumed confectionery at least once a day (36% vs. 30%, p=0.007).

READY MEALS

Half (50%) of the sample consumed ready meals (defined as ready meals, burgers, pizzas, or chips) at least once a week. Fewer individuals who are categorised as being highly active were found to consume ready meals at least once a week than those categorised as inactive (39% vs. 52%, p<0.001). More parents than non-parents consume ready meals at least once a week (58% vs. 48%, p<0.001). Significantly more males than females consumed ready meals at least once a week (56% vs. 44%, p<0.001). The 18-24 age group contains the highest proportion of those who consume ready meals at least once a week (61%), which is significantly more than all other age groups, including 65+ (36%, p<0.001) (see appendix 3 for full results).

FAST FOOD AND TAKEAWAYS

Sixteen percent of the sample consumed fast food and takeaway at least once a week. A higher proportion of parents than non-parents consumed fast food and takeaway at least once a week (21% vs. 15%, p<0.001). A higher proportion of males than females (19% vs. 13%, p<0.001) consume fast food and takeaway at least once a week.

Twenty eight percent of 18-24 year olds consumed fast food and takeaway at least once a week, significantly more frequently than all other age groups (see Table 2).

TABLE 2 AGE AND FAST FOOD CONSUMPTION

Fast food and takeaway		Once a week or more	1 to 3 times a month	Less than once a month	OR	P-value
Total Consumption (n=3293)		16.0%	19.0%	65.0%		
Age* (n=3293)	18-24 (n=283)	27.6%	34.6%	37.8%		
	25-34 (n=631)	26.3%	25.5%	48.2%	1.461	0.008
	35-44 (n=570)	21.2%	23.0%	55.8%	2.178	<0.001
	45-54 (n=562)	14.9%	19.4%	65.7%	3.294	<0.001
	55-64 (n=510)	9.4%	15.7%	74.9%	5.135	<0.001
	65+ (n=737)	4.2%	6.5%	89.3%	13.486	<0.001

Differences in consumption were present between the AB and C2 socioeconomic group; significantly more of those from the C2 socioeconomic group consumed fast food and takeaway at least once a week than the AB group (19% v 13%, p=0.003).

SOFT DRINKS

Almost three-quarters (73%) of the sample consumed soft drinks (not including sugar free drinks) less than once a week, and 15% consumed soft drinks at least once a day. A higher proportion of males than females consumed soft drinks at least once a day (17% vs. 13%, p<0.001). Almost twice as many (19%) 18-24 year olds consumed soft drinks at least once a day compared to those in the 55-64 age group (10%, p<0.001) and more than twice as many compared to those in the 65+ (8%, p<0.001) age category.

POPULATION CONSUMPTION

Once the consumption behaviours were applied to the UK population, the following figures were estimated to be consumed by adults in the UK:

- Thirty-six million items of confectionary are consumed each day.
- Seventy-nine million ready meals each week.
- Twenty-two million fast food and takeaway meals each week.
- Twenty-one million soft drinks are consumed each day.
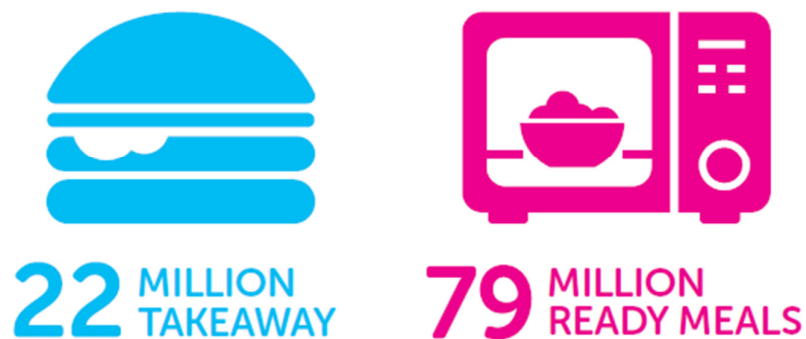
FIGURE 2 NUMBER OF READY MEALS AND TAKEAWAYS CONSUMED

ADDED-SUGAR GUIDELINES

Two percent of the sample correctly identified the maximum recommended sugar guidelines. This was despite 17% of the sample answering that they knew the sugar guidelines. However, no significant differences between groups were found from the univariate analysis conducted. Hence no further multivariate tests were conducted.

CALORIE GUIDELINES
Less than half (46%) of the sample knew the recommended daily calorie intake. Differences between age-groups stood out, as more than half of 18-24, 25-34 and 35-44 year olds all knew the calorie guidelines. Conversely, less than 40% of 45-54, 55-64 and 65+ year olds knew the calorie guidelines. No significant differences were found between BMI groups.

Correct Identification of Calorie Guidelines
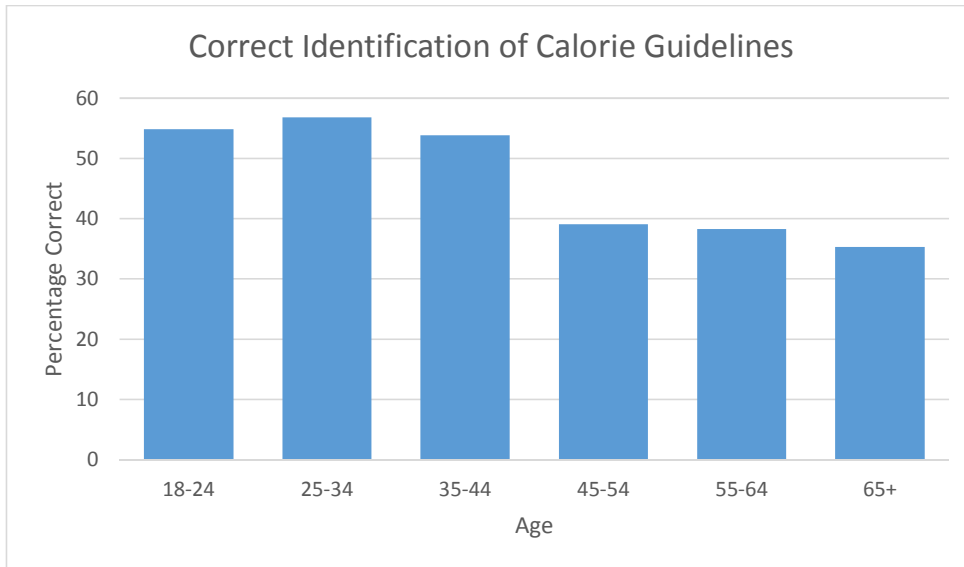
FIGURE 3 AGE AND KNOWLEDGE OF CALORIE GUIDELINES

PHYSICAL ACTIVITY

Two-thirds (66%) of the sample were sufficiently active. BMI was significantly associated with physical activity levels. Ten percentage points more males than females (71% vs. 61 %, p<0.001) were sufficiently active. Eighty percent of those in the 18-24 age group were sufficiently active, which was significantly higher than all other age groups apart from 25-34 (p=0.076) (see appendix 7). Obese people were significantly more inactive than those who were underweight (54% vs. 38%, P<0.001). Awareness of the link between obesity and cancer was also significantly associated with physical activity levels, as those who correctly identified the link were more likely to be sufficiently active (73% vs. 64%, p<0.001).

BMI

When respondents whose BMI was not calculated were excluded, 53% of the sample were overweight or obese. Almost half (49%) of females were overweight or obese, compared to 58% of males (p<.001). The 18-24 age group had the lowest level of overweight or obesity (27%), significantly lower than all other age groups.

DISCUSSION

This study shows that adults in the UK consume a large amount of ready meals each week, with clear gender differences in food and drink consumption and physical activity behaviours. Males reported more frequent consumption behaviours for ready meals, fast food and takeaway and soft drinks. This supports research indicating that females are more likely to avoid energy-dense foods(30). These differences should be considered to prevent this gap from widening further. Females were significantly less likely to be overweight or obese despite also being less likely to be sufficiently active – therefore physical activity alone is unlikely to curb the obesity epidemic.

Significant differences also exist for both knowledge and behaviours across age groups. Eighteen to 24 year olds were more likely to know the recommended calorie guidelines. However, they consumed more ready meals and fast food and takeaways than all other age groups and significantly more confectionery than the 55-64 group and more soft drinks than the 55-64 and 65+ groups. In this study, knowledge of calorie guidelines was not associated with a lower level of consuming unhealthy foods and soft drinks.

GUIDELINE KNOWLEDGE

This study showed low awareness amongst the population of the added sugar guidelines introduced by the SACN. These guidelines suggest that no more than 30 grams, 7 teaspoons or 5% of daily dietary energy intake should be consumed as added sugar. No significant differences were found between added sugar guideline knowledge and consumption behaviours. This finding contradict research which showed nutritional knowledge was linked to healthier consumption behaviours (19, 20, 31). This could be due to only 17% of the study sample suggesting an amount of added sugar which should not be exceeded.

EXERCISE

Seventy-one percent of males and 61% of females were sufficiently active, which is slightly higher than the Health Survey for England 2012(15) where 67% of males and 55% of females met the minimum exercise guidelines. This could reflect that the data used in this report allows for a UK-wide picture of physical activity, rather than the England only data gained from the Health Survey for England 2012. The difference could also reflect the time difference between the two datasets, differences in the measures of physical activity used or changes in the behaviour of the population. Interestingly, 46% of obese respondents reported that they were at least sufficiently active, demonstrating that action beyond increasing physical activity is needed to curb obesity epidemic.

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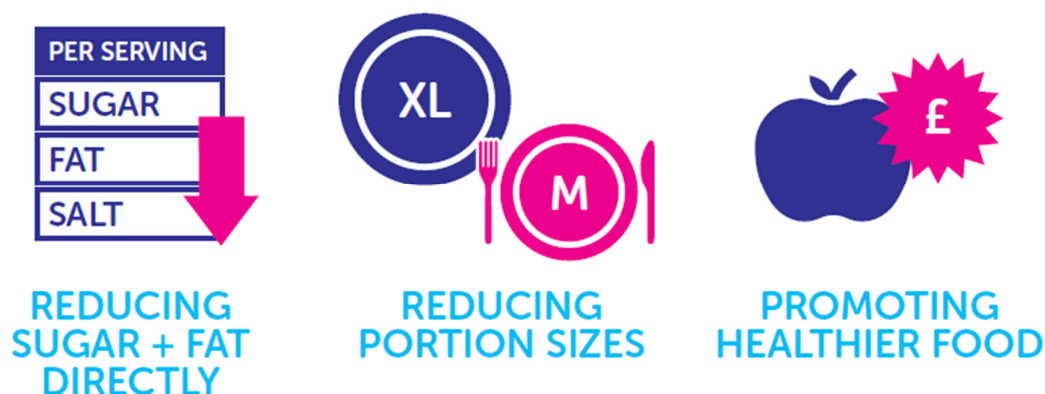
FIGURE 4 FOOD INDUSTRY ACTION

POLICY IMPLICATIONS

This report reinforces the need for a wide-ranging, comprehensive obesity strategy – as outlined by Cancer Research UK and UK Health (2016)(9) – to reduce levels of obesity in the UK by improving peoples' eating habits. The findings from this report suggest that awareness of nutritional guidelines alone is unlikely to curb the obesity epidemic as those who knew the guidelines consumed the most high fat, sugar and salt foods. It is important to consider the variations in consumption, knowledge and physical activity between males and females and different social groups beyond age and socioeconomic status. This knowledge should be used to ensure that inequalities do not increase as a result of policy interventions, even if the overall situation improves. Therefore, targeted approaches for different social groups could be required in addition to population level measures as obesity remains a significant problem across all societal levels.

Alongside targeted measures, population-level interventions and a comprehensive obesity strategy are necessary to improve dietary habits and minimise the negative health consequences of the modern British diet. Public Health England's Sugar Reduction – The Evidence for Action(11) shows that strategies for obesity should include measures to tax sugary soft drinks, restrictions on the marketing and promotion of foods high in sugar, salt and fat, and action to improve the nutritional content of regularly consumed food through reformulation by manufacturers. Such a pragmatic approach can balance the need to shift consumption away from unhealthy foods through market restrictions alongside actively improving the nutritional content of these foods.

This report demonstrates the need for further action on improving the diet of adults. The current 'Sugar Reduction' programme run by Public Health England(32) provides a platform for this. To achieve substantial health improvement across both the child and adult population,

consideration should be given to improving the nutritional quality of foods that are also high in nutrients such as saturated fat and salt and which form a regular part of the diet of adults. In particular, further plans to expand this programme should look at ready meals and takeaways which this report shows are regularly consumed alongside soft drinks and confectionery. Regular consumption of fast food and takeaways highlights the importance of the involvement of the out of home catering sector in reformulation programmes in the UK.

STRENGTHS AND LIMITATIONS

This study provides up to date evidence of the current consumption patterns of soft drinks, confectionery, fast food and takeaways and ready meals as well as the physical activity levels of adults in the UK. Care was taken to ensure the sample was nationally representative of the United Kingdom adult population in terms of age, sex, region of residence and social grade. The levels of obesity, as calculated by self-reported BMI, are lower than those seen in the latest Health Survey for England (HSE, 2015) data (20% vs. 27 %)(5). This could be due to nearly one in 10 participants not reporting their weight.

Evidence suggests that individuals underestimate the amount of food and drink they consume (33, 34). Consequently, the consumption figures reported in this report may be lower than the true figures. Different self-report measures can lead to different results for the amount of exercise respondents report having completed(35, 36), with all self-report measures likely to overestimate the amount and intensity of exercise carried out(37). This could further explain the differences found between the results in this report and those from Health Survey England data. The underestimation of food and soft drink consumption and overestimation of physical activity may mean that the situation for consumption behaviours and physical activity levels may be more severe than this report suggests due to the limitations of self-report measures.

Only the exact correct values for suggested calorie intake (2500 for men and 2000 for women) were coded as being correct for calorie guideline knowledge. However, this excluded respondents who answered with values close to the correct figures. Similarly, the question asked "Do you know how many calories it is recommended someone like you should consume each day?" which may have led to respondents who are trying to lose or gain weight to answer with these values rather than the guideline value.

There are limitations associated with cross-sectional surveys and it is possible that people who are willing to participate in an online survey differ from the general population in ways that were not captured in this study. Furthermore, questions used in the survey did not provide the opportunity to explore the reasons for participant's answers or the meaning they attributed to the questions.

FUTHER WORK

This report follows the Cancer Research UK publication which found that only one in four people were aware of the link between obesity and cancer(10). Future work will explore associations between smoking and alcohol consumption with obesogenic factors. Research has indicated that consumption of alcohol may lead to an increased consumption of confectionery(38), however this research was carried out laboratory setting; there the findings cannot be applied to a wider environment. The data used for the series of reports could allow investigation of this link, as well as potential links between smoking status and food consumption, for the UK population.

APPENDICES

APPENDIX 1 SOURCE OF SURVEY QUESTIONS

Question	Source	Additional notes
Consumption patterns		
2, 3	National Secondary Students' Diet and Activity (NaSSDA) Survey, reported in Scully et al.(28)	Frequency categories were taken from the Scottish Heath Survey
Physical Activity		
4	International Physical Activity Questionnaire(39)	NHS guideline physical activities were used for walking, moderate and vigorous physical activities. Strength exercises were included as an additional category.
Knowledge of calorie/sugar guidelines		
8 – 11	Devised for this survey	An explanation of added or free sugars was taken from the NHS Live Well website: *'Free sugars are any sugars added to food or drinks, or found naturally in honey, syrups and unsweetened fruit juices.'*
12	Devised for this survey	Infographics for each beverage was created by the Cancer Research UK's infographics team.

APPENDIX 2 CONFECTIONARY CONSUMPTION

Confectionary consumption		At least once a day	2 to 6 times a week	Once a week or less	OR	P-value
Total Consumption		31.4%	32.8%	35.9%		
Gender (n=3292)	Male (n=1603)	32.8%	32.9%	34.4%		
	Female (n=1689)	30.0%	32.6%	37.4%		
Age* (n=3294)	18-24 (n=283)	33.2%	33.6%	33.2%		
	25-34 (n=631)	36.0%	32.0%	32.0%	0.977	0.864
	35-44 (n=571)	34.3%	36.3%	29.4%	1.033	0.819
	45-54 (n=562)	28.6%	34.2%	37.2%	1.286	0.070

	55-64 (n=510)	**25.3%**	**35.3%**	**39.4%**	**1.408**	**0.014**
	65+ (n=737)	30.7%	27.5%	41.8%	1.287	0.056
SES* (n=3292)	AB (n=724)	32.6%	34.7%	32.7%		
	C1 (n=988)	32.6%	35.2%	32.2%	1.054	0.561
	C2 (n=493)	32.9%	30.1%	37.0%	1.1	0.383
	DE (n=1087)	**28.7%**	**30.5%**	**40.8%**	**1.301**	**0.003**
Nation* (n=3293)	England (n=2763)	30.0%	33.3%	36.6%		
	Wales (n=158)	36.1%	29.1%	34.8%	0.84	0.263
	Scotland (n=280)	**39.4%**	**30.1%**	**30.5%**	**0.709**	**0.003**
	Northern Ireland (n=92)	39.8%	29.0%	31.2%	0.715	0.092
BMI (n=2918)	Normal weight (n=1327)	33.1%	32.6%	34.3%		
	Overweight (n=944)	29.9%	34.0%	36.1%		
	Obese (n=647)	29.4%	33.6%	37.0%		
Parent* (n=3270)	Parent (n=687)	35.6%	35.3%	29.1%		
	Non-parent (n=2583)	**30.4%**	**32.1%**	**37.5%**	**1.265**	**0.007**
Correct knowledge calorie guidelines (n=2175)	No (n=1167)	27.4%	34.3%	38.3%		
	Yes (n=1008)	31.5%	33.7%	34.7%		
IPAQ* (n=3294)	Inactive (n=1118)	31.1%	29.9%	39.0%		
	Minimally active (n=1756)	**31.9%**	**35.0%**	**33.1%**	**0.866**	**0.046**
	HEPA active (n=420)	29.8%	31.0%	39.3%	1.163	0.164
Unprompted (n=3292)	Not cancer (n=2456)	31.8%	32.1%	36.1%		
	Cancer (n=836)	30.1%	34.8%	35.0%		

APPENDIX 3 READY MEAL CONSUMPTION

Ready Meal Consumption		Once a week or more	1 to 3 times a month	Less than once a month	OR	P-value
Total Consumption (n=3293)		49.9%	20.5%	29.7%		
Gender* (n=3293)	Male (n=1603)	55.6%	19.8%	24.5%		
	Female (n=1690)	**44.4%**	**21.1%**	**34.6%**	**1.653**	**<0.001**
Age* (n=3290)	18-24 (n=282)	61.3%	20.2%	18.4%		
	25-34 (n=631)	**54.5%**	**20.3%**	**25.2%**	**1.448**	**0.010**
	35-44 (n=571)	**56.6%**	**21.0%**	**22.4%**	**1.467**	**0.012**
	45-54 (n=561)	**54.5%**	**18.2%**	**27.3%**	**1.633**	**0.001**
	55-64 (n=509)	**45.6%**	**22.4%**	**32.0%**	**2.157**	**<0.001**
	65+ (n=736)	**35.7%**	**20.7%**	**43.6%**	**3.253**	**<0.001**
SES* (n=3294)	AB (n=725)	47.2%	21.8%	31.0%		
	C1 (n=988)	49.4%	23.9%	26.7%	1.134	0.278
	C2 (n=494)	54.3%	17.4%	28.3%	1.021	0.884
	DE (n=1087)	50.1%	17.8%	32.1%	0.916	0.471
Nation (n=3293)	England (n=2762)	49.1%	20.6%	30.3%		
	Wales (n=44)	55.1%	17.1%	27.8%		
	Scotland (n=74)	52.1%	21.4%	26.4%		
	Northern Ireland (n=24)	55.9%	18.3%	25.8%		
BMI* (n=3003)	Underweight (n=85)	49.4%	22.4%	28.2%		

	Normal weight (n=1327)	49.3%	19.4%	31.3%	1.198	0.412
	Overweight (n=943)	47.0%	22.2%	30.9%	1.179	0.460
	Obese (n=648)	57.3%	17.9%	24.8%	0.829	0.411
Parent* (n=3270)	Parent (n=688)	57.8%	21.8%	20.3%		
	Non-parent (n=2582)	**47.9%**	**20.1%**	**32.0%**	**1.396**	**<0.001**
Correct knowledge calorie guidelines* (n=2176)	No (n=1167)	47.3%	18.9%	33.8%		
	Yes (n=1009)	51.3%	22.9%	25.8%	0.909	0.283
IPAQ* (n=3293)	Inactive (n=1117)	51.7%	18.6%	29.6%		
	Minimally active (n=1756)	51.2%	22.0%	26.8%	1.061	0.427
	HEPA active (n=420)	**39.3%**	**19.0%**	**41.7%**	**2.271**	**<0.001**
Unprompted (n=3293)	Not cancer (n=2457)	50.0%	20.4%	29.6%		
	Cancer (n=836)	49.5%	20.6%	29.9%		

APPENDIX 4 FAST FOOD AND TAKEAWAY CONSUMPTION

Fast food and takeaway		Once a week or more	1 to 3 times a month	Less than once a month	OR	P-value
Total Consumption (n=3293)		16.0%	19.0%	65.0%		
Gender* (n=3293)	Male (n=1604)	19.3%	21.6%	59.1%		
	Female (n=1689)	**12.9%**	**16.6%**	**70.5%**	**1.701**	**<0.001**

Age* (n=3293)	18-24 (n=283)	27.6%	34.6%	37.8%		
	25-34 (n=631)	**26.3%**	**25.5%**	**48.2%**	**1.461**	**0.008**
	35-44 (n=570)	**21.2%**	**23.0%**	**55.8%**	**2.178**	**<0.001**
	45-54 (n=562)	**14.9%**	**19.4%**	**65.7%**	**3.294**	**<0.001**
	55-64 (n=510)	**9.4%**	**15.7%**	**74.9%**	**5.135**	**<0.001**
	65+ (n=737)	**4.2%**	**6.5%**	**89.3%**	**13.486**	**<0.001**
SES* (n=3292)	AB (n=724)	13.1%	18.2%	68.8%		
	C1 (n=988)	18.1%	22.3%	59.6%	0.831	0.098
	C2 (n=494)	**19.0%**	**20.0%**	**60.9%**	**0.672**	**0.003**
	DE (n=1086)	14.6%	16.2%	69.2%	0.89	0.307
Nation (n=3294)	England (n=2763)	15.5%	18.6%	65.9%		
	Wales (n=158)	18.4%	20.9%	60.8%		
	Scotland (n=280)	16.1%	21.8%	62.1%		
	Northern Ireland (n=93)	25.8%	20.4%	53.8%		
BMI* (n=3005)	Underweight (n=85)	16.5%	18.8%	64.7%		
	Normal weight (n=1327)	14.6%	19.0%	66.4%	1.088	0.729
	Overweight (n=944)	14.8%	19.6%	65.6%	0.809	0.392
	Obese (n=649)	**20.6%**	**19.0%**	**60.4%**	**0.577**	**0.029**
Parent* (n=3270)	Parent (n=688)	20.6%	27.0%	52.3%		
	Non-parent (n=2582)	**14.6%**	**17.0%**	**68.4%**	**1.418**	**<0.001**

		At least once a day	2 to 6 times a week	once a week or less		
Correct knowledge calorie guidelines* (n=2174)	No (n=1167)	13.4%	20.1%	66.5%		
	Yes (n=1007)	17.6%	21.4%	61.0%	0.977	0.814
IPAQ (n=3293)	Inactive (n=1117)	15.3%	17.2%	67.5%		
	Minimally active (n=1756)	16.5%	20.4%	63.0%		
	HEPA active (n=420)	15.7%	17.9%	66.4%		
Unprompted (n=3292)	Not cancer (n=2456)	16.3%	19.1%	64.6%		
	Cancer (n=836)	15.1%	18.9%	66.0%		

APPENDIX 5 SOFT DRINK CONSUMPTION

Soft drink		At least once a day	2 to 6 times a week	once a week or less	OR	P-value
Total Consumption (n=3293)		15.2%	11.7%	73.1%		
Gender* (n=3293)	Male (n=1604)	17.3%	14.0%	68.6%		
	Female (n=1689)	**13.1%**	**9.5%**	**77.4%**	1.563	<0.001
Age* (n=3291)	18-24 (n=283)	18.7%	19.4%	61.8%		
	25-34 (n=630)	22.3%	15.4%	62.3%	0.865	0.357
	35-44 (n=570)	17.9%	14.7%	67.4%	1.210	0.244
	45-54 (n=562)	17.6%	12.6%	69.8%	1.368	0.062
	55-64 (n=510)	**9.6%**	**7.1%**	**83.3%**	**2.877**	**<0.001**
	65+ (n=736)	**7.7%**	**5.8%**	**86.4%**	**3.762**	**<0.001**
SES (n=3294)	AB (n=724)	12.6%	10.8%	76.7%		
	C1 (n=988)	14.3%	13.2%	72.6%		
	C2 (n=495)	16.4%	10.9%	72.7%		
	DE (n=1087)	17.2%	11.4%	71.4%		
Nation* (n=3292)	England (n=2763)	14.3%	11.5%	74.2%		

	Wales (n=158)	22.8%	13.3%	63.9%	0.838	0.452
	Scotland (n=279)	17.9%	12.1%	70.0%	0.898	0.562
	Northern Ireland (n=92)	20.4%	14.0%	65.6%	0.731	0.305
BMI* (n=3003)	Underweight (n=85)	20.0%	12.9%	67.1%		
	Normal weight (n=1326)	10.9%	12.3%	76.8%		
	Overweight (n=944)	13.0%	12.2%	74.8%		
	Obese (n=648)	22.5%	11.3%	66.2%		
Parent* (n=3271)	Parent (n=688)	20.3%	12.5%	67.2%		
	Non-parent (n=2583)	13.9%	11.5%	74.6%	1.211	0.070
Correct knowledge calorie guidelines* (n=2175)	No (n=1167)	12.5%	8.7%	78.8%		
	Yes (n=1008)	12.7%	14.8%	72.4%	0.888	0.275
IPAQ* (n=3292)	Inactive (n=1116)	17.8%	10.1%	72.1%		
	Minimally active (n=1756)	12.9%	13.1%	74.0%	1.131	0.203
	HEPA active (n=420)	17.9%	10.0%	72.1%	1.162	0.280
Unprompted* (n=3292)	Not cancer (n=2456)	16.5%	11.9%	71.6%		
	Cancer (n=836)	11.2%	11.2%	77.5%	1.112	0.369

APPENDIX 6 CALORIE GUIDELINE KNOWLEDGE

Calorie guidelines		Incorrect	Correct	OR	P-value
Total (n=2175)		53.7%	46.3%		
Gender (n=2174)	Male (n=956)	54.5%	45.5%		
	Female (n=1218)	53.0%	47.0%		
Age* (n=2176)	18-24 (n=199)	45.2%	54.8%		
	25-34 (n=488)	43.2%	56.8%	1.084	0.635
	35-44 (n=390)	46.2%	53.8%	0.962	0.823
	45-54 (n=381)	**60.9%**	**39.1%**	**0.53**	**<0.001**
	55-64 (n=316)	**61.7%**	**38.3%**	**0.513**	**<0.001**
	65+ (n=402)	**64.7%**	**35.3%**	**0.449**	**<0.001**
SES (n=2173)	AB (n=541)	55.1%	44.9%		
	C1 (n=686)	53.1%	46.9%		
	C2 (n=316)	53.2%	46.8%		
	DE (n=630)	53.3%	46.7%		
Nation (n=2175)	England (n=1818)	54.2%	45.8%		
	Wales (n=106)	51.9%	48.1%		
	Scotland (n=192)	48.4%	51.6%		
	Northern Ireland (n=59)	57.6%	42.4%		
BMI (n=2004)	Underweight (n=45)	40.0%	60.0%		
	Normal weight (n=839)	52.3%	47.7%		
	Overweight (n=647)	53.9%	46.1%		
	Obese (n=473)	56.2%	43.8%		
Parent (n=2163)	Parent (n=482)	50.8%	49.2%		
	Non-parent (n=1681)	54.5%	45.5%		

Correct knowledge calorie guidelines	No Yes				
IPAQ (n=2174)	Inactive (n=682)	55.6%	44.4%		
	Minimally active (n=1202)	52.7%	47.3%		
	HEPA active (n=290)	53.1%	46.9%		
Unprompted (n=2175)	Not cancer (n=1525)	54.0%	46.0%		
	Cancer (n=650)	52.9%	47.1%		

APPENDIX 7 PHYSICAL ACTIVITY LEVELS

Physical activity levels		Inactive	Minimally Active	HEPA active	OR	P-value
Total (n=3293)		33.9%	53.3%	12.8%		
Gender* (n=3293)	Male (n=1604)	29.0%	56.5%	14.5%		
	Female (n=1605)	**38.6%**	**50.3%**	**11.1%**	**0.660**	**<0.001**
Age* (n=3295)	18-24 (n=283)	20.5%	59.4%	20.1%		
	25-34 (n=631)	30.4%	50.2%	19.3%	0.765	0.076
	35-44 (n=571)	**33.8%**	**50.4%**	**15.8%**	**0.649**	**0.005**
	45-54 (n=562)	**37.5%**	**52.5%**	**10.0%**	**0.500**	**<0.001**
	55-64 (n=511)	**31.7%**	**59.7%**	**8.6%**	**0.554**	**<0.001**
	65+ (n=737)	**40.8%**	**52.0%**	**7.2%**	**0.398**	**<0.001**
SES* (n=3293)	AB (n=724)	32.0%	54.8%	13.1%		
	C1 (n=988)	29.9%	55.4%	14.8%	1.045	0.688
	C2 (n=494)	34.8%	51.4%	13.8%	0.961	0.742
	DE (n=1087)	38.5%	51.3%	10.2%	0.838	0.074
Nation (n=3292)	England (n=2763)	33.5%	54.0%	12.6%		
	Wales (n=158)	40.5%	44.3%	15.2%		
	Scotland (n=279)	31.5%	54.5%	14.0%		

					OR	P-value
	Northern Ireland (n=92)	42.4%	46.7%	10.9%		
BMI* (n=3003)	Underweight (n=85)	37.6%	38.8%	23.5%		
	Normal weight (n=1326)	25.5%	59.3%	15.2%	1.202	0.426
	Overweight (n=944)	28.8%	57.3%	13.9%	1.107	0.664
	Obese (n=648)	**54.3%**	**38.4%**	**7.3%**	**0.403**	**<0.001**
Parent (n=3270)	Parent (n=688)	33.0%	51.7%	15.3%		
	Non-parent (n=2582)	34.1%	53.9%	12.0%		
Correct knowledge calorie guidelines (n=2174)	No (n=1167)	32.5%	54.3%	13.2%		
	Yes (n=1007)	30.1%	56.4%	13.5%		
Unprompted* (n=3294)	Not cancer (n=2457)	36.4%	51.3%	12.3%		
	Cancer (n=837)	**26.5%**	**59.1%**	**14.3%**	**1.393**	**<0.001**

APPENDIX 8 BMI

BMI Category		Underweight	Normal	Overweight / Obese	OR	P-value
Total (n=3003)		2.8%	44.2%	53.0%		
Gender* (n=3003)	Male (n=1497)	2.0%	40.4%	57.5%		
	Female (n=1506)	**3.7%**	**47.9%**	**48.5%**	**0.606**	**<0.001**
Age* (n=3004)	18-24 (n=248)	6.0%	67.3%	26.7%		
	25-34 (n=577)	**3.1%**	**54.2%**	**42.6%**	**1.65**	**0.002**
	35-44 (n=513)	**4.1%**	**45.4%**	**50.5%**	**1.968**	**<0.001**
	45-54 (n=507)	**1.0%**	**36.9%**	**62.1%**	**3.417**	**<0.001**
	55-64	**2.5%**	**35.5%**	**61.9%**	**3.753**	**<0.001**

		2.0%	37.8%	60.2%	3.576	<0.001
	(n=476)					
	65+ (n=683)	**2.0%**	**37.8%**	**60.2%**	**3.576**	**<0.001**
SES* (n=3004)	AB (n=675)	3.1%	43.7%	53.2%		
	C1 (n=900)	3.3%	48.2%	48.4%	1.003	0.98
	C2 (n=454)	2.2%	42.5%	55.3%	1.194	0.165
	DE (n=975)	2.5%	41.5%	56.0%	1.148	0.191
Nation (n=3003)	England (n=2510)	2.8%	44.8%	52.4%		
	Wales (n=148)	3.4%	40.5%	56.0%		
	Scotland (n=260)	3.5%	40.0%	56.6%		
	Northern Ireland (n=85)	1.2%	44.7%	54.2%		
BMI	Underweight					
	Normal weight					
	Overweight					
	Obese					
Parent* (n=2983)	Parent (n=643)	2.2%	39.8%	58.0%		
	Non-parent (n=2340)	**3.0%**	**45.2%**	**51.8%**	**0.639**	**<0.001**
Correct knowledge calorie guidelines (n=2004)	No (n=1072)	1.7%	41.0%	57.4%		
	Yes (n=932)	2.9%	42.9%	54.2%		
IPAQ* (n=3003)	Inactive (n=994)	3.2%	34.0%	62.8%		
	Minimally active (n=1609)	**2.1%**	**48.9%**	**49.1%**	**0.646**	**<0.001**
	HEPA active (n=400)	**5.0%**	**50.5%**	**44.6%**	**0.487**	**<0.001**
Unprompted (n=3003)	Not cancer (n=2218)	2.8%	43.1%	54.1%		
	Cancer (n=785)	2.8%	47.1%	50.1%		

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